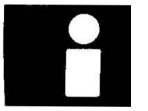
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ACURA

MDX

Service Manual 01-02

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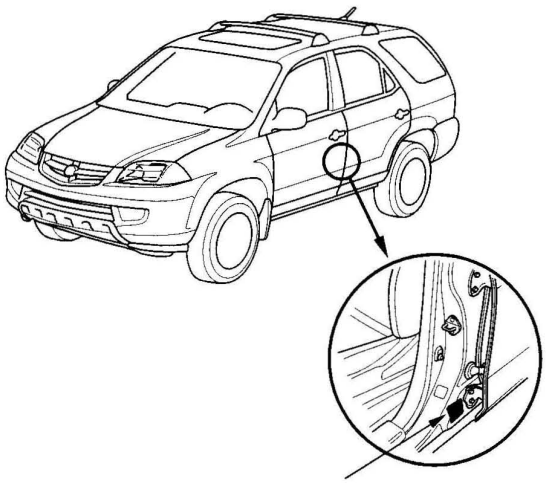
Chassis and Paint Codes - U.S. Model

Vehicle Identification Number

2HN YD1 8 2 * 1 H 500001

a b c d e f g h

a. **Manufacturer, Make, and Type of Vehicle**
   2HN: HONDA OF CANADA MFG.,
   HONDA CANADA INC.
   ACURA, Sports Utility Vehicle
b. **Line, Body, and Engine Type**
   YD1: MDX/J35A3
c. **Body Type and Transmission Type**
   8: 5-door/5-speed Automatic
d. **Vehicle Grade (Series)**
   2: MDX
   4: MDX with Navigation System
   6: Touring
   8: Touring with Navigation System
e. **Check Digit**
f. **Model Year**
   1: 2001
   2: 2002
g. **Factory Code**
   H: Ontario Factory in Canada
h. **Serial Number**



Vehicle Identification Number and Federal Motor Vehicle Safety Standard Certification.

Engine Number

J35A3 - 1000001

a b

a. **Engine Type**
   J35A3: 3.5 ℓ SOHC VTEC Sequential Multiport Fuel-injected engine
b. **Serial Number**

Transmission Number

MGHA- 1000001

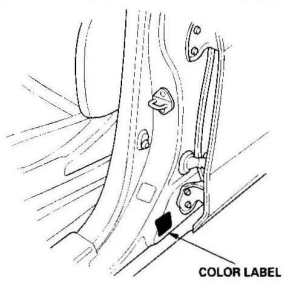
a b

a. **Transmission Type**
   BGHA: 5-speed Automatic
   MGHA: 5-speed Automatic
b. **Serial Number**

Paint Code

Code (2001 Model)	Color
B-92P	Nighthawk Black Pearl
G-501M	Granite Green Metallic
G-87P	Dark Emerald Pearl
NH-638M	Starlight Silver Metallic
YR-520M	Mesa Beige Metallic
YR-530P	Deep Mahogany Pearl

Code (2002 Model)	Color
B-92P/B-92PX	Nighthawk Black Pearl
BG-50M	Huvasu Blue
G-501M	Granite Green Metallic
NH-578	Taffeta White
NH-638M	Starlight Silver Metallic
R-519P	Reorock Pearl
YR-520M	Mesa Beige Metallic
YR-530P	Deep Mahogany Pearl



BACK

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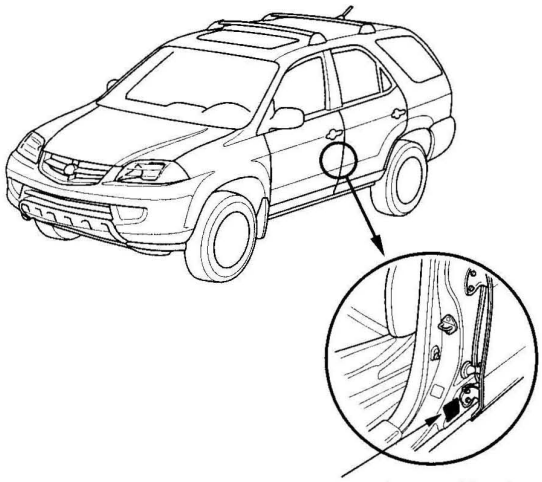
Chassis and Paint Codes - Canada Model

Vehicle Identification Number

2HN YD1 8 6 * 1 H 000001

a b c d e f g h

a. Manufacturer, Make, and Type of Vehicle
2HN: HONDA OF CANADA MFG.,
HONDA CANADA INC.
ACURA, Sports Utility Vehicle
b. Line, Body, and Engine Type
YD1: MDX/J35A3
c. Body Type and Transmission Type
8: 5-door/5-speed Automatic
d. Vehicle Grade (Series)
6: PREMIUM
e. Check Digit
f. Model Year
1: 2001
2: 2002
g. Factory Code
H: Ontario Factory in Canada
h. Serial Number



Vehicle Identification Number and Canadian Motor Vehicle Safety Standard Certification.

Engine Number

J35A3 - 1000001

a b

a. Engine Type
J35A3: 3.5 ℓ SOHC VTEC Sequential Multiport Fuel-injected engine
b. Serial Number

Transmission Number

MGHA- 1000001

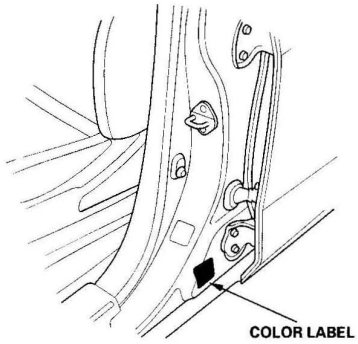
a b

a. Transmission Type
BGHA: 5-speed Automatic
MGHA: 5-speed Automatic
b. Serial Number

Paint Code

Code (2001 Model)	Color
B-92P	Nighthawk Black Pearl
G-501M	Granite Green Metallic
G-87P	Dark Emerald Pearl
NH-638M	Starlight Silver Metallic
YR-520M	Mesa Beige Metallic
YR-530P	Deep Mahogany Pearl

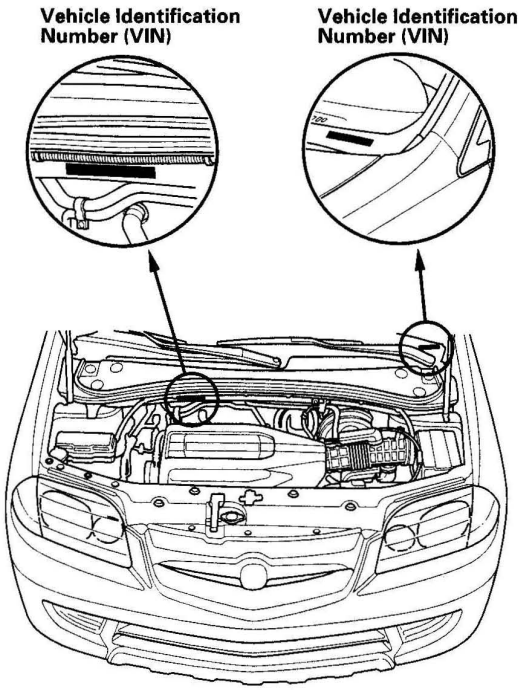
Code (2002 Model)	Color
B-92P	Nighthawk Black Pearl
G-510P	Evergreen Pearl
NH-638M	Starlight Silver Metallic
YR-520M	Mesa Beige Metallic
YR-530P	Deep Mahogany Pearl

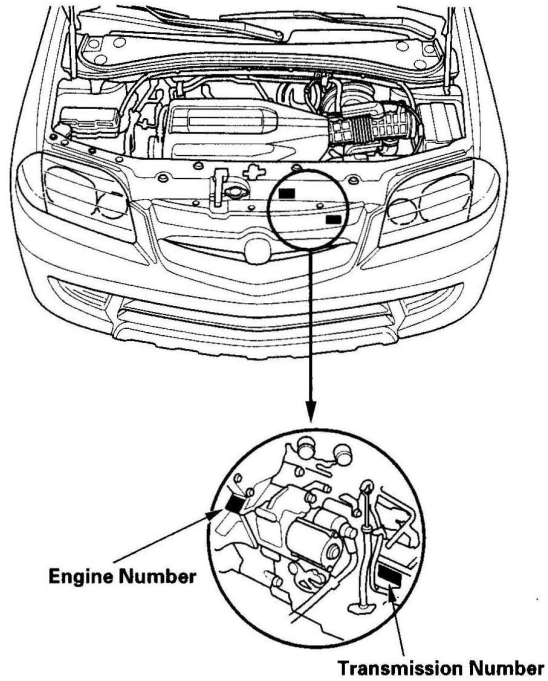


BACK

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Identification Number Locations

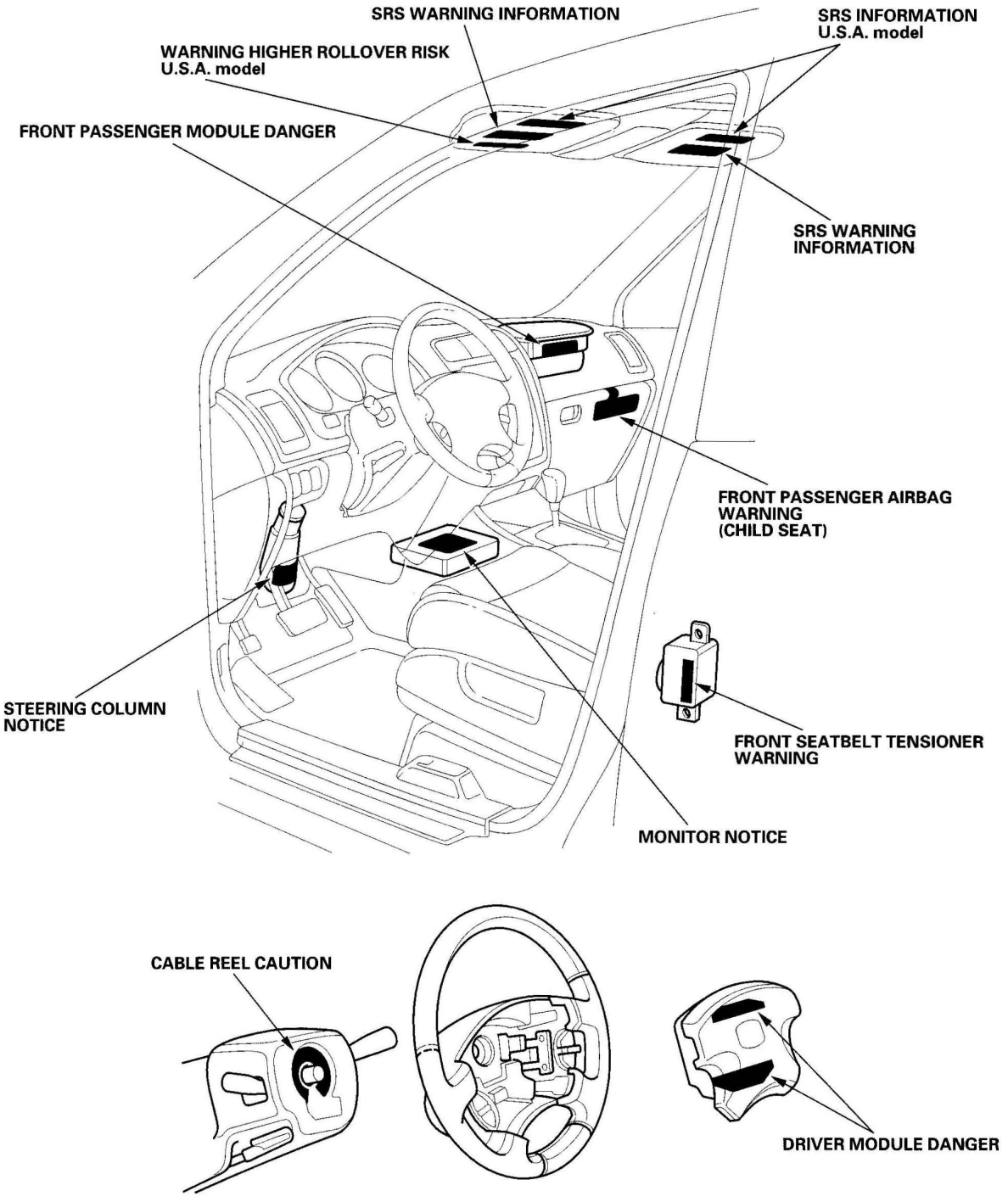




BACK

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Warning/Caution Label Locations

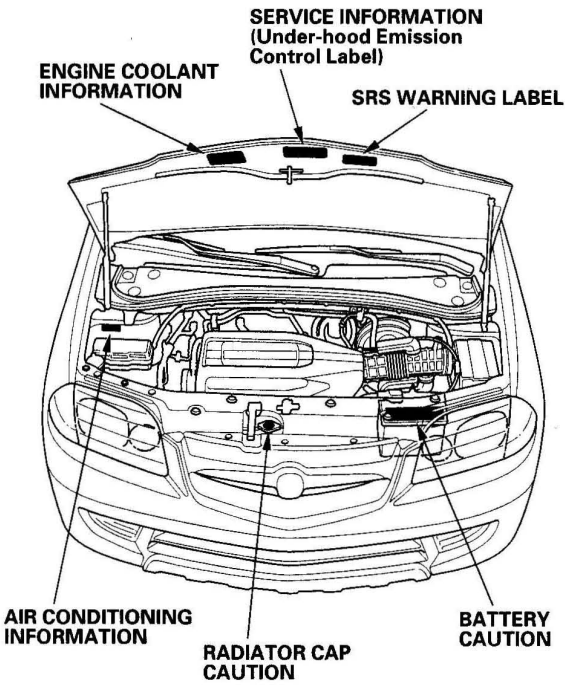


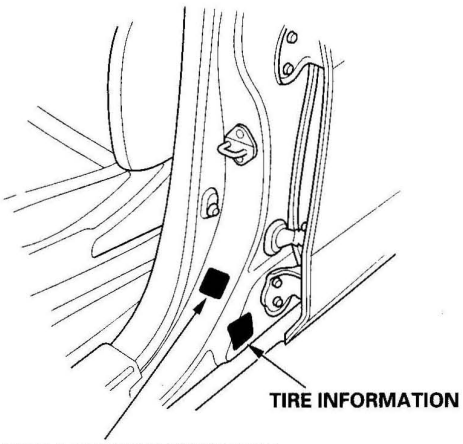
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BACK

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Warning/Caution Label Locations (cont'd)





SIDE AIRBAG INFORMATION
Located on driver's doorjamb and passenger's doorjamb (not shown)

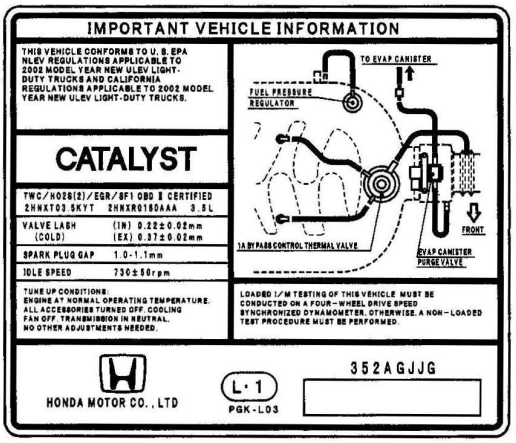
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Under-hood Emission Control Label

Emission Group Identification

Example:



2001 Model:
50 State ULEV

THIS VEHICLE CONFORMS TO U.S. EPA NLEV REGULATIONS APPLICABLE TO 2001 MODEL YEAR NEW ULEV LIGHT-DUTY TRUCKS AND CALIFORNIA REGULATIONS APPLICABLE TO 2001 MODEL YEAR NEW ULEV LIGHT-DUTY TRUCKS.

CANADIAN TIER 1

THIS VEHICLE CONFORMS TO U.S. EPA NLEV REGULATIONS AND CANADIAN TIER 1 STANDARDS FOR 2001 MODEL YEAR NEW LIGHT-DUTY TRUCKS.

2002 Model:
50 State ULEV and CANADIAN TIER 1

THIS VEHICLE CONFORMS TO U.S. EPA NLEV REGULATIONS AND CANADIAN TIER 1 STANDARDS APPLICABLE TO 2002 MODEL YEAR NEW ULEV LIGHT-DUTY TRUCKS AND CALIFORNIA REGULATIONS APPLICABLE TO 2002 MODEL YEAR NEW ULEV LIGHT-DUTY TRUCKS.

Engine and Evaporative Families

Engine Family:

2 HNX T 03.5 KYT
a b c d e

a. **Model Year**
   1: 2001
   2: 2002
b. **Manufacturer Subcode**
   HNX: HONDA
c. **Family Type**
   T: LDT
d. **Displacement**
e. **Sequence Characters**

Evaporative Family:

2 HNX R 0160 AAA
a b c d e

a. **Model Year**
   1: 2001
   2: 2002
b. **Manufacturer Subcode**
   HNX: HONDA
c. **Family Type**
   R: EVAP/ORVR
d. **Canister Work Capacity**
e. **Sequence Characters**

BACK

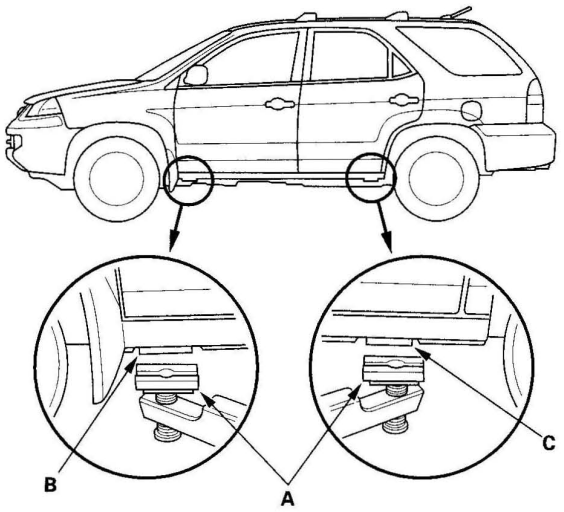
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Lift and Support Points

NOTE: If you are going to remove heavy components such as suspension or the fuel tank from the rear of the vehicle, first support the front of the vehicle with tall safety stands. When substantial weight is removed from the rear of the vehicle, the center of gravity can change and cause the vehicle to tip forward on the hoist.

Frame Hoist

1. Position the hoist lift blocks (A), or safety stands, under the vehicle's front support points (B) and rear support points (C).



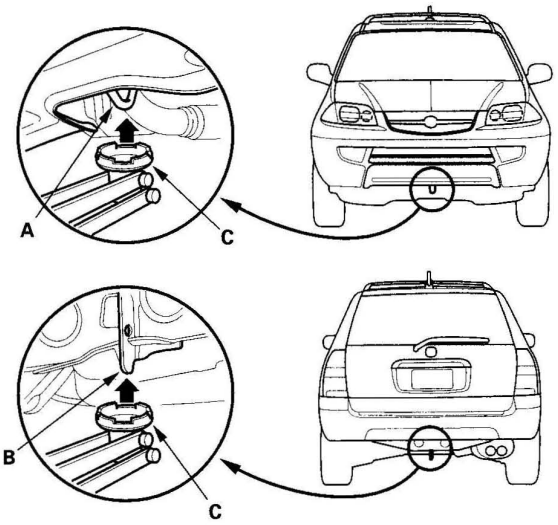
2. Raise the hoist a few inches, and rock the vehicle gently to be sure it is firmly supported.
3. Raise the hoist to full height, and inspect the lift points for solid contact with the lift blocks.

Safety Stands

To support the vehicle on safety stands, use the same support points (B and C) as for a frame hoist. Always use safety stands when working on or under any vehicle that is supported only by a jack.

Floor Jack

1. Set the parking brake.
2. Block the wheels that are not being lifted.
3. When lifting the rear of the vehicle, put the shift lever in P position.
4. Position the floor jack under the front jacking bracket (A) or rear jacking bracket (B), center the jack lift platform (C), on the jacking bracket and jack up the vehicle high enough to fit the safety stands under it.



5. Position the safety stands under the support points and adjust them so the vehicle will be level.
6. Lower the vehicle onto the stands.

BACK

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Towing

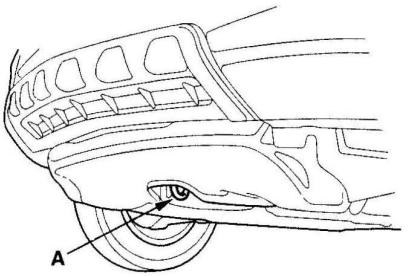
If the vehicle needs to be towed, call a professional towing service. Never tow the vehicle behind another vehicle with just a rope or chain. It is very dangerous.

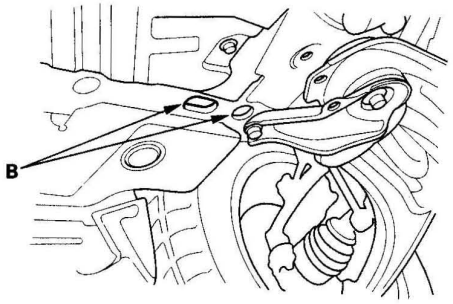
Emergency Towing
There are three popular methods of towing a vehicle.

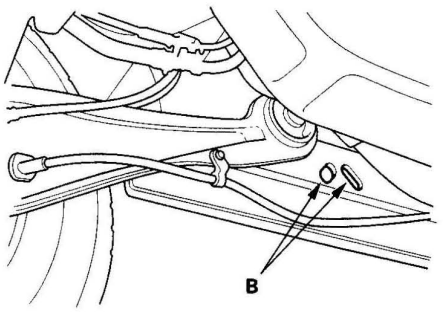
Flat-bed Equipment— The operator loads the vehicle on the back of a truck. **This is the only way of transporting the vehicle.**

To accommodate flat-bed equipment, the vehicle is equipped with a towing hook (A) and tie down hook slots (B).

The towing hook can be used with a winch to pull the vehicle onto the truck, and the tie down hook slots can be used to secure the vehicle to the truck.







Wheel Lift Equipment— The tow truck uses two pivoting arms that go under the tires (front or rear) and lift them off the ground. The other two wheels remain on the ground. **This method of towing the MDX is unacceptable.**

Sling-type Equipment— The tow truck uses metal cables with hooks on the ends. These hooks go around parts of the frame or suspension, and the cables lift that end of the vehicle off the ground. The vehicle's suspension and body can be seriously damaged if this method of towing is attempted. **This method of towing the MDX is unacceptable.**

The only recommended way of towing the MDX is on a flat-bed truck.

NOTICE

- Towing the MDX with only two wheels on the ground will damage parts of the 4WD system. If this vehicle is damaged, it should be towed on a flat-bed truck or trailer.
- Trying to lift or tow the vehicle by the bumpers will cause serious damage. The bumpers are not designed to support the vehicle's weight.

For non-emergency towing information, refer to the owner's manual.

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Parts Marking

To deter vehicle theft, certain major components are marked with the vehicle identification number (VIN). Original parts have self-adhesive labels. Replacement body parts have generic self-adhesive labels. The original engine or transmission VIN plate is transferred to a replacement engine or transmission and attached with break-off bolts.

NOTE: Be careful not to damage the parts marking labels during body repair. Mask the labels before repairing the part.

Precautions for Real-time 4WD (Four-wheel Drive)

Under normal conditions, the vehicle is in 2WD (front-wheel drive). However, the system will instantly transmit appropriate driving force to the rear wheels (depending on the driving force of the front wheels and the road conditions).

The Real-time 4WD-Dual Pump System does not have a manual switch to disable the 4WD system. Whenever service work requires spinning the front or rear wheels with the engine, always lift up and support the vehicle so all four wheels are off the ground.

BACK

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Standards and Service Limits

Engine Electrical

Item	Measurement	Qualification	Standard or New	Service Limit
Ignition coil	Rated voltage		12 V	
	Firing order		1−4−2−5−3−6	
Spark plug	Type		NGK: PZFR5F-11 DENSO: PKJ16CR-L11	
	Gap		1.0−1.1 mm (0.039−0.043 in.)	1.3 mm (0.051 in.)
Ignition timing		At idle (check the *red* mark)	A/T (in [N] or [P]): 10±2°BTDC at 730±50 rpm	
Alternator compressor belt	Tension adjustment		Auto adjuster type	
Alternator	Output	At 13.5 V and normal engine temperature	130 A	
	Coil (rotor) resistance	at 68°F (20°C)	2.3−2.7 kΩ	
	Slip ring O.D.		14.2−14.4 mm (0.56−0.57 in.)	13.8 mm (0.54 in.)
	Brush length		10.5 mm (0.41 in.)	1.5 mm (0.06 in.)
	Brush spring tension		2.94−3.53 N (0.30−0.36 kgf, 0.66−0.80 lbf)	
Starter	Output		1.6 kW	
	Commutator mica depth		0.4−0.5 mm (0.016−0.020 in.)	0.15 mm (0.006 in.)
	Commutator runout		0.02 mm (0.001 in.) max.	0.05 mm (0.002 in.)
	Commutator O.D.		28.0−28.1 mm (1.102−1.106 in.)	27.5 mm (1.083 in.)
	Brush length		15.8−16.2 mm (0.62−0.64 in.)	11.0 mm (0.43 in.)
	Brush spring tension (new)		15.7−17.7 N (1.60−1.80 kgf, 3.53−3.97 lbs)	

Engine Assembly

Item	Measurement	Qualification	Standard or New	Service Limit
Compression	Pressure Check at 200 rpm with wide open throttle. (See Design Specs for ratio.)	Minimum	990 kPa (10.1 kgf/cm², 145 psi)	———
		Maximum variation	200 kPa (2.0 kgf/cm², 28 psi)	———

BACK

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Cylinder Head

Item	Measurement	Qualification	Standard or New	Service Limit
Head	Warpage		———	0.05 mm (0.002 in.)
	Height		120.95—121.05 mm (4.762—4.766 in.)	———
Camshaft	End play		0.05—0.20 mm (0.002—0.008 in.)	0.20 mm (0.008 in.)
	Camshaft-to-holder oil clearance		0.050—0.089 mm (0.0020—0.0035 in.)	0.15 mm (0.006 in.)
	Total runout		0.03 mm (0.001 in.) max.	0.04 mm (0.002 in.)
	Cam lobe height	Intake, primary	34.737 mm (1.3676 in.)	———
		Intake, mid	36.445 mm (1.4348 in.)	———
		Intake, secondary	34.919 mm (1.3748 in.)	———
		Exhaust	36.326 mm (1.4302 in.)	———
Valves	Clearance (cold)	Intake	0.20—0.24 mm (0.008—0.009 in.)	———
		Exhaust	0.28—0.32 mm (0.011—0.0125 in.)	———
	Stem O.D.	Intake	5.485—5.495 mm (0.2159—0.2163 in.)	5.455 mm (0.2148 in.)
		Exhaust	5.450—5.460 mm (0.2146—0.2150 in.)	5.420 mm (0.2134 in.)
	Stem-to-guide clearance	Intake	0.020—0.045 mm (0.0008—0.0018 in.)	0.08 mm (0.003 in.)
		Exhaust	0.055—0.080 mm (0.0022—0.0031 in.)	0.12 mm (0.005 in.)
Valve seats	Width	Intake	1.25—1.55 mm (0.049—0.061 in.)	2.00 mm (0.079 in.)
		Exhaust	1.25—1.55 mm (0.049—0.061 in.)	2.00 mm (0.079 in.)
	Stem installed height	Intake	46.75—47.55 mm (1.841—1.872 in.)	47.80 mm (1.882 in.)
		Exhaust	46.68—47.48 mm (1.838—1.869 in.)	47.73 mm (1.879 in.)
Valve springs	Free length	Intake	51.54 mm (2.029 in.)	———
		Exhaust	51.06 mm (2.010 in.)	———
Valve guides	I.D.	Intake	5.515—5.530 mm (0.2171—0.2177 in.)	5.55 mm (0.219 in.)
		Exhaust	5.515—5.530 mm (0.2171—0.2177 in.)	5.55 mm (0.219 in.)
	Installed height	Intake	21.20—22.20 mm (0.835—0.874 in.)	———
		Exhaust	20.63—21.63 mm (0.812—0.852 in.)	———
Rocker arms	Arm-to-shaft clearance	Intake	0.026—0.067 mm (0.0010—0.0026 in.)	0.067 mm (0.0026 in.)
		Exhaust	0.026—0.077 mm (0.0010—0.0030 in.)	0.077 mm (0.0030 in.)

BACK

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Standards and Service Limits

Engine Block

Item	Measurement	Qualification	Standard or New	Service Limit
Block	Warpage of deck		0.07 mm (0.003 in.) max.	0.10 mm (0.004 in.)
	Bore diameter		89.000–89.015 mm (3.5039–3.5045 in.)	89.065 mm (3.5065 in.)
	Bore taper		———	0.05 mm (0.002 in.)
	Reboring limit		———	0.5 mm (0.02 in.)
Piston	Skirt O.D. at 16.0 mm (0.63 in.) from bottom of skirt		88.975–88.985 mm (3.5029–3.5033 in.)	88.965 mm (3.5026 in.)
	Clearance in cylinder		0.015–0.040 mm (0.0006–0.0016 in.)	0.08 mm (0.003 in.)
	Ring groove width	Top	1.240–1.250 mm (0.0488–0.0492 in.)	1.27 mm (0.050 in.)
		Second	1.220–1.230 mm (0.0480–0.0484 in.)	1.25 mm (0.049 in.)
		Oil	2.805–2.825 mm (0.1104–0.1112 in.)	2.85 mm (0.112 in.)
Piston rings	Ring-to-groove clearance	Top	0.055–0.080 mm (0.0022–0.0031 in.)	0.13 mm (0.005 in.)
		Second	0.030–0.055 mm (0.0012–0.0022 in.)	0.13 mm (0.005 in.)
	Ring end gap	Top	0.20–0.35 mm (0.008–0.014 in.)	0.60 mm (0.024 in.)
		Second	0.40–0.55 mm (0.0016–0.022 in.)	0.70 mm (0.028 in.)
		Oil	0.20–0.70 mm (0.008–0.028 in.)	0.80 mm (0.031 in.)
Piston pin	O.D.		21.962–21.965 mm (0.8646–0.8648 in.)	21.954 mm (0.8643 in.)
	Pin-to-piston clearance		−0.0050–+0.0010 mm (−0.00020–+0.00004 in.)	0.004 mm (0.0002 in.)
Connecting rod	Pin-to-rod clearance		0.005–0.014 mm (0.0002–0.0006 in.)	0.019 mm (0.0007 in.)
	Small-end bore diameter		21.970–21.976 mm (0.8650–0.8652 in.)	———
	Large-end bore diameter	Nominal	58.0 mm (2.28 in.)	———
	End play installed on crankshaft		0.15–0.35 mm (0.006–0.014 in.)	0.45 mm (0.018 in.)
Crankshaft	Main journal diameter		71.976–72.000 mm (2.8337–2.8346 in.)	———
	Rod journal diameter		54.976–55.000 mm (2.1644–2.1654 in.)	———
	Rod/main journal taper		0.005 mm (0.0002 in.) max.	0.010 mm (0.0004 in.)
	Rod/main journal out-of-round		0.005 mm (0.0002 in.) max.	0.010 mm (0.0004 in.)
	End play		0.10–0.35 mm (0.004–0.014 in.)	0.45 mm (0.018 in.)
	Runout		0.020 mm (0.0008 in.) max.	0.03 mm (0.0012 in.)
Crankshaft bearings	Main bearing-to-journal oil clearance		0.020–0.044 mm (0.0008–0.0017 in.)	0.050 mm (0.0020 in.)
	Rod bearing clearance		0.020–0.044 mm (0.0008–0.0017 in.)	0.050 mm (0.0020 in.)

BACK

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Engine Lubrication

Item	Measurement	Qualification	Standard or New	Service Limit
Engine oil	Capacity		5.5 ℓ (5.8 US qt, 4.8 Imp qt) for engine overhaul 4.7 ℓ (5.0 US qt, 4.1 Imp qt) for oil change, including filter 4.3 ℓ (4.5 US qt, 3.8 Imp qt) for oil change, without filter	
Oil pump	Inner-to-outer rotor clearance		0.04 – 0.16 mm (0.002 – 0.006 in.)	0.20 mm (0.008in.)
	Pump housing-to-outer rotor clearance		0.14 – 0.19 mm (0.006 – 0.007 in.)	0.20 mm (0.008 in.)
	Pump housing-to-outer rotor axial clearance		0.02 – 0.07 mm (0.001 – 0.003 in.)	0.12 mm (0.005 in.)
	Oil pressure with oil temperature at 176°F (80°C)	at idle	70 kPa (0.7 kgf/cm², 10 psi)	
		at 3,000 rpm	490 kPa (5.0 kgf/cm², 71 psi)	

Cooling

Item	Measurement	Qualification	Standard or New	Service Limit
Radiator	Coolant capacity (includes engine, heater, hoses, and reservoir)	Engine overhaul	8.7 ℓ (9.2 US qt, 7.6 Imp qt)	
		Coolant change	7.6 ℓ (8.0 US qt, 6.7 Imp qt)	
Reservoir	Coolant capacity		0.6 ℓ (0.6 US qt, 0.5 Imp qt)	
Radiator cap	Opening pressure		93 – 123 kPa (0.95 – 1.25 kgf/cm², 14 – 18 psi)	
Thermostat	Opening temperature	Begins to open	168 – 176°F (76 – 80°C)	
		Fully open	194°F (90°C)	
	Valve lift at fully open		10.0 mm (0.39 in.) min.	
Radiator fan switch	Thermoswitch "ON" temperature		205 – 216°F (96 – 102°C)	
	Thermoswitch "OFF" temperature		Subtract 5 – 23°F (3 – 13°C) from actual "ON" temperature	
	Fan timer "ON" temperature		212 – 226°F (100 – 108°C)	
	Fan timer "OFF" temperature		Subtract 5 – 23°F (3 – 13°C) from actual "ON" temperature	

Fuel and Emissions

Item	Measurement	Qualification	Standard or New	Service Limit
Fuel pressure regulator	Pressure with regulator vacuum hose disconnected		330 – 380 kPa (3.4 – 3.9 kgf/cm², 48 – 55 psi)	
Fuel tank	Capacity		72.7 ℓ (19.2 US gal, 16.0 Imp gal)	
Engine idle	Idle speed with headlights and radiator fan off	In N or P	730 ± 50 rpm	
	Idle CO %		0.1 max.	

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Standards and Service Limits

Automatic Transmission and Differential

Item	Measurement	Qualification	Standard or New	Service Limit
ATF (Automatic Transmission Fluid)	Capacity	Use Honda ATF-Z1	For fluid change: 3.0 ℓ (3.2 US qt, 2.6 Imp qt) For overhaul: 7.8 ℓ (8.2 US qt, 6.9 Imp qt)	
ATF pressure	Line pressure	At 2,000 rpm in N or P position	900–960 kPa (9.2–9.8 kgf/cm², 130–140 psi)	850 kPa (8.7 kgf/cm², 120 psi)
	5th clutch pressure	At 2,000 rpm in D5 position	890–970 kPa (9.1–9.9 kgf/cm², 130–140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	4th clutch pressure	At 2,000 rpm in D4 position	890–970 kPa (9.1–9.9 kgf/cm², 130–140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	3rd clutch pressure	At 2,000 rpm in D3 position	890–970 kPa (9.1–9.9 kgf/cm², 130–140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	2nd clutch pressure	At 2,000 rpm in 2 position	890–970 kPa (9.1–9.9 kgf/cm², 130–140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	1st clutch pressure	At 2,000 rpm in 1 position	890–970 kPa (9.1–9.9 kgf/cm², 130–140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	1st-hold clutch pressure	At 2,000 rpm in 1 position	760–830 kPa (7.7–8.5 kgf/cm², 110–120 psi)	710 kPa (7.2 kgf/cm², 100 psi)
Torque converter	Stall speed	Check with vehicle on level ground		2,250–2,550 rpm
Clutches	Clutch end-plate-to-top-disc clearance	1st		1.1–1.3 mm (0.043–0.051 in.)
		2nd		0.85–1.05 mm (0.033–0.041 in.)
		3rd		0.7–0.9 mm (0.028–0.035 in.)
		4th, 5th		0.55–0.75 mm (0.022–0.030 in.)
		1st-hold		0.5–0.9 mm (0.020–0.035 in.)
	Clutch return spring free length	1st	68.3 mm (2.69 in.)	66.3 mm (2.61 in.)
		2nd	53.4 mm (2.10 in.)	51.4 mm (2.02 in.)
		3rd	52.0 mm (2.05 in.)	50.0 mm (1.97 in.)
		4th, 5th	33.5 mm (1.32 in.)	31.5 mm (1.24 in.)
	Clutch disc thickness		1.94 mm (0.076 in.)	———
	Clutch plate thickness	1st, 2nd	1.6 mm (0.063 in.)	When discolored
		3rd, 4th	2.3 mm (0.091 in.)	When discolored
		5th	2.0 mm (0.079 in.)	When discolored
		1st-hold	1.8 mm (0.071 in.)	When discolored
	1st clutch end plate thickness	Mark 1	3.10 mm (0.122 in.)	When discolored
		Mark 2	3.20 mm (0.126 in.)	When discolored
		Mark 3	3.30 mm (0.130 in.)	When discolored
		Mark 4	3.40 mm (0.134 in.)	When discolored
		Mark 5	3.50 mm (0.138 in.)	When discolored
		Mark 6	3.60 mm (0.142 in.)	When discolored
		Mark 7	3.70 mm (0.146 in.)	When discolored
		Mark 8	3.80 mm (0.150 in.)	When discolored
		Mark 9	3.90 mm (0.154 in.)	When discolored
	1st-hold clutch end plate thickness		5.00 mm (0.197 in.)	When discolored

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Item	Measurement	Qualification	Standard or New	Service Limit
Clutches	2nd, 4th and 5th clutch end plate thickness	Mark 1	2.10 mm (0.083 in.)	When discolored
		Mark 2	2.20 mm (0.087 in.)	When discolored
		Mark 3	2.30 mm (0.091 in.)	When discolored
		Mark 4	2.40 mm (0.094 in.)	When discolored
		Mark 5	2.50 mm (0.098 in.)	When discolored
		Mark 6	2.60 mm (0.102 in.)	When discolored
		Mark 7	2.70 mm (0.106 in.)	When discolored
		Mark 8	2.80 mm (0.110 in.)	When discolored
		Mark 9	2.90 mm (0.114 in.)	When discolored
	3rd clutch end plate thickness	Mark 1	3.10 mm (0.122 in.)	When discolored
		Mark 2	3.20 mm (0.126 in.)	When discolored
		Mark 3	3.30 mm (0.130 in.)	When discolored
		Mark 4	3.40 mm (0.134 in.)	When discolored
		Mark 6	2.60 mm (0.102 in.)	When discolored
		Mark 7	2.70 mm (0.106 in.)	When discolored
		Mark 8	2.80 mm (0.110 in.)	When discolored
		Mark 9	2.90 mm (0.114 in.)	When discolored
		Mark 0	3.00 mm (0.118 in.)	When discolored
Valve body	Stator shaft needle bearing contact I.D.	Torque converter side	27.000 – 27.021 mm (1.0630 – 1.0638 in.)	When worn or damaged
		ATF pump side	29.000 – 29.021 mm (1.1417 – 1.1426 in.)	When worn or damaged
	ATF pump gear thrust clearance		0.03 – 0.06 mm (0.001 – 0.002 in.)	0.07 mm (0.003 in.)
	ATF pump gear-to-body clearance	Drive gear	0.210 – 0.265 mm (0.0083 – 0.0104 in.)	———
		Driven gear	0.070 – 0.125 mm (0.0028 – 0.0049 in.)	———
	ATF pump driven gear I.D.		14.016 – 14.034 mm (0.5518 – 0.5525 in.)	When worn or damaged
	ATF pump driven gear shaft O.D.		13.980 – 13.990 mm (0.5504 – 0.5508 in.)	When worn or damaged
Reverse shift fork	Fork finger thickness		5.60 – 6.00 mm (0.220 – 0.236 in.)	5.40 mm (0.213 in.)
Park gear and pawl			———	When worn or damaged
Servo body	Shift fork shaft bore I.D.		14.000 – 14.010 mm (0.5512 – 0.5516 in.)	———
	Shift fork shaft valve bore I.D.		37.000 – 37.039 mm (1.4567 – 1.4582 in.)	37.045 mm (1.4585 in.)
Regulator valve body	Sealing ring contact I.D.		32.000 – 32.025 mm (1.2598 – 1.2608 in.)	32.050 mm (1.2618 in.)
Accumulator body	Sealing ring contact I.D.		35.000 – 35.025 mm (1.3780 – 1.3789 in.)	35.05 mm (1.3799 in.)
Stator shaft	Sealing ring contact I.D.		29.000 – 29.021 mm (1.1417 – 1.1426 in.)	29.050 mm (1.1437 in.)

BACK

Protected by AR

Standards and Service Limits

Automatic Transmission and Differential (cont'd)

Item	Measurement	Qualification	Standard or New	Service Limit
Mainshaft	Diameter of needle bearing contact area	at stator shaft	22.984–23.000 mm (0.9049–0.9055 in.)	When worn or damaged
		at 4th gear	52.975–52.991 mm (2.0856–2.0863 in.)	When worn or damaged
		at 5th gear collar	33.975–33.991 mm (1.3376–1.3382 in.)	When worn or damaged
	I.D. of 4th gear		59.000–59.019 mm (2.3228–2.3236 in.)	When worn or damaged
	I.D. of 5th gear		40.000–40.016 mm (1.5748–1.5754 in.)	When worn or damaged
	End play of 4th gear		0.03–0.31 mm (0.001–0.012 in.)	———
	End play of 5th gear		0.10–0.22 mm (0.004–0.009 in.)	———
	41 x 73 mm thrust shim thickness	No. 1	7.85 mm (0.309 in.)	When worn or damaged
		No. 2	7.90 mm (0.311 in.)	When worn or damaged
		No. 3	7.95 mm (0.313 in.)	When worn or damaged
		No. 4	8.00 mm (0.315 in.)	When worn or damaged
		No. 5	8.05 mm (0.317 in.)	When worn or damaged
		No. 6	8.10 mm (0.319 in.)	When worn or damaged
	Thrust washer thickness	27 x 47 x 5 mm	5.00 mm (0.197 in.)	When worn or damaged
	Length of 5th gear collar		58.5–58.6 mm (2.303–2.307 in.)	———
	5th gear collar flange thickness		4.45–4.60 mm (0.175–0.181 in.)	When worn or damaged
	Sealing ring thickness	32 mm sealing ring	1.87–1.97 mm (0.074–0.078 in.)	1.800 mm (0.071 in.)
		29 mm sealing ring	1.87–1.97 mm (0.074–0.078 in.)	1.800 mm (0.071 in.)
	Width of sealing ring groove		2.025 – 2.060 mm (0.080 – 0.081 in.)	2.080 mm (0.082 in.)
	Clutch feed pipe O.D.	4th clutch	5.97 – 5.98 mm (0.2350 – 0.2354 in.)	5.95 mm (0.2343 in.)
		5th clutch	11.47 – 11.48 mm (0.4516 – 0.4520 in.)	11.45 mm (0.4508 in.)
	Clutch feed pipe bushing I.D.	4th clutch	6.018 – 6.030 mm (0.2369 – 0.2374 in.)	6.045 mm (0.2380 in.)
		5th clutch	11.500 – 11.518 mm (0.4528 – 0.4535 in.)	11.530 mm (0.4539 in.)

BACK

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Item	Measurement	Qualification	Standard or New	Service Limit
Countershaft	Diameter of needle bearing contact area	at 5th gear	34.975—34.991 mm (1.3770—1.3776 in.)	When worn or damaged
		at 2nd gear	39.979—40.000 mm (1.574—1.575 in.)	When worn or damaged
		at park gear	41.964—41.980 mm (1.6521—1.6528 in.)	When worn or damaged
		at right end	38.505—38.515 mm (1.5159—1.5163 in.)	When worn or damaged
	I.D. of 5th gear		41.000—41.016 mm (1.6142—1.6148 in.)	When worn or damaged
	I.D. of 3rd gear		50.000—50.016 mm (1.9685—1.9691 in.)	When worn or damaged
	I.D. of reverse gear		46.000—46.016 mm (1.8110—1.8116 in.)	When worn or damaged
	End play of 1st gear		0.00—0.33 mm (0.000—0.013 in.)	———
	End play of 5th gear		0.04—0.27 mm (0.002—0.011 in.)	———
	End play of 3rd gear		0.015—0.045 mm (0.0006—0.0018 in.)	———
	End play of reverse gear		0.10—0.25 mm (0.004—0.010 in.)	———
	31 x 63.5 x 8.5 mm splined washer	A	3.503—3.515 mm (0.1379—0.1384 in.)	When worn or damaged
		B	3.490—3.502 mm (0.1374—0.1379 in.)	When worn or damaged
		C	3.477—3.489 mm (0.1369—0.1374 in.)	When worn or damaged
		D	3.464—3.476 mm (0.1364—0.1369 in.)	When worn or damaged
	Length of distance collar	35 x 47 x 45.6	45.56—45.60 mm (1.794—1.795 in.)	———
		35 x 47 x 7.8	5.92—5.96 mm (0.233—0.235 in.)	———
	Cotter thickness		1.99—2.02 mm (0.078—0.080 in.)	———
	Reverse selector hub O.D.		55.87—55.90 mm (2.1996—2.2008 in.)	When worn or damaged
	Clutch feed pipe O.D.		8.97—8.98 mm (0.353—0.354 in.)	8.95 mm (0.352 in.)
	Clutch feed pipe bushing I.D.		9.000—9.015 mm (0.354—0.355 in.)	9.030 mm (0.356 in.)

BACK

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Standards and Service Limits

Automatic Transmission and Differential (cont'd)

Item	Measurement	Qualification	Standard or New	Service Limit
Secondary shaft	Diameter of needle bearing contact area	at 1st gear	37.978–37.993 mm (1.4951–1.4958 in.)	When worn or damaged
		at 2nd gear	33.986–33.999 mm (1.3380–1.3385 in.)	When worn or damaged
	I.D. of 1st gear		44.000–44.016 mm (1.7323–1.7329 in.)	When worn or damaged
	I.D. of 2nd gear		40.000–40.016 mm (1.5748–1.5754 in.)	When worn or damaged
	End play of 1st gear		0.07–0.15 mm (0.003–0.006 in.)	———
	End play of 2nd gear		0.04–0.12 mm (0.002–0.005 in.)	———
	38 x 56.5 mm splined washer thickness	No. 1	6.85 mm (0.270 in.)	When worn or damaged
		No. 2	6.90 mm (0.272 in.)	When worn or damaged
		No. 3	6.95 mm (0.274 in.)	When worn or damaged
		No. 4	7.00 mm (0.276 in.)	When worn or damaged
		No. 5	7.05 mm (0.278 in.)	When worn or damaged
		No. 6	7.10 mm (0.280 in.)	When worn or damaged
	37 x 55 mm thrust shim thickness	No. 1	4.90 mm (0.193 in.)	When worn or damaged
		No. 2	4.95 mm (0.195 in.)	When worn or damaged
		No. 3	5.00 mm (0.197 in.)	When worn or damaged
		No. 4	5.05 mm (0.199 in.)	When worn or damaged
		No. 5	5.10 mm (0.201 in.)	When worn or damaged
		No. 6	5.15 mm (0.203 in.)	When worn or damaged
		No. 7	5.20 mm (0.205 in.)	When worn or damaged
	Cotter thickness		1.99–2.02 mm (0.078–0.080 in.)	———
	Sealing ring thickness		1.890–1.950 mm (0.074–0.077 in.)	1.800 mm (0.071 in.)
	Width of sealing ring groove		2.025–2.060 mm (0.080–0.081 in.)	2.080 mm (0.082 in.)
	Clutch feed pipe O.D.		7.97–7.98 mm (0.3138–0.3142 in.)	7.95 mm (0.3130 in.)
	Clutch feed pipe bushing I.D.		8.000–8.015 mm (0.3150–0.3156 in.)	8.030 mm (0.3161 in.)
Reverse idler gear	Diameter of needle bearing contact area	at reverse idler gear shaft	13.990–14.000 mm (0.5508–0.5512 in.)	When worn or damaged
	End play		0.06–0.38 mm (0.002–0.015 in.)	———
	I.D.		18.007–18.020 mm (0.7089–0.7094 in.)	When worn or damaged
	Thrust washer thickness	Transmission housing side	0.96–1.04 mm (0.038–0.041 in.)	———
		Reverse idler gear shaft holder side	0.97–1.05 mm (0.038–0.041 in.)	———
	I.D. of reverse idler gear shaft holder		14.006–14.024 mm (0.5514–0.5521 in.)	When worn or damaged
	I.D. of transmission housing of reverse idler gear shaft contact area		14.006–14.024 mm (0.5514–0.5521 in.)	———

BACK

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Item	Measurement	Qualification	Standard or New			
			Wire Diameter	O.D.	Free Length	No. of Coils
Main valve body springs (see page 14-203)	Shift valve D spring		0.7 mm (0.028 in.)	6.6 mm (0.260 in.)	33.7 mm (1.327 in.)	11.6
	Shift valve C spring		0.8 mm (0.031 in.)	6.6 mm (0.260 in.)	49.1 mm (1.933 in.)	21.7
	Kick-down valve spring		0.8 mm (0.031 in.)	6.6 mm (0.260 in.)	49.1 mm (1.933 in)	21.7
	Modulator valve spring		1.6 mm (0.063 in.)	10.4 mm (0.409 in.)	33.5 mm (1.319 in)	9.8
	Relief valve spring		1.2 mm (0.047 in.)	11.1 mm (0.437 in.)	39.0 mm (1.535 in.)	9.9
	Lock-up shift valve spring		0.9 mm (0.035 in.)	7.6 mm (0.299 in.)	63.0 mm (2.480 in.)	22.4
	Cooler check valve spring		0.6 mm (0.024 in.)	5.8 mm (0.228 in.)	14.5 mm (0.571 in.)	6.8
	Torque converter check valve spring		1.2 mm (0.047 in.)	8.6 mm (0.339 in.)	35.1 mm (1.382 in.)	14.3
	Servo control valve spring		0.9 mm (0.035 in.)	6.4 mm (0.252 in.)	32.5 mm (1.280 in.)	17.5
	Reverse CPC valve spring		0.7 mm (0.028 in.)	6.1 mm (0.240 in)	17.8 mm (0.701 in.)	7.9
Regulator valve body springs (see page 14-206)	Stator reaction spring		5.5 mm (0.217 in.)	37.4 mm (1.472 in.)	30.3 mm (1.193 in.)	2.1
	Regulator valve spring A		1.9 mm (0.075 in.)	14.7 mm (0.579 in.)	80.6 mm (3.173 in.)	16.1
	Regulator valve spring B		1.4 mm (0.055 in.)	8.8 mm (0.346 in.)	44.0 mm (1.732 in.)	12.0
	Lock-up control valve spring		0.7 mm (0.028 in.)	6.6 mm (0.260 in.)	42.9 mm (1.689 in.)	14.2
	Lock-up timing valve spring		0.65 mm (0.026 in.)	6.6 mm (0.260 in.)	34.8 mm (1.370 in.)	15.6
Servo body springs (see page 14-207)	CPC valve B spring		0.7 mm (0.028 in.)	6.1 mm (0.240 in.)	17.8 mm (0.701 in.)	7.9
	CPC valve A spring		0.7 mm (0.028 in.)	6.1 mm (0.240 in.)	17.8 mm (0.701 in.)	7.9
	Shift valve B spring		0.8 mm (0.031 in.)	6.6 mm (0.260 in.)	49.1 mm (1.933 in.)	21.7
	Shift valve A spring		0.8 mm (0.031 in.)	6.6 mm (0.260 in.)	49.1 mm (1.933 in.)	21.7
Top accumulator body springs (see page 14-208)	Shift valve E spring		0.8 mm (0.031 in.)	7.1 mm (0.280 in.)	49.0 mm (1.929 in.)	17.2
	CPC valve C spring		0.7 mm (0.028 in.)	6.1 mm (0.240 in.)	17.8 mm (0.701 in.)	7.9
	5th accumulator spring A		2.2 mm (0.087 in.)	16.4 mm (0.646 in.)	75.7 mm (2.980 in.)	14.2
	5th accumulator spring B		2.0 mm (0.079 in.)	10.0 mm (0.394 in.)	45.5 mm (1.791 in.)	11.6
	4th/1st-hold accumulator spring		3.4 mm (0.134 in.)	19.6 mm (0.772 in.)	57.4 mm (2.260 in.)	8.4

BACK

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Standards and Service Limits

Automatic Transmission and Differential (cont'd)

Item	Measurement	Qualification	Standard or New			
			Wire Diameter	O.D.	Free Length	No. of Coils
Accumulator body springs (see page 14-209)	1st accumulator spring B		2.3 mm (0.091 in.)	12.6 mm (0.496 in.)	42.0 mm (1.654 in.)	9.9
	1st accumulator spring A		2.4 mm (0.094 in.)	19.5 mm (0.768 in.)	67.7 mm (2.665 in.)	10.2
	2nd accumulator spring B		2.6 mm (0.102 in.)	13.0 mm (0.512 in.)	44.0 mm (1.732 in.)	9.0
	2nd accumulator spring A		2.5 mm (0.098 in.)	19.6 mm (0.772 in.)	57.7 mm (2.272 in)	9.5
3rd accumulator spring (see page 14-210)	3rd accumulator spring		3.1 mm (0.122 in.)	19.6 mm (0.772 in.)	39.4 mm (1.551 in.)	5.5

Item	Measurement	Qualification	Standard or New	Service Limit
A/T differential carrier	Pinion shaft contact area I.D.		18.000 – 18.025 mm (0.7087 – 0.7096 in.)	———
	Carrier-to-pinion shaft clearance		0.013 – 0.054 mm (0.0005 – 0.0021 in.)	0.1 mm (0.004 in.)
	Driveshaft contact area I.D.		30.025 – 30.055 mm (1.182 – 1.183 in.)	———
	Carrier-to-driveshaft clearance		0.045 – 0.096 mm (0.002 – 0.004 in.)	0.13 mm (0.005 in.)
	Carrier-to-intermediate shaft clearance		0.080 – 0.126 mm (0.003 – 0.005 in.)	———
	Tapered roller bearing starting torque (preload)	For new bearing	3.8 – 5.3 N·m (39 – 54 kgf·cm, 34 – 47 lbf·in.)	Adjust
		For used bearing	3.5 – 5.0 N·m (36 – 51 kgf·cm, 31 – 44 lbf·in.)	Adjust
A/T differential pinion gear	Backlash		0.175 – 0.275 mm (0.007 – 0.011 in.)	———
	I.D.		18.042 – 18.066 mm (0.7103 – 0.7113 in.)	———
	Pinion gear-to-pinion shaft clearance		0.055 – 0.095 mm (0.0022 – 0.0037 in.)	0.12 mm (0.005 in.)
Transfer	Diameter of ball bearing contact area on transfer driven gear shaft	Transmission housing side	35.002 – 35.018 mm (1.3780 – 1.3787 in.)	34.95 mm (1.376 in.)
		Torque converter housing side	23.977 – 23.990 mm (0.9440 – 0.9445 in.)	23.92 mm (0.942 in.)
	Diameter of tapered roller bearing contact area on transfer shaft		24.987 – 25.000 mm (0.9837 – 0.9843 in.)	24.93 mm (0.9815 in.)
	Diameter of tapered roller bearing contact area on transfer drive gear (hypoid gear)		45.002 – 45.018 mm (1.7717 – 1.7724 in.)	44.95 mm (1.770 in.)
	Diameter of tapered roller bearing contact area on transfer driven gear (hypoid gear) shaft	Gear side	35.002 – 35.018 mm (1.3780 – 1.3787 in.)	34.95 mm (1.3760 in.)
		Locknut side	27.975 – 27.990 mm (1.1014 – 1.1020 in.)	27.92 mm (1.099 in.)
	Transfer gear backlash		0.06 – 0.16 mm (0.002 – 0.006 in.)	Adjust
	Tapered roller bearing total starting torque (preload)	Includes transfer driven gear starting torque valve	3.89 – 7.26 N·m (39.7 – 74.0 kgf·cm, 34.5 – 64.2 lbf·in.)	Adjust

BACK

Protected by AR

Rear Differential

Item	Measurement	Qualification	Standard or New	Service Limit
Rear differential fluid	Capacity	Use Honda VTM-4 Differential Fluid	Fluid replacement: • Touring, PREMIUM: 2.8 ℓ (3.0 US qt, 2.5 Imp qt) • MDX: 2.6 ℓ (2.7 US qt, 2.3 Imp qt)	

Steering

Item	Measurement	Qualification	Standard or New	Service Limit
Steering wheel	Rotational play measured at outside edge	With engine running	0—10 mm (0—0.39 in.)	————
	Starting load measured at outside edge	With engine running	29 N (3.0 kgf, 6.5 lbf)	If higher, check gearbox and pump.
Gearbox	Angle of rack guide screw loosened from locked position		20° max. Tighten locknut to 25 N·m (2.5 kgf·m, 18 lbf·ft)	
Pump	Output pressure with shut-off valve closed		8,300—8,800 kPa (85—90 kgf/cm², 1,210—1,280 psi)	
Power steering fluid	Capacity	Use Honda power steering fluid	For fluid change: 0.4 ℓ (0.42 US qt, 0.35 Imp qt)	
			For system overhaul: With accessary power steering cooler: 1.26 ℓ (1.33 US qt, 1.11 Imp qt) Without accessary power steering cooler: 1.22 ℓ (1.29 US qt, 1.07 Imp qt)	
Power steering pump belt NOTE: Adjust a *new* belt to the new belt spec, run the engine for 5 minutes, then readjust it to the *used* belt spec.	Deflection with 98 N (10 kgf, 22 lbs) applied mid-way between pulleys		Used belt: 13.0—16.5 mm (0.51—0.65 in.)	
			New belt: 8.5—11.0 mm (0.33—0.43 in.)	
	Tension (measured with belt tension gauge)		Used belt: 390—540 N (40—55 kgf, 88—121 lbf)	
			New belt: 740—880 N (75—90 kgf, 165—198 lbf)	

Suspension

Item	Measurement	Qualification	Standard or New	Service Limit
Wheel alignment	Camber	Front	−0°30′ ± 1°	
		Rear	−0°30′ ± 45′	
	Caster	Front	1°53′ ± 1°	
	Total Toe	Front	0 ± 2 mm (0 ± 1/16 in.)	
		Rear	0 ± 2 mm (0 ± 1/16 in.)	
	Front wheel turning angle	Inside wheel	38°08′	
		Outside wheel	30°19′	
Aluminum wheel	Runout	Axial	0—0.7 mm (0—0.03 in.)	2.0 mm (0.08 in.)
		Radial	0—0.7 mm (0—0.03 in.)	1.5 mm (0.06 in.)
Wheel bearings	End play	Front	0—0.05 mm (0—0.002 in.)	
		Rear	0—0.05 mm (0—0.002 in.)	

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Standards and Service Limits

Brakes

Item	Measurement	Qualification	Standard or New	Service Limit
Parking brake pedal	Distance travelled when pressed with 294 N (30 kgf, 66 lbs) of force		4 to 6 clicks	
Brake pedal	Pedal height (carpet removed)		164 mm (6 7/16 in.)	
	Free play		1—5 mm (1/16—3/16 in.)	
Brake disc	Thickness	Front	27.9—28.1 mm (1.10—1.11 in.)	26.0 mm (1.02 in.)
		Rear	10.9—11.1 mm (0.43—0.44 in.)	9 mm (0.35 in.)
	Runout	Front and rear	————	0.10 mm (0.004 in.)
	Parallelism	Front and rear		0.015 mm (0.0006 in.)
Brake pads	Thickness	Front	10.5—11.5 mm (0.41—0.45 in.)	1.6 mm (0.06 in.)
		Rear	9.5—10.5 mm (0.37—0.41 in.)	9.5—10.5 mm (0.37—0.41 in.)
Parking brake shoe lining	Thickness		4.0 mm (0.16 in.)	1.0 mm (0.04 in.)
Parking brake drum	Inside diameter		209.9 mm—210.0 mm (8.264—8.267 in.)	211.0 mm (8.307 in.)

Air Conditioning

Item	Measurement	Qualification	Standard or New	Service Limit
Refrigerant	Type		HFC-134a (R-134a)	
	Capacity or system	Dual	700—750 g (25—26 oz)	
Refrigerant oil	Type		DENSO: ND-OIL 8 (P/N 38897-PR7-A01AH or 38899-PR7-A01)	
	Capacity of components	Condenser	35 mℓ (1 1/6 fl oz, 1.2 Imp oz)	
		Evaporator (front)	40 mℓ (1 1/3 fl oz, 1.4 Imp oz)	
		Evaporator (rear)	30 mℓ (1 fl oz, 1.1 Imp oz)	
		Each line and hose	10 mℓ (1/3 fl oz, 0.4 Imp oz)	
		Compressor	180 mℓ (6 fl oz, 6.3 Imp oz)	
Compressor (DENSO)	Starter coil resistance	at 68°F (20°C)	3.4—3.8 Ω	
	Pulley-to-pressure plate clearance		0.5±0.15 mm (0.02±0.006 in.)	

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Design Specifications

specs

Item	Measurement	Qualification	Specification
DIMENSIONS	Overall length		4,790 mm (188.6 in.)
	Overall width		1,955 mm (77.0 in.)
	Overall height	MDX	1,745 mm (68.7 in.)
		Touring, PREMIUM	1,810 mm (71.3 in.)
	Wheelbase		2,700 mm (106.3 in.)
	Track	Front	1,685 mm (66.3 in.)
		Rear	1,690 mm (66.5 in.)
	Ground clearance		203 mm (8.0 in.)
	Seating capacity		Seven
WEIGHT (U.S.A.)	Gross Vehicle Weight Rating (GVWR)		5,690 lbs
WEIGHT (CANADA)	Gross Vehicle Weight Rating (GVWR)		2,580 kg
ENGINE	Type		Water-cooled, 4-stroke SOHC VTEC V6 gasoline engine
	Cylinder arrangement		60° V6-cylinder, transverse
	Bore and stroke		89.0 x 93.0 mm (3.50 x 3.66 in.)
	Displacement		3,471 cm^3 (mℓ) (222 cu in.)
	Compression ratio		10.0
	Valve train		Belt driven, SOHC VTEC 4 valves per cylinder
	Ignition system		DLI (Distributorless Ignition)
	Lubrication system		Forced, wet sump, with trochoid pump
	Oil pump displacement	at 6,000 engine rpm	58.4 ℓ (61.7 US qt, 51.4 Imp qt)/minute
	Water pump displacement	at 6,000 engine rpm	172 ℓ (182 US qt, 151 Imp qt)/minute
	Emission system		CAT/ EGR
	Fuel supply system		Honda PGM-FI SMPI
	Fuel required		UNLEADED gasoline with 91 Pump Octane Number or higher
STARTER	Type		Gear reduction
	Normal output		1.6 kW
	Nominal voltage		12 V
	Hour rating		30 seconds
	Direction of rotation		Clockwise as viewed from gear end

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Design Specifications

(cont'd)

Item	Measurement	Qualification	Specification
AUTOMATIC TRANSMISSION	Type		Electronically controlled automatic, 5-speed forward, 1 reverse
	Primary reduction		Direct 1:1
	Gear ratio	1st	2.563
		2nd	1.552
		3rd	1.021
		4th	0.727
		5th	0.520
		Reverse	1.846
	Final reduction	Type	Single helical gear
		Gear ratio	4.428
STEERING	Type		Power-assisted rack and pinion
	Gear ratio		42.3
	Overall ratio		16.9
	Turns, lock-to-lock		3.22
	Steering wheel diameter		380 mm (15.0 in.)
SUSPENSION	Type	Front	Strut with "L" arm
		Rear	Multilink with trailing arm
	Shock absorber	Front	NWS twin tube gas
		Rear	SPV twin tube gas
WHEEL ALIGNMENT	Camber	Front	−0°30′
		Rear	−0°30′
	Caster	Front	1°53′
	Total toe	Front	0 mm (0 in.)
		Rear	0 mm (0 in.)
	SAI at camber (kingpin axis)		11°54′
BRAKES	Type of service brake	Front	Power-assisted self-adjusting ventilated disc
		Rear	Power-assisted self-adjusting solid disk
	Type of parking brake		Foot type mechanical actuating, rear wheels
	Pad friction surface area (swept area)	Front	409.6 cm^2 (63.49 sq in.)
		Rear	225.9 cm^2 (35.01 sq in.)
TIRES	Size of front and rear tires		P235/65 R17 103T
	Size of spare tire		T155/90 D16 110M

BACK

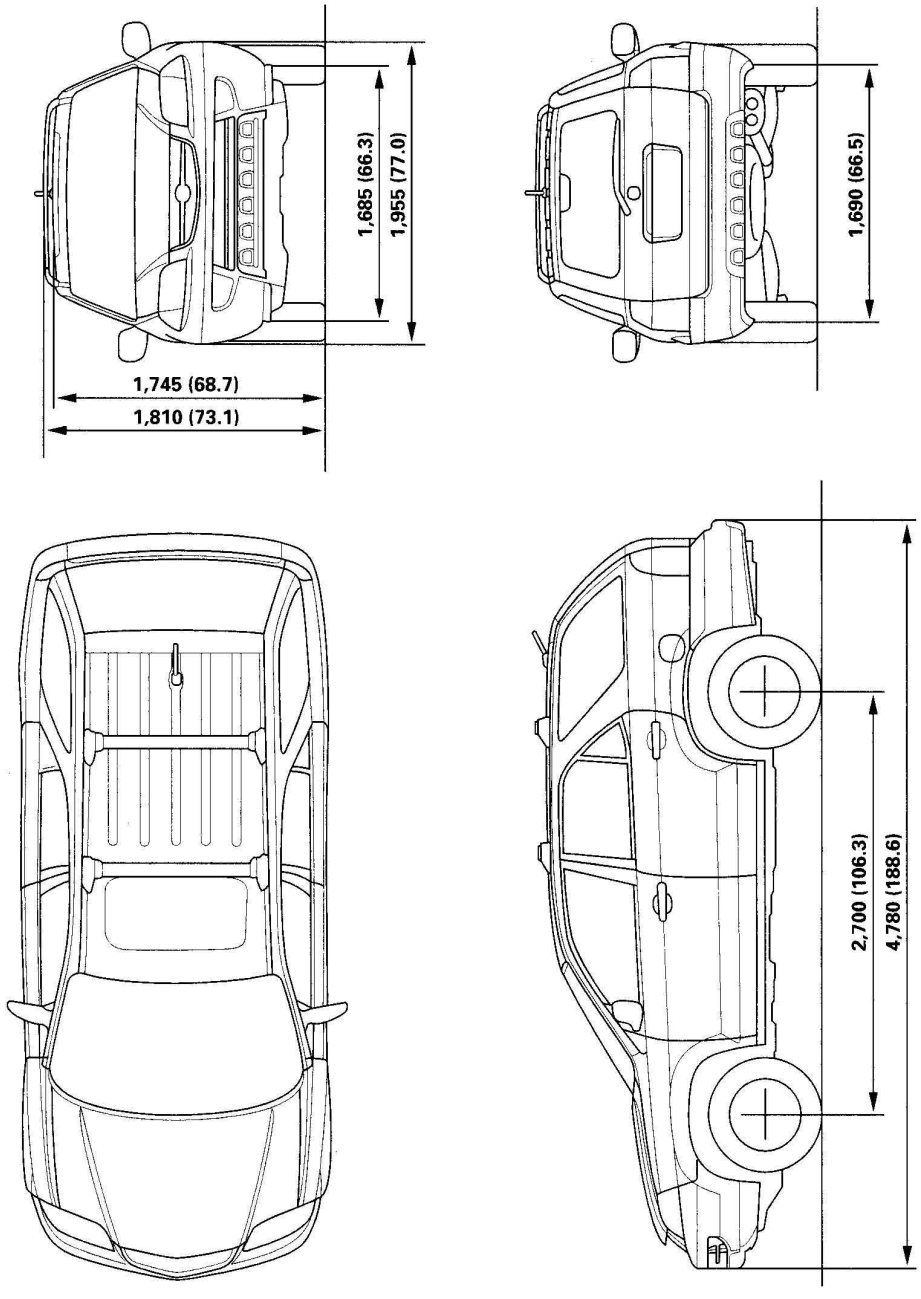
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Item	Measurement	Qualification	Specification
AIR CONDITIONING	Cooling capacity	Front	4,375 Kcal/h (17,300 BTU/h)
		Rear	3,119 Kcal/h (12,400 BTU/h)
	Compressor	Type/Manufacturer	Swash plate/DENSO
		Number of cylinders	10
		Capacity	210 mℓ/rev. (12.81 cu in/rev.)
		Maximum speed	7,600 rpm
		Lubricant capacity	180 mℓ (6 fl oz)
		Lubricant type	ND-OIL 8
	Condenser	Type	Corrugated fin
	Evaporator	Type	Corrugated fin
	Blower	Type	Sirocco fan
		Motor input (Front)	228 W/12 V
		Motor input (Rear)	125 W/12 V
		Speed control (Front)	Infinite variable
		Speed control (Rear: Auto A/C)	Infinite variable
		Speed control (Rear: Manual A/C)	5-speed
		Maximum capacity (Front)	490 m^3/h (17,300 cu ft/h)
		Maximum capacity (Rear)	310 m^3/h (11,000 cu ft/h)
	Temperature control		Air-mix type
	Compressor clutch	Type	Dry, single plate, Poly-V belt drive
		Electrical power consumption at 68°F (20°C)	40 W maximum at 12 V
	Refrigerant	Type	HFC-134 a (R-134 a)
		Quantity (Dual)	700 – 750 g (25 – 26 fl oz)
ELECTRICAL RATINGS	Battery		12 V – 20 AH/5 hours
	Starter		12 V – 1.6 kW
	Alternator		12 V – 130A
	Fuses	Under-hood fuse/relay box	120A, 50A, 40A, 30A, 20A, 15A, 7.5A
		Under-dash driver's fuse/ relay box	30A, 15A, 10A, 7.5A
		Under-dash driver's inline fuse (located above fuse box)	7.5A
		Under-dash passenger's fuse/relay box	30A, 20A, 15A, 10A, 7.5A
	Light bulbs	Headlight high beam	12 V – 60 W (HB3)
		Headlight low beam	12 V – 51 W (HB4)
		Fog light	12 V – 51 W (HB4)
		Front turn signal/Front side marker lights	12 V – 35 W/12 V – 5 W
		Rear turn signal lights	12 V – 27 W
		Brake/Taillights	12 V – 21/5 W
		High mount brake light	12 V – 21 W
		Back-up lights	12 V – 18 W
		License plate light	12 V – 5 W
		Cargo area light	12 V – 5 W
		Vanity mirror lights	12 V – 1.1 W
		Front individual map lights	12 V – 6.2 W
		2nd row map light	12 V – 5 W
		3rd row map light	12 V – 7 W
		Courtesy light	12 V – 3.8 W
		Gauge lights	12 V – 3.0 W, 1.4 W, 1.12 W
		Indicator lights	12 V – LED,14 V – 0.84 W, 1.4 W
		Panel and pilot lights	14 V – 0.7 W
		Front heater control panel lights	14 V – 1.4 W, 10 V – 0.6 W
		Rear heater control panel lights	14 V – 1.12 W

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Body Specifications

Unit: mm (in.)



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Maintenance

Lubricants and Fluids **3-2**

Maintenance Schedule for Normal Conditions
Listed by Distance/Time 3-4

Maintenance Schedule for Severe Conditions
Listed by Distance/Time 3-6

Maintenance Schedule for Normal and Severe Conditions
Listed by Maintenance Item 3-8

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Lubricants and Fluids

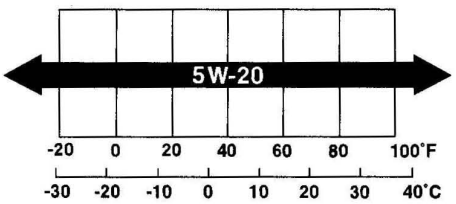
For details of the lubrication points and type of lubricants to be applied, refer to the illustrated index and various work procedures (such as Assembly/Reassembly, Replacement, Overhaul, Installation, etc.) contained in each section.

NO.	LUBRICATION POINTS	LUBRICANT
1	Engine	API Service Grade: Use SJ "Energy Conserving" grade oil. The oil container may also display the API Certification seal shown below. Make sure it says "For Gasoline Engines." SAE Viscosity: See chart below.
2	Transmission	Honda ATF-Z1 (Automatic Transmission Fluid)*1
3	Rear differential	Honda VTM-4 Differential Fluid
4	Brake line (includes ABS line)	Honda DOT 3 Brake Fluid*2
5	Power steering gearbox	Steering grease P/N 08733-B070E
6	Throttle cable end (dashboard lower panel hole)	Silicone grease
7 8 9 10 11	Throttle cable end (throttle link) Brake master cylinder pushrod Pedal linkage Battery terminals Fuel fill lid	Multi-purpose grease
12 13 14 15	Hood hinges and hood latch Tailgate hinges and tailgate latch Door hinges, upper and lower Door opening detent	Honda White Lithium Grease
16	Rear brake calipers	Silicone grease
17	Caliper piston seal, caliper piston boots, caliper pin	
18	Brake line joints (front and rear wheelhouse)	Rust preventives
19	Power steering system	Honda Power Steering Fluid *3
20	Air conditioning compressor	Compressor oil: DENSO: ND-OIL 8 (P/N 38897-PR7-A01 AH or 38899-PR7-A01) For Refrigerant: HFC-134 a (R-134 a)

API CERTIFICATION SEAL



Recommended Engine Oil
Engine oil viscosity for ambient temperature ranges

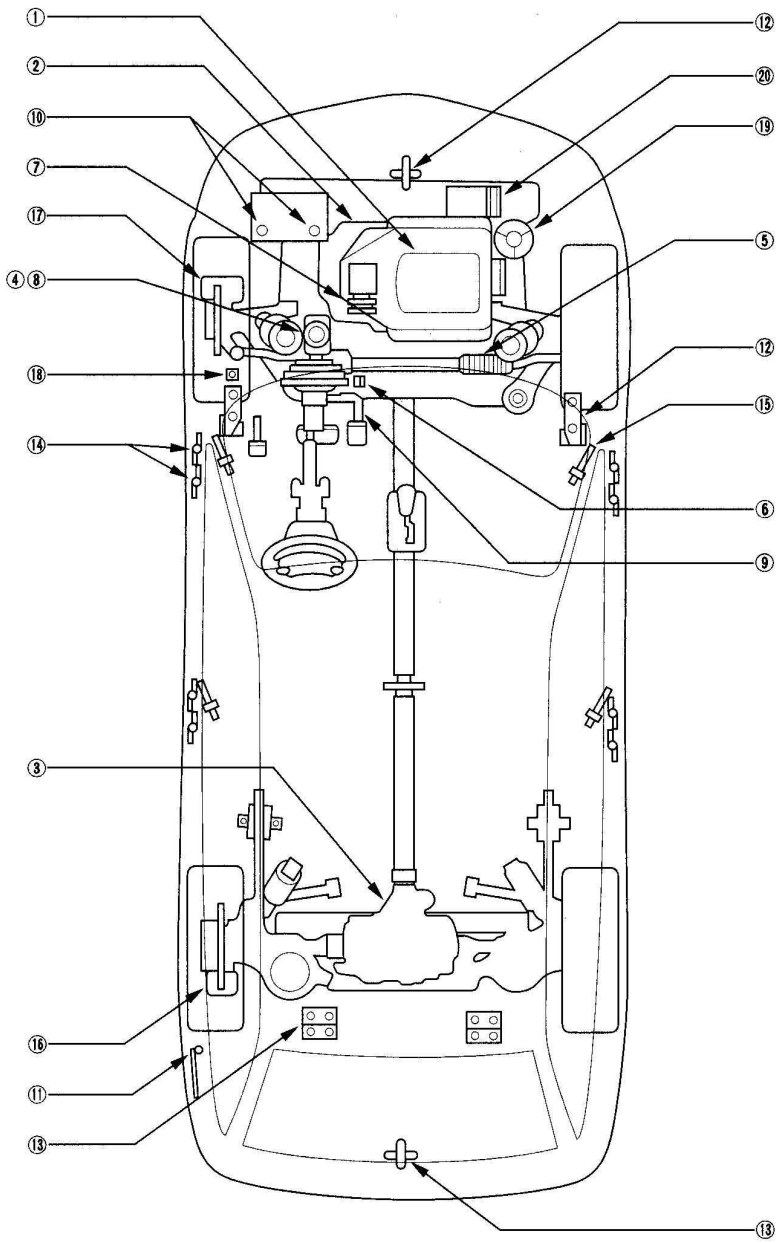


*1: Always use Honda ATF-Z1 (Automatic Transmission Fluid). Using a non-Honda ATF can affect shift quality.
*2: Always use Honda DOT 3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.
*3: Always use Honda Power Steering Fluid. Using any other type of power steering fluid or automatic transmission fluid can cause increased wear and poor steering in cold weather.

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NOTE:
Lubricate all hinges, latches, and locks once a year.
In corrosive areas, more frequent lubrication is necessary.
We recommend Honda White Lithium Grease.



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Maintenance Schedule

Listed by Distance/Time for Normal Conditions

This two-page Maintenance Schedule outlines the minimum required maintenance. Service at the indicated distance or time, whichever comes first. Use the Maintenance Schedule for Severe Conditions if the vehicle meets any of the qualifiers listed in the severe conditions schedule or if the vehicle is normally driven in Canada.
According to state and federal regulations, failure to do the maintenance items marked with asterisk (*) will not void customer's emissions warranties. However, Honda recommends that all maintenance services be done at the recommended interval to ensure long-term reliability.

7,500 mi/ 12,000 km/ —	☐ Do items in A and D.
15,000 mi/ 24,000 km/ 1 year:	☐ Do items in A and B.
22,500 mi/ 36,000 km/—	☐ Do items in A.
30,000 mi/ 48,000 km/ 2 years:	☐ Do items in A, B, C, and D.
37,500 mi/ 60,000 km/ —	☐ Do items in A.
45,000 mi/ 72,000 km/ 3 years:	
☐ Replace transmission fluid. 3.0 ℓ (3.2 US qt, 2.6 Imp qt). Use Honda ATF-Z1 (see page 14-132).	
☐ Do items in A and B.	
— mi/ — km/ 3 years:	☐ Do items in E.
52,500 mi/ 84,000 km/ —	☐ Do items in A.
60,000 mi/ 96,000 km/4 years:	☐ Do items in A, B, C and D.
67,500 mi/108,000 km/ —	☐ Do items in A.
75,000 mi/120,000 km/ 5 years:	
☐ Replace transmission fluid. 3.0 ℓ (3.2 US qt, 2.6 Imp qt). Use Honda ATF-Z1 (see page 14-132).	
☐ Do items in A and B.	
82,500 mi/132,000 km/—	☐ Do items in A.
90,000 mi/144,000 km/ 6 years:	☐ Do items in A, B, C and D.
— mi/— km/ 6 years:	☐ Do items in E.
97,500 mi/156,000 km/ —	☐ Do items in A.
105,000 mi/168,000 km/ 7 years:	
☐ Check valve clearance (see page 6-11).	
☐ Replace spark plugs (see page 4-18). Use NGK (PZFR5F-11) or DENSO (PKJ 16CR-L11). GAP: 1.0 – 1.1 mm (0.039 – 0.043 in)	
☐ Replace timing belt (see page 6-19) and inspect water pump (see page 10-7).	
☐ Check idle speed. It should be 730 ± 50 rpm in [N] or [P] position (see page 11-112).	
☐ Replace transmission fluid. 3.0 ℓ (3.2 US qt, 2.6 Imp qt). Use Honda ATF-Z1 (see page 14-132).	
☐ Do items in A and B.	
112,500 mi/180,000 km/ —	☐ Do items in A.
120,000 mi/192,000 km/ 8 years:	☐ Do items in A, B, C and D.
— mi/— km/ 9 years:	☐ Do items in E.
120,000 mi/192,000 km/ 10 years, then every 60,000 mi/96,000 km/ 5 years:	
☐ Replace engine coolant (see page 10-8). Capacity: 6.6 ℓ (7.0 US qt. 5.8 Imp qt). Use Honda All Season Antifreeze/coolant Type 2.	

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Do the items in parts A, B, C, D and E as required for mileage/time interval listed.

A

- ☐ Replace engine oil (see page 8-5). —Capacity without filter change: 4.3 L (4.5 US qt, 3.8 Imp qt). Capacity with filter change: 4.7 L (5.0 US qt, 4.1 Imp qt)
- ☐ Rotate tires. Follow the pattern shown in the Owner's Manual —Check tire inflation and condition.

B

- ☐ Replace engine oil filter (see page 8-5).
- ☐ Inspect front and rear brakes (see page 19-9).
  - Check pads and discs for wear (thickness), damage, and cracks.
  - Check calipers for damage, leaks, and tightness of mount bolts.
  - Check brake linings for cracking, glazing, wear or contamination.
- ☐ Check parking brake adjustment. It should be fully applied within 4 to 6 clicks.
- ☐ Inspect tie-rod ends, steering gearbox, and boots (see page 17-8).
  - Check rack grease and steering linkage.
  - Check boots for damage and leaking grease.
  - Check fluid line for damage and leaks.
- ☐ Inspect suspension components.
  - Check bolts for tightness.
  - Check condition of ball joint boots for deterioration and damage.
- ☐ Inspect driveshaft boots. Check boots for cracks and boot bands for tightness (see page 16-3).
- ☐ Inspect brake hoses and lines (including ABS). —Check the master cylinder, and ABS modulator for damage and leakage.
- ☐ Check all fluid levels and condition of fluids; check for leaks. If necessary, add ATF (see page 14-131), engine coolant, brake fluid, and windshield washer fluid.
- ☐ Inspect cooling system hoses and connections (see page 10-2).
  - Check for damage, leaks, and deterioration.
  - Check for proper fan operation.
- ☐ Inspect exhaust system* . Check catalytic converter heat shield, exhaust pipe, and muffler for damage, leaks, and tightness (see page 9-4).
- ☐ Inspect fuel lines and connections*. Check for loose connections, cracks and deterioration; retighten loose connections and replace damaged parts (see page 11-121).

C

- ☐ Replace air cleaner element.
- ☐ Inspect and adjust drive belt.
  - Look for cracks and damage, then check belt deflection by pushing on it with 98 N (10 kgf, 22 lbs) midway between the pulleys.
    - P/S pump belt: 13.0—16.5 mm (1/2—5/8 in) (see page 17-12).
- ☐ Replace the dust and pollen filter (see page 21-54).
  - Replace it twice as often (at 15,000 mile interval) if the vehicle is driven mostly in urban areas that have high concentrations of soot in the air from industry and diesel-powered vehicles.
  - Replace it whenever airflow from the heating and cooling/climate control system is less than normal.

D

- ☐ Replace rear differential fluid: MDX 2.6 L (2.7 US qt, 2.3 Imp qt), Touring and PREMIUM 2.8 L (3.0 US qt, 2.5 Imp qt). Use Honda VTM-4 Differential Fluid (see page 15-39).
  NOTE: Rear differential fluid replacement at 7,500 miles (12,000 km) is necessary for proper break-in of the VTM-4 rear differential.

E

- ☐ Replace brake fluid every 3 years (independent of mileage). Use Honda DOT3 Brake Fluid. Fill between marks on reservoir (see page 19-6).

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Maintenance Schedule

Listed by Distance/Time for Severe Conditions

Service at the indicated distance or time, whichever comes first. Use this schedule if the vehicle is driven MAINLY in Canada or in any of the following conditions; if only OCCASIONALLY driven in these conditions, use the Normal Conditions schedule (see page 3-4).
According to state and federal regulations, failure to do the maintenance items marked with asterisk (*) will not void customer's emissions warranties. However, Honda recommends that all maintenance services be done at the recommended interval to ensure long-term reliability.

Severe Driving Conditions

- Less than 5 miles (8 km) per trip, in freezing temperatures, or less than 10 miles (16 km) per trip
- In extremely hot weather (over 90°F/32°C)
- Extensive idling or long periods of stop-and-go driving, such as a taxi or a commercial delivery vehicle
- Trailer towing, driving with a roof-top carrier, or driving in mountainous conditions
- On muddy, dusty, or de-iced roads

3,750 mi/ 6,000 km/6 mo:	☐ Do items in A.
7,500 mi/ 12,000 km/ — 6 mo:	☐ Do items in A, B and E.
11,250 mi/ 18,000 km/ —	☐ Do items in A.
15,000 mi/ 24,000 km/ 1 year:	☐ Do items in A, B, C and E.
18,750 mi/ 30,000 km/ —	☐ Do items in A.
22,500 mi/ 36,000 km/ 1 1/2 years:	☐ Do items in A and B.
26,250 mi/ 42,000 km/ —	☐ Do items in A.
30,000 mi/ 48,000 km/ 2 years:	☐ Do items in A, B, C, D and E.
33,750 mi/ 54,000 km/ —	☐ Do items in A.
37,500 mi/ 60,000 km/2 1/2 years:	☐ Do items in A, and B.
41,250 mi/ 66,000 km/ —	☐ Do items in A.
45,000 mi/ 72,000 km/ 3 years:	☐ Do items in A, B, C and E.
— mi/ — km/ 3 years:	☐ Do items in F.
48,750 mi/ 78,000 km/ —	☐ Do items in A.
52,500mi/ 84,000 km 3 1/2 years:	☐ Do items in A and B.
56,250 mi/ 90,000 km/ —	☐ Do items in A.

60,000 mi/ 96,000 km/ 4 years:

- ☐ Replace timing belt (see page 6-19) and inspect the water pump (see page 10-7) if the vehicle is regularly driven in weather over 110°F (43°C) or under −20°F (−29°C), or if frequently towing a trailer; If not, replace the belt at 105,000 miles (168,000 km).
- ☐ Do items in A, B, C, D and E.

63,750 mi/102,000 km/ —	☐ Do items in A.
67,500 mi/108,000 km 4 1/2 years:	☐ Do items in A and B.
71,250 mi/114,000 km —	☐ Do items in A.
75,000mi/120,000 km/5 years:	☐ Do items in A, B, C and E.
78,750 mi/126,000 km/ —	☐ Do items in A.
82,500 mi/132,000 km/5 1/2 years:	☐ Do items in A and B.
86,250 mi/138,000 km/ —	☐ Do items in A.
90,000 mi/144,000 km/ 6 years:	☐ Do items in A, B, C, D and E.
— mi/— km/ 6 years:	☐ Do items in F.
93,750 mi/150,000 km/ —	☐ Do items in A.
97,500 mi/156,000 km/6 1/2 years:	☐ Do items in A and B.
101,250 mi/162,000 km/ —	☐ Do items in A.

105,000 mi/168,000 km/ 7 years:

- ☐ Check valve clearance (see page 6-11).
- ☐ Replace spark plugs. Use NGK (PZFR5F-11) or DENSO (PKJ16CR-L11). Gap: 1.0−1.1 mm (0.039−0.043 in) (see page 4-18).
- ☐ Replace timing belt (see page 6-19), and inspect the water pump (see page 10-7) only if the belt was not replaced at 60,000 miles (96,000 km).
- ☐ Check idle speed* (see page 11-112): 730±50 rpm in [P] or [N] position.
- ☐ Do items in A, B, C and E.

108,750 mi/174,000 km/ —	☐ Do items in A.
112,500 mi/180,000 km/ 7 1/2 years:	☐ Do items in A and B.
116,250 mi/186,000 km/ —	☐ Do items in A.

120,000 mi/192,000 km/ 8 years:

- ☐ Replace timing belt (see page 6-19) and inspect the water pump (see page 10-7) if the belt was replaced at 60,000 miles (96,000 km) and if the vehicle is regularly driven in weather over 110°F (43°C) or under −20°F (−29°C), or if frequently towing a trailer; If not, replace the belts at 210,000 miles (336,000km).
- ☐ Do items in A, B, C, D and E.

— mi/— km/ 9 years	☐ Do items in F.

120,000 mi/192,000 km/ 10 years, then every 60,000 mi/96,000 km/ 5 years:

- ☐ Replace engine coolant (see page 10-8). Use Honda All Season Antifreeze/coolant Type 2. Capacity: 6.6 ℓ (7.0 US qt, 5.8 Imp qt).

BACK

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Do the items in parts A, B, C, D, E and F as required for mileage/time interval.

A

☐ Replace engine oil and filter (see page 8-5). — Capacity with filter change: 4.7 L (5.0 US qt, 4.1 Imp qt)

B

☐ Inspect front and rear brakes, every 6 months if vehicle is driven less than 7,500 mile per year (see page 19-9).
- Check pads and discs for wear (thickness), damage, and cracks.
- Check calipers for damage, leaks, and tightness of mount bolts.
- Check brake linings for cracking, glazing, wear or contamination.

☐ Rotate tires, if the vehicle has been driven the distance listed. Follow the pattern shown in the Owner's Manual. (Check tire inflation and condition.)

☐ Inspect tie rod ends, steering gearbox, and boots (see page 17-8).
- Check rack grease and steering linkage.
- Check boots for damage and leaking grease.
- Check fluid lines for damage and leaks.

☐ Inspect suspension components.
- Check bolts for tightness.
- Check condition of ball joint boots for deterioration and damage.

☐ Inspect driveshaft boots. Check boots for cracks and boot bands for tightness (see page 16-3).

C

☐ Replace air cleaner element in dusty conditions. Use normal schedule except in dusty conditions.

☐ Check parking brake adjustment. — It should be fully applied within 4 to 6 clicks.

☐ Lubricate all hinges, locks, and latches with Honda white lithium grease.

☐ Inspect brake hoses and lines (including ABS). Check the master cylinder, and ABS modulator for damage and leakage (see page 19-26).

☐ Check fluid levels and condition of fluids; check for leaks. If necessary, add ATF (see page 14-131), engine coolant, brake fluid, power steering fluid, and windshield washer fluid.

☐ Inspect cooling system hoses and connections (see page 10-2).
- Check for damage, leaks, and deterioration.
- Check for proper fan operation.

☐ Inspect exhaust system.* Check catalytic converter heat shield, exhaust pipe, and muffler for damage, leaks, and tightness (see page 9-4).

☐ Inspect fuel lines and connections.* Check for loose connections, cracks and deterioration; retighten loose connections and replace damaged parts (see page 11-121).

☐ Check all lights. Check function of all interior and exterior lights, and the positions of the headlights (see page 22-112).

☐ Inspect the vehicle underbody. Check the paint for damage, scratches, stone chipping, and dents.

D

☐ Inspect and adjust drive belt. Look for cracks and damage, then check tension by pushing on the belt with 98 N (10 kgf, 22 lbs) midway between the pulleys:
- P/S pump belt: 13.0—16.5 mm (1/2—5/8 in) (see page 17-12)

☐ Replace dust and pollen filter, every 15,000 miles if vehicle is driven mostly where air has high concentration of soot from industry and diesel-powered vehicles; also replace it anytime airflow is less than usual (see page 21-54).

☐ Replace transmission fluid 3.0 L (3.2 US qt, 2.6 Imp qt). Use Honda ATF-Z1 (see page 14-132).

E

☐ Replace rear differential fluid: MDX 2.6 L (2.7 US qt, 2.3 Imp qt), Touring and PREMIUM 2.8 L (3.0 US qt, 2.5 Imp qt). Use Honda VTM-4 Differential Fluid (see page 15-39).
NOTE: Rear differential fluid replacement at 7,500 miles (12,000 km) is necessary for proper break-in of the VTM-4 rear differential.

F

☐ Replace brake fluid every 3 years (independent of mileage). Use Honda DOT3 Brake Fluid. Fill between marks on reservoir (see page 19-6).

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Maintenance Schedule for Normal and Severe Conditions

Listed by Maintenance Item

Service at the indicated distance or time, whichever comes first.
- If driven in normal conditions, do items with a dot (●).
- If driven in severe conditions (see page 3-6) or normally driven in Canada, do the circle (○) and dot (●) items.

Service at the indicated distance or time, whichever comes first.	miles x 1000	3.75	7.5	11.25	15	18.75	22.5	26.25	30	33.75	37.5
	km x 1000	6	12	18	24	30	36	42	48	54	60
	years	—	1/2	—	1	—	1 1/2	—	2	—	2 1/2
Replace engine oil		Normal Conditions: Every 7,500 miles (12,000 km) or 1 year Severe Conditions: Every 3,750 miles (6,000 km) or 6 months									
Replace engine oil filter		Normal Conditions: Every 15,000 miles (24,000 km) or 2 years Severe Conditions: Every engine oil change									
Check engine oil and coolant		Check oil and coolant at each fuel stop									
Replace air cleaner element NOTE 1					○				●		
Inspect valve clearance		Adjust only if noisy.									
Replace spark plugs											
Replace timing belt NOTE 2 and inspect water pump											
Inspect and adjust drive belts									●		
Inspect idle speed*											
Replace engine coolant		Every 120,000 miles (192,000 km) or 10 years, then every 60,000 miles (96,000 km) or 5 years									
Replace transmission fluid									○		
Replace VTM-4 rear differential fluid			● NOTE 4		○				●		
Inspect front and rear brakes			○		●		○		●		○
Replace brake fluid		Every 3 years, regardless of mileage									
Check parking brake adjustment					●				●		
Replace dust and pollen filter NOTE 3									●		
Lubricate all hinges, locks, and latches.					○				○		
Rotate tires (Check tire inflation and condition at least once a month)			●		●		●		●		●
Inspect tie-rod ends, steering gearbox, and boots			○		●		○		●		○
Inspect suspension components and driveshaft boots			○		●		○		●		○
Inspect brake hoses and lines (including ABS)					●				●		
Inspect all fluid levels and condition of fluid					●				●		
Inspect cooling system hoses and connection					●				●		
Inspect exhaust system*					●				●		
Inspect fuel lines and connections*					●				●		
Check lights and controls					○				○		
Inspect vehicle underbody					○				○		

NOTE 1: Use normal schedule except in dusty conditions.
NOTE 2: If the vehicle is regularly driven in very hot or cold weather, over 110°F (43°C) or under −20°F (−29°C), or if frequently towing a trailer, replace this belt every 60,000 miles (96,000 km); if not, replace it at 105,000 miles (168,000 km).
NOTE 3: Replace the air conditioning filter every 15,000 miles (24,000 km) if the vehicle is driven mostly where air has a high concentration of soot from industry and diesel-powered vehicle; also replace it anytime airflow is less than usual.
NOTE 4: Rear differential fluid replacement at 7,500 miles (12,000 km) is necessary for proper break-in of the VTM-4 rear differential.

BACK

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41.25	45	48.75	52.5	56.25	60	63.75	67.5	71.25	75	78.75	82.5	86.25	90	93.75	97.5	101.25	105	108.75	112.5	116.25	120
66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	175	181	187	192
—	3	—	3 1/2	—	4	—	4 1/2	—	5	—	5 1/2	—	6	—	6 1/2	—	7	—	7 1/2	—	8
Normal Conditions: Every 7,500 miles (12,000 km) or 1 year Severe Conditions: Every 3,750 miles (6,000 km) or 6 months																					
Normal Conditions: Every 15,000 miles (24,000 km) or 2 years Severe Conditions: Every engine oil change																					
Check oil and coolant at each fuel stop																					
	○				●				○				●				○				●
Adjust only if noisy.																	●				
																	●				
																	●				
					●								●								●
																	●				
Every 120,000 miles (192,000 km) or 10 years, then every 60,000 miles (96,000 km) or 5 years																					
	●				○				●				○				●				○
	○				●				○				●				○				●
	●		○		●		○		●		○		●		○		●		○		●
Every 3 years, regardless of mileage																					
	●				●				●				●				●				●
					●								●								●
	○				○				○				○				○				○
	●		●		●		●		●		●		●		●		●		●		●
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	○				○				○				○				○				○

* According to state and federal regulations, failure to do the maintenance items marked with an asterisk (*) will not void customer's emissions warranties. However, Honda recommends that all maintenance services be done at the recommended interval to ensure long-term reliability.

BACK

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Engine Electrical
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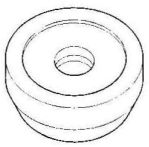
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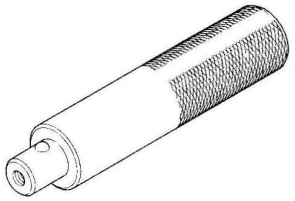
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Special Tools

Number	Tool Number	Description	Qty
①	07746-0010400	Driver Attachment, 52 x 55 mm	1
②	07749-0010000	Handle Driver	1



①

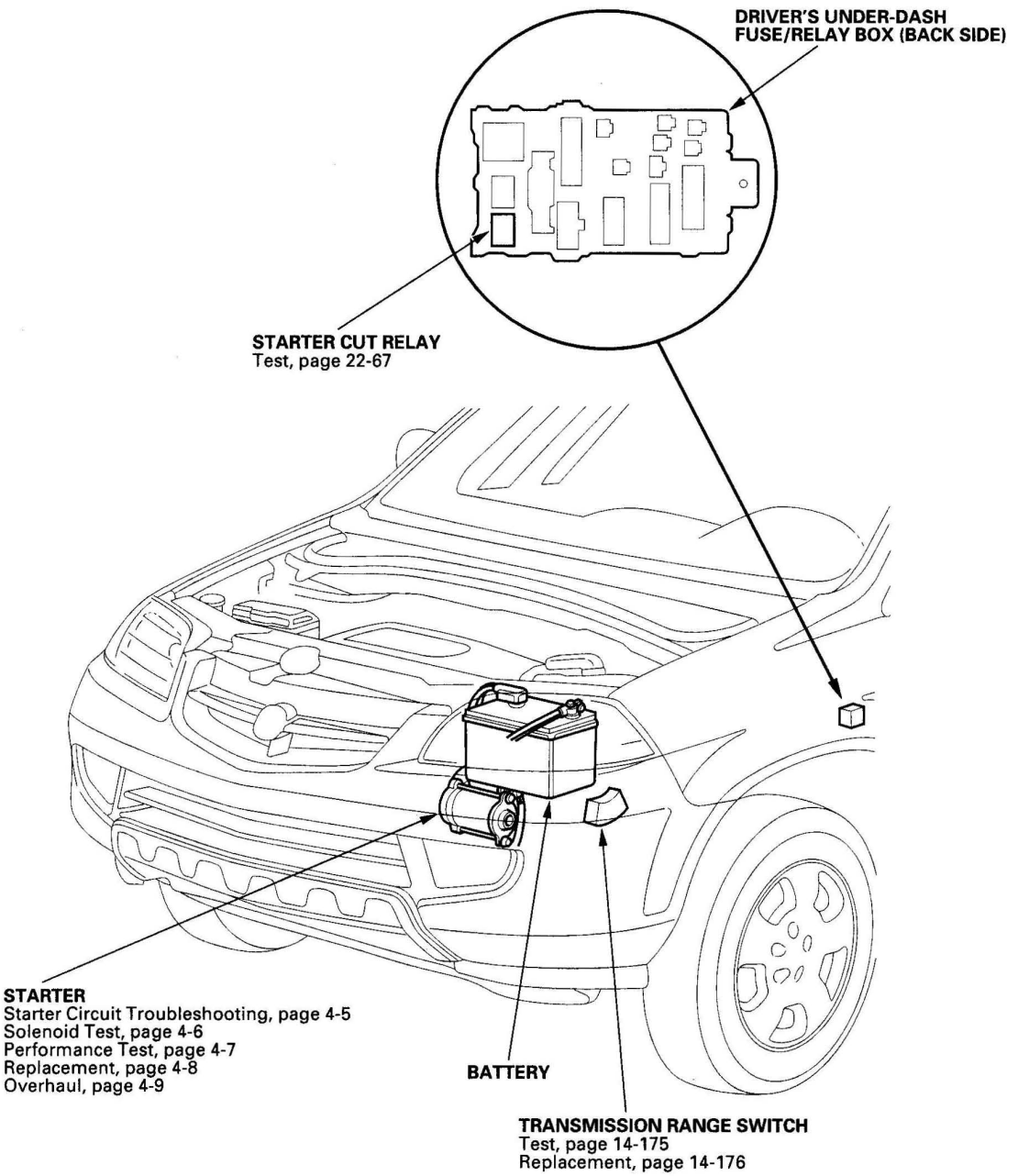


②

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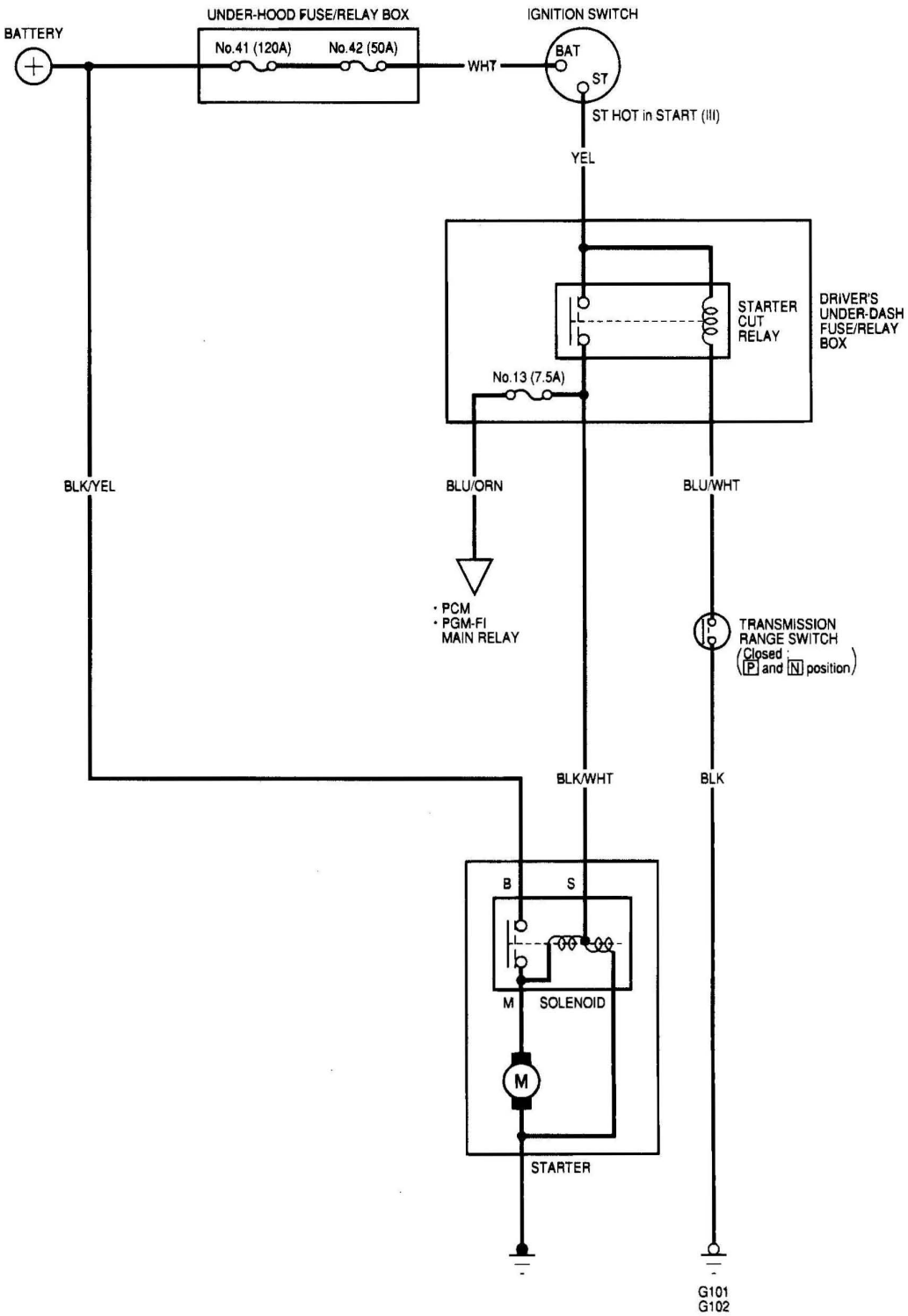
Component Location Index



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Starting System

Circuit Diagram



BACK

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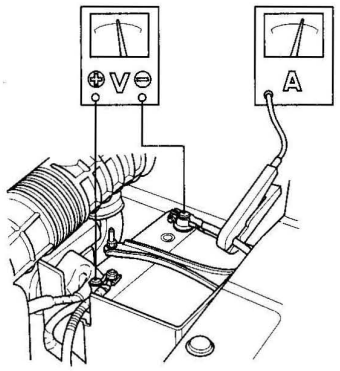
Starter Circuit Troubleshooting

NOTE:
- Air temperature must be between 59° and 100°F (15° and 38°C) during this procedure.
- After this test, or any subsequent repair, reset the PCM to clear any DTCs (see page 11-4).
- The battery must be in good condition and fully charged.

Recommended Procedure:
- Use a starter system tester.
- Connect and operate the equipment in accordance with the manufacturer's instructions.

Alternate Procedure

1. Hook up the following equipment:
   - Ammeter, 0 – 400 A
   - Voltmeter, 0 – 20 V (accurate within 0.1 volt)
   - Tachometer, 0 – 1200 rpm



2. Remove the No. 1 FUEL PUMP (15 A) fuse from the driver's under-dash fuse/relay box.

3. With the shift lever in Park or Neutral, turn the ignition switch to start (III).

   Did the starter crank the engine normally?

   YES – The starting system is OK. ■

   NO – Go to step 4.

4. Check the battery condition. Check electrical connections at the battery, battery negative cable connected to the body, engine ground cables, and the starter for looseness and corrosion. Then check the starter again.

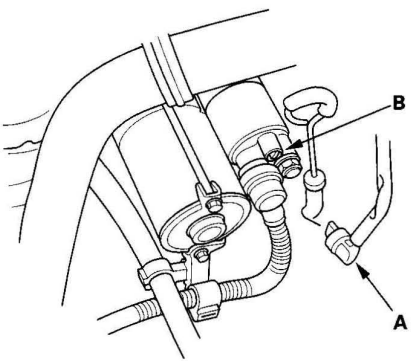
   Did the starter crank the engine?

   YES – Repairing the loose connection fixed the problem. The starting system is OK. ■

   NO – If the starter will not crank the engine at all, go to step 5. If it cranks the engine erratically or too slowly, go to step 7. If it won't disengage from the torque converter ring gear when you release the key, check for the following until you find the cause.

   - Solenoid plunger and switch malfunction
   - Dirty drive gear or damaged overrunning clutch.

5. Make sure the transmission is in Park or Neutral, then disconnect the BLK/WHT wire (A) from the starter solenoid (B). Connect a jumper wire from the battery positive terminal to the solenoid terminal.



   Did the starter crank the engine?

   YES – Go to step 6.

   NO – Remove the starter, and repair or replace as necessary.

6. Check the following items in the order listed until you find the open circuit.
   - Check the BLK/WHT wire and connectors between the under-dash fuse/relay box and the ignition switch, and between the under-dash fuse /relay box and the starter.
   - Check the ignition switch (see page 22-70).
   - Check the transmission range switch and connector.
   - Substitute a known-good starter relay.
   - Check the BLU/WHT wire between the starter cut relay and the transmission range switch.

(cont'd)

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Starter Circuit Troubleshooting (cont'd)

7. Check the engine speed while cranking the engine.

   Is the engine speed above 100 rpm?

   YES – Go to step 8.

   NO – Replace the starter, or remove and disassemble the starter, and check for the following until you find the cause.

   - Excessively worn starter brushes
   - Open circuit in commutator brushes
   - Dirty or damaged helical splines or drive gear
   - Faulty drive gear clutch

8. Check the cranking voltage and current draw.

   Is cranking voltage 8.5 volts or higher and current draw below 380 amps?

   YES – Go to step 9.

   NO – Replace the starter, or remove and disassemble the starter, and check for the following until you find the cause.

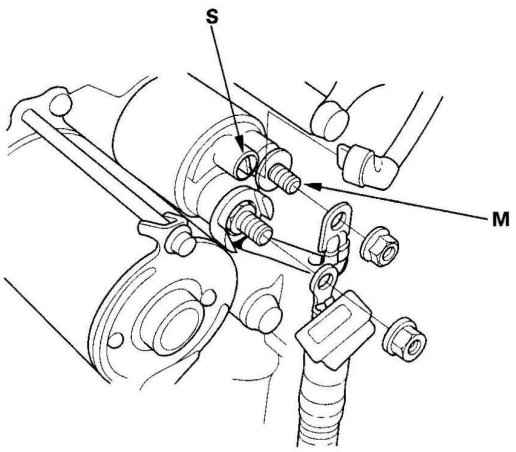
   - Open circuit in starter armature commutator segments
   - Starter armature dragging
   - Shorted armature winding
   - Excessive drag in engine

9. Remove the starter, and inspect its drive gear and the torque converter ring gear for damage. Replace any damaged parts.

Starter Solenoid Test

1. Check the hold-in coil for continuity between the S terminal and the armature housing (ground). There should be continuity.

   - If there is continuity, go to step 2.
   - If there is no continuity, replace the solenoid.



2. Check the pull-in coil for continuity between the S terminal and M terminal. There should be continuity.

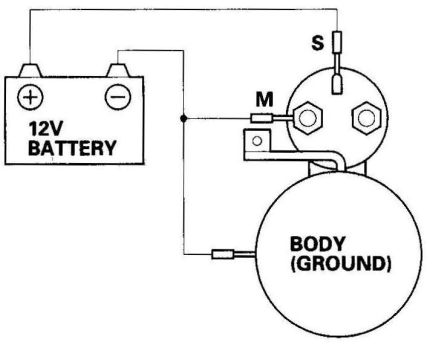
   - If there is continuity, the solenoid is OK.
   - If there is no continuity, replace the solenoid.

BACK

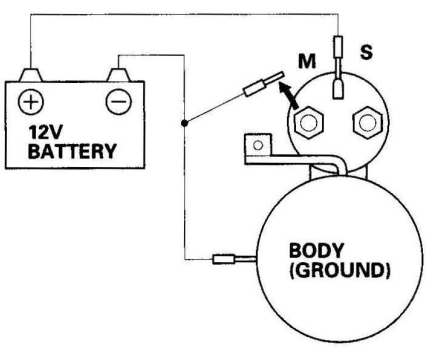
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Starter Performance Test

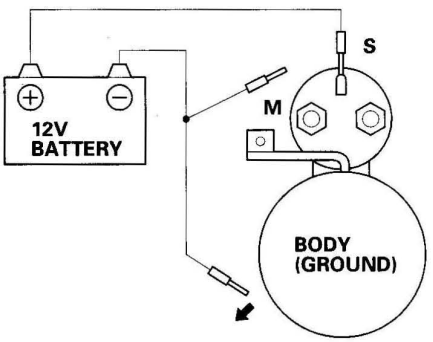
1. Disconnect the wires from the S terminal and the M terminal. To avoid damaging the starter, do not leave the battery connected for more than 10 seconds.
2. Make a connection as described below using as heavy a wire as possible (preferably equivalent to the wire used for the vehicle).
3. Connect the battery as shown. Be sure to disconnect the starter motor wire from the solenoid. If the starter pinion pops out, it is working properly.



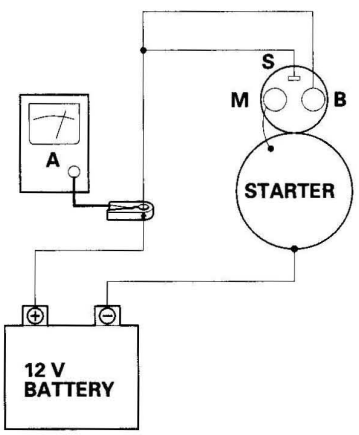
4. Disconnect the battery from the M terminal. If the pinion does not retract, the hold-in coil of the solenoid is working properly.



5. Disconnect the starter battery from the starter body. If the pinion retracts immediately, it is working properly.



6. Clamp the starter firmly in a vise.
7. Connect the starter to the battery as described in the diagram below, and confirm that the motor starts and keeps rotating.



8. If the electric current and motor speed meet the specifications when the battery voltage is at 11.5 V, the starter is working properly.

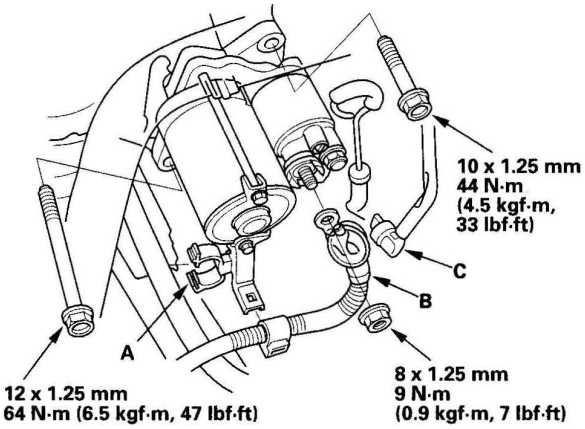
Specifications:

1.6 kw	**80 A or less (Electric current), 2,600 rpm or more (Motor-speed)**

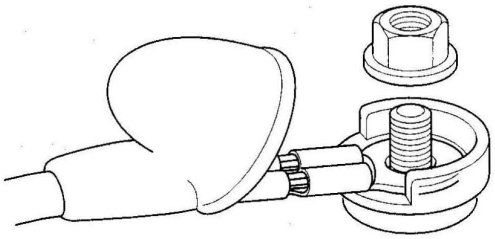
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Starter Replacement

1. Make sure you have the anti-theft code for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait at least 3 minutes.
3. Unlatch the ATF cooler hose clamp (A), then disconnect the starter cable (B) and BLK/WHT wire (C).



4. Remove the two bolts holding the starter, then remove the starter.
5. Install in the reverse order of removal. Make sure the crimped side of the ring terminal is facing out.



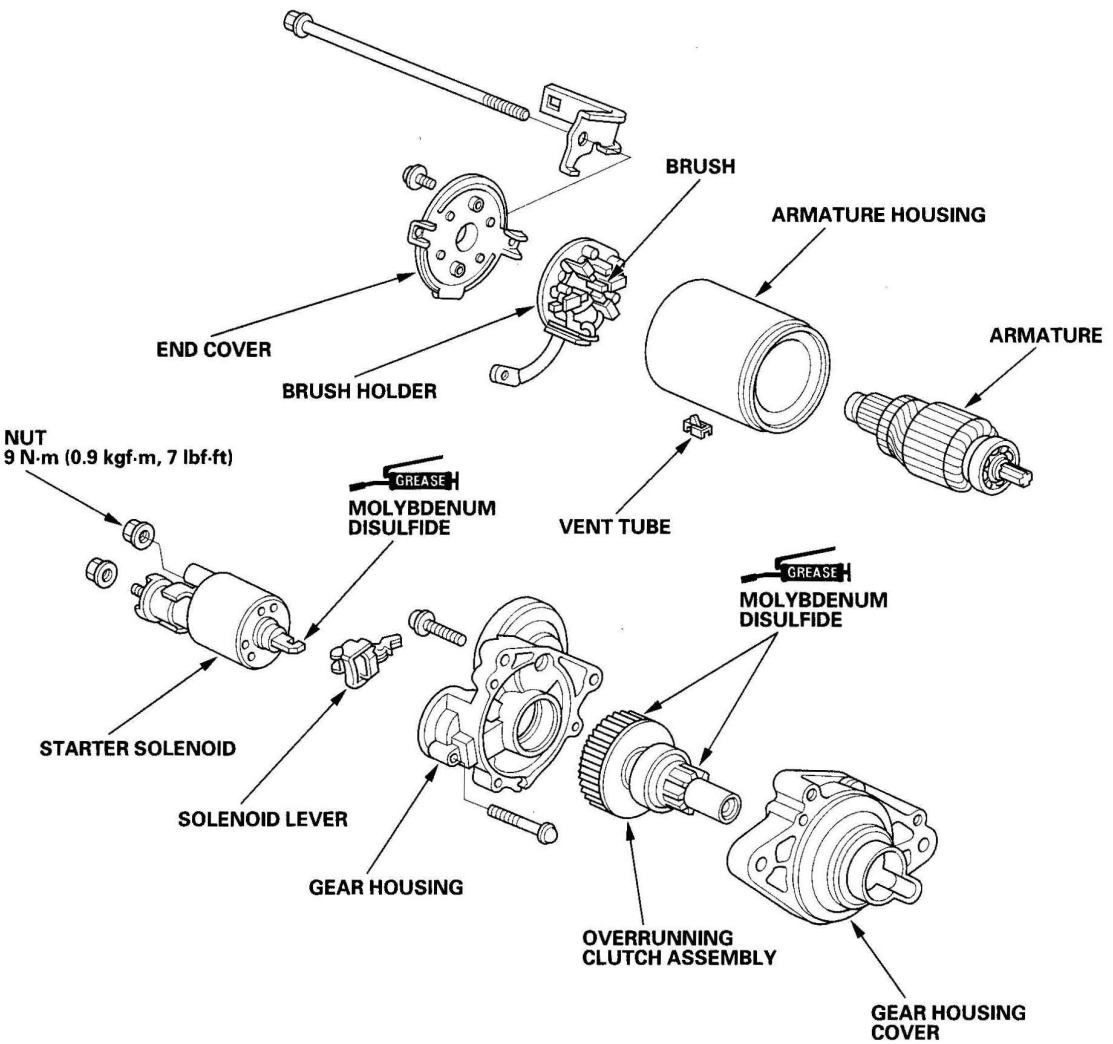
6. Connect the battery positive cable and negative cable to the battery.
7. Start the engine to test the starter.
8. Enter the anti-theft code for the radio and the navigation system, then enter the customer's radio station presets.

BACK

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Starter Overhaul

Disassembly/Reassembly



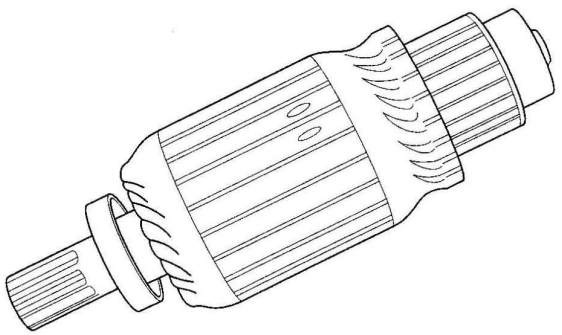
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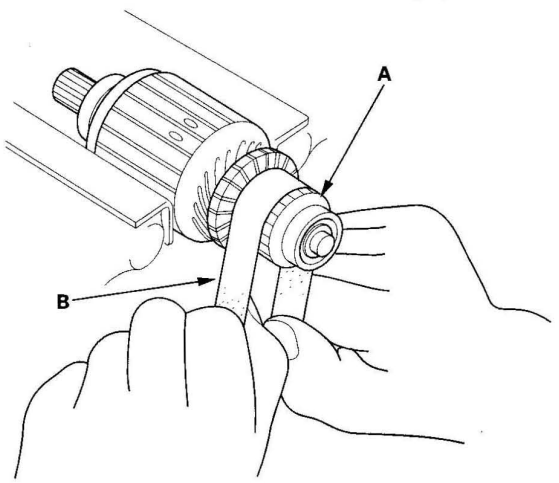
Starter Overhaul (cont'd)

Armature Inspection and Test

1. Remove the starter (see page 4-8).
2. Disassemble the starter as shown at the beginning of this procedure.
3. Inspect the armature for wear or damage due to contact with the permanent magnet. If there is wear or damage, replace the armature.

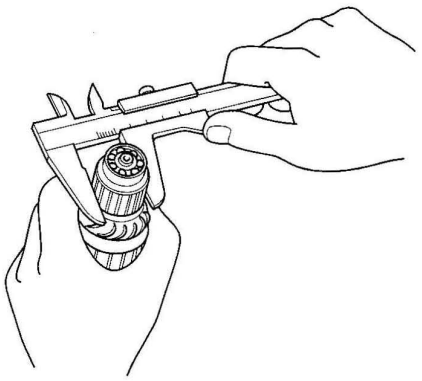


4. Check the commutator (A) surface. If the surface is dirty or burnt, resurface it with emery cloth or a lathe within the following specifications, or recondition with #500 or #600 sandpaper (B).



5. Check the commutator diameter. If the diameter is below the service limit, replace the armature.

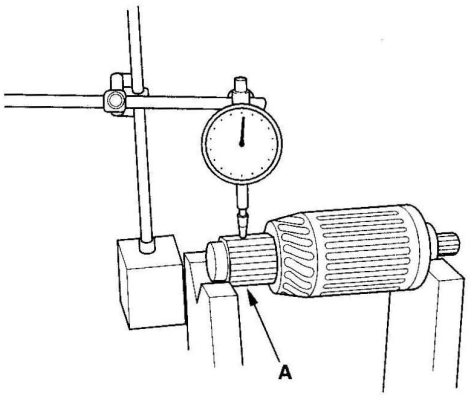
Commutator Diameter
Standard (New): 28.0—28.1 mm (1.102—1.106 in.)
Service Limit: 27.5 mm (1.083 in.)



6. Measure the commutator (A) runout.

- If the commutator runout is within the service limit, check the commutator for carbon dust or brass chips between the segments.
- If the commutator runout is not within the service limit, replace the armature.

Commutator Runout
Standard (New): 0.02 mm (0.001 in.) max.
Service Limit: 0.05 mm (0.002 in.)

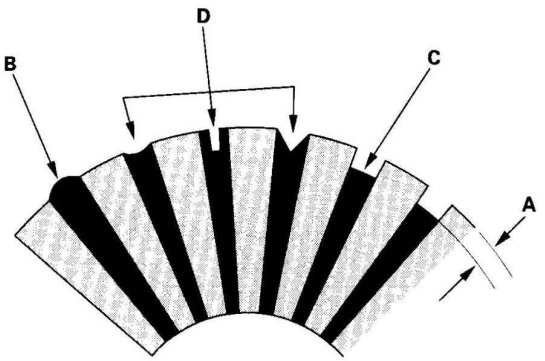


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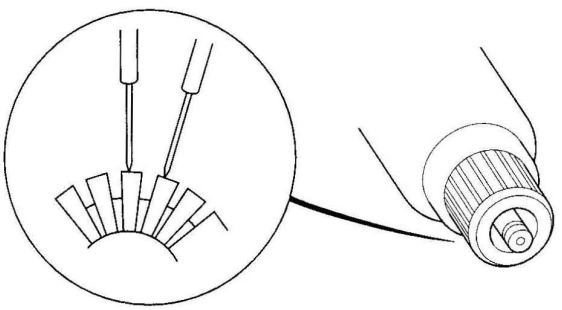
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7. Check the mica depth (A). If the mica is too high (B), undercut the mica with a hacksaw blade to the proper depth. Cut away all the mica (C) between the commutator segments. The undercut should not be too shallow, too narrow, or V-shaped (D).

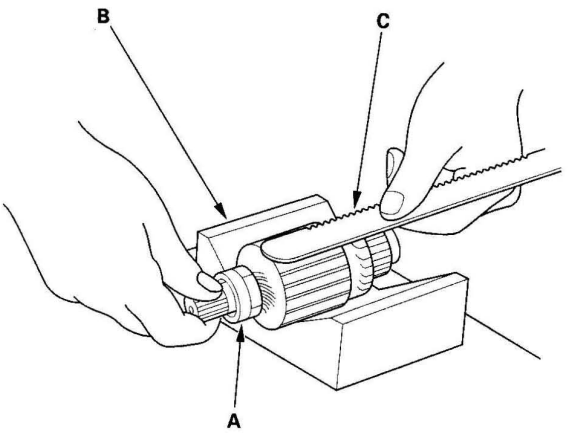
Commutator Mica Depth
Standard (New): 0.4—0.5 mm (0.016—0.020 in.)
Service Limit: 0.15 mm (0.006 in.)



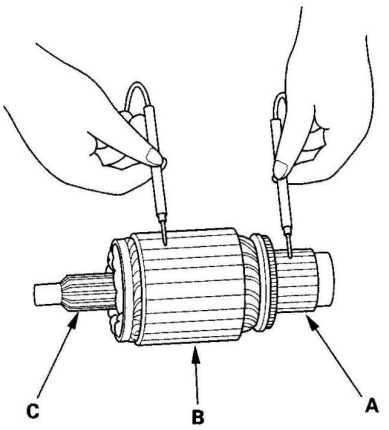
8. Check for continuity between the segments of the commutator. If an open circuit exists between any segments, replace the armature.



9. Place the armature (A) on an armature tester (B). Hold a hacksaw blade (C) on the armature core. If the blade is attracted to the core or vibrates while the core is turned, the armature is shorted. Replace the armature.



10. Check with an ohmmeter that no continuity exists between the commutator (A) and armature coil core (B), and between the commutator and armature shaft (C). If continuity exists, replace the armature.



(cont'd)

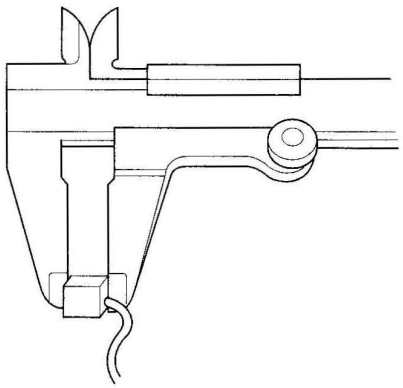
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Starter Overhaul (cont'd)

Starter Brush Inspection

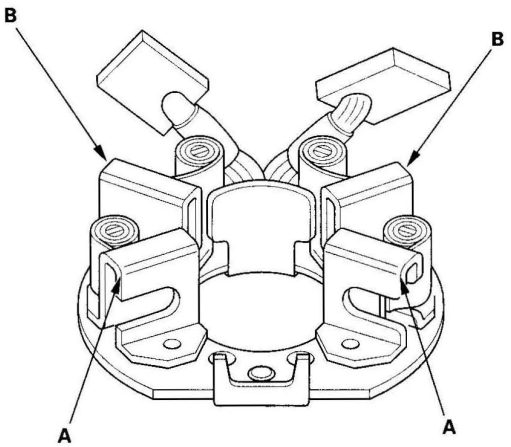
11. Measure the brush length. If it is not within the service limit, replace the brush holder assembly.

Brush Length
Standard (New): 15.8—16.2 mm (0.62—0.64 in.)
Service Limit: 11.0 mm (0.43 in.)



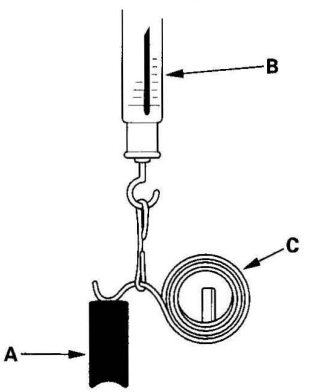
Starter Brush Holder Test

12. Check that there is no continuity between the (+) brush holder (A) and (—) brush holder (B). If there is continuity, replace the brush holder assembly.



13. Insert the brush (A) into the brush holder, and bring the brush into contact with the commutator, then attach a spring scale (B) to the spring (C). Measure the spring tension at the moment the spring lifts off the brush. If the spring tension is not within specification, replace the spring.

Spring Tension:
15.7—17.7 N (1.60—1.80 kgf, 3.53—3.97 lbf)

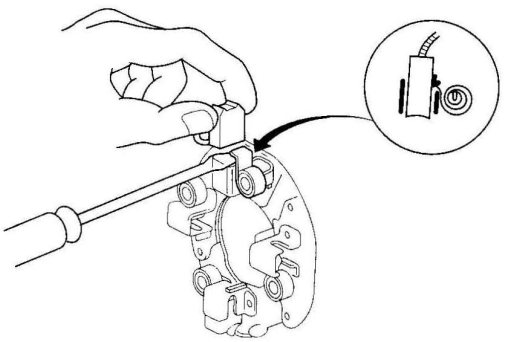


BACK

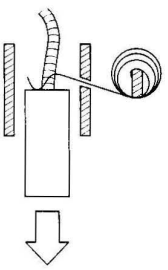
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14. Pry back each brush spring with a screwdriver, then position the brush about halfway out of its holder, and release the spring to hold it there.

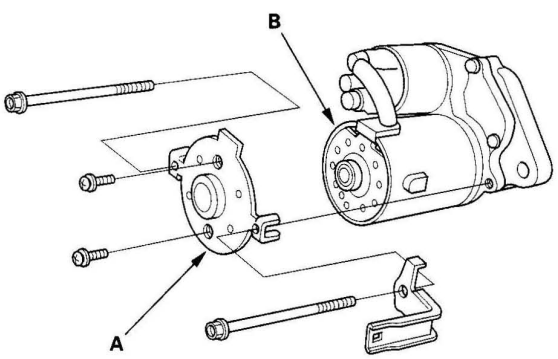
    NOTE: To seat new brushes, slip a strip of # 500 or # 600 sandpaper, with the grit side up, between the commutator and each brush, and smoothly rotate the armature. The contact surface of the brushes will be sanded to the same contour as the commutator.



15. Install the armature in the housing. Next, pry back each brush spring again, and push the brush down until it seats against the commutator, then release the spring against the end of the brush.



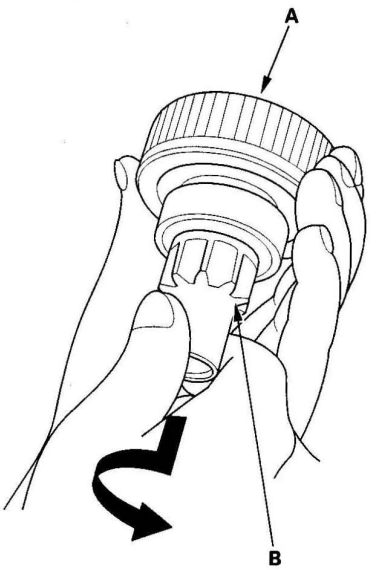
16. Install the starter end cover (A) to retain the brush holder (B).



Overrunning Clutch Inspection

17. Slide the overrunning clutch along the shaft. Replace it if it does not slide smoothly.

18. Rotate the overrunning clutch (A) both ways. If it does not lock in either direction or it locks in both directions, replace it.



19. If the starter drive gear (B) is worn or damaged, replace the overrunning clutch assembly; the gear is not available separately.

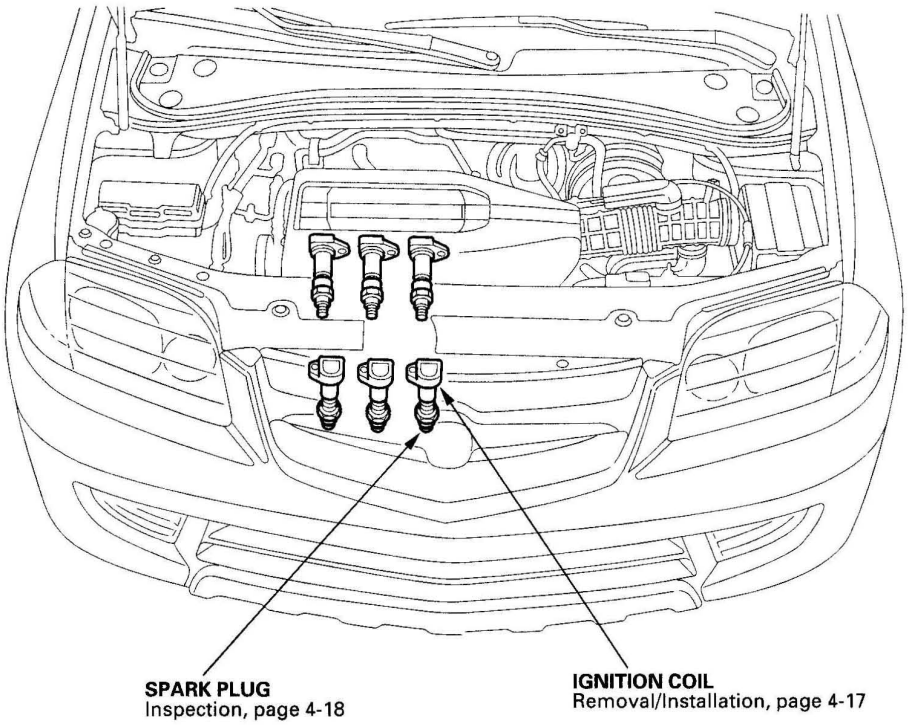
    Check the condition of the torque converter ring gear if the starter drive gear teeth are damaged.

20. Reassemble the starter in reverse order of disassembly.

BACK

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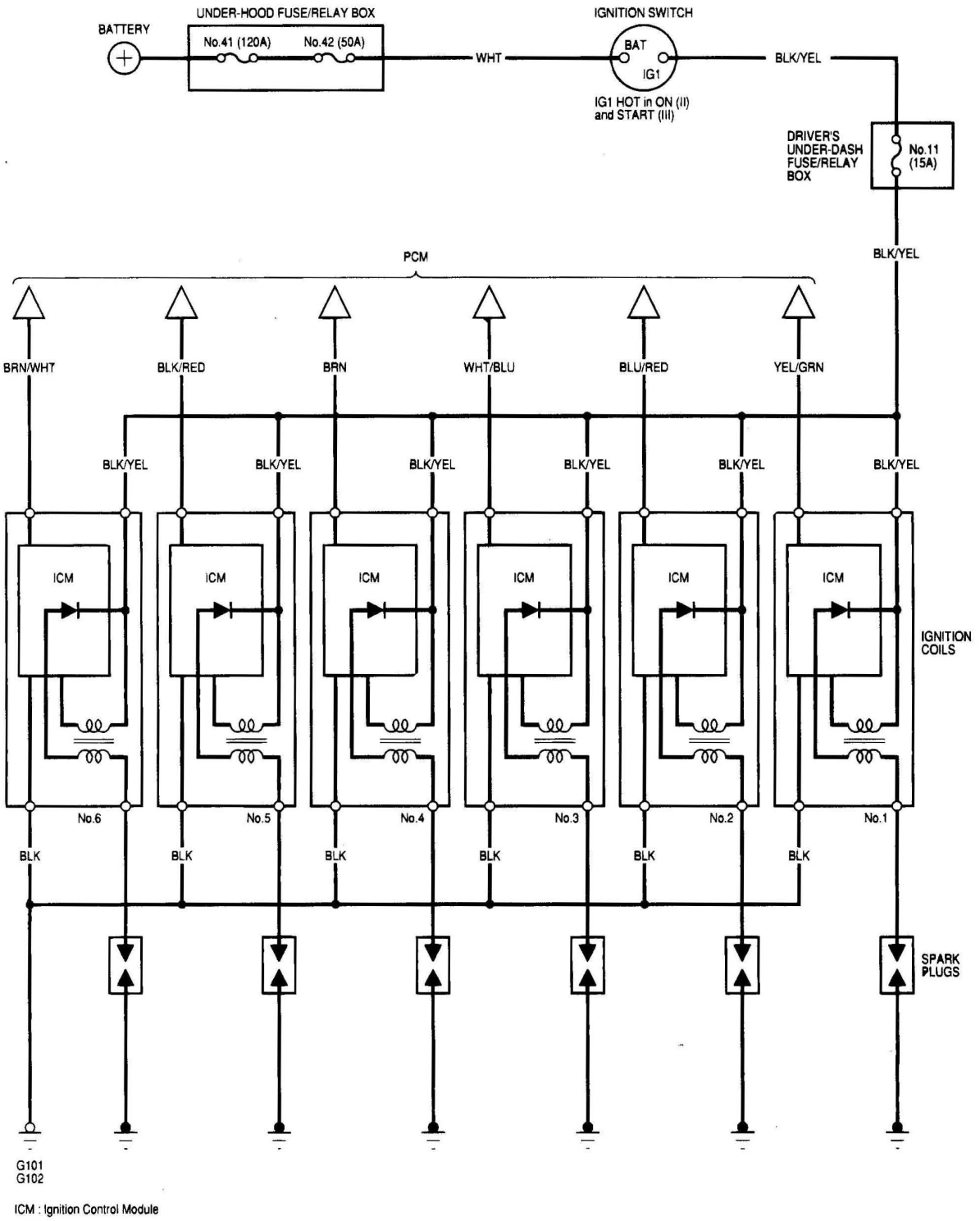
Component Location Index



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Circuit Diagram



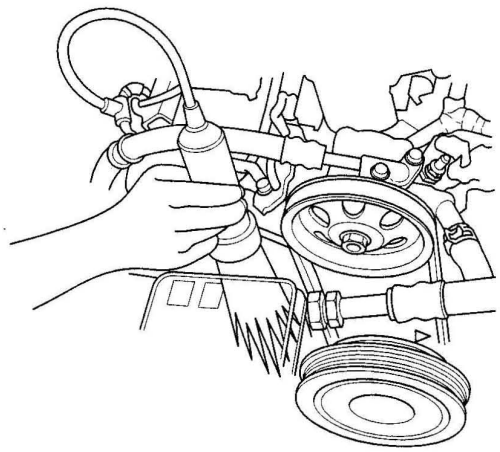
ICM : Ignition Control Module

BACK

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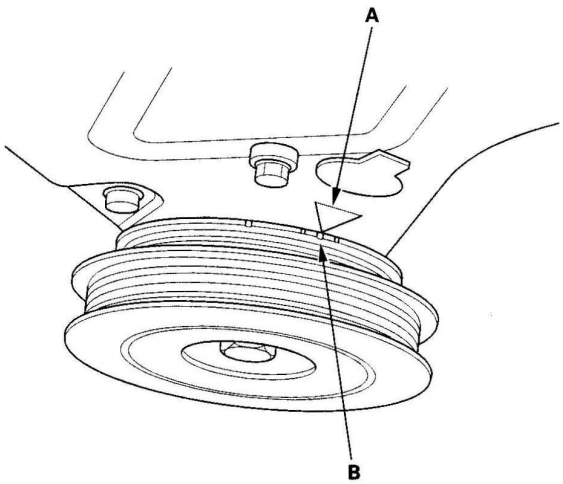
Ignition Timing Inspection

1. Check the idle speed, and adjust it if necessary (see page 11-112).
2. Connect the Honda PGM Tester to the Data Link Connector (DLC), and follow the tester's prompts to get the tester in the "SCS" mode (see the Honda PGM Tester Operator's Manual).
3. Start the engine. Hold the engine at 3,000 rpm with no load (in Neutral) until the radiator fan comes on, then let it idle.
4. Connect the timing light to the No. 1 ignition coil wire.



5. Point the light toward the pointer (A) on the timing belt cover. Check the ignition timing under no load condition: headlights, blower fan, rear window defogger, and air conditioner are not operating. If the ignition timing differs from the specification below, check the cam timing, and the TDC and CKP sensors. If necessary, substitute a known-good powertrain control module (PCM), and recheck (PCM) (see page 11-4).

Ignition Timing:
10° ±2° BTDC (RED mark (B)) at idle in Park or Neutral



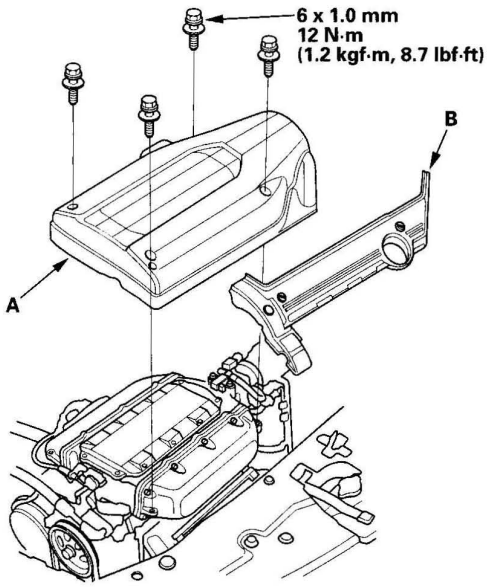
6. Turn the ignition switch OFF.
7. Disconnect the Honda PGM Tester and the timing light.

BACK

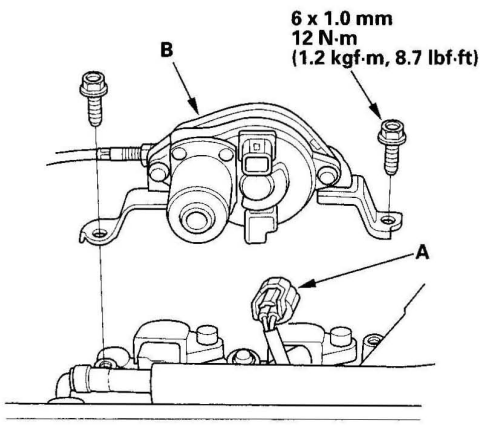
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Ignition Coil Removal/Installation

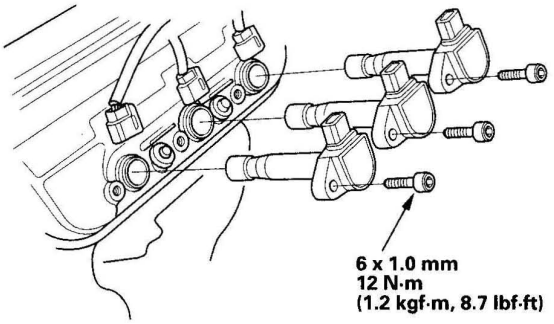
1. Remove the intake manifold cover (A) and ignition coil cover (B).



2. Disconnect the intake manifold runner control (IMRC) actuator connector (A), then remove the IMRC actuator (B).



3. Remove the ignition coils.



4. Install the ignition coils in the reverse order of removal.

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Spark Plug Inspection

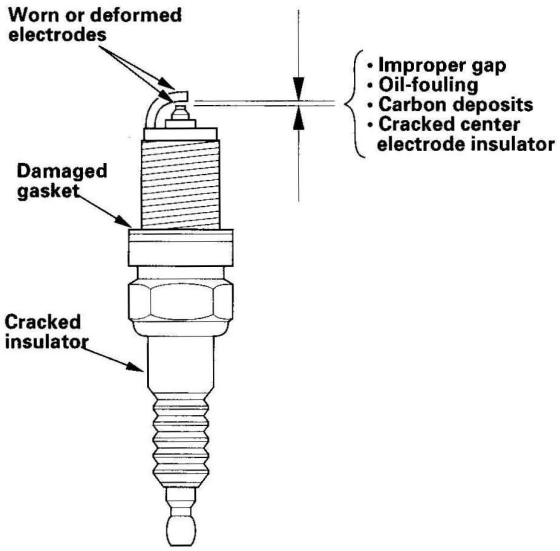
1. Inspect the electrodes and ceramic insulator.

   Burned or worn electrodes may be caused by:

   - Advanced ignition timing
   - Loose spark plug
   - Plug heat range too hot
   - Insufficient cooling

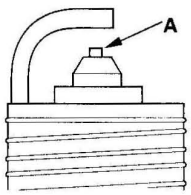
   Fouled plug may be caused by:

   - Retarded ignition timing
   - Oil in combustion chamber
   - Incorrect spark plug gap
   - Plug heat range too cold
   - Excessive idling/low speed running
   - Clogged air cleaner element
   - Deteriorated ignition coils



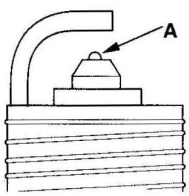
2. Do not adjust the gap of platinum tip plugs (A); replace the spark plug if the gap is out of specification.

   Electrode Gap:
   Standard (New): 1.0 – 1.1 mm (0.039 – 0.043 in.)
   Service Limit: 1.3 mm (0.05 in.)



3. Replace the plug at the specified interval or if the center electrode is rounded (A). Use only the spark plugs listed below.

   Spark Plugs:
   NGK: PZFR5F-11
   DENSO: PKJ16CR-L11

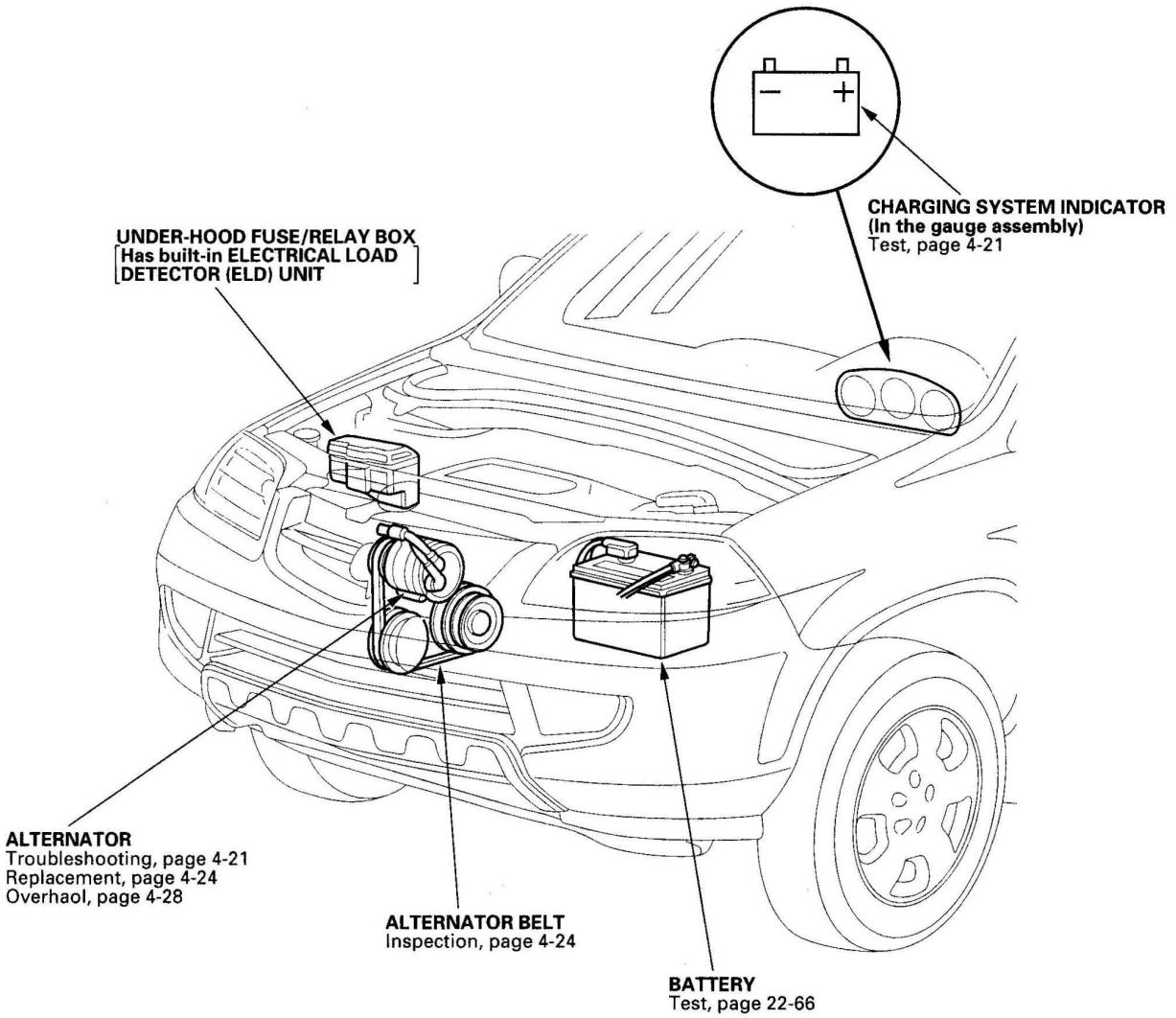


4. Apply a small quantity of anti-seize compound to the plug threads, and screw the plugs into the cylinder head finger-tight. Then torque them to 18 N·m (1.8 kgf·m, 13 lbf·ft).

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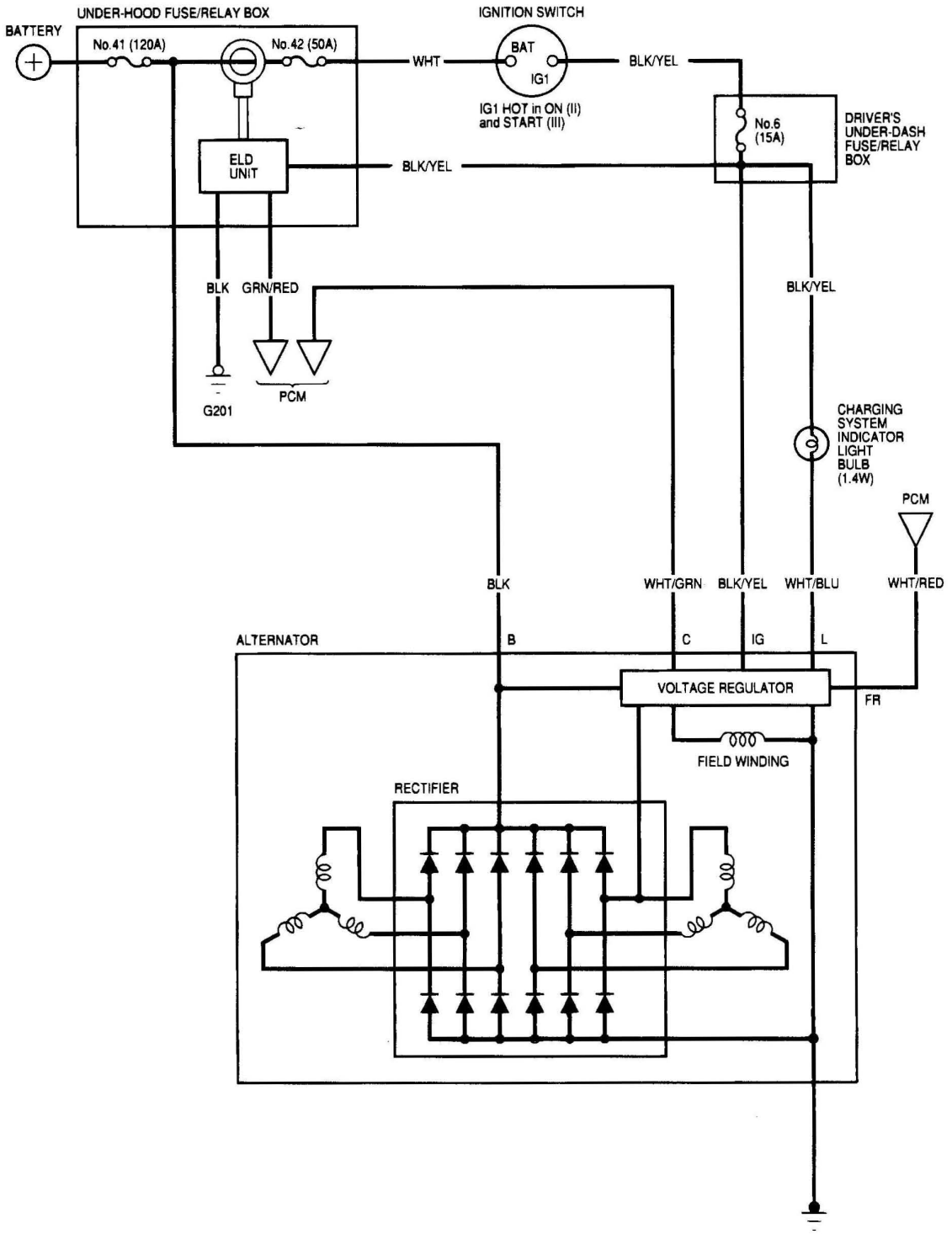
Component Location Index



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Charging System

Circuit Diagram



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Charging Circuit Troubleshooting

If the charging system indicator does not come on or does not go off, or the battery is dead or low, test the following items in the order listed below:

Battery (see page 22-66)
Charging system indicator
Alternator and regulator circuit
Alternator control system

Charging System Indicator Test

1. Turn the ignition switch ON (II).

   Does the charging system indicator come on?

   YES – Go to step 2.

   NO – Go to step 6.

2. Start the engine.

   Does the charging system indicator go off?

   YES – Charging system indicator circuit is OK. ■

   NO – Go to step 3.

3. Turn the ignition switch OFF.

4. Disconnect the alternator 4P connector from the alternator.

5. Turn the ignition switch ON (II).

   Does the charging system indicator come on?

   YES – Turn the ignition switch OFF, and repair the short in the WHT/BLU wire. If the WHT/BLU wire is shorted to ground, the voltage regulator in the alternator may be damaged. ■

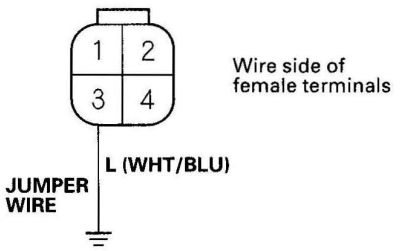
   NO – Go to step 9.

6. Turn the ignition switch OFF.

7. Disconnect the alternator 4P connector from the alternator.

8. Connect the alternator 4P connector terminal No. 3 to body ground with a jumper wire. Turn the ignition switch ON (II).

ALTERNATOR 4P CONNECTOR



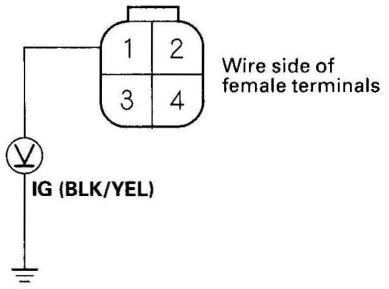
Does the charging system indicator come on?

YES – Go to step 9.

NO – Turn the ignition switch OFF. Check for a blown No. 6 (15 A) fuse and a blown charging system light bulb. If the fuse and bulb are OK, repair the open in the BLK/YEL or WHT/BLU wire. ■

9. Measure the voltage at the No. 1 terminal of the alternator 4P connector with the ignition switch ON (II).

ALTERNATOR 4P CONNECTOR



Is there battery voltage?

YES – Go to Alternator and Regulator Circuit Test. ■

NO – Repair open in the BLK/YEL wire between the alternator and the driver's under-dash fuse relay box. ■

(cont'd)

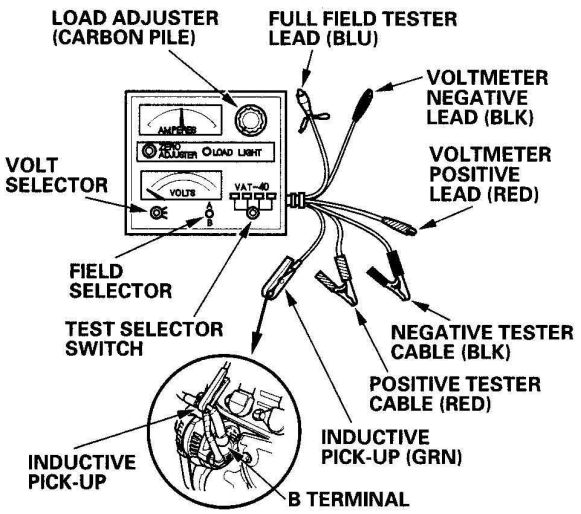
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Charging Circuit Troubleshooting (cont'd)

Alternator and Regulator Circuit Test

1. Be sure the battery is sufficiently charged and in good condition (see page 22-66).

2. Connect a VAT-40 (or equivalent tester), and turn the selector switch to position 1 (starting).



3. Shift to Park or Neutral, and start the engine. Hold the engine at 3,000 rpm, with no load until the radiator fan comes on, then let it idle.

4. Raise the engine speed to 2,000 rpm, and hold it there.

   Is the voltage over 15.1 V?

   YES – Replace the rear housing assembly. ■

   NO – Go to step 5.

5. Release the accelerator pedal, and let the engine idle.

6. Make sure all accessories are turned off. Turn the selector switch to position 2 (charging).

7. Remove the inductive pick-up, and zero the ammeter.

8. Place the inductive pick-up over the B terminal wire of the alternator so that the arrow points away from the alternator.

9. Raise the engine speed to 2,000 rpm, and hold it there.

   Is the voltage less than 13.5 V?

   YES – Go to Alternator Control System Test. ■

   NO – Go to step 10.

10. Apply a load with the VAT-40 until the battery voltage drops to between 12 – 13.5 V.

    Is the amperage 87.5 A or more?

    YES – The charging system is OK. ■

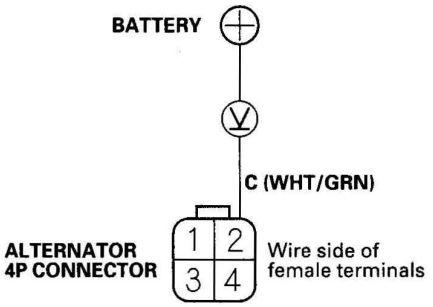
    NO – Repair the alternator (see page 4-28). ■

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Alternator Control System Test

1. Check for proper operation of the Electrical Load Detector (ELD) by checking the Malfunction Indicator Lamp (MIL) (see page 11-3).
2. Disconnect the alternator 4P connector from the alternator.
3. Start the engine, and turn the headlights (high beam) ON.
4. Measure voltage between the alternator 4P connector terminal No. 2 and the positive terminal of the battery.

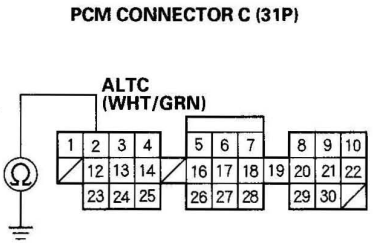


Is there 1 V or less?

YES—Go to step 9.

NO—Go to step 5.

5. Turn the headlight and ignition switch OFF.
6. Disconnect the negative cable from the battery.
7. Disconnect Powertrain Control Module (PCM) connector C (31P).
8. Check for continuity between the PCM connector terminal C2 and body ground.



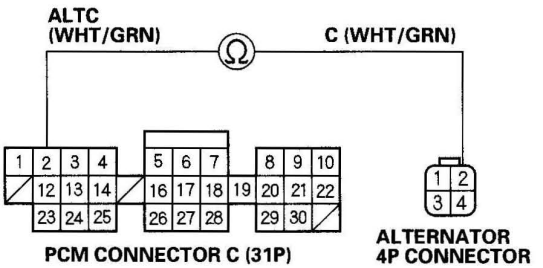
Wire side of female terminals

Is there continuity?

YES—Repair short to ground in the wire between the alternator and PCM. ■

NO—Substitute a known-good PCM and recheck (see page 11-4). If prescribed voltage is now available, replace the original PCM. ■

9. Turn the headlight and ignition switch OFF.
10. Disconnect the negative cable from the battery.
11. Disconnect PCM connector C (31P).
12. Check for continuity between the PCM connector terminal C2 and alternator 4P connector terminal No. 2.



Wire side of female terminals

Is there continuity?

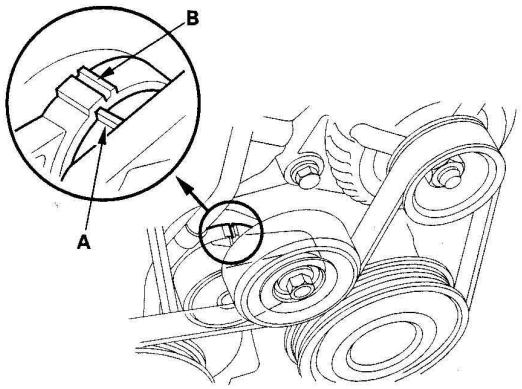
YES—Repair the alternator (see page 4-28). ■

NO—Repair open in the wire between the alternator and PCM. ■

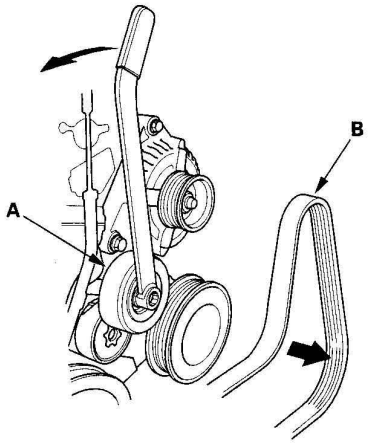
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Alternator-compressor Belt Inspection and Replacement

1. Inspect the belt for cracks and damaged. If the belt is cracks or damaged, replace it.
2. Check that the pointer (A) on the auto-tensioner housing is not beyond the edge of the indicator rib (B) on the tensioner base.



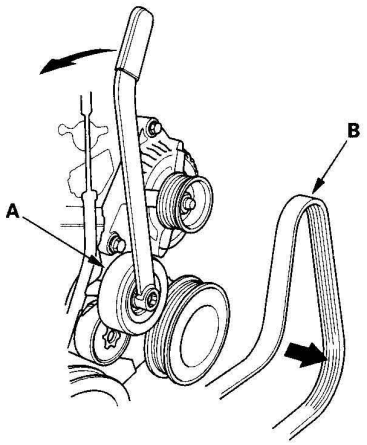
3. Move the auto-tensioner (A) to relieve tension from the alternator belt (B), and remove the alternator belt.



4. Install the new belt in the reverse order of removal.

Alternator Replacement

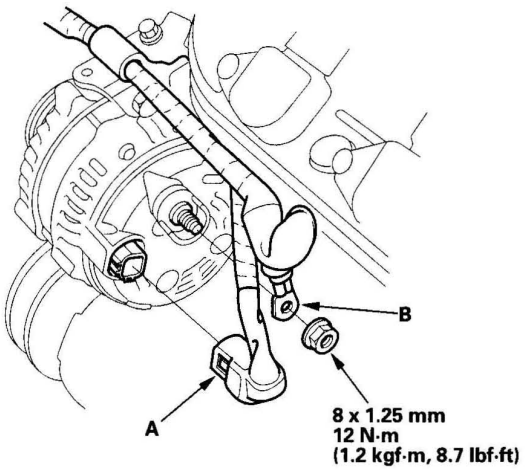
1. Make sure you have the anti-theft code for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative cable.
3. Remove the intake manifold cover and ignition coil cover.
4. Move the auto-tensioner (A) to relieve tension from the alternator belt (B), and remove the alternator belt.



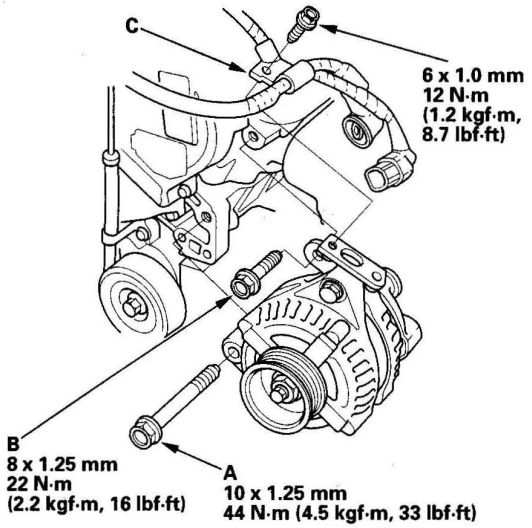
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5. Disconnect the alternator 4P connector (A) and BLK wire (B) from the alternator.



6. Remove the mount bolt (A) and alternator bracket mounting bolt (B), then remove the harness clamp (C) from the alternator bracket.

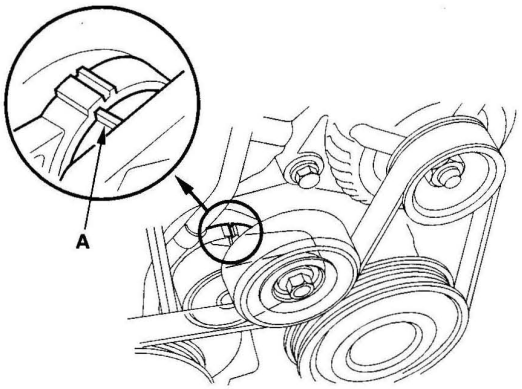


7. Install in the reverse order of removal.

8. Enter the anti-theft code for the radio and the navigation system, then enter the customer's radio station presets.

Auto-Tensioner Inspection/ Replacement

1. Check the position of the auto-tensioner indicator's pointer (A), start the engine, then check the position of the pointer again. If the position changes, go to step 5.



2. Check for abnormal noise from the tensioner pulley. If you hear abnormal noise, replace the tensioner pulley.

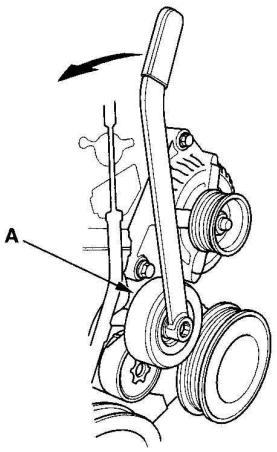
3. Turn the ignition switch OFF, then remove the alternator belt (see page 4-24).

(cont'd)

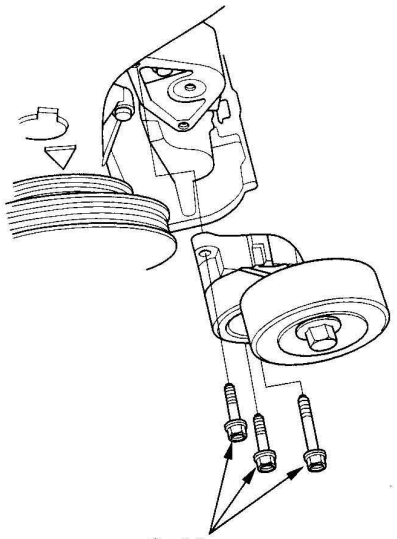
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Auto-Tensioner Inspection/Replacement (cont'd)

4. Check if the auto-tensioner (A) moves smoothly, and check for abnormal noise when the pulley is turned counterclockwise with the designated tool. If the auto-tensioner does not move smoothly or if the there is abnormal noise, replace the auto-tensioner. Do not move the auto-tensioner beyond its limit.

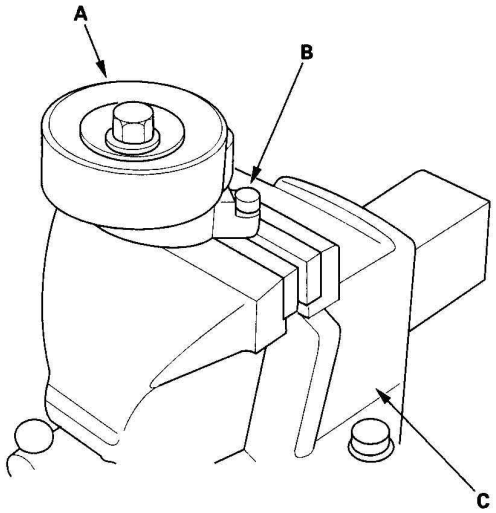


5. Turn the ignition switch OFF, then remove the auto-tensioner.



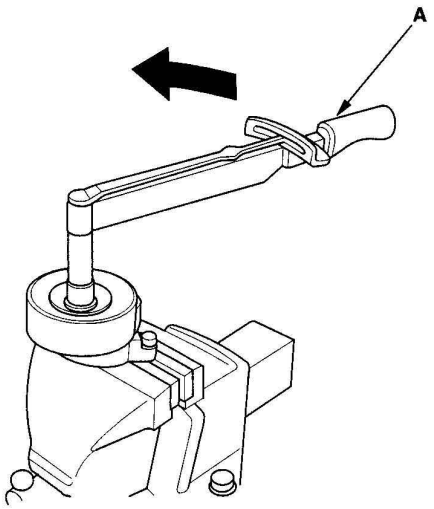
6 x 1.0 mm
12 N·m (1.2 kgf·m, 8.7 lbf·ft)

6. Clamp the auto-tensioner (A) by using two 6 mm bolts (B) and a vise (C) as shown. Do not clamp the auto-tensioner itself.



7. Attach a torque wrench (A) to the pulley bolt. Measure the torque when the tensioner is turned counterclockwise. If the torque is less than the specified value, replace the auto-tensioner.

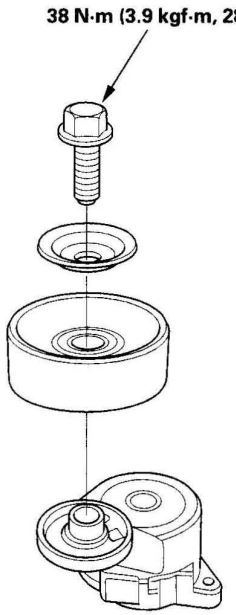
23 N·m (2.3 kgf·m, 17 lbf·ft)



BACK

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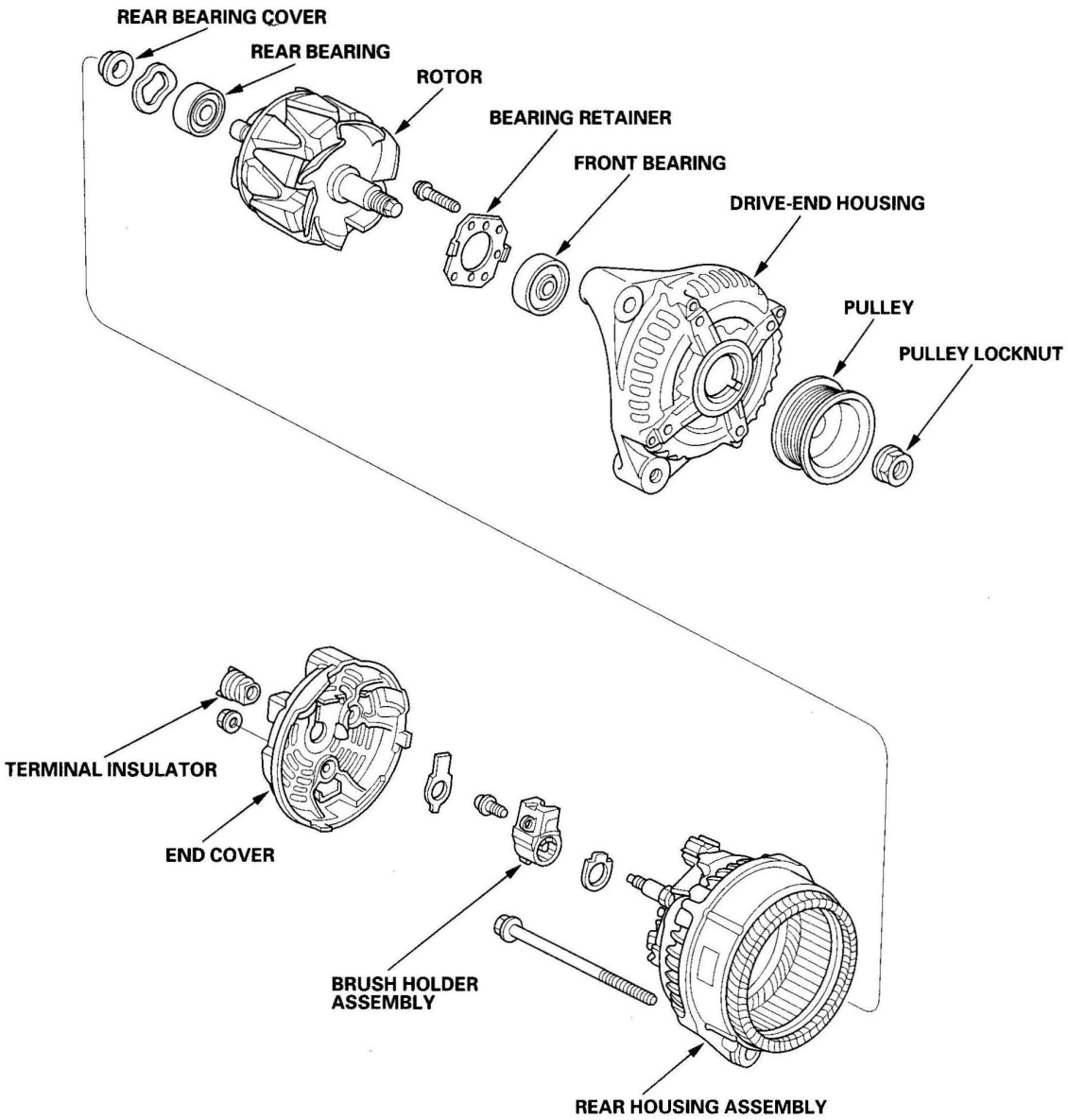
8. If necessary, remove the pulley bolt (left-hand threads), and replace the tensioner pulley.



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Alternator Overhaul

Exploded View



BACK

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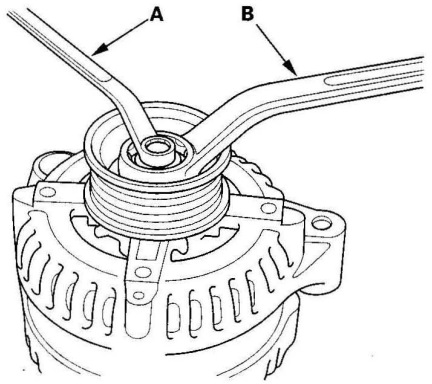
Special Tools Required
- Handle Driver 07749-0010000
- Driver attachment, 52 x 55 mm 07746-0010400

NOTE: Refer to the Exploded View as needed during this procedure.

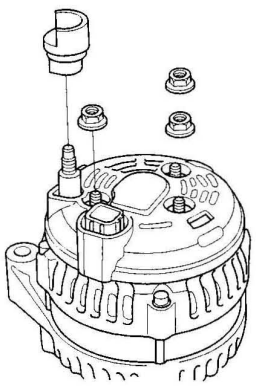
1. Test the alternator and regulator before you remove them (see page 4-21).

2. Remove the alternator (see page 4-24).

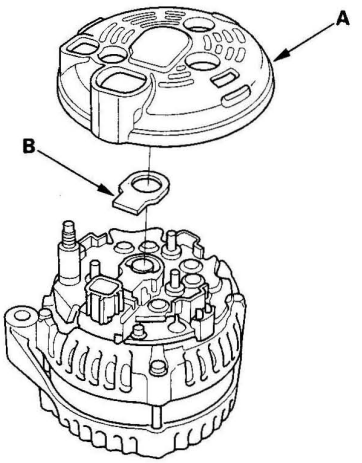
3. If the front bearing needs replacing, remove the pulley locknut with a 10 mm wrench (A) and a 22 mm wrench (B). If necessary, use an impact wrench.



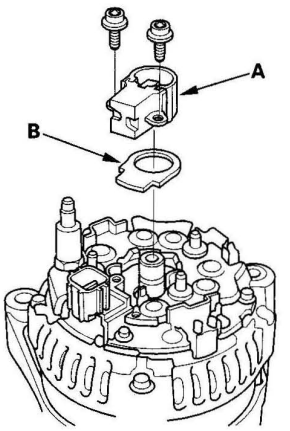
4. Remove the three flange nuts and the insulator from the alternator.



5. Remove the end cover (A) and seal ring (B).



6. Remove the brush holder (A) and seal ring (B).

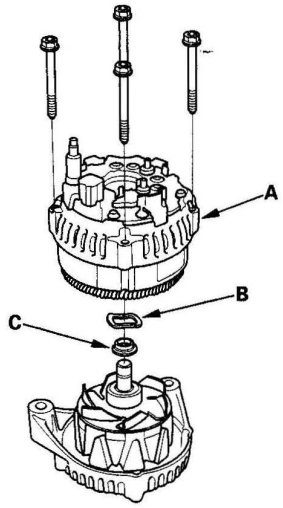


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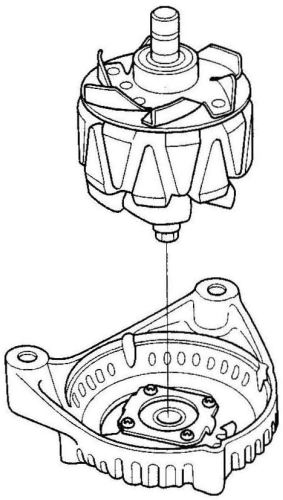
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Alternator Overhaul (cont'd)

7. Remove the four bolts, then remove the rear housing assembly (A), washer (B), and rear bearing cover (C).



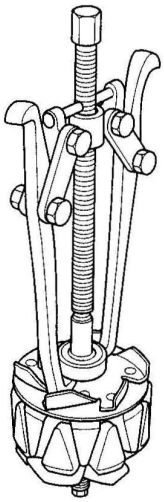
8. If you are not replacing the front bearing and/or rear bearing, go to step 15. Otherwise, remove the rotor from the drive end housing.



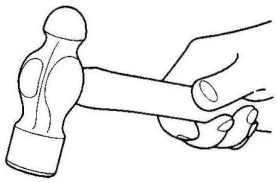
9. Inspect the rotor shaft for galling, and inspect the bearing journal surface in the drive end housing for seizure marks.

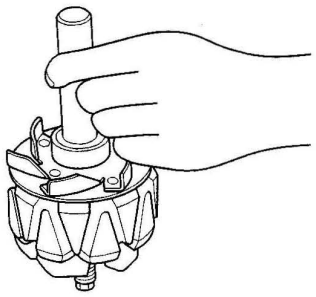
   - If the rotor is damaged, replace the rotor assembly.
   - If the rotor is OK, go to step 10.

10. Remove the rear bearing using a puller as shown.



11. With a hammer and commercially available tools shown, install a new rear bearing in the rotor shaft.

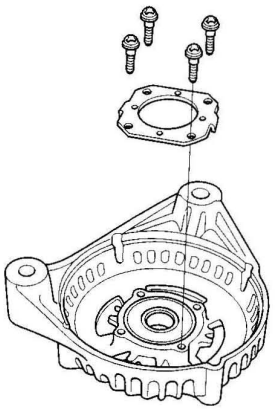




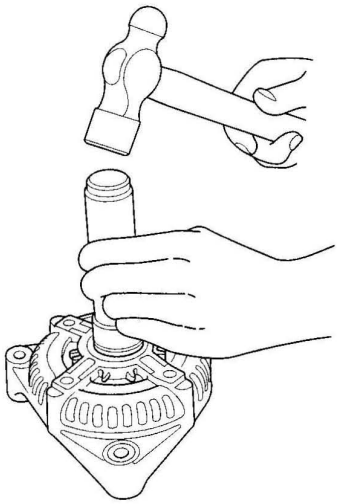
BACK

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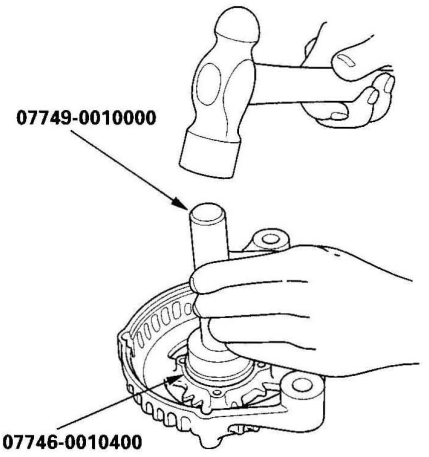
12. Remove the front bearing retainer plate.



13. Drive out the front bearing with a brass drift and hammer.



14. With a hammer and special tools, install a new front bearing in the drive end housing.



(cont'd)

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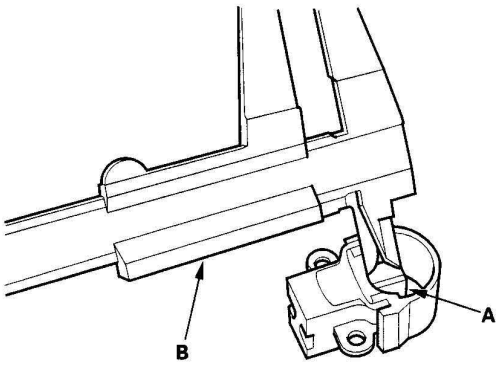
Alternator Overhaul (cont'd)

Alternator Brush Inspection

15. Measure the length of both brushes (A) with vernier calipers (B).

    - If either brush is shorter than the service limit, replace the brush holder assembly.
    - If brush length is OK, go to step 16.

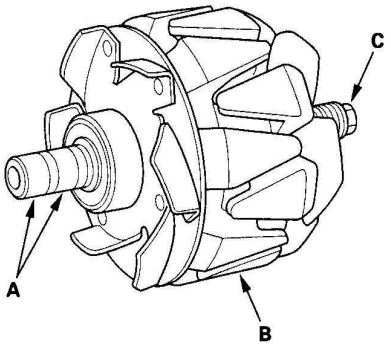
Alternator Brush Length:
Standard (New): 10.5 mm (0.41 in.)
Service Limit: 1.5 mm (0.06 in.)



Rotor Slip Ring Test

16. Check that there is continuity between the slip rings (A).

    - If there is continuity, go to step 17.
    - If there is no continuity, replace the rotor assembly.



17. Then check that there is no continuity between each slip ring and the rotor (B) and the rotor shaft (C).

    - If there is no continuity, replace the rear housing assembly, and go to step 18.
    - If there is continuity, replace the rotor assembly.

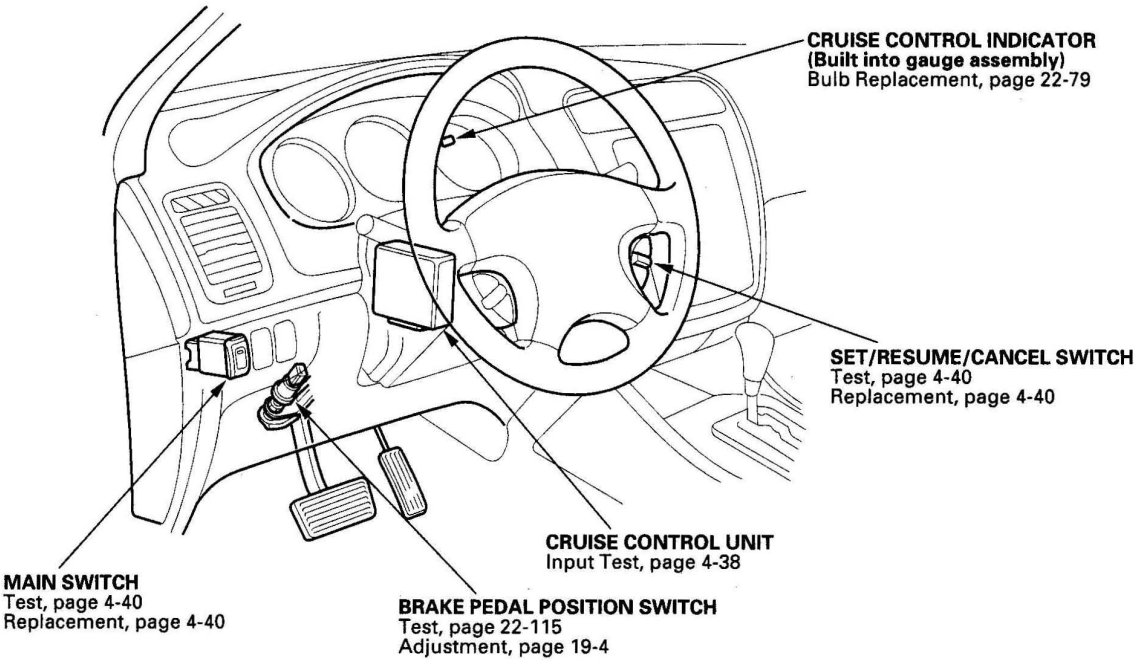
18. Reassemble the alternator in reverse order of disassembly, and note these items:

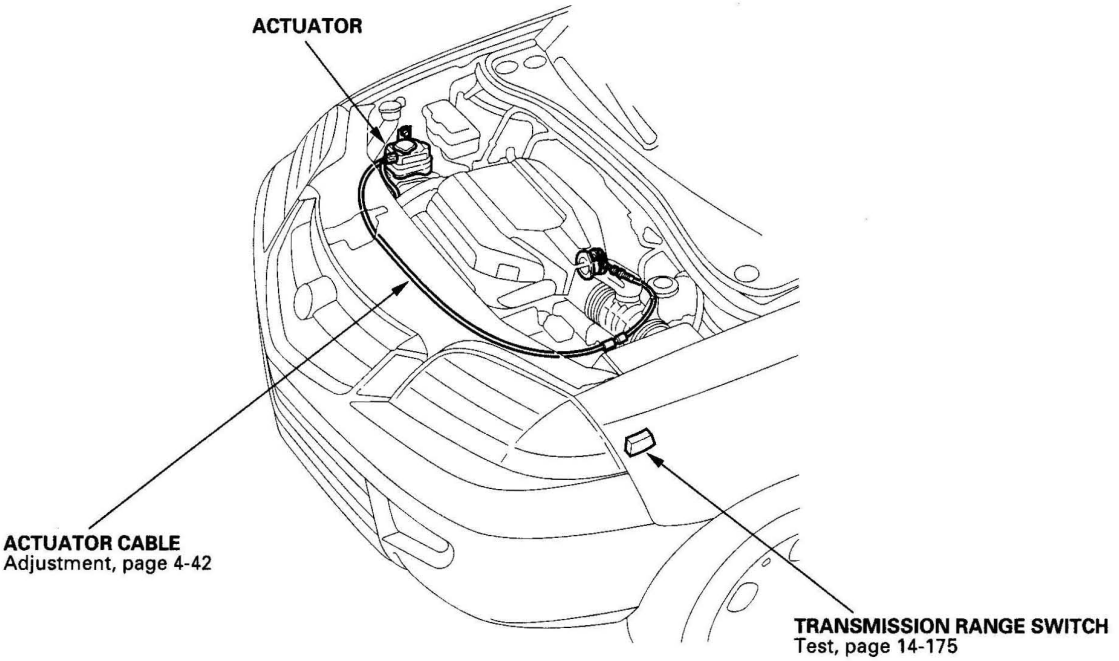
    - Be careful not to get any grease or oil on the slip rings.
    - If you removed the pulley, tighten its locknut to 111 N·m (11.3 kgf·m, 81.7 lbf·ft) when you reinstall it.

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Component Location Index

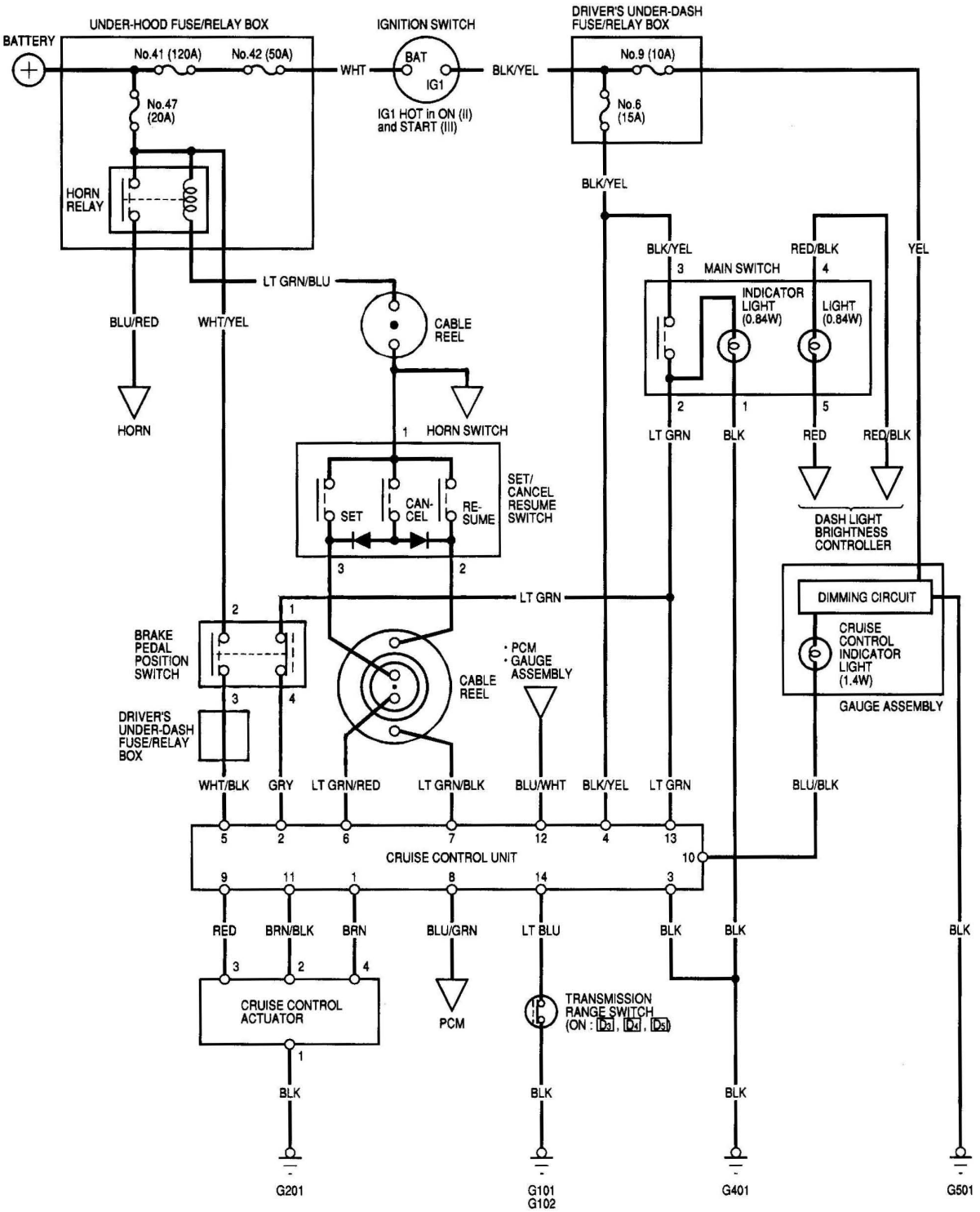




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Cruise Control

Circuit Diagram



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Symptom Troubleshooting Index

NOTE:
- The numbers in the table show the troubleshooting sequence.
- Before troubleshooting,
  - check that the speedometer works properly.
  - check the No. 9 (10 A) and No. 6 (15 A) fuses in the driver's under-dash fuse/relay box, and No. 47 (20 A) fuse in the under-hood fuse/relay box.
  - check that the horn sounds.
  - check the tachometer to see if it works properly.

Symptom	Diagnostic procedure	Also check for
Cruise control cannot be set	1. Check main switch (see page 4-40) 2. Check SET/RESUME/CANCEL switch (see page 4-40) Check brake pedal position switch and adjustment (see page 22-115) 3. Check transmission range switch (see page 14-175) 4. Check control unit (see page 4-38)	• Poor ground: G101, G102 • Open circuit, loose or disconnected terminals: BLK/YEL, LT GRN, LT GRN/RED, GRY, LT BLU, BLU/WHT
Cruise control can be set, but indicator light does not go on	1. Check dimming circuit in gauge (see page 22-73) 2. Check control unit (see page 4-38)	• Poor ground: G101, G102, G501 • Open circuit, loose or disconnected terminals: YEL, BLU/BLK
Cruise speed is noticeably higher or lower than what was set	1. Check control unit (see page 4-38)	
Excessive overshooting or undershooting when trying to set speed	1. Check control unit (see page 4-38) 2. Check actuator cable adjustment (see page 4-42)	
Speed fluctuates on a flat road with cruise control set	1. Check control unit (see page 4-38) 2. Check actuator cable adjustment (see page 4-42)	
Vehicle does not decelerate or accelerate accordingly when SET/RESUME/CANCEL button is pushed	1. Check SET/RESUME/CANCEL switch (see page 4-40) 2. Check control unit (see page 4-38)	Open circuit, loose or disconnected terminals: LT GRN/RED, LT GRN/BLK
Set speed not cancelled (engine rpm stays high) when shift lever is moved to Neutral position	1. Check transmission range switch (see page 14-175) 2. Check control unit (see page 4-38)	Open circuit, loose or disconnected terminals, short to ground: LT BLU
Set speed not cancelled when brake pedal is pushed	1. Check brake pedal position switch and mounting (see page 22-115) 2. Check control unit (see page 4-38)	Open circuit, loose or disconnected terminals: WHT/BLK

(cont'd)

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Symptom Troubleshooting Index (cont'd)

Symptom	Diagnostic procedure	Also check for
Set speed does not cancel when main switch is pushed OFF	1. Check main switch (see page 4-40) 2. Check control unit (see page 4-38)	Open circuit, loose or disconnected terminals, short to power: LT GRN
Set speed does not cancel when CANCEL button is pushed	1. Check SET/RESUME/CANCEL switch (see page 4-40) 2. Check control unit (see page 4-38)	Open circuit, loose or disconnected terminals: LT GRN/RED, LT GRN/BLK
Set speed will not resume when RESUME button is pushed (with main switch on, set speed is temporarily cancelled by pressing brake pedal)	1. Check SET/RESUME/CANCEL switch (see page 4-40) 2. Check control unit (see page 4-38)	Open circuit, loose or disconnected terminals: LT GRN/BLK
The transmission shifts down slower than normal when going up a hill with the cruise control on	1. Troubleshoot the cruise control communication circuit (see page 4-37)	Open circuit, loose or disconnected terminals, short to ground: BLU/GRN

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Cruise Control Communication Circuit Troubleshooting

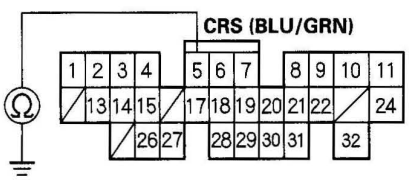
1. Start the engine.
2. Turn on the cruise control main switch, then drive the vehicle at speeds over 25 mph (40 km/h) with the cruise control.

   Does the cruise control operate?

   YES – Go to step 3.

   NO – Check the cruise control unit (see page 4-38) or cruise control actuator. ■
3. Turn the ignition switch OFF.
4. Disconnect the negative cable from the battery.
5. Disconnect Powertrain Control Module (PCM) connector A (32P) and the cruise control unit 14P connector.
6. Check for continuity between PCM connector terminal A5 and body ground.

PCM CONNECTOR A (32P)



Wire side of female terminals

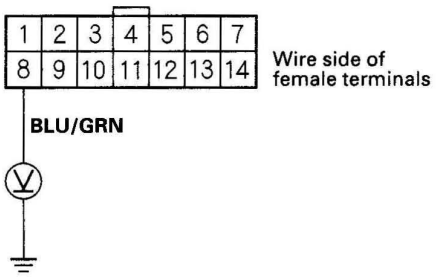
Is there continuity?

YES – Repair a short in the wire between PCM connector terminal A5 and the cruise control unit 14P connector terminal No. 8. ■

NO – Go to step 7.

7. Reconnect PCM connector A (32P) and the cruise control unit 14P connector.
8. Reconnect the negative cable to the battery.
9. Connect a voltmeter between the No. 8 terminal of the cruise control unit 14P connector and body ground. Test drive the vehicle at speeds over 25 mph (40 km/h) with the cruise control set, and watch the voltmeter.

CRUISE CONTROL UNIT 14P CONNECTOR



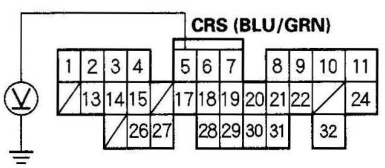
Is there about 1 V?

YES – Go to step 10.

NO – Substitute a known-good control unit. If the system works properly, replace the cruise control unit. ■

10. Connect a voltmeter between PCM connector terminal A5 and body ground. Drive the vehicle at speeds over 25 mph (40 km/h) with the cruise control set, and watch the voltmeter.

PCM CONNECTOR A (32P)



Wire side of female terminals

Is there about 1 V?

YES – Check for loose connectors of the BLU/GRN wire between the cruise control unit and the PCM. If necessary replace the PCM and recheck. ■

NO – Repair open in the wire between the PCM connector terminal A5 and the cruise control unit 14P connector terminal No. 8. ■

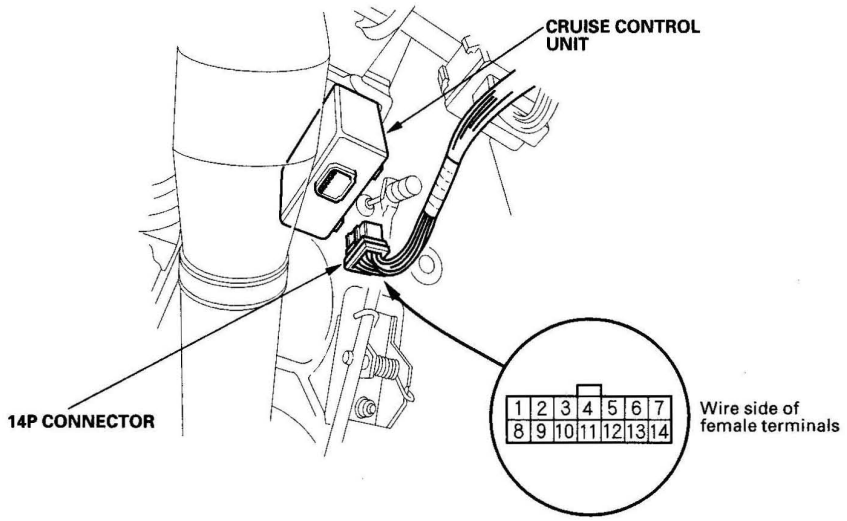
BACK

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Control Unit Input Test

SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

1. Remove the driver's dashboard lower cover.
2. Disconnect the 14P connector from the control unit.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.



4. With the 14P connector disconnected, make these input tests.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
2	GRY	Ignition switch ON (II), main switch ON and brake pedal pressed, then released	Check for voltage to ground: There should be 0 V with the pedal pressed and battery voltage with the pedal released.	• Misadjusted or faulty brake pedal position switch • An open in the wire • Open in cruise control main switch • Blown No. 6 (15 A) fuse in the driver's under-dash fuse/relay box
3	BLK	Ignition switch ON (II) and main switch ON.	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G401) • An open in the wire
4	BLK/ YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 6 (15 A) fuse in the driver's under-dash fuse/relay box • An open in the wire
5	WHT/ BLK	Brake pedal pressed, then released	Check for voltage to ground: There should be battery voltage with the pedal pressed, and 0 V with the pedal released.	• Blown No. 47 (20 A) fuse in the under-hood fuse/relay box • Misadjusted or faulty brake pedal position switch • An open in the wire

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Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
6	LT GRN/ RED	Set button pushed	Check for voltage to ground: There should be battery voltage. When testing terminal No. 6, there should be no voltage on terminal No. 7.	• Blown No. 47 (20 A) fuse in the under-hood fuse/relay box • Faulty horn relay • Faulty set/resume/cancel switch • Faulty cable reel • An open in the wire
7	LT GRN/ BLK	Resume buttons pushed	Check for voltage to ground: There shuld be battery voltage. When testing terminal No. 7, there should be no voltage on terminal No. 6.	
12	BLU/ WHT	Ignition switch ON (II), raise the front of the vehicle, and rotate one wheel slowly while holding the other wheel	Check for voltage between the BLU/WHT (+) and BLK (–) terminals: There should be 0– 5 V (2.5 V average)	• An open in the wire • Short to ground • Faulty PCM
13	LT GRN	Ignition switch ON (II) and main switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 6 (15 A) fuse in the driver's under-dash fuse/relay box • Faulty main switch • An open in the wire
14	LT BLU	Shift lever in D3 , D4 or D5	Check for voltage to ground: There should be less than 1 V.	• Faulty A/T gear position switch • Poor ground (G101, G102) • An open in the wire
8	BLU/ GRN	Reconnect the cruise control unit 14P connector, start the engine, turn the main switch ON, and drive the vehicle at speeds over 25 mph (40 km/h) with the cruise control set.	Check for voltage to ground: There should be about 1 V	• Loose connection at the Powertrain Control Module (PCM) • Fauty cruise control unit • Short to ground • Faulty PCM

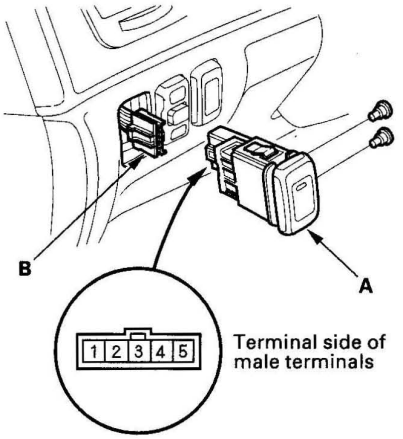
5. Reconnect the 14P connector, and make these input tests.
6. If any test indicates a problem, find and correct the cause, then recheck the system. If all the input tests prove OK, the control unit may be faulty. Substitute a known-good control unit and retest. If the system works properly, replace the control unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BRN	Connect battery power to the BRN terminal, then connect battery power to the RED terminal and ground to the BRN/BLK terminal just long enough to check actuator motor operation.	Check the operation of the actuator motor: The motor should run and the throttle should open.	• Fauty actuator • An open in the wire • Poor ground (G201) • Short to ground
9	RED			
11	BRN/ BLK			
10	BLU/ BLK	Ignition switch ON (II)	Attach to ground: Cruise indicator light in the gauge assembly should come on.	• Blown bulb • Blown No. 9 (10 A) fuse in the driver's under-dash fuse/relay box • Faulty dimming circuit in the gauge assembly • An open in the wire

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Main Switch Test/Replacement

1. Carefully pry the switch (A) out of the instrument panel.

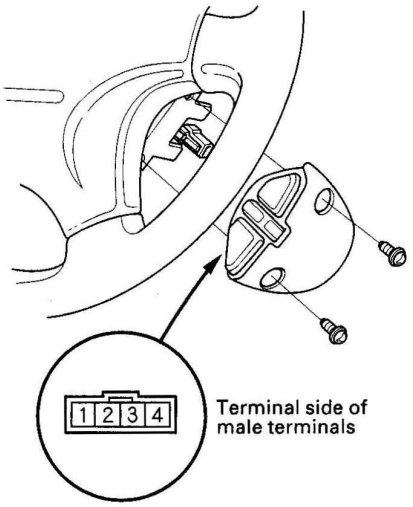


2. Disconnect the 5P connector (B) from the switch.
3. Check for continuity between the terminals in each switch position according to the table. If there is no continuity.
   - If the continuity is not as specified, replace the switch.
   - If OK, install the switch.

Terminal / Position	1		2	3	4		5
OFF	○	⊗	○		○	⊗	○
ON	○	⊗	○	○	○	⊗	○

Set/Resume/Cancel Switch Test/ Replacement

1. Remove the two screws, then remove the switch.



2. Check for continuity between the terminals in switch position according to the table.
   - If there is continuity and it matches the table, but switch failure was suspected after the cruise control unit input test, check and repair the wire harness or cable reel.
   - If there is no continuity in any position, replace the switch.

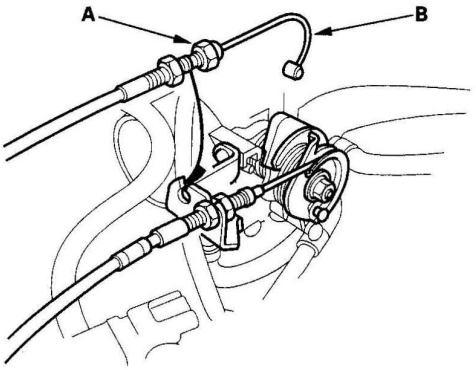
Terminal / Position	2		3	4
SET (ON)	○			○
RESUME (ON)	○		○	
CANCEL (ON)	○		○	○

BACK

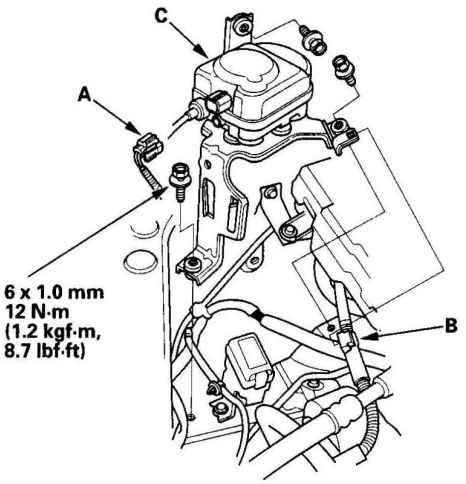
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Actuator/Cable Replacement

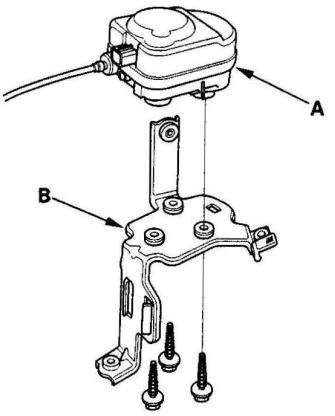
1. Remove the intake manifold cover.
2. Loosen the locknut (A), then disconnect the actuator cable (B) from the throttle linkage.



3. Disconnect the 4P connector (A) and harness clamp (B) from the actuator assembly.



4. Remove the three mounting bolts, and remove the actuator assembly (C).
5. Remove the actuator (A) from the bracket (B).



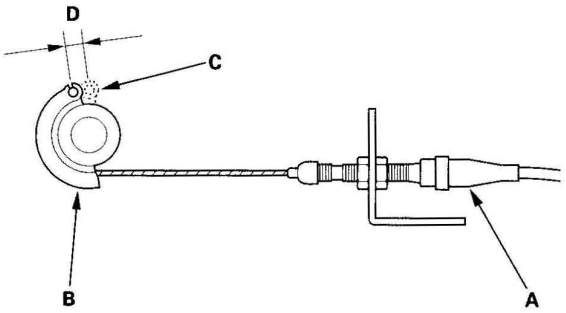
6. Install the actuator in the reverse order of removal, and adjust the free play at the throttle linkage after connecting the actuator cable.

BACK

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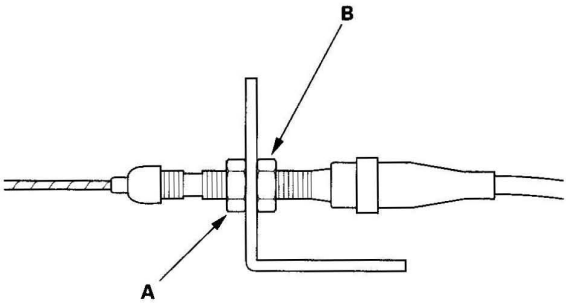
Actuator Cable Adjustment

1. Check that the actuator cable (A) moves smoothly with no binding or sticking.



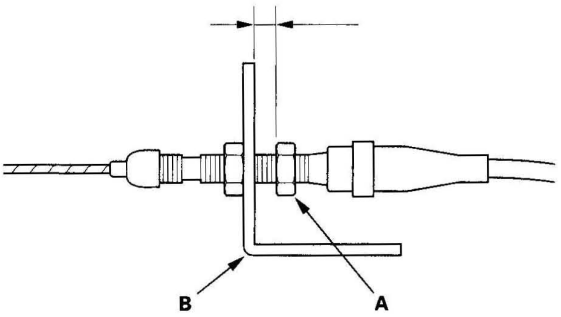
2. Measure the amount of movement of the output linkage (B) until the engine speed starts to increase. At first, the output linkage should be located at the fully closed position (C). The free play (D) should be 3.75±0.5 mm (0.15±0.02 in.).

3. If the free play is not within specs, move the cable to the point where the engine speed starts to increase, and tighten the locknut (A) and adjusting nut (B).

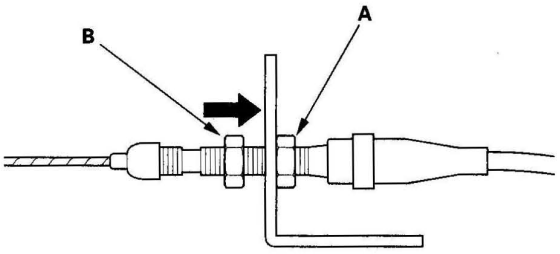


4. Turn the adjusting nut (A) until it is 3.75±0.5 mm (0.15±0.02 in.) away from the bracket (B).

3.75±0.5 mm (0.15±0.02 in.)



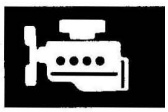
5. Pull the cable so that the adjusting nut (A) touches the bracket, and tighten the locknut (B).



BACK

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Engine Mechanical



Engine Assembly
Engine Removal 5-2
Engine Installation 5-11

Cylinder Head **6-1**

Engine Block **7-1**

Engine Lubrication **8-1**

Intake Manifold/Exhaust System **9-1**

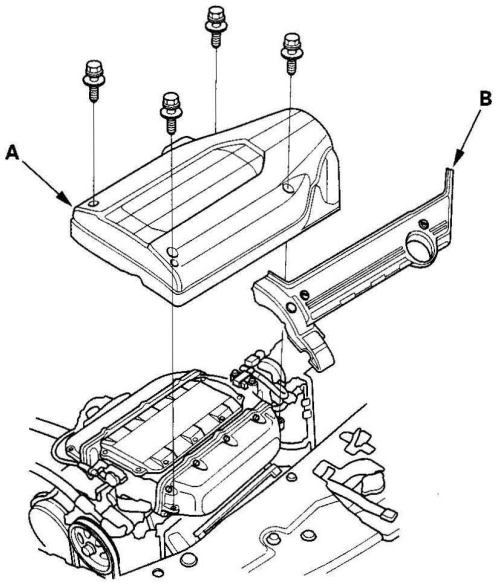
Engine Cooling **10-1**

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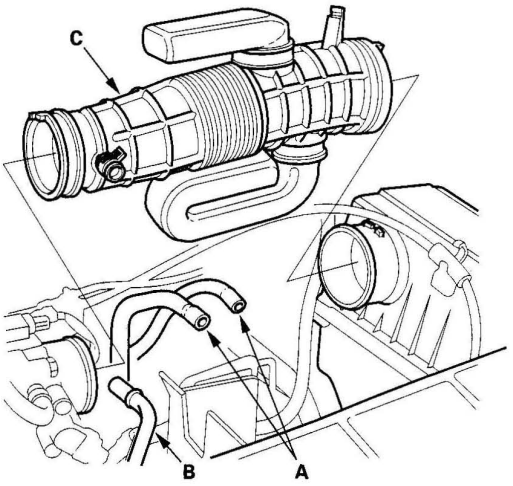
Engine Removal

NOTE:
- Use fender covers to avoid damaging painted surfaces.
- To avoid damage, unplug the wiring connectors carefully while holding the connector portion.
- Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses, or interfere with other parts.

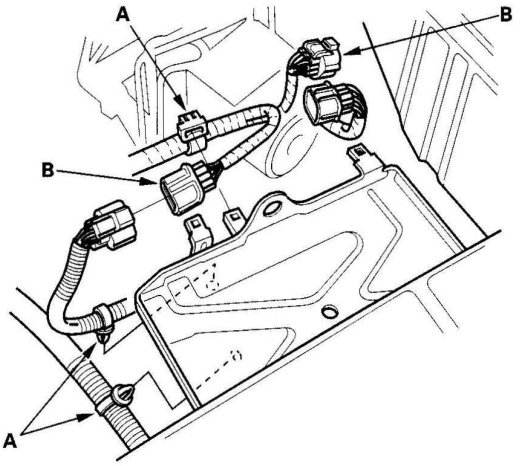
1. Remove the support struts from the hood, and prop the hood in a vertical position.
2. Drain the power steering system fluid (see page 17-14).
3. Make sure you have the anti-theft code for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
4. Disconnect the negative cable from the battery first, then disconnect the positive cable.
5. Remove the battery and battery tray.
6. Remove the intake manifold cover (A) and ignition coil cover (B).



7. Remove the vacuum hoses (A) and breather pipe (B), then remove the intake air duct (C).



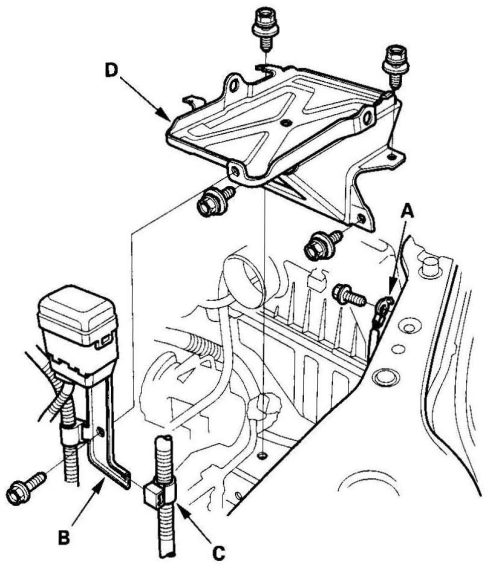
8. Remove the harness clips (A), and disconnect the engine wire harness connectors (B) on the left side of the engine compartment.



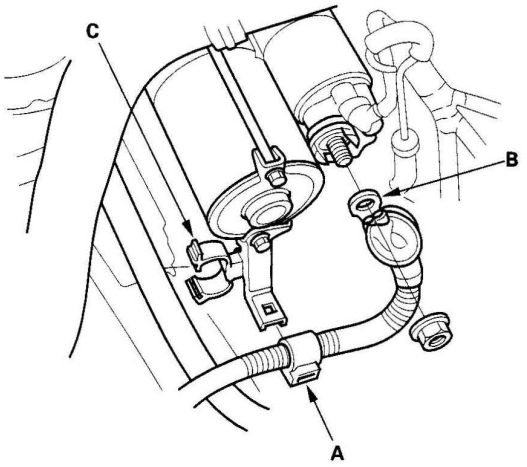
BACK

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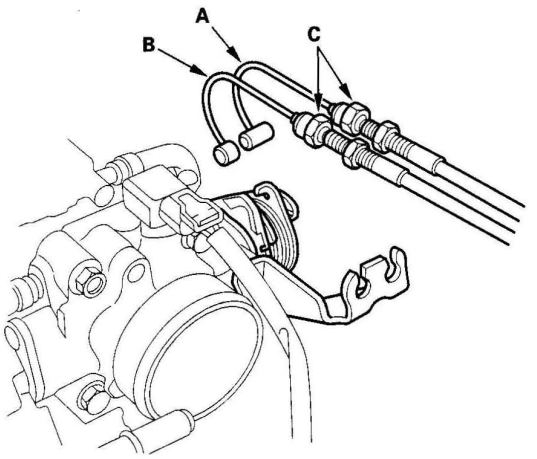
9. Remove the ground cable (A), relay bracket (B), and harness clip (C), then remove the battery base (D).



10. Remove the harness clip (A) and starter motor cable (B), and unlatch the Automatic Transmission Fluid (ATF) cooler hose clamp (C).

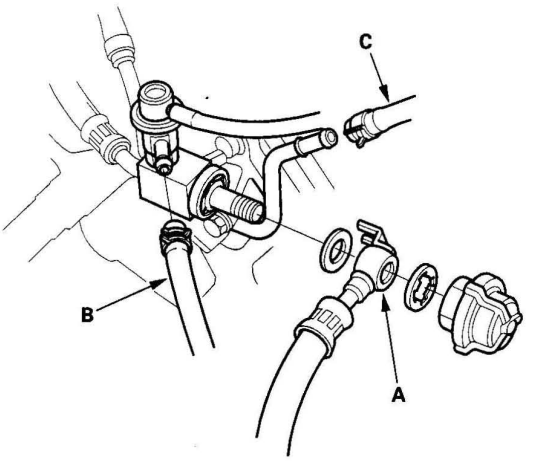


11. Remove the throttle cable (A) and cruise control cable (B) by loosening the locknuts (C), then slipping the cable ends out of the accelerator linkage. Take care not to bend the cables when removing them. Always replace any kinked cable with a new one.



12. Relieve fuel pressure (see page 11-117).

13. Remove the fuel feed hose (A), fuel return hose (B), and Evaporative Emission (EVAP) canister hose (C).



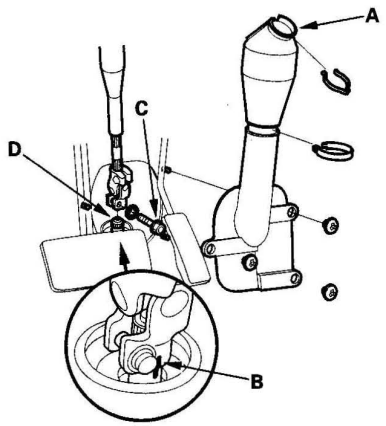
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Engine Removal (cont'd)

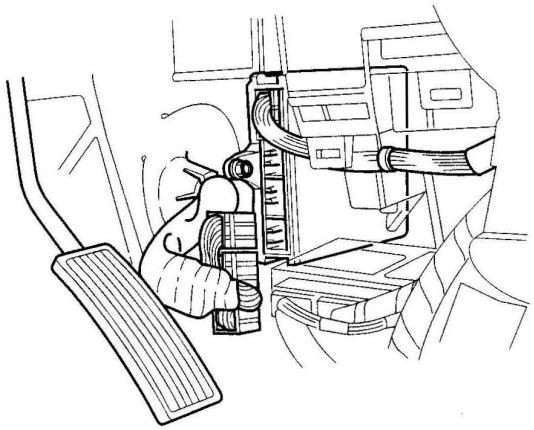
14. Remove the center console lower panel (driver's side), and pull back the carpet to expose the steering joint cover.

15. Remove the steering joint cover (A).

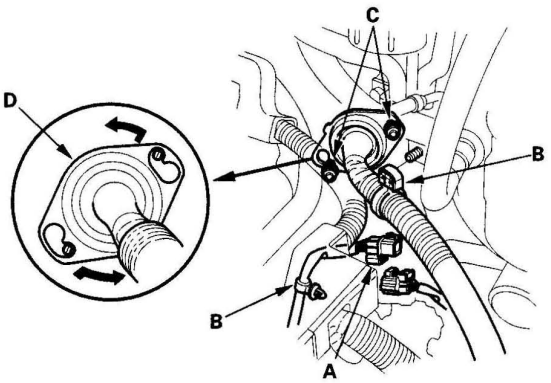


16. Make a reference mark (B) across the steering joint and steering gearbox pinion shaft. Remove the steering joint bolt (C), and disconnect the steering joint from the steering gearbox pinion shaft (D).

17. Disconnect the Powertrain Control Module (PCM) connectors.

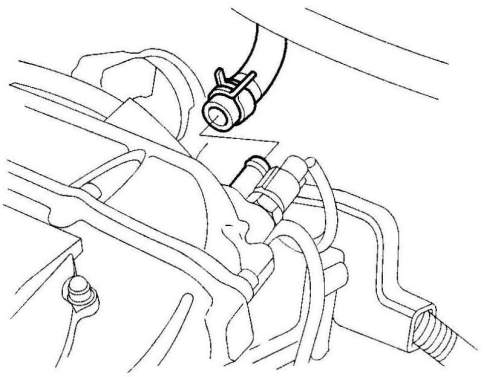


18. Disconnect the primary Heated Oxygen Sensor (primary HO2S) connector (A), and remove the harness clamps (B).



19. Loosen the grommet mounting nuts (C). Turn the grommet (D) counterclockwise, then pull the engine wire harness through the bulkhead.

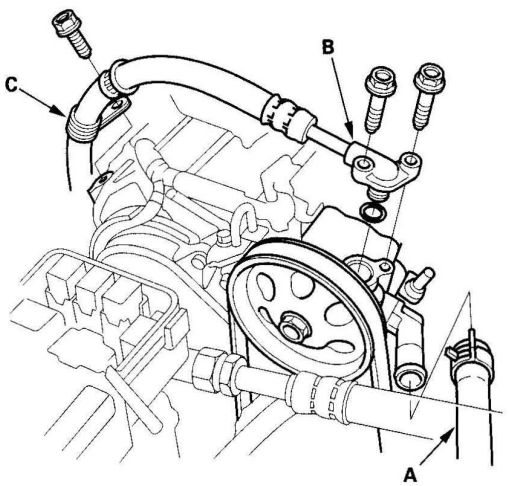
20. Remove the brake booster vacuum hose.



BACK

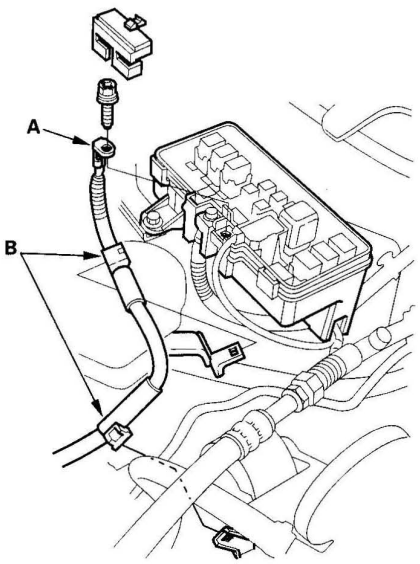
Protected by AR

21. Remove the Power Steering (P/S) pump inlet hose (A) and P/S pump outlet hose (B) from the P/S pump.

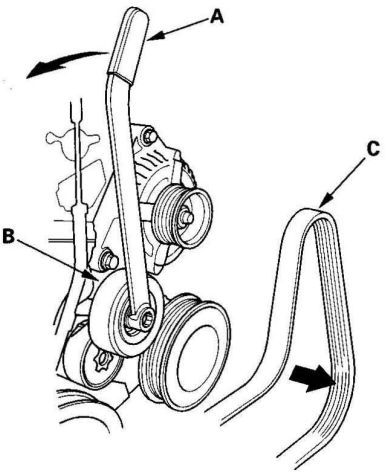


22. Remove the P/S hose clamp (C).

23. Remove the battery cable (A) from the under-hood fuse relay box, and remove the harness clamps (B).



24. Use the belt tension release arm (A) to move the auto-tensioner (B), then remove the alternator belt (C).

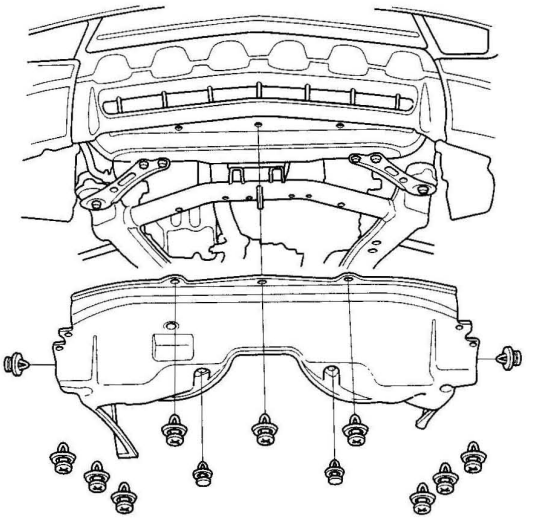


25. Remove the radiator cap.

26. Raise the hoist to full height.

27. Remove the front tires/wheels.

28. Remove the splash shield.



(cont'd)

BACK

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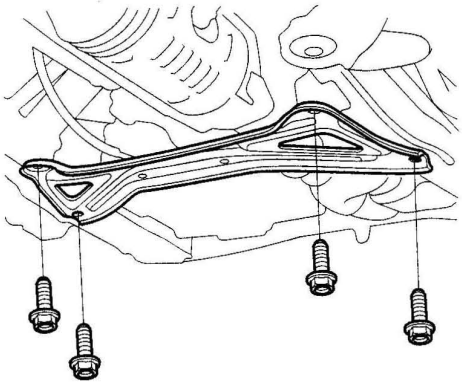
Engine Removal (cont'd)

29. Loosen the drain plug in the radiator, and drain the engine coolant (see page 10-8).

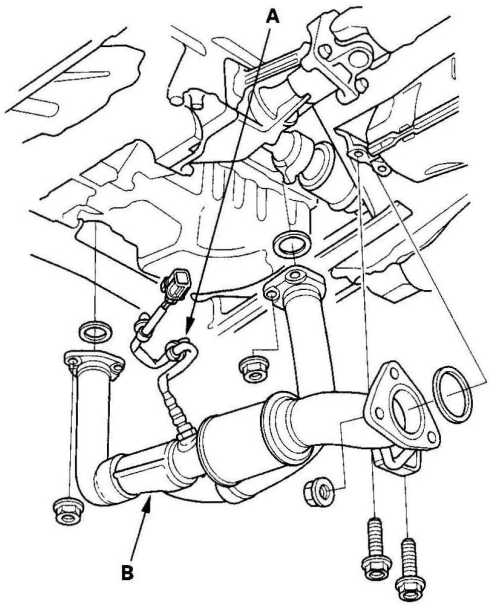
30. Drain the ATF. Reinstall the drain plug using a new washer (see page 14-132).

31. Drain the engine oil. Reinstall the drain bolt using a new washer (see page 8-5).

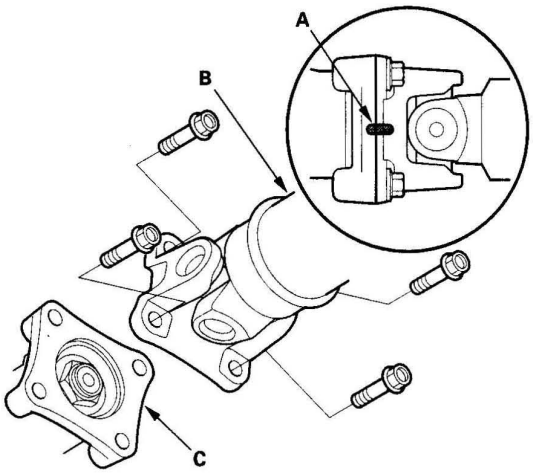
32. Remove the front sub-frame stiffener.



33. Remove the harness clamp (A), then remove exhaust pipe A (B).



34. Make reference marks (A) on the propeller shaft (B) and transfer shaft flange (C), then separate the propeller shaft from the transfer shaft flange.



BACK

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35. Remove the shift control cable (see page 14-165).

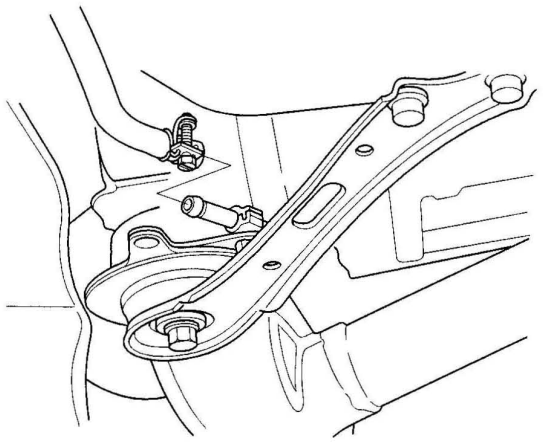
36. Remove the transfer assembly (see page 14-134).

37. Disconnect the tie-rod end ball joints (see step 11 on page 17-31).

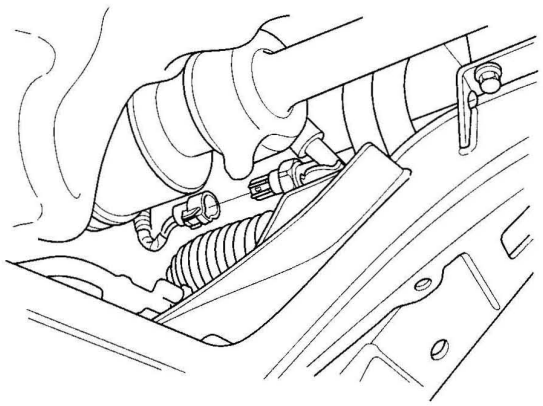
38. Disconnect the suspension lower arm ball joints and stabilizer links (see page 18-14).

39. Remove the driveshafts (see page 16-3). Coat all precision finished surfaces with clean engine oil. Tie plastic bags over the driveshaft ends.

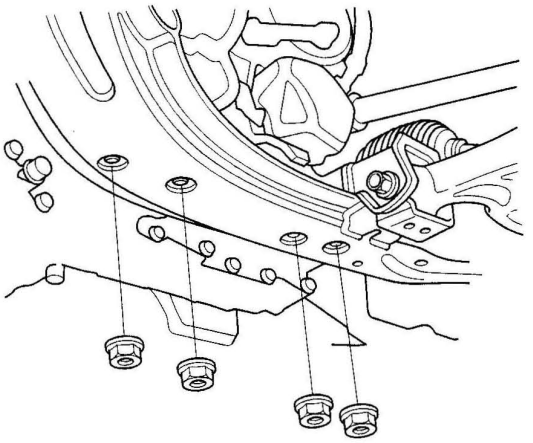
40. Remove the P/S hose.



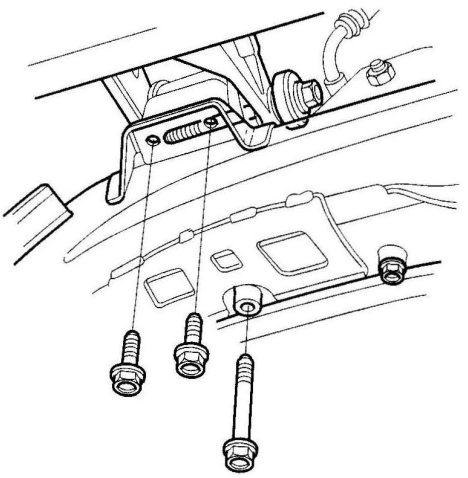
41. Disconnect the power steering pressure switch connector.



42. Remove the nuts securing the transmission lower front mount and transmission lower rear mount.



43. Remove the bolts securing the rear mount.

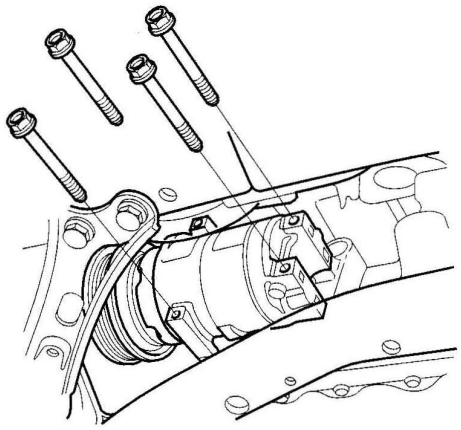


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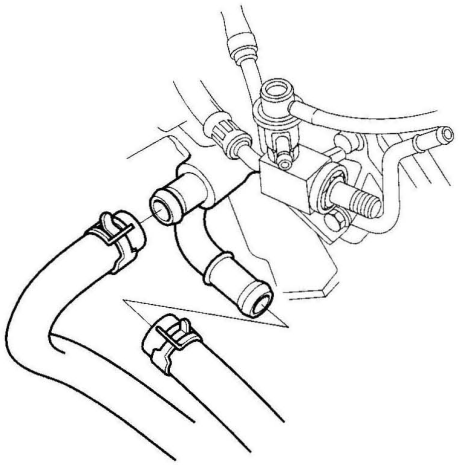
Engine Removal (cont'd)

44. Remove the A/C compressor without disconnecting the A/C hoses.

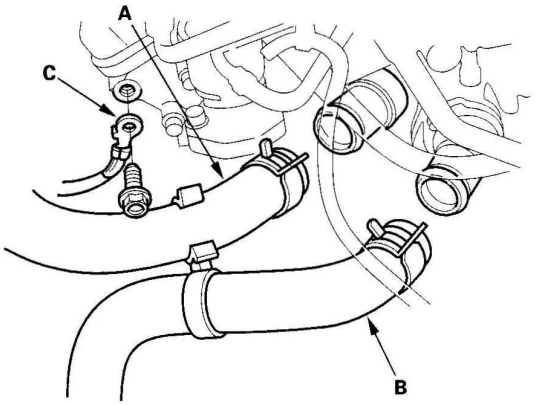


45. Lower the hoist.

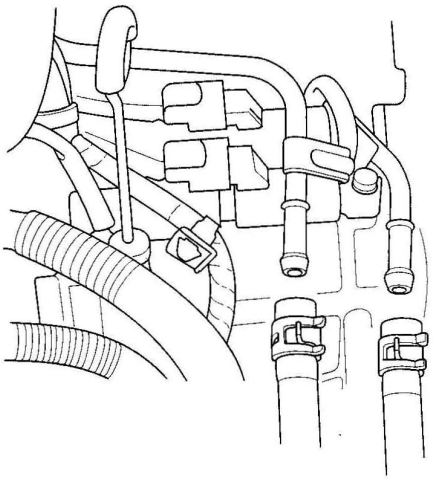
46. Remove the heater hoses.



47. Remove the upper radiator hose (A), lower radiator hose (B), and ground cable (C).



48. Remove the ATF cooler hoses, then plug the ATF cooler hoses and lines.

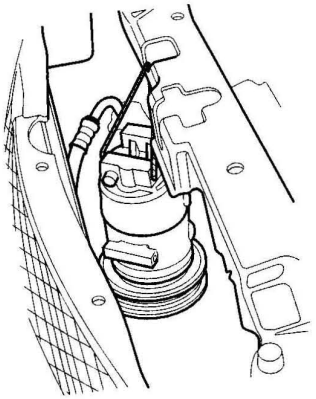


BACK

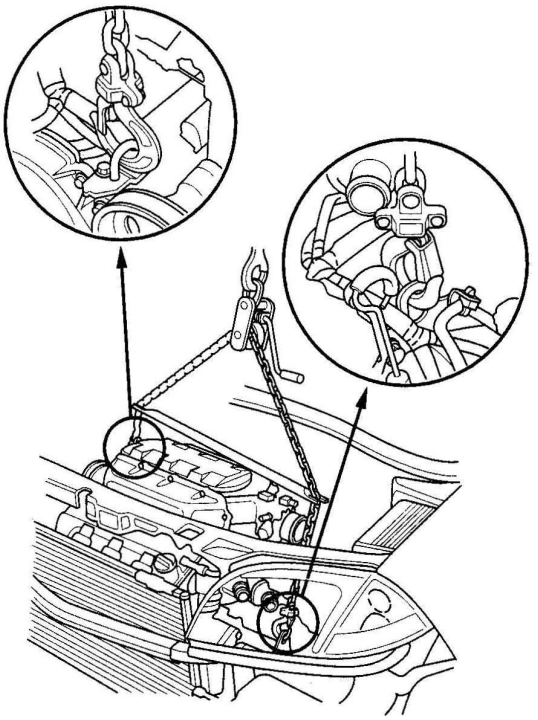
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49. Remove the radiator (see page 10-11).

50. Hang the A/C compressor with a rope as shown.



51. Attach the chain hoist to the engine as shown.

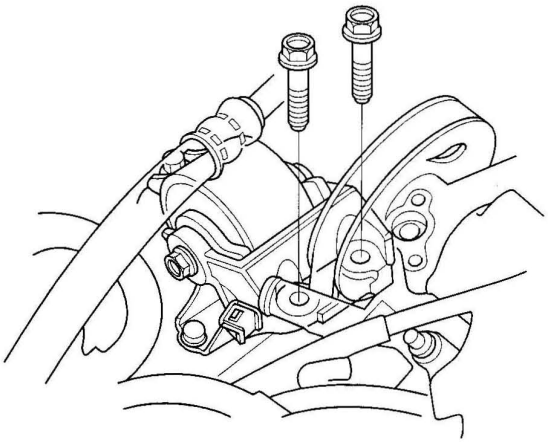


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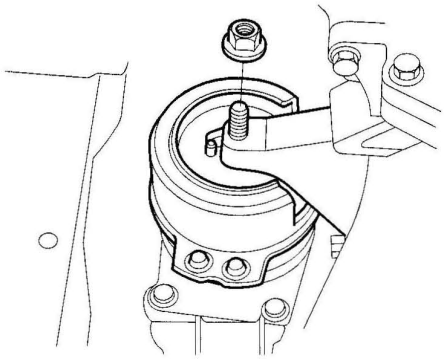
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Engine Removal (cont'd)

52. Remove the bolts securing the side engine mount bracket.

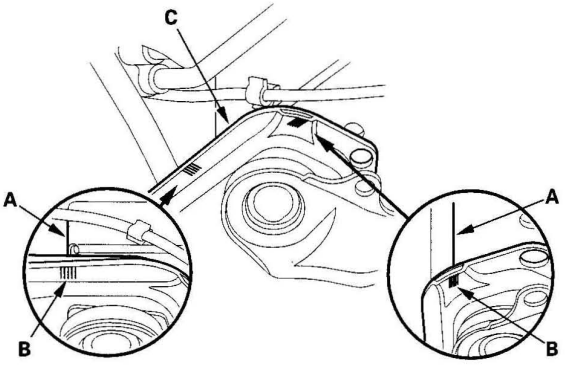


53. Remove the nut securing the front mount bracket.

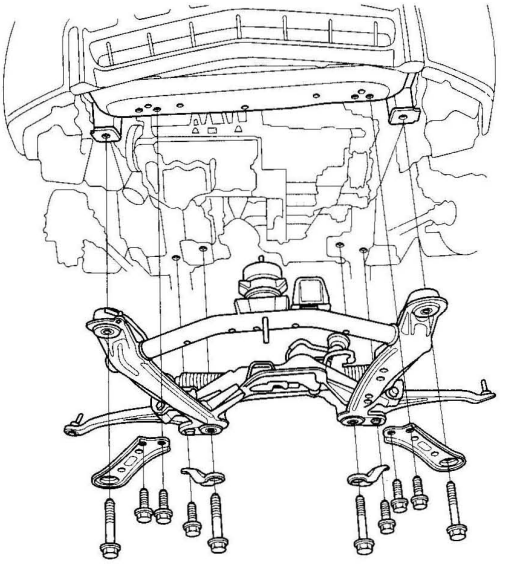


54. Make sure the hoist brackets are positioned properly. Raise the hoist to full height.

55. Make reference marks (A) on the body next to the marks (B) on the front sub-frame (C).



56. Remove the front sub-frame.



57. Check that the engine/transmission is completely free of vacuum hoses, fuel and coolant hoses, and electrical wiring.

58. Slowly lower the engine about 150 mm (6 in.). Check once again that all hoses and wires are disconnected from the engine/transmission.

59. Lower the engine all the way. Remove the chain hoist from the engine.

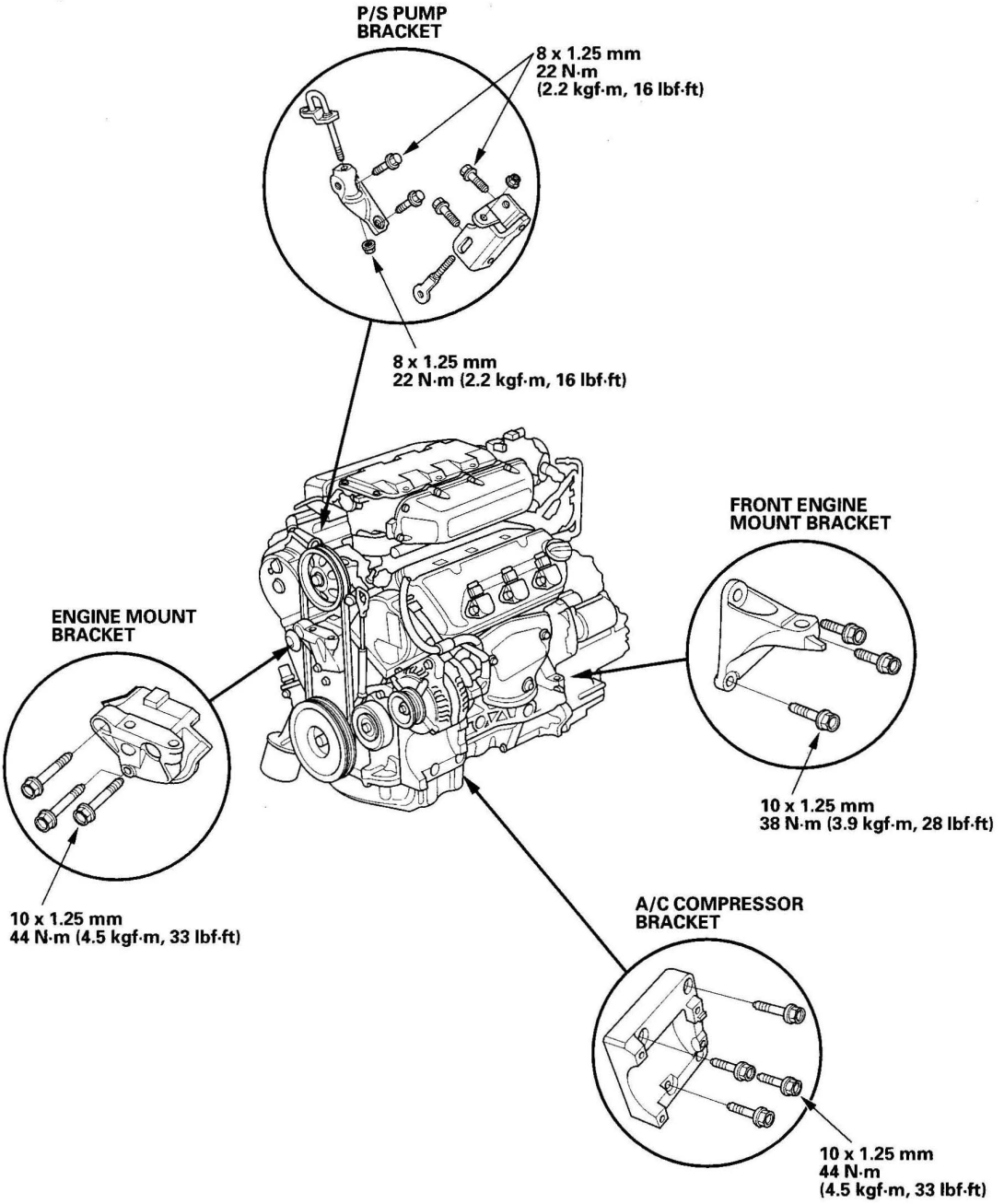
60. Remove the engine from under the vehicle.

BACK

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Engine Installation

1. Install the accessory brackets, and tighten their bolts and nuts to the specified torques.



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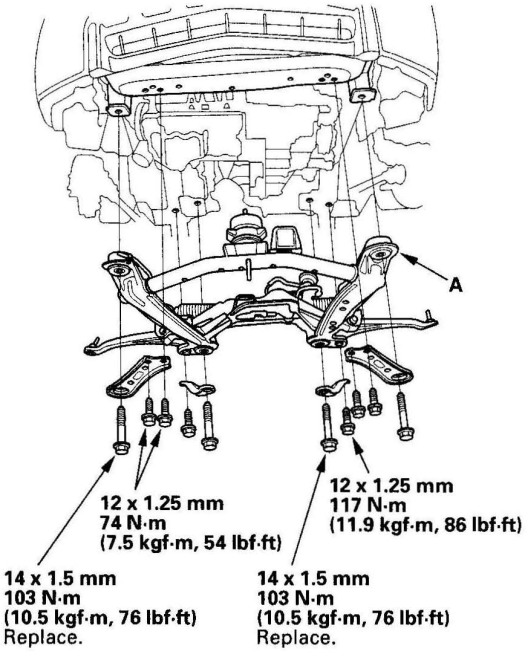
Engine Installation (cont'd)

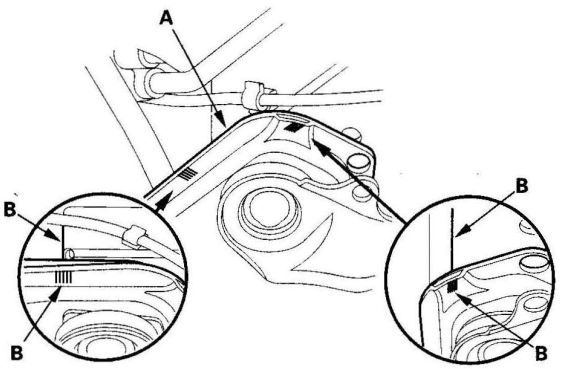
2. Position the engine under the vehicle. Attach the chain hoist to the engine, then lift the engine into position in the vehicle.

NOTICE

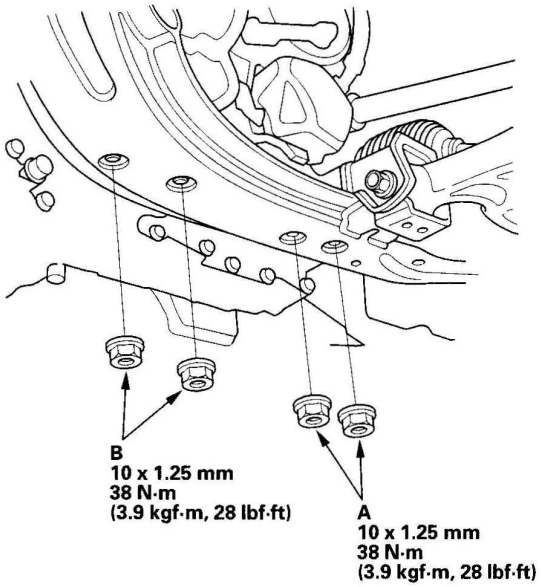
Reinstall the mounting bolts/support nuts in the sequence given. Failure to follow this sequence may cause excessive noise and vibration, and reduce bushing life.

3. Install the front sub-frame (A). Align the reference marks (B) on the front sub-frame with the body, then tighten the bolts.

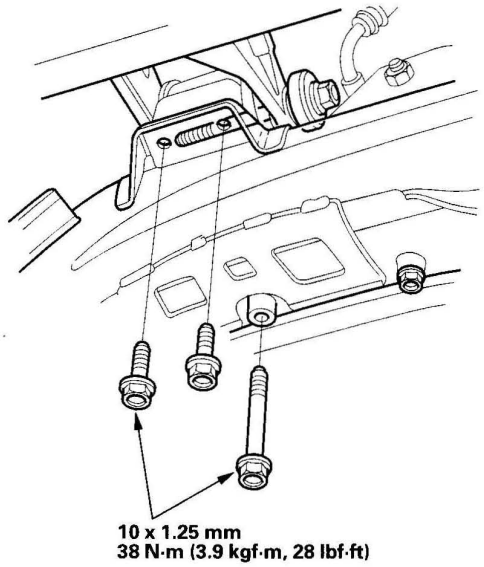




4. Tighten the transmission lower rear mount mounting nuts (A) and transmission lower front mount mounting nuts (B).



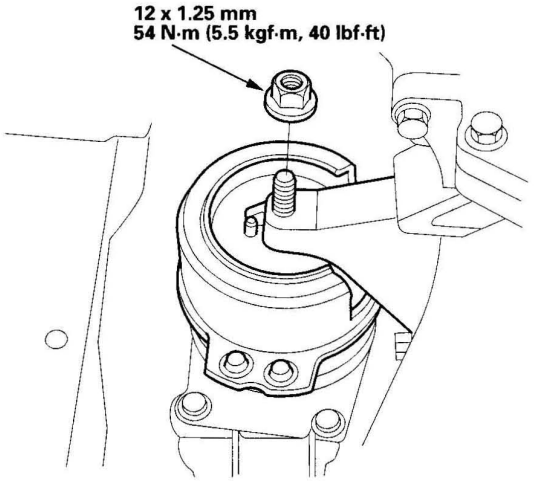
5. Tighten the rear mount mounting bolts.



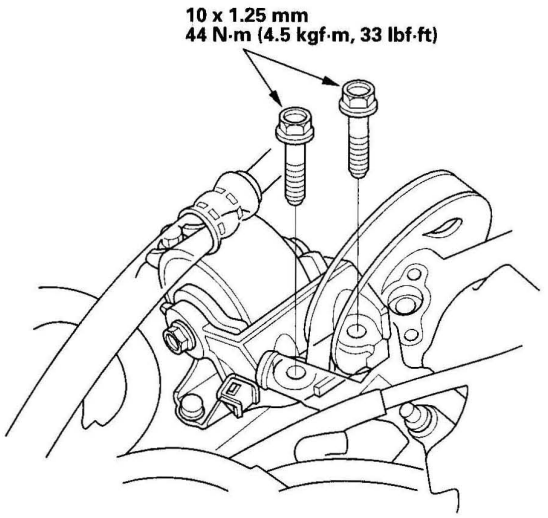
BACK

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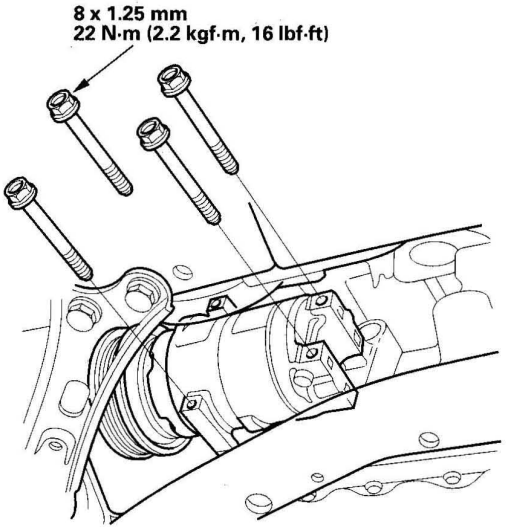
6. Lower the hoist.
7. Tighten the front mount support nut.



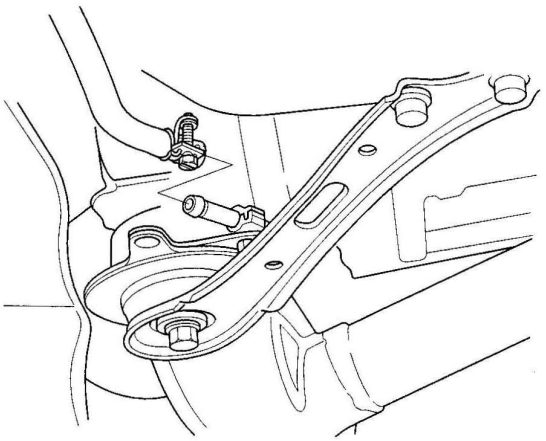
8. Tighten the side engine mount mounting bolts.



9. Remove the chain hoist from the engine.
10. Raise the hoist to full height.
11. Install the A/C compressor.



12. Install the Power Steering (P/S) hose.

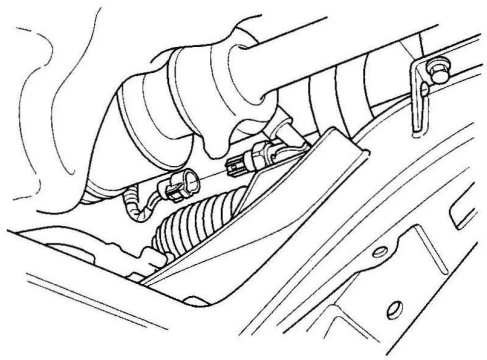


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Protected by AR

Engine Installation (cont'd)

13. Connect the power steering pressure switch connector.



14. Install a new spring clip on the end of each driveshaft, then install the driveshafts. Make sure each clip "clicks" into place in the differential and intermediate shaft.

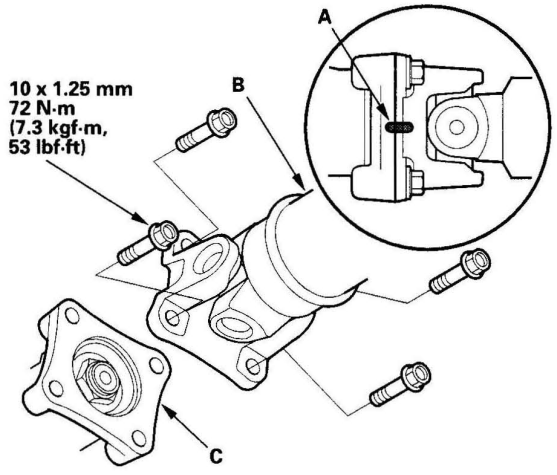
15. Connect the suspension lower arm ball joints, and stabilizer links (see page 18-14).

16. Connect the tie-rod end ball joints (see step 23 on page 17-56).

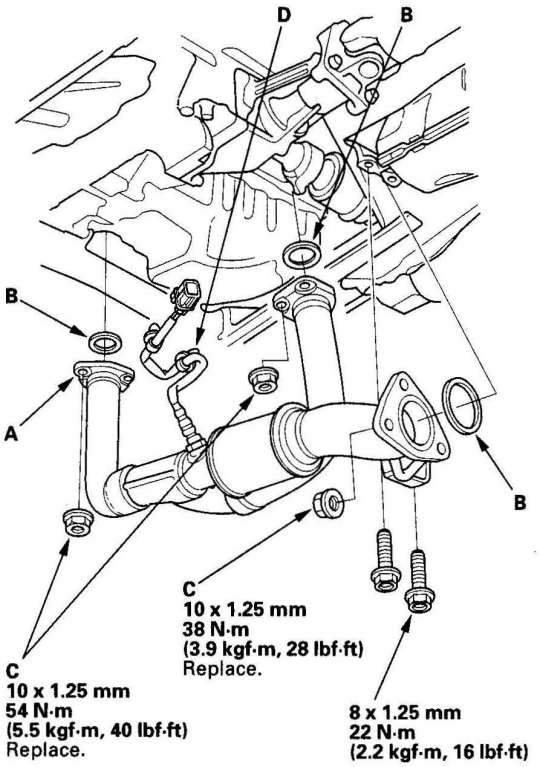
17. Install the transfer assembly (see page 14-136).

18. Install the shift cable (see page 14-165).

19. Align the reference marks (A) on the propeller shaft (B) and transfer shaft flange (C), then install the propeller shaft.



20. Install exhaust pipe A (A); use new gaskets (B) and new self locking nuts (C).

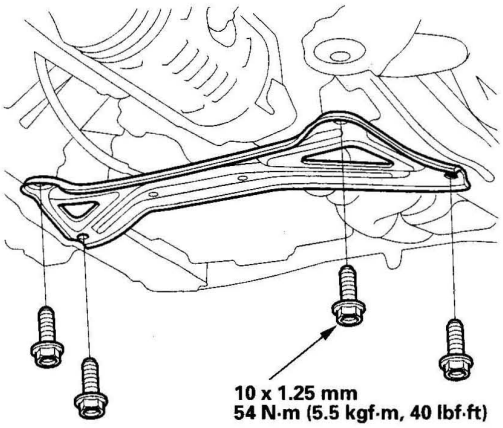


21. Install the harness clamp (D).

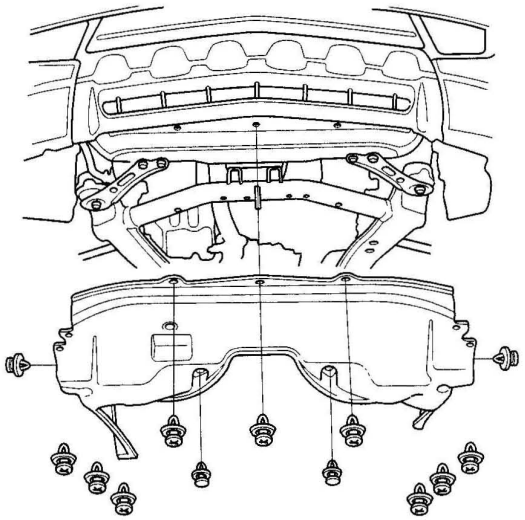
BACK

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22. Install the front sub-frame stiffener.



23. Install the splash shield.

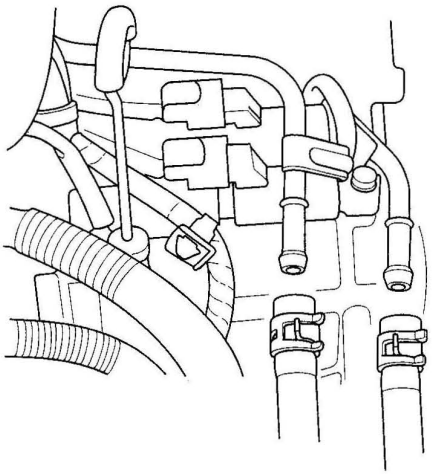


24. Install the front tires/wheels.

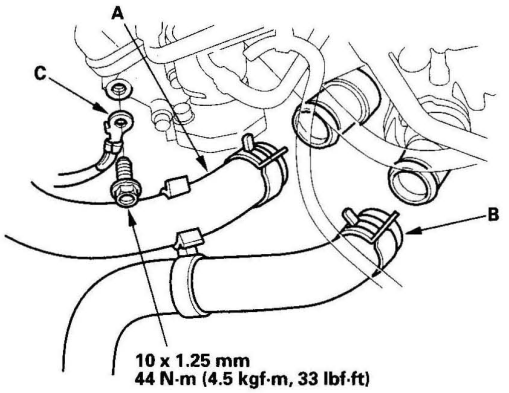
25. Lower the hoist.

26. Install the radiator (see page 10-11).

27. Install the Automatic Transmission Fluid (ATF) cooler hoses.



28. Install the upper radiator hose (A), lower radiator hose (B), and ground cable (C).

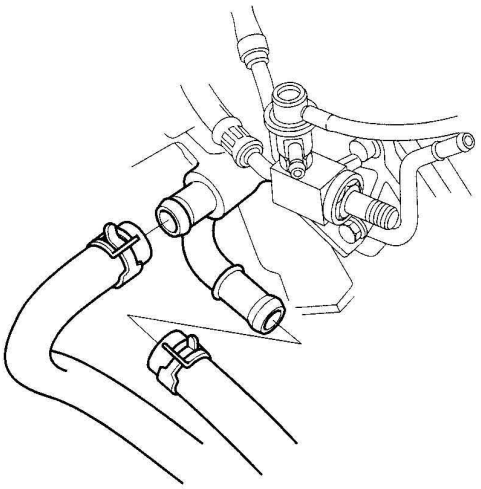


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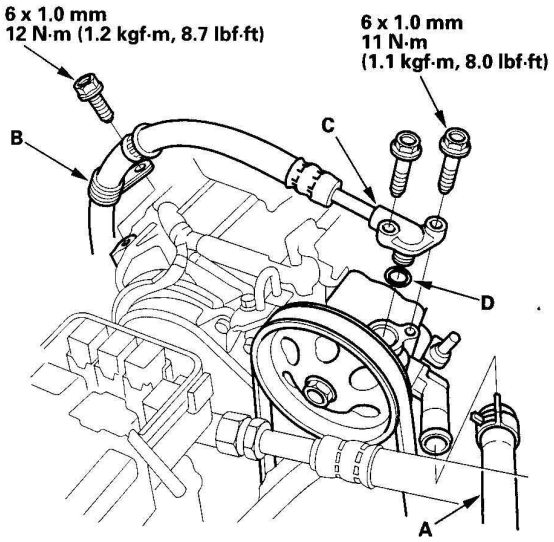
Engine Installation (cont'd)

29. Install the heater hoses.



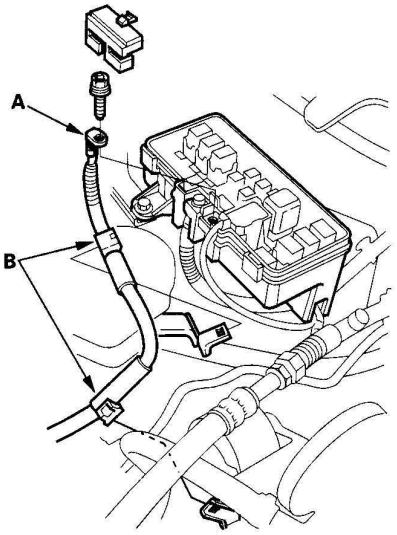
30. Install the alternator belt.

31. Install the P/S pump inlet hose (A) and P/S hose clamp (B).

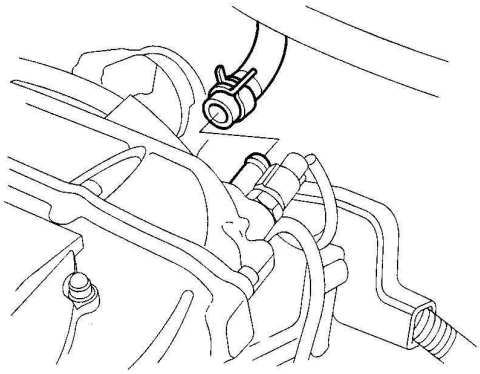


32. Install the P/S pump outlet hose (C) with a new O-ring (D).

33. Install the battery cable (A) on the under-hood fuse/relay box, then install the harness clamps (B).



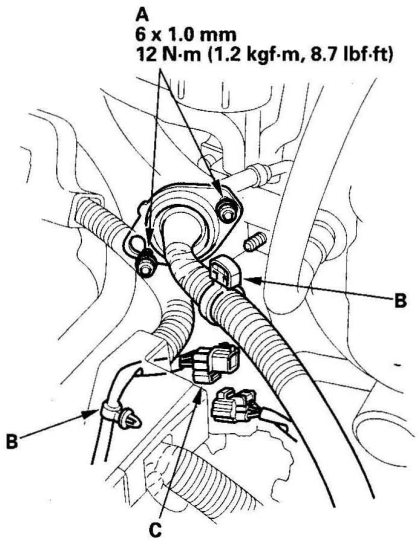
34. Install the brake booster vacuum hose.



BACK

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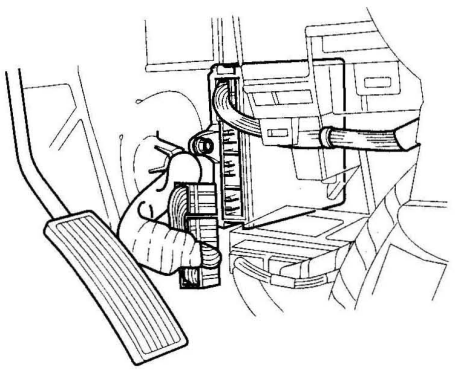
35. Push the Powertrain Control Module (PCM) connectors through the bulkhead. Install the grommet, then tighten the grommet mounting nuts (A).



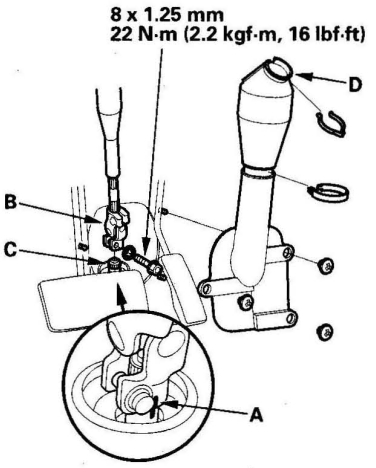
36. Install the harness clamps (B).

37. Connect the primary Heated Oxygen Sensor (primary HO2S) connector (C).

38. Connect the PCM connectors.

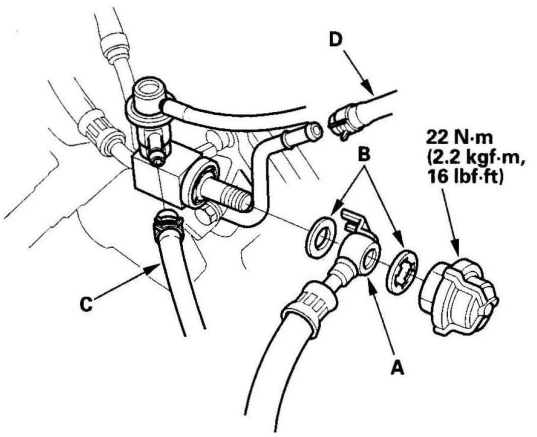


39. Align the reference mark (A) on the steering joint and steering gearbox pinion shaft. Connect the steering joint (B) to the steering gearbox pinion shaft (C). Tighten the steering joint bolt.



40. Install the steering joint cover (D).

41. Install the fuel feed hose (A) with new washers (B).



42. Install the fuel return hose (C) and Evaporative Emission (EVAP) canister hose (D).

(cont'd)

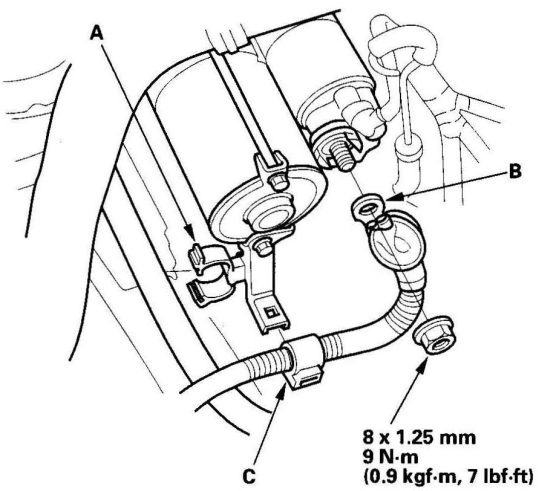
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Engine Installation (cont'd)

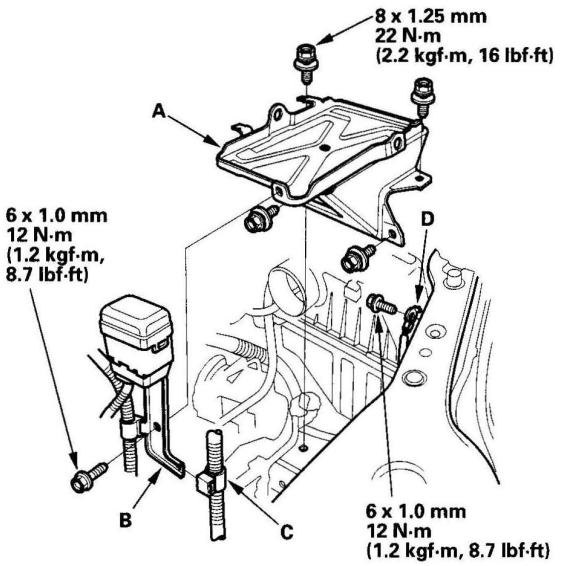
43. Install the cruise control cable, then adjust the cable (see page 4-42).

44. Install the throttle cable, then adjust the cable (see page 11-140).

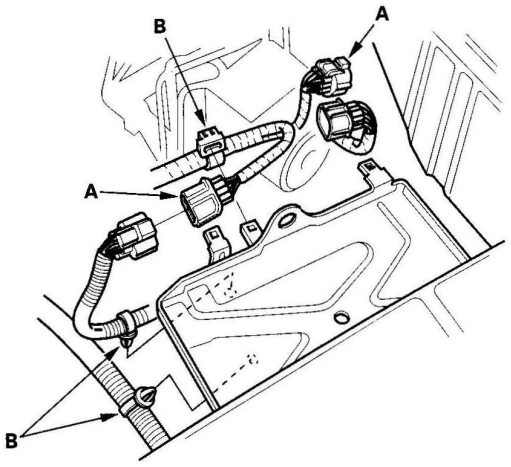
45. Install the ATF cooler hose in the clamp (A), and install the starter motor cable (B) and harness clamp (C).



46. Install the battery base (A), then install the relay bracket (B), harness clamp (C), and ground cable (D).



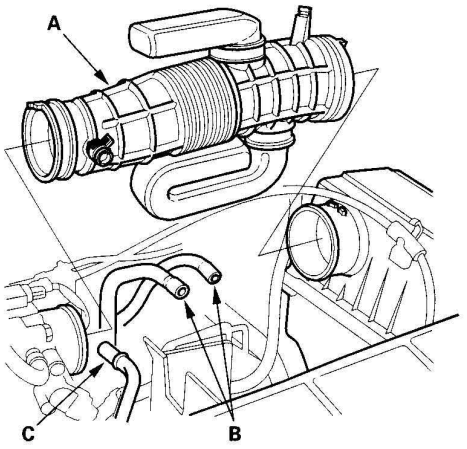
47. Connect the engine wire harness connectors (A) on the left side of the engine compartment, and install the harness clamps (B).



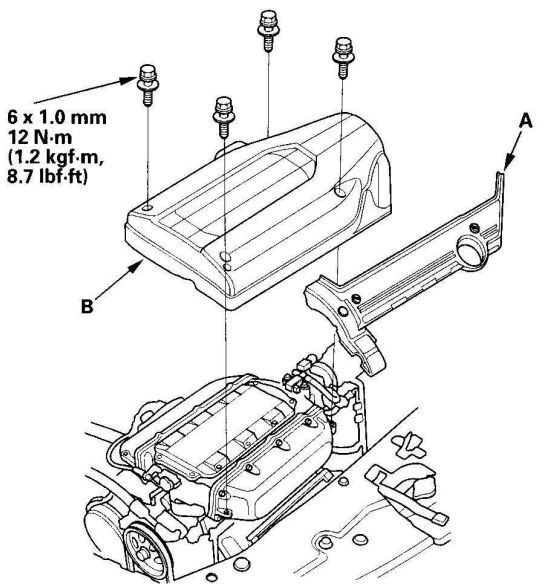
BACK

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48. Install the intake air duct (A), then install the vacuum hoses (B) and breather pipe (C).



49. Install the ignition coil cover (A) and intake manifold cover (B).



50. Clean the battery posts and cable terminals with sandpaper, then assemble them and apply grease to prevent corrosion.

51. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the transmission range switch.

52. Inspect for fuel leaks. Turn the ignition switch ON (II) (do not operate the starter) so that the fuel pump runs for about 2 seconds and pressurizes the fuel line. Repeat this operation two or three times, then check for fuel leakage at any point in the fuel line.

53. Refill the engine with engine oil (see page 8-5).

54. Refill the transmission with ATF (see page 14-132).

55. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see page 10-8).

56. Refill the power steering system fluid (see page 17-14).

57. Inspect the idle speed (see page 11-112).

58. Inspect the ignition timing (see page 4-16).

59. Check the wheel alignment (see page 18-5).

60. Enter the anti-theft code for the radio and the navigation system, then enter the customer's radio station presets.

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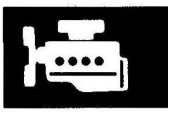
BACK

Protected by AR

Engine Mechanical

Cylinder Head

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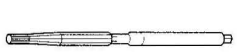
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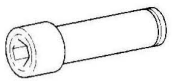
Cylinder Head

Special Tools

Ref. No.	Tool Number	Description	Qty
①	07HAH-PJ7010B	Valve Guide Reamer, 5.5 mm	1
②	07JAA-001020A	Socket, 19 mm	1
③	07JAB-001020A	Holder Handle	1
④	07MAB-PY3010A	Holder Attachment, 50 mm, Offset	1
⑤	07VAJ-P8A010A	VTEC Air Adapter	1
⑥	07VAJ-P8A020A	VTEC Air Stopper	1
⑦	07742-0010100	Valve Guide Driver, 5.5 mm	1
⑧	07757-PJ1010A	Valve Spring Compressor Attachment	1



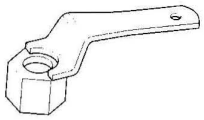
①



②



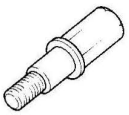
③



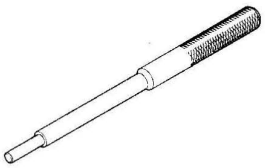
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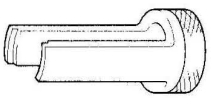
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⑥



⑦

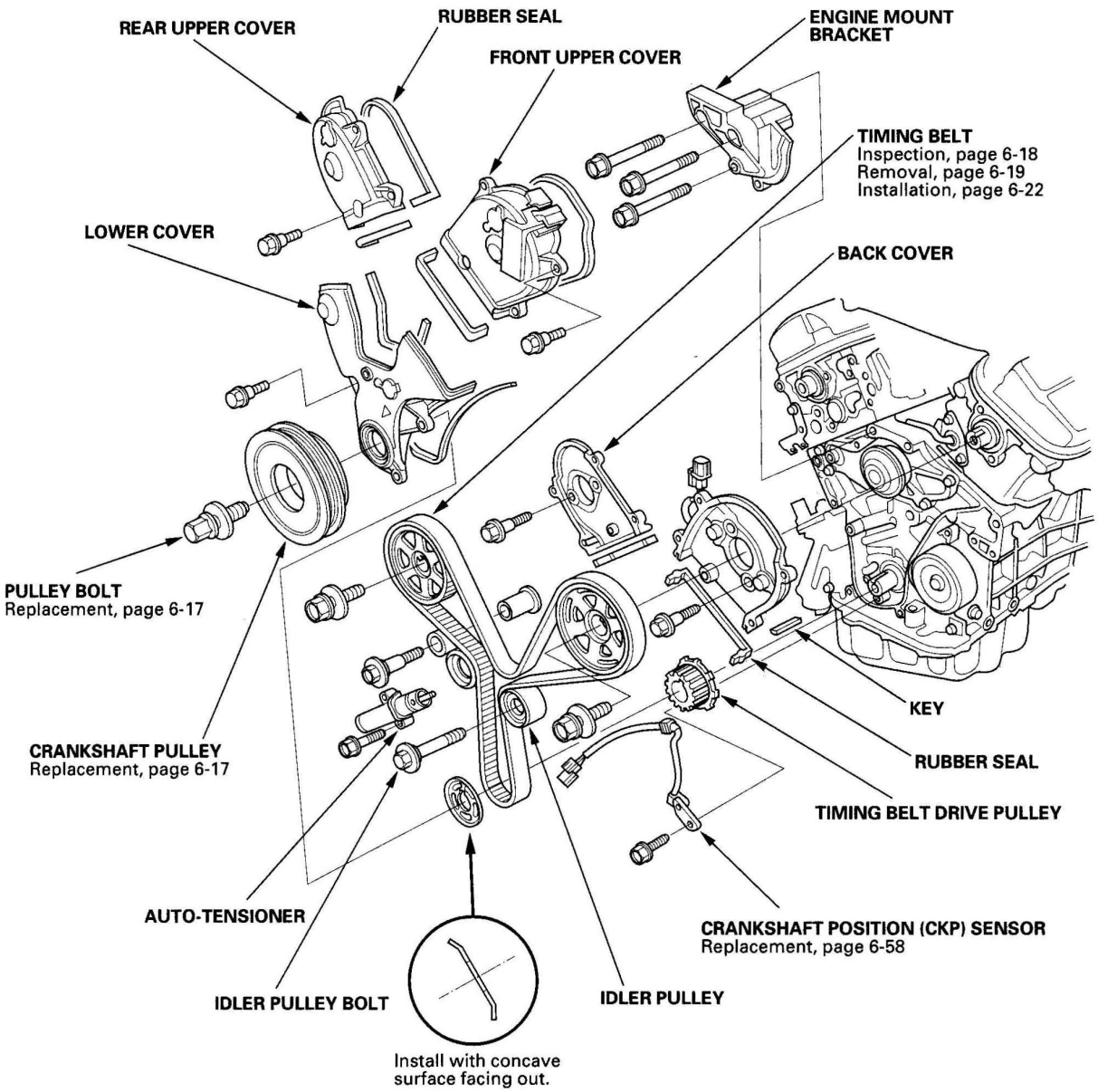


⑧

BACK

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Component Location Index

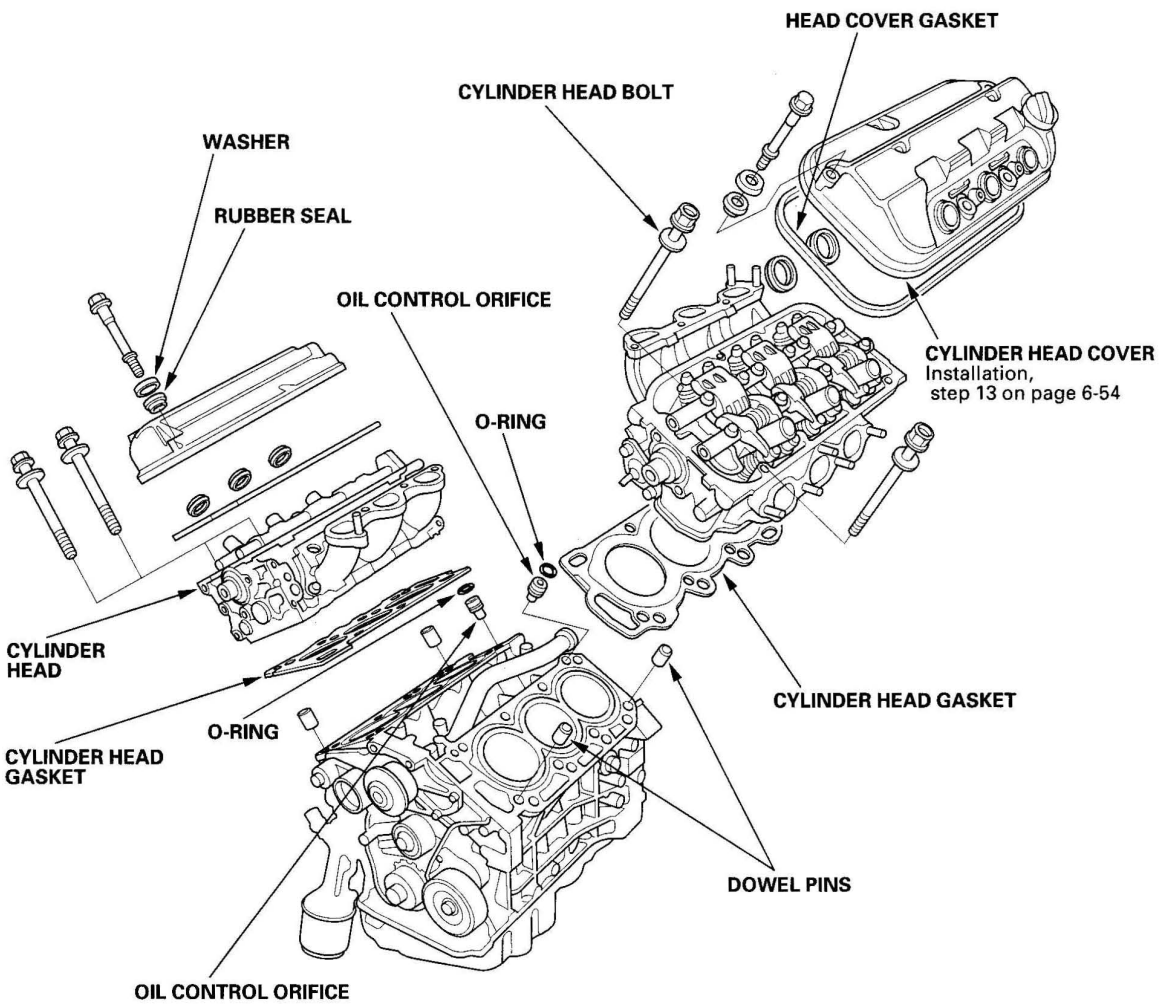


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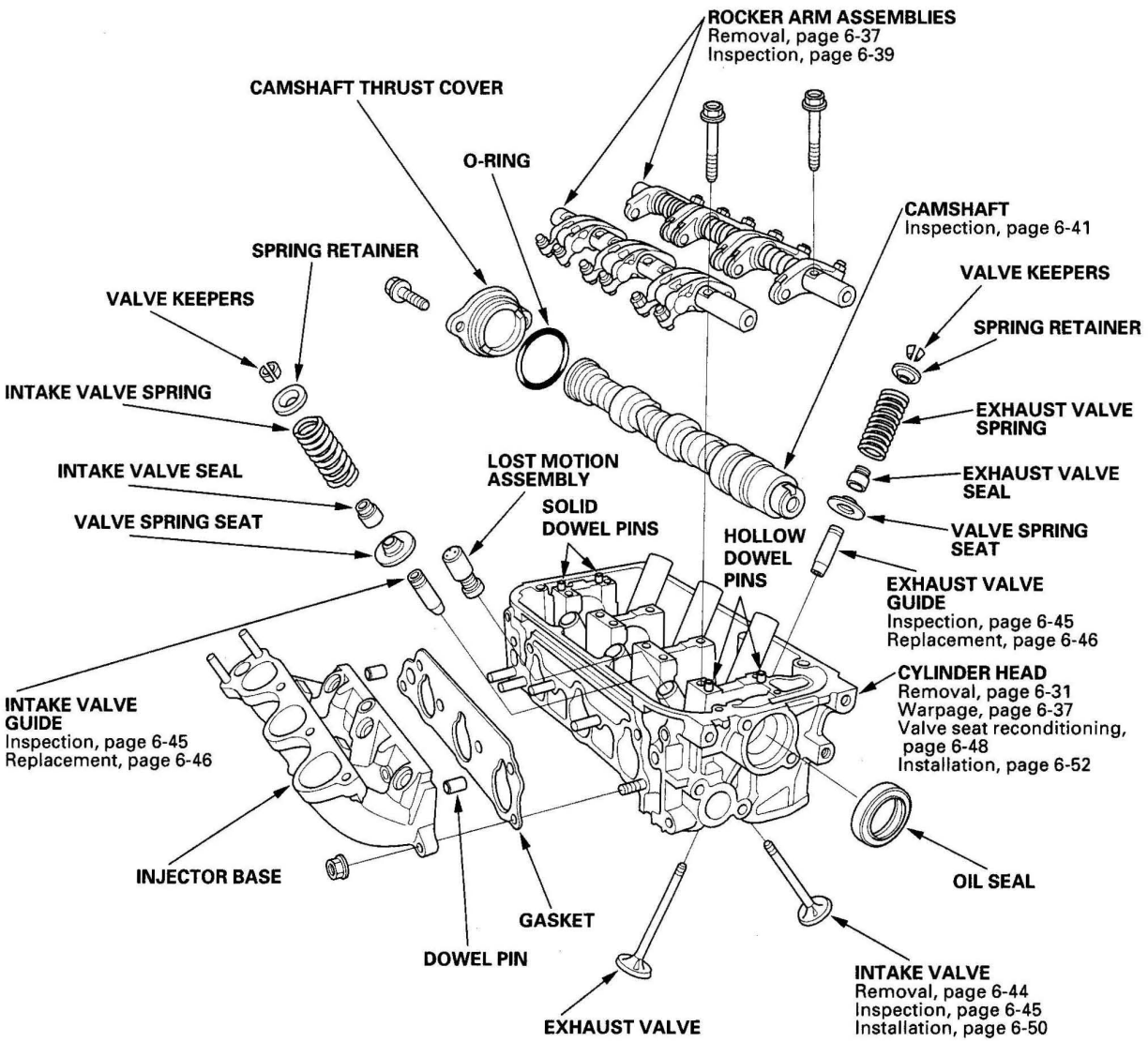
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Component Location Index (cont'd)



BACK

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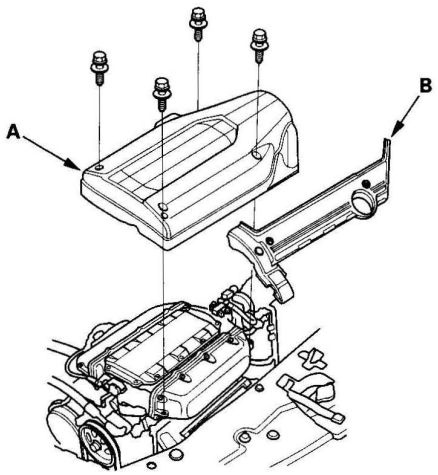


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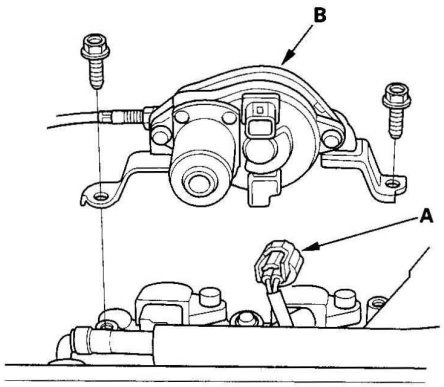
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Engine Compression Inspection

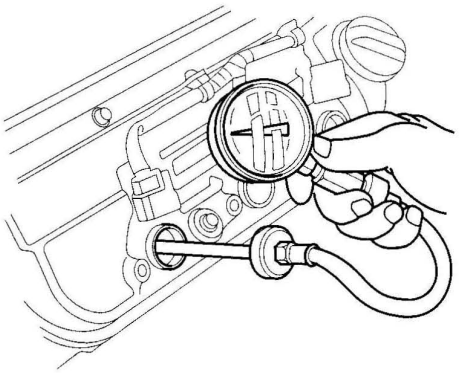
1. Warm up the engine to normal operating temperature (cooling fan comes on).
2. Turn the ignition switch OFF.
3. Remove the intake mainfold cover (A) and ignition coil cover (B).



4. Disconnect the Intake Manifold Runner Control (IMRC) actuator connector (A), then remove the IMRC actuator (B).



5. Disconnect the six injector connectors.
6. Remove the six ignition coils (see step 3 on page 4-18).
7. Remove the six spark plugs.
8. Attach the compression gauge to a spark plug hole.



9. Connect a tachometer.
10. Open the throttle fully, then crank the engine with the starter motor and measure the compression.

    Compression Pressure:
    Above 990 kPa (10.1 kgf/cm², 145 psi)-200rpm

11. Perform the same measurement on the remaining cylinders.

    Maximum Variation:
    Within 200 kPa (2.0 kgf/cm², 28 psi)

12. If the compression is not within specifications, check the following items, then remeasure the compression.

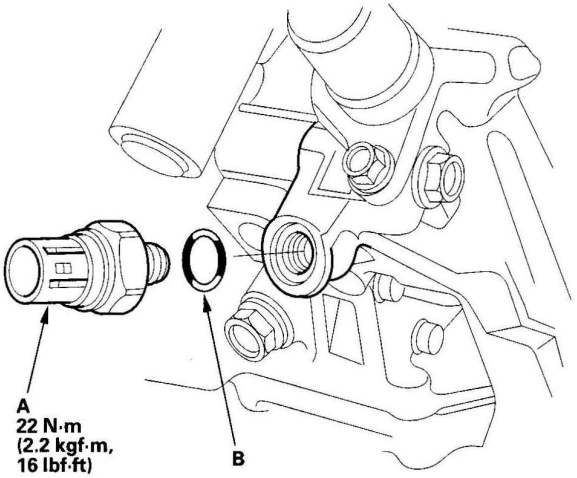
    - Damaged or worn valves and seats
    - Damaged cylinder head gasket
    - Damaged or worn piston rings
    - Damaged or worn piston and cylinder bore

BACK

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VTEC Oil Pressure Switch Replacement

1. Disconnect the VTEC oil pressure switch connector, then remove the VTEC oil pressure switch (A).

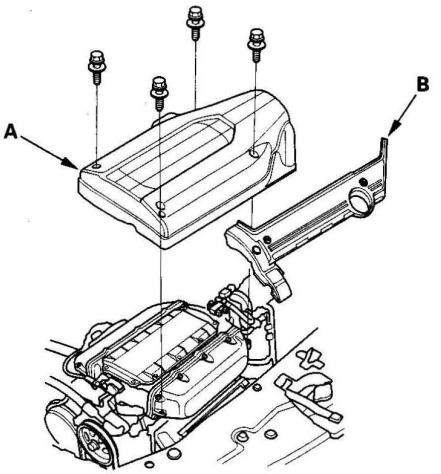


2. Install the VTEC oil pressure switch with a new O-ring (B).

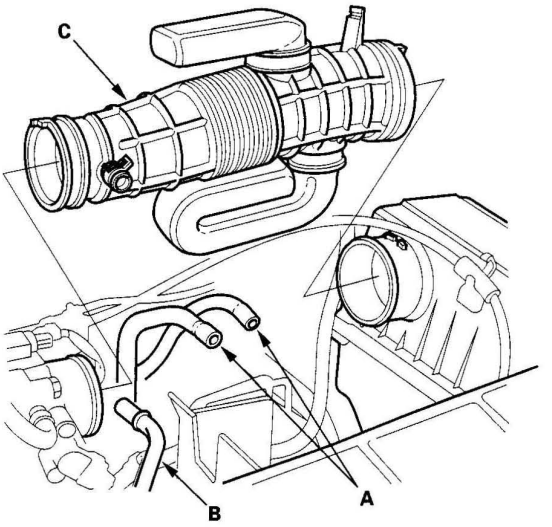
VTEC Rocker Arm Test

Special Tools Required
- VTEC air adapter 07VAJ-P8A010A
- VTEC air stopper 07VAJ-P8A020A

1. Remove the intake manifold cover (A) and ignition coil cover (B).



2. Remove the vacuum hoses (A) and breather pipe (B), then remove the intake air duct (C).

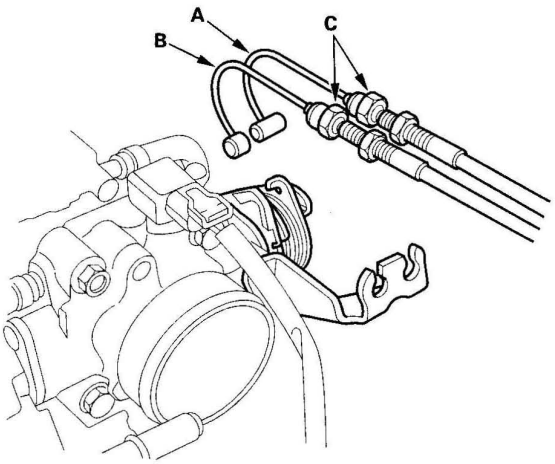


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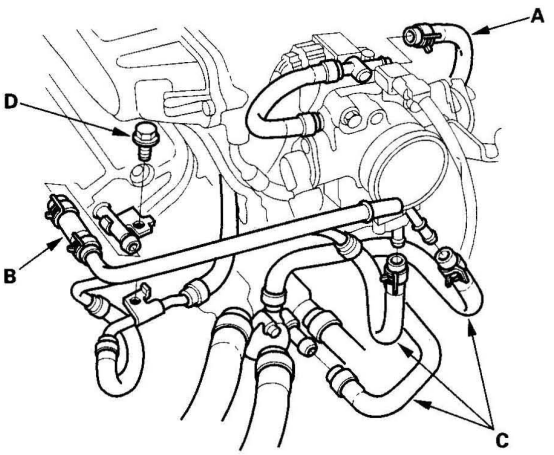
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VTEC Rocker Arm Test (cont'd)

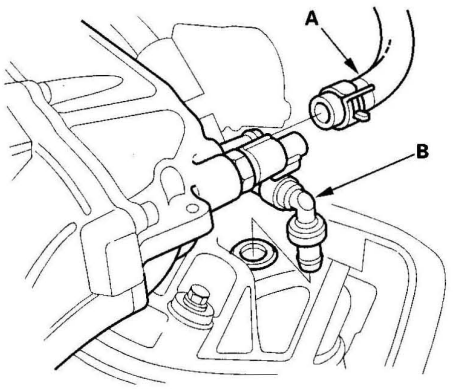
3. Remove the throttle cable (A) and cruise control cable (B) by loosening the locknuts (C), then slipping the cable ends out of the accelerator linkage. Take care not to bend the cables when removing them. Always replace any kinked cable with a new one.



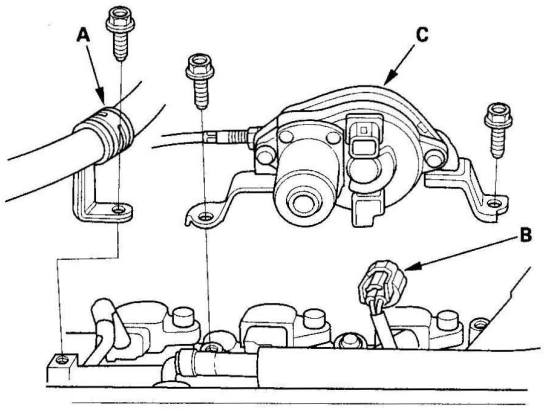
4. Remove the Evaporative Emission (EVAP) canister hose (A), breather hose (B), water bypass hoses (C), and water bypass pipe mounting bolt (D).



5. Remove the brake booster vacuum hose (A) and Positive Crankcase Ventilation (PCV) hose (B).



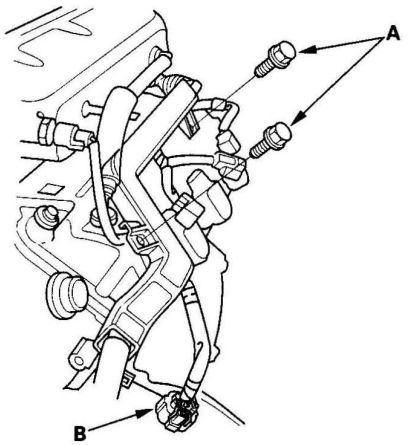
6. Remove the Power Steering (P/S) hose clamp (A), and disconnect the Intake Manifold Runner Control (IMRC) actuator connector (B), then remove the IMRC actuator (C).



BACK

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7. Remove two bolts (A) securing the wire harness holder, then remove the joint connector (B).

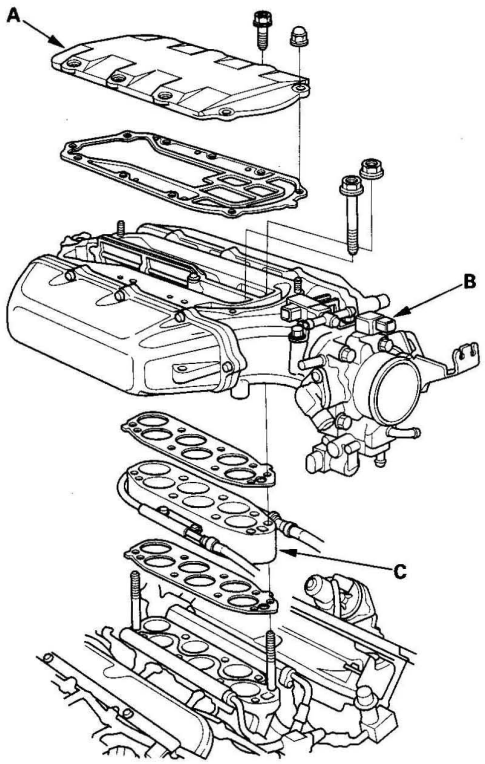


8. Remove the engine wire harness connectors and wire harness clamps from the intake manifold.

   - Intake Air Temperature (IAT) sensor connector
   - Idle Air Control (IAC) valve connector
   - Throttle Position (TP) sensor connector
   - Manifold Absolute Pressure (MAP) sensor connector
   - Evaporative Emission (EVAP) canister purge valve connector

9. Remove the six ignition coils.

10. Remove the upper cover (A), then remove the intake manifold assembly (B) and spacer (C).



(cont'd)

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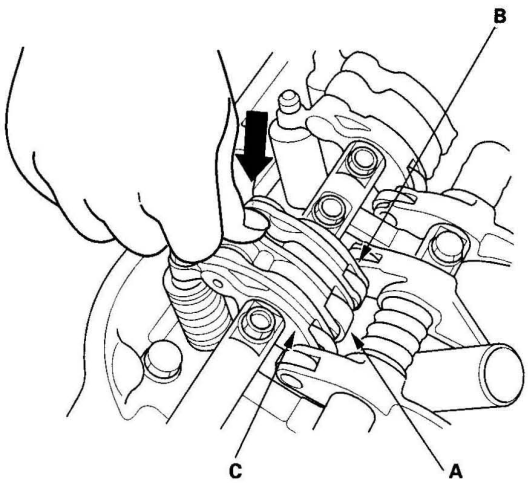
VTEC Rocker Arm Test (cont'd)

11. Remove the cylinder head covers.

12. Set the No. 1 piston at Top Dead Center (TDC) (see step 12 on page 6-14).

13. Push on the intake mid rocker arm (A) for the No. 1 cylinder. The mid rocker arm should move independently of the primary rocker arm (B) and secondary rocker arm (C).

    - If the intake mid rocker arm does not move, remove the mid, primary, and secondary intake rocker arms as an assembly, and check that the pistons in the mid and primary rocker arms move smoothly.
      If any rocker arm needs replacing, replace the primary, mid and secondary rocker arms as an assembly, and retest.
    - If the mid rocker arm moves freely, go to step 14.



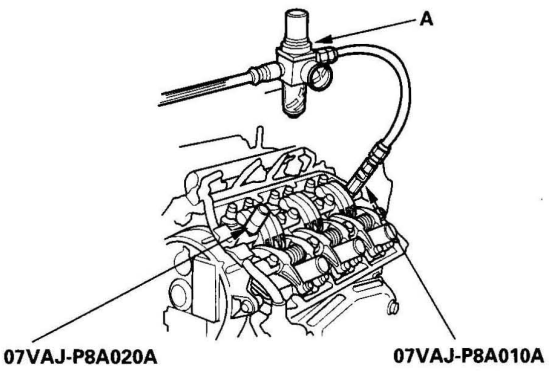
14. Repeat step 13 on the remaining intake mid rocker arms with each piston at TDC. When all the mid rocker arms pass the test, go to step 15.

15. Check that the air pressure on the shop air compressor gauge indicates over 690 kPa (7.0 kgf/cm², 100 psi).

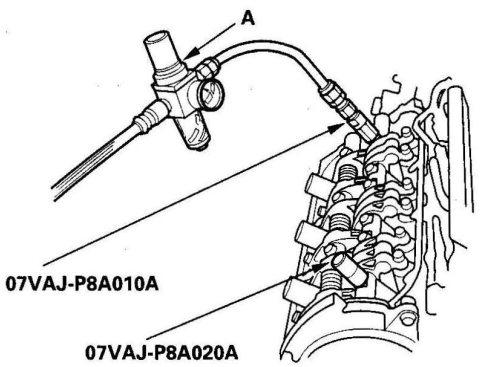
16. Inspect the valve clearance (see page 6-11).

17. Remove the two end intake rocker shaft mounting bolts, then install and connect the special tools and an air pressure regulator with a 0 – 100 psi gauge (A) as shown below.

FRONT:



REAR:



18. Loosen the valve on the regulator, and apply the specified air pressure.

Specified Air Pressure:
440-540 kPa (4.5-5.5 kgf/cm², 64-78 psi)

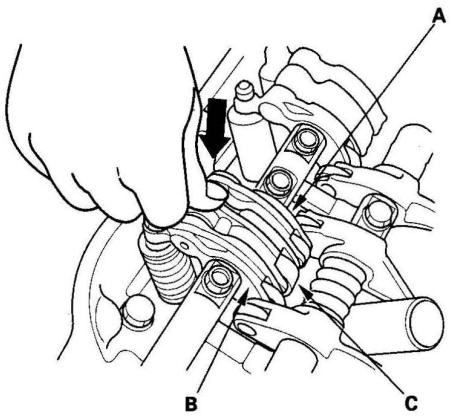
NOTE: If the synchronizing pistons A and B do not move after applying air pressure, move the primary or secondary rocker arm up and down manually.

BACK

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Valve Clearance Adjustment

19. Make sure that the intake primary rocker arm (A) and intake secondary rocker arm (B) are mechanically connected by the piston and that the mid rocker arm (C) does not move when pushed manually. If any intake mid rocker arm moves independently of the primary and secondary rocker arms, replace the rocker arms as a set.

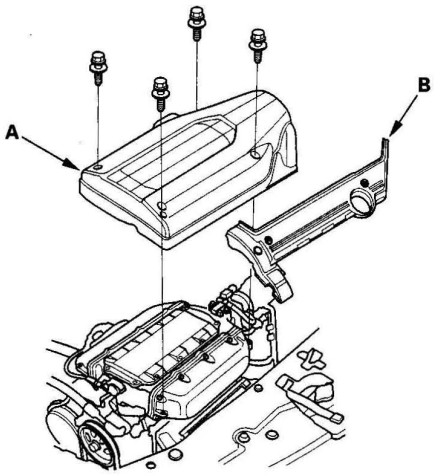


20. Remove the tools.

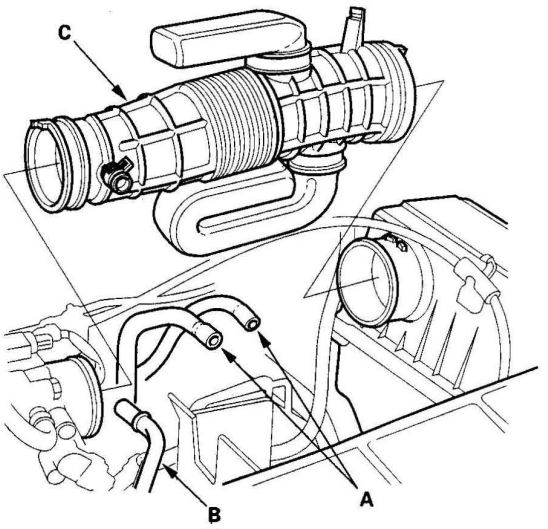
21. Check for smooth operation of each lost motion assembly (see page 6-40). Replace the lost motion assembly if it does not move smoothly.

NOTE: Adjust the valves only when the cylinder head temperature is less than 100 °F (38 °C).

1. Remove the intake manifold cover (A) and ignition coil cover (B).



2. Remove the vacuum hoses (A) and breather pipe (B), then remove the intake air duct (C).

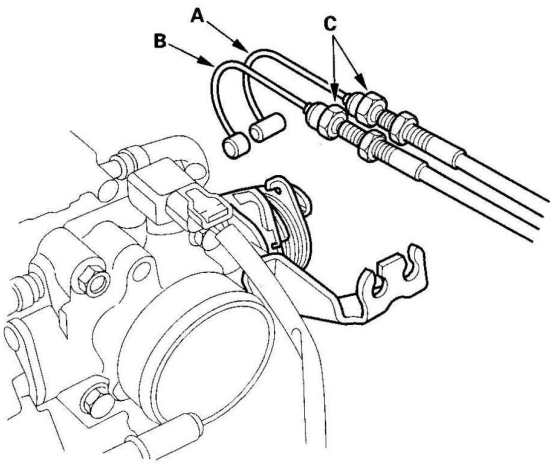


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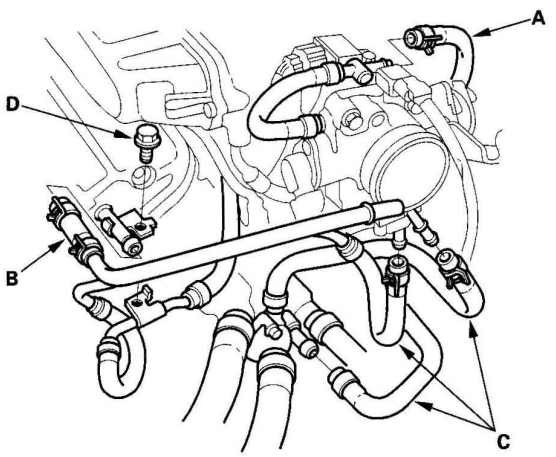
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Valve Clearance Adjustment (cont'd)

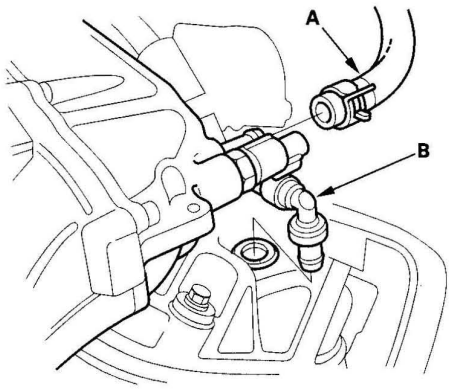
3. Remove the throttle cable (A) and cruise control cable (B) by loosening the locknuts (C), then slipping the cable ends out of the accelerator linkage. Take care not to bend the cables when removing them. Always replace any kinked cable with a new one.



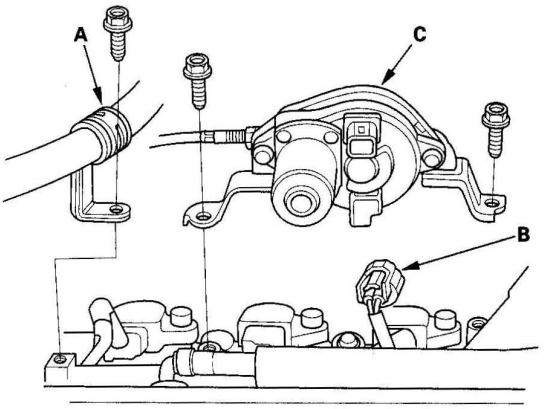
4. Remove the Evaporative Emission (EVAP) canister hose (A), breather hose (B), water bypass hoses (C), and water bypass pipe mounting bolt (D).



5. Remove the brake booster vacuum hose (A) and Positive Crankcase Ventilation (PCV) hose (B).



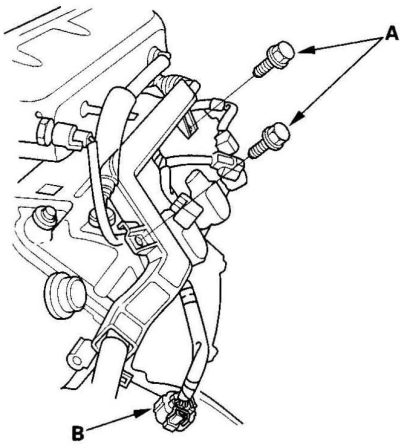
6. Remove the Power Steering (P/S) hose clamp (A), and disconnect the Intake Manifold Runner Control (IMRC) actuator connector (B), then remove the IMRC actuator (C).



BACK

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7. Remove two bolts (A) securing the wire harness holder, then remove the joint connector (B).

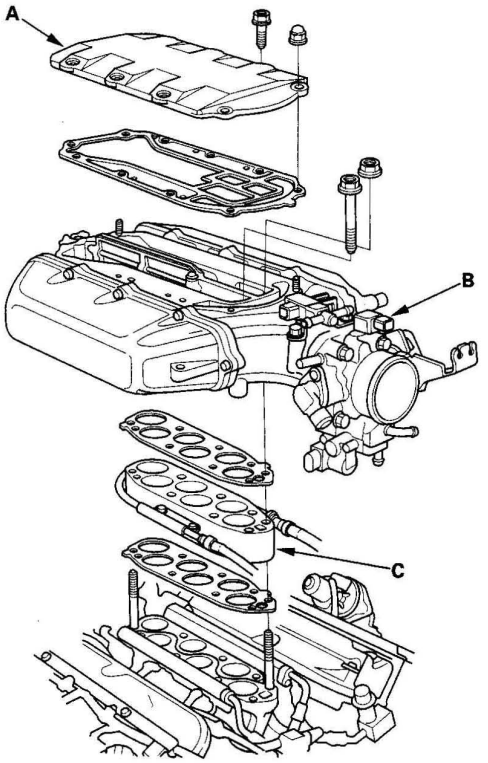


8. Remove the engine wire harness connectors and wire harness clamps from the intake manifold.

   - Intake Air Temperature (IAT) sensor connector
   - Idle Air Control (IAC) valve connector
   - Throttle Position (TP) sensor connector
   - Manifold Absolute Pressure (MAP) sensor connector
   - Evaporative Emission (EVAP) canister purge valve connector

9. Remove the six ignition coils.

10. Remove the upper cover (A), then remove the intake manifold assembly (B) and spacer (C).



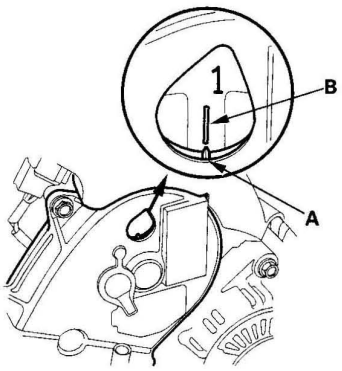
11. Remove the cylinder head covers.

(cont'd)

Protected by AR

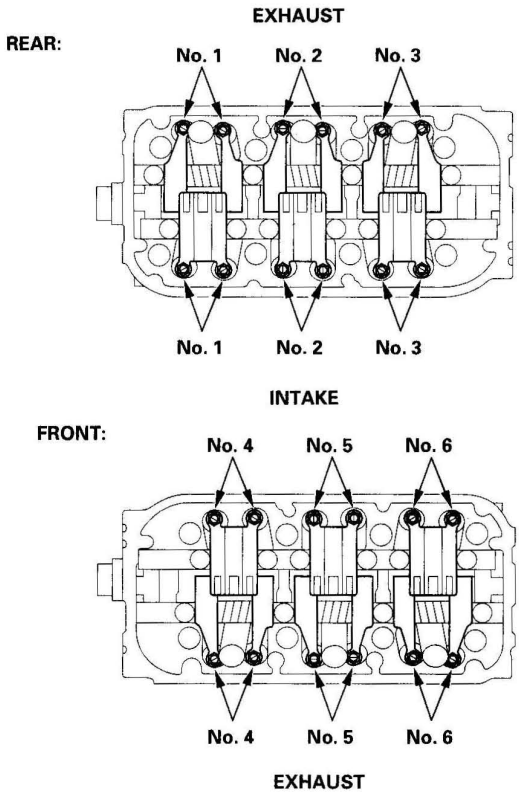
Valve Clearance Adjustment (cont'd)

12. Set the No. 1 piston at Top Dead Center (TDC). Align the pointer (A) on the front upper cover with the No. 1 piston TDC mark (B) on the front camshaft pulley.

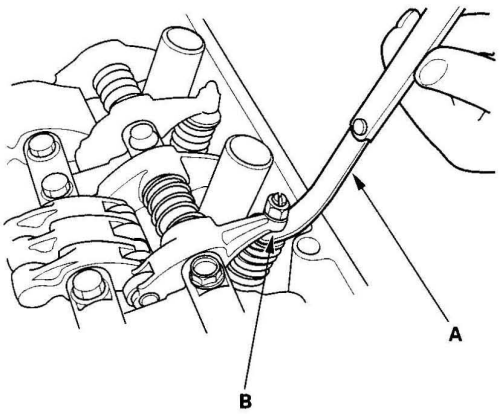


13. Select the correct thickness feeler gauge for the valves you're going to check.
Intake: 0.20–0.24 mm (0.008–0.009 in.)
Exhaust: 0.28–0.34 mm (0.011–0.013 in.)

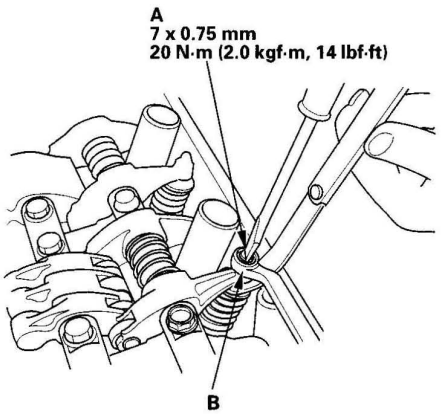
Adjusting screw locations:



14. Insert the feeler gauge (A) between the adjusting screw (B) and the end of the valve stem and slide it back and forth; you should feel a slight amount of drag.



15. If you feel too much or too little drag, loosen the locknut (A), and turn the adjusting screw (B) until the drag on the feeler gauge is correct.

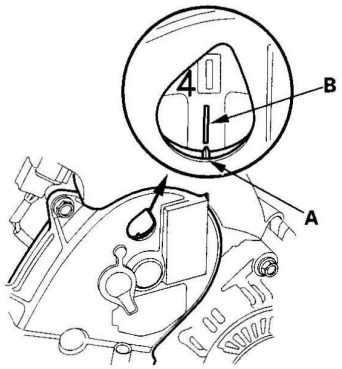


16. Tighten the locknut and recheck the clearance. Repeat the adjustment if necessary.

BACK

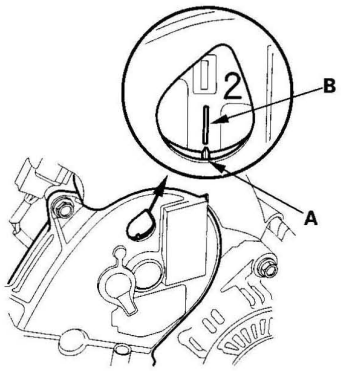
Protected by AR

17. Rotate the crankshaft clockwise. Align the pointer (A) on the front upper cover with the No. 4 piston TDC mark (B) on the front camshaft pulley.



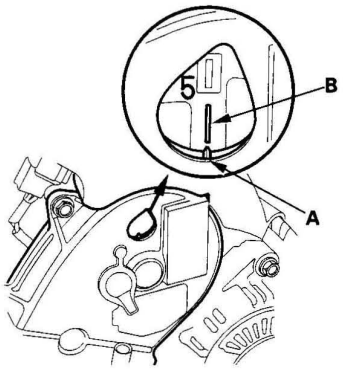
18. Check and, if necessary, adjust the valve clearance on No. 4 cylinder.

19. Rotate the crankshaft clockwise. Align the pointer (A) on the front upper cover with the No. 2 piston TDC mark (B) on the front camshaft pulley.



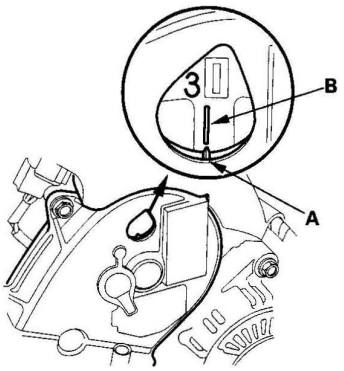
20. Check and, if necessary, adjust the valve clearance on No. 2 cylinder.

21. Rotate the crankshaft clockwise. Align the pointer (A) on the front upper cover with the No. 5 piston TDC mark (B) on the front camshaft pulley.



22. Check and, if necessary, adjust the valve clearance on No. 5 cylinder.

23. Rotate the crankshaft clockwise. Align the pointer (A) on the front upper cover with the No. 3 piston TDC mark (B) on the front camshaft pulley.



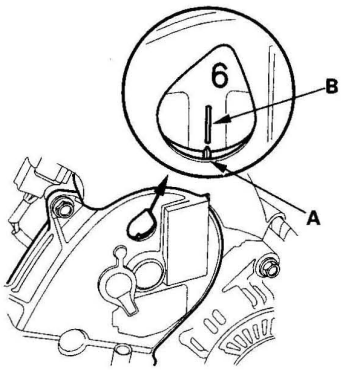
24. Check and, if necessary, adjust the valve clearance on No. 3 cylinder.

(cont'd)

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Valve Clearance Adjustment (cont'd)

25. Rotate the crankshaft clockwise. Align the pointer (A) on the front upper cover with the No. 6 piston TDC mark (B) on the front camshaft pulley.



26. Check and, if necessary, adjust the valve clearance on No. 6 cylinder.

27. Reinstall all removed parts.

BACK

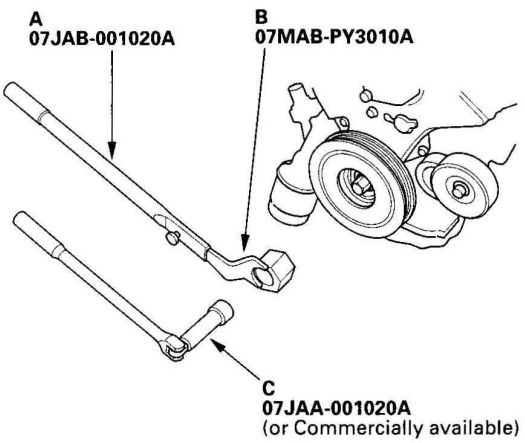
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Crankshaft Pulley Removal and Installation

Special Tools Required
- Holder handle 07JAB-001020A
- Holder attachment, 50 mm, offset 07MAB-PY3010A
- Socket, 19 mm 07JAA-001020A
  or a commercially available 19 mm socket

Removal

1. Hold the pulley with the holder handle (A) and holder attachment (B).

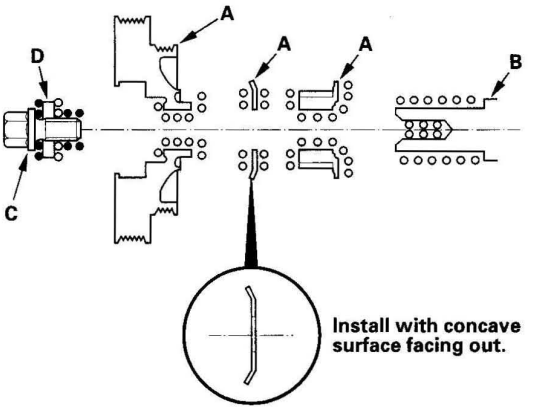


2. Remove the bolt with a heavy duty 19 mm socket (C) and breaker bar.

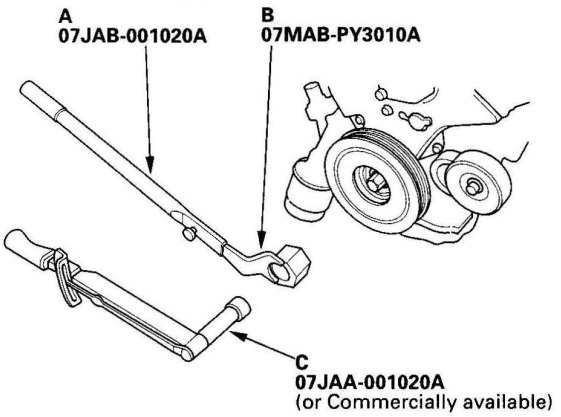
Installation

1. Remove any oil from the pulleys (A), crankshaft (B), bolt (C), and washer (D). Clean and lubricate the points shown below.

○ : Clean
● : Lubricate



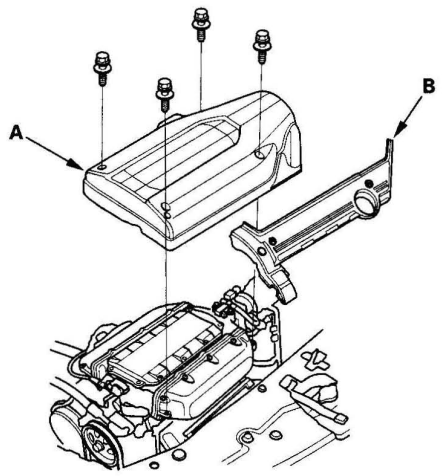
2. Install the crankshaft pulley, and tighten the bolt to 245 N·m (25.0 kgf·m, 181 lbf·ft). Do not use an impact wrench.
   -1 Hold the pulley with the holder handle (A) and holder attachment (B).
   -2 Tighten the bolt with a torque wrench and 19 mm socket (C).



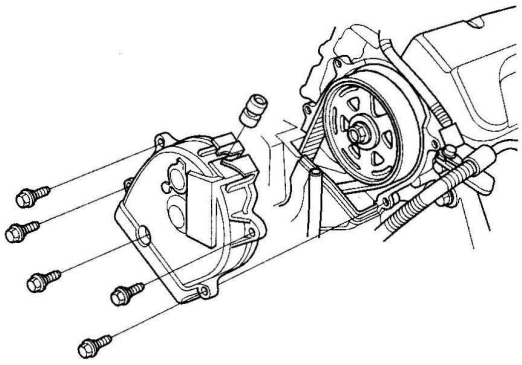
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Timing Belt Inspection

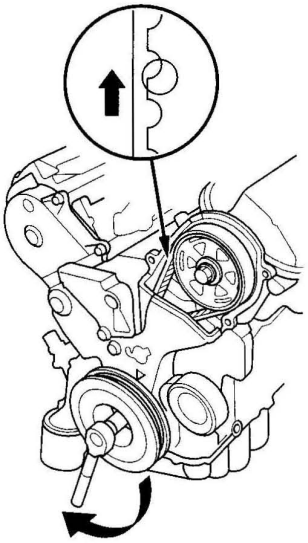
1. Remove the intake manifold cover (A) and ignition coil cover (B).



2. Remove the front upper cover.



3. Inspect the timing belt for cracks and oil or coolant soaking. Replace the belt if it is oil or coolant soaked. Remove any oil or solvent that gets on the belt.



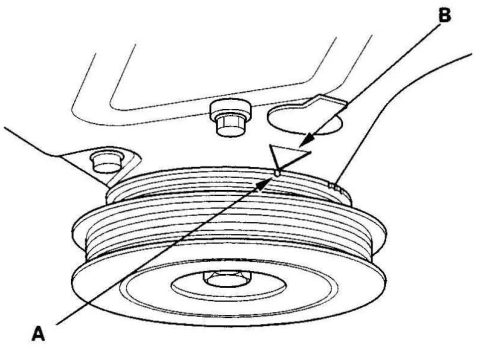
BACK

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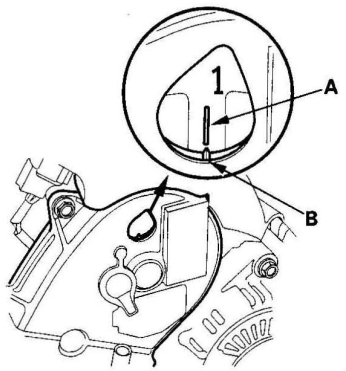
Timing Belt Removal

Special Tools Required
- Holder handle 07JAB-001020A
- Holder attachment, 50 mm, offset 07MAB-PY3010A
- Socket, 19 mm 07JAA-001020A
  or a commercially available 19 mm socket

1. Turn the crankshaft so its white mark (A) lines up with the pointer (B).

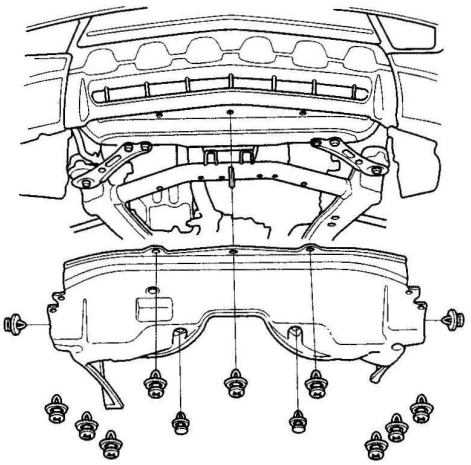


2. Check that the No. 1 piston Top Dead Center (TDC) mark (A) on the front camshaft pulley and the pointer (B) on the front upper cover are aligned.

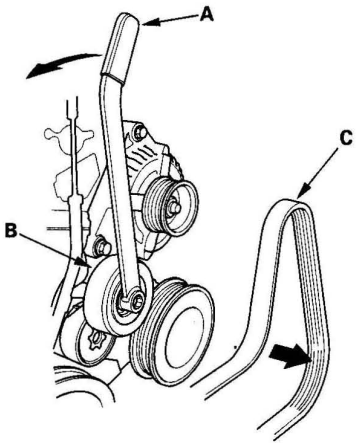


3. Remove the front tires/wheels.

4. Remove the splash shield.



5. Use the belt tension release arm (A) to move the auto-tensioner (B), then remove the alternator belt (C).

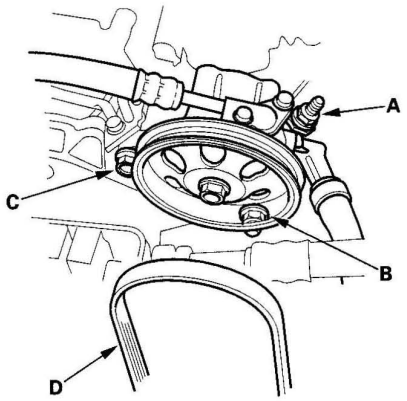


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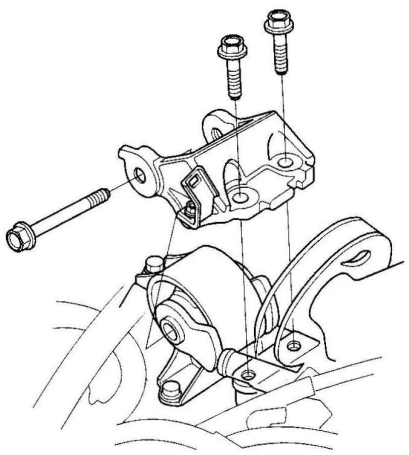
Timing Belt Removal (cont'd)

6. Loosen the adjusting nut (A), locknut (B), and mounting bolt (C), then remove the power steering (P/S) pump belt (D).

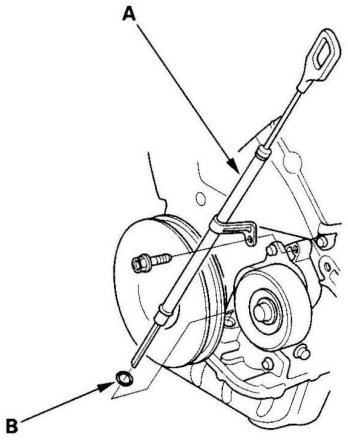


7. Support the engine with a jack and wood block under the oil pan.

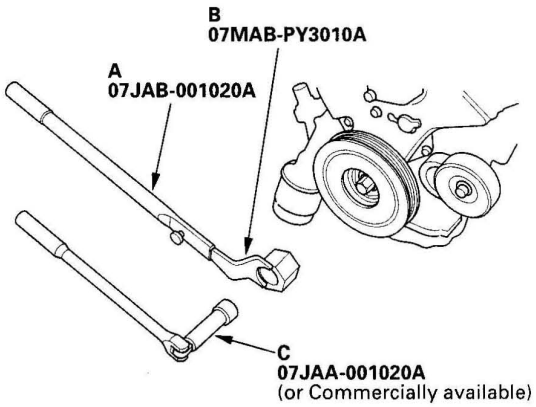
8. Remove the side engine mount bracket.



9. Remove the dipstick and tube (A); discard the O-ring (B).



10. Hold the pulley with the holder handle (A) and holder attachment (B).

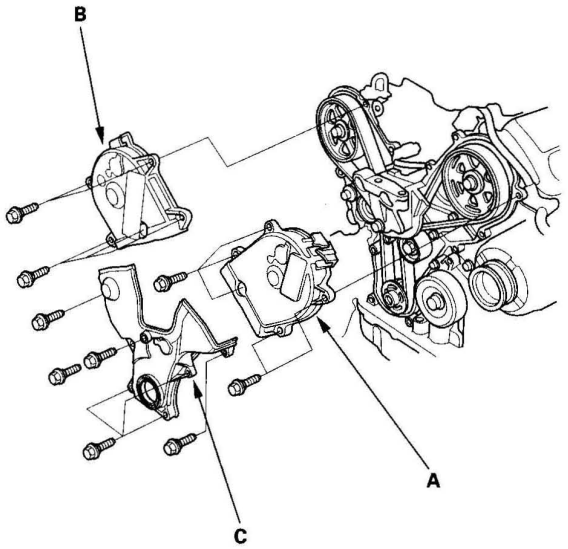


11. Remove the bolt with a heavy duty 19 mm socket (C) and breaker bar.

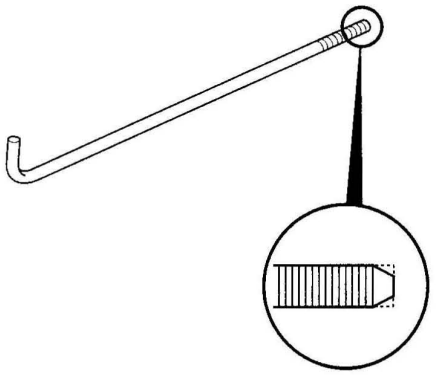
BACK

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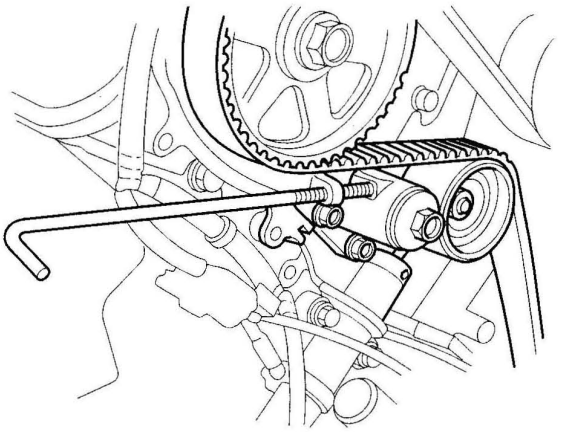
12. Remove the front upper cover (A), rear upper cover (B), and lower cover (C).



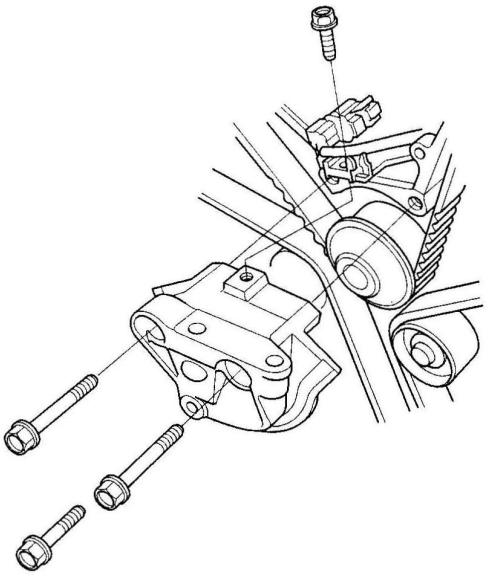
13. Remove one of the battery clamp bolts from the battery tray, and grind the end of it as shown.



14. Screw the battery clamp bolt in as shown to hold the timing belt adjuster in its current position. Tighten it by hand, do not use a wrench.



15. Remove the engine mount bracket.

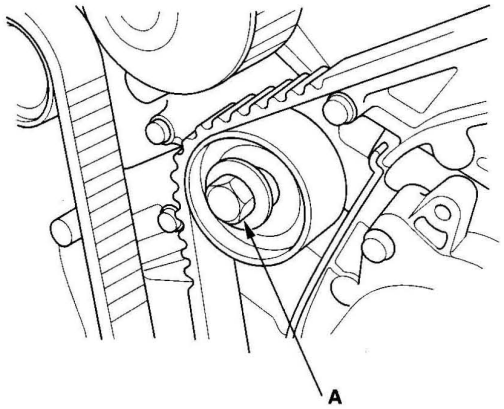


(cont'd)

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Timing Belt Removal (cont'd)

16. Loosen the idler pulley bolt (A) about five or six turns, then remove the timing belt.



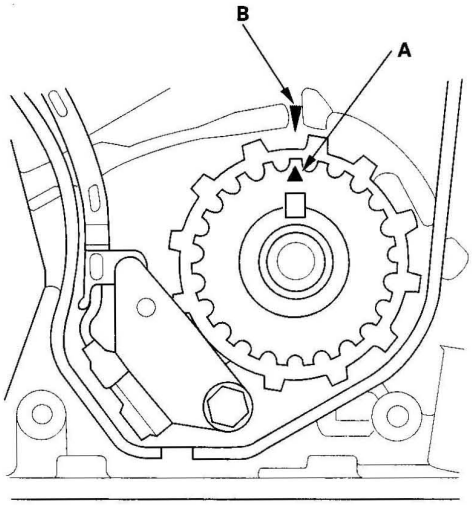
Timing Belt Installation

NOTE: The following procedure is for installing a new timing belt. If you are installing a used timing belt, refer to the next procedure.

New Belt

1. Clean the timing belt pulleys, and the upper and lower covers.

2. Set the timing belt drive pulley to Top Dead Center (TDC) by aligning the TDC mark (A) on the tooth of the timing belt drive pulley with the pointer (B) on the oil pump.

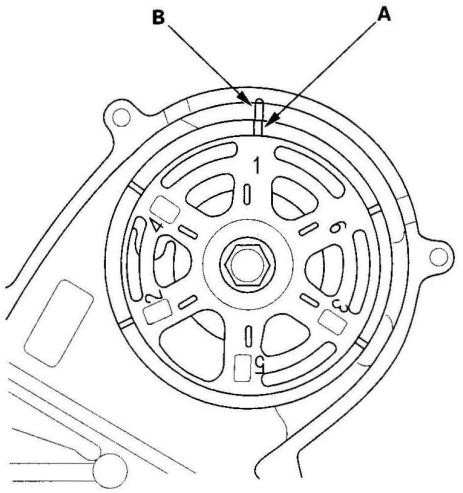


BACK

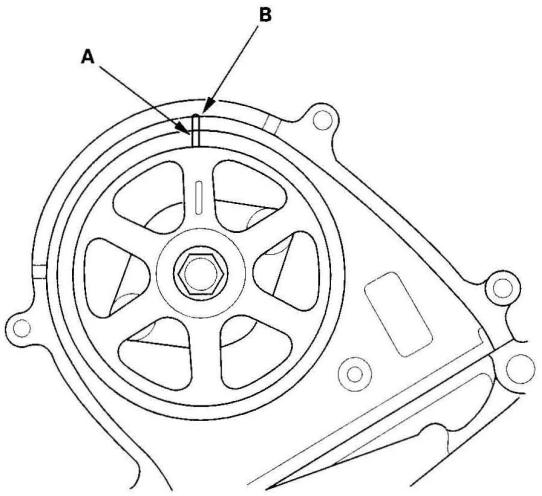
Protected by AR

3. Set the camshaft pulleys to TDC by aligning the TDC marks (A) on the camshaft pulleys with the pointers (B) on the back covers.

FRONT:



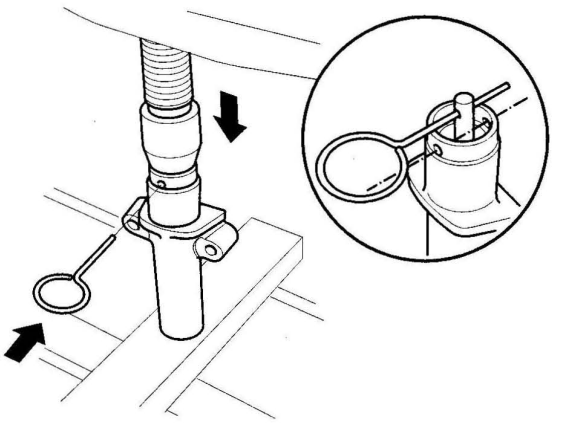
REAR:



4. Remove the battery clamp bolt from the back cover.

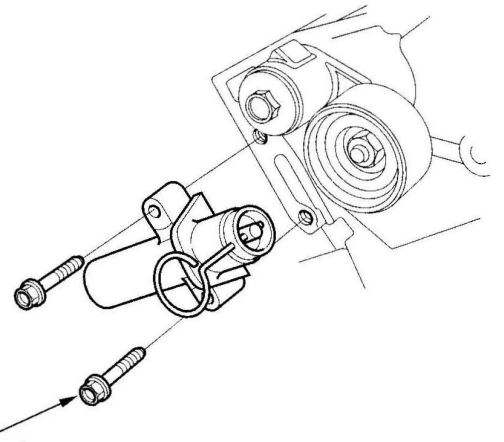
5. Remove the auto-tensioner.

6. Align the holes on the rod and housing of the auto-tensioner.



7. Use a hydraulic press to slowly compress the auto-tensioner. Insert a 2.0 mm (0.08 in.) pin through the housing and the rod.
NOTE: The compression pressure should not exceed 9,800 N (1,000 kgf, 2,200 lbf).

8. Install the auto-tensioner.
NOTE: Make sure the pin stays in place.



6 x 1.0 mm
12 N·m (1.2 kgf·m, 8.7 lbf·ft)

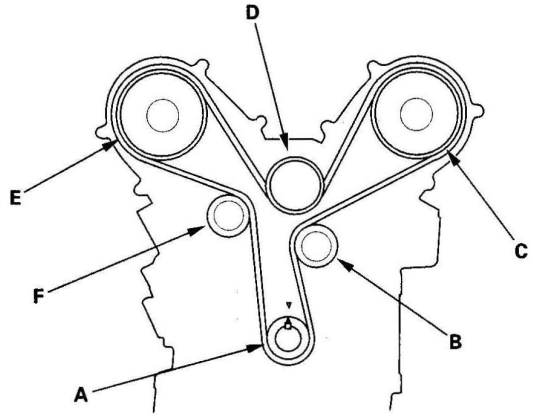
(cont'd)

Protected by AR

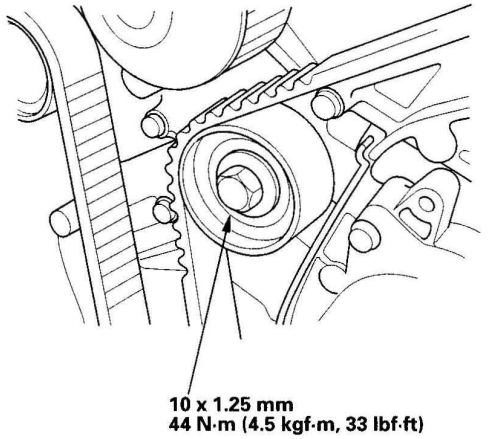
Timing Belt Installation (cont'd)

9. Install the timing belt in a counterclockwise sequence starting with the drive pulley.

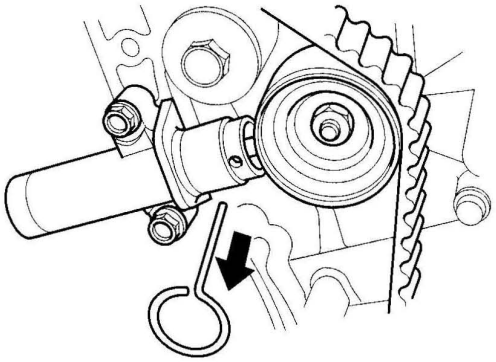
   – 1 Drive pulley (A).
   – 2 Idler pulley (B).
   – 3 Front camshaft pulley (C).
   – 4 Water pump pulley (D).
   – 5 Rear camshaft pulley (E).
   – 6 Adjusting pulley (F).



10. Tighten the idler pulley bolt.



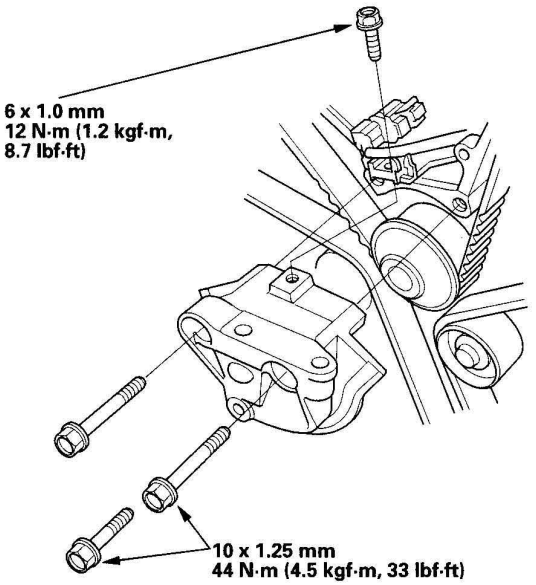
11. Remove the pin from the auto-tensioner.



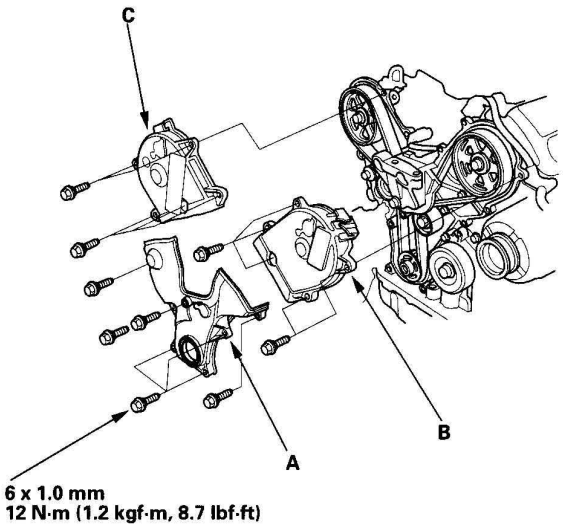
BACK

Protected by AR

12. Install the engine mount bracket.

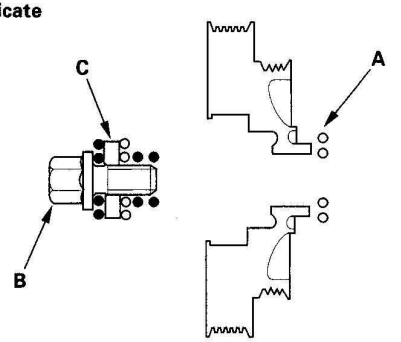


13. Install the lower cover (A), front upper cover (B), and rear upper cover (C).



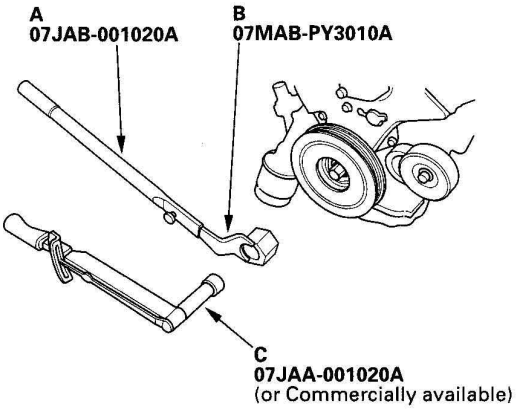
14. Clean all oil off the inside face (A) of the crankshaft pulley, and apply lubricant to the pulley bolt (B) and washer (C).

○: Clean
●: Lubricate



15. Install the crankshaft pulley, and tighten the bolt to 245 N·m (25.0 kgf·m, 181 lbf·ft). Do not use an impact wrench.

–1 Hold the pulley with the holder handle (A) and holder attachment (B).
–2 Tighten the bolt with a torque wrench and 19 mm socket (C).



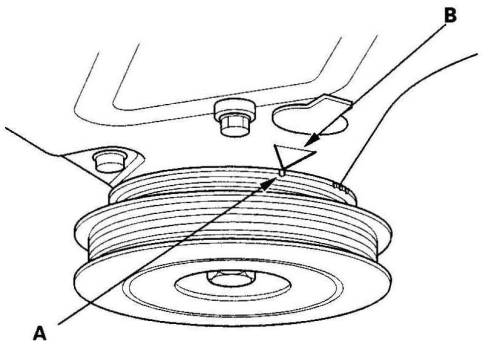
16. Rotate the crankshaft pulley about five or six turns clockwise so the timing belt positions on the pulleys.

(cont'd)

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Timing Belt Installation (cont'd)

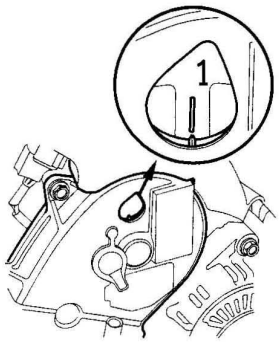
17. Turn the crankshaft pulley so its white mark (A) lines up with the pointer (B).



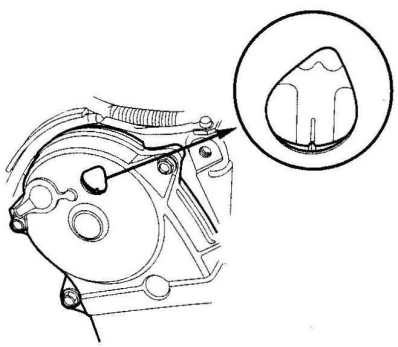
18. Check the camshaft pulley marks.

- If the camshaft pulley marks are at TDC, go to step 19.
- If the camshaft pulley marks are not at TDC, remove the timing belt and repeat steps 2 through 15.

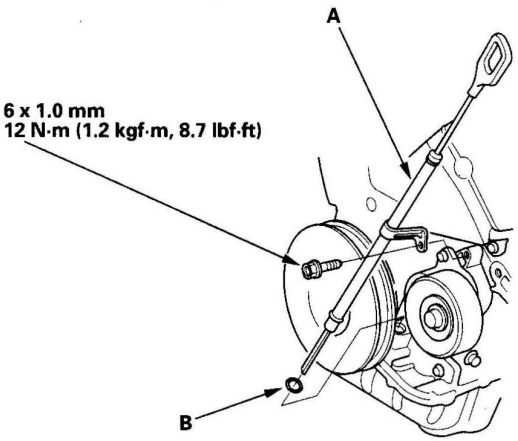
FRONT CAMSHAFT PULLEY:



REAR CAMSHAFT PULLEY:



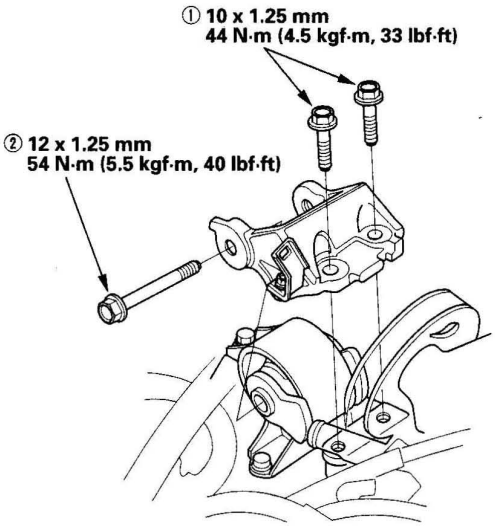
19. Install the dipstick and tube (A) with a new O-ring (B).



20. Install and adjust the Power Steering (P/S) pump belt (see page 17-12).

21. Install the alternator belt.

22. Install the side engine mount bracket, then tighten the mounting bolts in the numbered sequence shown.



BACK

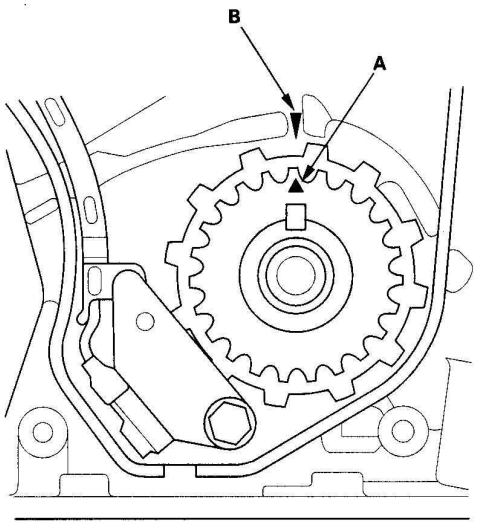
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Used Belt

Follow this procedure when installing a used timing belt.

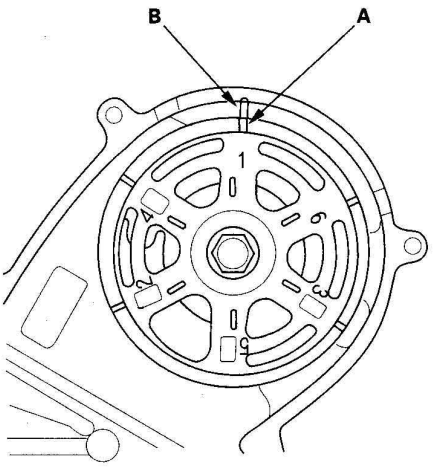
1. Clean the timing belt pulleys, and the upper and lower covers.

2. Set the timing belt drive pulley to TDC by aligning the TDC mark (A) on the tooth of the timing belt drive pulley with the pointer (B) on the oil pump.

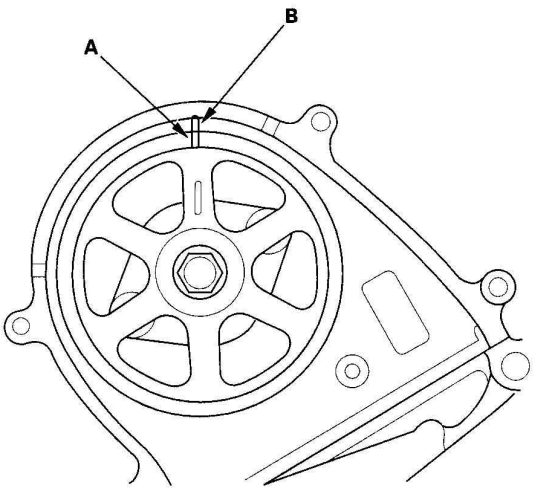


3. Set the camshaft pulleys to TDC by aligning the TDC marks (A) on the camshaft pulleys with the pointers (B) on the back covers.

FRONT:



REAR:



(cont'd)

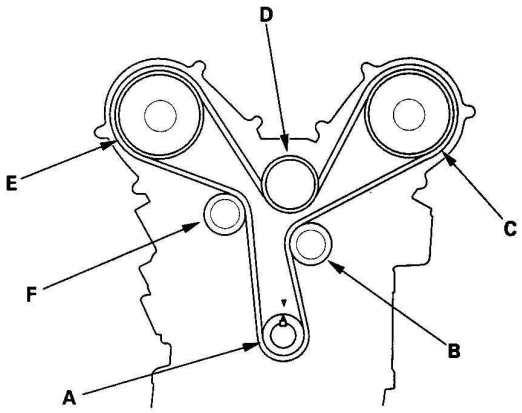
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Timing Belt Installation (cont'd)

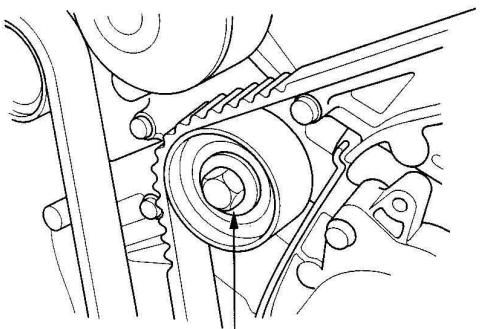
4. If the auto-tensioner has extended and the timing belt cannot be installed, remove and compress the auto-tensioner.

5. Install the timing belt in a counterclockwise sequence starting with the drive pulley. Take care not to damage the timing belt when installing it.

   -1 Drive pulley (A).
   -2 Idler pulley (B).
   -3 Front camshaft pulley (C).
   -4 Water pump pulley (D).
   -5 Rear camshaft pulley (E).
   -6 Adjusting pulley (F).

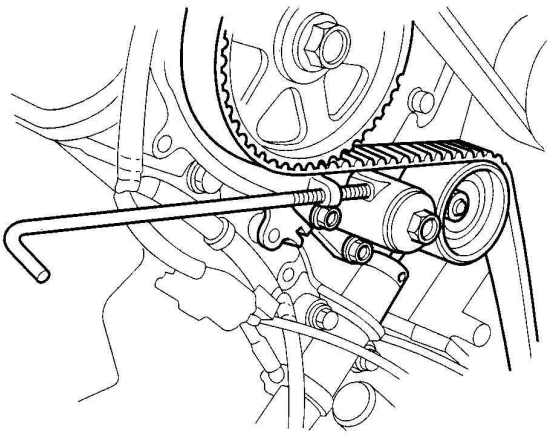


6. Tighten the idler pulley bolt.



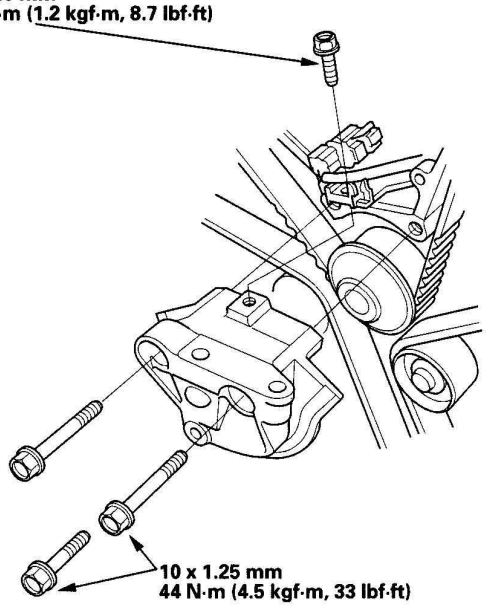
10 x 1.25 mm
44 N·m (4.5 kgf·m, 33 lbf·ft)

7. Remove the battery clamp bolt from the back cover.



8. Install the engine mount bracket.

6 x 1.0 mm
12 N·m (1.2 kgf·m, 8.7 lbf·ft)

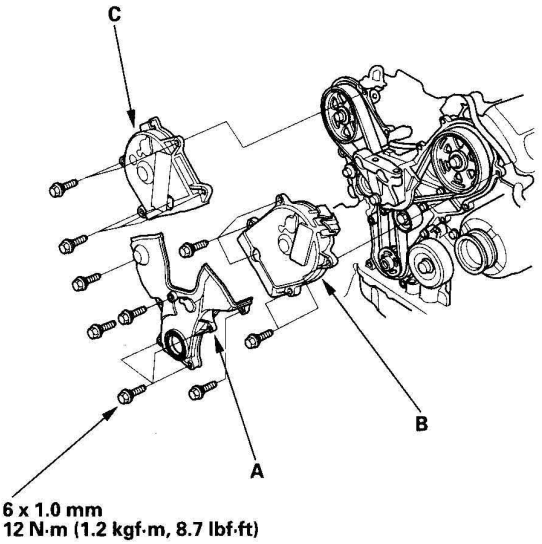


10 x 1.25 mm
44 N·m (4.5 kgf·m, 33 lbf·ft)

BACK

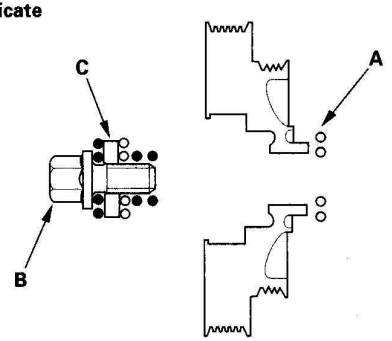
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9. Install the lower cover (A), front upper cover (B), and rear upper cover (C).



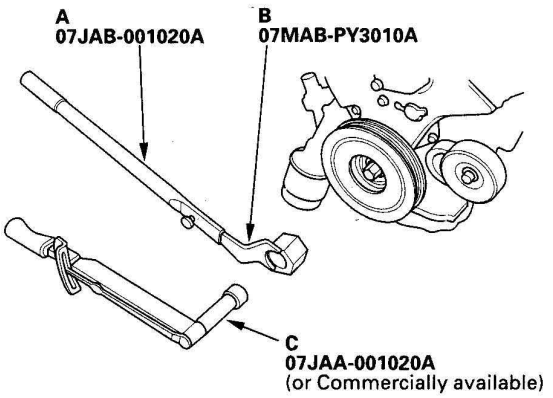
10. Clean any oil off the inside face (A) of the crankshaft pulley, and apply lubricant to the pulley bolt (B) and washer (C).

○: Clean
●: Lubricate



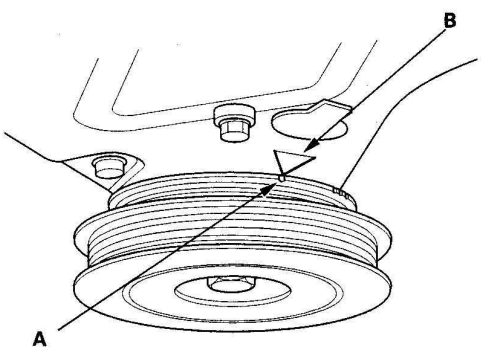
11. Install the crankshaft pulley, and tighten the bolt to 245 N·m (25.0 kgf·m, 181 lbf·ft). Do not use an impact wrench.

– 1 Hold the pulley with the holder handle (A) and holder attachment (B).
– 2 Tighten the bolt with a torque wrench and 19 mm socket (C).



12. Rotate the crankshaft pulley about five or six turns clockwise so the timing belt positions on the pulleys.

13. Turn the crankshaft pulley so its white mark (A) lines up with the pointer (B).



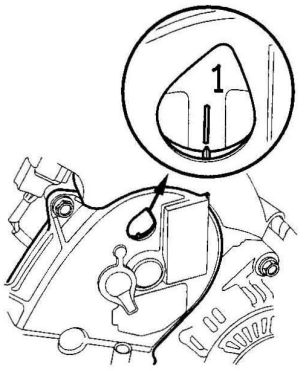
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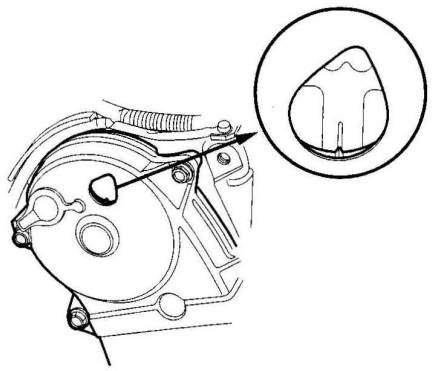
Timing Belt Installation (cont'd)

14. Check the camshaft pulley marks.
    - If the camshaft pulley marks are at TDC, go to step 15.
    - If the camshaft pulley marks are not at TDC, remove the timing belt and repeat steps 2 through 11.

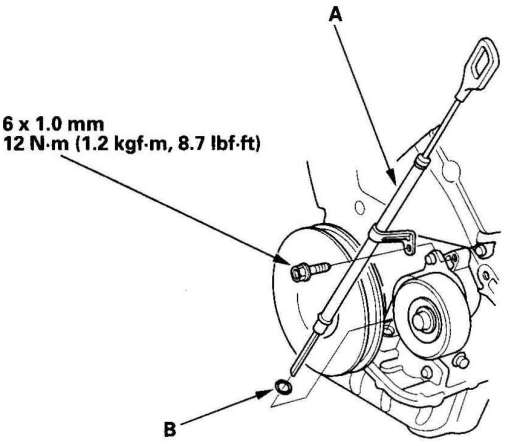
FRONT CAMSHAFT PULLEY:



REAR CAMSHAFT PULLEY:



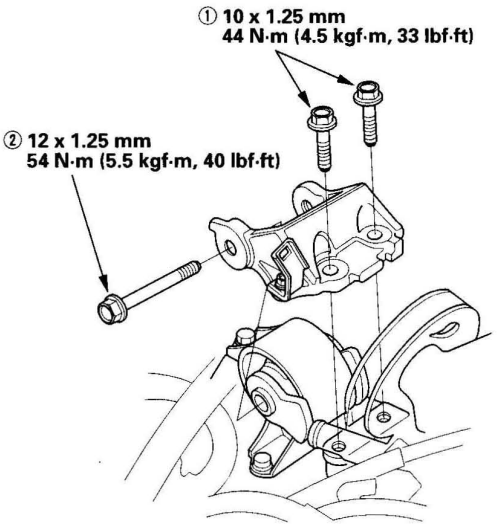
15. Install the dipstick and tube (A) with a new O-ring (B).



16. Install and adjust the P/S pump belt (see page 17-12).

17. Install the alternator belt.

18. Install the side engine mount bracket, then tighten the mounting bolts in the numbered sequence shown.



BACK

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Cylinder Head Removal

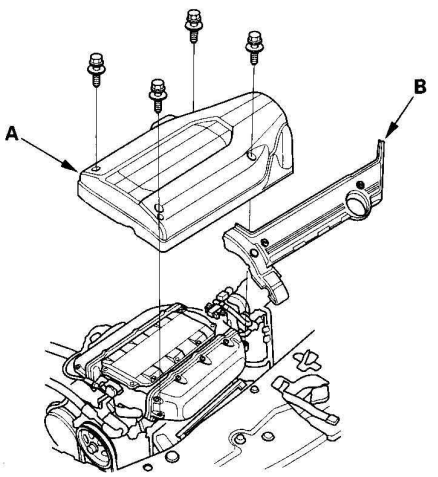
NOTE:
- Use fender covers to avoid damaging painted surfaces.
- To avoid damage, unplug the wiring connectors carefully while holding the connector portion.
- To avoid damaging the cylinder head, wait until the engine coolant temperature drops below 100 °F (38 °C) before loosening the cylinder head bolts.
- Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses, or interfere with other parts.

1. Make sure you have the anti-theft code for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.

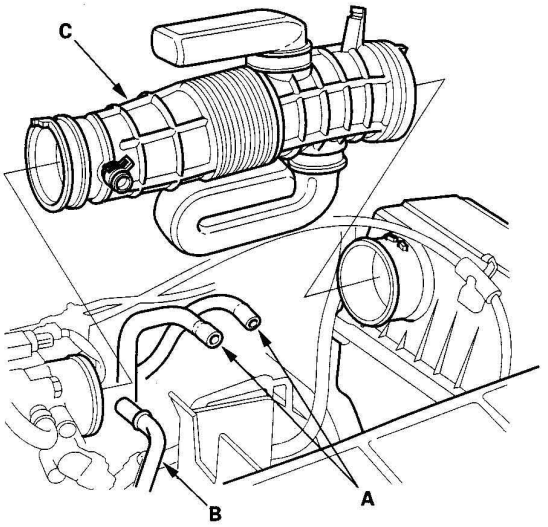
2. Disconnect the battery negative terminal.

3. Drain the engine coolant (see page 10-8).

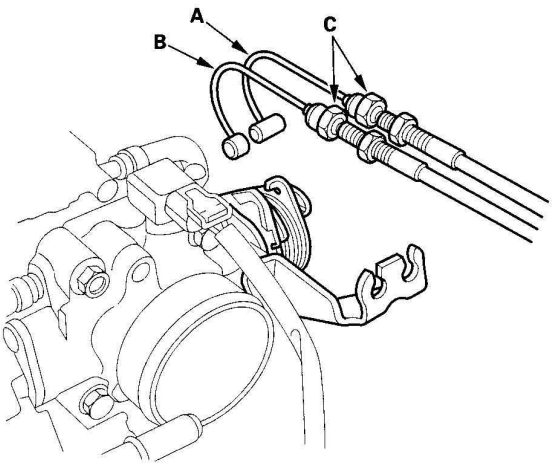
4. Remove the intake manifold cover (A) and ignition coil cover (B).



5. Remove the vacuum hoses (A) and breather pipe (B), then remove the intake air duct (C).



6. Remove the throttle cable (A) and cruise control cable (B) by loosening the locknuts (C), then slipping the cable ends out of the accelerator linkage. Take care not to bend the cables when removing them. Always replace any kinked cable with a new one.

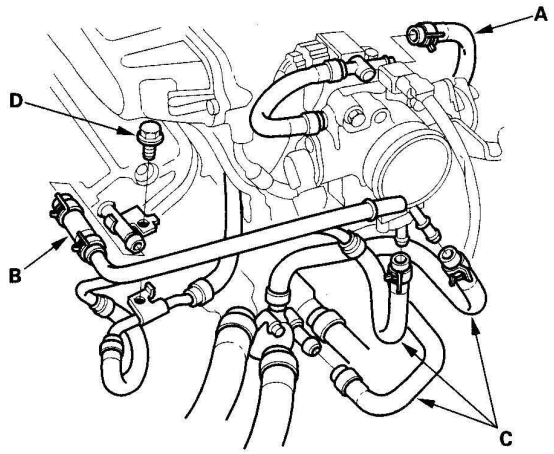


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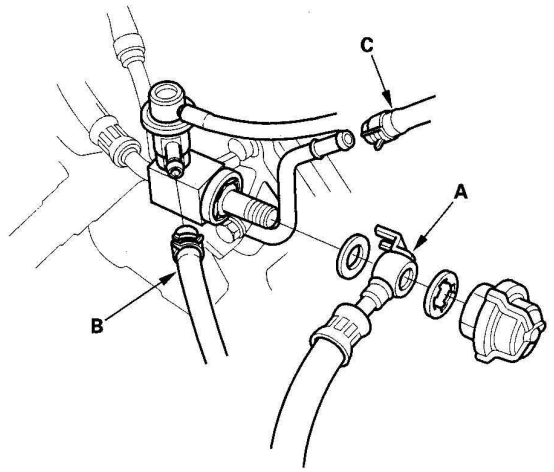
Cylinder Head Removal (cont'd)

7. Remove the Evaporative Emission (EVAP) canister hose (A), breather hose (B), water bypass hoses (C), and water bypass pipe mounting bolt (D).

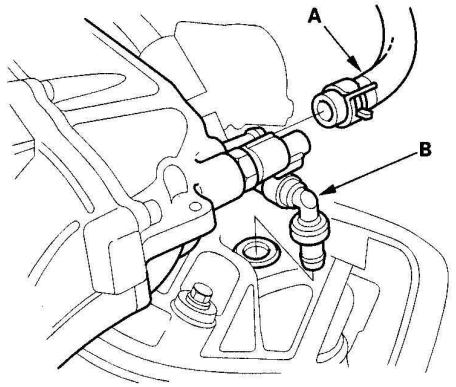


8. Relieve fuel pressure (see page 11-117).

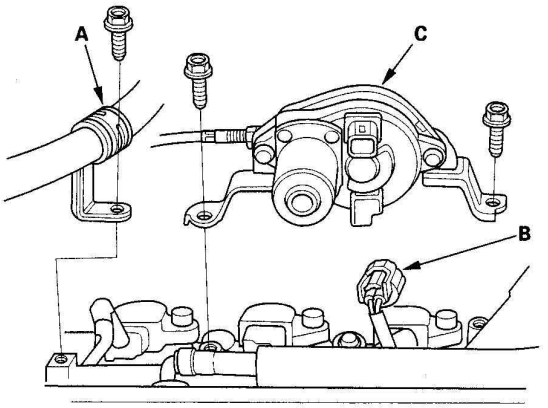
9. Remove the fuel feed hose (A), fuel return hose (B), and EVAP canister hose (C).



10. Remove the brake booster vacuum hose (A) and Positive Crankcase Ventilation (PCV) hose (B).



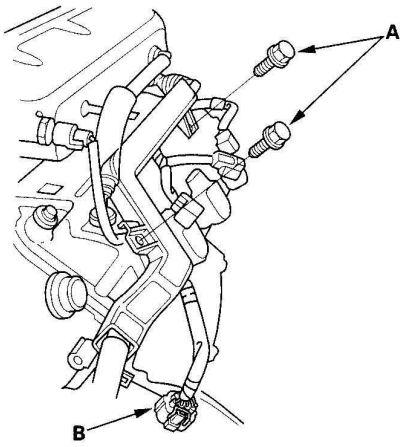
11. Remove the Power Steering (P/S) hose clamp (A), and disconnect the Intake Manifold Runner Control (IMRC) actuator connector (B), then remove the IMRC actuator (C).



BACK

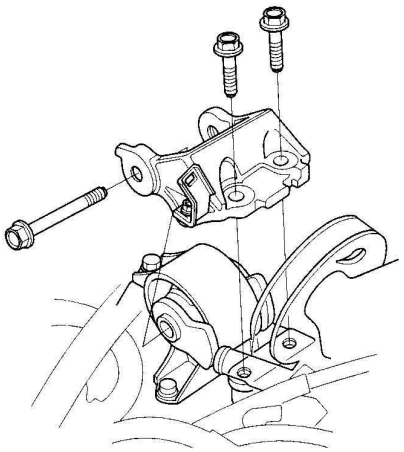
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12. Remove two bolts (A) securing the wire harness holder, then remove the joint connector (B).

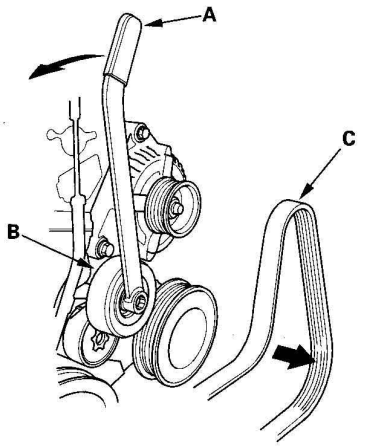


13. Support the engine with a jack and wood block under the oil pan.

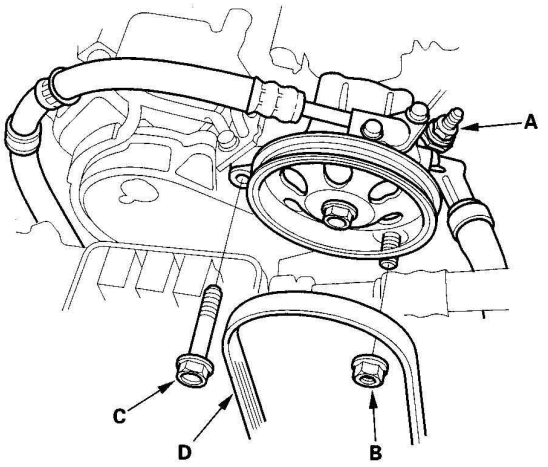
14. Remove the side engine mount bracket.



15. Use the belt tension release arm to move the auto-tensioner (B), then remove the alternator belt (C).



16. Loosen the adjusting nut (A), and remove the locknut (B) and mounting bolt (C), then remove the P/S pump belt (D) and pump without disconnecting the P/S hoses.



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Cylinder Head Removal (cont'd)

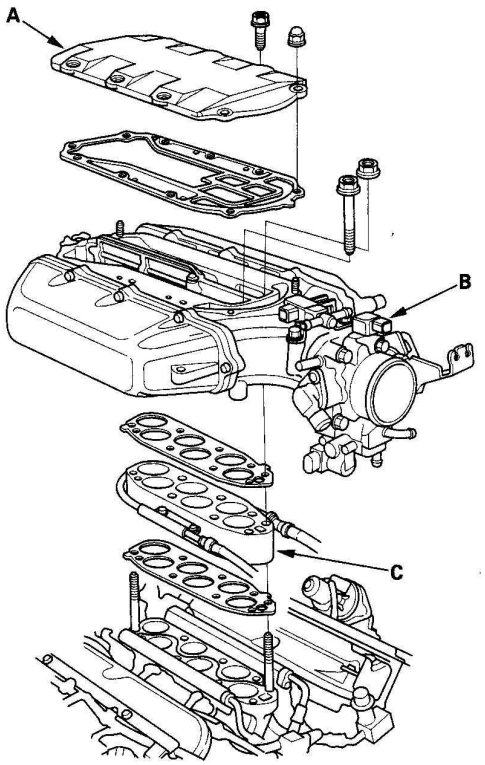
17. Remove the alternator (see page 4-24).

18. Remove the engine wire harness connectors and wire harness clamps from the intake manifold.

    - Intake Air Temperature (IAT) sensor connector
    - Idle Air Control (IAC) valve connector
    - Throttle position sensor connector
    - Manifold Absolute Pressure (MAP) sensor connector
    - Evaporative Emission (EVAP) canister purge valve connector
    - Engine Coolant Temperature (ECT) sensor connector
    - Radiator fan switch A connector
    - Radiator fan switch B connector
    - Crankshaft Position (CKP) sensor connector
    - Top Dead Center (TDC) sensor connector
    - Exhaust Gas Recirculation (EGR) connector
    - VTEC solenoid valve connector
    - VTEC oil pressure switch connector
    - Oil pressure sensor connector

19. Remove the six ignition coils (see step 3 on page 4-18).

20. Remove the upper cover (A), then remove the intake manifold assembly (B) and spacer (C).

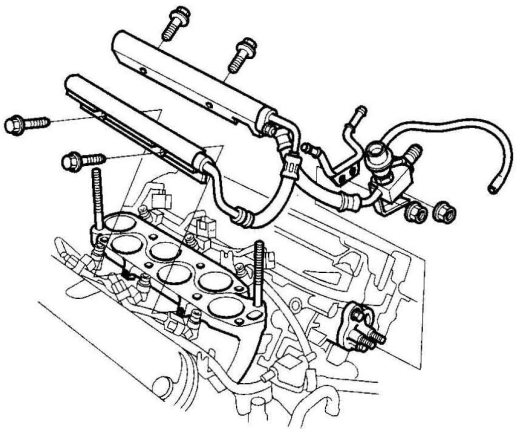


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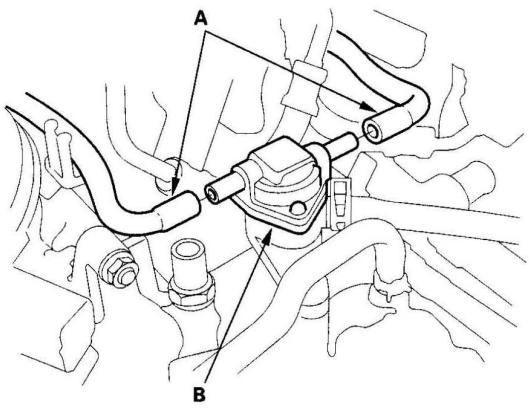
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21. Disconnect the six injector connectors.

22. Remove the fuel rails.

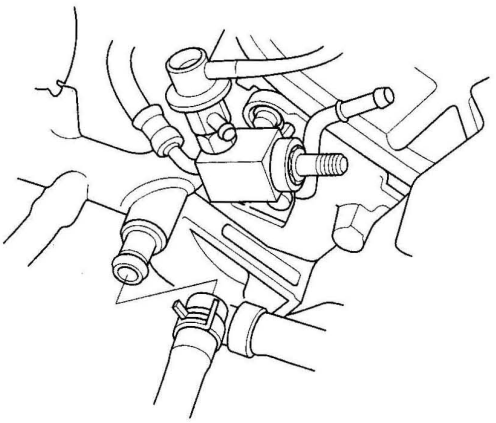


23. Remove the vacuum hoses (A) from the intake air bypass control valve (B).

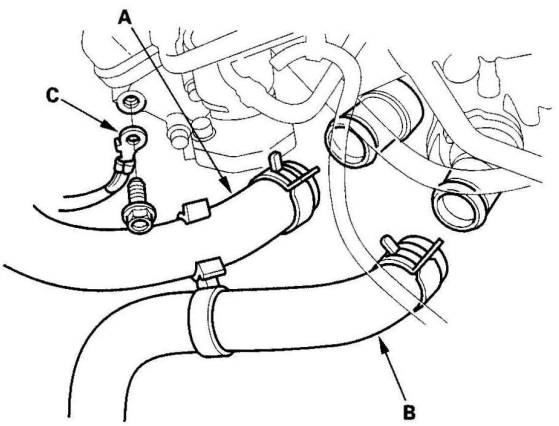


24. Remove the timing belt (see page 6-19).

25. Remove the heater hoses.



26. Remove the upper radiator hose (A), lower radiator hose (B), and ground cable (C).



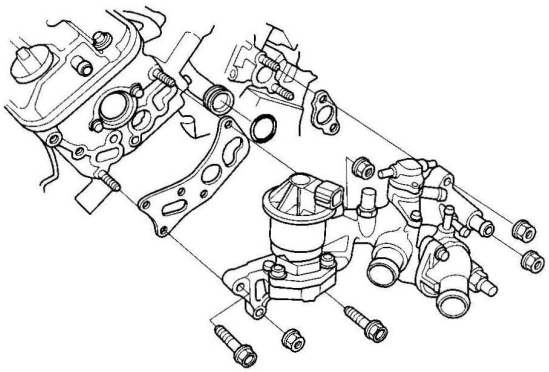
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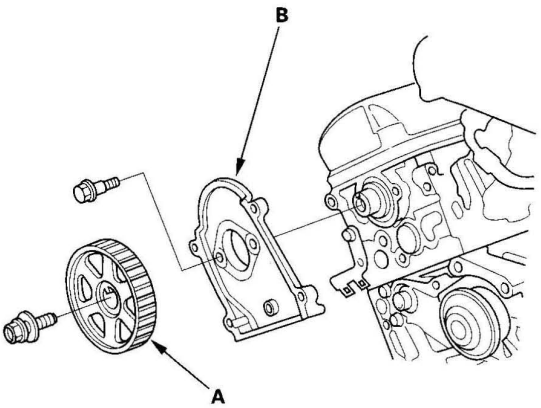
Cylinder Head Removal (cont'd)

27. Remove the front and rear exhaust manifolds (see page 9-3).

28. Remove the water passage.



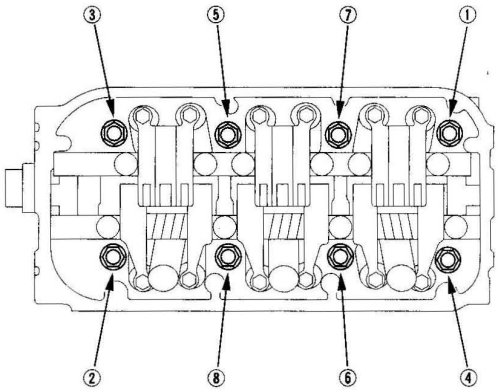
29. Remove the camshaft pulleys (A) and back covers (B).



30. Remove the cylinder head covers.

31. Remove the cylinder head bolts. To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat the sequence until all bolts are loosened.

CYLINDER HEAD BOLT LOOSENING SEQUENCE:



32. Remove the cylinder heads.

BACK

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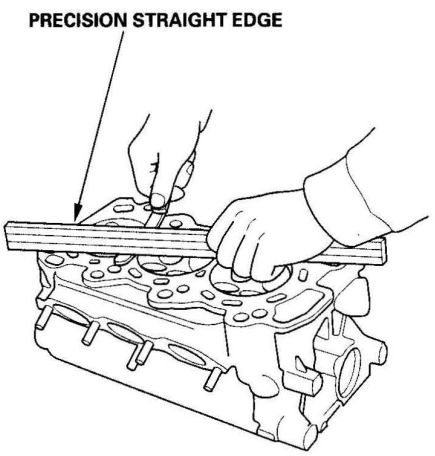
Cylinder Head Inspection for Warpage

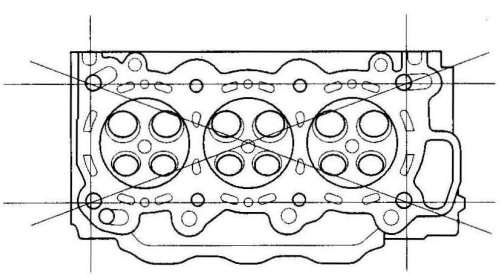
NOTE: If camshaft-to-holder oil clearances (see page 6-41) are not within specifications, the cylinder head cannot be resurfaced.

If camshaft-to-holder oil clearances are within specifications, check the cylinder head for warpage. Measure along edges, and three ways across the center.

- If warpage is less than 0.05 mm (0.002 in.), cylinder head resurfacing is not required.
- If warpage is between 0.05 mm (0.002 in.) and 0.2 mm (0.008 in.), resurface the cylinder head.
- Maximum resurface limit is 0.2 mm (0.008 in.) based on a height of 121 mm (4.76 in.).

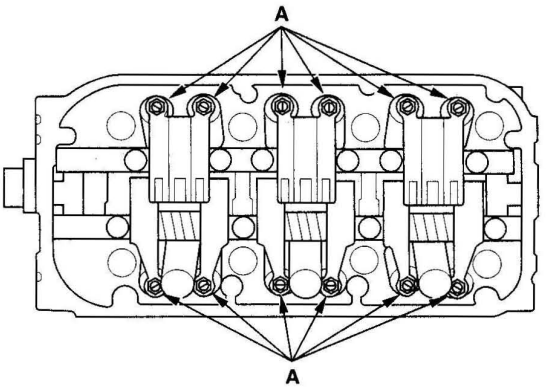
Cylinder Head Height:
Standard (New): 120.95 – 121.05 mm (4.762 – 4.766 in.)





Rocker Arm Assembly Removal

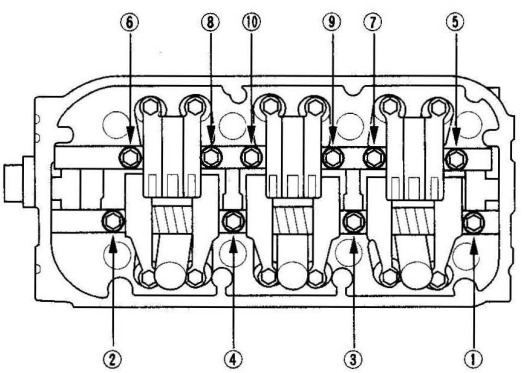
1. Loosen the adjusting screws (A).



2. Remove the bolts and the rocker arm assembly.

– 1 Unscrew the rocker shaft mounting bolts two turns at a time, in a crisscross pattern, to prevent damaging the valves or rocker arm assembly.
– 2 When removing the rocker arm assembly, do not remove the rocker shaft mounting bolts. The bolts will keep the springs and the rocker arms on the shafts.

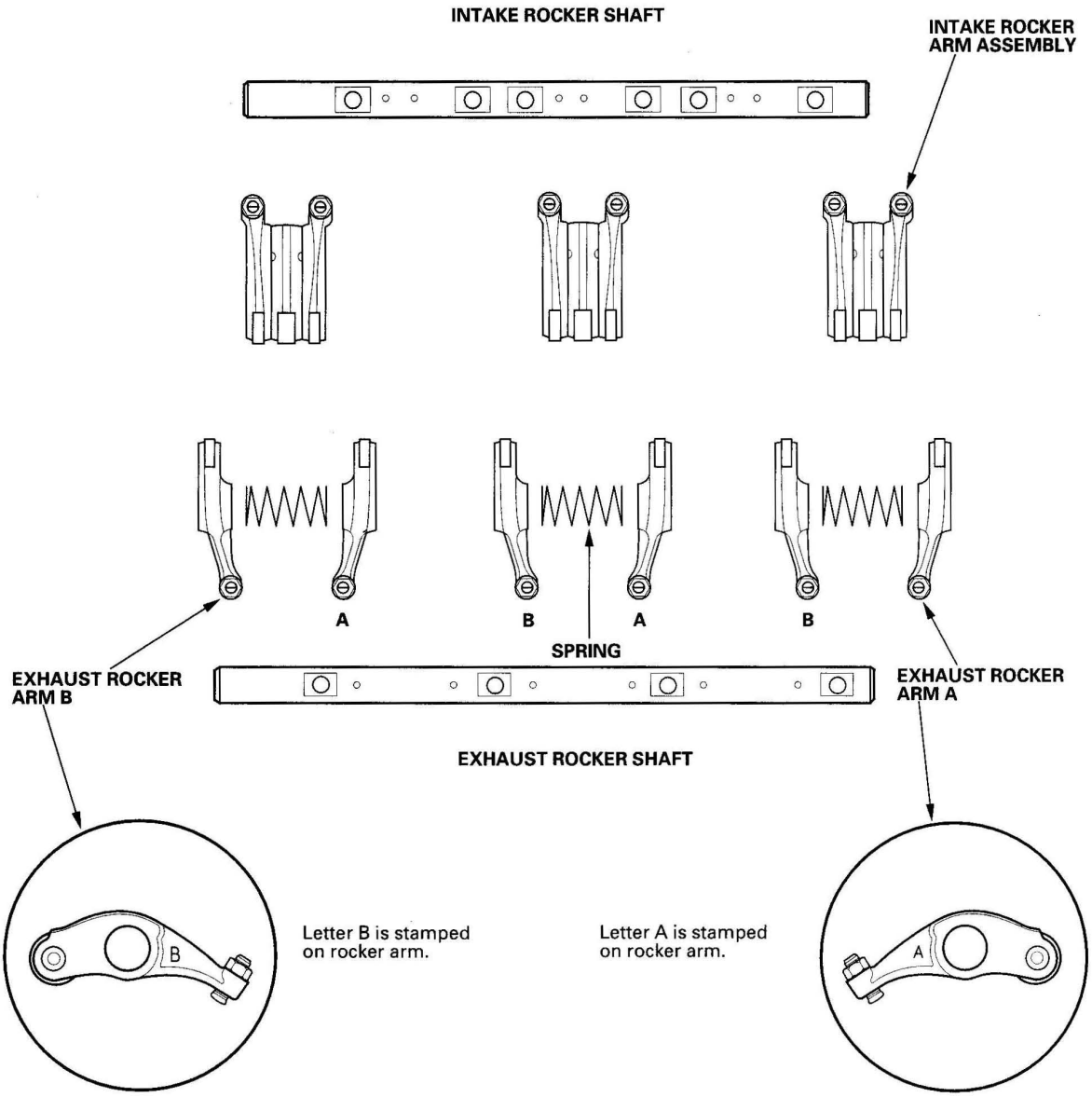
CAMSHAFT HOLDER BOLT LOOSENING SEQUENCE:



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Rocker Arms and Shafts Disassembly/Reassembly

NOTE:
- Identify parts as they are removed so they can be reinstalled in their original locations.
- Inspect the rocker shafts and rocker arms (see page 6-39).
- Rocker arms must be installed in the same positions if reused.
- When removing or installing the rocker arm assembly, do not remove the rocker shaft mounting bolts. The bolts will keep the springs and rocker arms on the shaft.
- Bundle the intake rocker arms with rubber bands to keep them together as a set.
- Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact points.

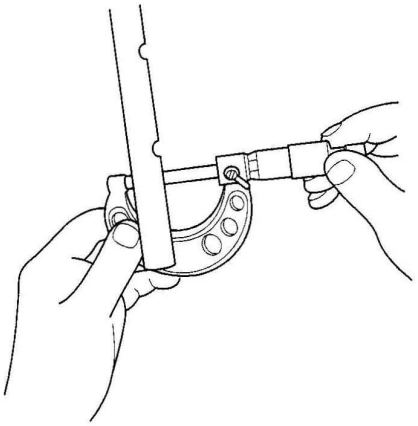


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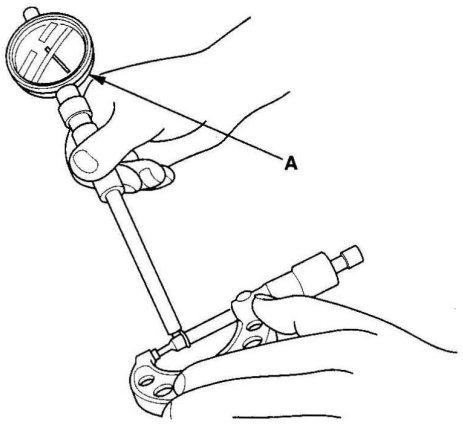
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Rocker Arms and Shafts Inspection

1. Measure the diameter of the shaft at the first rocker location.

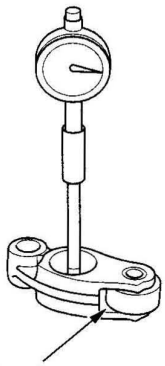


2. Zero the gauge (A) to the shaft diameter.



3. Measure the inside diameter of the rocker arm, and check it for an out-of-round condition.

Rocker Arm-to-Shaft Clearance:
Standard (New):
Intake: 0.026–0.067 mm (0.0010–0.0026 in.)
Service Limit: 0.067 mm (0.0026 in.)
Exhaust: 0.026–0.077 mm (0.0010–0.0030 in.)
Service Limit: 0.077 mm (0.0030 in.)


Inspect rocker arm face for wear.

4. Repeat for all rockers and both shafts. If the clearance is over the limit, replace the rocker shaft and all overtolerance rocker arms. If any intake rocker arm needs replacement, replace all three rocker arms in that set (primary, mid, and secondary).

(cont'd)

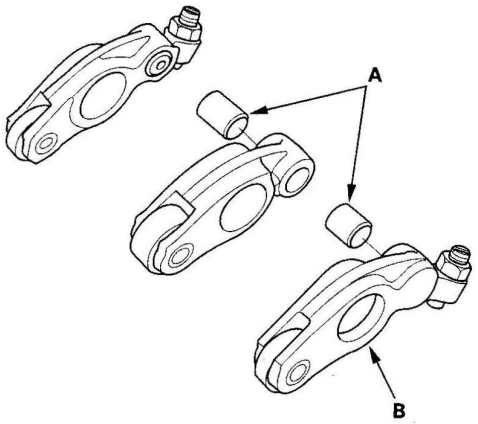
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Rocker Arms and Shafts Inspection (cont'd)

VTEC Rocker Arms

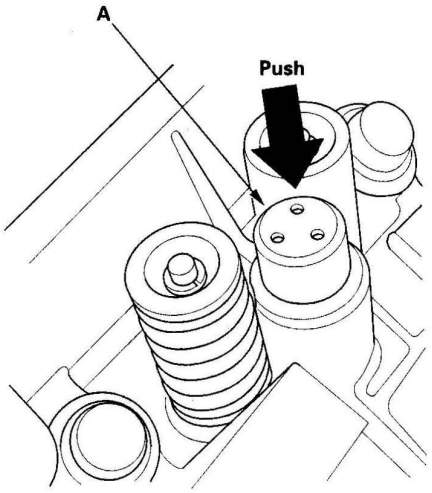
5. Inspect the rocker arm pistons (A). Push them manually. If they do not move smoothly, replace the rocker arm set.

NOTE:
- Apply oil to the pistons when reassembling.
- When reassembling the primary rocker arm (B), carefully apply air pressure to the oil passage of the rocker arm.



VTEC Lost Motion Assemblies Inspection

Push on the lost motion assembly (A) with your finger. If it does not move smoothly, replace it.



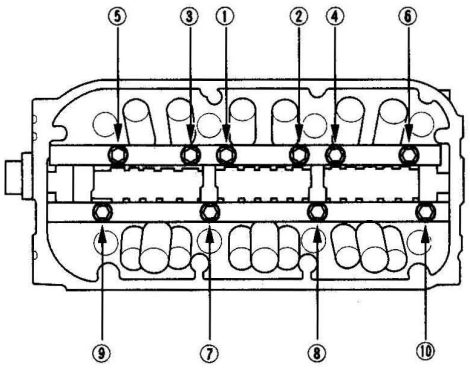
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Camshaft Inspection

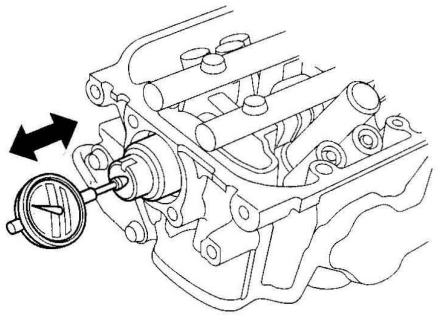
1. Remove the rocker arms.
2. Put the rocker shafts on the cylinder head, then tighten the bolts to the specified torque.

Specified torque:
8 x 1.25 mm
24 N·m (2.4 kgf·m, 17 lbf·ft)
Apply engine oil to the bolt threads and flange

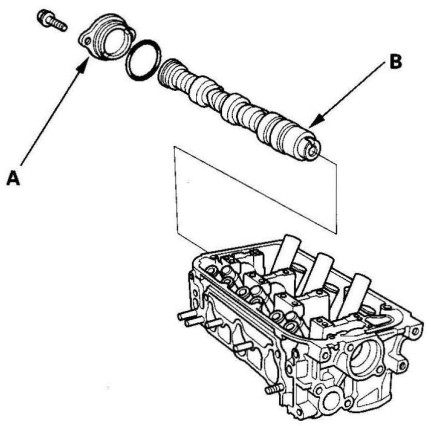


3. Seat the camshaft by pushing it toward the rear of the cylinder head.
4. Zero the dial indicator against the end of the camshaft. Push the camshaft back and forth and read the end play. If the end play is beyond the service limit, replace the thrust cover and recheck. If it is still beyond the service limit, replace the camshaft.

Camshaft End Play:
Standard (New): **0.05–0.20 mm (0.002–0.008 in.)**
Service Limit: **0.20 mm (0.008 in.)**



5. Remove the camshaft thrust cover (A), then pull out the camshaft (B).



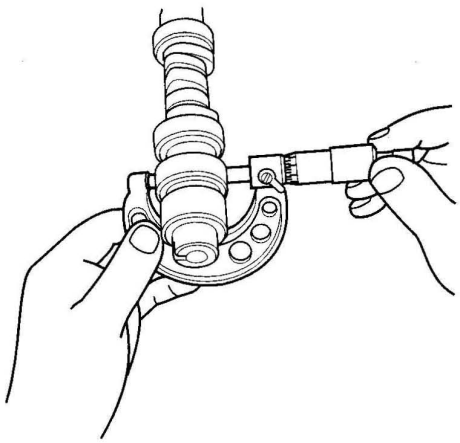
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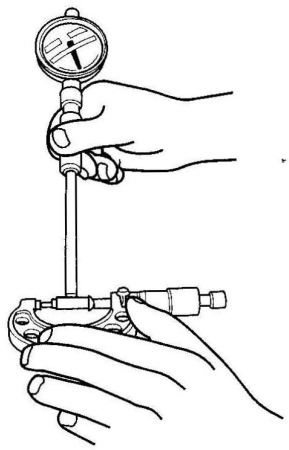
Camshaft Inspection (cont'd)

6. Wipe the camshaft clean, then inspect the lift ramps. Replace the camshaft if any lobes are pitted, scored or excessively worn.

7. Measure the diameter of each camshaft journal.



8. Zero the gauge to the journal diameter.

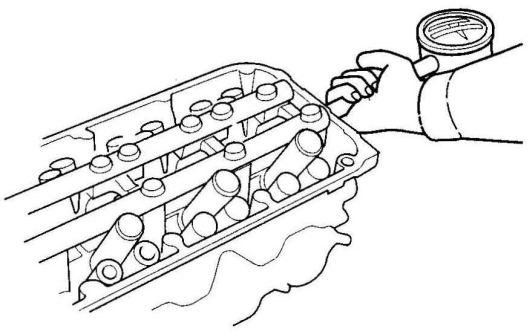


9. Clean the camshaft bearing surfaces in the cylinder head. Measure the inside diameter of each camshaft bearing surface, and check for an out-of-round condition.

   - If the camshaft-to-holder clearance is within limits, go to step 11.
   - If the camshaft-to-holder clearance is beyond the service limit and the camshaft has been replaced, replace the cylinder head.
   - If the camshaft-to-holder clearance is beyond the service limit and the camshaft has not been replaced, go to step 10.

Camshaft-to-Holder Oil Clearance:

Standard (New):	**0.050–0.089 mm (0.0020–0.0035 in.)**
Service Limit:	**0.15 mm (0.006 in.)**



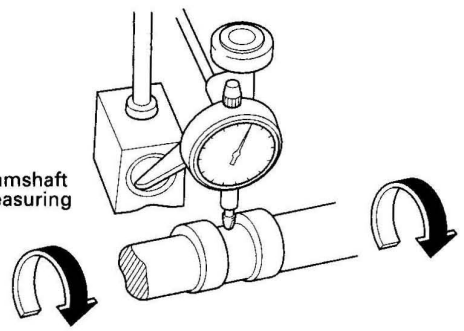
BACK

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10. Check total runout with the camshaft supported on V-blocks.

    - If the total runout of the camshaft is within the service limit, replace the cylinder head.
    - If the total runout is beyond the service limit, replace the camshaft and recheck the oil clearance. If the oil clearance is still out of tolerance, replace the cylinder head.

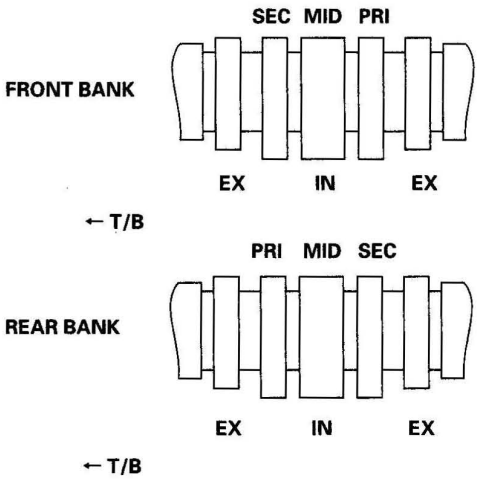
    Camshaft Total Runout:
    Standard (New): 0.03 mm (0.001 in.) max.
    Service Limit: 0.04 mm (0.002 in.)

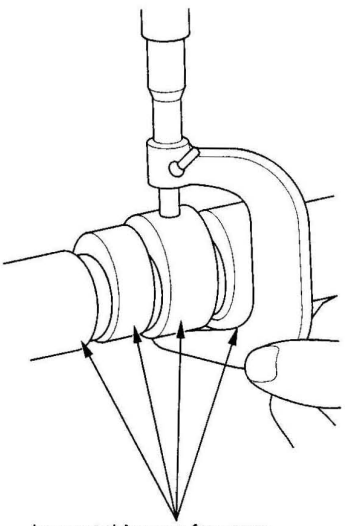


11. Measure cam lobe height.

    Cam Lobe Height Standard (New):

	INTAKE	EXHAUST
PRI	34.737 mm (1.3676 in.)	36.326 mm (1.4302 in.)
MID	36.445 mm (1.4348 in.)	
SEC	34.919 mm (1.3748 in.)	





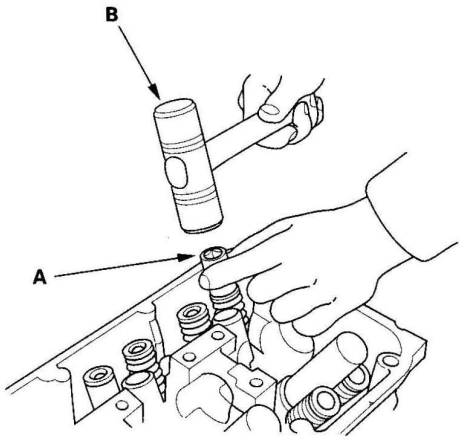
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Valves, Springs and Valve Seals Removal

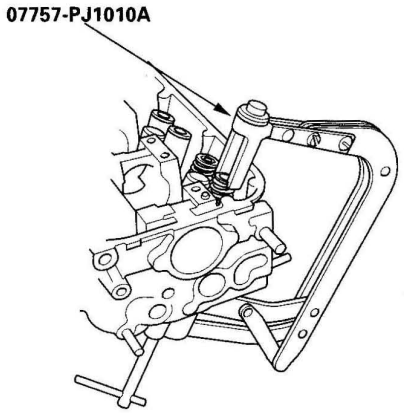
Special Tools Required
- Valve spring compressor attachment 07757-PJ1010A
- Valve spring compressor, KD383 with No. 32 jaws, commercially available
- Valve guide seal remover, KD3350, commercially available

Identify the valves and valve springs as they are removed so that each item can be reinstalled in its original position.

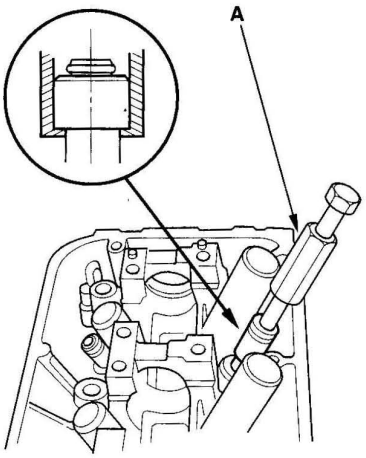
1. Using an appropriate-sized socket (A) and plastic mallet (B), lightly tap the valve retainer to loosen the valve keepers.



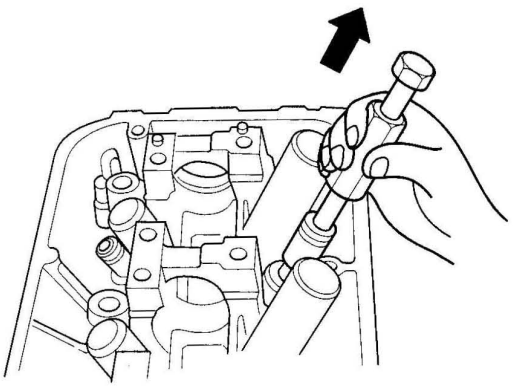
2. Install the valve spring compressor. Compress the spring and remove the valve keepers.



3. Install the valve guide seal remover (A).



4. Remove the valve seal.



BACK

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Valve Inspection

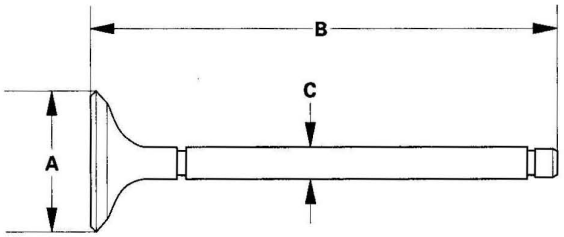
Measure the valve in these areas.

Intake Valve Dimensions

A Standard (New):	34.90–35.10 mm (1.374–1.382 in.)
B Standard (New):	115.70–116.30 mm (4.555–4.579 in.)
C Standard (New):	5.485–5.495 mm (0.2159–0.2163 in.)
C Service Limit:	5.455 mm (0.2148 in.)

Exhaust Valve Dimensions

A Standard (New):	29.90–30.10 mm (1.177–1.185 in.)
B Standard (New):	113.90–114.50 mm (4.484–4.508 in.)
C Standard (New):	5.450–5.460 mm (0.2146–0.2150 in.)
C Service Limit:	5.420 mm (0.2134 in.)



Valve Stem-to-Guide Clearance Inspection

1. Slide the valve out of its guide about 10 mm, then measure the guide-to-stem clearance with a dial indicator while rocking the stem in the direction of normal thrust (wobble method).

   - If the measurement exceeds the service limit, recheck it using a new valve.
   - If the measurement is now within the service limit, reassemble using a new valve.
   - If the measurement with a new valve still exceeds the service limit, go to step 2.

   Intake Valve Stem-to-Guide Clearance:

Standard (New):	0.04–0.09 mm (0.002–0.004 in.)
Service Limit:	0.16 mm (0.006 in.)

   Exhaust Valve Stem-to-Guide Clearance:

Standard (New):	0.11–0.16 mm (0.004–0.006 in.)
Service Limit:	0.24 mm (0.009 in.)



2. Subtract the O.D. of the valve stem, measured with a micrometer, from the I.D. of the valve guide, measured with an inside micrometer or ball gauge. Take the measurements in three places along the valve stem and three places inside the valve guide. The difference between the largest guide measurement and the smallest stem measurement should not exceed the service limit.

   Intake Valve Stem-to-Guide Clearance:

Standard (New):	0.020–0.045 mm (0.0008–0.0018 in.)
Service Limit:	0.08 mm (0.003 in.)

   Exhaust Valve Stem-to-Guide Clearance:

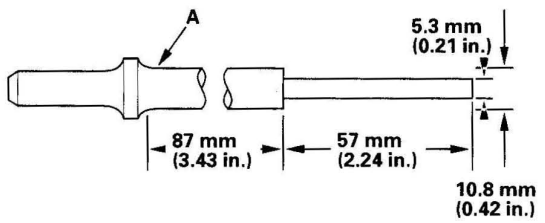
Standard (New):	0.055–0.080 mm (0.0022–0.0031 in.)
Service Limit:	0.12 mm (0.005 in.)

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Valve Guide Replacement

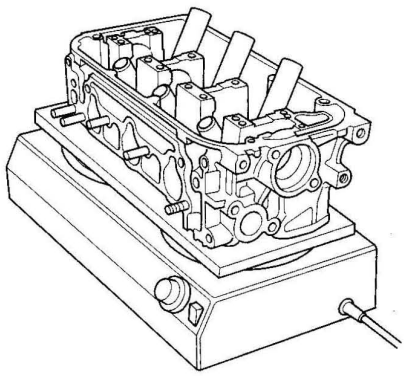
Special Tools Required
- Valve guide driver, 5.5 mm 07742-0010100
- Valve guide reamer, 5.5 mm 07HAH-PJ7010B

1. As illustrated below, use a commercially available air-impact valve guide driver (A) modified to fit the diameter of the valve guides. In most cases, the same procedure can be done using the special tool and a conventional hammer.



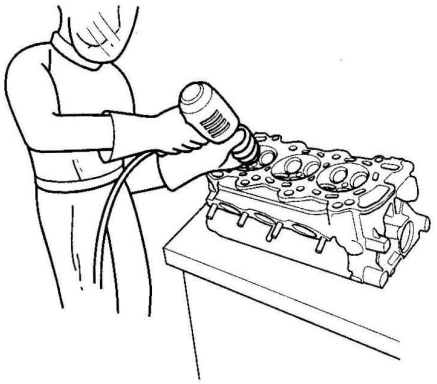
2. Select the proper replacement guides, and chill them in the freezer section of a refrigerator for about an hour.

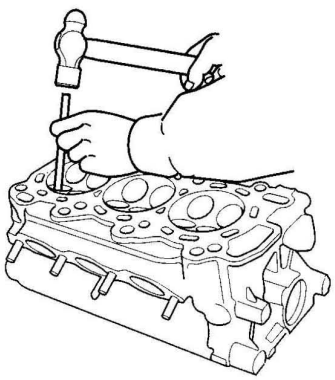
3. Use a hot plate or oven to evenly heat the cylinder head to 300°F (150°C). Monitor the temperature with a cooking thermometer. Do not get the head hotter than 300°F (150°C); excessive heat may loosen the valve seats.



4. Working from the camshaft side, use the driver and an air hammer to drive the guide about 2 mm (0.1 in.) towards the combustion chamber. This will knock off some of the carbon and make removal easier. Hold the air hammer directly in line with the valve guide to prevent damaging the driver. Wear safety goggles or a face shield.

5. Turn the head over, and drive the guide out toward the camshaft side of the head.





6. If a valve guide still won't move, drill it out with a 8 mm (5/16 inch) bit, then try again. Drill guides only in extreme cases; you could damage the cylinder head if the guide breaks.

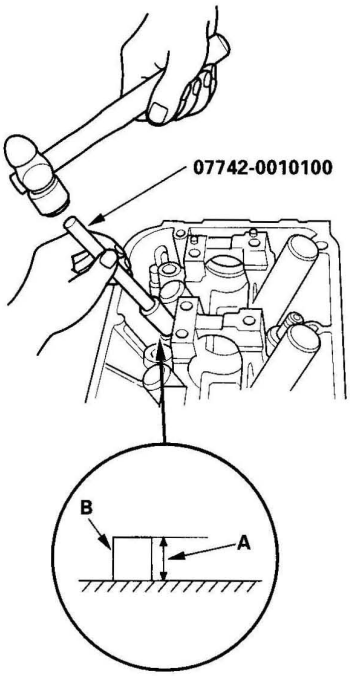
7. Remove the new guide(s) from the freezer, one at a time, as you need them.

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8. Apply a thin coat of clean engine oil to the outside of the new valve guide. Install the guide from the camshaft side of the head; use the special tool to drive the guide in to the specified installed height (A) of the guide (B). If you have all 12 guides to do, you may have to reheat the head.

Valve Guide Installed Height:
Intake: 21.20–22.20 mm (0.835–0.874 in.)
Exhaust: 20.63–21.63 mm (0.812–0.852 in.)



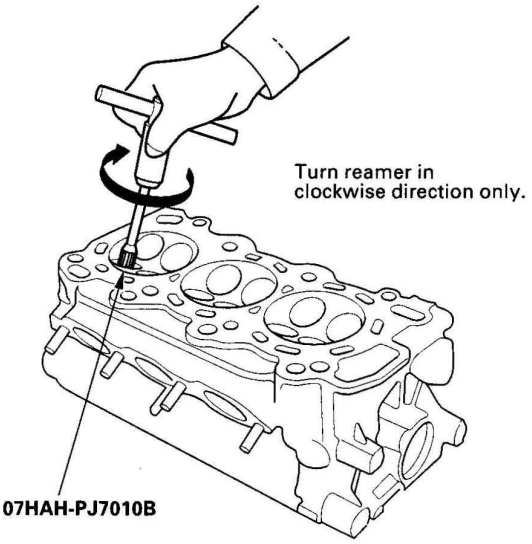
9. Coat both the reamer and the valve guide with cutting oil.

10. Rotate the reamer clockwise the full length of the valve guide bore.

11. Continue to rotate the reamer clockwise while removing it from the bore.

12. Thoroughly wash the guide in detergent and water to remove any cutting residue.

13. Check the clearance with an appropriate valve (see page 6-45). Verify that a valve slides in the intake and exhaust valve guides without exerting pressure.



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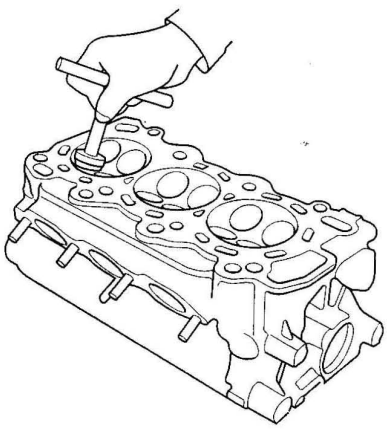
Valve Seat Reconditioning

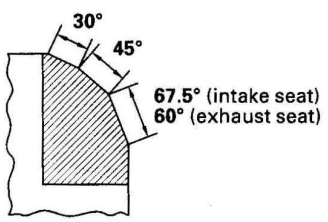
If the valve guides are worn (see page 6-45), replace them (see page 6-46) before cutting the valve seats.

1. Renew the valve seats in the cylinder head using a valve seat cutter.

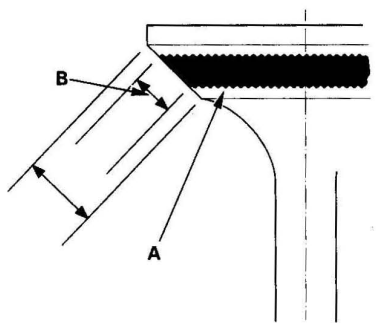
   – 1 Carefully cut a 45° seat, removing only enough material to ensure a smooth and concentric seat.
   – 2 Bevel the upper edge of the seat with the 30° cutter and the lower edge of the seat with the 67.5° cutter (intake seat) or the 60° cutter (exhaust seat). Check the width of the seat and adjust accordingly.
   – 3 Make one more very light pass with the 45° cutter to remove any possible burrs caused by the other cutters.

   Valve Seat Width:
   Standard (New): 1.25 – 1.55 mm (0.049 – 0.061 in.)
   Service Limit: 2.00 mm (0.079 in.)





2. After resurfacing the seat, inspect it for even valve seating: Apply Prussian Blue compound (A) to the valve face. Insert the valve in its original location in the head, then lift it and snap it closed against the seat several times.



3. The actual valve seating surface (B), as shown by the blue compound, should be centered on the seat.

   - If it is too high (closer to the valve stem), you must make a second cut with the 67.5° cutter (intake seat) or the 60° cutter (exhaust seat) to move it down, then one more cut with the 45° cutter to restore seat width.
   - If it is too low (closer to the valve edge), you must make a second cut with the 30° cutter to move it up, then one more cut with the 45° cutter to restore seat width.

   NOTE: The final cut should always be made with the 45° cutter.

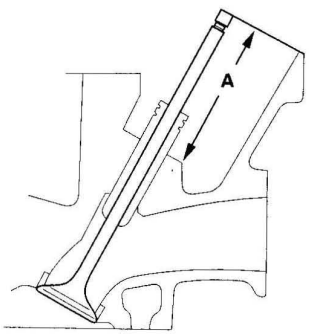
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4. Insert the intake and exhaust valves in the head, and measure the valve stem installed height (A).

Intake Valve Stem Installed Height:
Standard (New): 46.75 – 47.55 mm (1.841 – 1.872 in.)
Service Limit: 47.80 mm (1.882 in.)

Exhaust Valve Stem Installed Height:
Standard (New): 46.68 – 47.48 mm (1.838 – 1.869 in.)
Service Limit: 47.73 mm (1.879 in.)



5. If the valve stem installed height is over the service limit, replace the valve and recheck. If it is still over the service limit, replace the cylinder head; the valve seat in the head is too deep.

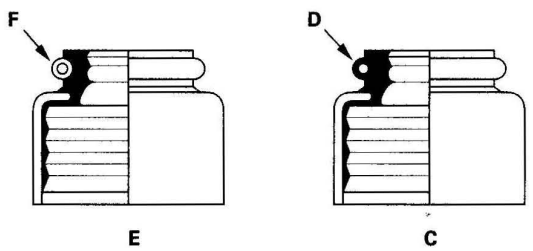
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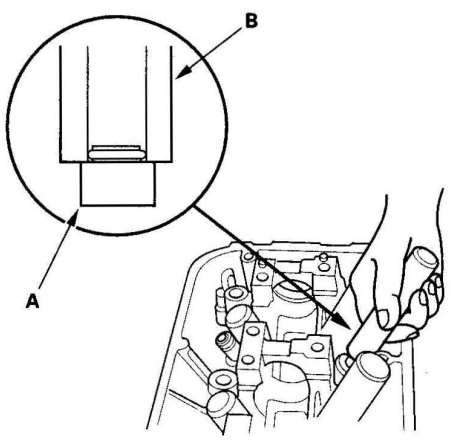
Valves, Springs, and Valve Seals Installation

Special Tools Required
- Valve spring compressor attachment 07757-PJ1010A
- Valve spring compressor, KD383 with No. 32 jaws, commercially available
- Valve guide seal installer, KD3372, commercially available

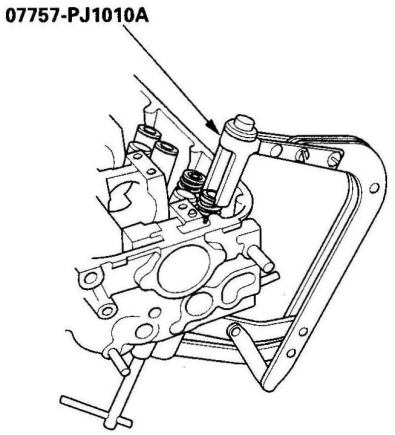
1. Coat the valve stems with engine oil. Install the valves in the valve guides.
2. Check that the valves move up and down smoothly.
3. Install the spring seats on the cylinder head.
4. Install the new valve seals (A) using the valve guide seal installer (B).

   NOTE: Exhaust valve seals (C) have a black spring (D) and intake valve seals (E) have a white spring (F); they are not interchangeable.

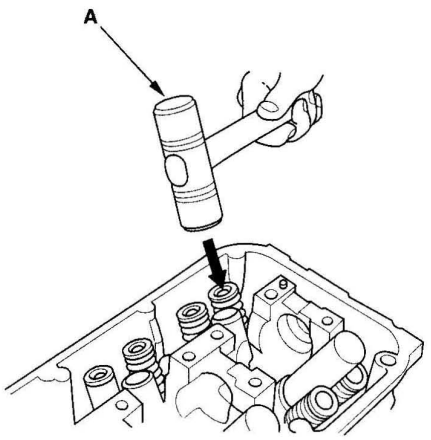




5. Install the valve spring and valve retainer. Place the end of the valve spring with closely wound coils toward the cylinder head.
6. Install the valve spring compressor. Compress the spring and install the valve keepers.



7. Lightly tap the end of each valve stem two or three times with a plastic mallet (A) to ensure proper seating of the valve and valve keepers. Tap the valve stem only along its axis so you do not bend the stem.

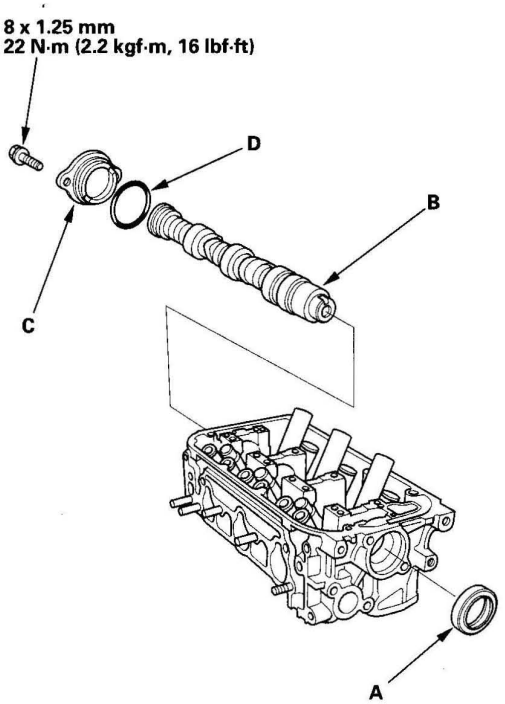


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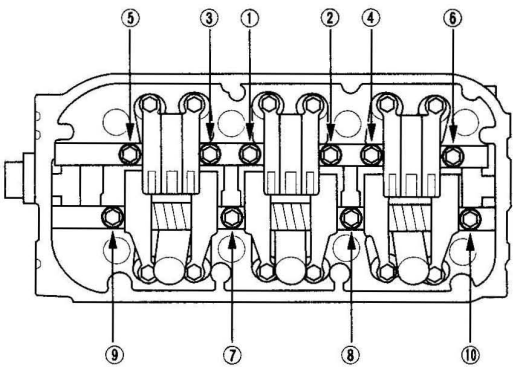
Camshaft/Rocker Arms, Camshaft Seal, and Pulley Installation

1. Apply a light coat of oil around the camshaft oil seal.
2. Gently tap the new camshaft oil seal (A) into the cylinder head.
   - 1 Tap the camshaft oil seal in squarely.
   - 2 Install the oil seal in the cylinder head about 0.5 – 1.5 mm (0.02 – 0.06 in.) from the surface of the cylinder head.

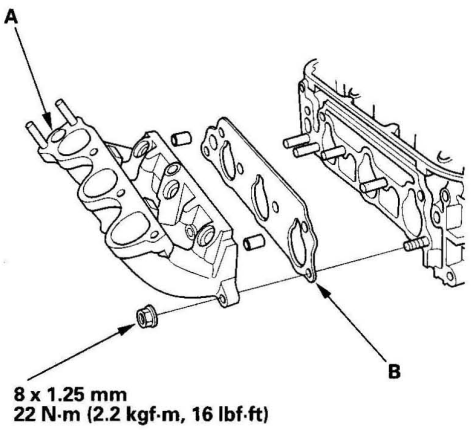


3. Insert the camshaft (B) into the cylinder head, then install the camshaft thrust cover (C). Always use a new O-ring (D).
4. Check that the oil seal lips are not distorted.
5. Loosen the valve adjusting screws.
6. Make sure the hollow dowel pins are installed in the camshaft pulley end of the head. Set the rocker arm assembly in place, and loosely install the bolts. Make sure that the rocker arms are properly positioned on the valve stems.
7. Tighten each bolt two turns at a time in the sequence shown below to ensure that the rockers do not bind on the valves.

   Specified torque:
   8 x 1.25 mm
   24 N·m (2.4 kgf·m, 17 lbf·ft)
   Apply engine oil to the bolt threads and flange



8. Install the injector base (A). Always use a new gasket (B).

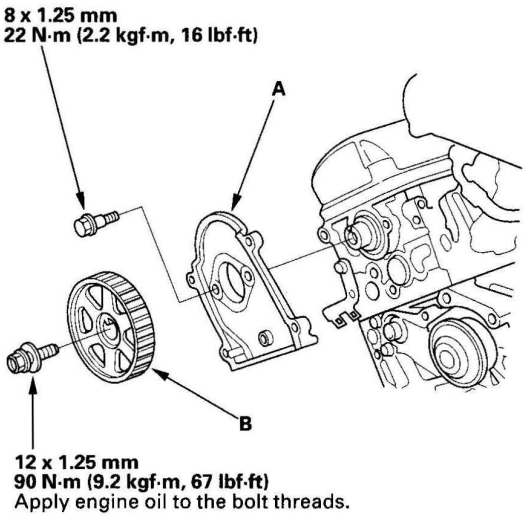


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Camshaft/Rocker Arms, Camshaft Seal, and Pulley Installation (cont'd)

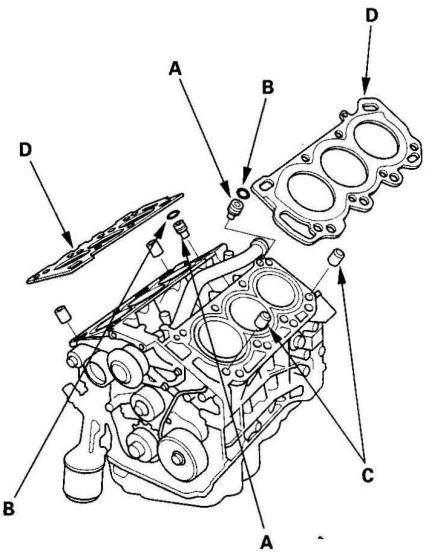
9. Install the back cover (A), then install the camshaft pulley (B).



Cylinder Head Installation

Install the cylinder head in the reverse order of removal:

1. Clean the cylinder head and block surface.
2. Clean and install the oil control orifices (A) with new O-rings (B).



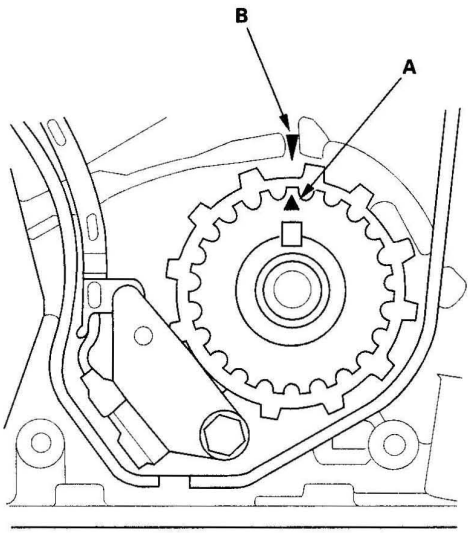
3. Install the dowel pins (C) and new cylinder head gaskets (D).

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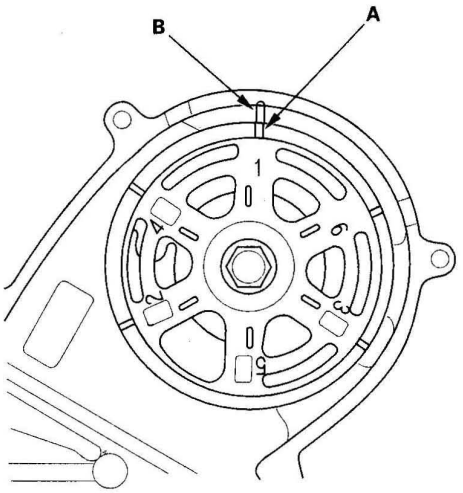
4. Clean the timing belt drive pulley.

5. Set the timing belt drive pulley to Top Dead Center (TDC) by aligning the TDC mark (A) on the tooth of the timing belt drive pulley with the pointer (B) on the oil pump.

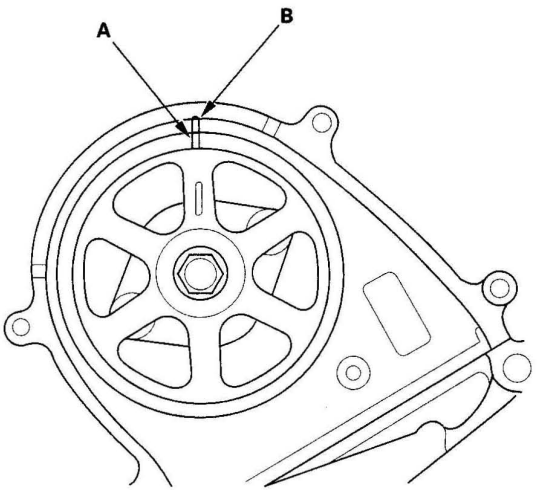


6. Clean the camshaft pulleys. Set the camshaft pulleys to TDC by aligning the TDC marks (A) on the camshaft pulleys with the pointers (B) on the back covers.

FRONT:



REAR:



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Cylinder Head Installation (cont'd)

7. Apply clean engine oil to the threads and flanges of the cylinder head bolts.

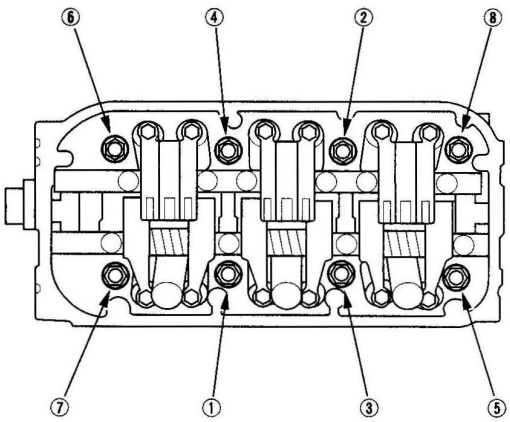
8. Tighten the cylinder head bolts sequentially in three steps.

   NOTE: Perform each step twice.

   1st step torque: 39 N·m (4.0 kgf·m, 29 lbf·ft)
   2nd step torque: 69 N·m (7.0 kgf·m, 51 lbf·ft)
   3rd step torque: 98.1 N·m (10.0 kgf·m, 72.3 lbf·ft)

   Use a beam-type torque wrench. When using a preset-type torque wrench, be sure to tighten slowly and not to overtighten.
   If a bolt makes any noise while you are torquing it, loosen the bolt, and retighten it from the 1st step.

CYLINDER HEAD BOLTS TORQUE SEQUENCE:



9. Install the exhaust manifold, and tighten the nuts in a crisscross pattern in two or three steps, beginning with the inner nut (see page 9-3). Always use a new exhaust manifold gasket.

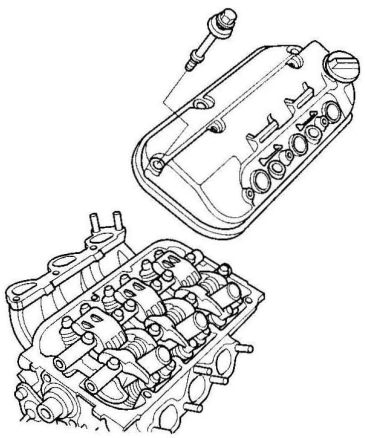
10. Install the splash shield.

11. Install the timing belt (see page 6-22).

12. Adjust the valve clearance (see page 6-11).

13. Install the cylinder head cover.

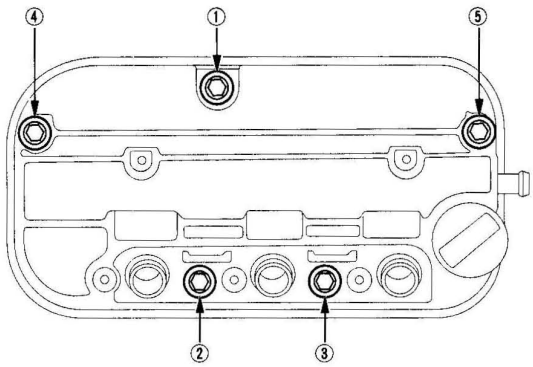
    NOTE:
    - Before installing the cylinder head cover, clean the cylinder head contacting surfaces with a shop towel.
    - Take care not to damage the spark plug seals when installing the cylinder head cover.
    - Visually check the spark plug seals for damage.
    - Replace any washer that is damaged or deteriorated.



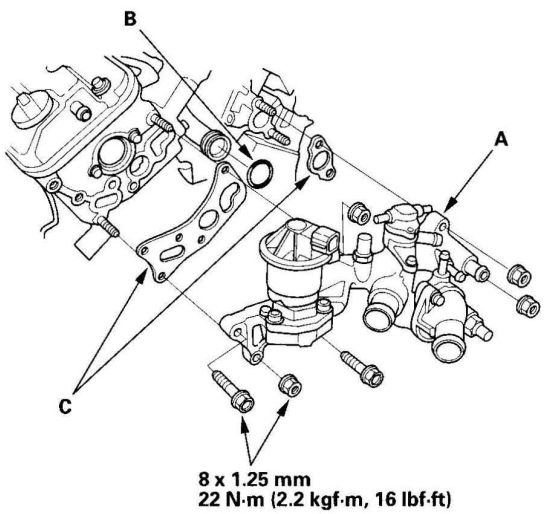
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14. Tighten the bolts in two or three steps. In the final step, tighten all bolts, in sequence, to 12 N·m (1.2 kgf·m, 8.7 lbf·ft).

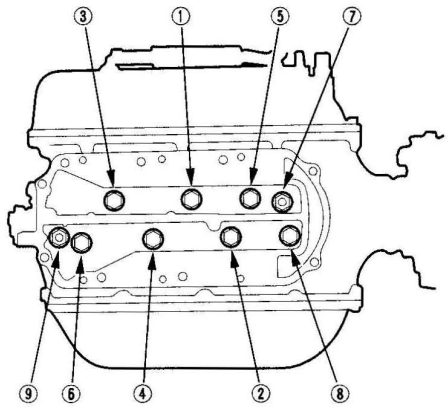


15. Install the water passage (A). Always use a new O-ring (B) and new gaskets (C).



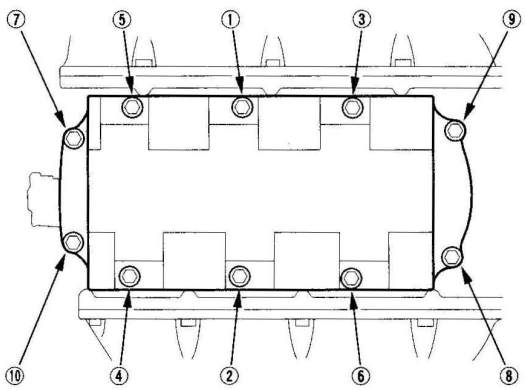
16. Install the spacer and intake manifold. Tighten the bolts and nuts sequentially in two or three steps. Always use a new intake manifold gasket.

Specified torque:
8 x 1.25 mm
22 N·m (2.2 kgf·m, 16 lbf·ft)



17. Install the upper cover. Tighten the bolts and nuts sequentially in two or three steps. Always use a new gasket.

Specified torque:
6 x 1.0 mm
12 N·m (1.2 kgf·m, 8.7 lbf·ft)



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Cylinder Head Installation (cont'd)

18. Install the six ignition coils (see step 3 on page 4-18).

19. After installation, check that all tubes, hoses and connectors are installed correctly.

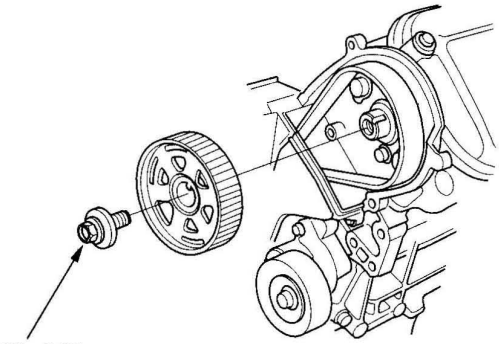
20. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

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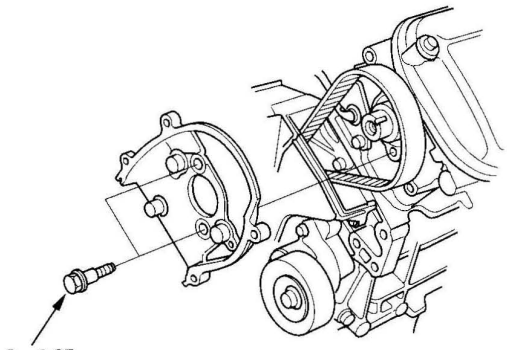
TDC Sensor Replacement

1. Set the No. 1 piston at Top Dead Center (TDC) (see page 6-19).
2. Remove the upper covers.
3. To hold the timing belt adjuster in its current position, thread in the battery clamp bolt hand-tight (see step 14 on page 6-21).
4. Loosen the idler pulley bolt about five or six turns, then remove the timing belt from the front camshaft pulley (see step 16 on page 6-22).
5. Remove the front camshaft pulley.



12 x 1.25 mm
90 N·m (9.2 kgf·m, 67 lbf·ft)
Apply engine oil to the bolt threads.

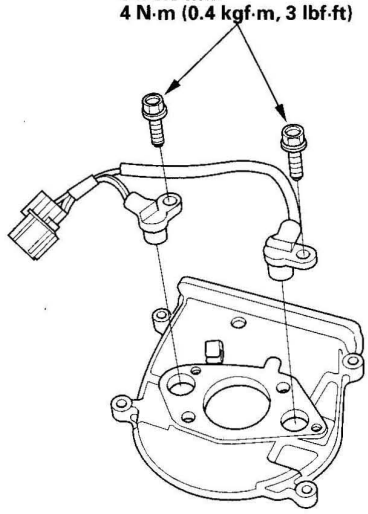
6. Disconnect the TDC 1/TDC 2 sensor connector, then remove the back cover.



8 x 1.25 mm
22 N·m (2.2 kgf·m, 16 lbf·ft)

7. Remove the TDC 1/TDC 2 sensor from the back cover.

5 x 0.8 mm
4 N·m (0.4 kgf·m, 3 lbf·ft)

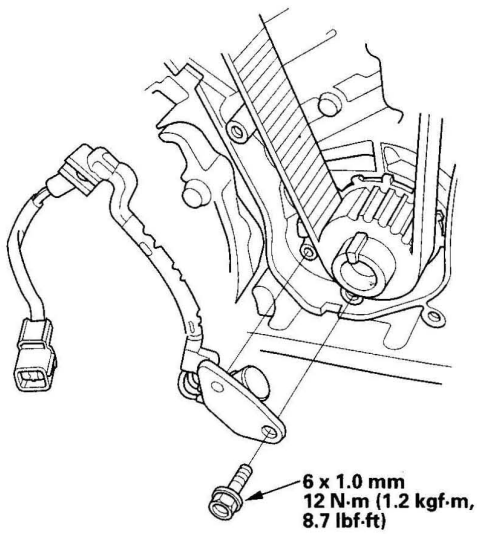


8. Install the TDC 1/TDC 2 sensor in reverse order of removal. Reinstall the timing belt (see page 6-22) and other removed components.

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CKP Sensor Replacement

1. Move the auto-tensioner to remove tension from the alternator belt, then remove the alternator belt (see step 5 on page 6-19).
2. Loosen the adjusting nut, locknut, and mounting bolt, then remove the Power Steering (P/S) pump belt (see step 6 on page 6-20).
3. Remove the dipstick and tube (see step 9 on page 6-20).
4. Remove the crankshaft pulley (see step 10 on page 6-20).
5. Remove the upper and lower covers (see step 12 on page 6-21).
6. Remove the Crankshaft Position (CKP) sensor from the oil pump.



7. Install the CKP sensor in the reverse order of removal.

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Engine Mechanical



Engine Block

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Engine Block

Special Tools

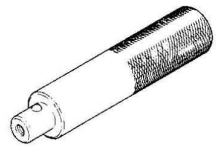
Ref. No.	Tool Number	Description	Qty
①	07LAD-PT3010A	Oil Seal Driver	1
②	07VAD-P8A010A	Oil Seal Driver Attachment, 80 mm I.D.	1
③	07749-0010000	Driver	1



①



②

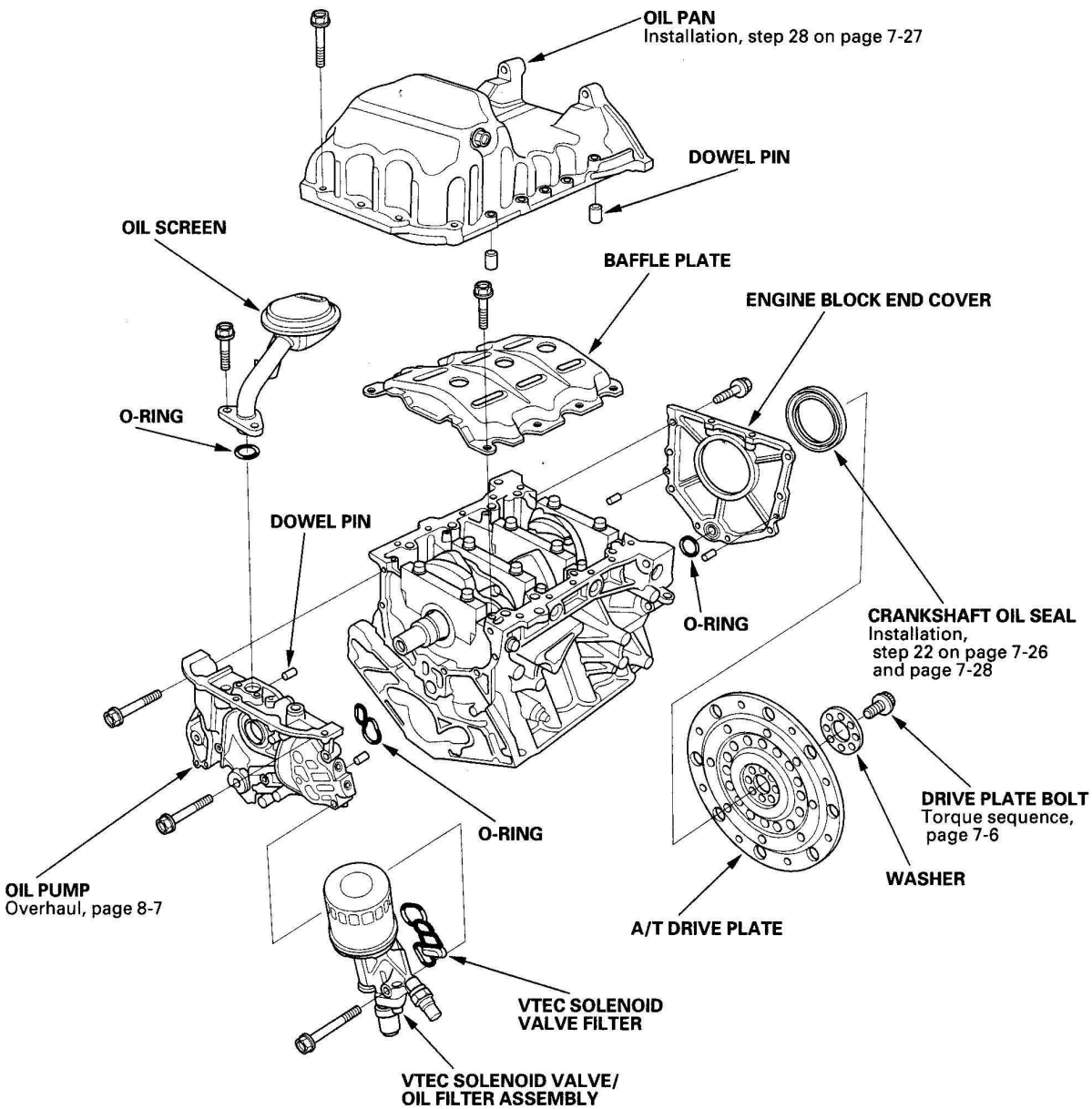


③

BACK

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Component Location Index



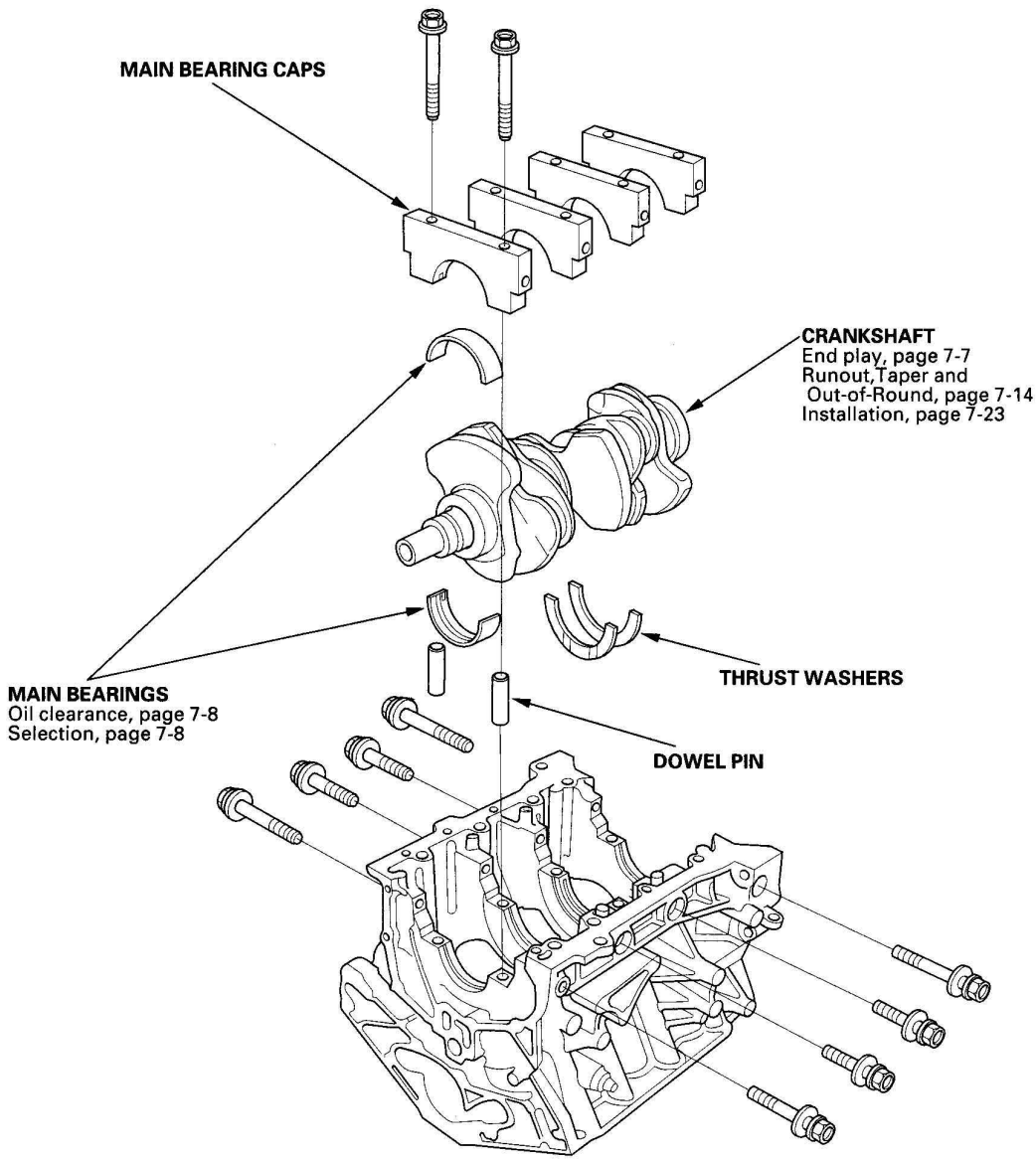
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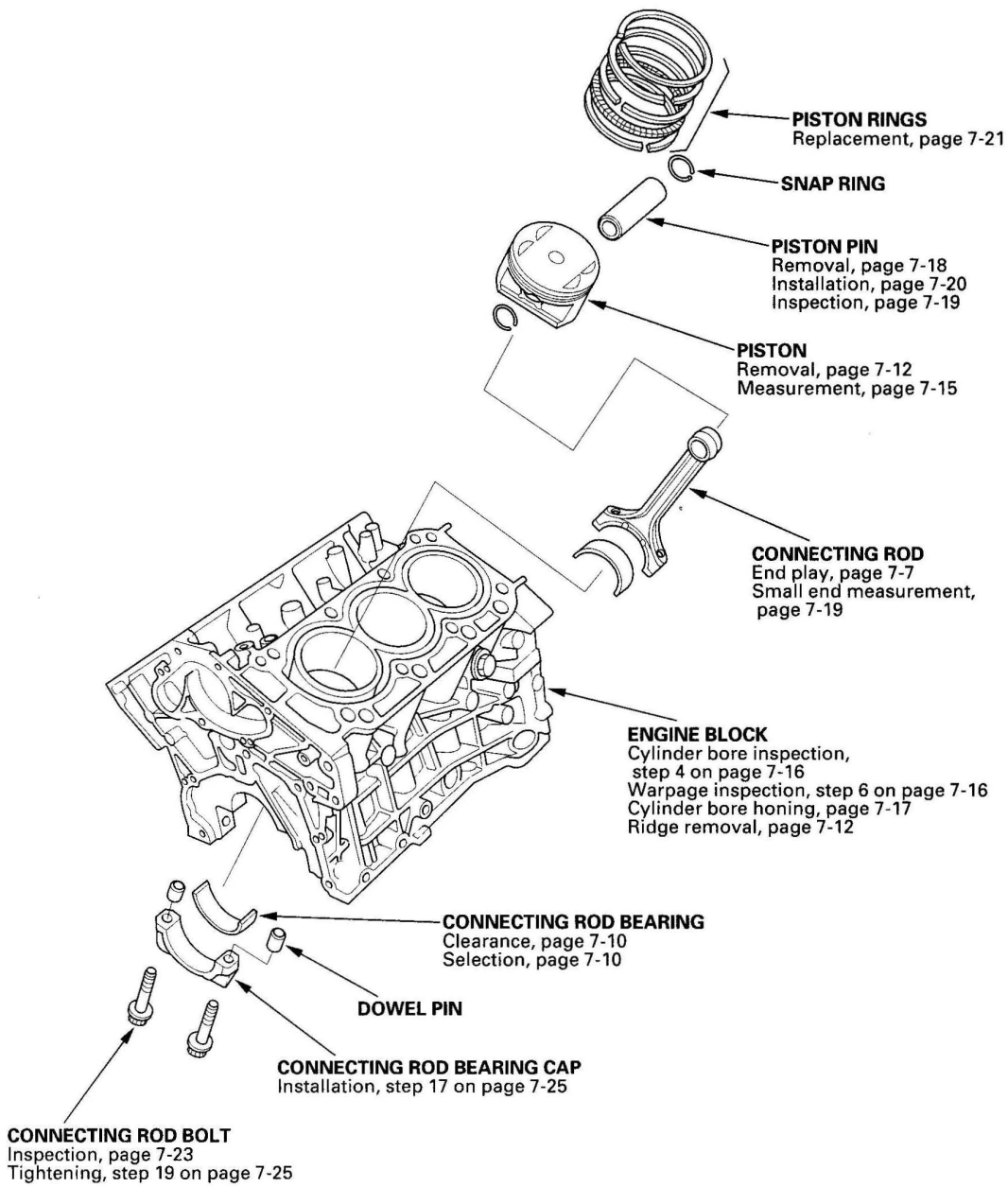
Engine Block

Component Location Index (cont'd)



BACK

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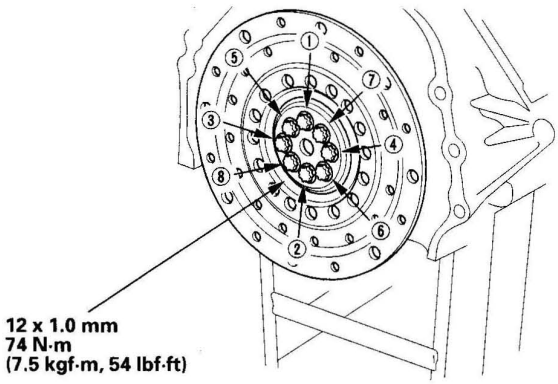
BACK

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Drive Plate Removal and Installation

1. Remove the transmission (see page 14-138).

2. Remove the eight drive plate bolts, then separate the drive plate from the crankshaft flange. After installation, tighten the bolts in the sequence shown.



3. Install the transmission (see page 14-149).

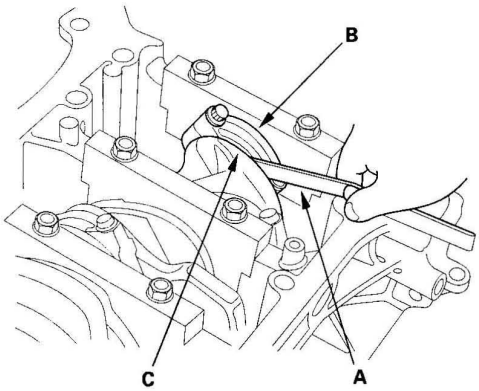
BACK

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Connecting Rod and Crankshaft End Play Inspection

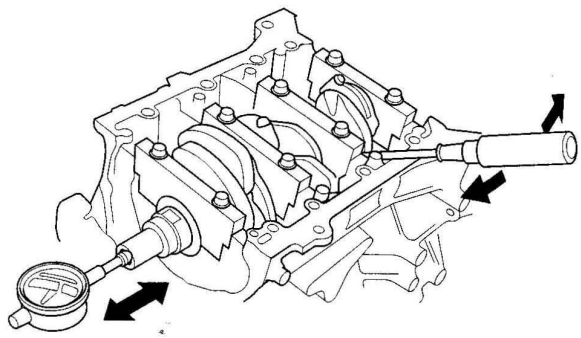
1. Remove the oil pump (see page 8-8).
2. Remove the baffle plate (see page 7-12).
3. Measure the connecting rod end play with a feeler gauge (A) between the connecting rod (B) and crankshaft (C).

   Connecting Rod End Play:
   Standard (New): 0.15–0.35 mm (0.006–0.014 in.)
   Service Limit: 0.45 mm (0.018 in.)



4. If the connecting rod end play is out-of-tolerance, install a new connecting rod and recheck. If it still out-of-tolerance, replace the crankshaft (see page 7-12).
5. Push the crankshaft firmly away from the dial indicator, and zero the dial against the end of the crankshaft. Then pull the crankshaft firmly back toward the indicator; dial reading should not exceed the service limit.

   Crankshaft End Play:
   Standard (New): 0.10–0.35 mm (0.004–0.014 in.)
   Service Limit: 0.45 mm (0.018 in.)



6. If end play is excessive, replace the thrust washers and recheck. If it is still out-of-tolerance, replace the crankshaft.

BACK

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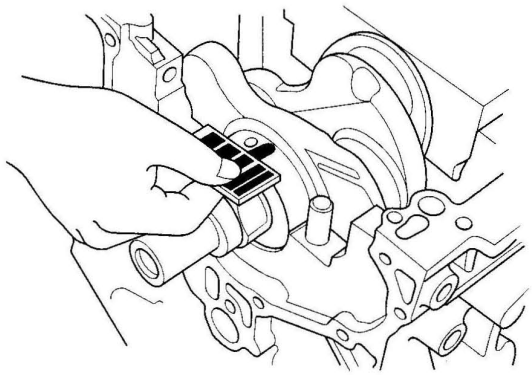
Crankshaft Main Bearing Replacement

Main Bearing Clearance Inspection

1. To check main bearing-to-journal oil clearance, remove the main caps and bearing halves.
2. Clean each main journal and bearing half with a clean shop towel.
3. Place one strip of plastigage across each main journal.

   NOTE: If the engine is still in the vehicle when you bolt the main cap down to check the clearance, the weight of the crankshaft and drive plate will flatten the plastigage further than just the torque on the cap bolt and give you an incorrect reading. For an accurate reading, support the crank with a jack under the counterweights, and check only one bearing at a time.
4. Reinstall the bearings and caps, then torque the bolts (see step 21 on page 7-25). Do not rotate the crankshaft.
5. Remove the cap and bearing half, and measure the widest part of the plastigage.

   Main Bearing-to-Journal Oil Clearance:
   Standard (New): 0.020–0.044 mm (0.0008–0.0017 in.)
   Service Limit: 0.050 mm (0.0020 in.)



6. If the plastigage measures too wide or too narrow, remove the crankshaft, and remove the upper half of the bearing. Install a new, complete bearing with the same color code, and recheck the clearance. Do not file, shim, or scrape the bearings or the caps to adjust clearance.
7. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check again. If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crankshaft and start over.

BACK

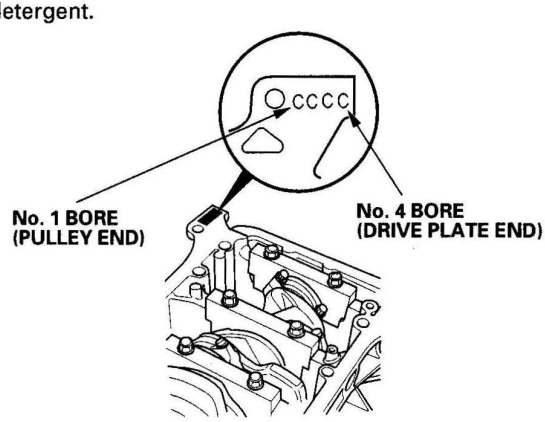
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Main Bearing Selection

Crankshaft Bore Code Location

Letters or bars have been stamped on the end of the block as a code for the size of each of the four main journal bores.

Use them, and the numbers stamped on the crankshaft (codes for main journal size), to choose the correct bearings. If the codes are indecipherable because of an accumulation of dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.



Bearing Identification

Color code is on the edge of the bearing

→ Larger crank bore

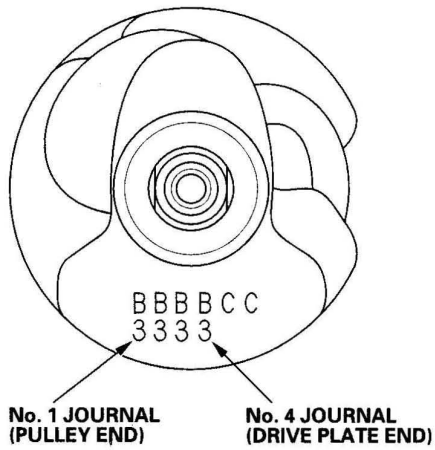
1 or I	A or I	B or II	C or III	D or IIII
2 or II	Red/ Pink	Pink	Pink/ Yellow	Yellow
3 or III	Pink	Pink/ Yellow	Yellow	Yellow/ Green
4 or IIII	Pink/ Yellow	Yellow	Yellow/ Green	Green
5 or IIIII	Yellow	Yellow/ Green	Green	Green/ Brown
6 or IIIIII	Yellow/ Green	Green	Green/ Brown	Brown
	Green	Green/ Brown	Brown	Brown/ Black

↓ Smaller main Journal

→ Smaller bearing (Thicker)

NOTE: When using bearing halves of different colors, it does not matter which color is used in the top or bottom.

Main Journal Code Locations (Numbers or Bars)



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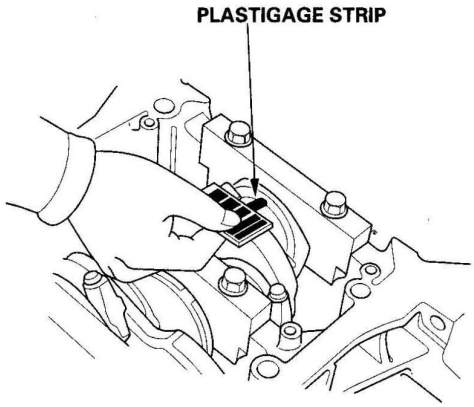
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Connecting Rod Bearing Replacement

Rod Bearing Clearance Inspection

1. Remove the connecting rod cap and bearing half.
2. Clean the crankshaft rod journal and bearing half with a clean shop towel.
3. Place a strip of plastigage across the rod journal.
4. Reinstall the bearing half and cap, and torque the bolts (see step 18 on page 7-25). Do not rotate the crankshaft.
5. Remove the rod cap and bearing half and measure the widest part of the plastigage.

   Connecting Rod Bearing-to-Journal Oil Clearance:
   Standard (New): 0.020–0.044 mm (0.0008–0.0017 in.)
   Service Limit: 0.050 mm (0.0020 in.)



6. If the plastigage measures too wide or too narrow, remove the upper half of the bearing, install a new, complete bearing with the same color code, and recheck the clearance. Do not file, shim, or scrape the bearings or the caps to adjust clearance.
7. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check clearance again. If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crankshaft and start over.

BACK

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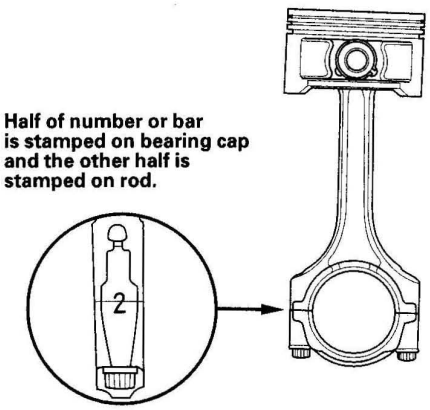
Rod Bearing Selection

Each rod falls into one of four tolerance ranges (from 0 to 0.024 mm (0.0009 in.), in 0.006 mm (0.0002 in.) increments) depending on the size of its big end bore. It's then stamped with a number or bar (1,2,3, or 4/I, II, III,or IIII) indicating the range.
You may find any combination of 1,2,3, or 4/I, II, III,or IIII in any engine.

Normal Bore Size: 58.0 mm (2.28 in.)

Inspect the connecting rod for cracks and heat damage.

Connecting Rod Journal Code Locations
Numbers or bars have been stamped on the side of each connecting rod as a code for the size of the big end. Use them, and the letters or bars stamped on the crank (codes for rod journal size), to choose the correct bearings. If the codes are indecipherable because of an accumulation of dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.



Bearing Identification

Color code is on the edge of the bearing

Larger big end bore →

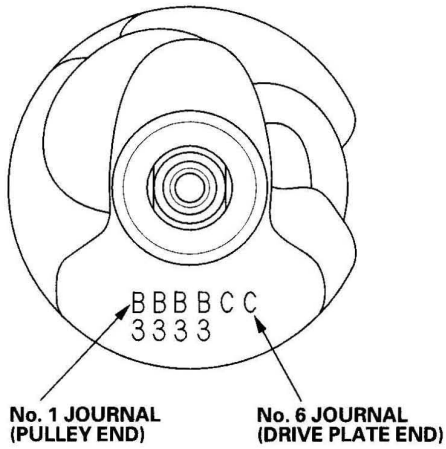
Smaller bearing (Thicker) →

Smaller rod Journal	1 or I	2 or II	3 or III	4 or IIII
A or I	Pink	Pink/ Yellow	Yellow	Yellow/ Green
B or II	Pink/ Yellow	Yellow	Yellow/ Green	Green
C or III	Yellow	Yellow/ Green	Green	Green/ Brown
D or IIII	Yellow/ Green	Green	Green/ Brown	Brown
E or IIIII	Green	Green/ Brown	Brown	Brown/ Black
F or IIIIII	Green/ Brown	Brown	Brown/ Black	Black

Smaller rod Journal ↓ Smaller bearing (Thicker) ↓

NOTE: When using bearing halves of different colors, it does not matter which color is used in the top or bottom.

Connecting Rod Journal Code Locations (Letters or Bars)

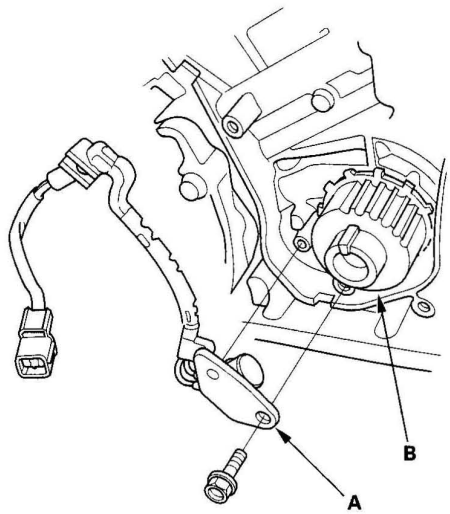


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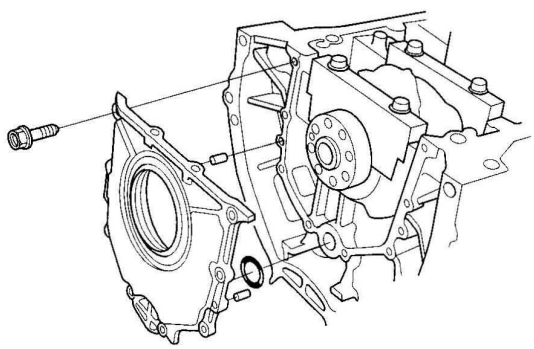
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Crankshaft and Piston Removal

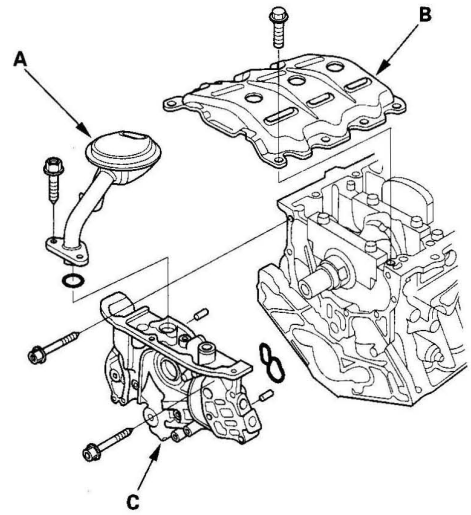
1. Remove the engine assembly (see page 5-2).
2. Remove the transmission (see page 14-138).
3. Remove the Crankshaft Position (CKP) sensor (A) from the oil pump, then remove the timing belt drive pulley (B).



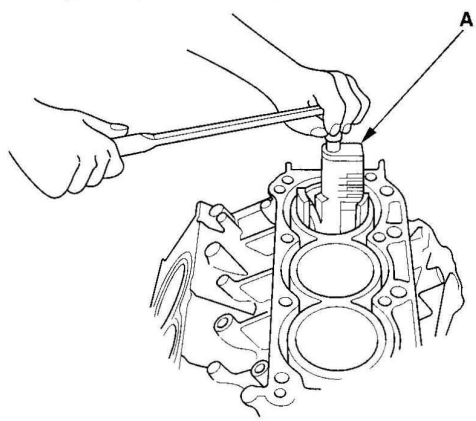
4. Remove the oil pan.
5. Remove the engine block end cover.



6. Remove the oil screen (A), baffle plate (B), and oil pump (C).



7. If you can feel a ridge of metal or hard carbon around the top of any cylinder, remove it with a ridge reamer (A). Follow the reamer manufacturer's instructions. If the ridge is not removed, it may damage the piston as it's pushed out.

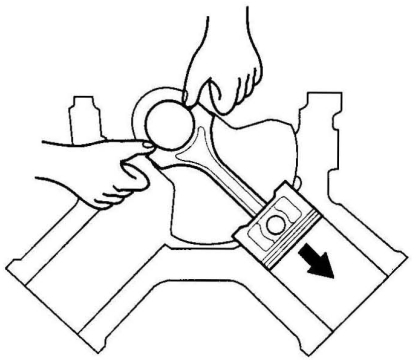


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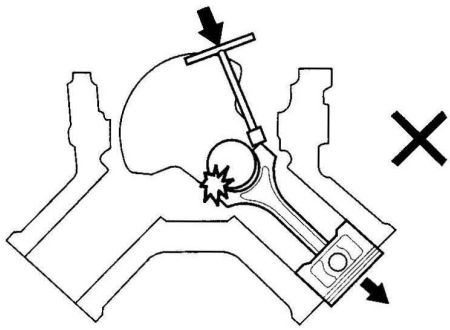
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8. Remove the connecting rod caps after setting the crank pin at Bottom Dead Center (BDC) for each cylinder. Remove the piston assembly by pushing on the connecting rod. Take care not to damage the crank pin or cylinder with the connecting rod.

CORRECT



INCORRECT



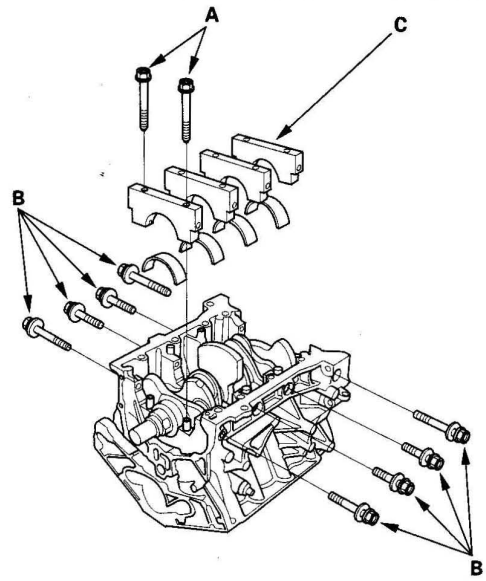
9. Remove the bearing from the cap. Keep all caps/ bearings in order.

10. Remove the upper bearing halves from the connecting rods, and set them aside with their respective caps.

11. After removing a piston/connecting rod assembly, reinstall the cap on the rod.

12. To avoid mixup during reassembly, mark each piston/connecting rod assembly with its cylinder number.

13. Remove the bearing cap bolts (A) and bearing cap side bolts (B), then remove the bearing cap (C).



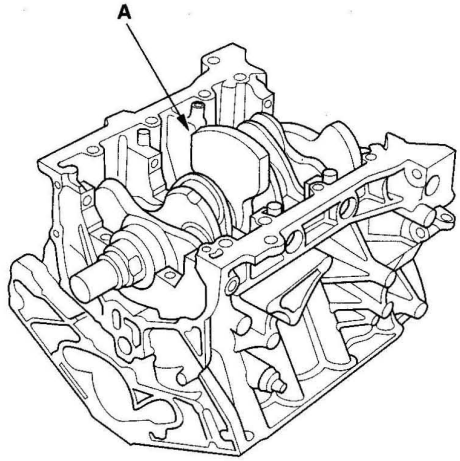
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BACK

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Crankshaft and Piston Removal (cont'd)

14. Lift the crankshaft (A) out of the cylinder block, being careful not to damage the journals.



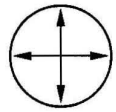
15. Reinstall the main caps and bearings on the cylinder block in the proper order.

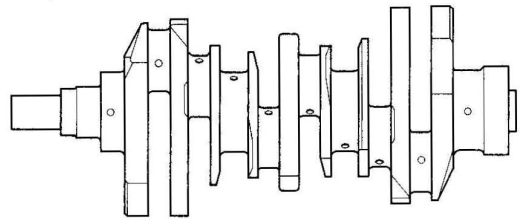
Crankshaft Inspection

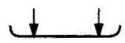
Out-of-Round and Taper

1. Remove the crankshaft from the cylinder block (see page 7-12).
2. Clean the crankshaft oil passages with pipe cleaners or a suitable brush.
3. Check the keyway and threads.
4. Measure out-of-round at the middle of each rod and main journal in two places. The difference between measurements on each journal must not be more than the service limit.

Journal Out-of-Round:
Standard (New): 0.005 mm (0.0002 in.) max.
Service Limit: 0.010 mm (0.0004 in.)









5. Measure taper at the edges of each rod and main journal. The difference between measurements on each journal must not be more than the service limit.

Journal Taper:
Standard (New): 0.005 mm (0.0002 in.) max.
Service Limit: 0.010 mm (0.0004 in.)

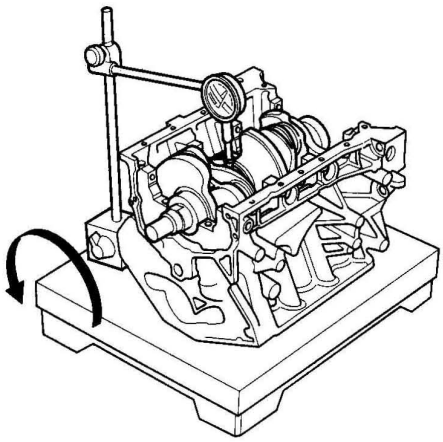
BACK

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Straightness

6. Place the cylinder block on the surface plate.
7. Clean and install the bearings on the No. 1 and No. 4 journal of the cylinder block.
8. Lower the crankshaft into the block.
9. Measure runout on all main journals. Rotate the crankshaft two complete revolutions. The difference between measurements on each journal must not be more that the service limit.

Crankshaft Total Runout:
Standard (New): 0.020 mm (0.0008 in.) max.
Service Limit: 0.030 mm (0.0012 in.)

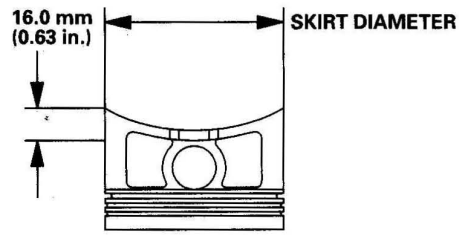


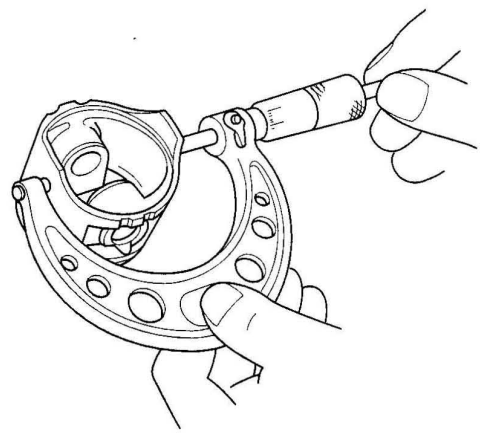
Block and Piston Inspection

1. Remove the piston from the cylinder block (see page 7-12).
2. Check the piston for distortion or cracks.
3. Measure the piston diameter at a point 16.0 mm (0.63 in.) from the bottom of the skirt.

Piston Diameter:
Standard (New): 88.975–88.985 mm (3.5029–3.5033 in.)
Service Limit: 88.965 mm (3.5026 in.)

Oversize Piston Diameter:
0.25: 89.225–89.235 mm (3.5128–3.5132 in.)
0.50: 89.475–89.485 mm (3.5226–3.5230 in.)





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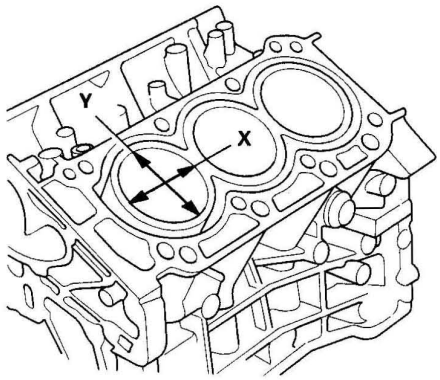
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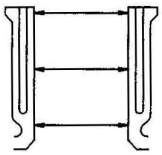
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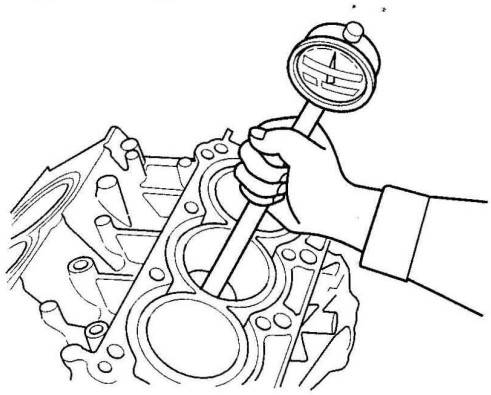
Block and Piston Inspection (cont'd)

4. Measure wear and taper in directions X and Y at three levels in each cylinder as shown.

   - If the bore size or taper in any cylinder is over the service limit, the block must be rebored.
   - If the measurements in any cylinder are beyond the oversize bore service limit, replace the cylinder block.







Cylinder Bore Size:
Standard (New): 89.000–89.015 mm (3.5039–3.5045 in.)
Service Limit: 89.065 mm (3.5065 in)

Oversize
0.25: 89.250–89.265 mm (3.5138–3.5144 in.)
0.50: 89.500–89.515 mm (3.5236–3.5242 in.)

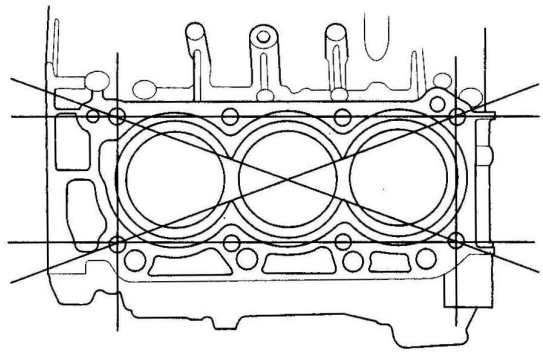
Reboring Limit: 0.5 mm (0.02 in.)

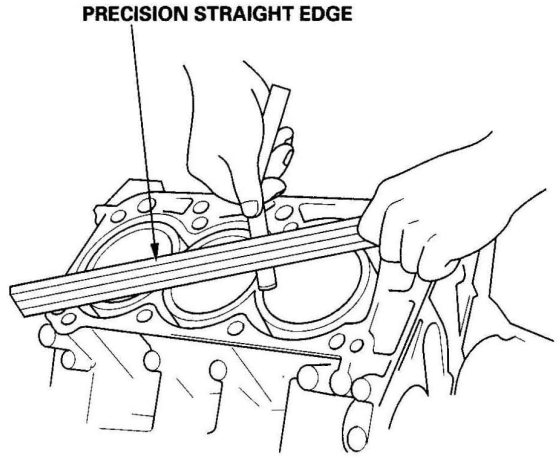
Bore Taper
Limit: (Difference between first and third measurement) 0.05 mm (0.002 in.)

5. Scored or scratched cylinder bores must be honed.

6. Check the top of the cylinder block for warpage. Measure along the edges and across the center as shown.

Cylinder Block Warpage:
Standard (New): 0.07 mm (0.003 in.) max.
Service Limit: 0.10 mm (0.004 in.)



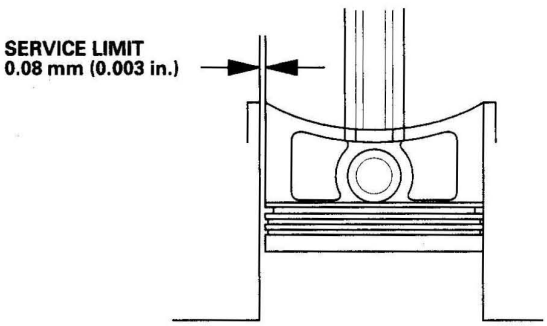


BACK

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7. Calculate the difference between cylinder bore diameter and piston diameter.

Piston-to-Block Clearance:
Standard (New): 0.015–0.040 mm (0.0006–0.0016 in.)
Service Limit: 0.08 mm (0.003 in.)

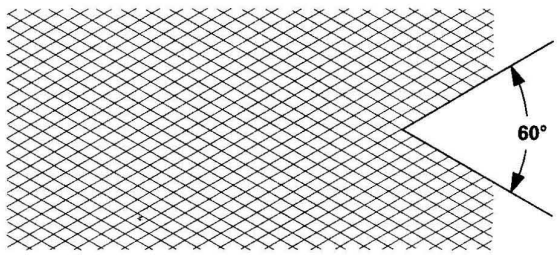


Cylinder Honing

1. Measure the cylinder bores (see step 4 on page 7-16). If the cylinder block is to be reused, hone the cylinders and remeasure the bores. Only scored or scratched cylinder bores must be honed.

2. Hone the cylinder bores with honing oil and a fine (400 grit) stone in a 60 degree crosshatch pattern.

   NOTE:
   - Use only a rigid hone with 400 grit or finer stone, such as Sunnen, Ammco, or equivalent.
   - Do not use stones that are worn or broken.



3. When honing is complete, thoroughly clean the cylinder block of all metal particles. Wash the cylinder bores with hot soapy water, then dry and oil them immediately to prevent rusting. Never use solvent, it will only redistribute the grit on the cylinder walls.

4. If scoring or scratches are still present in the cylinder bores after honing to the service limit, rebore the cylinder block. Some light vertical scoring and scratching is acceptable if it is not deep enough to catch your fingernail and does not run the full length of the bore.

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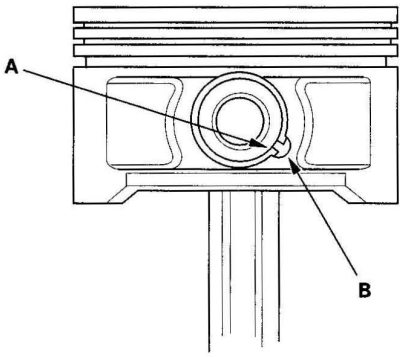
Piston, Pin, and Connecting Rod Replacement

Disassembly

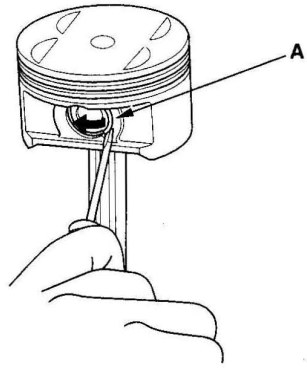
1. Remove the piston from the cylinder block (see page 7-12).

2. Apply engine oil to the piston pin snap rings (A) and turn them in the ring grooves until the end gaps are lined up with the cutouts in the piston pin bores (B).

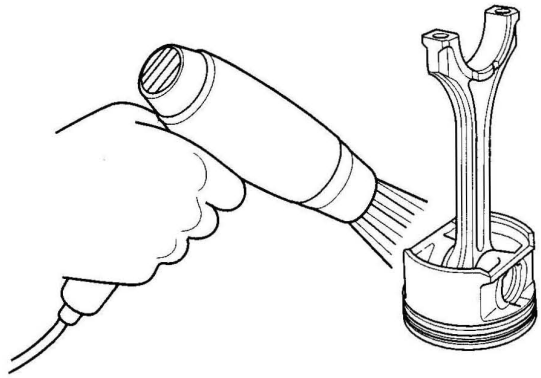
   NOTE: Take care not to damage the ring grooves.



3. Remove both piston pin circlips (A). Start at the cutout in the piston pin bore. Remove the circlips carefully so they do not go flying or get lost. Wear eye protection.



4. Heat the piston and connecting rod assembly to about 158°F (70°C), then remove the piston pin.



BACK

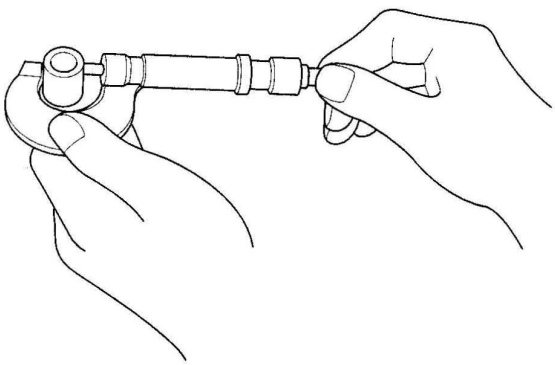
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Inspection

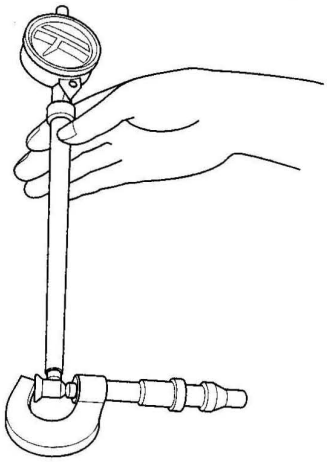
NOTE: Inspect the piston, piston pin, and connecting rod when they are at room temperature.

1. Measure the diameter of the piston pin.

Piston Pin Diameter:
Standard (New): 21.962–21.965 mm (0.8646–0.8648 in.)
Service Limit: 21.954 mm (0.8643 in.)

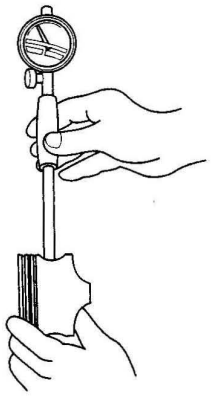


2. Zero the dial indicator to the piston pin diameter.



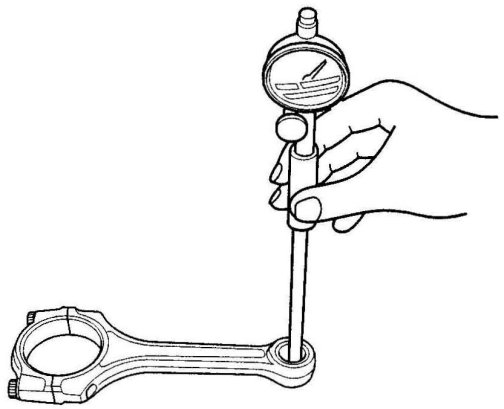
3. Check the difference between the piston pin diameter and piston pin hole diameter on the piston.

Piston Pin-to-Piston Clearance:
Standard (New): −0.0050 to +0.0010 mm (−0.00020 to +0.00004 in.)
Service Limit: 0.004 mm (0.0002 in.)



4. Measure the piston pin-to-connecting rod clearance.

Piston Pin-to-Connecting Rod Clearance:
Standard (New): 0.005–0.014 mm (0.0002–0.0006 in.)
Service Limit: 0.019 mm (0.0007 in.)



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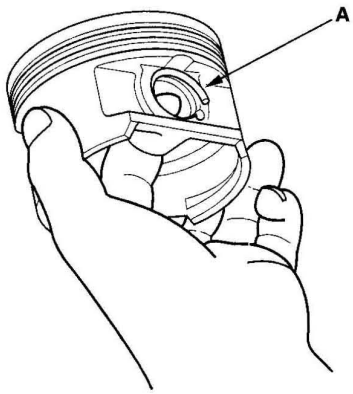
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Piston, Pin, and Connecting Rod Replacement (cont'd)

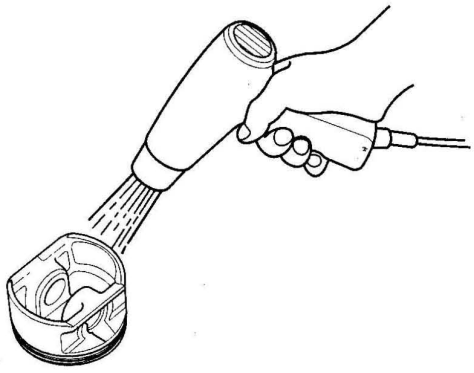
Reassembly

1. Install a piston pin circlip (A).

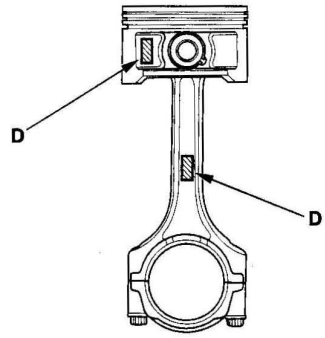


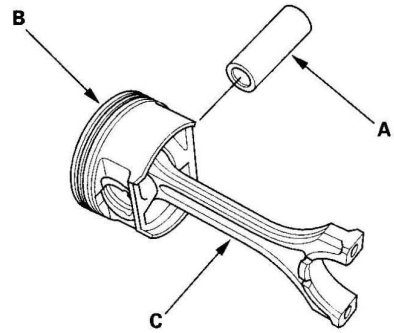
2. Coat the piston pin bore in the piston, the bore in the connecting rod, and the piston pin with engine oil.

3. Heat the piston to about 158°F (70°C).



4. Install the piston pin (A). Assemble the piston (B) and connecting rod (C) with the embossed marks (D) on the same side.





5. Install the remaining circlips.

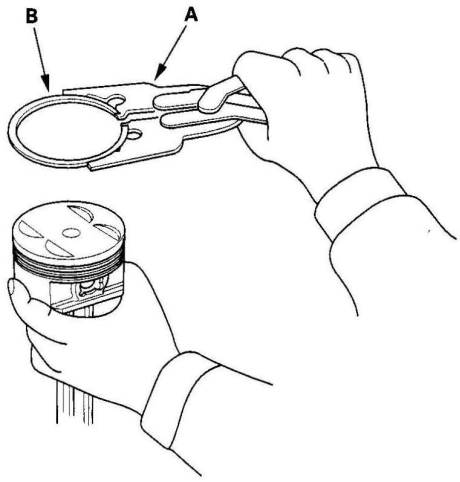
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Piston Ring Replacement

1. Remove the piston from the cylinder block (see page 7-12).

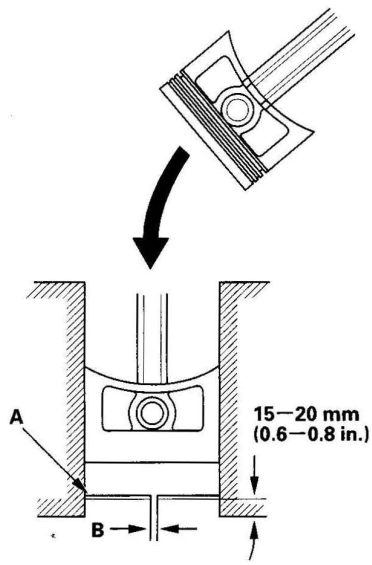
2. Using a ring expander (A), remove the old piston rings (B).



3. *Clean all the ring grooves throughly with a* squared-off broken ring, or a ring groove cleaner with a blade to fit the piston grooves. File down the blade if necessary. Top ring and second ring grooves are 1.2 mm (0.05 in.) wide, and the oil ring groove is 2.8 mm (0.11 in.) wide. Do not use a wire brush to clean the ring grooves, or cut the ring grooves deeper with the cleaning tool.

   NOTE: If the piston is to be separated from the connecting rod, do not install new rings yet.

4. Using a piston, push a new ring (A) into the cylinder bore 15—20 mm (0.6—0.8 in.) from the bottom.



5. Measure the piston ring end-gap (B) with a feeler gauge:

   - If the gap is too small, check to see if you have the proper rings for your engine.
   - If the gap is too large, recheck the cylinder bore diameter against the wear limits (see step 4 on page 7-16).
     If the bore is over the service limit, the cylinder block must be rebored.

Piston Ring End-Gap:

Top Ring
Standard (New): 0.20—0.35 mm (0.008—0.014 in.)
Service Limit: 0.60 mm (0.024 in.)

Second Ring
Standard (New): 0.40—0.55 mm (0.016—0.022 in.)
Service Limit: 0.70 mm (0.028 in.)

Oil Ring
Standard (New): 0.20—0.70 mm (0.008—0.028 in.)
Service Limit: 0.80 mm (0.031 in.)

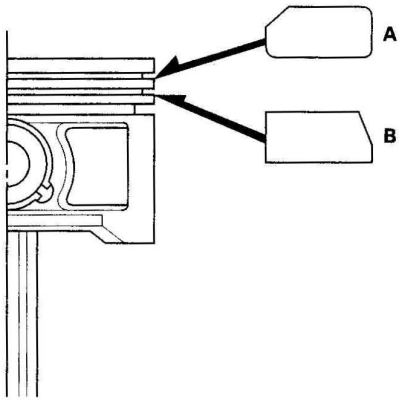
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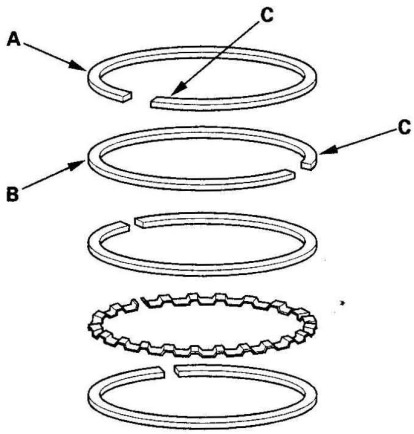
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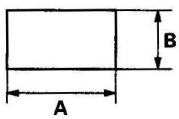
Piston Ring Replacement (cont'd)

6. Install the rings as shown. The top ring (A) has a 1D mark and the second ring (B) has a 2C mark. The manufacturing marks (C) must be facing upward.





Piston Ring Dimensions:



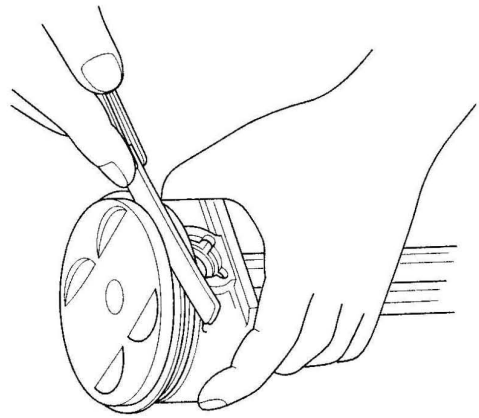
Top Ring (Standard)
A: 3.1 mm (0.12 in.)
B: 1.2 mm (0.05 in.)

Second Ring (Standard)
A: 3.4 mm (0.13 in.)
B: 1.2 mm (0.05 in.)

7. After installing a new set of rings, measure the ring-to-groove clearance:

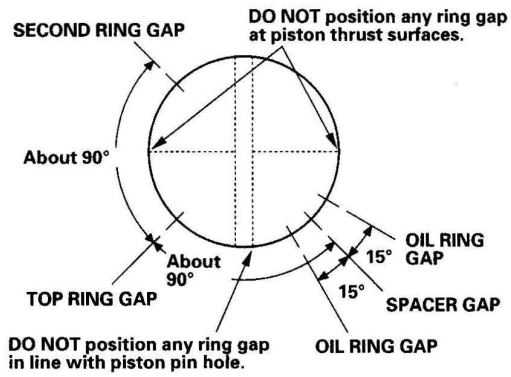
Top Ring Clearance
Standard (New): 0.055–0.080 mm (0.0022–0.0031 in.)
Service Limit: 0.13 mm (0.005 in.)

Second Ring Clearance
Standard (New): 0.030–0.055 mm (0.0012–0.0022 in.)
Service Limit: 0.13 mm (0.005 in.)



8. Rotate the rings in their grooves to make sure they do not bind.

9. Position the ring end gaps as shown:



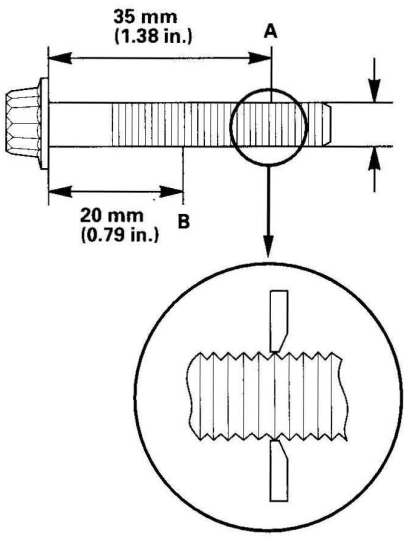
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Crankshaft and Piston Installation

Special Tools Required
- Driver 07749-0010000
- Oil seal driver attachment, 80 mm I.D. 07VAD-P8A010A

1. Measure the diameter of each connecting rod bolt at point A and point B.



2. Calculate the difference in diameter between point A and point B.

   Point A − Point B = Difference in Diameter

   Difference in Diameter:
   Specification: 0 − 0.1 mm (0 − 0.004 in.)

3. If the difference in diameter is out of tolerance, replace the connecting rod bolt.

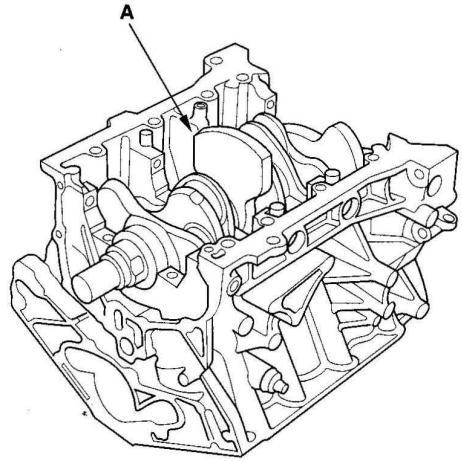
4. Check the connecting rod bearing clearance with plastigage (see page 7-10).

5. Check the main bearing clearance with plastigage (see page 7-8).

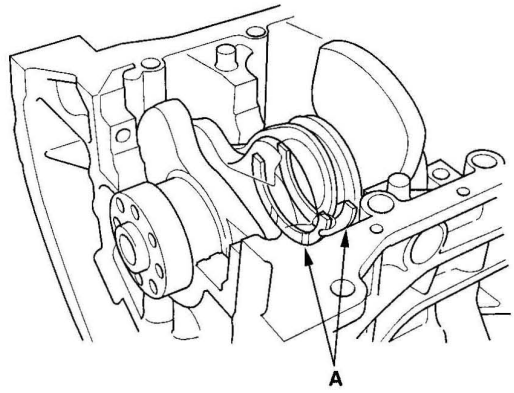
6. Install the bearing halves in the cylinder block and connecting rods.

7. Apply engine oil to the main bearings and rod bearings.

8. Lower the crankshaft (A) into the block.



9. Oil the thrust washer surfaces. Install the thrust washers (A) in the No. 3 journal.



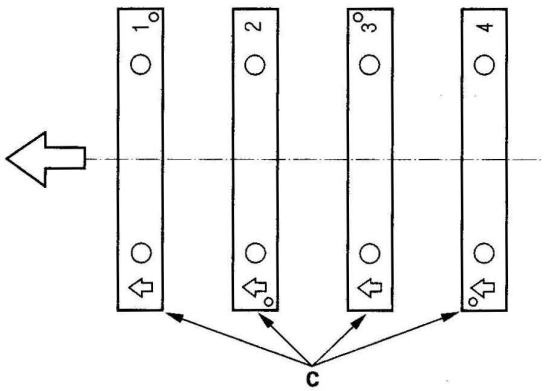
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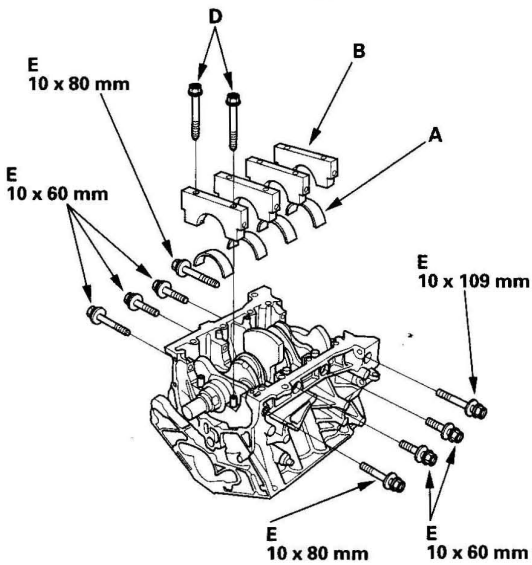
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Crankshaft and Piston Installation (cont'd)

10. Install the bearings (A) and bearing caps (B) with the arrow (C) facing the timing belt end of the engine.



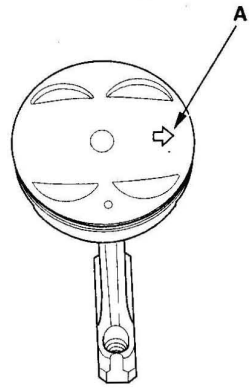


11. Apply engine oil to the bolt threads and flanges, then install the bearing cap bolts (D) and bearing cap side bolts (E).

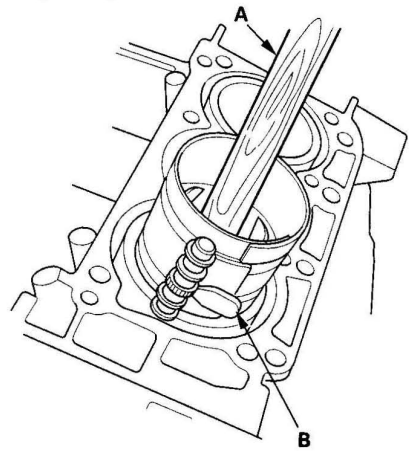
12. Set the crankshaft to Bottom Dead Center (BDC) for the cylinder you are installing the piston in.

13. Remove the connecting rod cap. Install the ring compressor, and check that the bearing is securely in place.

14. Position the piston with the arrow (A) facing the timing belt side of the engine.



15. Position the piston in the cylinder, and tap it in using the wooden handle of a hammer (A). Maintain downward force on the ring compressor (B) to prevent the rings from expanding before entering the cylinder bore.



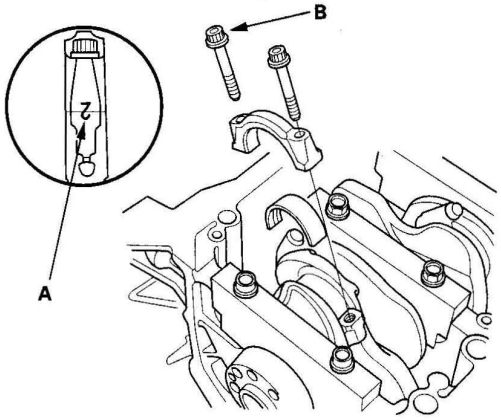
16. Stop after the ring compressor pops free, and check the connecting rod-to-crank journal alignment before pushing the piston into place.

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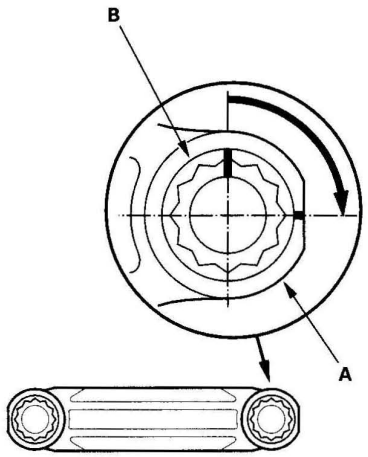
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17. Line up the mark (A) on the connecting rod and cap, then install the cap.

18. Apply engine oil to the bolt threads. Torque the bolts (B) to 20 N·m (2.0 kgf·m, 14 lbf·ft).



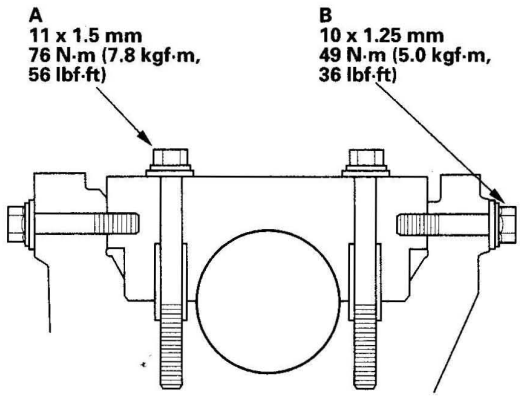
19. Mark the connecting rod (A) and bolt head (B) as shown.

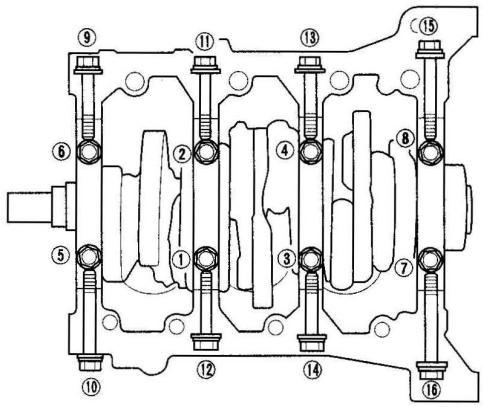


20. Tighten the bolt until the mark on the bolt head lines up with the mark on the connecting rod (turn the bolt 90°).

21. Torque the bearing cap bolts (A), then torque the bearing cap side bolts (B).

NOTE: Whenever any crankshaft or connecting rod bearing is replaced, it is necessary after reassembly to run the engine at idling speed until it reaches normal operating temperature, then continue to run it for about 15 minutes.





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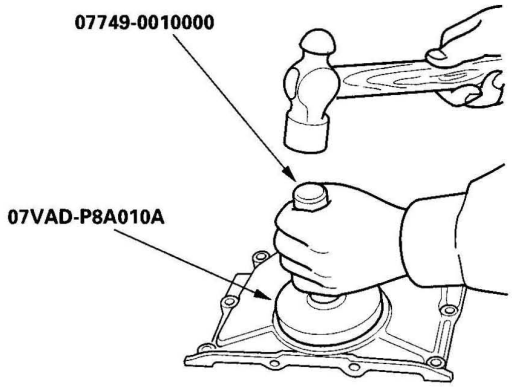
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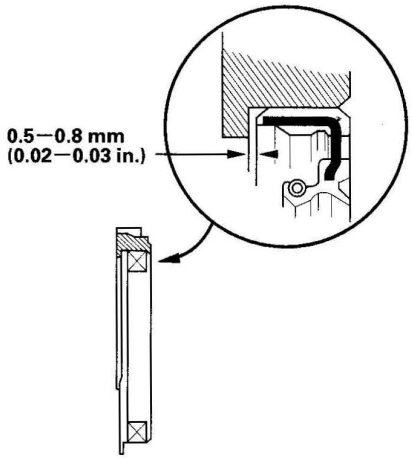
Crankshaft and Piston Installation (cont'd)

22. The seal mating surface on the engine block end cover should be dry. Apply a light coat of grease to the crankshaft and to the lip of the seal.

23. Drive the crankshaft oil seal squarely into the engine block end cover.



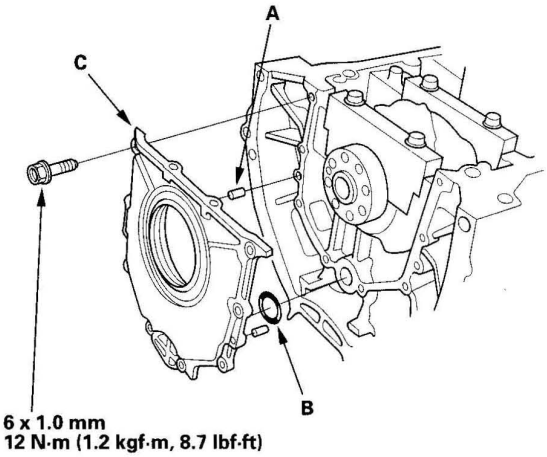
24. Confirm that the clearance is equal all the way around with a feeler gauge.
Clearance: 0.5—0.8 mm (0.02—0.03 in.)



25. Clean and dry the engine block end cover mating surfaces.

26. Apply liquid gasket, part No. 08718-0001 or 08718-0003, evenly to the block mating surface of the engine block end cover and to the inner threads of the bolt holes. Install the dowel pins (A), new O-ring (B), and the engine block end cover (C) on the cylinder block.

NOTE: Do not install the parts if 5 minutes or more have elapsed since applying the liquid gasket. Instead, reapply liquid gasket after removing the old residue.



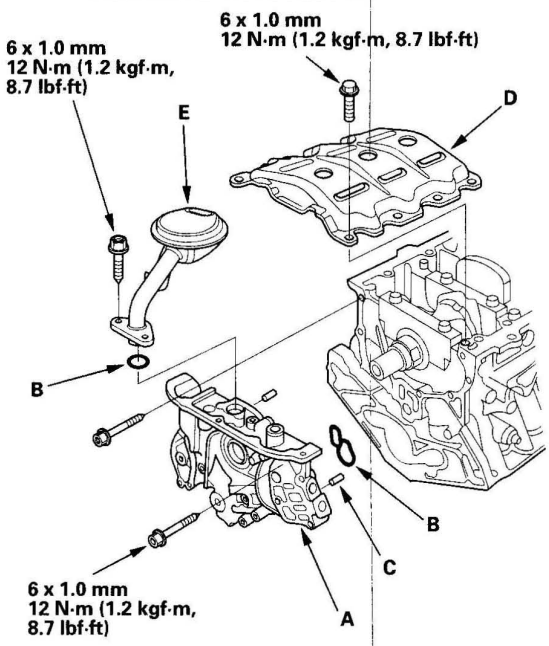
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27. Clean and dry the oil pump mating surfaces.

28. Install the oil pump (A).

–1 Install a new crankshaft oil seal in the oil pump (see step 15 on page 8-9).
–2 Apply liquid gasket, part No. 08718-0001 or 08718-0003, evenly to the block mating surface of the oil pump and to the inner threads of the bolt holes.
NOTE: Do not install the parts if 5 minutes or more have elapsed since applying the liquid gasket.
Instead, reapply liquid gasket after removing the old residue.
–3 Grease the lip of the oil seal and apply oil to the new O-rings (B).
–4 Install the dowel pins (C), then align the inner rotor with the crankshaft and install the oil pump.
–5 Clean the excess grease off the crankshaft and check the seal for distortion.

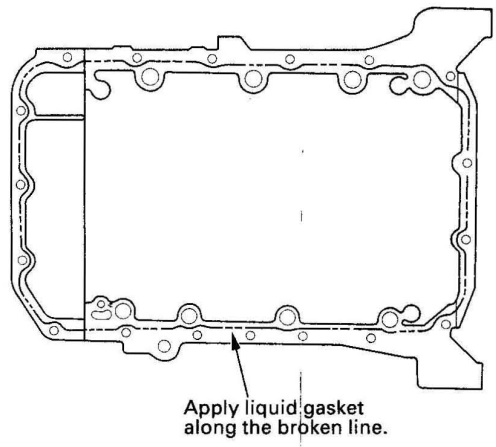


29. Install the baffle plate (D), then install the oil screen (E).

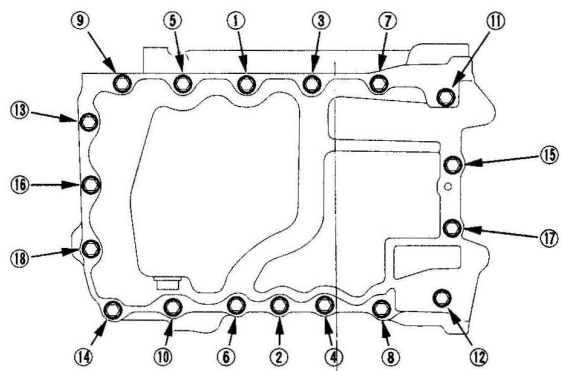
30. Clean and dry the oil pan mating surfaces.

31. Apply liquid gasket, part No. 08718-0001 or 08718-0003, evenly to the oil pan mating surface of the block and to the inner threads of the bolt holes.
NOTE: Do not install the parts if 5 minutes or more have elapsed since applying the liquid gasket.
Instead, reapply liquid gasket after removing the old residue.

32. Install the oil pan.



33. Tighten the bolts in two or three steps. In the final step, tighten all bolts, in sequence to 12 N·m (1.2 kgf·m, 8.7 lbf·ft).



34. After assembly, wait at least 30 minutes before filling the engine with oil.

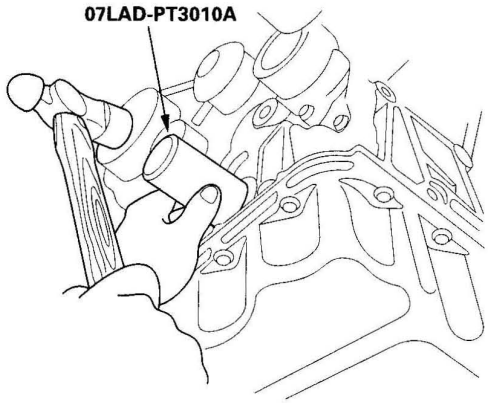
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Pulley End Crankshaft Seal Installation - In-car

Special Tools Required
Oil seal driver 07LAD-PT3010A

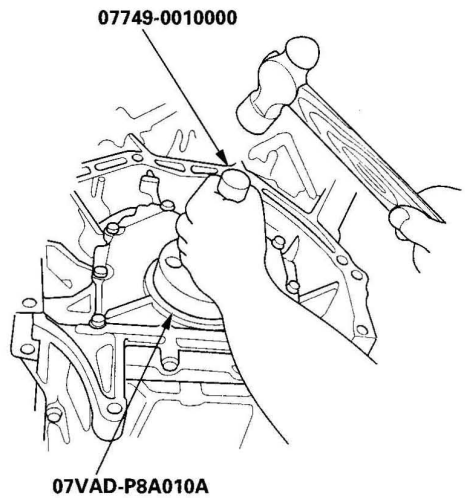
1. Dry the crankshaft oil seal housing.
2. Apply a light coat of grease to the crankshaft and to the lip of the seal.
3. Using the seal driver, drive in the crankshaft oil seal until the driver bottoms against the oil pump. When the seal is in place, clean any excess grease off the crankshaft, and check that the oil seal lip is not distorted.



Transmission End Crankshaft Seal Installation - In-car

Special Tools Required
- Driver 07749-0010000
- Oil seal driver attachment, 80 mm I.D. 07VAD-P8A010A

1. Dry the crankshaft oil seal housing.
2. Apply a light coat of grease to the crankshaft and to the lip of the seal.
3. Using the special tools, drive in the crankshaft oil seal until the driver attachment bottoms against the crankshaft. Align the hole in the driver attachment with the pin on the crankshaft.



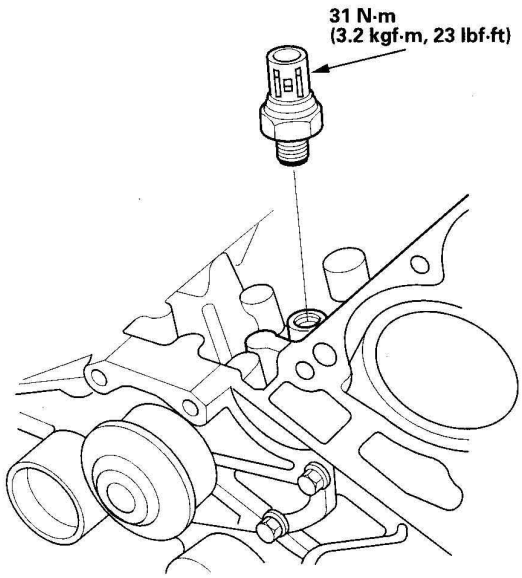
4. Clean any excess grease off the crankshaft, and check that the oil seal lip is not distorted.

BACK

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Knock Sensor Replacement

1. Remove the intake manifold (see page 9-2).
2. Disconnect the knock sensor connector, then remove the knock sensor.



3. Install the knock sensor.
4. Reinstall all removed parts.

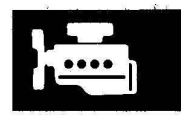
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Engine Mechanical



Engine Lubrication

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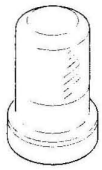
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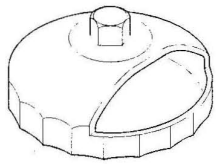
Engine Lubrication

Special Tools

Ref. No.	Tool Number	Description	Qty
①	07GAD-PH70201	Oil Seal Driver	1
②	07912-6110001	Oil Filter Wrench	1



①

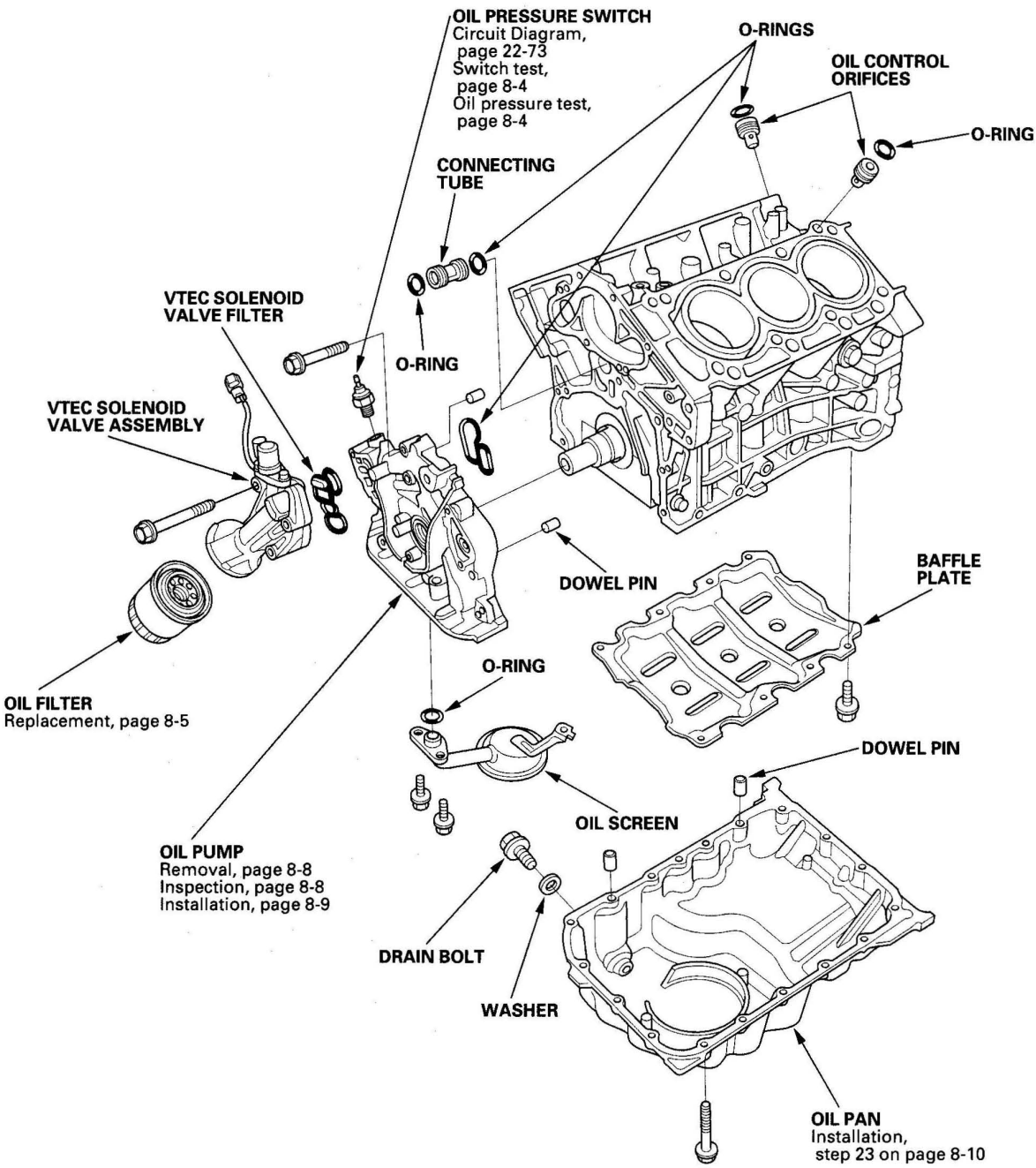


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Component Location Index

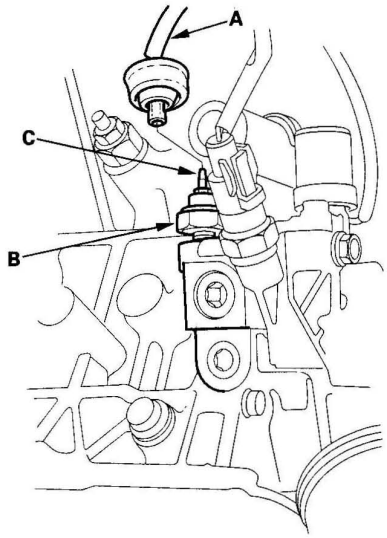


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Oil Pressure Switch Test

1. Remove the YEL/RED wire (A) from the engine oil pressure switch (B).

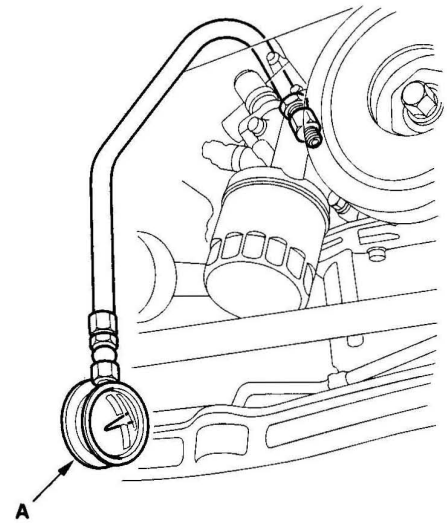


2. Check for continuity between the positive terminal (C) and the engine (ground). There should be continuity with the engine stopped. There should be no continuity with the engine running.

Oil Pressure Test

If the low oil pressure indicator stays on with the engine running, check the engine oil level. If the oil level is correct:

1. Connect a tachometer.
2. Remove the engine oil pressure switch, and install an oil pressure gauge (A).



3. Start the engine. Shut it off immediately if the gauge registers no oil pressure. Repair the problem before continuing.
4. Allow the engine to reach operating temperature (fan comes on at least twice). The pressure should be:

Engine Oil Temperature: 176°F (80°C)
Engine Oil Pressure:
At Idle: 70 kPa (0.7 kgf/cm², 10 psi) minimum
At 3,000 rpm: 490 kPa (5.0 kgf/cm², 71 psi) minimum

5. If oil pressure is NOT within specifications, inspect these items.

- Check the oil screen for clogging.
- Check the oil pump (see page 8-7).

BACK

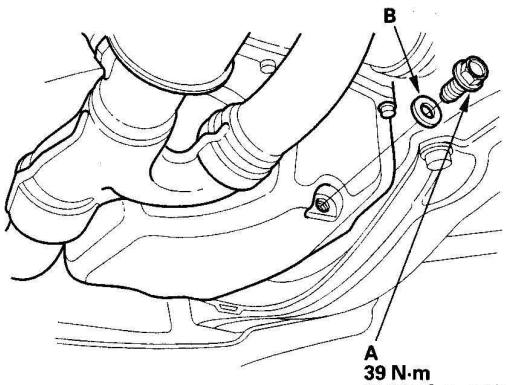
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Engine Oil Replacement

NOTE: Under normal conditions, the oil filter should be replaced at every other oil change. Under severe conditions, the oil filter should be replaced at each oil change.

Change interval:
Every 7,500 miles (12,000 km) or 12 months (Normal conditions)
Every 3,750 miles (6,000 km) or 6 months (Severe conditions).

1. Warm up the engine.
2. Remove the drain bolt (A), and drain the engine oil.



39 N·m
(4.0 kgf·m, 29 lbf·ft)
Do not overtighten.

3. Reinstall the drain bolt with a new washer (B).
4. Refill with the recommended oil (see page 3-2).

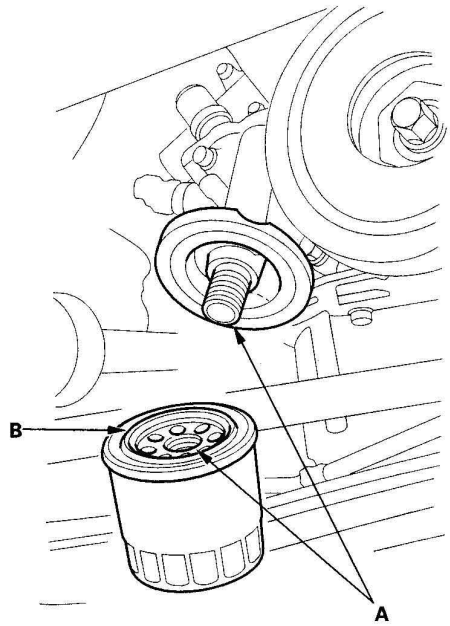
Capacity
4.3 ℓ (4.5 US qt, 3.8 Imp qt) at oil change.
4.7 ℓ (5.0 US qt, 4.1 Imp qt) at oil change including filter.
5.5 ℓ (5.8 US qt, 4.8 Imp qt) after engine overhaul.

5. Run the engine for more than 3 minutes, then check for oil leakage.

Engine Oil Filter Replacement

Special Tools Required
Oil filter wrench 07912-6110001

1. Remove the oil filter with the special oil filter wrench.
2. Inspect the threads (A) and rubber seal (B) on the new filter. Wipe off the seat on the engine block, then apply a light coat of oil to the filter rubber seal. Use only filters with a built-in bypass system.



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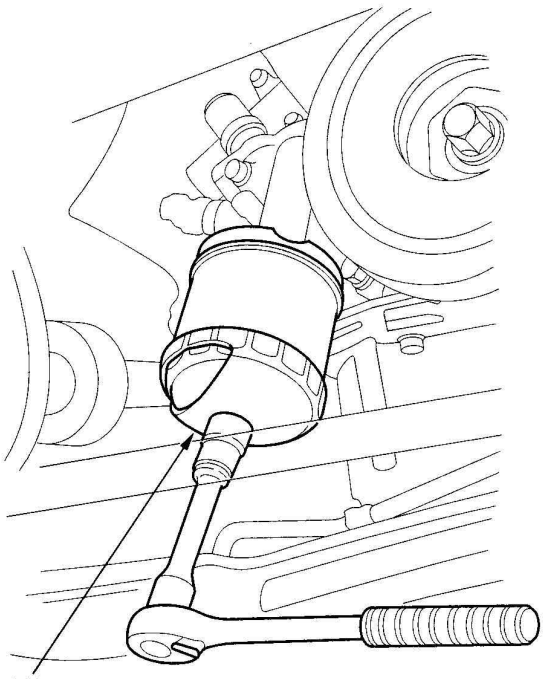
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Engine Oil Filter Replacement (cont'd)

3. Install the oil filter by hand.

4. After the rubber seal seats, tighten the oil filter clockwise with the special tool.

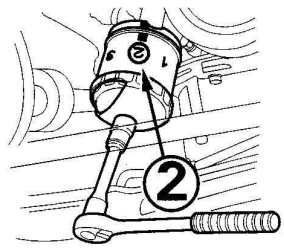
   Tighten: 7/8 turn clockwise.
   Tightening torque: 22 N·m (2.2 kgf·m, 16 lbf·ft)



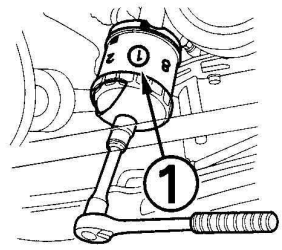
07912-6110001

5. If eight numbers (1 to 8) are printed around the outside of the filter, use the following procedure to tighten the filter.

   - Spin the filter on until its seal lightly seats against the block, and note which number is at the bottom.
   - Tighten the filter by turning it clockwise seven numbers from the one you noted. For example, if number 2 is at the bottom when the seal is lightly seated, tighten the filter until the number 1 comes around to the bottom.



Number when rubber seal is seated.



Number after tightening.

Number when rubber seal is seated	1	2	3	4	5	6	7	8
Number after tightening	8	1	2	3	4	5	6	7

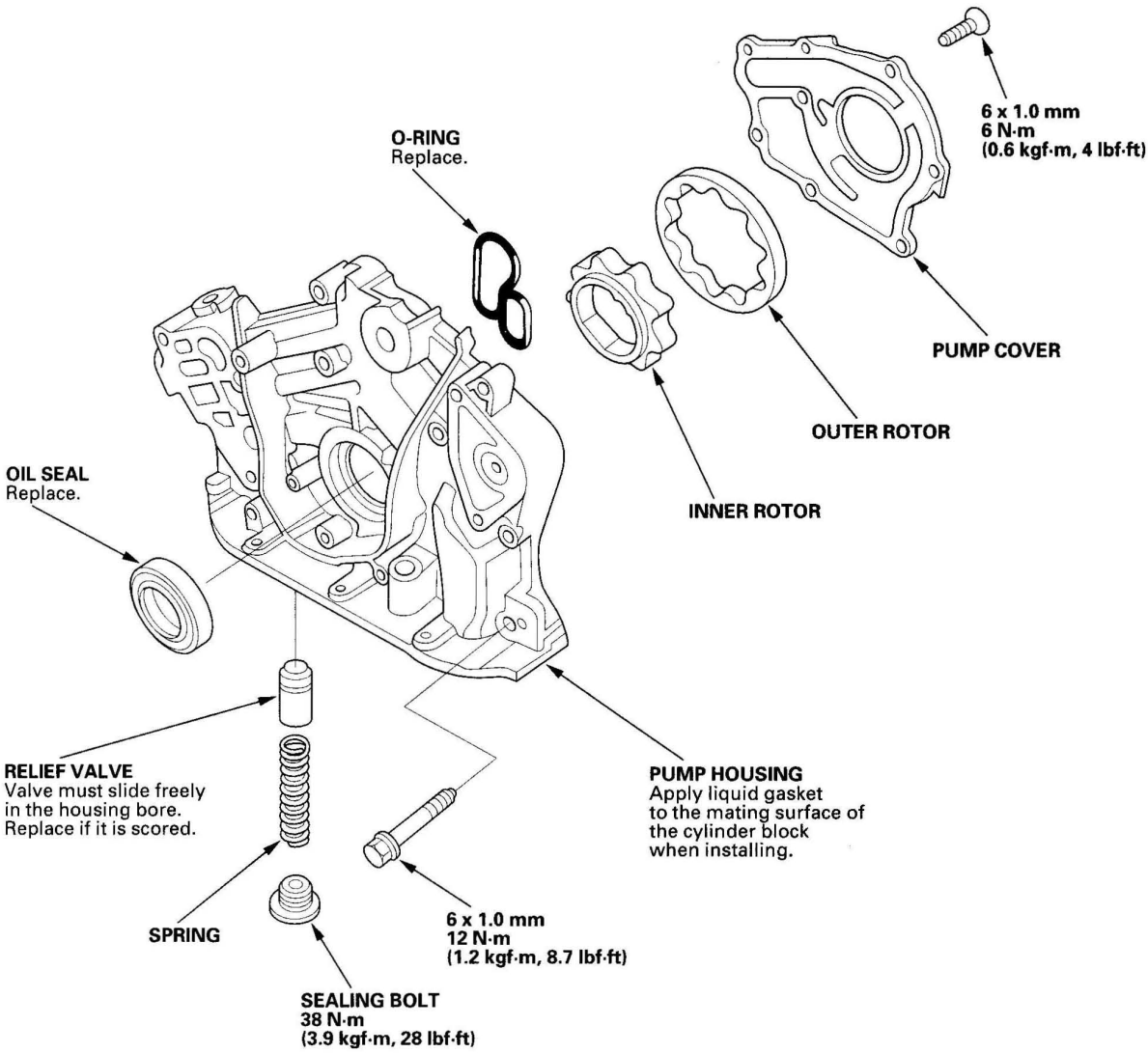
6. After installation, fill the engine with oil up to the specified level, run the engine for more than 3 minutes, then check for oil leakage.

BACK

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Oil Pump Overhaul

Exploded View



(cont'd)

BACK

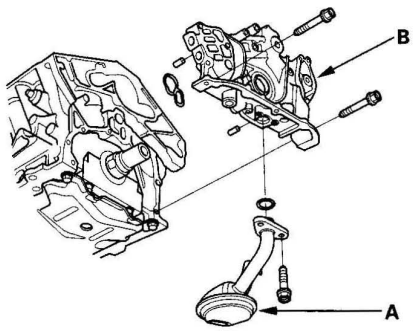
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Oil Pump Overhaul (cont'd)

Special Tools Required
Oil seal driver 07GAD-PH70201

Removal

1. Drain the engine oil.
2. Turn the crankshaft so that the No. 1 piston is at top dead center (see page 6-19).
3. Remove the timing belt (see page 6-19).
4. Remove the idler pulley.
5. Remove the Crankshaft Position (CKP) sensor, then remove the timing belt drive pulley (see page 6-58).
6. Remove the VTEC solenoid valve and oil filter assembly (see page 11-97).
7. Remove the oil pan and the oil screen (A).

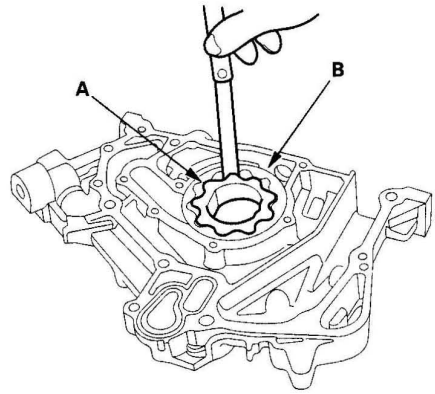


8. Remove the mounting bolts and the oil pump assembly (B).
9. Remove the screws from the pump housing, then separate the housing and cover.

Inspection

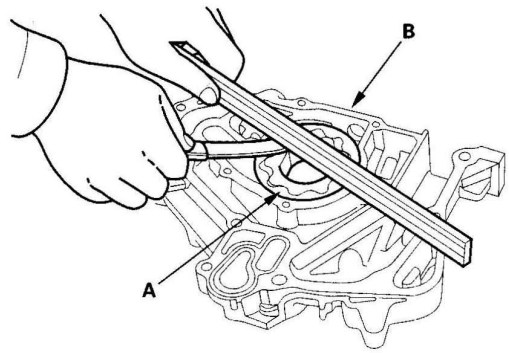
10. Check the inner-to-outer rotor radial clearance between the inner rotor (A) and outer rotor (B). If the inner-to-outer rotor clearance exceeds the service limit, replace the oil pump assembly.

Inner Rotor-to-Outer Rotor Radial Clearance
Standard (New): 0.04–0.16 mm (0.002–0.006 in.)
Service Limit: 0.20 mm (0.008 in.)



11. Check the housing-to-rotor axial clearance between the rotors (A) and pump housing (B). If the housing-to-rotor axial clearance exceeds the service limit, replace the oil pump assembly.

Housing-to-Rotor Axial Clearance
Standard (New): 0.02–0.07 mm (0.001–0.003 in.)
Service Limit: 0.12 mm (0.005 in.)

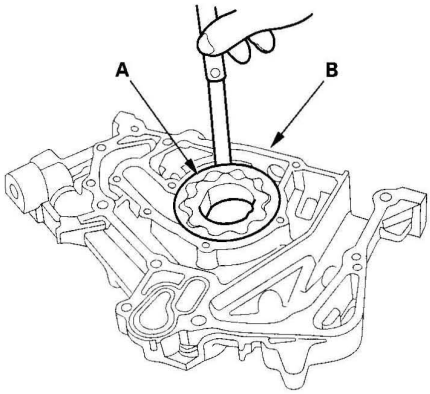


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12. Check the housing-to-outer rotor radial clearance between the outer rotor (A) and pump housing (B). If the housing-to-outer rotor radial clearance exceeds the service limit, replace the oil pump assembly.

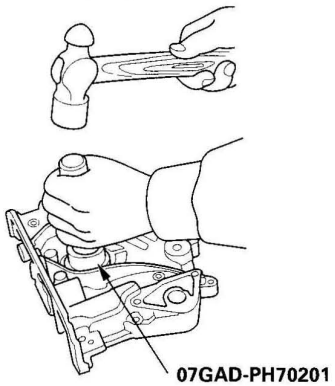
Housing-to-Outer Rotor Radial Clearance
Standard (New): 0.14—0.19 mm (0.006—0.007 in.)
Service Limit: 0.20 mm (0.008 in.)



13. Inspect both rotors and the pump housing for scoring or other damage. Replace parts if necessary.

14. Remove the old oil seal from the oil pump.

15. Gently tap in the new oil seal until the special tool bottoms on the pump.



16. Apply liquid thread lock to the pump housing screws.

17. Reassemble the oil pump.

18. Check that the oil pump turns freely.

19. Clean and dry the oil pump mating surfaces.

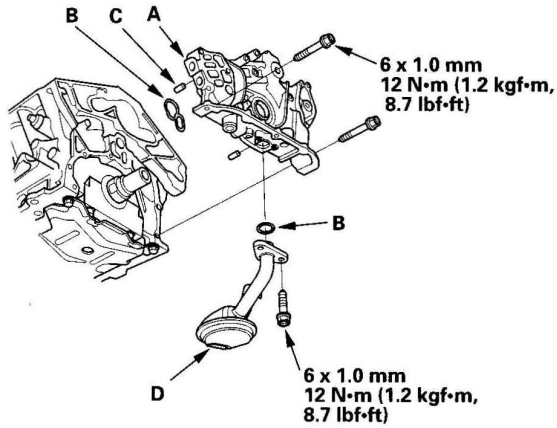
Installation

20. Install the oil pump (A).

- 1 Apply liquid gasket, part No. 08718-0001 or 08718-0003, evenly to the block mating surface of the oil pump and to the inner threads of the bolt holes.

  NOTE: Do not install the parts if 5 minutes or more have elapsed since applying the liquid gasket. Instead, reapply liquid gasket after removing the old residue.

- 2 Grease the lip of the oil seal, and apply oil to the new O-rings (B).
- 3 Install the dowel pins (C), then align the inner rotor with the crankshaft and install the oil pump.
- 4 Clean the excess grease off the crankshaft, and check the seal for distortion.



21. Install the oil screen (D).

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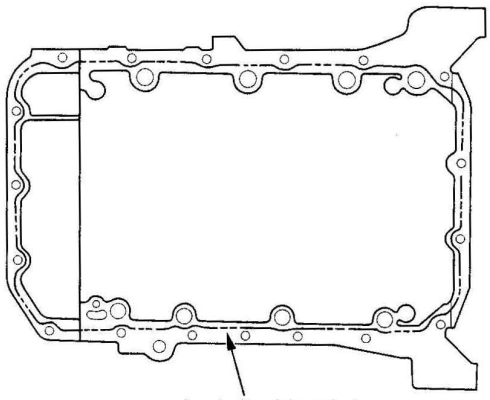
Oil Pump Overhaul (cont'd)

22. Clean and dry the oil pan mating surfaces.

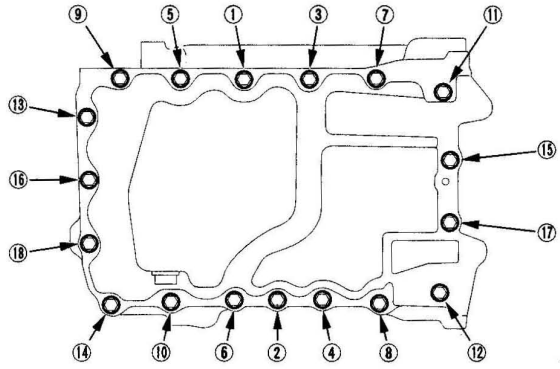
23. Apply liquid gasket, part No. 08718-0001 or 08718-0003, evenly to the oil pan mating surface of the block and to the inner threads of the bolt holes.

    NOTE: Do not install the parts if 5 minutes or more have elapsed since applying the liquid gasket. Instead, reapply liquid gasket after removing the old residue.

24. Install the oil pan.

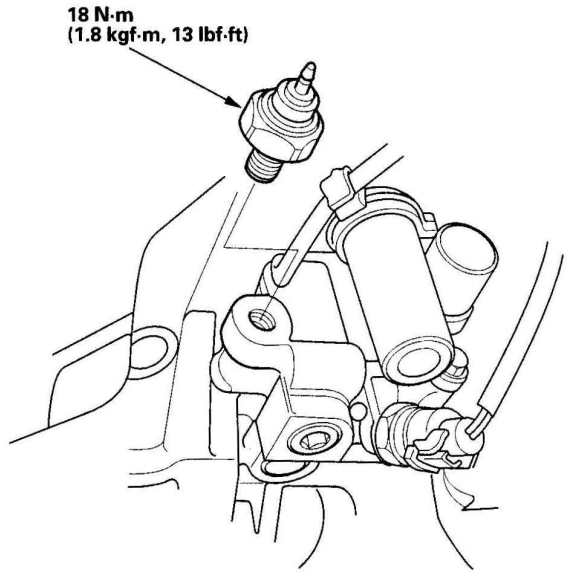


25. Tighten the bolts in two or three steps. In the final step, tighten all bolts, in sequence to 12 N·m (1.2 kgf·m, 8.7 lbf·ft).



Oil Pressure Switch Replacement

1. Disconnect the oil pressure switch connector, then remove the oil pressure switch.



2. Apply liquid gasket to the oil pressure switch, then install the oil pressure switch.

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Engine Mechanical

Intake Manifold and Exhaust System

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Exhaust Manifold Removal and Installation 9-3
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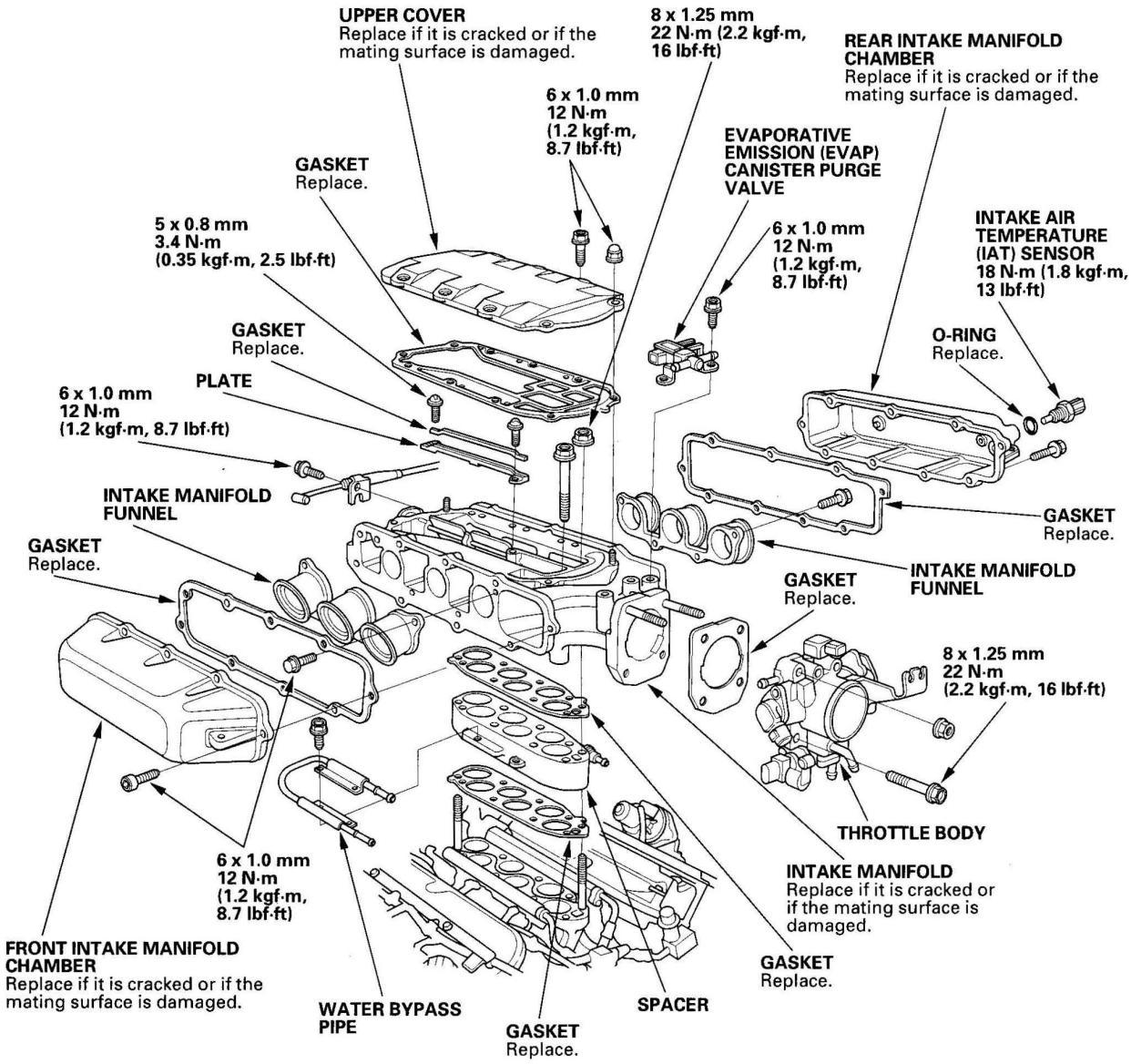
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Intake Manifold and Exhaust System

Intake Manifold Removal and Installation

NOTE: Use new O-rings and gaskets when reassembling.



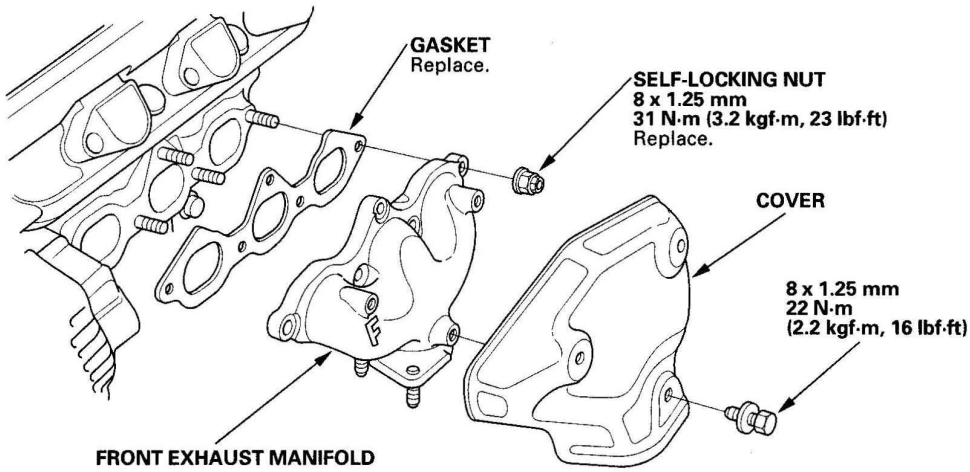
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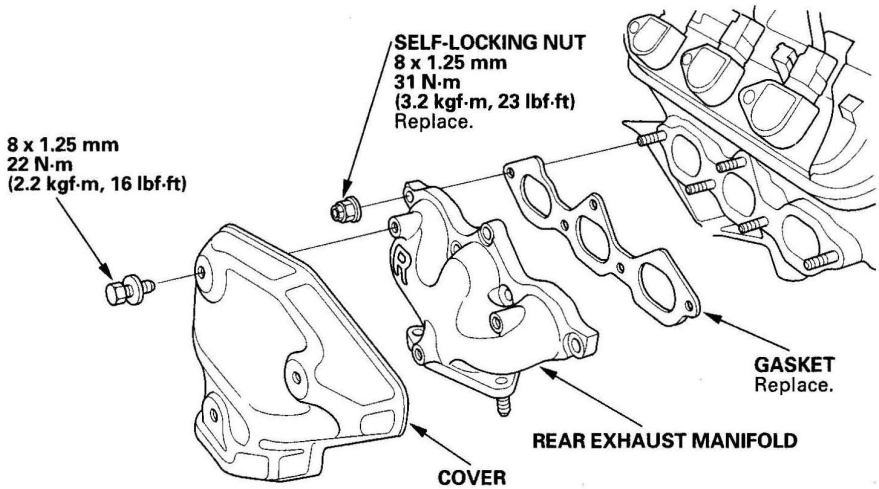
Exhaust Manifold Removal and Installation

NOTE:
- Use new gaskets and self-locking nuts when reassembling.
- Check for folds or scratches on the surfaces of the gaskets.

FRONT:



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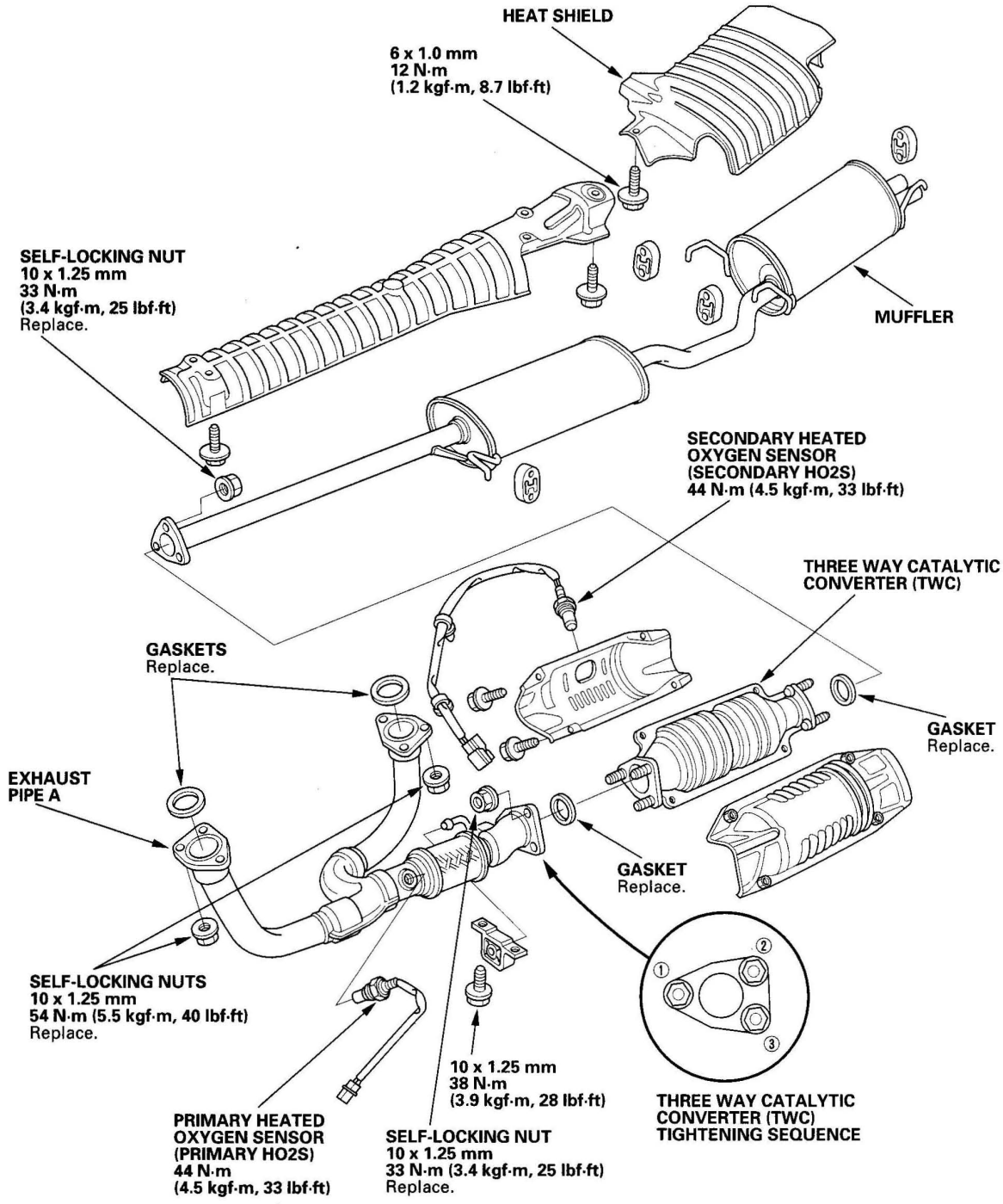


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Exhaust Pipe and Muffler Replacement

NOTE: Use new gaskets and self-locking nuts when reassembling.



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Engine Cooling

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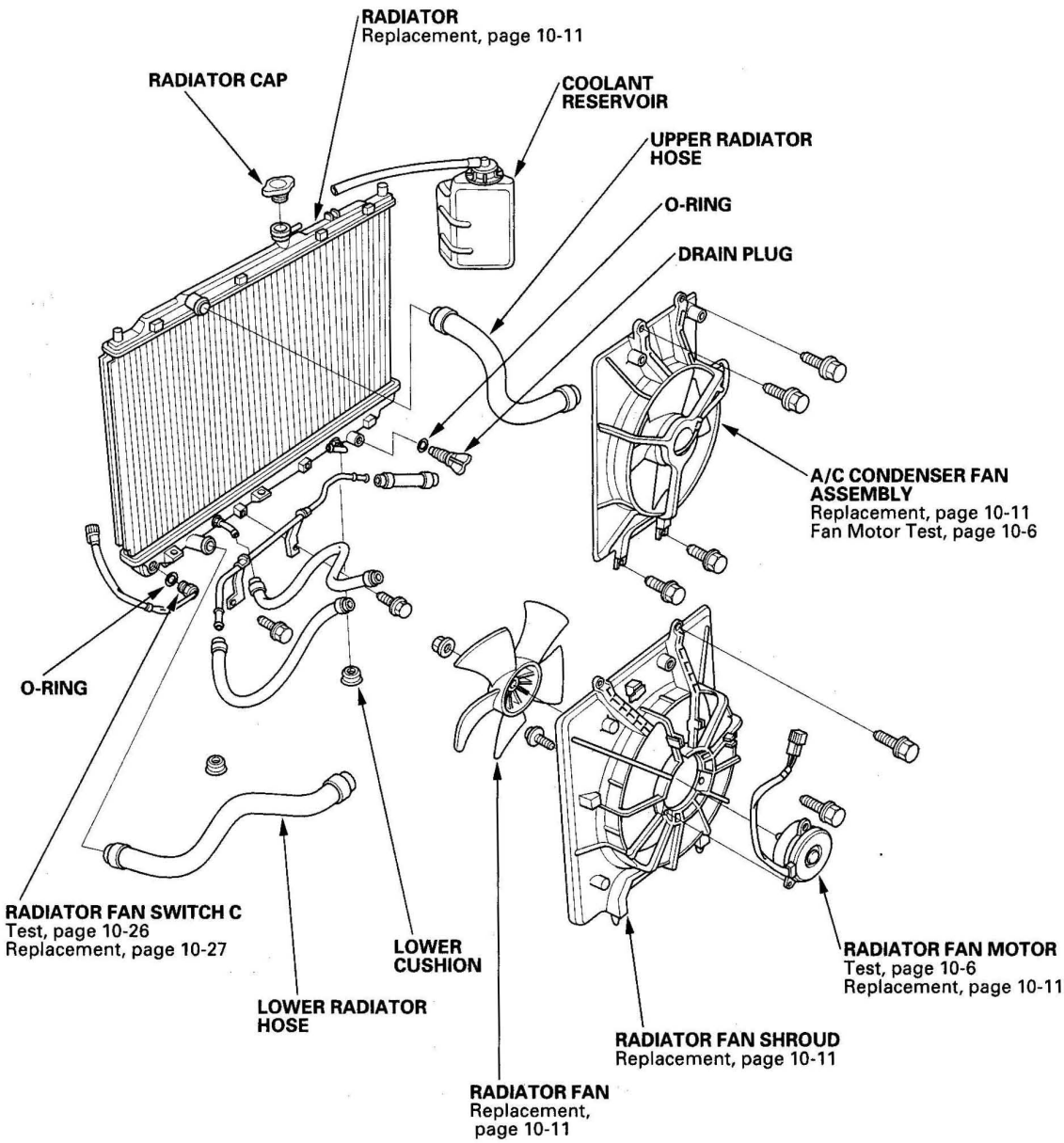
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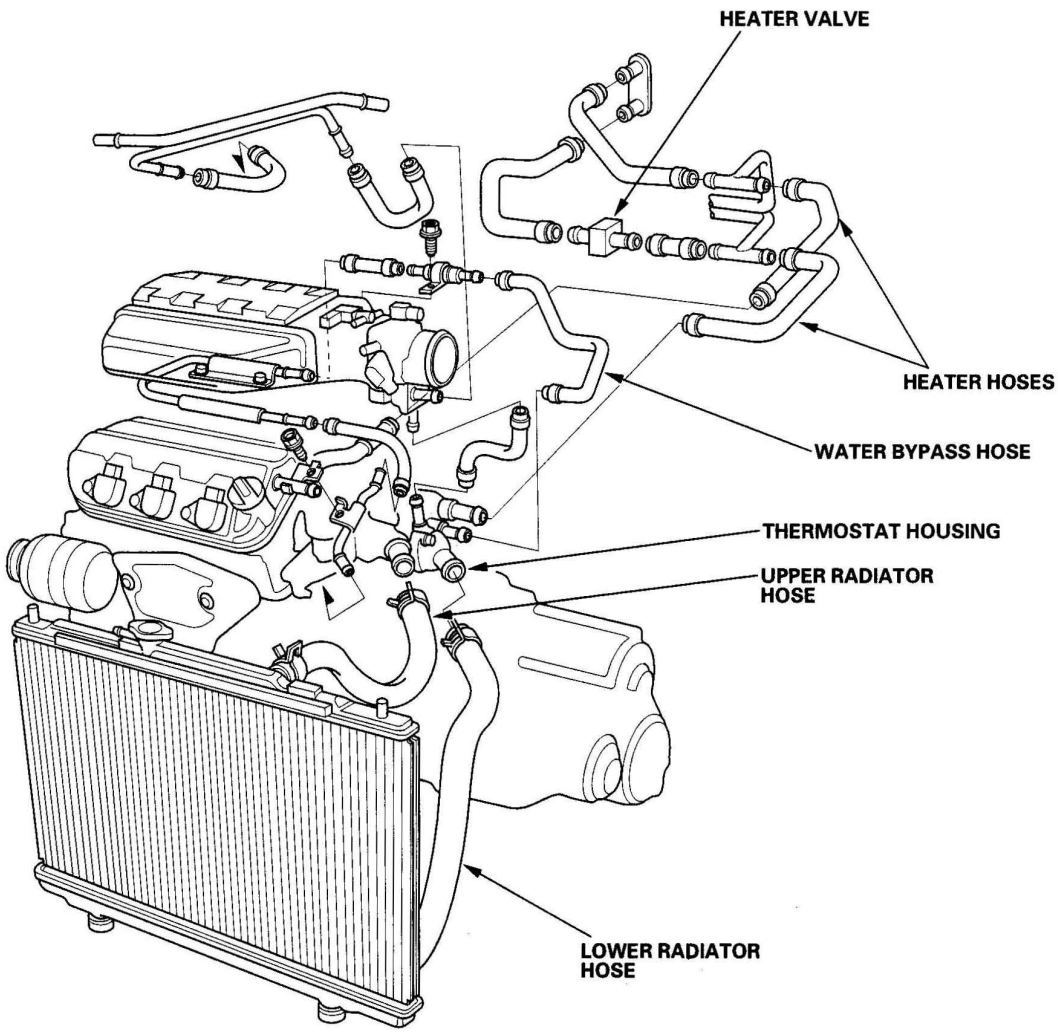
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Component Location Index



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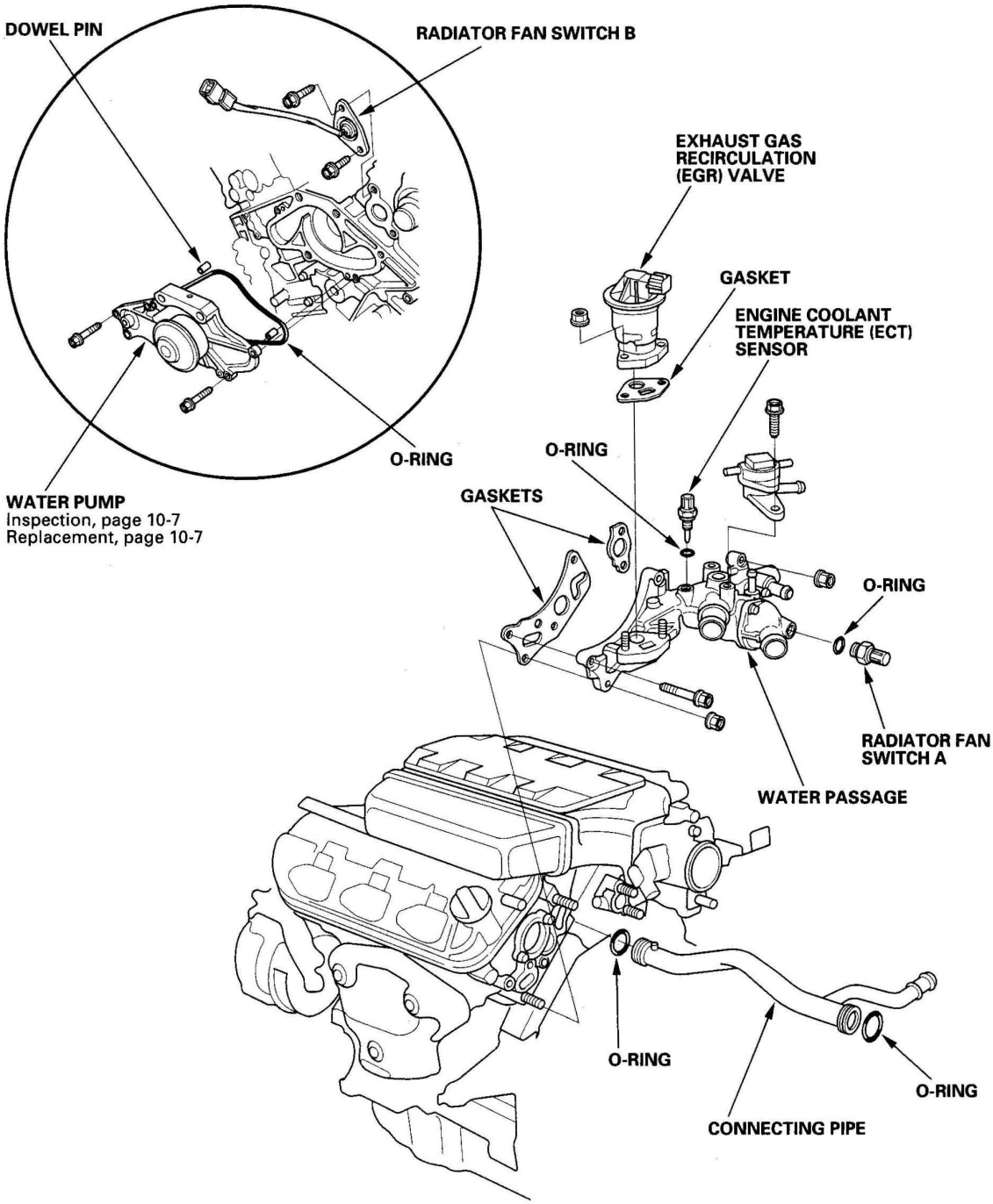


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Component Location Index (cont'd)

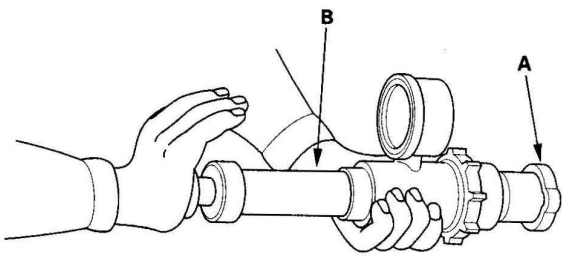


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Radiator Cap Test

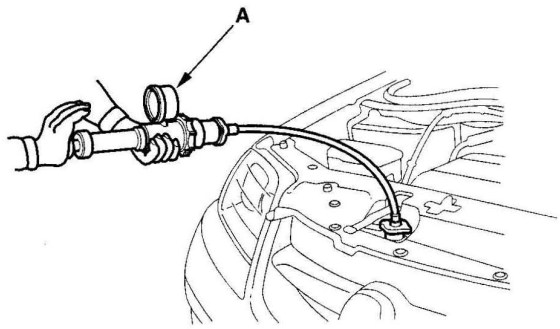
1. Remove the radiator cap (A), wet its seal with engine coolant, then install it on a commercially available pressure tester (B).



2. Apply a pressure of 93 – 123 kPa (0.95 – 1.25 kgf/cm², 14 – 18 psi).
3. Check for a drop in pressure.
4. If the pressure drops, replace the cap.

Radiator Test

1. Wait until the engine is cool, then carefully remove the radiator cap, and fill the radiator with engine coolant to the top of the filler neck.
2. Attach a commercially available pressure tester (A) to the radiator, and apply a pressure of 93 – 123 kPa (0.95 – 1.25 kgf/cm², 14 – 18 psi).

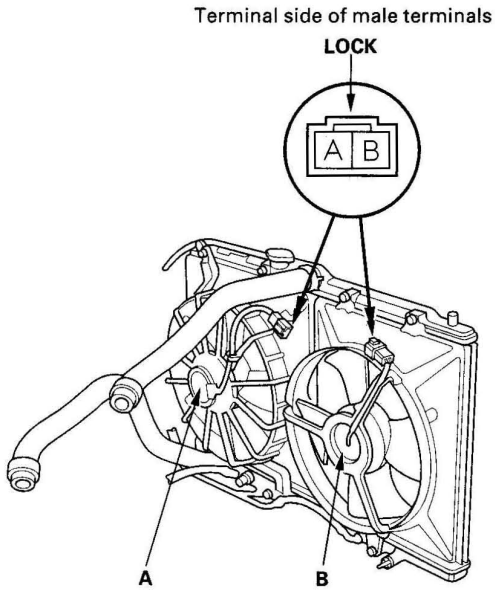


3. Inspect for engine coolant leaks and a drop in pressure.
4. Remove the tester, and reinstall the radiator cap.
5. Check for engine oil in the coolant and/or coolant in the engine oil.

Protected by AR

Fan Motor Test

1. Disconnect the 2P connectors from the radiator fan motor (A) and condenser fan motor (B).



2. Test the motor by connecting battery power to the B terminal and ground to the A terminal.

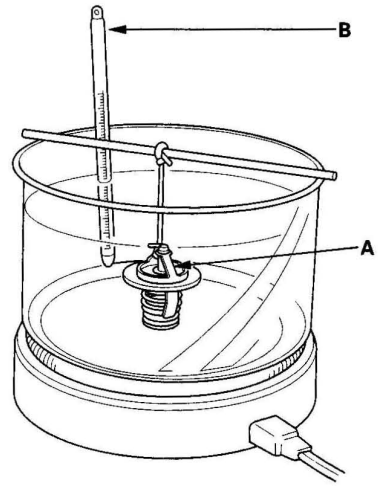
3. If the motor fails to run or does not run smoothly, replace it.

Thermostat Test

Replace the thermostat if it is open at room temperature.

To test a closed thermostat:

1. Suspend the thermostat (A) in a container of water. Do not let the thermometer (B) touch the bottom of the hot container.



2. Heat the water and check the temperature with a thermometer. Check the temperature at which the thermostat first opens, and at which it is fully open.

3. Measure the lift height of the thermostat when it is fully open.

STANDARD THERMOSTAT

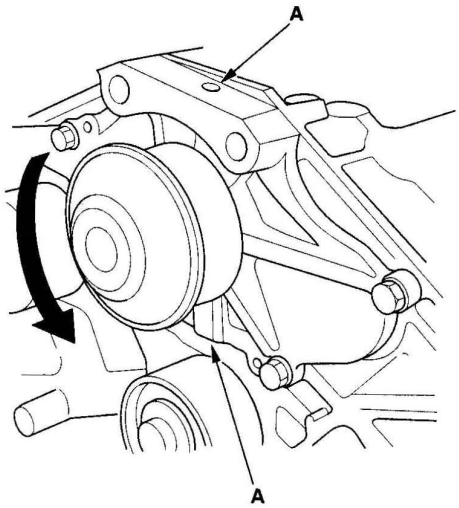
Lift height:	**above 10.0 mm (0.39 in.)**
Starts opening:	**169–176°F (76–80°C)**
Fully open:	**194°F (90°C)**

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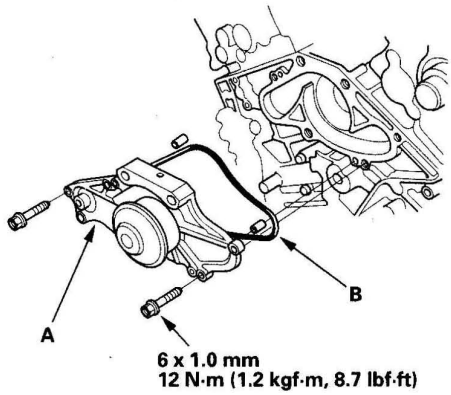
Water Pump Inspection

1. Remove the timing belt (see page 6-19).
2. Turn the water pump pulley counterclockwise. Check that it turns freely.
3. Check for signs of seal leakage. A small amount of "weeping" from the bleed hole (A) is normal.



Water Pump Replacement

1. Remove the timing belt (see page 6-19).
2. Remove the timing belt tensioner.
3. Remove the water pump (A) by removing five bolts.

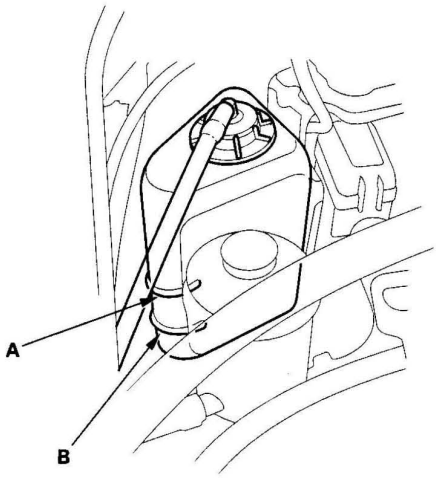


4. Inspect and clean the O-ring groove and mating surface with the cylinder block.
5. Install the water pump with a new O-ring (B) in the reverse order of removal.
6. Clean up any spilled engine coolant.

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Coolant Check

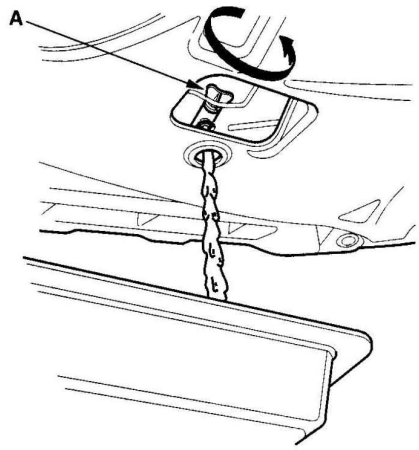
1. Look at the coolant level in the coolant reservoir. Make sure it is between the MAX mark (A) and MIN mark (B).



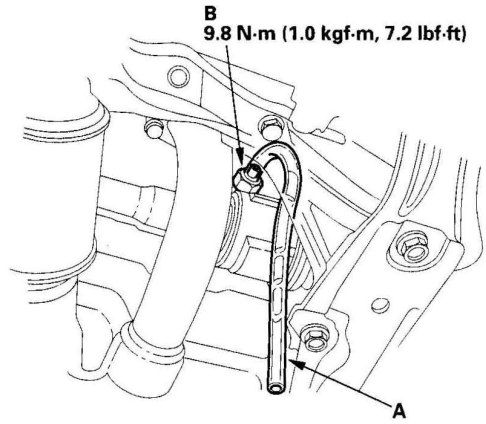
2. If the coolant level in the coolant reservoir is at or below the MIN mark, add coolant to bring it up to the MAX mark, and inspect the cooling system for leaks.

Coolant Replacement

1. Turn the ignition switch ON (II). Set the displayed temperature on the climate control system to 90°F (32°C), then turn the ignition switch OFF. Make sure the engine and radiator are cool to the touch.
2. Remove the radiator cap.
3. Loosen the drain plug (A), and drain the coolant.



4. Install a rubber hose (A) on the drain bolt (B) located at the rear of the cylinder block, then loosen the drain bolt.



5. When the coolant stops draining, tighten the drain bolt.
6. Tighten the radiator drain plug securely.

BACK

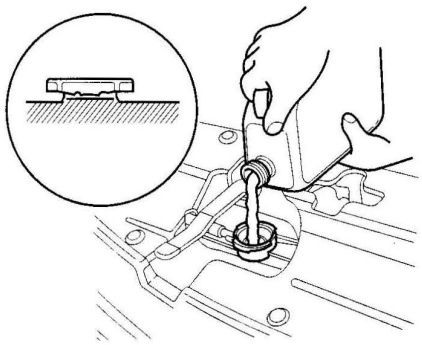
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7. Remove, drain, and reinstall the coolant reservoir.

8. Pour Honda All Season Antifreeze/Coolant Type 2 into the radiator up to the base of the filler neck.

   NOTE:
   - Always use Honda All Season Antifreeze/Coolant Type 2. Using a non-Honda coolant can result in corrosion, causing the cooling system to malfunction or fail.
   - Honda All Season Antifreeze/Coolant Type 2 is a mixture of 50% antifreeze and 50% water. Pre-mixing is not required.

   Engine Coolant Refill Capacity [including the reservoir capacity of 0.6 ℓ (0.6 US qt, 0.5 Imp qt)] : 7.6 ℓ (7.0 US qt, 5.8 Imp qt)



9. Start the engine. Hold the engine speed at 1,500 rpm until it warms up (the radiator fan comes on at twice). Make sure the thermostat is open.

10. Turn off the engine. Check the level in the radiator, and add Honda All Season Antifreeze/Coolant Type 2, if needed.

11. Set the displayed temperature on the climate control to maximum cool. Start the engine. Hold the engine speed at 1,500 rpm for 5 minutes, then turn off the engine.

12. Check the level in the radiator, and add Honda All Season Antifreeze/Coolant Type 2, if needed.

13. Set the displayed temperature to maximum heat. Start the engine. Hold the engine speed at 1,500 rpm for 5 minutes, then turn off the engine.

14. Check the level in the radiator, and add Honda All Season Antifreeze/Coolant Type 2, if needed.

15. Set the displayed temperature to maximum cool. Start the engine. Hold the engine speed at 1,500 rpm for 3 minutes, then turn off the engine.

16. Check the level in the radiator, and add Honda All Season Antifreeze/Coolant Type 2, if needed.

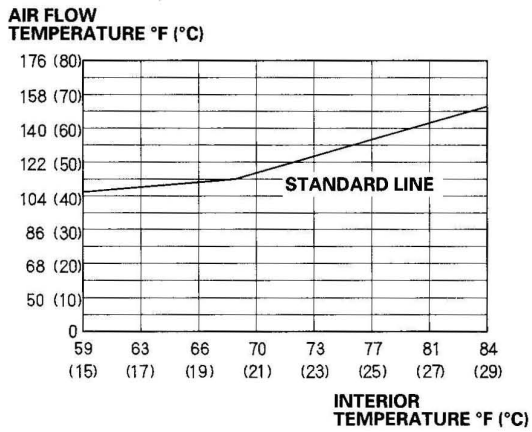
17. Set the displayed temperature to maximum heat. Start the engine. Hold the engine speed at 1,500 rpm for 3 minutes, then turn off the engine.

18. Check the level in the radiator, and add Honda All Season Antifreeze/Coolant Type 2, if needed.

19. Repeat steps 15 through 18 until the coolant level does not change in the radiator, then install the radiator cap loosely.

20. Set the displayed temperature to maximum cool. Start the engine. Hold the engine speed at 2,500 rpm for 1 minute.

21. Set the displayed temperature on the climate control system to maximum heat, and select (Hot) mode on the rear control panel. Measure the temperature of the air at the rear floor vent for 2 or 3 minutes.
    Make sure the temperature is above the standard line of the graph shown below. If the temperature is below the standard line, repeat steps 15 through 18 several more times. Then loosely install the radiator cap and recheck.



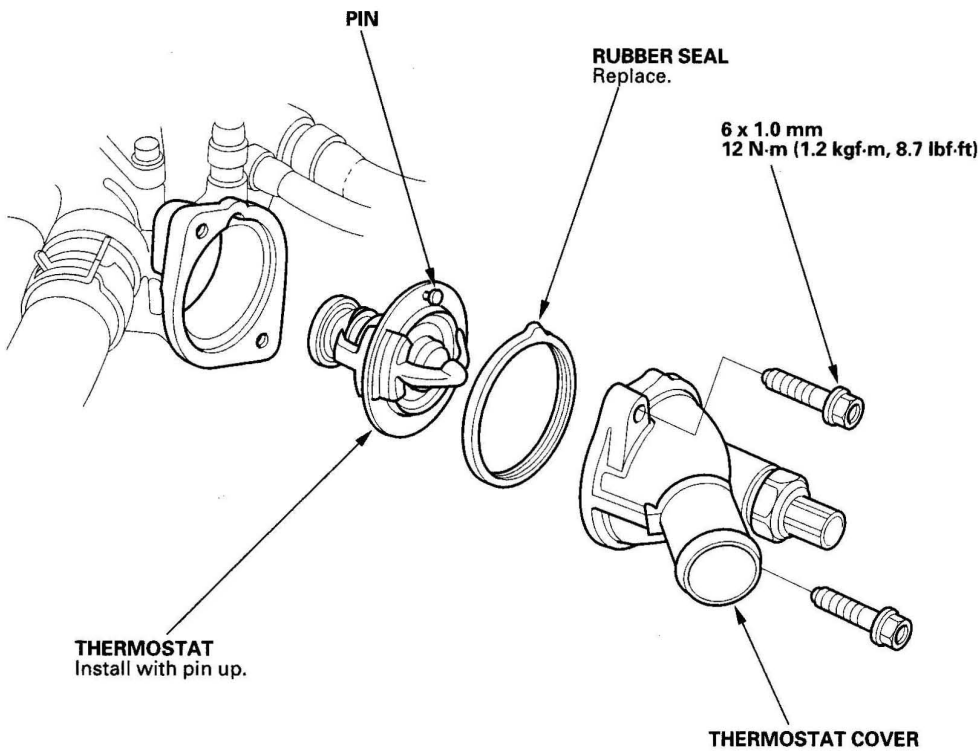
22. Check for the sound of water flowing near the rear heater unit. If you hear water flowing, repeat steps 15 through 18 several more times. Then loosely install the radiator cap and recheck. If there is no water flowing sound, go to step 23.

23. Fill the reserve tank with Honda All Season Antifreeze/coolant Type 2 up to the MAX mark on the tank, then add an extra 0.4 ℓ (0.4 US qt, 0.4 Imp qt) coolant.

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Thermostat Replacement



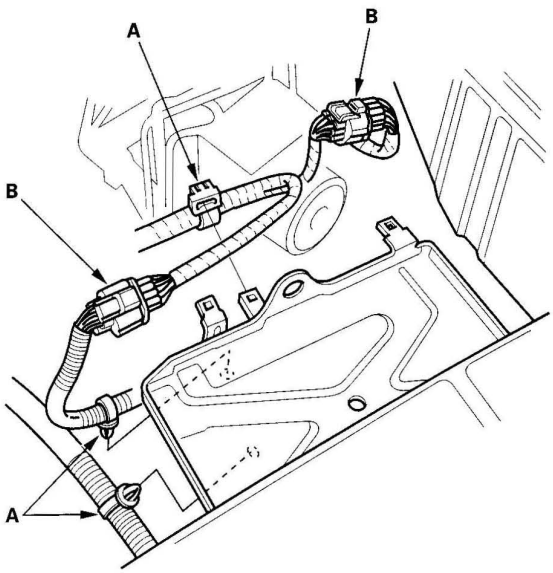
BACK

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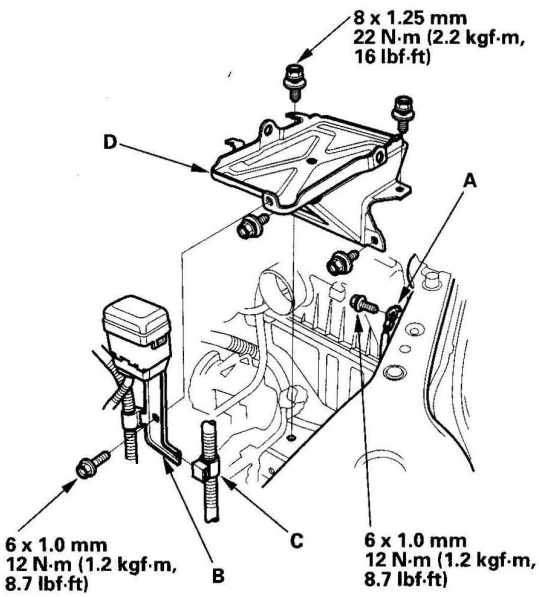
Radiator and Fans Replacement

NOTE:
- Use fender covers to avoid damaging painted surfaces.
- To avoid damage, unplug the wiring connectors carefully while holding the connector portion.
- Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses, or interfere with other parts.

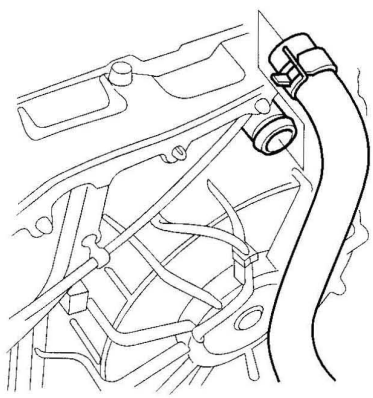
1. Remove the radiator cover.
2. Remove the front bumper (see page 20-106).
3. Make sure you have the anti-theft code for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
4. Disconnect the battery negative terminal first, then the positive terminal.
5. Remove the battery and battery tray.
6. Drain the engine coolant (see page 10-8).
7. Remove the harness clamps (A), and engine wire harness connectors (B) from the battery base.



8. Remove the ground cable (A), relay bracket (B) and harness clamp (C), then remove the battery base (D).



9. Remove the upper radiator hose.



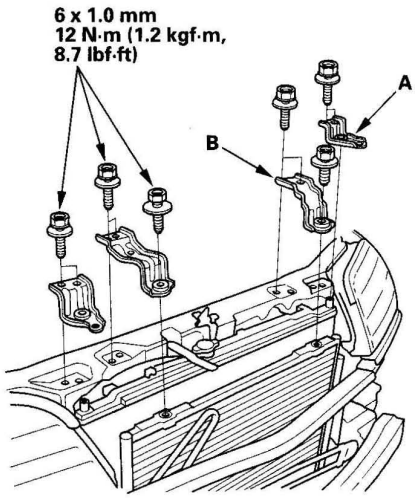
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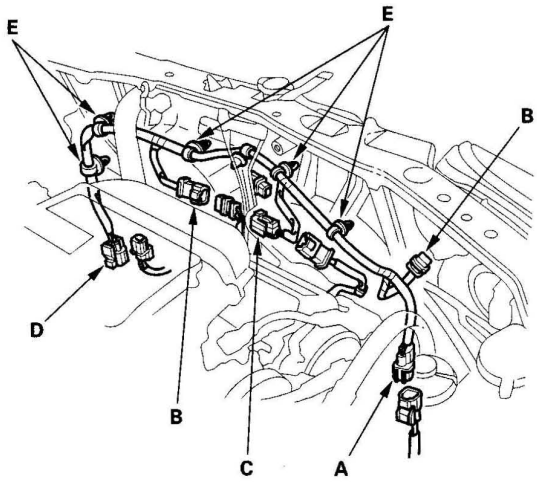
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Radiator and Fans Replacement (cont'd)

10. Remove the radiator upper brackets/cushions (A) and condenser brackets (B).

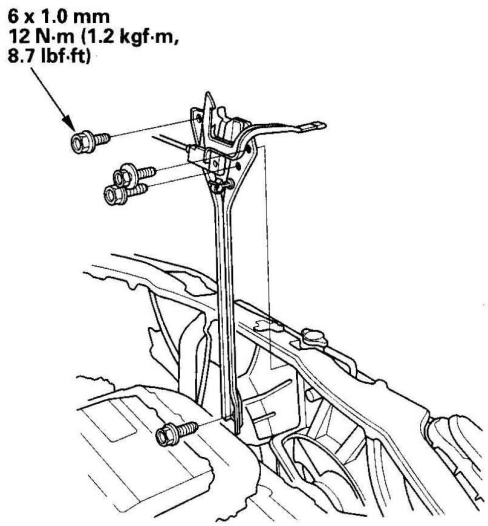


11. Disconnect the compressor clutch connector (A), fan motor connectors (B), hood switch connector (C), and radiator fan switch C connector (D).



12. Remove the harness clamps (E).

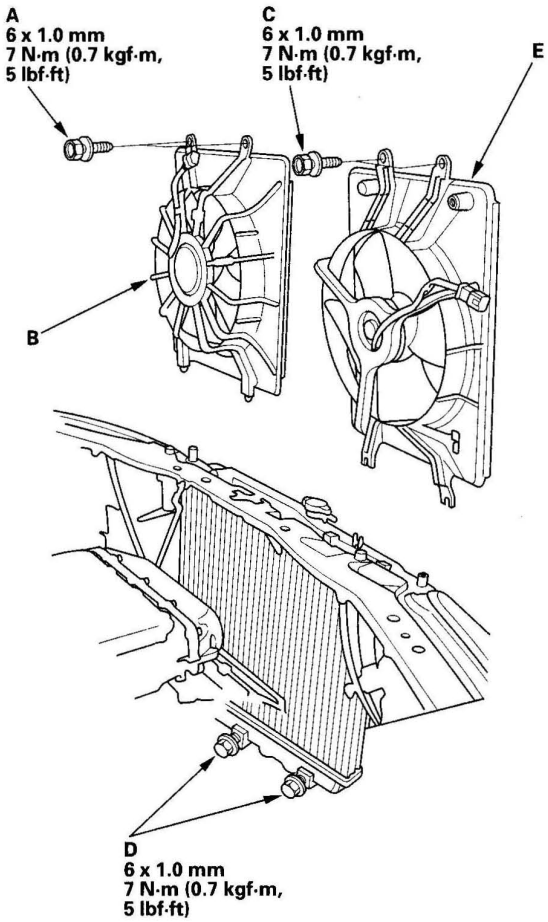
13. Remove the bulkhead bracket.



BACK

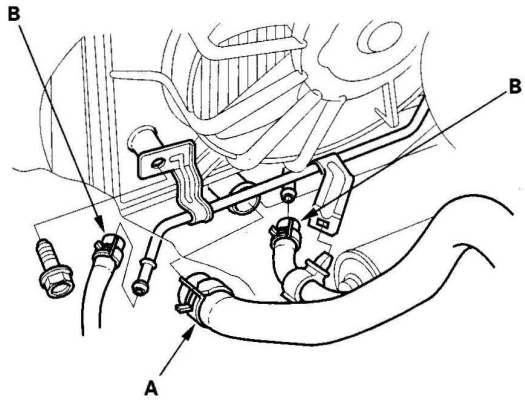
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14. Remove the two bolts (A) securing the radiator fan shroud, then remove the radiator fan shroud assembly (B) from the battery side.

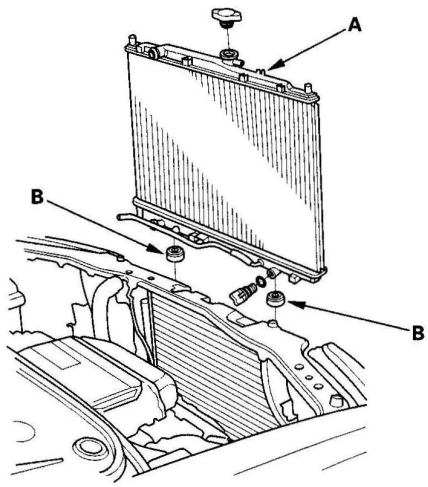


15. Remove the two bolts (C), and loosen the two bolts (D) securing the condenser fan shroud, then remove the condenser fan shroud assembly (E) from the battery side.

16. Remove the lower radiator hose (A) and Automatic Transmission Fluid (ATF) cooler hoses (B). Plug the ATF cooler hoses and lines.



17. Pull up the radiator assembly (A), then remove the lower cushions (B).



(cont'd)

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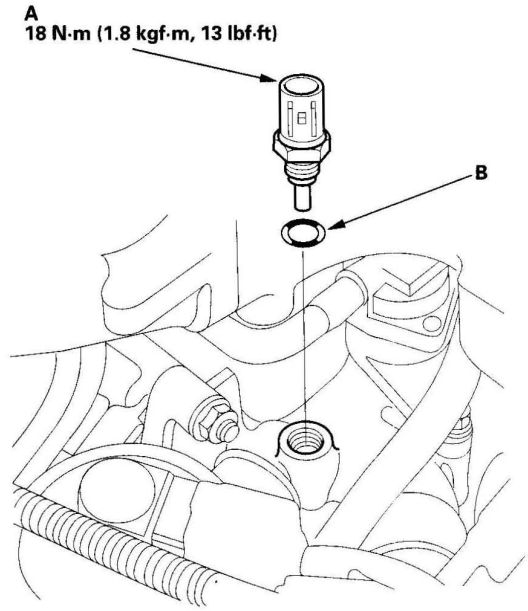
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Radiator and Fans Replacement (cont'd)

18. Remove the ATF cooler line, radiator cap, and drain plug.
19. Install the radiator in the reverse order of removal.
20. Set the upper and lower cushions securely.
21. Fill the radiator with engine coolant, and bleed the air (see page 10-8).
22. Adjust the hood latch (see page 20-108).
23. Enter the anti-theft code for the radio and the navigation system, then enter the customer's radio station presets.

ECT Sensor Replacement

1. Disconnect the Engine Coolant Temperature (ECT) sensor connector, then remove the ECT sensor (A).

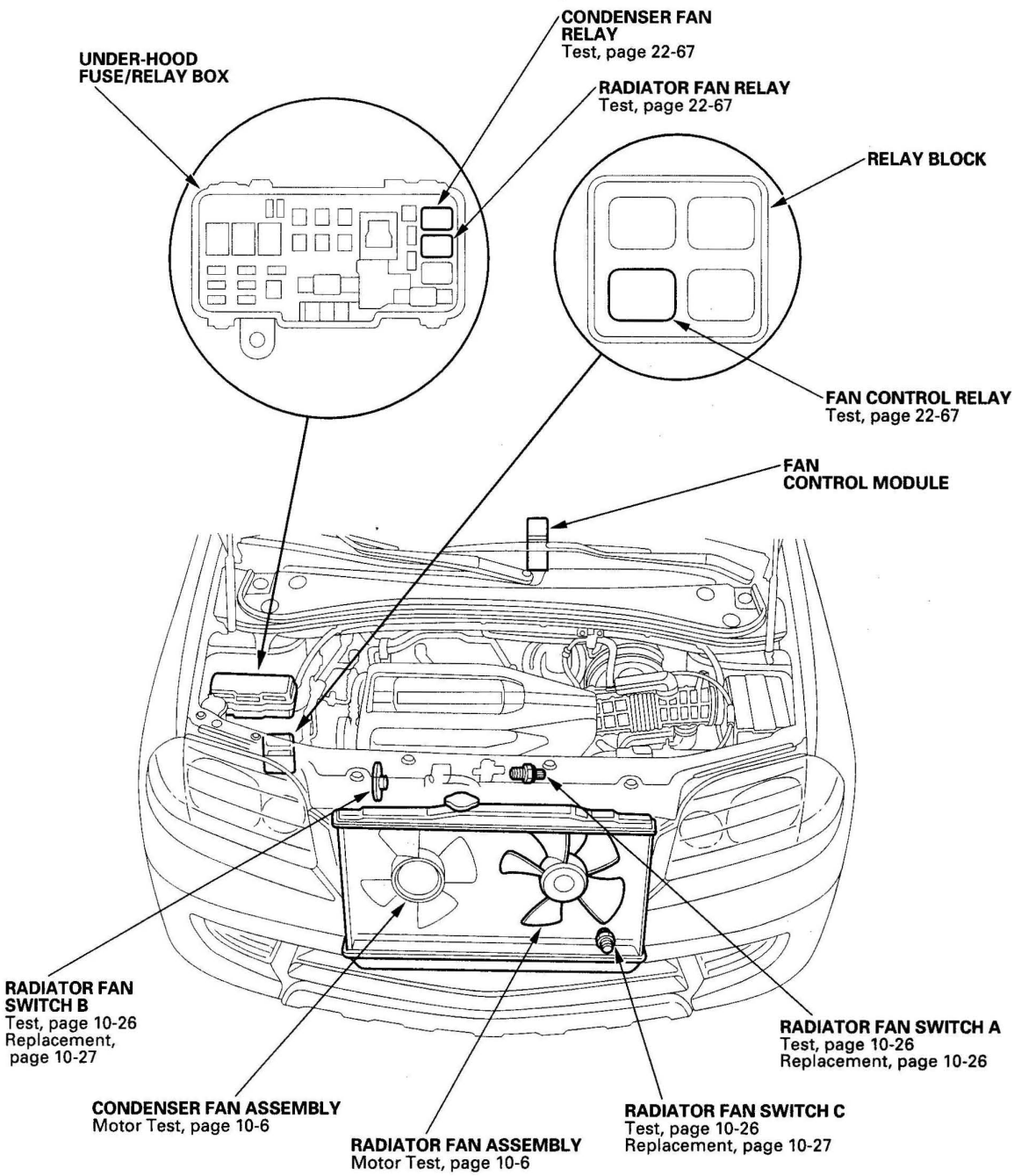


2. Install the ECT sensor using a new O-ring (B).

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Component Location Index



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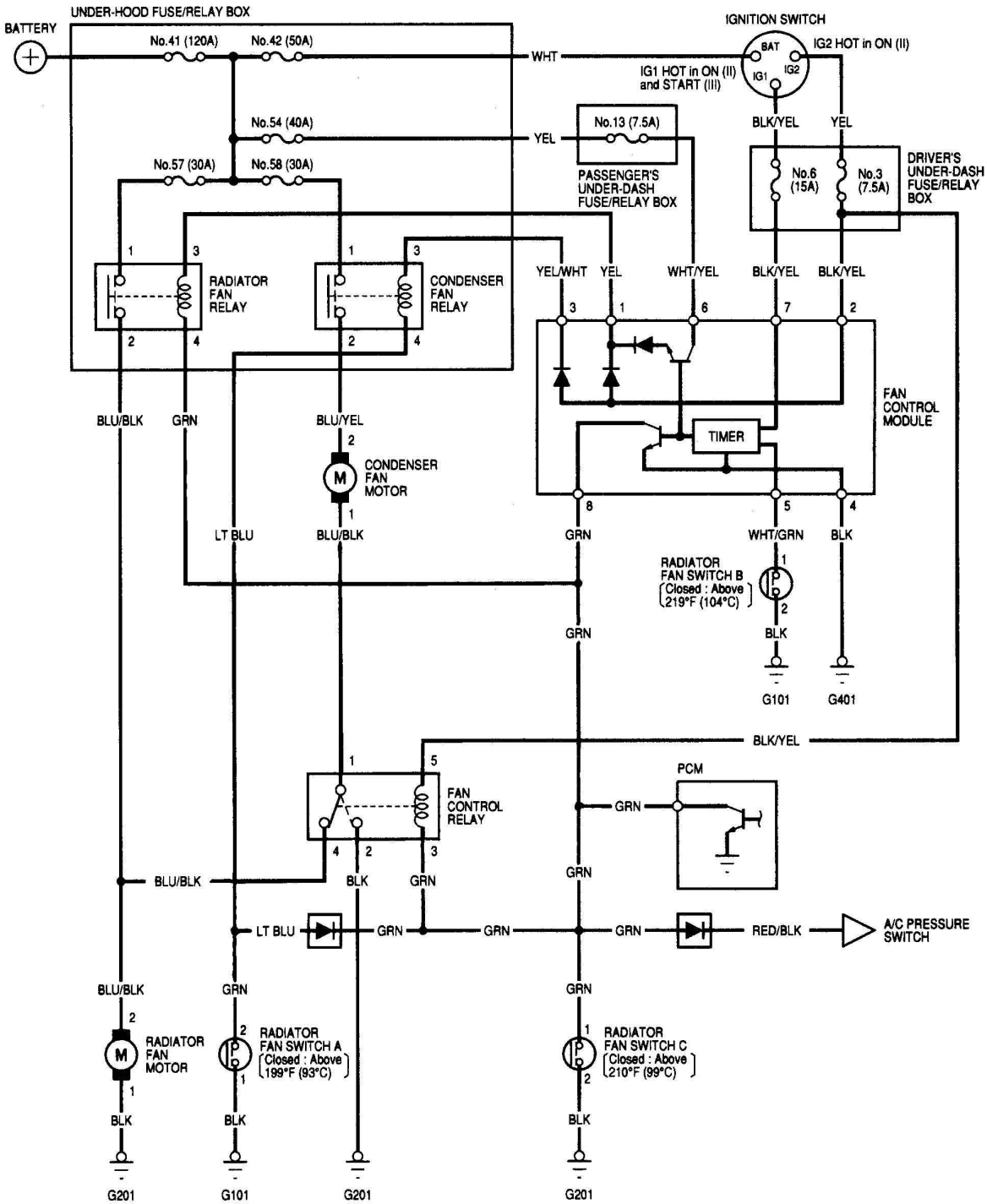
Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
Radiator fan does not run at all, but condenser fan runs with A/C ON or when the engine coolant temperature is above 199°F (93° C)	Radiator and condenser fans circuit troubleshooting A (see page 10-18).	
Both radiator fan and condenser fan do not run with A/C ON and when the engine coolant temperature is above 199°F (93°C)	Radiator and condenser fans circuit troubleshooting B (see page 10-20).	
Condenser fan runs but radiator fan does not run when the engine coolant temperature is above 199°F (93°C), but both fans run with A/C ON	Remove the radiator fan control relay, and test. • If the relay is faulty, replace it. • If the relay is OK, repair an short in the wire between the radiator fan control relay 5P connector terminal No. 4 and the radiator fan motor 2P connector terminal No. 2.	
Both radiator fan and condenser fan do not run when the engine coolant temperature is above 199°F (93°C), but both fans run with A/C ON	Radiator and condenser fans circuit troubleshooting C (see page 10-21).	
Both radiator and condenser fans do not run when the engine coolant temperature is above 199°F (93°C), but radiator fan runs with A/C ON	Radiator and condenser fans circuit troubleshooting D (see page 10-23).	
Both radiator fan and condenser fan run with ignition switch ON (II), with A/C OFF, and when the engine coolant temperature is below 199°F (93°C)	Radiator and condenser fans circuit troubleshooting E (see page 10-24).	
Both radiator fan and condenser fan do not run at high speed with the A/C ON	Radiator and condenser fans high speed circuit troubleshooting (see page 21-40).	
Both radiator fan speed and condenser fan speed do not change from Low to Hi when the engine coolant temperature 210°F (99°C), but both fan's speed change with A/C ON	Radiator and condenser fans circuit troubleshooting F (see page 10-24).	
Condenser fan speed does not change from Low to Hi with A/C ON and the engine coolant temperature above 210°F (99°C)	Condenser Fan High Speed Circuit Troubleshooting (see page 21-39).	

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Circuit Diagram



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Radiator and Condenser Fans Circuit Troubleshooting A

1. Check the No. 57 (30A) fuse in the under-hood fuse/relay box.

   Is the fuse OK?

   YES – Go to step 2.

   NO – Check for a short in the wire between the radiator fan relay, radiator fan motor and fan control relay, and condenser fan motor or a faulty fan motor. ■

2. Remove the radiator fan relay from the under-hood fuse/relay box and test it (see page 22-67).

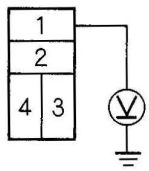
   Is the relay OK?

   YES – Go to step 3.

   NO – Replace radiator fan relay. ■

3. Measure the voltage between radiator fan relay 4P socket terminal No. 1 and body ground.

   RADIATOR FAN RELAY 4P SOCKET



   Terminal side of female terminals

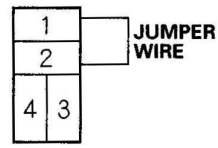
   Is there battery voltage?

   YES – Go to step 4.

   NO – Replace the under-hood fuse/relay box. ■

4. Connect a jumper wire between radiator fan relay 4P socket terminals No. 1 and No. 2.

   RADIATOR FAN RELAY 4P SOCKET



   Terminal side of female terminals

   Does the radiator fan run?

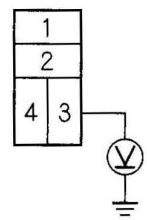
   YES – Go to step 5.

   NO – Go to step 10.

5. Disconnect the jumper wire, and turn the ignition switch ON (II).

6. Measure the voltage between radiator fan relay 4P socket terminal No. 3 and body ground.

   RADIATOR FAN RELAY 4P SOCKET



   Terminal side of female terminals

   Is there the battery voltage?

   YES – Repair an open in the wire between the radiator fan relay and the A/C pressure switch. ■

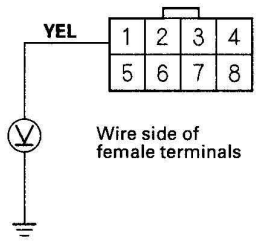
   NO – Go to step 7.

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7. Measure the voltage between fan control module 8P connector terminal No. 1 and body ground.

FAN CONTROL MODULE 8P CONNECTOR



Is there the battery voltage?

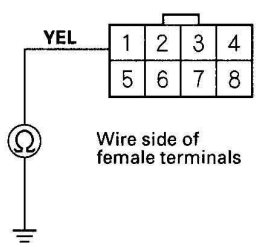
YES — Repair an open in the wire between fan control module terminal No. 1 and radiator fan relay 4P socket terminal No. 3. ■

NO — Go to step 8.

8. Disconnect the fan control module 8P connector.

9. Check for continuity between fan control module 8P connector terminal No. 1 and body ground.

FAN CONTROL MODULE 8P CONNECTOR



Is there the continuity?

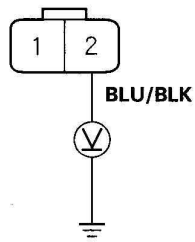
YES — Repair short in the wire between fan control module 8P connector terminal No. 1 and radiator fan relay 4P socket terminal No. 3.
A short on the YEL wire may damage the fan control module. If the symptom is still present after, repairing the short, substitute a known-good fan control module, and recheck. ■

NO — Replace the fan control module. ■

10. Disconnect the radiator fan motor 2P connector.

11. Measure the voltage between fan motor 2P connector terminal No. 2 and body ground.

RADIATOR FAN MOTOR 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES — Go to step 12.

NO — Repair an open in the wire between radiator fan relay 4P socket terminal No. 2 and radiator 2P connector terminal No. 2. ■

12. Disconnect the jumper wire.

13. Test the radiator fan motor (see page 10-6).

Is the fan motor OK?

YES — Repair an open in the wire between radiator fan motor 2P connector terminal No. 1 and body ground G201. ■

NO — Replace the radiator fan motor. ■

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Radiator and Condenser Fans Circuit Troubleshooting B

1. Check for the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES – Go to step 2.

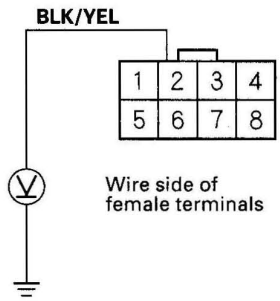
   NO – Check for these problems:

   - A short in the wire between the driver's under-dash fuse/relay box and fan control module 8P connector terminal No. 2.
   - A short in the wire between the driver's under-dash fuse/relay box and fan control relay 4P socket terminal No. 5. ■

2. Turn the ignition switch ON (II).

3. Measure the voltage between fan control module 8P connector terminal No. 2 and body ground.

   FAN CONTROL MODULE 8P CONNECTOR



   Is there battery voltage?

   YES – Go to step 4.

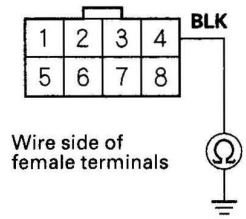
   NO – Repair an open in the wire between the driver's under-dash fuse/relay box and fan control module 8P connector terminal No. 2. ■

4. Turn the ignition switch OFF.

5. Disconnect the fan control module 8P connector.

6. Check for continuity between fan control module 8P connector terminal No. 4 and body ground.

   FAN CONTROL MODULE 8P CONNECTOR



   Is there continuity?

   YES – Replace the fan control module and if the radiator fan does not run, replace the fan itself. ■

   NO – Repair an open in the wire between fan control module terminal No. 4 and G401. ■

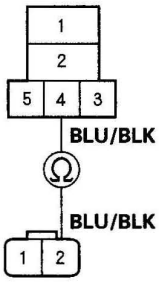
BACK

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Radiator and Condenser Fans Circuit Troubleshooting C

1. Disconnect the fan control relay.
2. Disconnect the radiator fan motor 2P connector.
3. Check for continuity between fan control relay 5P connector terminal No. 4 and radiator fan motor 2P connector terminal No. 2.

FAN CONTROL RELAY 5P SOCKET



RADIATOR FAN MOTOR 2P CONNECTOR
Wire side of female terminals

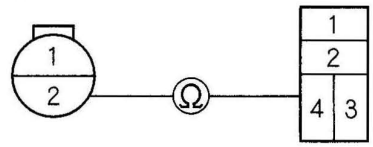
Is there continuity?

YES – Go to step 4.

NO – Repair an open in the wire between fan control relay 5P connector terminal No. 4 and radiator fan motor 2P connector terminal No. 2. ■

4. Remove the condenser fan relay from the under-hood fuse/relay box.
5. Disconnect the radiator fan switch A 2P connector.
6. Check for continuity between condenser fan relay 4P connector terminal No. 4 and radiator fan switch A 2P connector terminal No. 2.

RADIATOR FAN SWITCH A 2P CONNECTOR **CONDENSER FAN RELAY 4P SOCKET**



Wire side of female terminals

Terminal side of female terminals

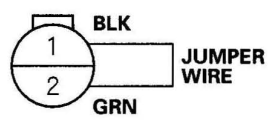
Is there continuity?

YES – Go to step 7.

NO – Repair an open in the wire between condenser fan relay 4P connector terminal No. 4 and radiator fan switch A 2P connector terminal No. 2. ■

7. Install the condenser fan relay and fan control relay, and connect the radiator fan motor 2P connector.
8. Connect a jumper wire between radiator switch A 2P connector terminals No. 1 and No. 2.

RADIATOR FAN SWITCH A 2P CONNECTOR



Wire side of female terminals

(cont'd)

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Radiator and Condenser Fans Circuit Troubleshooting C (cont'd)

9. Turn the ignition switch ON (II).

   Does the radiator fan run?

   YES – Replace radiator fan switch A and recheck. ■

   NO – Repair an open in the wire between radiator fan switch A 2P connector terminal No 1 and ground G101. ■

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Radiator and Condenser Fans Circuit Troubleshooting D

1. Remove the condenser fan relay from the under-hood fuse/relay box and test it (see page 22-67).

   Is the relay OK?

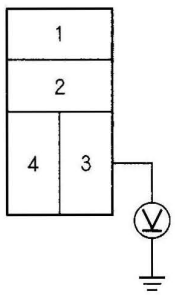
   YES – Go to step 2.

   NO – Replace the condenser fan relay. ■

2. Turn the ignition switch ON (II).

3. Measure the voltage between condenser fan relay 4P socket terminal No. 3 and body ground.

   RADIATOR FAN RELAY 4P SOCKET



   Terminal side of female terminals

   Is there battery voltage?

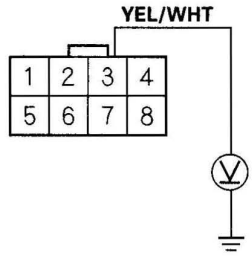
   YES – Check for these circuit:

   - The wire between condenser fan relay 4P socket terminal No. 4 and radiator fan switch C terminal No. 1.
   - The connection between condenser fan relay 4P socket terminal No. 1 and fuse No. 58 (30A) in the under-hood fuse/relay box.
   - The wire between condenser fan relay 4P socket terminal No. 2 and the condenser fan motor.
   - The wire between the condenser fan motor and the fan control relay. ■

   NO – Go to step 4.

4. Measure the voltage between fan control module 8P connector terminal No. 3 and body ground.

   FAN CONTROL MODULE 8P CONNECTOR



   Wire side of female terminals

   Is there battery voltage?

   YES – Repair an open in the wire between fan control module terminal No. 3 and condenser fan relay 4P socket terminal No. 3. ■

   NO – Replace the fan control module. ■

BACK

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Radiator and Condenser Fans Circuit Troubleshooting E

1. Remove the condensor fan relay, and test it (see page 22-67).

   Is the relay OK?

   YES – Go to step 2.

   NO – Replace the relay. ■

2. Disconnect radiator fan switch C 2P connector and turn the ignition switch ON (II).

   Does the radiator fan stop?

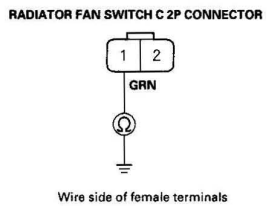
   YES – Replace radiator fan switch C and recheck. ■

   NO – Go to step 3.

3. Turn the ignition switch OFF.

4. Remove the radiator fan relay from the under-hood fuse/relay box.

5. Check for continuity between radiator fan switch C 2P connector terminal No. 1 and body ground.



   Is there continuity?

   YES – Repair a short in the wire between radiator fan relay 4P socket terminal No. 4, radiator fan switch C 2P connector terminal No. 1 and A/C pressure switch. ■

   NO – Go to step 6.

6. Disconnect the radiator fan switch A 2P connector and turn the ignition switch ON (II).

   Does the radiator fan stop?

   YES – Replace radiator fan switch A. ■

   NO – Repair a short in the wire between radiator fan relay 4P socket terminal No. 4, condenser fan relay 4P socket terminal No. 4. ■

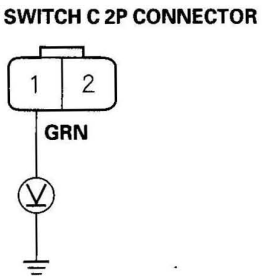
Radiator and Condenser Fans Circuit Troubleshooting F

1. Remove the radiator fan relay and condenser fan relay from the under-hood fuse/relay box.

2. Disconnect the radiator fan switch C 2P connector.

3. Turn the ignition switch ON (II).

4. Measure the voltage between radiator fan switch C 2P connector terminal No. 1 and body ground.



   Is there the battery voltage?

   YES – Go to step 5.

   NO – Repair an open in the wire between fan control relay 5P socket terminal No. 3 and radiator fan switch C terminal No. 1. ■

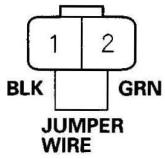
5. Install the radiator fan relay and condenser fan relay.

BACK

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6. Connect a jumper wire between radiator fan switch C 2P connector terminals No. 1 and No. 2.

RADIATOR FAN SWITCH C 2P CONNECTOR



Wire side of female terminals

7. Turn the ignition switch ON (II).

Do the radiator and condenser fans run?

YES—Replace radiator fan switch C.■

NO—Repair an open in the wire between radiator fan switch C 2P connector terminal No. 2 and ground G201.■

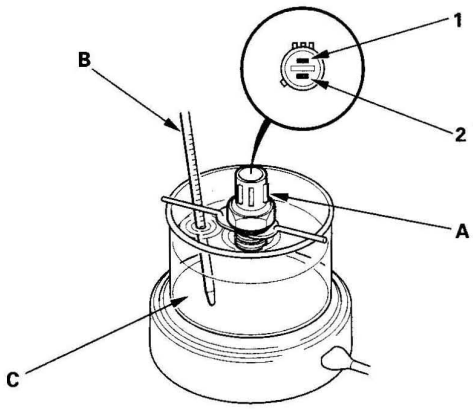
BACK

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Radiator Fan Switch Test

NOTE: Bleed air from the cooling system after installing the radiator fan switch (see page 10-8).

1. Remove radiator fan switch A from the water passage (see page 10-26), remove radiator fan switch B from the cylinder head (see page 10-27), and remove radiator fan switch C from the radiator (see page 10-27).
2. Suspend each radiator fan switch (A) in a container of water as (C) shown.

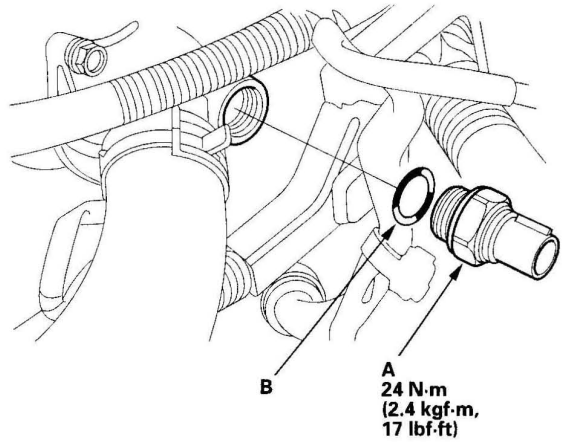


3. Heat the water, and check the temperature with a thermometer (B). Do not let the thermometer touch the bottom of the hot container.
4. Measure the continuity between terminal 1 and terminal 2 according to the table.

Operation		Temperature	Terminal 1	Terminal 2
SWITCH A	ON	196—203°F (91—95°C)	○—○	
	OFF	5—15°F (3—8°C) lower than the temperature when it goes on		
SWITCH B	ON	212—226°F (100—108°C)	○—○	
	OFF	5—23°F (3—13°C) lower than the temperature when it goes on		
SWITCH C	ON	205—216°F (96—102°C)	○—○	
	OFF	5—23°F (3—13°C) lower than the temperature when it goes on		

Radiator Fan Switch A Replacement

1. Disconnect the radiator fan switch A connector, then remove radiator fan switch A (A).



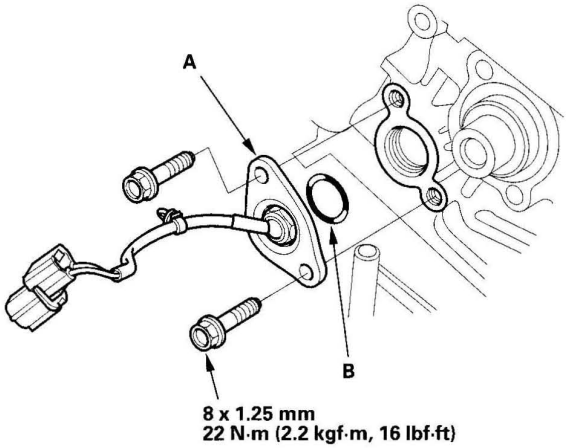
2. Install radiator fan switch A with a new O-ring (B).

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Radiator Fan Switch B Replacement

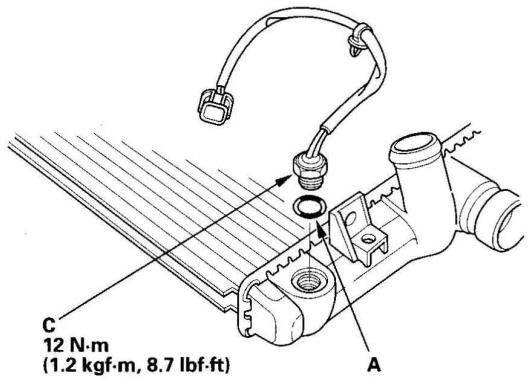
1. Set the No. 1 piston at Top Dead Center (TDC) (see page 6-19).
2. Remove the upper covers.
3. To hold the timing adjuster in its current position, thread in the battery clamp bolt hand-tight (see step 14 on page 6-21).
4. Loosen the idler pulley bolt about five or six turns, then remove the timing belt from the front camshaft pulley (see step 16 on page 6-22).
5. Remove the front camshaft pulley (see step 5 on page 6-57).
6. Disconnect the TDC 1/TDC 2 sensor connector, then remove the back cover (see step 6 on page 6-57).
7. Disconnect the radiator fan switch B connector, then remove radiator fan switch B (A).



8. Install radiator fan switch B with a new O-ring (B).

Radiator Fan Switch C Replacement

1. Disconnect the radiator fan switch C connector, then remove radiator fan switch C.



2. Install radiator fan switch C with a new O-ring (A).

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Special Tools

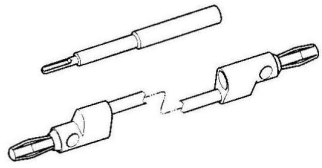
Ref. No.	Tool Number	Description	Qty
①	A973X-041-XXXXX	Vacuum Pump/Gauge, 0 – 30 in. Hg	1
②	07JAZ-001000B	Vacuum/Pressure Gauge, 0 – 4 in. Hg	1
③	07SAZ-001000A	Backprobe Set	2
④	07VAJ-0040100	Fuel Pressure Gauge Attachment	1
⑤	07406-004000A	Fuel Pressure Gauge	1
⑥	07XAA-001010A	Fuel Tank Assembly Wrench	1
⑦	07NAJ-P07010A	Pressure Gauge Adapter	1
⑧-1	07406-0070300	A/T Low Pressure Gauge W/Panel	1
⑧-2	07MAJ-PY4011A	A/T Pressure Hose, 2,210 mm	1
⑧-3	07MAJ-PY40120	A/T Pressure Hose Adapter	1



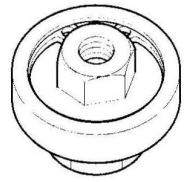
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②



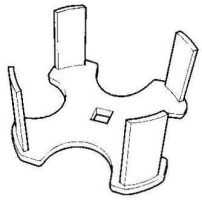
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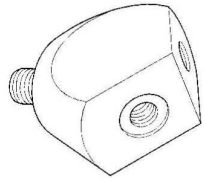
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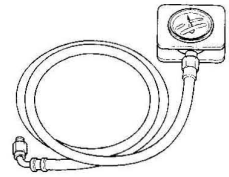
⑤



⑥



⑦



⑧-1, ⑧-2, ⑧-3

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General Troubleshooting Information

Intermittent Failures

The term "intermittent failure" means a system may have had a failure, but it checks OK now. If the Malfunction Indicator Lamp (MIL) on the dash does not come on, check for poor connections or loose wires at all connectors related to the circuit that you are troubleshooting.

Opens and Shorts

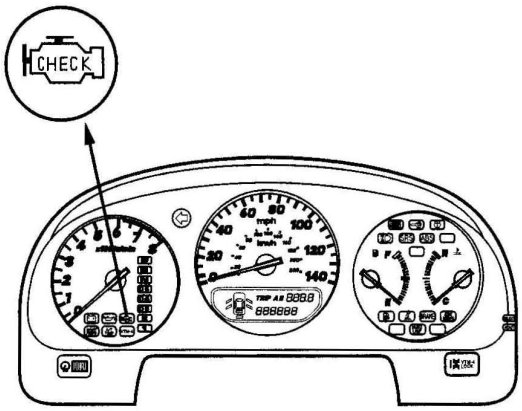
"Open" and "Short" are common electrical terms. An open is a break in a wire or at a connection. A short is an accidental connection of a wire to ground or to another wire. In simple electronics, this usually means something won't work at all. With complex electronics such as PCMs, this can sometimes mean something works, but not the way it's supposed to.

How to Use the PGM Tester or a Scan Tool

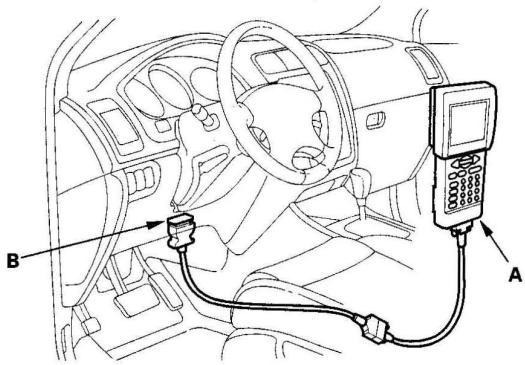
If the MIL (Malfunction Indicator Lamp) has come on

1. Start the engine and check the MIL.

   NOTE: If the ignition switch is turned ON (II), and the engine is not started, the MIL will stay on for 15 – 20 seconds (see page 11-26).



2. If the MIL stays on, connect the Honda PGM Tester (A) or an OBD II scan tool to the Data Link Connector (DLC) (B) located behind driver's dashboard lower cover.



3. Turn the ignition switch ON (II).

4. Check the Diagnostic Trouble Code (DTC) and note it. Also check the freeze data. Refer to the DTC Troubleshooting Index and begin the appropriate troubleshooting procedure.

NOTE:
- Freeze data indicates the engine conditions when the first malfunction, misfire, or fuel trim malfunction was detected.
- The scan tool and the Honda PGM Tester can read the DTC, freeze data, current data, and other Powertrain Control Module (PCM) data.
- For specific operations, refer to the user's manual that came with the scan tool or Honda PGM Tester.

If the MIL did not come on
If the MIL did not come on, but there is a driveablility problem, refer to the Symptom Troubleshooting Index in this section.

If you can't duplicate the DTC
Some of the troubleshooting in this section requires you to reset the PCM and try to duplicate the DTC. If the problem is intermittent and you can't duplicate the code, do not continue through the procedure. To do so will only result in confusion and, possibly, a needlessly replaced PCM.

(cont'd)

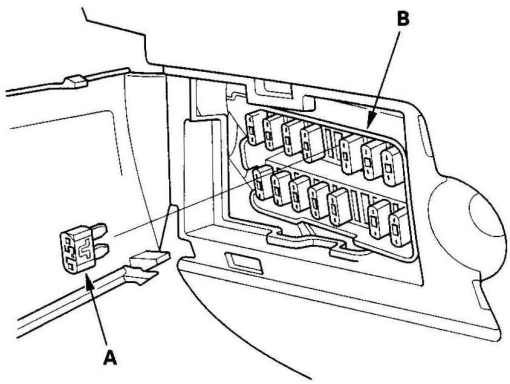
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General Troubleshooting Information (cont'd)

How to Reset the PCM

You can reset the PCM in either of two ways:

- Use the OBD II scan tool or Honda PGM Tester to clear the PCM memory.
  See the OBD II scan tool or Honda PGM Tester user's manuals for specific instructions.
- Turn the ignition switch OFF, and remove the No. 13 CLOCK BACKUP fuse (7.5 A) (A) from the passenger's under-dash fuse/relay box (B) for 10 seconds.



How to End a Troubleshooting Session (required after any troubleshooting)

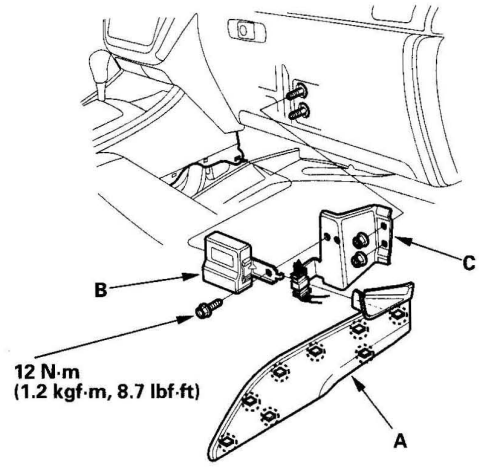
1. Reset the PCM as described above.
2. Turn the ignition switch OFF.
3. Disconnect the OBD II scan tool or Honda PGM Tester from the DLC.

   NOTE: The PCM is part of the immobilizer system. If you replace the PCM, it will have a different immobilizer code. In order for the engine to start, you must rewrite the immobilizer code with the Honda PGM Tester.

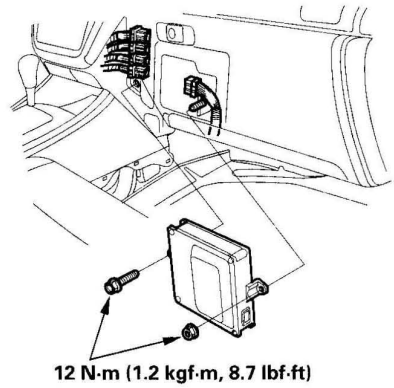
How to Remove the PCM for Testing

If the inspection for a trouble code requires voltage or resistance checks at the PCM connectors, remove the PCM and test it:

1. Remove the passenger's center console side trim (A).



2. Remove the bolt from the intake manifold runner control (IMRC) module (B).
3. Remove the two nuts from the bracket (C).
4. Remove the bolt and the nut from the PCM.



BACK

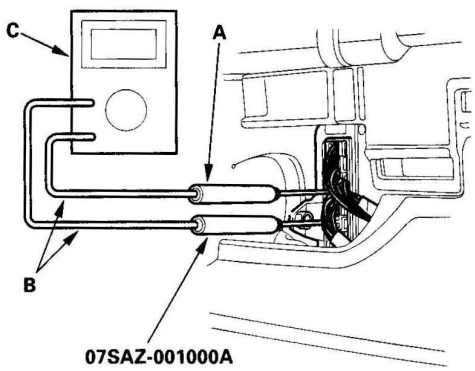
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How to Troubleshoot Circuits at the PCM

Special Tools Required

- Digital Multimeter KS-AHM-32-003 (1) or a commercially available digital multimeter
- Backprobe Set 07SAZ-001000A (2)

1. Connect the backprobe adapters (A) to the stacking patch cords (B), and connect the cords to a digital multimeter (C).

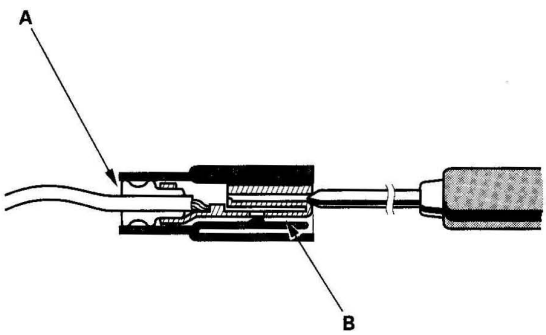


2. Using the wire insulation as a guide for the contoured tip of the backprobe adapter, gently slide the tip into the connector from the wire side until it touches the end of the wire terminal.

3. If you cannot get to the wire side of the connector or the wire side is sealed (A), disconnect the connector and probe the terminals (B) from the terminal side. Do not force the probe into the connector.

NOTICE

Do not puncture the insulation on a wire. Punctures can cause poor or intermittent electrical connections.



How to substitute the PCM for testing purposes

Use this procedure if you need a known-good PCM to test a vehicle. It allows you to swap a PCM from a "donor" vehicle without having to program it to the test vehicle's ignition key.

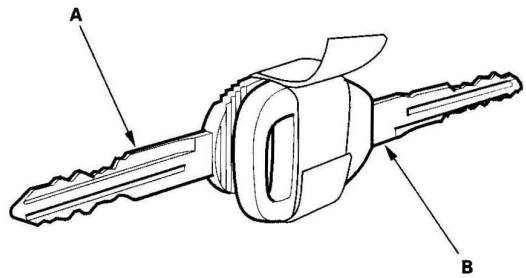
1. Cut a temporary ignition key for the test vehicle with a non-immobilizer key blank.

2. Remove the PCM from the test vehicle.

3. Write the test vehicle's VIN on the PCM you just removed to avoid confusing it with the donor vehicle's PCM.

4. Remove the known-good PCM from the donor vehicle, and install it in the test vehicle.

5. Tape the donor vehicle's ignition key head-to-head to the test vehicle's temporary key (A). The PCM will recognize the code from the donor vehicle's key (B) and allow you to start the engine with the temporary key.



6. After completing your tests, reinstall both PCMs, and destroy the temporary key.

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DTC Troubleshooting Index

DTC (MIL indication*)	Temporary DTC	Detection Item	Note
P0107 (3)	———	Manifold Absolute Pressure (MAP) Sensor Circuit Low Voltage	(see page 11-52)
P0108 (3)	———	Manifold Absolute Pressure (MAP) Sensor Circuit High Voltage	(see page 11-53)
P0112 (10)	———	Intake Air Temperature (IAT) Sensor Circuit Low Voltage	(see page 11-55)
P0113 (10)	———	Intake Air Temperature (IAT) Sensor Circuit High Voltage	(see page 11-56)
P0116 (86)	P0116	Engine Coolant Temperature (ECT) Sensor Range/ Performance Problem	(see page 11-57)
P0117 (6)	———	Engine Coolant Temperature (ECT) Sensor Circuit Low Voltage	(see page 11-57)
P0118 (6)	———	Engine Coolant Temperature (ECT) Sensor Circuit High Voltage	(see page 11-58)
P0122 (7)	———	Throttle Position (TP) Sensor Circuit Low Voltage	(see page 11-60)
P0123 (7)	———	Throttle Position (TP) Sensor Circuit High Voltage	(see page 11-62)
P0128 (87)	P0128	Cooling System Malfunction	(see page 11-64)
P0131 (1)	P0130	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Circuit Low Voltage	(see page 11-65)
P0132 (1)	P0130	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Circuit High Voltage	(see page 11-66)
P0133 (61)	P0133	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Slow Response	(see page 11-67)
P0135 (41)	———	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Heater Circuit Malfunction	(see page 11-71)
P0137 (63)	P0136	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) Circuit Low Voltage	(see page 11-68)
P0138 (63)	P0136	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) Circuit High Voltage	(see page 11-69)
P0139 (63)	P0136	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) Slow Response	(see page 11-70)
P0141 (65)	———	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) Heater Circuit Malfunction	(see page 11-71)
P0171 (45)	P0170	Fuel System Too Lean	(see page 11-73)
P0172 (45)	P0170	Fuel System Too Rich	(see page 11-73)
P0300 and some of P0301 (71) P0302 (72) P0303 (73) P0304 (74) P0305 (75) P0306 (76)	P1399	Random Misfire	(see page 11-74)

*: These DTCs are indicated by a blinking Malfunction Indicator Lamp (MIL) when the SCS service signal line is jumped with the Honda PGM Tester.
**: D5 indicator light and the MIL may come on simultaneously.

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DTC (MIL indication*)	Temporary DTC	Detection Item	Note
P0301 (71)	P1399	No. 1 Cylinder Misfire	(see page 11-75)
P0302 (72)	P1399	No. 2 Cylinder Misfire	(see page 11-75)
P0303 (73)	P1399	No. 3 Cylinder Misfire	(see page 11-75)
P0304 (74)	P1399	No. 4 Cylinder Misfire	(see page 11-75)
P0305 (75)	P1399	No. 5 Cylinder Misfire	(see page 11-75)
P0306 (76)	P1399	No. 6 Cylinder Misfire	(see page 11-75)
P0325 (23)	———	Knock Sensor Circuit Malfunction	(see page 11-80)
P0335 (4)	———	Crankshaft Position (CKP) Sensor No Signal	(see page 11-81)
P0336 (4)	———	Crankshaft Position (CKP) Sensor Intermittent Interruption	(see page 11-81)
P0401 (80)	P0401	Exhaust Gas Recirculation (EGR) Insufficient Flow	(see page 11-149)
P0420 (67)	P0420	Catalyst System Efficiency Below Threshold	(see page 11-148)
P0451 (91)	P0451	Fuel Tank Pressure (FTP) Sensor Range/ Performance Problem	(see page 11-156)
P0452 (91)	P0450	Fuel Tank Pressure (FTP) Sensor Circuit Low Voltage	(see page 11-157)
P0453 (91)	P0450	Fuel Tank Pressure (FTP) Sensor Circuit High Voltage	(see page 11-158)
P0505 (14)	P0505	Idle Control System Malfunction	(see page 11-102)
P07xx** (70) P0700***	———	Automatic Transaxle System Malfunction	Refer to the Automatic Transmission DTC Troubleshooting Index
P1106 (13)	P1106	Barometric Pressure (BARO) Sensor Range/ Performance Problem	(see page 11-83)
P1107 (13)	———	Barometric Pressure (BARO) Sensor Circuit Low Voltage	(see page 11-83)
P1108 (13)	———	Barometric Pressure (BARO) Sensor Circuit High Voltage	(see page 11-83)
P1121 (7)	P1121	Throttle Position (TP) Sensor Signal Lower Than Expected	(see page 11-63)
P1122 (7)	P1122	Throttle Position (TP) Sensor Signal Higher Than Expected	(see page 11-63)
P1128 (5)	P1128	Manifold Absolute Pressure (MAP) Sensor Signal Lower Than Expected	(see page 11-54)
P1129 (5)	P1129	Manifold Absolute Pressure (MAP) Sensor Signal Higher Than Expected	(see page 11-54)
P1259 (22)	———	VTEC System Malfunction	(see page 11-84)

*: These DTCs are indicated by a blinking MIL when the SCS service signal line is jumped with the Honda PGM Tester.

**: The D5 indicator light and the MIL may come on simultaneously.

***: DTC P0700 indicates that the MIL came on because an automatic transmission DTC was set. Go to the A/T menu on the Honda PGM Tester or the OBD II scan tool to check the A/T DTC and freeze data.

(cont'd)

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DTC Troubleshooting Index (cont'd)

DTC (MIL indication*)	Temporary DTC	Detection Item	Page
P1297 (20)	———	Electrical Load Detector (ELD) Circuit Low Voltage	(see page 11-88)
P1298 (20)	———	Electrical Load Detector (ELD) Circuit High Voltage	(see page 11-89)
P1361 (8)	———	Top Dead Center (TDC) 1 Sensor Intermittent Interruption	(see page 11-91)
P1362 (8)	———	Top Dead Center (TDC) 1 Sensor No Signal	(see page 11-91)
P1366 (58)	———	Top Dead Center (TDC) 2 Sensor Intermittent Interruption	(see page 11-91)
P1367 (58)	———	Top Dead Center (TDC) 2 Sensor No Signal	(see page 11-91)
P1456 (90)	P1456	Evaporative Emission (EVAP) Control System Leakage (Fuel Tank System)	(see page 11-160)
P1457 (90)	P1457	Evaporative Emission (EVAP) Control System Leakage (EVAP Canister System)	(see page 11-165)
P1491 (12)	P1491	Exhaust Gas Recirculation (EGR) Valve Insufficient Lift	(see page 11-149)
P1498 (12)	———	Exhaust Gas Recirculation (EGR) Valve Position Sensor Circuit High Voltage	(see page 11-153)
P1519 (14)	———	Idle Air Control (IAC) Valve Circuit Malfunction	(see page 11-103)
P1607 (—)	———	Powertrain Control Module (PCM) Internal Circuit Malfunction	(see page 11-92)
P1656 (70)	———	Automatic Transaxle System Malfunction	Refer to the Automatic Transmission DTC Troubleshooting Index
P17xx** (70)	(P17xx)	Automatic Transaxle System Malfunction	Refer to the Automatic Transmission DTC Troubleshooting Index

*: These DTCs are indicated by a blinking MIL when the SCS service signal line is jumped with the Honda PGM Tester.

**: The D5 indicator light and the MIL may come on simultaneously.

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Symptom Troubleshooting Index

These symptoms DO NOT trigger Diagnostic Trouble codes (DTCs) and cause the Malfunction Indicator Lamp (MIL) to come on. If the MIL is reported on, check for DTCs. If the vehicle has one of these symptoms, do the diagnostic procedure for it, in the sequence listed, until you find the cause.

Symptom	Diagnostic procedure	Also check for
Engine will not start (MIL works OK, no DTCs set)	1. Test the battery (see page 22-66). 2. Test the starter (see page 4-7). 3. Test the fuel pump (see page 11-120). 4. Troubleshoot the PGM-FI main relay circuit (see page 11-114).	• Low compression • No ignition spark • Intake air leaks • Locked up engine • Slipped/ broken timing belt • Contaminated fuel
Engine will not start (MIL comes on and stays on, or never comes on at all, no DTCs set)	Troubleshoot the MIL circuit (see page 11-93).	
Engine will not start (immobilizer indicator light comes on)	Troubleshoot the immobilizer system (see page 22-200).	
Hard starting (MIL works OK, no DTCs set)	1. Test the battery (see page 22-66). 2. Check the fuel pressure (see page 11-118).	• Low compression • Intake air leaks • Contaminated fuel
Cold fast idle too low (MIL works OK, no DTCs set)	Check/adjust the idle speed (see page 11-112).	
Cold fast idle too high (MIL works OK, no DTCs set)	1. Check/adjust the idle speed (see page 11-112). 2. Inspect/adjust the throttle cable (see page 11-139). 3. Inspect and test the throttle body (see page 11-136).	
Idle speed fluctuates (MIL works OK, no DTCs set)	1. Check/adjust the idle speed (see page 11-112). 2. Inspect/adjust the throttle cable (see page 11-139). 3. Inspect and test the throttle body (see page 11-136).	Intake air leaks
Low power (MIL works OK, no DTCs set)	1. Check the fuel pressure (see page 11-118). 2. Inspect and test the throttle body (see page 11-136). 3. Inspect/adjust the throttle cable (see page 11-139).	Low compression
Engine stalls (MIL works OK, no DTCs set)	1. Check the fuel pressure (see page 11-118). 2. Check/adjust the idle speed (see page 11-112). 3. Troubleshoot the brake pedal position switch signal circuit.	• Intake air leaks • Faulty harness and sensor connections
Difficult to refuel (MIL works OK, no DTCs set)	1. Test the fuel tank vapor control valve (see page 11-171). 2. Inspect the fuel tank vapor control signal tube between the fuel pipe and the fuel tank vapor control valve. 3. Inspect the fuel tank vapor vent tube between the EVAP canister and the fuel tank vapor control valve. 4. Check the EVAP canister.	Malfunction gas station filling nozzle.
Fuel overflows during refueling (No DTCs set)	Replace the fuel tank vapor control valve (see page 11-173).	Malfunction gas station filling nozzle.

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System Descriptions

Electronic Control System

The functions of the fuel and emission control systems are managed by the powertrain control module (PCM).

Fail-safe Function
When an abnormality occurs in the signal from a sensor, the PCM ignores that signal and assumes a pre-programmed value for that sensor that allows the engine to continue to run.

Back-up Function
When an abnormality occurs in the PCM, the injectors are controlled by a back-up circuit independent of the system in order to permit minimal driving.

Self-diagnosis
When an abnormality occurs in the signal from a sensor, the PCM supplies ground for the Malfunction Indicator Lamp (MIL) and stores the Diagnostic Trouble Code (DTC) in erasable memory. When the ignition is first turned on, the PCM supplies ground to the MIL for 15 to 20 seconds to check the MIL bulb condition.

Two Driving Cycle Detection Method
To prevent false indications, the "two driving cycle detection method" is used for some self-diagnostic functions. When an abnormality occurs, the PCM stores it in its memory. When the same abnormality recurs after the ignition switch is turned OFF and ON (II) again, the PCM turns on the MIL.

BACK

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PCM Data

You can retrieve data from the PCM by connecting the OBD II scan tool or the Honda PGM Tester to the Data Link Connector (DLC). The items listed in the table below conform to SAE recommended practice. The Honda PGM Tester also reads data beyond that recommended by SAE to help you find the causes of intermittent problems.

NOTE:
- The "operating values" listed are approximate and may vary depending on the environment and the individual vehicle.
- Unless noted otherwise, "at idle speed" means idling with the engine completely warmed up, A/T in Park or neutral position, and the A/C and all accessories turned off.

Data	Description	Operating Value	Freeze Data
Diagnostic Trouble Code (DTC)	If the PCM detects a problem, it will store it as a code consisting of one letter and four numbers. Depending on the problem, an SAE-defined code (P0xxx) or a Honda-defined code (P1xxx) will be output to the tester.	If no problem is detected, there is no output.	YES
Engine Speed	The PCM computes engine speed from the signals sent from the crankshaft position (CKP) sensor. This data is used for determining the time and amount of injected fuel.	Nearly the same as tachometer indication At idle speed: 730±50 rpm	YES
Vehicle Speed	The PCM converts pulse signals from the countershaft speed sensor into speed data.	Nearly the same as speedometer indication	YES
Manifold Absolute Pressure (MAP)	The absolute pressure caused in the intake manifold by engine load and speed.	With engine stopped: Nearly the same as atmospheric pressure At idle speed: 20−34 kPa (150−260 mmHg, 6−10 in.Hg), 0.7−1.1 V	YES
Engine Coolant Temperature (ECT)	The ECT sensor converts coolant temperature into voltage and signals the PCM. The sensor is a thermistor whose internal resistance changes with coolant temperature. The PCM uses the voltage signals from the ECT sensor to determine the amount of injected fuel.	With cold engine: Same as ambient temperature and intake air temperature (IAT) With engine warmed up: about 176−212°F (80−100°C), 0.5−0.8 V	YES
Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1), Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2)	The HO2S detects the oxygen content in the exhaust gas and sends voltage signals to the PCM. Based on these signals, the PCM controls the air fuel ratio. When the oxygen content is high (that is, when the ratio is leaner than the stoichiometric ratio), the voltage signal is lower. When the oxygen content is low (that is, when the ratio is richer than the stoichiometric ratio), the voltage signal is higher.	0.0−1.25 V At idle speed: about 0.1−0.9 V	NO

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System Descriptions (cont'd)

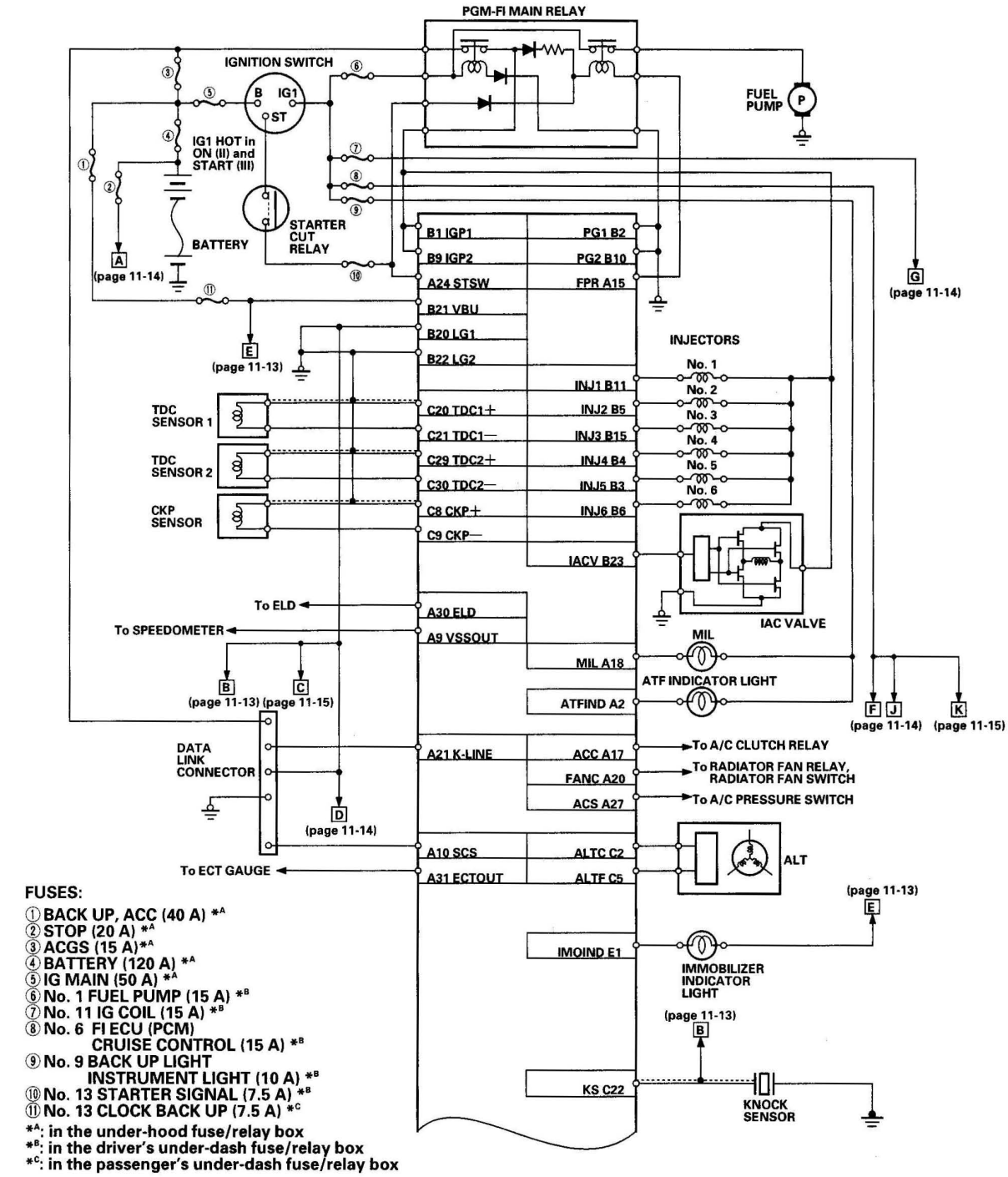
PCM Data (cont'd)

Data	Description	Operating Value	Freeze Data
Fuel System Status	Fuel system status is indicated as "open" or "closed". Closed: Based on the HO2S output, the PCM determines the air/fuel ratio and controls the amount of injected fuel. Open: Ignoring HO2S output, the PCM refers to signals from the throttle position (TP), manifold absolute pressure (MAP), intake air temperature (IAT), barometric pressure (BARO) and engine coolant temperature (ECT) sensors to control the amount of injected fuel.	At idle speed: closed	YES
Short Term Fuel Trim	The air/fuel ratio correction coefficient for correcting the amount of injected fuel when the Fuel System Status is "closed." When the ratio is leaner than the stoichiometric ratio, the PCM increase short term fuel trim gradually, and the amount of injected fuel increases. The air fuel ratio gradually gets richer, causing a lower oxygen content in the exhaust gas. Consequently, the short term fuel trim is lowered, and the PCM reduces the amount of injected fuel. This cycle keeps the air/fuel ratio close to the stoichiometric ratio when in closed loop status.	0.7 – 1.5	YES
Long Term Fuel Trim	Long term fuel trim is computed from short term fuel trim and indicates changes occurring in the fuel supply system over a long period. If long term fuel trim is higher than 1.00, the amount of injected fuel must be increased. If it is lower than 1.00, the amount of injected fuel must be reduced.	0.8 – 1.2	YES
Intake Air Temperature (IAT)	The IAT sensor converts intake air temperature into voltage and signals the PCM. When intake air temperature is low, the internal resistance of the sensor increases, and the voltage signal is higher.	With cold engine: Same as ambient temperature and ECT	YES
Throttle Position	Based on the accelerator pedal position, the opening angle of the throttle valve is indicated.	At idle speed: about 10 %	YES
Ignition Timing	Ignition timing is the ignition advance angle set by the PCM. The PCM matches ignition timing to the driving conditions.	At idle speed: 10° ± 2° BTDC with the SCS service signal jumped	NO
Calculated Load Value (CLV)	CLV is the engine load calculated from the MAP data.	At idle speed: 16 – 33 % At 2,500 rpm with no load: 18 – 26 %	YES

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PCM Electrical Connections



FUSES:

① BACK UP, ACC (40 A) *A
② STOP (20 A) *A
③ ACGS (15 A)*A
④ BATTERY (120 A) *A
⑤ IG MAIN (50 A) *A
⑥ No. 1 FUEL PUMP (15 A) *B
⑦ No. 11 IG COIL (15 A) *B
⑧ No. 6 FI ECU (PCM)
CRUISE CONTROL (15 A) *B
⑨ No. 9 BACK UP LIGHT
INSTRUMENT LIGHT (10 A) *B
⑩ No. 13 STARTER SIGNAL (7.5 A) *B
⑪ No. 13 CLOCK BACK UP (7.5 A) *C

*A: in the under-hood fuse/relay box
*B: in the driver's under-dash fuse/relay box
*C: in the passenger's under-dash fuse/relay box

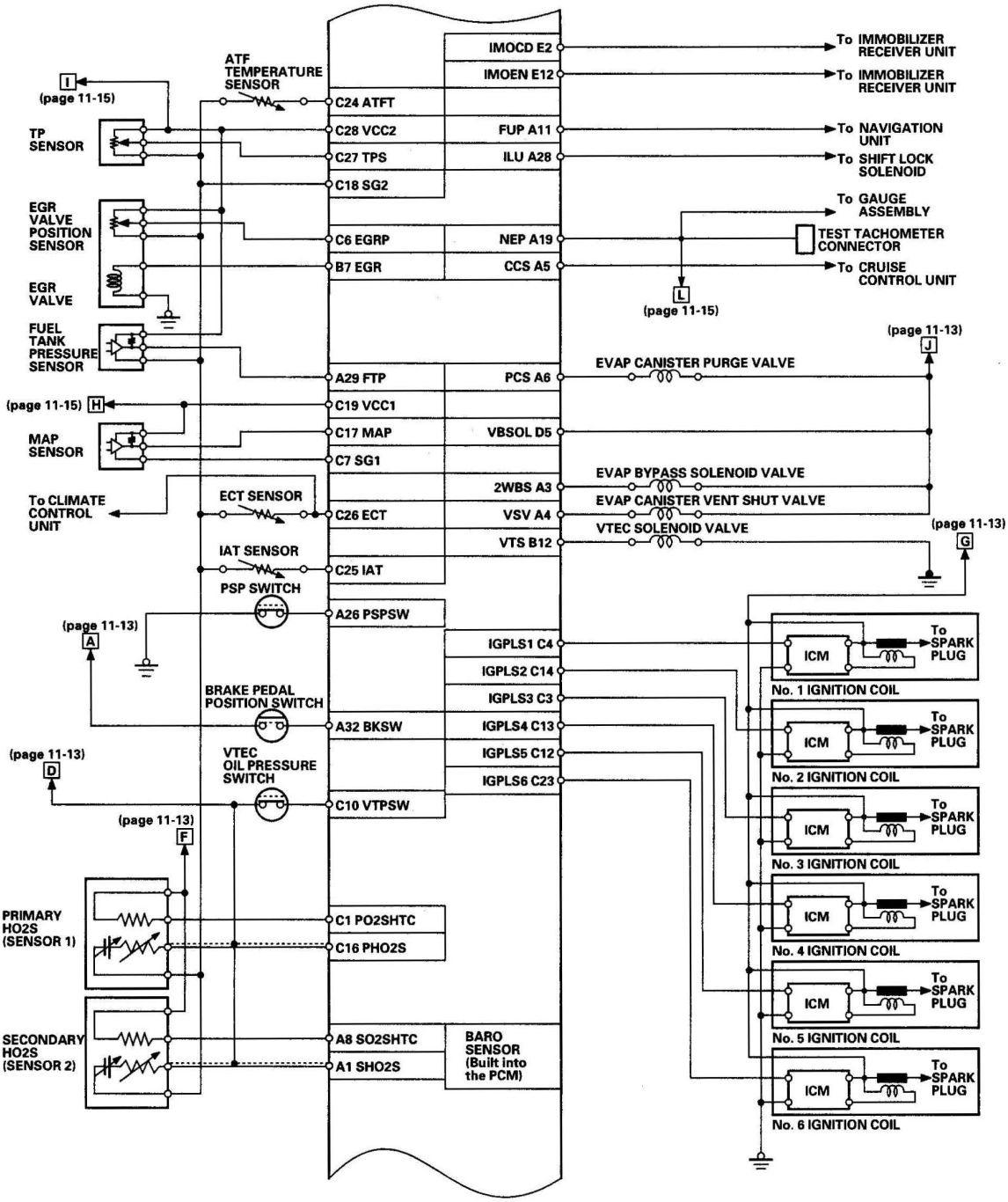
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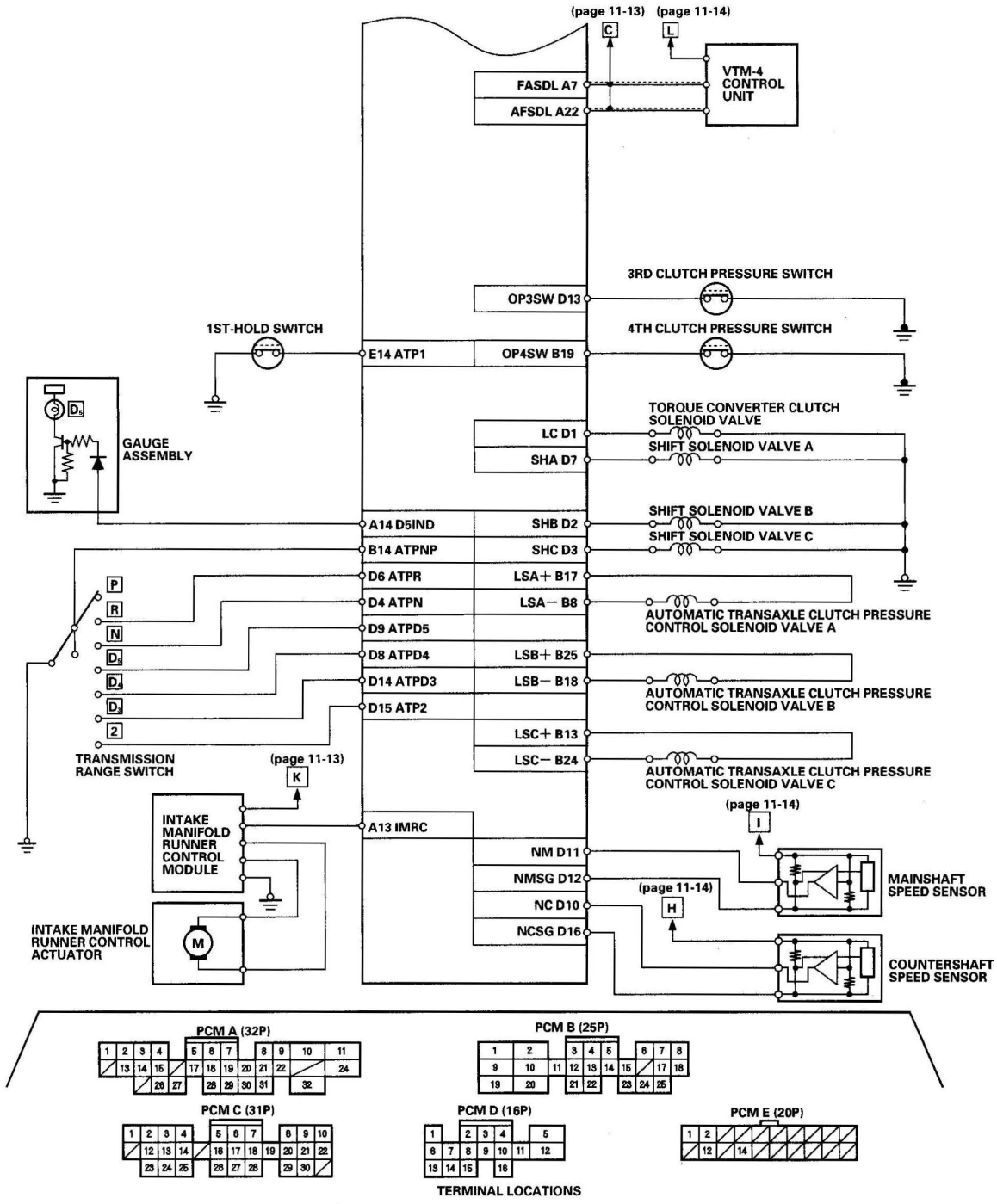
System Descriptions (cont'd)

PCM Electrical Connections (cont'd)



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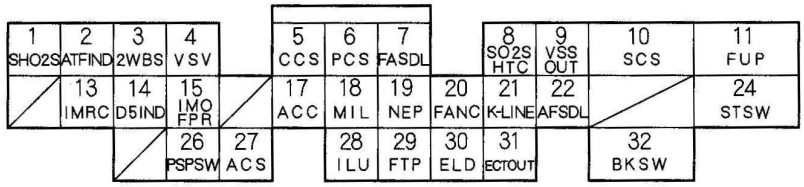
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BACK

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System Descriptions (cont'd)

PCM Inputs and Outputs at Connector A (32P)



Wire side of female terminals

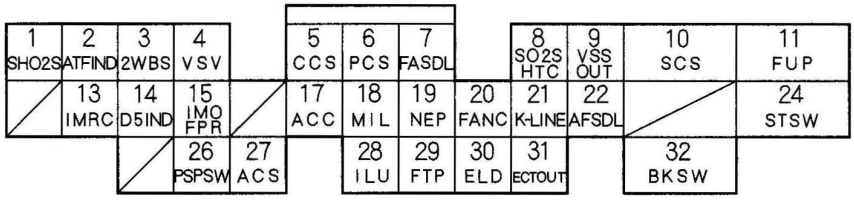
NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	WHT/RED	SHO2S (SECONDARY HEATED OXYGEN SENSOR, SENSOR 2)	Detected secondary heated oxygen sensor (sensor 2) signal	With throttle fully opened from idle with fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
2	RED/GRN	ATFIND (ATF INDICATOR LIGHT)	Drives ATF indicator light	With ATF indicator turned ON: above 0 V With ATF indicator turned OFF: battery voltage
3	ORN/WHT	2WBS (EVAPORATIVE EMISSION (EVAP) BYPASS SOLENOID VALVE)	Drives EVAP bypass solenoid valve	With ignition switch ON (II): battery voltage
4	LT GRN/WHT	VSV (EVEPORATIVE EMISSION (EVAP) CANISTER VENT SHUT VALVE)	Drives EVAP canister vent shut valve	With ignition switch ON (II): battery voltage
5	BLU/GRN	CCS (CRUISE CONTROL SIGNAL)	Detects cruise control signal	With ignition switch ON (II): 0 V
6	RED/YEL	PCS (EVAPOTARATIVE EMISSION (EVAP) CANISTER PURGE VALVE)	Drive EVAP canister purge valve	With engine running, engine coolant, below 147°F (64°C): battery voltage With engine running, engine coolant, above 147°F (64°C): duty controlled
7	BLK	FASDL (SERIAL DATA LINE)	Communicates with VTM-4 control unit	With ignition with ON (II): pulses
8	BLK/WHT	SO2SHTC (SECONDARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives secondary HO2S heater	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
9	BLU/WHT	VSSOUT (VEHICLE SPEED SIGNAL OUTPUT)	Sends vehicle speed signal	With ignition switch ON (II) and front wheel rotating: cycles about 0 V – 5 V or battery voltage
10	BRN	SCS (SERVICE CHECK SIGNAL)	Detects service check signal	With the service check signal shorted with the PGM Tester: about 0 V With the service check signal opened: about 5 V or battery voltage
11	PNK	FUP	Communicates with navigation unit	Depending on the vehicle speed: pulses
13	GRN/WHT	IMRC (INTAKE MANIFOLD RUNNER CONTROL)	Sends driving signal to intake manifold runner control solenoid valve	With engine speed above 3,400 rpm: about 0 V With engine speed below 3,200 rpm: about 5 V
14	GRN/BLK	D5IND (D5 INDICATOR)	Drives D5 indicator light	With D5 indicator light turned ON: above 0 V With D5 indicator light turned OFF: about 0 V
15	GRN/YEL	IMOFPR (IMMOBILIZER FUEL PUMP RELAY)	Drives fuel pump relay	0 V for 2 seconds after turning ignition switch ON (II), then battery voltage
17	RED	ACC (A/C COMPRESSOR CLUTCH RELAY)	Drives compressor clutch relay	With compressor ON: about 0 V With compressor OFF: battery voltage

BACK

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PCM Inputs and Outputs at Connector A (32P)



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
18	GRN/ORN	MIL (MALFUNCTION INDICATOR LAMP)	Drives MIL	With MIL turned ON: about 0 V With MIL turned OFF: battery voltage
19	GRN/BLU	NEP (ENGINE SPEED PULSE)	Outputs engine speed pulse	With engine running: pulses
20	GRN	FANC (RADIATOR FAN CONTROL)	Drive radiator fan relay	With radiator fan running: about 0 V With radiator fan stopped: battery voltage
21	GRY	K-LINE	Sends and receives scan tool signal	With ignition switch ON (II): pulses or battery voltage
22	WHT	AFSDL (SERIAL DATA LINE)	Communicates with the VTM-4 control unit	With ignition switch ON (II): pulses
24	BLU/ORN	STSW (STARTER SWITCH)	Detects starter switch signal	With ignition switch START (III): battery voltage With ignition switch OFF: about 0 V
26	LT BLU	PSPSW (POWER STEERING PRESSURE SWITCH)	Detects power steering pressure switch signal	At idle with steering wheel in straight ahead position: about 0 V At idle with steering wheel at full lock: battery voltage
27	BLU/RED	ACS (A/C SWITCH)	Detects A/C switch signal	With A/C switch ON: about 0 V With A/C switch OFF: about 5 V or battery voltage
28	WHT/GRN	ILU (INTERLOCK CONTROL UNIT)	Drives interlock control unit	With ignition switch ON (II) and brake pedal pressed: about 0 V
29	LT GRN	FTP (FUEL TANK PRESSURE)	Detects FTP sensor signal	With ignition switch ON (II) and fuel fill cap opened: about 2.5 V
30	GRN/RED	ELD (ELECTRICAL LOAD DETECTOR)	Detects ELD signal	With ignition switch ON (II): about 0.1 – 4.8 V (depending on electrical load)
31	YEL/GRN	ECTOUT (ENGINE COOLANT TEMPERATURE SIGNAL OUTPUT)	Sends ECT signal to ECT gauge	With ignition switch ON (II): duty controlled
32	WHT/BLK	BKSW (BRAKE PEDAL POSITION SWITCH)	Detects brake pedal position switch signal	With brake pedal released: about 0 V With brake pedal pressed: battery voltage

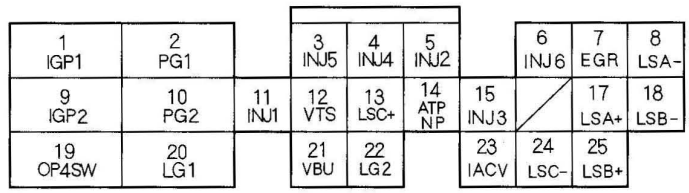
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BACK

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System Descriptions (cont'd)

PCM Inputs and Outputs at Connector B (25P)



Wire side of female terminals

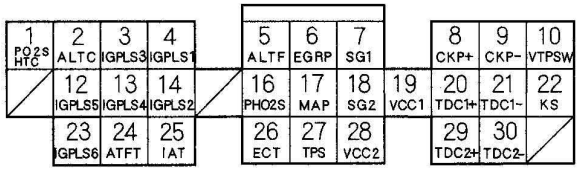
NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	YEL/BLK	IGP1 (POWER SOURCE)	Power source for the PCM circuit	With ignition switch ON (II): battery voltage With ignition switch OFF: about 0 V
2	BLK	PG1 (POWER GROUND)	Ground for the PCM circuit	Less than 1.0 V at all times
3	BLK/RED	INJ5 (No. 5 INJECTOR)	Drives No. 5 injector	With ignition switch ON (II): battery voltage At idle: duty controlled
4	YEL	INJ4 (No. 4 INJECTOR)	Drives No. 4 injector	
5	RED	INJ2 (No. 2 INJECTOR)	Drives No. 2 injector	
6	WHT/BLU	INJ6 (No. 6 INJECTOR)	Drives No. 6 injector	
7	BLU/RED	EGR (EXHAUST GAS RECIRCULATION (EGR) VALVE)	Drives EGR valve	With EGR operating: duty controlled With EGR not operating: about 0 V
8	WHT	LSA− (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A − SIDE)	A/T clutch pressure control solenoid valve A power supply negative terminal	With ignition switch ON (II): duty controlled
9	YEL/BLK	IGP2 (POWER SOURCE)	Power source for the PCM circuit	With the ignition switch ON (II): battery voltage With the ignition switch OFF: 0 V
10	BLK	PG2 (POWER GROUND)	Ground for the PCM circuit	Less than 1.0 V at all times
11	BRN	INJ1 (No.1 INJECTOR)	Drives No.1 injector	With ignition switch ON (II): battery voltage At idle: duty controlled
12	GRN/YEL	VTS (VTEC SOLENOID VALVE)	Drives VTEC solenoid valve	At idle: about 0 V
13	GRN/RED	LSC+ (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C + SIDE)	A/T clutch pressure control solenoid valve C power supply positive electrode	With ignition switch ON (II): duty controlled
14	BLU/WHT	ATPNP (TRANSMISSION RANGE SWITCH)	Detects transmission range switch signal	In Park or neutral: about 0 V In any other position: about 5 V or battery voltage
15	BLU	INJ3 (No. 3 INJECTOR)	Drives No. 3 injector	With ignition switch ON (II): battery voltage At idle: duty controlled
17	RED	LSA+ (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A + SIDE)	A/T clutch pressure control solenoid valve A power supply positive electrode	With the ignition switch ON (II): duty controlled
18	GRN	LSB− (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B − SIDE)	A/T clutch pressure control solenoid valve B power supply negative terminal	With ignition switch ON (II): duty controlled
19	BLU/YEL	OP4SW (4TH OIL PRESSURE SWITCH)	Detects 4th oil pressure switch	With ignition switch ON (II): battery voltage
20	BRN/YEL	LG1 (LOGIC GROUND)	Ground for the PCM circuit	Less than 1.0 V at all times
21	WHT/RED	VBU (VOLTAGE BACK UP)	Power source for the PCM memory	Battery voltage at all times
22	BRN/YEL	LG2 (LOGIC GROUND)	Ground for the PCM circuit	Less than 1.0 V at all times
23	BLK/RED	IACV (IDLE AIR CONTROL (IAC) VALVE)	Drives IAC valve	At idle: duty controlled
24	RED/BLU	LSC− (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C − SIDE)	A/T clutch pressure control solenoid valve C power supply negative terminal	With ignition switch ON (II): duty controlled
25	BRN/WHT	LSB+ (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B + SIDE)	A/T clutch pressure control solenoid valve B power supply positive terminal	With the ignition switch ON (II): duty controlled

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PCM Inputs and Outputs at connector C (31P)



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

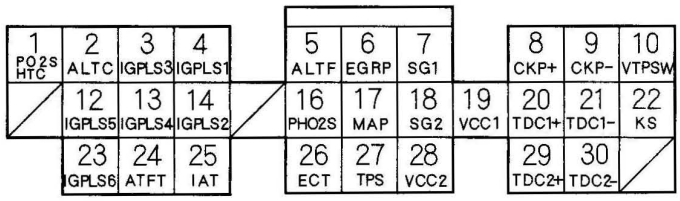
Terminal number	Wire color	Terminal name	Description	Signal
1	BLK/WHT	PO2SHTC (PRIMARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives primary HO2S heater	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
2	WHT/GRN	ALTC (ALTERNATOR CONTROL)	Sends alternator control signal	With engine running: about 0 V – 5 V (depending on electrical load)
3	WHT/BLU	IGPLS 3 (No. 3 IGNITION COIL PULSE)	Drives No. 3 ignition coil	With ignition switch ON (II): 0 V With engine running: pulses
4	YEL/GRN	IGPLS 1 (No. 1 IGNITION COIL PULSE)	Drives No. 1 ignition coil	With ignition switch ON (II): 0 V With engine running: pulses
5	WHT/RED	ALTF (ALTERNATOR FR SIGNAL)	Detects alternator FR signal	With engine running: about 0 V – 5 V (depending on electrical load)
6	WHT/BLK	EGRP (EXHAUST GAS RECIRCULATION VALVE POSITION SENSOR)	Detects EGR valve position sensor signal	With engine running: about 1.2 V – 2.0 V (depending on EGR valve lift)
7	GRN/WHT	SG1 (SENSOR GROUND)	Sensor ground	Less than 1.0 V at all times
8	BLU	CKP+ (CRANKSHAFT POSITION SENSOR + SIDE)	Detects CKP sensor signal	With engine running: pulses
9	WHT	CKP– (CRANKSHAFT POSITION SENSOR – SIDE)	Ground for CKP sensor	
10	BLU/BLK	VTPSW (VTEC OIL PRESSURE SWITCH)	Detects VTEC oil pressure switch signal	At idle: about 0 V
12	BLK/RED	IGPLS 5 (No. 5 IGNITION COIL PULSE)	Drives No. 5 ignition coil	With ignition switch ON (II): 0 V With engine running: pulses
13	BRN	IGPLS 4 (No. 4 IGNITION COIL PULSE)	Drives No. 4 ignition coil	With ignition switch ON (II): 0 V With engine running: pulses
14	BLU/RED	IGPLS 2 (No. 2 IGNITION COIL PULSE)	Drives No. 2 ignition coil	With ignition switch ON (II): 0 V With engine running: pulses
16	WHT	PHO2S (PRIMARY HEATED OXYGEN SENSOR, SENSOR 1)	Detects primary HO2S (sensor 1) signal	With throttle fully opened from idle with fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
17	GRN/RED	MAP (MANIFOLD ABSOLUTE PRESSURE SENSOR)	Detects MAP sensor signal	With ignition switch ON (II): about 3 V At idle: above 1.0 V
18	GRN/YEL	SG2 (SENSOR GROUND)	Sensor ground	Less than 1.0 V at all times
19	YEL/RED	VCC1 (SENSOR VOLTAGE)	Provides sensor voltage	With ignition switch ON (II): about 5 V With ignition switch OFF: about 0 V
20	GRN	TDC+ (TOP DEAD CENTER 1 SENSOR + SIDE)	Detects TDC1 sensor signal	With engine running: pulses
21	RED	TDC– (TOP DEAD CENTER 1 SENSOR – SIDE)	Ground for TDC1 sensor	
22	RED/BLU	KS (KNOCK SENSOR)	Detects knock sensor signal	With engine knocking: pulses
23	BRN/WHT	IGPLS 6 (No. 6 IGNITION COIL PULSE)	Drives No. 6 ignition coil	With ignition switch ON (II): 0 V With engine running: pulses
24	BLU/YEL	ATFT (ATF TEMPERATURE SENSOR)	Sends ATF signal	With ignition switch ON (II): about 0.1 – 4.2 V (depending on ATF temperature)

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System Descriptions (cont'd)

PCM Inputs and Outputs at connector C (31P)



Wire side of female terminals

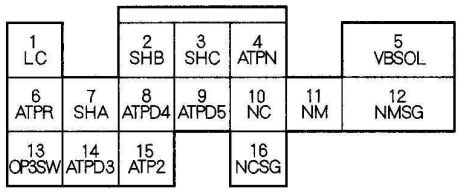
NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
25	RED/YEL	IAT (INTAKE AIR TEMPERATURE SENSOR)	Detects IAT sensor signal	With ignition switch ON (II): about 0.1 – 4.8 V (depending on intake air temperature)
26	RED/WHT	ECT (ENGINE COOLANT TEMPERATURE SENSOR)	Detects ECT sensor signal	With ignition switch ON (II): about 0.1 – 4.8 V (depending on engine coolant temperature)
27	RED/BLK	TPS (THROTTLE POSITION SENSOR)	Detects TP sensor signal	With throttle fully open: about 4.8 V With throttle fully closed: about 0.5 V
28	YEL/BLU	VCC2 (SENSOR VOLTAGE)	Provides sensor voltage	With ignition switch ON (II): about 5 V With ignition switch OFF: about 0 V
29	YEL	TDC2+ (TOP DEAD CENTER 2 SENSOR + SIDE)	Detects TDC2 sensor signal	With engine running: pulses
30	BLK	TDC2 – (TOP DEAD CENTER 2 SENSOR – SIDE)	Ground for TDC2 sensor	

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PCM Inputs and Outputs at Connector D (16P)



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

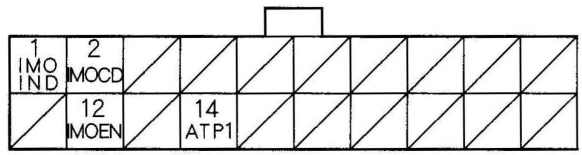
Terminal number	Wire color	Terminal name	Description	Signal
1	YEL	LC (TORQUE CONVERTER CLUTCH SOLENOID VALVE)	Drives torque converter clutch solenoid valve	With lock-up ON: battery voltage With lock-up OFF: about 0 V
2	GRN/WHT	SHB (SHIFT CONTROL SOLENOID VALVE B)	Drives shift control solenoid valve B	With engine running in 1st, 2nd gears: battery voltage With engine running in 3rd, 4th gears: about 0 V
3	GRN	SHC (SHIFT CONTROL SOLENOID VALVE C)	Drives shift control solenoid valve C	With engine running in 1st and 3rd gears: battery voltage With engine running in 2nd and 4th gears: about 0 V
4	RED/BLK	ATPN (TRANSMISSION RANGE SWITCH)	Detects transmission range switch signal	In neutral position: about 0 V In any other position: about 5 V or battery voltage
5	BLK/YEL	VBSOL (POWER SOURCE FOR SOLENOID VALVE)	Power source for solenoid valve	With ignition switch ON (II): battery voltage
6	WHT	ATPR (TRANSMISSION RANGE SWITCH)	Detects transmission range switch signal	In R position: about 0 V In any other position: about 5 V or battery voltage
7	BLU/YEL	SHA (SHIFT CONTROL SOLENOID VALVE A)	Drives shift control solenoid valve A	With engine running in 2nd, 3rd gears: battery voltage With engine running in 1st, 4th gears: about 0 V
8	YEL	ATPD4 (TRANSMISSION RANGE SWITCH)	Detects transmission range switch signal	In D4 position: about 0 V In any other position: about 5 V or battery voltage
9	YEL/GRN	ATPD5 (TRANSMISSION RANGE SWITCH)	Detects transmission range switch signal	In D5 position: about 0 V In any other position: about 5 V or battery voltage
10	BLU	NC (COUNTERSHAFT SPEED SENSOR)	Detects countershaft speed sensor signals	With ignition switch ON (II), and front wheels rotating: battery voltage
11	RED	NM (MAINSHAFT SPEED SENSOR)	Detects mainshaft speed sensor signals	With engine running: pulses
12	WHT	NMSG (MAINSHAFT SPEED SENSOR GROUND)	Ground for mainshaft speed sensor	
13	BLU/WHT	OP3SW (3RD OIL PRESSURE SWITCH)	Detects 3rd oil pressure switch	With ignition switch ON (II): battery voltage
14	RED	ATPD3 (TRANSMISSION RANGE SWITCH)	Detects transmission range switch signal	In D3 position: about 0 V In any other position: about 5 V or battery voltage
15	BLU	ATP2 (TRANSMISSION RANGE SWITCH)	Detects transmission range switch signal	In 2nd position: about 0 V In any other position: about 5 V or battery voltage
16	GRN	NCSG (COUNTERSHAFT SPEED SENSOR GROUND)	Ground for countershaft speed sensor	

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System Descriptions (cont'd)

PCM Inputs and Outputs at Connector E (20P)



Wire side of female terminals

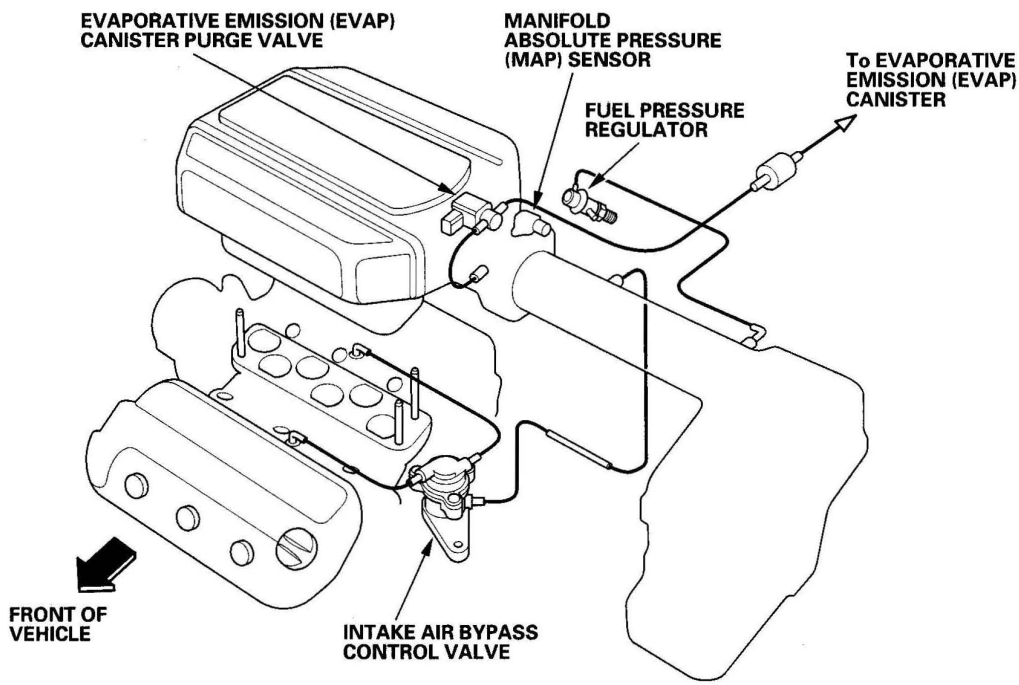
NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	PNK	IMOIND (IMMOBILIZER INDICATOR LIGHT)	Drivers immobilizer indicator light	With immobilizer indicator light turned ON: about 0 V With immobilizer indicator light turned OFF: battery voltage
2	RED	IMOCD (IMMOBILIZER CODE)	Detects immobilizer signal	
12	BLU	IMOEN (IMMOBILIZER ENABLE SIGNAL)	Sends immobilizer enable signal	
14	BRN	ATP1 (1ST-HOLD SWITCH)	Detects 1st-hold switch signal	With 1st-hold switch ON: about 0 V With 1st-hold switch OFF: battery voltage

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Vacuum Hose Routing

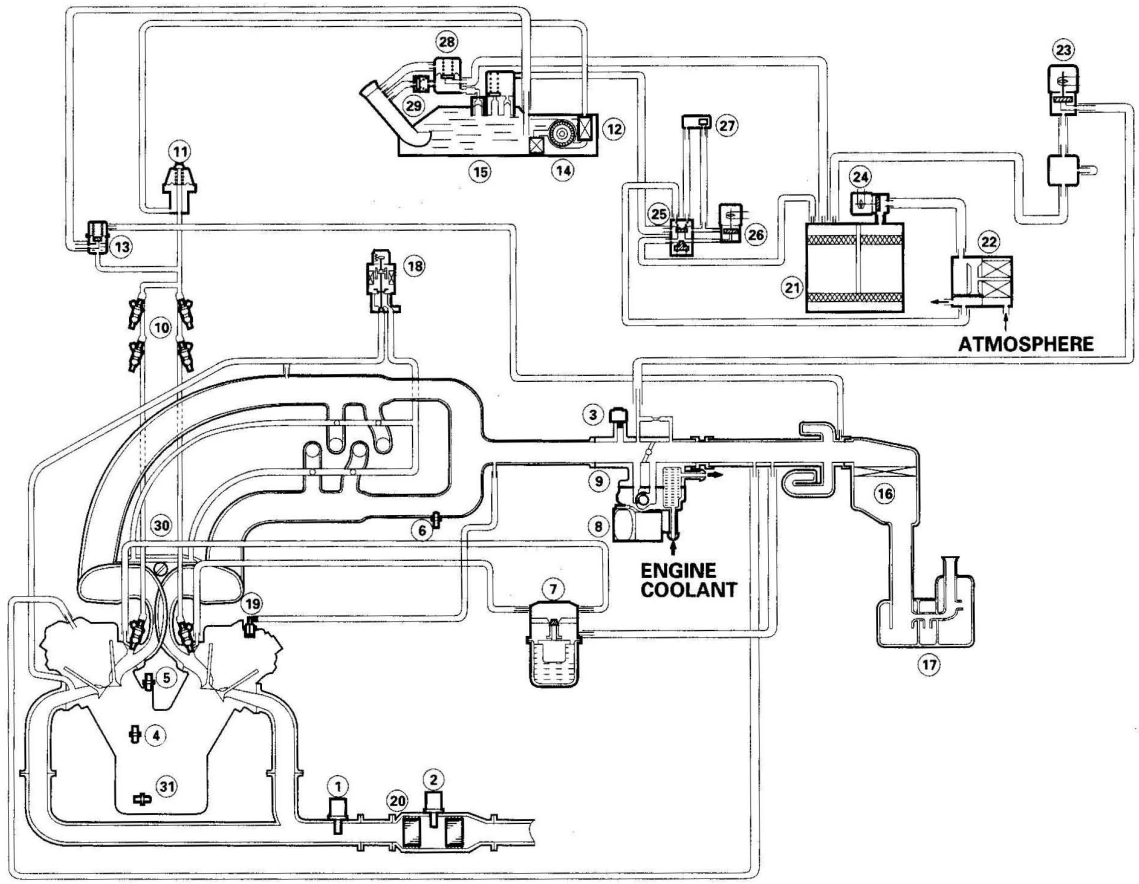


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System Descriptions (cont'd)

Vacuum Distribution



① PRIMARY HEATED OXYGEN SENSOR (PRIMARY HO2S) (SENSOR 1)
② SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) (SENSOR 2)
③ MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
④ ENGINE COOLANT TEMPERATURE (ECT) SENSOR
⑤ KNOCK SENSOR
⑥ INTAKE AIR TEMPERATURE (IAT) SENSOR
⑦ INTAKE AIR BYPASS CONTROL VALVE
⑧ IDLE AIR CONTROL (IAC) VALVE
⑨ THROTTLE BODY
⑩ INJECTOR
⑪ FUEL PULSATION DAMPER
⑫ FUEL FILTER
⑬ FUEL PRESSURE REGULATOR
⑭ FUEL PUMP
⑮ FUEL TANK
⑯ AIR CLEANER
⑰ RESONATOR
⑱ EXHAUST GAS RECIRCULATION (EGR) VALVE and POSITION SENSOR
⑲ POSITIVE CRANKCASE VENTILATION (PCV) VALVE
⑳ THREE WAY CATALYTIC CONVERTER
㉑ EVAPORATIVE EMISSION (EVAP) CANISTER
㉒ EVAPORATIVE EMISSION (EVAP) CANISTER FILTER
㉓ EVAPORATIVE EMISSION (EVAP) CANISTER PURGE VALVE
㉔ EVAPORATIVE EMISSION (EVAP) CANISTER VENT SHUT VALVE
㉕ EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE
㉖ EVAPORATIVE EMISSION (EVAP) BYPASS SOLENOID VALVE
㉗ FUEL TANK PRESSURE (FTP) SENSOR
㉘ FUEL TANK VAPOR CONTROL VALVE
㉙ FUEL TANK VAPOR RECIRCULATION VALVE
㉚ INTAKE MANIFOLD RUNNER CONTROL (IMRC) VALVE
㉛ ATF TEMPERATURE SENSOR

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PGM-FI System

The Programmed Fuel Injection (PGM-FI) system is a sequential multiport fuel injection system.

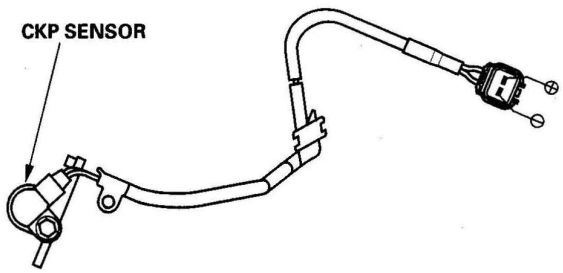
Alternator Control
The alternator signals the PCM during charging. The PCM then controls the voltage generated at the alternator according to the electrical load determined by the electrical load detector (ELD) and driving mode. This reduces engine load to improve fuel economy.

A/C Compressor Clutch Relay
When the PCM receives a demand for cooling from the A/C system, it delays the compressor from being energized, and enriches the mixture to assure smooth transition to the A/C mode.

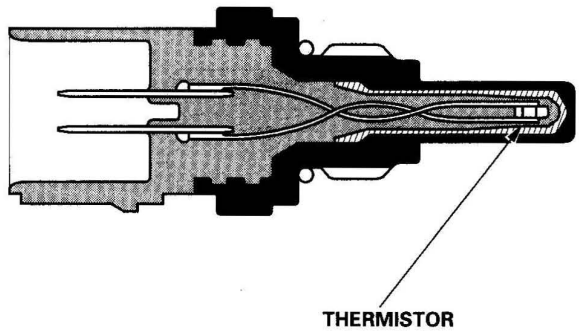
A/C Switch
The A/C (air conditioning) switch signals the PCM whenever there is a demand for cooling.

Barometric Pressure (BARO) Sensor
The BARO sensor is inside the PCM. It converts atmospheric pressure into a voltage signal that modifies the basic duration of the fuel injection discharge.

Crankshaft Position (CKP) Sensor
The CKP sensor determines timing for fuel injection of each cylinder and also detects engine speed and misfire.



Engine Coolant Temperature (ECT) Sensor
The ECT sensor is a temperature dependent resistor (thermistor). The resistance of the thermistor decreases as the engine coolant temperature increases.



Ignition Timing Control
The PCM contains the memory for basic ignition timing at various engine speeds and manifold absolute pressure. It also adjusts the timing according to engine coolant temperature.

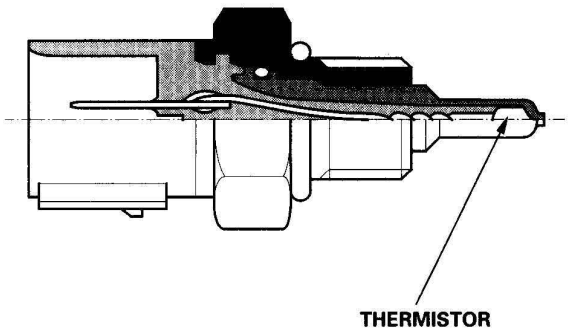
Injector Timing and Duration
The PCM contains the memory for basic discharge duration at various engine speeds and manifold pressures. The basic discharge duration, after being read out from the memory, is further modified by signals sent from various sensors to obtain the final discharge duration.
By monitoring Long Term Fuel Trim, the PCM detects long term malfunctions in the fuel system, and will set a Diagnostic Trouble Code (DTC).

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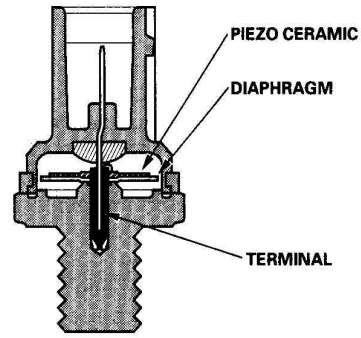
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System Descriptions (cont'd)

Intake Air Temperature (IAT) Sensor
The IAT sensor is a temperature dependent resistor (thermistor). The resistance of the thermistor decreases as the intake air temperature increases.



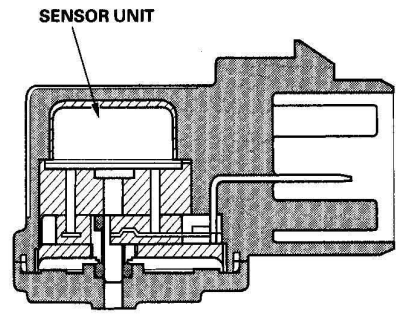
Knock Sensor
The knock control system adjusts the ignition timing to minimize knock



Malfunction Indicator Lamp (MIL) Indication (In relation to Readiness Codes)
The vehicle has certain "readiness codes" that are part of the on-board diagnostics for the emissions systems. If the vehicle's battery has been disconnected or gone dead, if the DTCs have been cleared, or if the PCM has been reset, these codes are reset. In some states, part of the emissions testing is to make sure these codes are set to complete. If all of them are not set to complete, the test cannot be finished.

To check if the readiness codes are set, turn the ignition switch ON (II), but do not start the engine. The MIL will come on for 15—20 seconds. If it then goes off, the readiness codes are set. If it blinks several times, one or more readiness codes are not set to complete. To set each code, drive the vehicle or run the engine as described in the procedures to set them in this section (see page 11-47).

Manifold Absolute Pressure (MAP) Sensor
The MAP sensor converts manifold absolute pressure into electrical signals to the PCM.

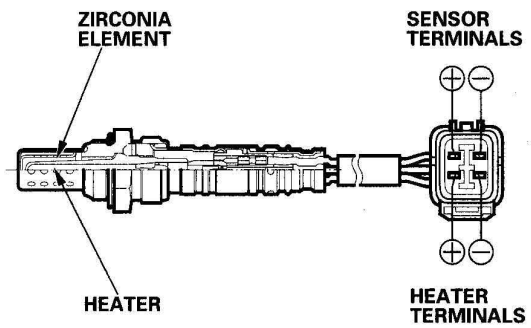


Primary Heated Oxygen Sensor (Primary HO2S)
The primary HO2S detects the oxygen content in the exhaust gas and sends signals to the PCM which varies

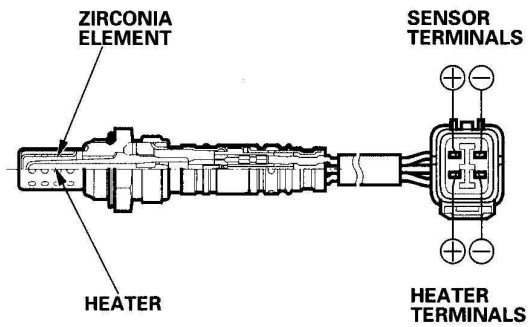
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the duration of fuel injection accordingly. To stabilize its output, the sensor has an internal heater. The primary HO2S is installed in the exhaust manifold. By controlling the air fuel ratio with primary HO2S and secondary HO2S, the deterioration of the primary HO2S can be evaluated by its feedback period. When the feedback period exceeds a certain value during stable driving conditions, the sensor is considered deteriorated and the PCM sets a DTC.

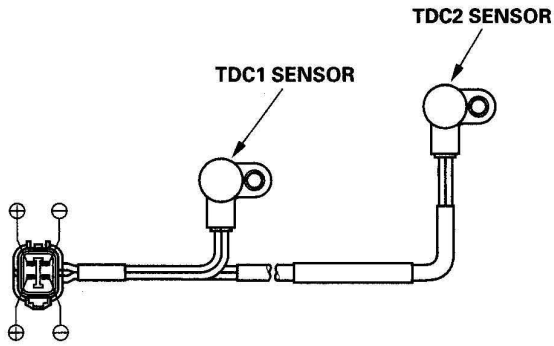


Secondary Heated Oxygen sensor (Secondary HO2S)
The secondary HO2S detects the oxygen content in the exhaust gas in the downstream of the Three Way Catalytic Converter (TWC) and sends signals to the PCM which varies the duration of fuel injection accordingly. To stabilize its output, the sensor has an internal heater. The secondary HO2S is installed in the TWC.

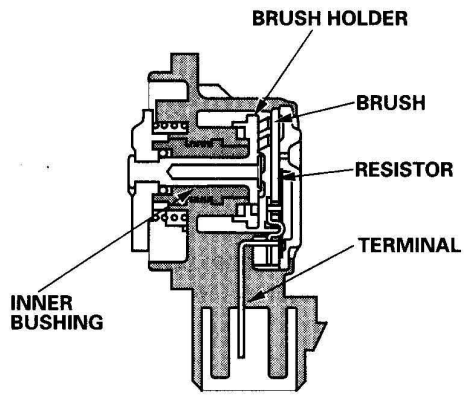


Starting Control
When the engine is started, the PCM provides a rich mixture by increasing injector duration.

Top Dead Center (TDC) Sensors
The TDC1/TDC2 sensor determines ignition timing at start up (cranking) and when crank angle is abnormal.



Throttle Position (TP) Sensor
The TP sensor is a potentiometer connected to the throttle valve shaft. As the throttle position changes, the sensor varies the signal voltage to the PCM. The TP sensor is not replaceable apart from the throttle body.



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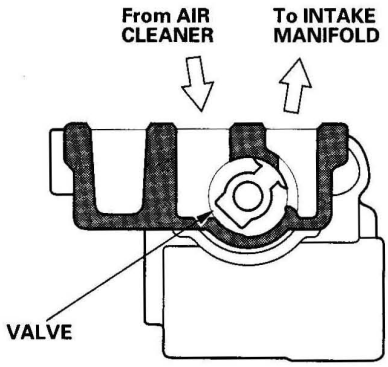
System Descriptions (cont'd)

Idle Control System

When the engine is cold, the A/C compressor is on, the transmission is in gear, the brake pedal is pressed, the power steering load is high, or the alternator is charging, the PCM controls current to the idle air control (IAC) valve to maintain the correct idle speed. Refer to the System Diagram to see the functional layout of the system.

Brake Pedal Position Switch
The brake pedal position switch signals the PCM when the brake pedal is pressed.

Idle Air Control (IAC) Valve
To maintain the proper idle speed, the IAC valve changes the amount of air bypassing the throttle body in response to an electrical signal from the PCM.



Power Steering Pressure (PSP) Switch
The PSP switch signals the PCM when the power steering load is high.

Starter (Ignition) Switch
The starter switch signals the PCM when the engine is cranking.

Fuel Supply System

Fuel Cut-off Control
During deceleration with the throttle valve closed, current to the injectors is cut off to improve fuel economy at engine speeds over 1,050 rpm.
Fuel cut-off action also occurs when engine speed exceeds 6,400 rpm, regardless of the position of the throttle valve, to protect the engine from over-revving. When the vehicle is stopped, the PCM cuts the fuel at engine speeds over 5,000 rpm.

Fuel Pump Control
When the ignition is turned on, the PCM grounds the PGM-FI main relay which feeds current to the fuel pump for 2 seconds to pressurize the fuel system. With the engine running, the PCM grounds the PGM-FI main relay and feeds current to the fuel pump. When the engine is not running and the ignition is on, the PCM cuts ground to the PGM-FI main relay which cuts current to the fuel pump.

PGM-FI Main Relay
The PGM-FI relay contains two separate relays. One is energized whenever the ignition is on to supply battery voltage to the PCM, power to the injectors, and power for the second relay. The second relay is energized to supply power to the fuel pump for two seconds when the ignition is switched ON (II), and when the engine is running.

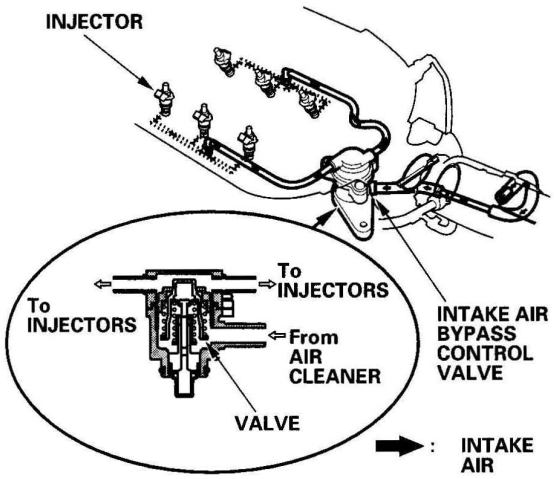
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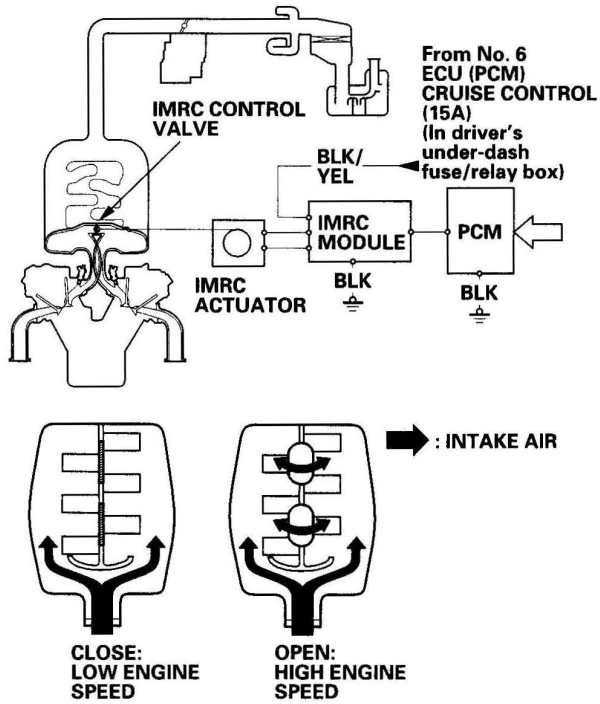
Intake Air System

Refer to the System Diagram to see the functional layout of the system.

Intake Air Bypass Control System
When the engine is running, the intake air bypass control valve sends air to the injectors.



Intake Manifold Runner Control (IMRC) System
Improved performance is achieved by closing and opening the intake manifold runner control (IMRC) control valves. High torque at low engine speed is achieved when the valves are closed, whereas high power at high engine speed is achieved when the valves are opened.

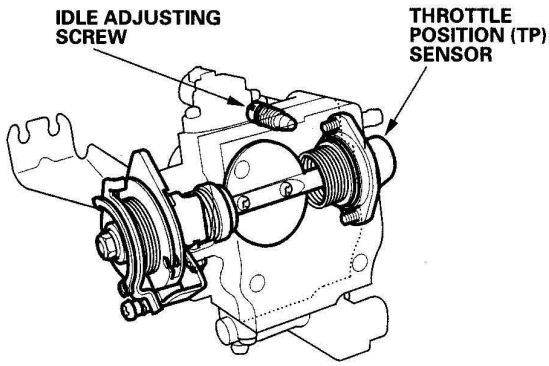


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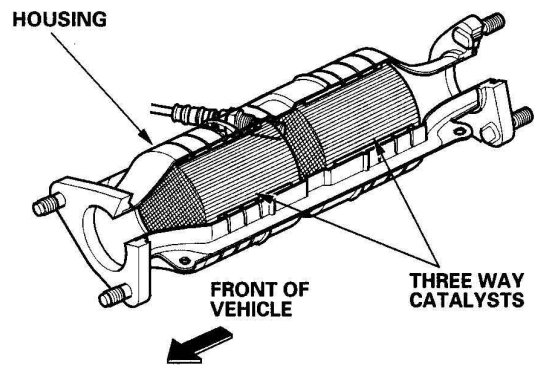
System Descriptions (cont'd)

Throttle Body
The throttle body is a single-barrel side draft type. The lower portion of the throttle valve is heated by engine coolant from the cylinder head. The idle adjusting screw, which increases/decreases bypass air, is located on top of the throttle body.



Catalytic Converter System

Three Way Catalytic Converter (TWC)
The TWC converts hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) in the exhaust gas to carbon dioxide (CO2), dinitrogen (N2), and water vapor.



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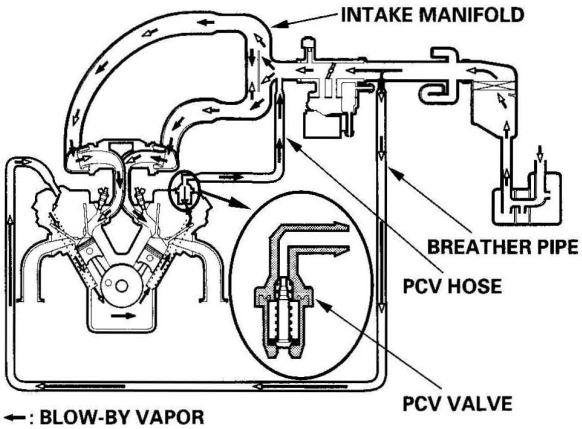
Exhaust Gas Recirculation (EGR) System

Refer to the System Diagram to see the functional layout of the system.

EGR Valve
The EGR valve is designed to lower peak combustion temperatures and reduce oxides of nitrogen emissions (NOx) by recirculating exhaust gas through the intake manifold and into the combustion chambers.

Positive Crankcase Ventilation (PCV) System

The PCV valve prevents blow-by gasses from escaping into the atmosphere by venting them into the intake manifold.



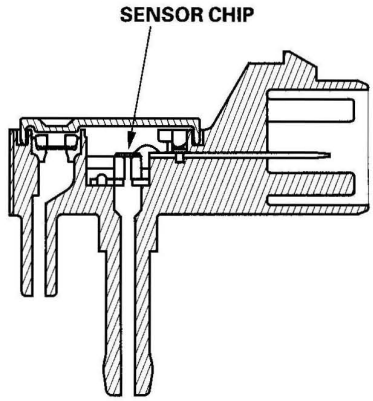
Evaporative Emission (EVAP) Control System

Refer to the System Diagram to see the functional layout of the system.

EVAP Canister
The EVAP canister temporarily stores fuel vapor from the fuel tank until it can be purged back into the engine and burned.

EVAP Canister Purge Valve
When the engine coolant temperature is below 147°F (64°C), the PCM turns off the EVAP canister purge valve which cuts vacuum to the EVAP canister.

Fuel Tank Pressure (FTP) Sensor
The FTP sensor converts fuel tank absolute pressure into an electrical input to the PCM.



(cont'd)

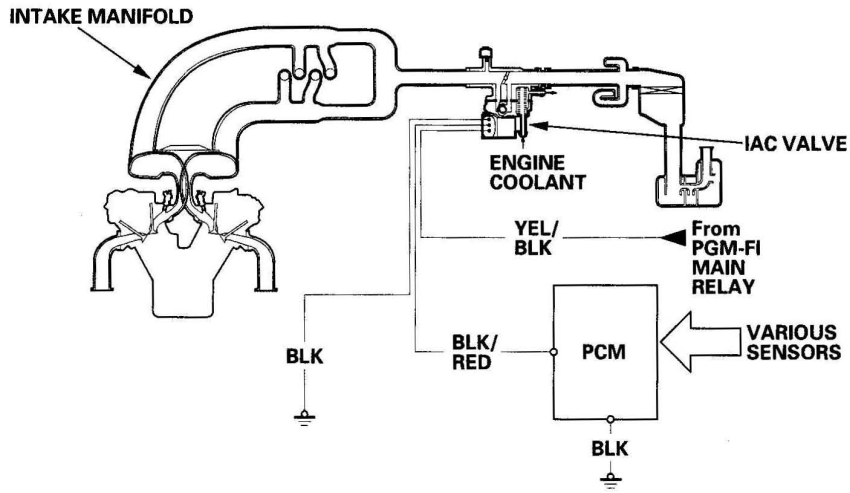
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System Descriptions (cont'd)

Idle Control System Diagram

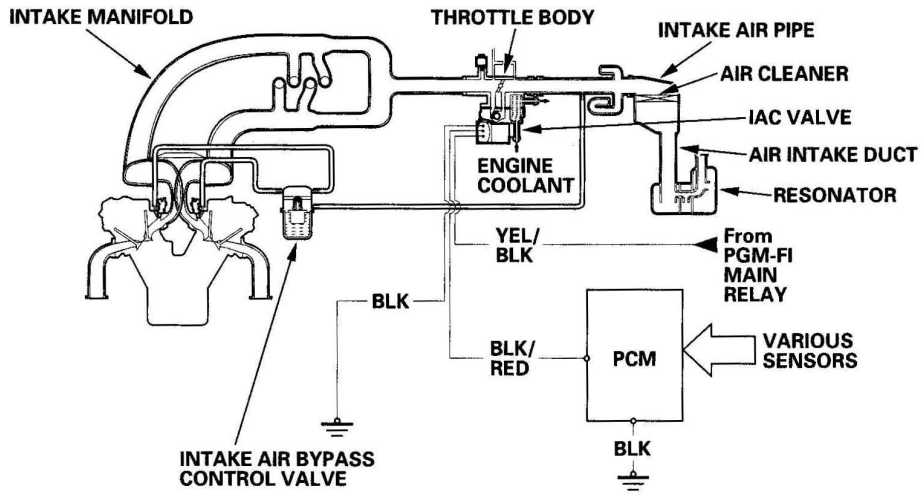
The idle speed of the engine is controlled by the idle air control (IAC) valve:

- After the engine starts, the IAC valve opens for a certain amount of time. The amount of air is increased to raise the idle speed.
- When the engine coolant temperature is low, the IAC valve is opened to obtain the proper fast idle speed. The amount of bypassed air is controlled in relation to engine coolant temperature.



Intake Air System Diagram

This system supplies air for engine needs. A resonator in the intake air pipe provides additional silencing as air is drawn into the system.



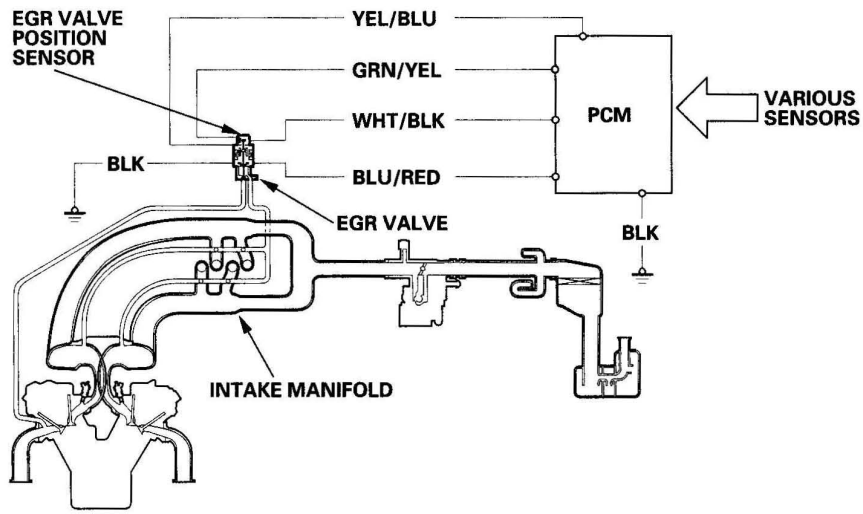
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Exhaust Gas Recirculation (EGR) System Diagram

The EGR system reduces oxides of nitrogen (NOx) emissions by recirculating exhaust gas through the EGR valve and the intake manifold into the combustion chambers. The PCM memory includes the ideal EGR valve position for varying operating conditions.

The EGR valve position sensor detects the amount of EGR valve lift and sends it to the PCM. The PCM then compares it with the ideal lift in its memory (based on signals sent from other sensors). If there is any difference between the two, the PCM cuts current to the EGR valve.



(cont'd)

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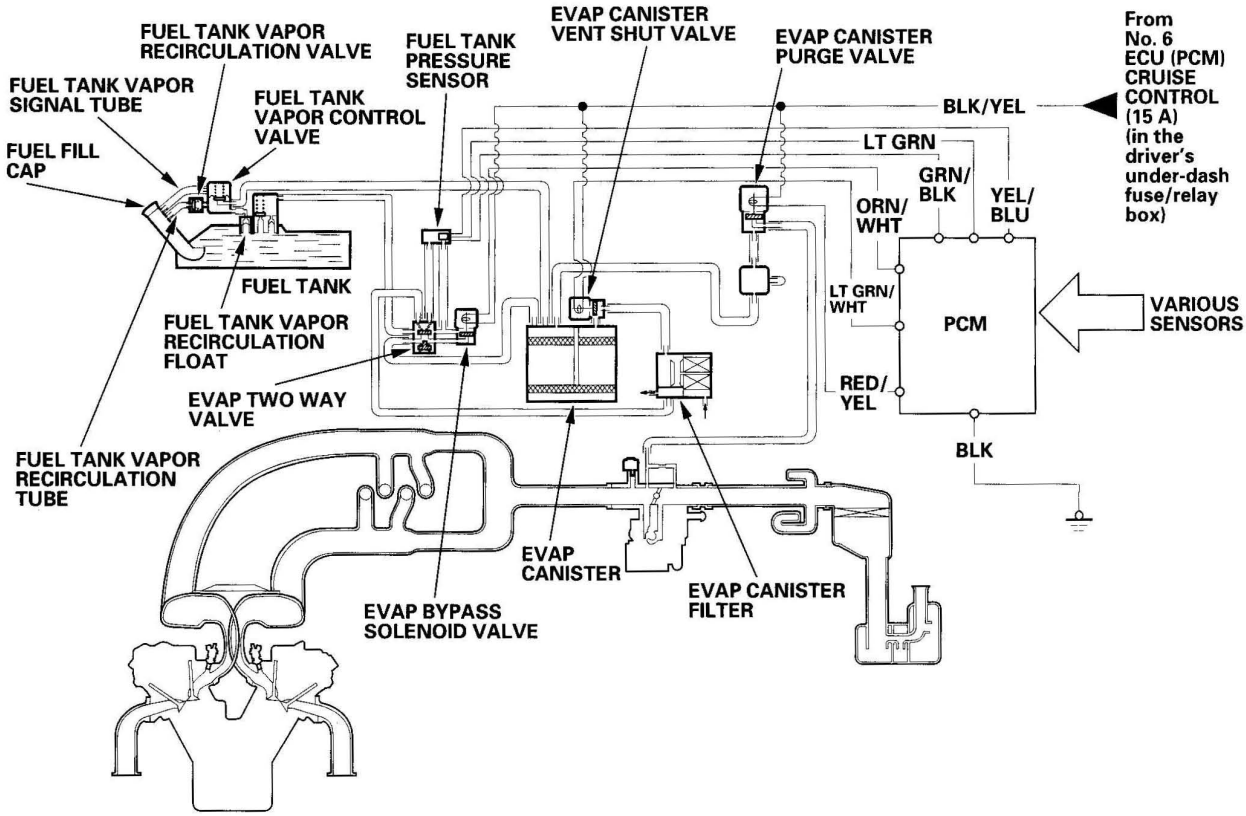
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System Descriptions (cont'd)

Evaporative Emission (EVAP) Control Diagram

The EVAP controls minimize the amount of fuel vapor escaping to the atmosphere. Vapor from the fuel tank is temporarily stored in the EVAP canister until it can be purged from the canister into the engine and burned.

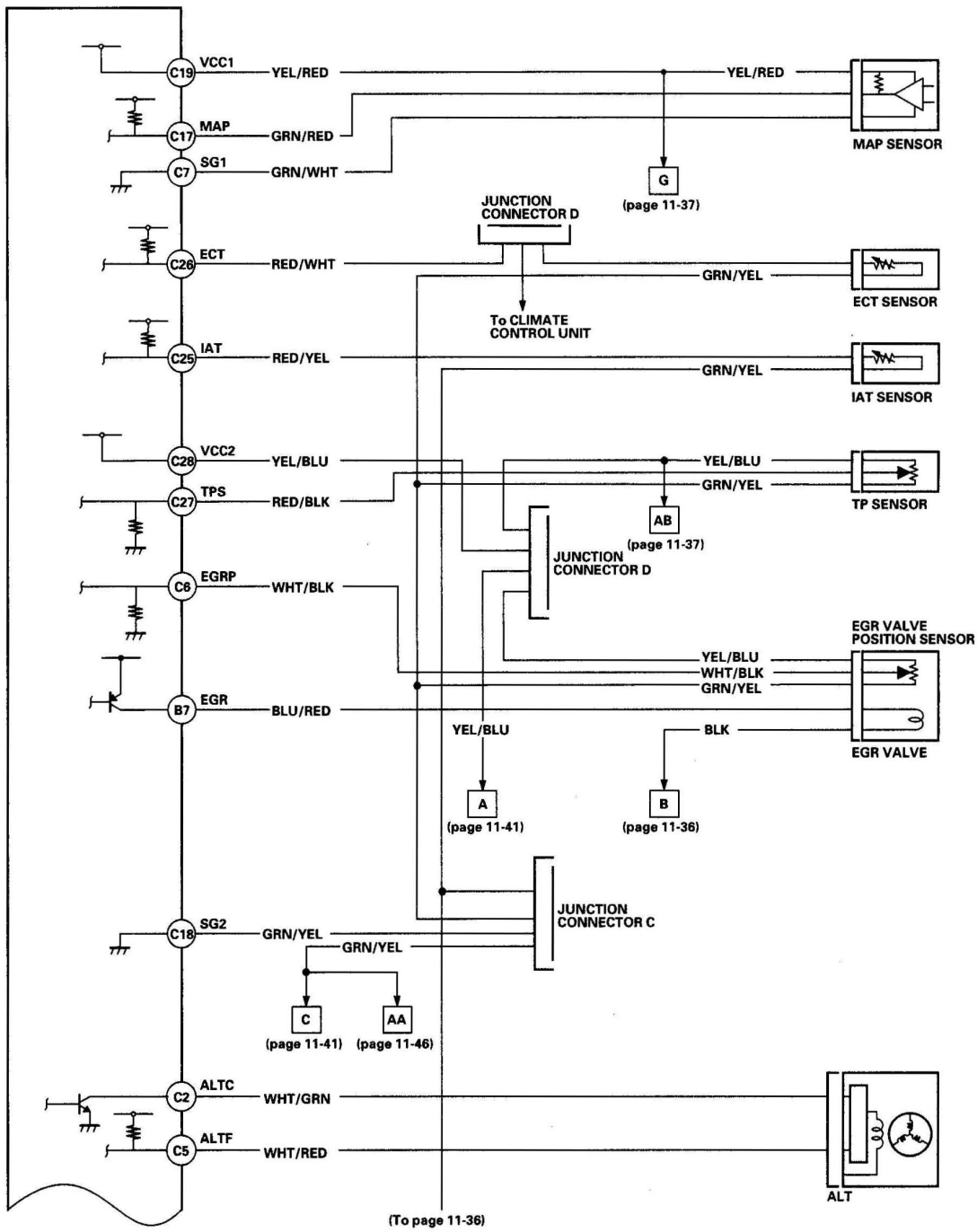
- The EVAP canister is purged by drawing fresh air through it and into a port on the throttle body. The purging vacuum is controlled by the EVAP canister purge valve, which is open whenever engine coolant temperature is above 147°F (64°C).
- When vapor pressure in the fuel tank is higher than the set valve of the EVAP two way valve, the valve opens and regulates the flow of fuel vapor to the EVAP canister.
- During refueling, the fuel tank vapor control valve opens with the pressure in the fuel tank, and feeds the vapor to the EVAP canister.



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PCM Circuit Diagram



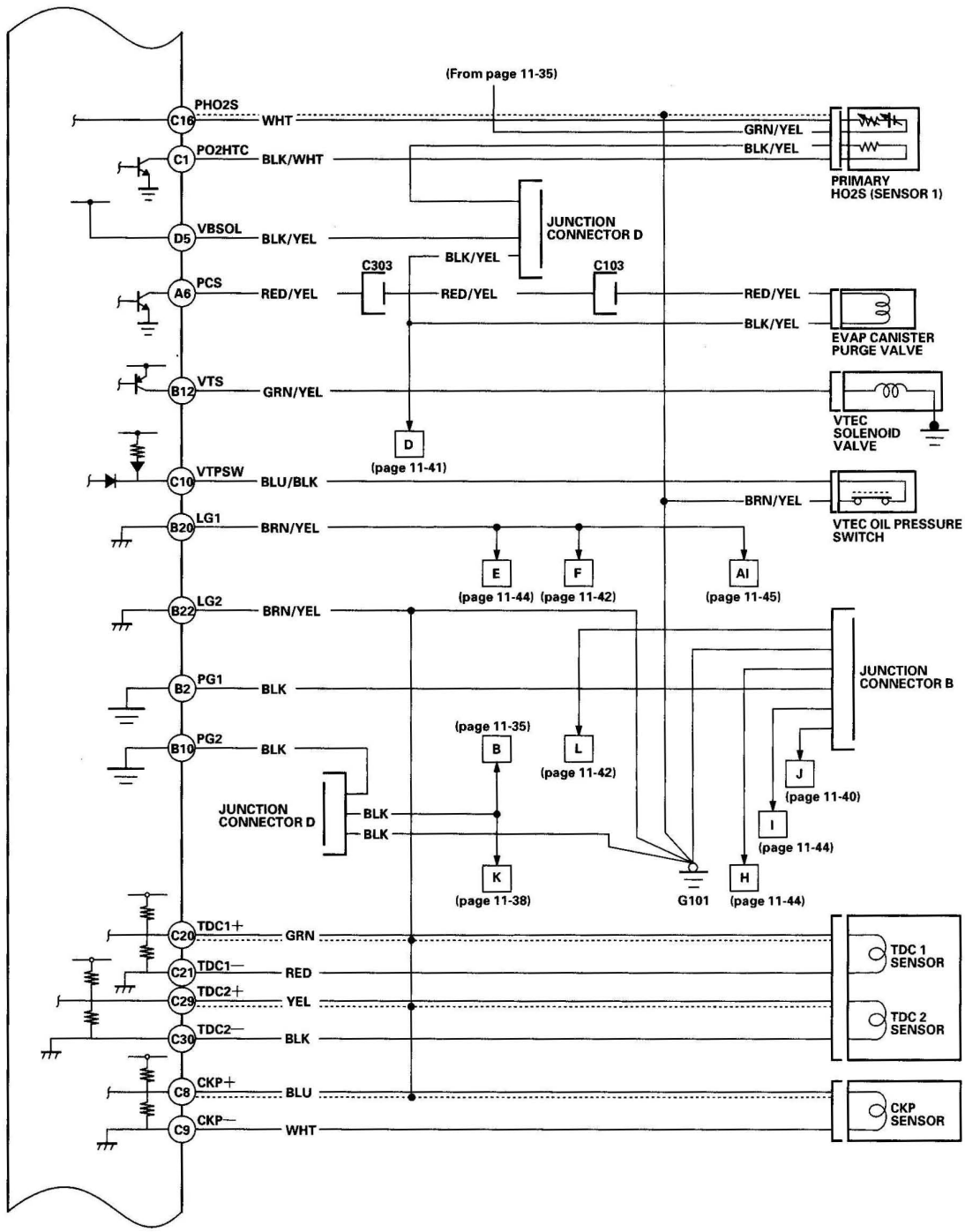
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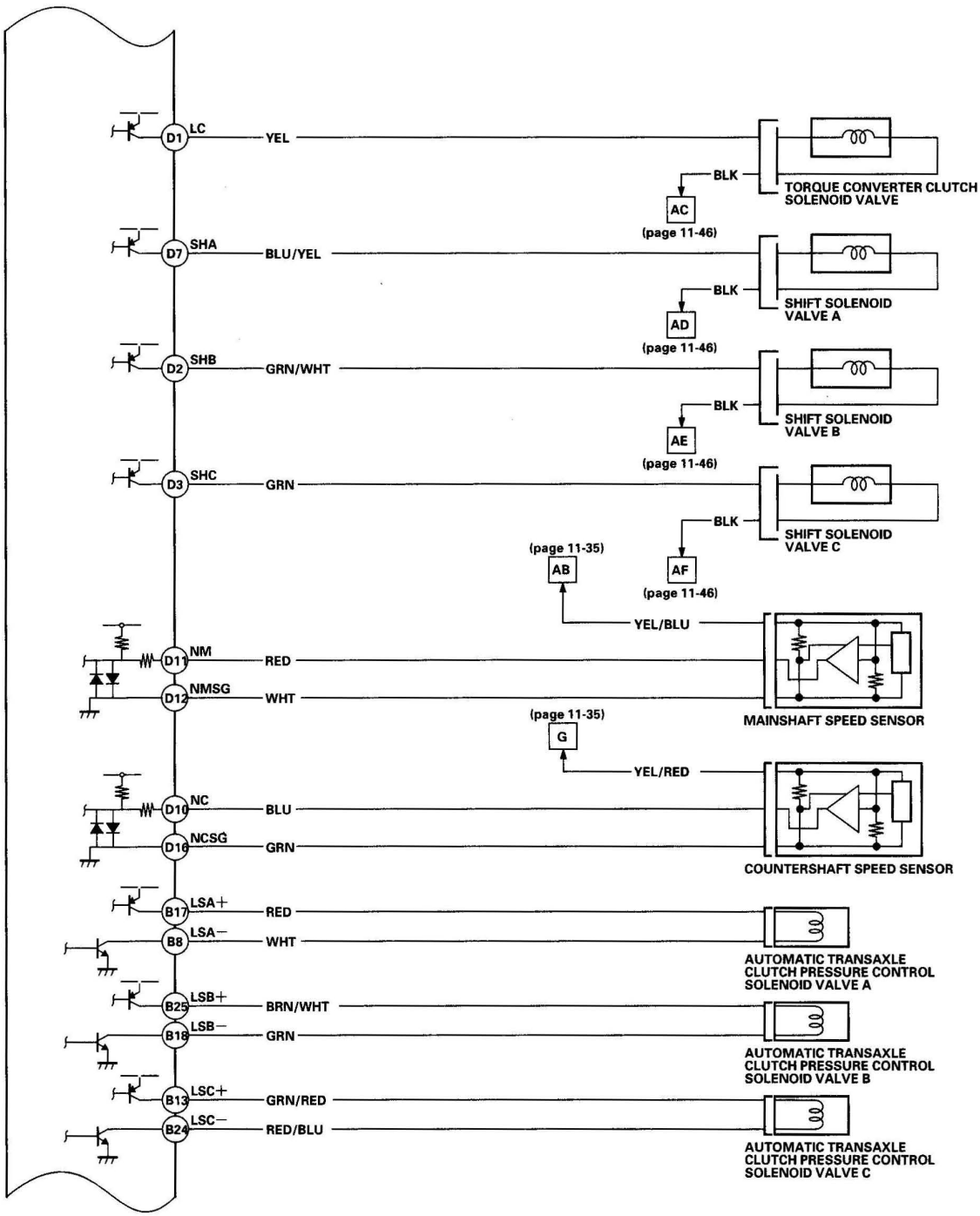
System Descriptions (cont'd)

PCM Circuit Diagram (cont'd)



BACK

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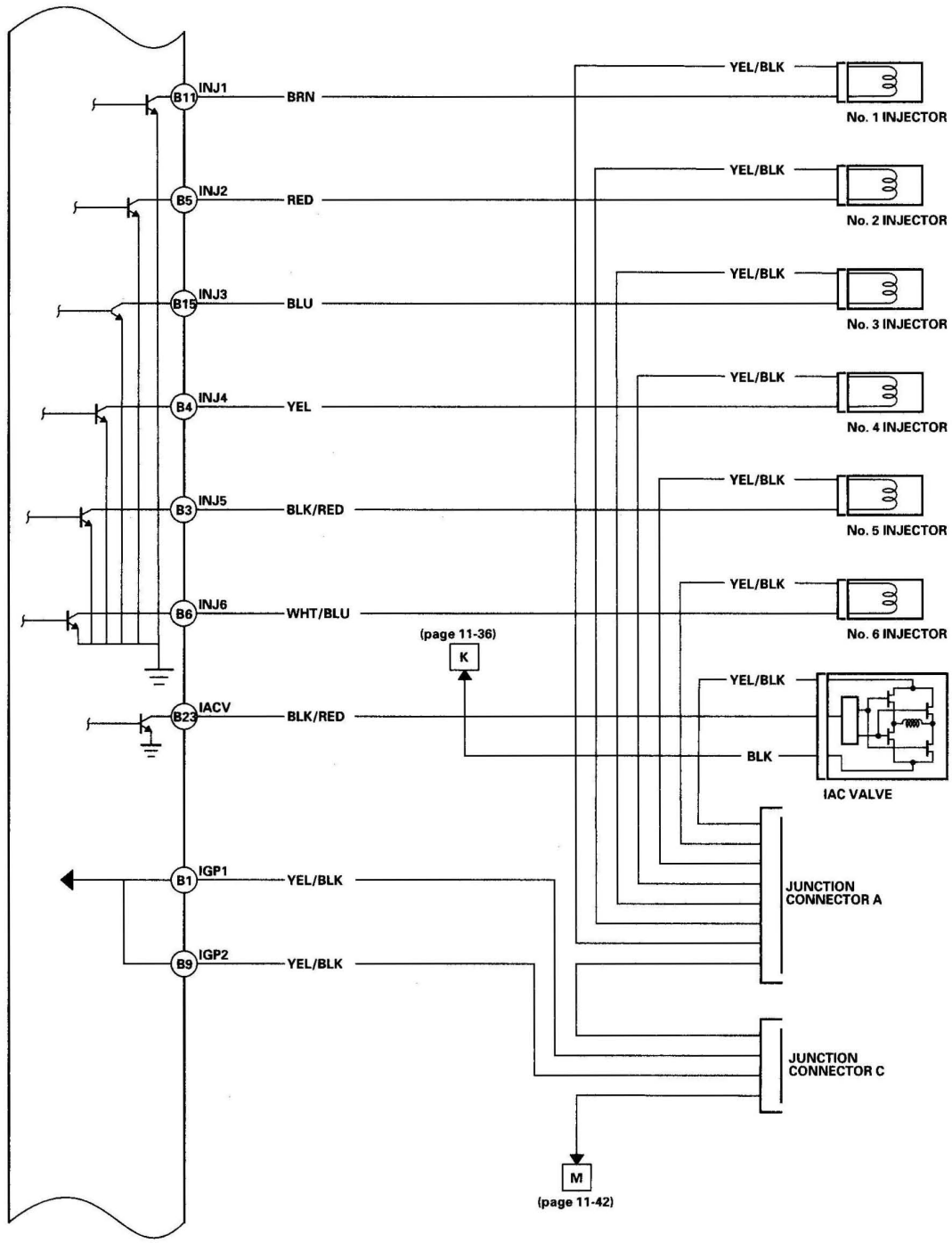
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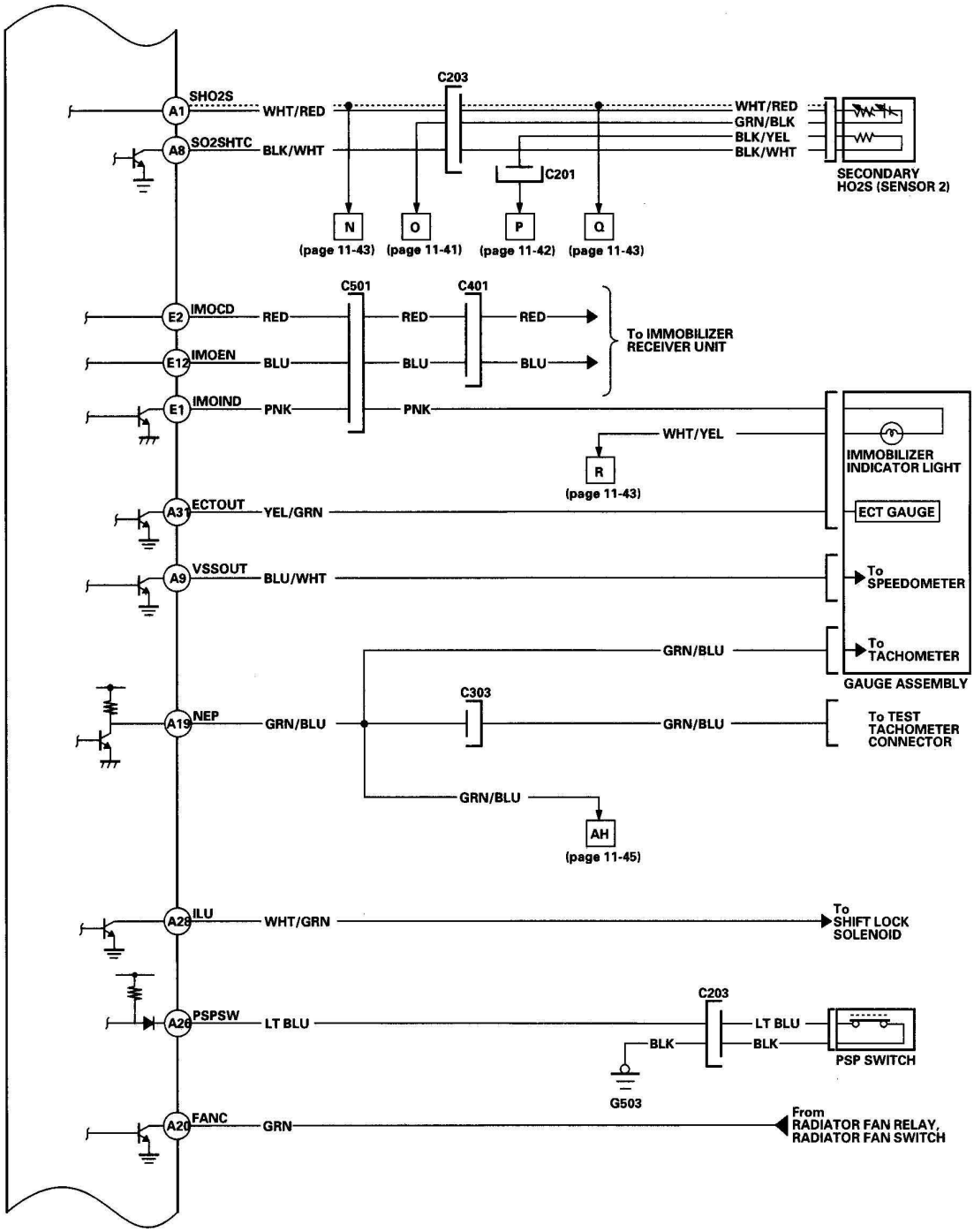
System Descriptions (cont'd)

PCM Circuit Diagram (cont'd)



BACK

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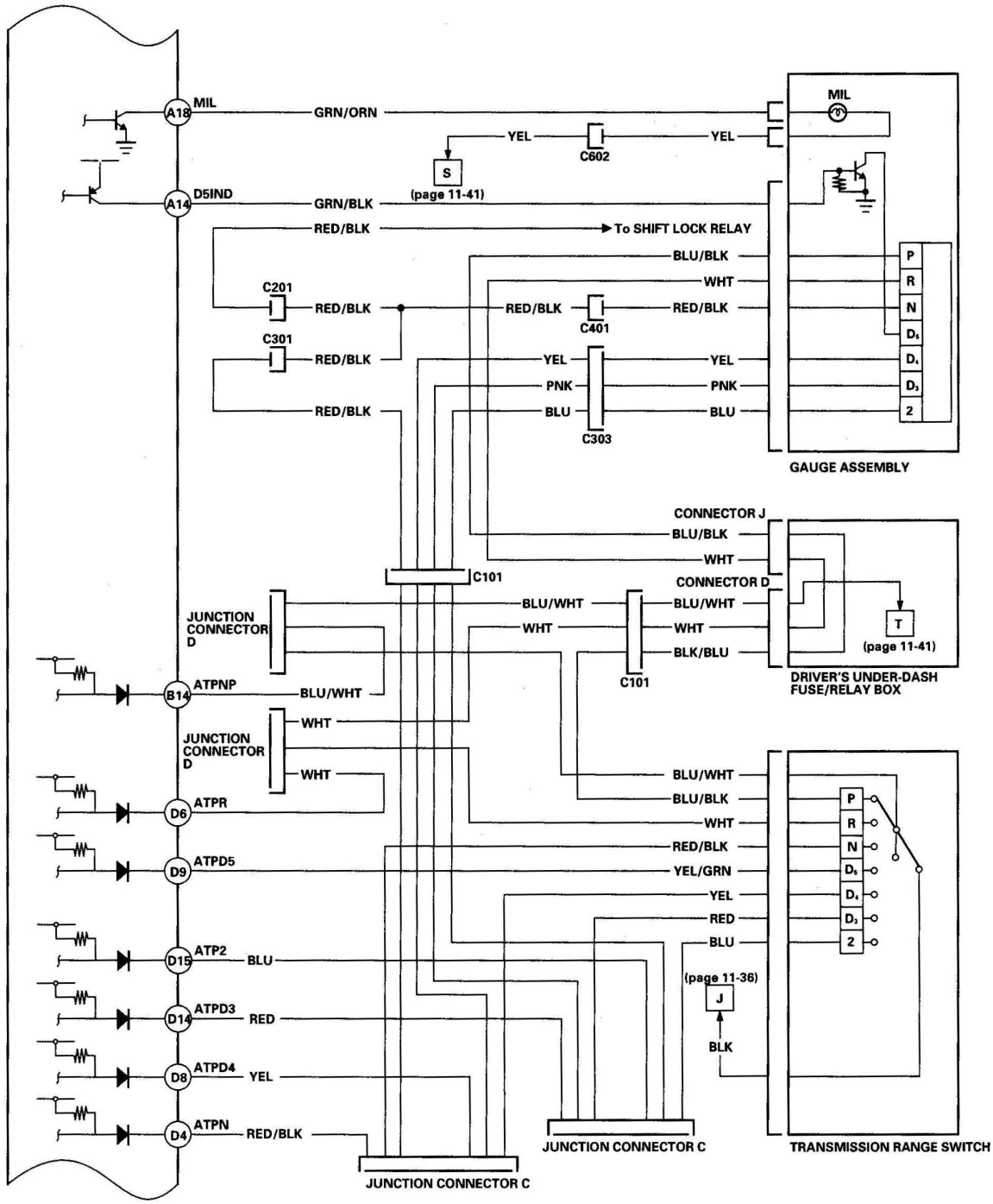
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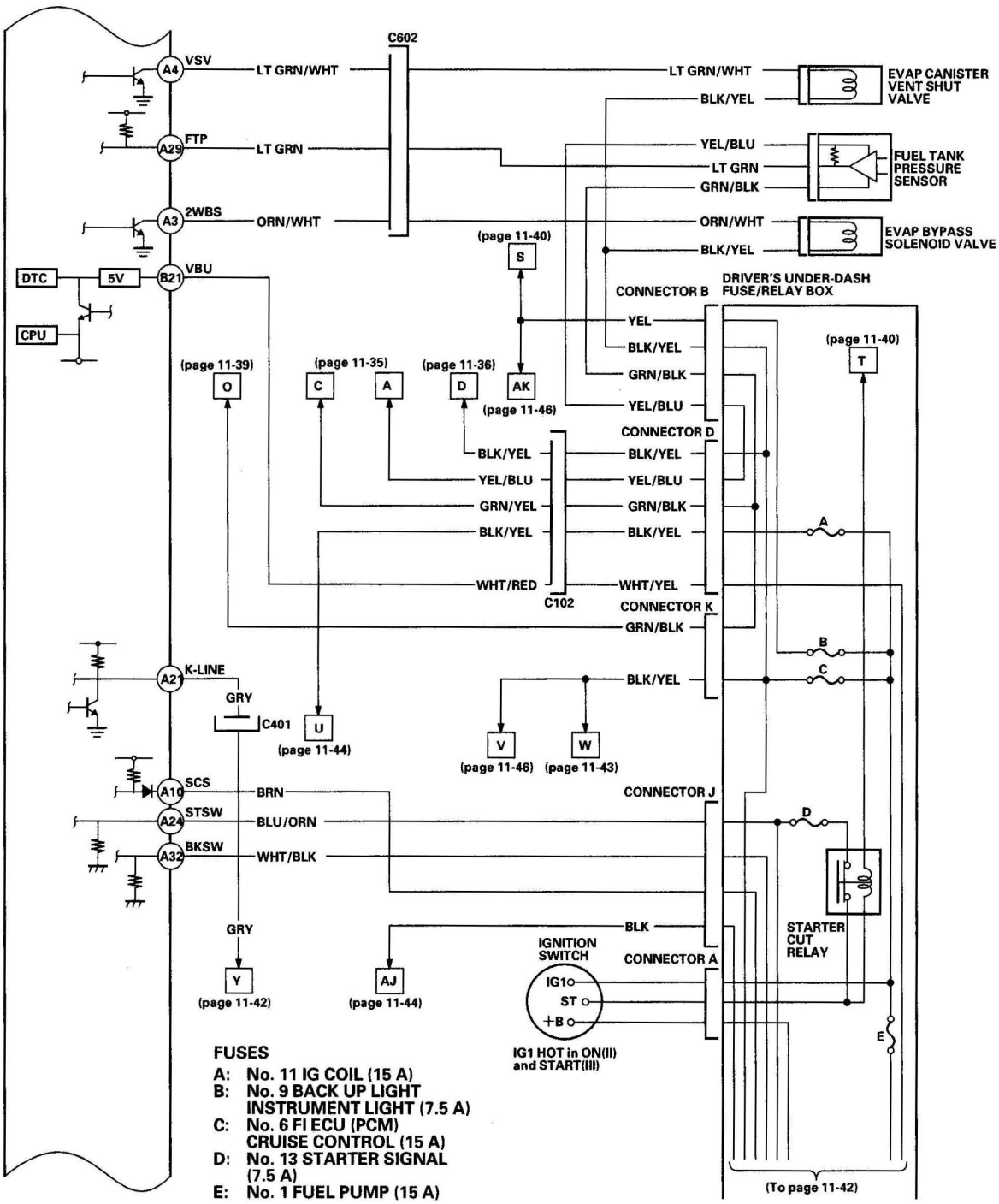
System Descriptions (cont'd)

PCM Circuit Diagram (cont'd)



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FUSES

- A: No. 11 IG COIL (15 A)
- B: No. 9 BACK UP LIGHT INSTRUMENT LIGHT (7.5 A)
- C: No. 6 FI ECU (PCM) CRUISE CONTROL (15 A)
- D: No. 13 STARTER SIGNAL (7.5 A)
- E: No. 1 FUEL PUMP (15 A)

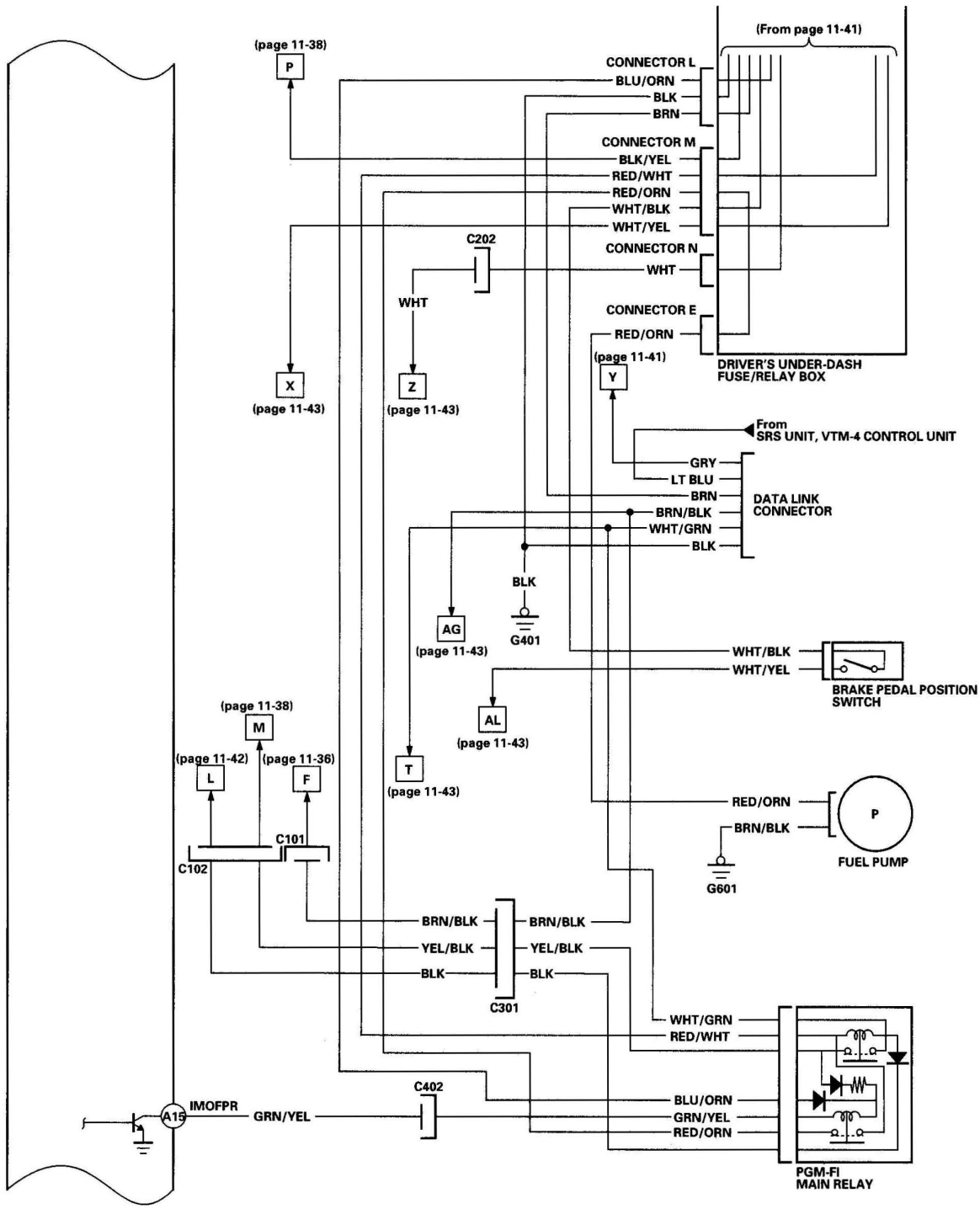
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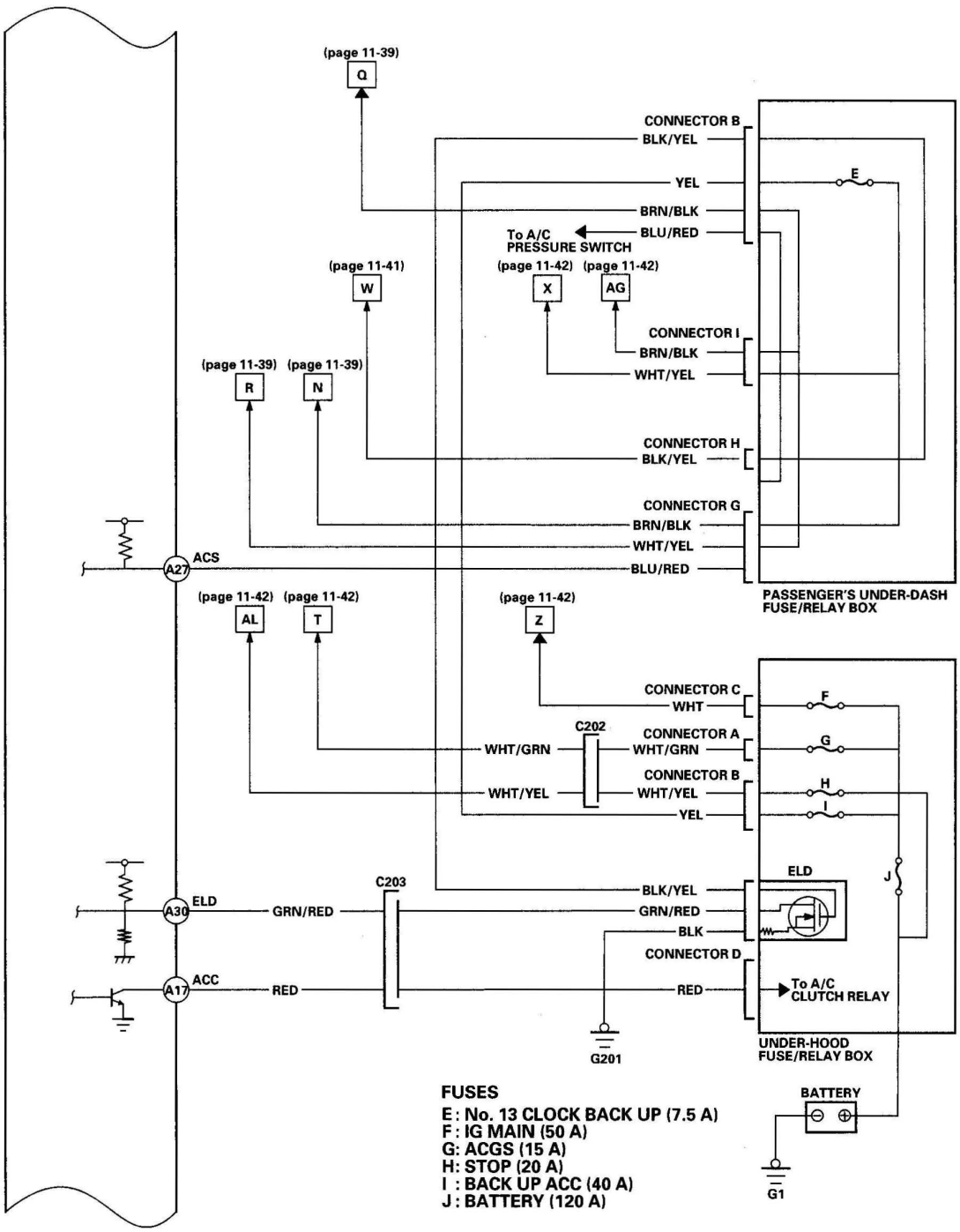
System Descriptions (cont'd)

PCM Circuit Diagram (cont'd)



BACK

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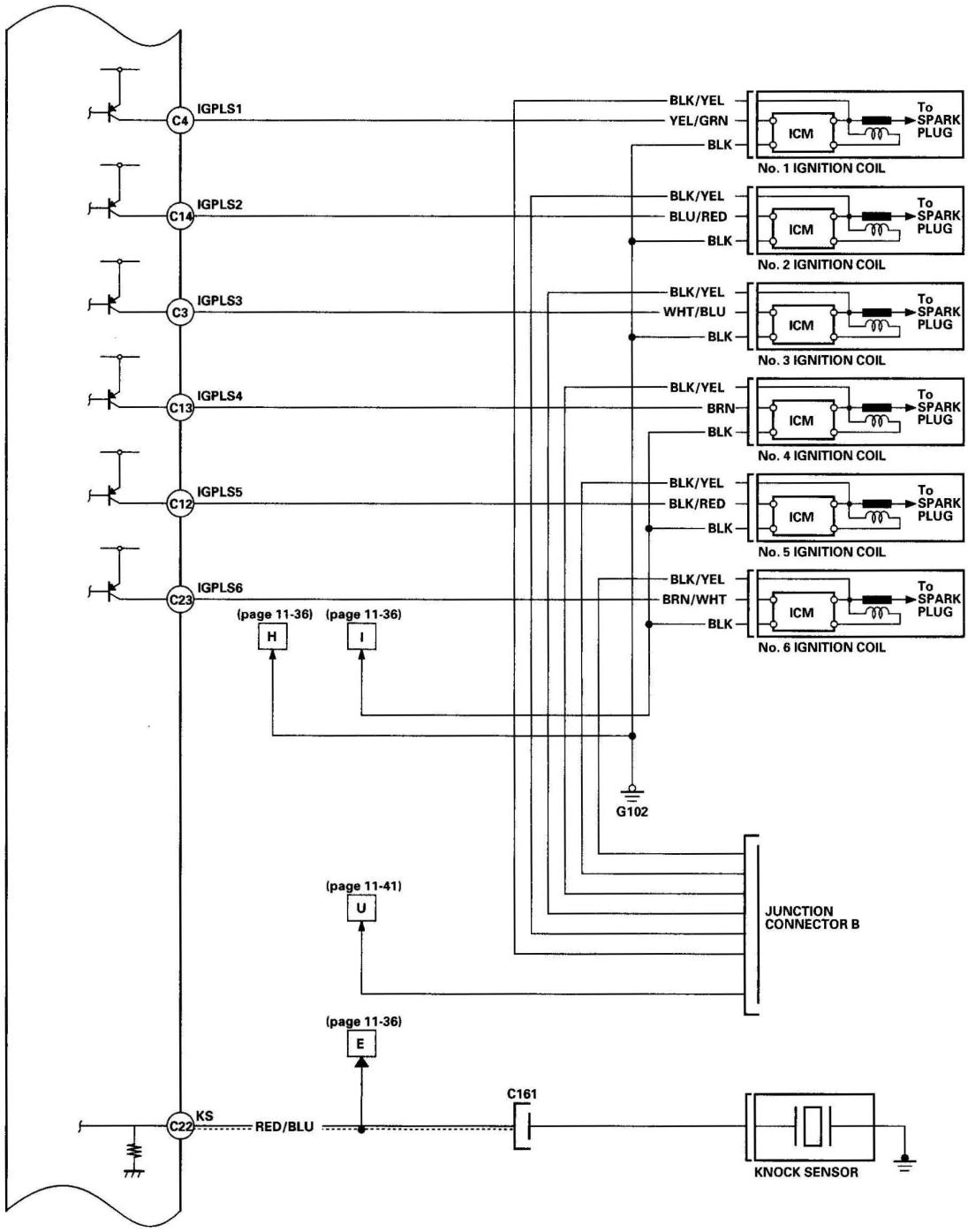
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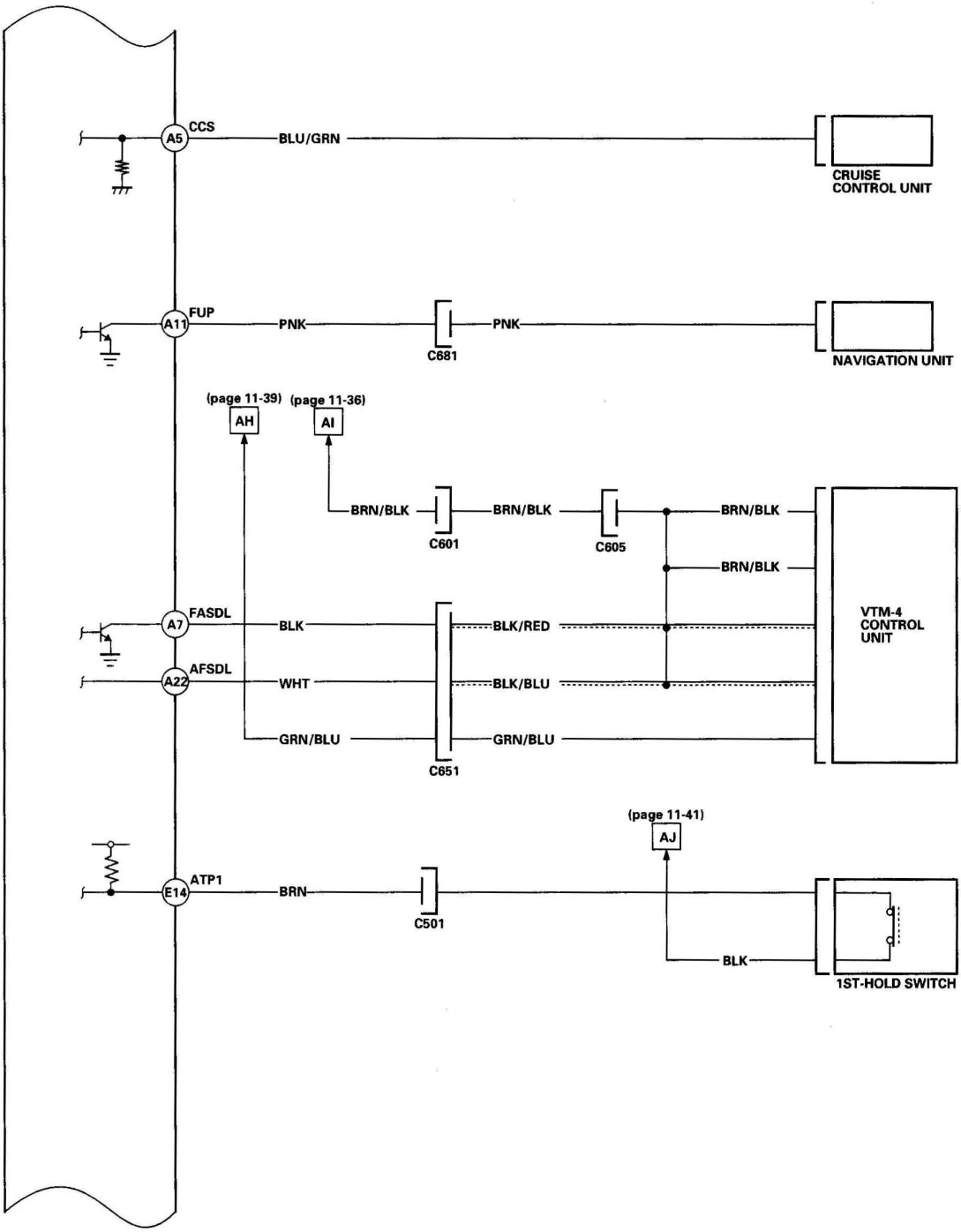
System Descriptions (cont'd)

PCM Circuit Diagram (cont'd)



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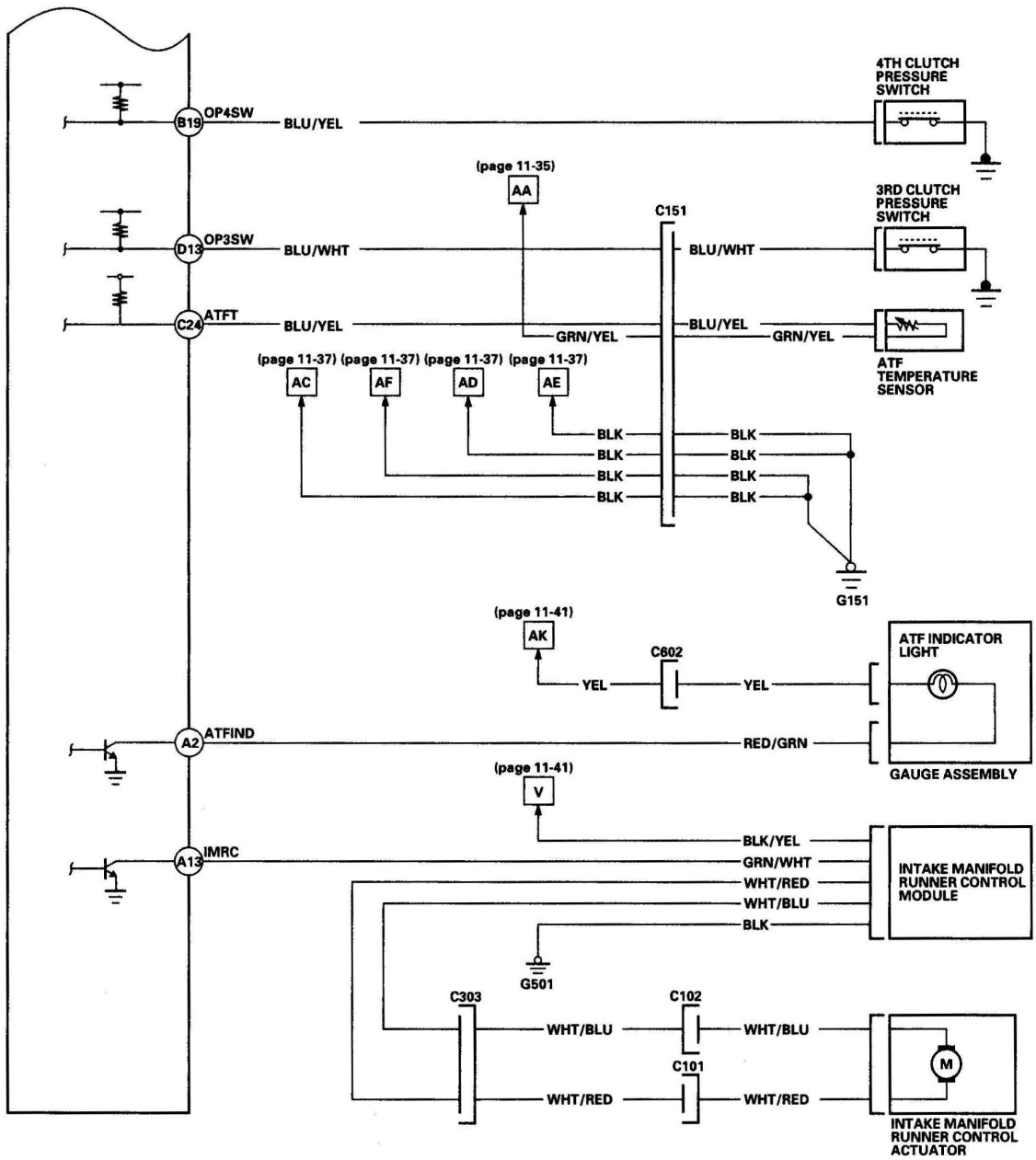
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System Descriptions (cont'd)

PCM Circuit Diagram



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How to Set Readiness Codes

Malfunction Indicator Lamp (MIL) Indication (In relation to Readiness Codes)

The vehicle has certain "readiness codes" that are part of the on-board diagnostics for the emissions systems. If the vehicle's battery has been disconnected or gone dead, if the DTCs have been cleared, or if the PCM has been reset, these codes are reset. In some states, part of the emissions testing is to make sure these codes are set to complete. If all of them are not set to complete, the test cannot be finished.

To check if the readiness codes are set, turn the ignition switch ON (II), but do not start the engine. The MIL will come on for 15—20 seconds. If it then goes off, the readiness codes are set. If it blinks several times, one or more readiness codes are not set to complete. To set each code, drive the vehicle or run the engine as described in the following procedures.

Catalytic Converter Codes

NOTE:
- Do not turn the ignition switch OFF.
- When the battery negative cable is disconnected, all readiness codes are cleared.
- When the PCM is cleared with the scan tool or PGM Tester, all readiness codes are cleared.

Required condition:
Ambient temperature between 20—95°F (—7—35°C).

1. Connect the scan tool to the Data Link Connector (DLC).
2. Start the engine. Hold it at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Drive for about 10 minutes without stopping on a highway. Your speed can vary.
4. With the transmission in D5 position, drive at a steady speed between 50—62 mph (80—100 km/h) for 30 seconds.
5. Do step 4 three times. Between each procedure, close the throttle completely for 1—2 seconds. If the engine is stopped during this procedure, go to step 3 and do the procedure again.
6. Check for the readiness code with the scan tool.

(cont'd)

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How to Set Readiness Codes (cont'd)

EGR Monitor

NOTE:
- Do not turn the ignition switch OFF.
- When the battery negative cable is disconnected, all readiness codes are cleared.

1. Connect the scan tool to the Data Link Connector (DLC).
2. Start the engine, and hold it at 3,000 rpm with no load (in Park and neutral) until the radiator fan comes on.
3. Drive at a steady speed with the transmission in D5 position between 50—62 mph (80—100 km/h) for more than 10 seconds.
4. With the transmission in D5 position, decelerate from 62 mph (100 km/h) by completely releasing the throttle for at least 5 seconds. If the engine is stopped during this procedure, go to step 3 and do the procedure again.
5. Check for the readiness code with the scan tool.

EVAP Leak Monitor

NOTE:
- When the battery negative cable is disconnected, all readiness codes are cleared.
- If the engine is stopped while doing the procedure between step 6 and 16, do this procedure from step 1 again.

1. Make sure the gasoline level is 60—90 % of fuel tank capacity (not full).
2. Turn the ignition switch OFF.
3. Let the vehicle sit more than 8 hours.
4. Make sure the outside temperature is 20—95°F (—7—35°C).
5. Connect the scan tool to the Data Link Connector (DLC).
6. Start the engine and drive for about 15 minutes.
7. Keep the vehicle at a steady speed between 50—70 mph (80—114 km/h), without moving the accelerator pedal, for about 1 minute.
8. Stop the vehicle (do not stop engine).
9. Replace steps 7 and 8 two more times.
10. Check for the readiness code with the scan tool. If the readiness code does not set, go to step 11.
11. When ambient temperature is less than 32°F (0°C), hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
12. When ambient temperature is more than 86°F (30°C), remove the fuel fill cap, then install the fuel fill cap.
13. After step 12, drive for about 20 minutes on a freeway.
14. Keep the vehicle at a steady speed between 50—70 mph (80—114 km/h), without moving the accelerator pedal, for about 1 minute.
15. Stop the vehicle (do not stop the engine).
16. Repeat steps 14 and 15 two more times.
17. Check for the readiness code with the scan tool.

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HO2S Monitor

NOTE:
- Do not turn the ignition switch OFF.
- When the battery negative cable is disconnected, all readiness codes are cleared.

Required condition:
Ambient temperature between 20−95°F (−7−35°C).

1. Connect the scan tool to the Data Link Connector (DLC).
2. Start the engine, and hold it at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Let the engine idle for 5 seconds.
4. Drive at a steady speed between 50−62 mph (80−100 km/h) for about 2 minutes.
5. With the transmission in D5 position, decelerate from 62 mph (100 km/h) by completely releasing the throttle with complete closed for at least 5 seconds. If the engine is stopped during this procedure, go to step 4 and do the procedure again.
6. Check for the readiness code with the scan tool.

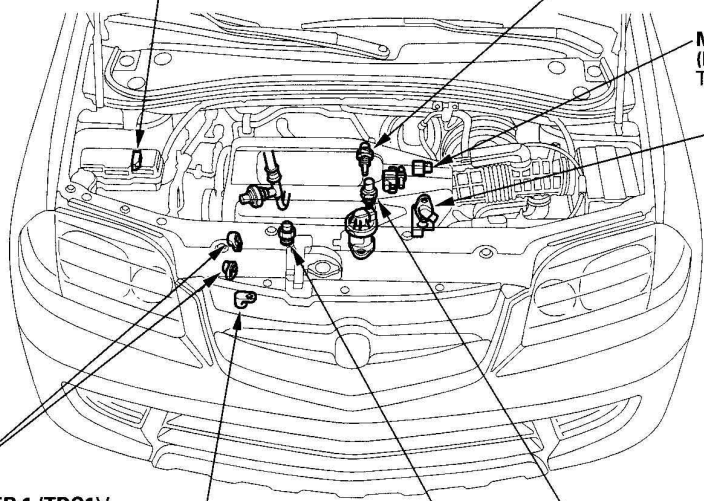
HO2S Heater Monitor

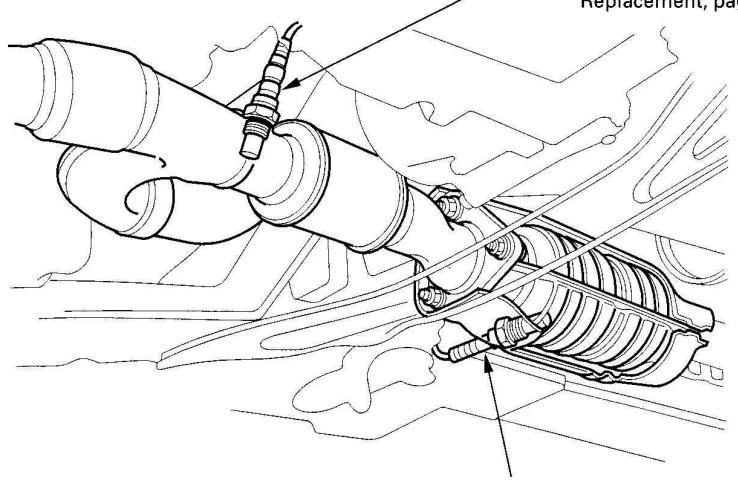
NOTE: When the battery negative cable is disconnected, all readiness codes are cleared.

1. Connect the scan tool to the Data Link Connector (DLC).
2. Start the engine, and let the engine idle for 10 minutes.
3. Check for the readiness code with the scan tool.

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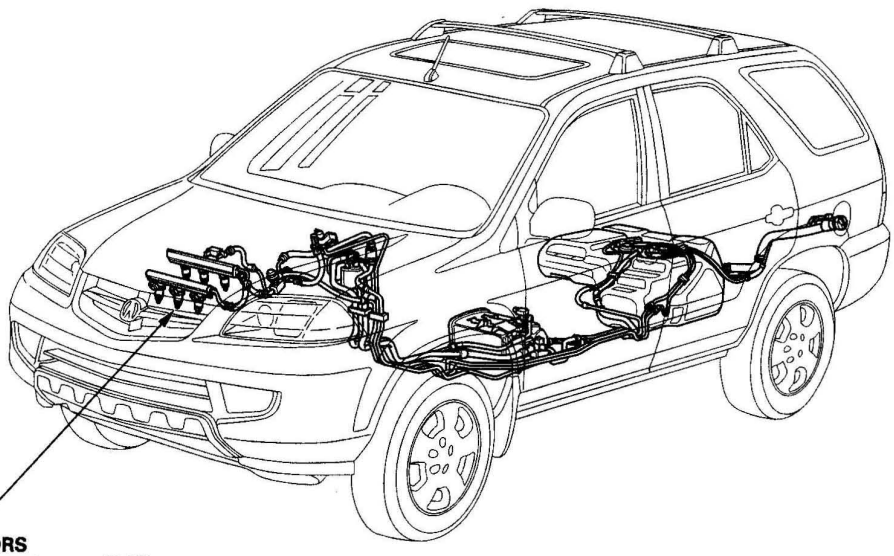
Component Location Index





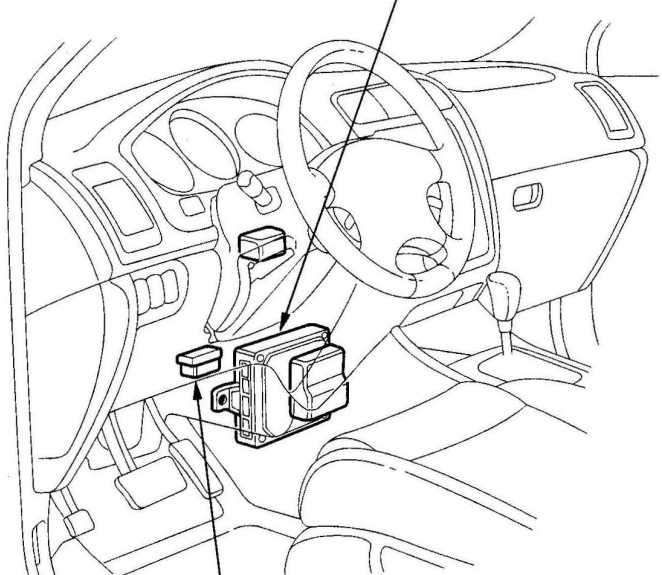
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INJECTORS
Replacement, page 11-98

POWERTRAIN CONTROL MODULE (PCM)
General Troubleshooting Information, page 11-3
Troubleshooting, page 11-93



DATA LINK CONNECTOR (DLC)
General Troubleshooting Information, page 11-3

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DTC Troubleshooting

DTC P0107: MAP Sensor Circuit Low Voltage

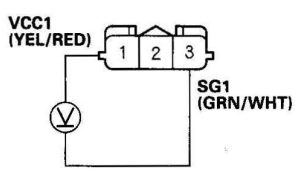
1. Turn the ignition switch ON (II).
2. Check the MAP with the scan tool.

   Is about 101 kPa (760 mmHg, 30 in.Hg) or 2.9 V indicated?

   YES – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the MAP sensor and at the PCM. ■

   NO – Go to step 3.
3. Turn the ignition switch OFF.
4. Disconnect the MAP sensor 3P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between the MAP sensor 3P connector terminals No. 1 and No. 3.

MAP SENSOR 3P CONNECTOR



Wire side of female terminals

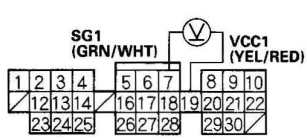
Is there about 5 V?

YES – Go to step 8.

NO – Go to step 7.

7. Measure voltage between PCM connector terminals C19 and C7.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there about 5 V?

YES – Repair open in the wire between the PCM (C19) and the MAP sensor. ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If normal MAP is indicated, replace the original PCM. ■

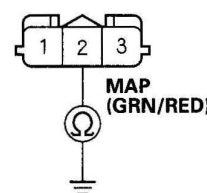
8. Check the MAP with the scan tool.

   Is about 2 kPa (15 mmHg, 0.6 in.Hg) or less, or 0 V indicated?

   YES – Go to step 9.

   NO – Replace the MAP sensor. ■
9. Turn the ignition switch OFF.
10. Disconnect PCM connector C (31P).
11. Check for continuity between MAP sensor 3P connector terminal No. 2 and body ground.

MAP SENSOR 3P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the PCM (C17) and the MAP sensor. ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If normal MAP is indicated, replace the original PCM. ■

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DTC P0108: MAP Sensor Circuit High Voltage

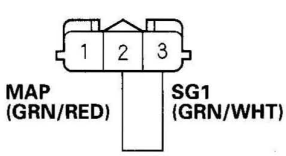
1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. Check the MAP with the scan tool.

   Is about 101 kPa (760 mmHg, 30 in.Hg) or higher, or about 2.9 V or higher indicated?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the MAP sensor and at the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the MAP sensor 3P connector.
5. Connect MAP sensor 3P connector terminals No. 2 and No. 3 with a jumper wire.

MAP SENSOR 3P CONNECTOR



Wire side of female terminals

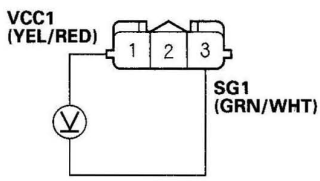
6. Turn the ignition switch ON (II).
7. Check the MAP with the scan tool.

   Is about 101 kPa (760 mmHg, 30 in.Hg) or higher or 2.9 V or higher indicated?

   YES – Go to step 8.

   NO – Replace the MAP sensor. ■
8. Remove the jumper wire.
9. Measure voltage between MAP sensor 3P connector terminals No. 1 and No. 3.

MAP SENSOR 3P CONNECTOR



Wire side of female terminals

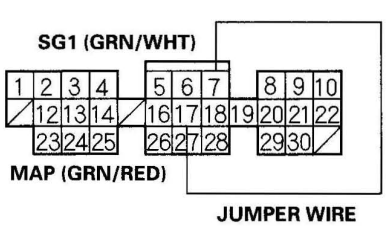
Is there about 5 V?

YES – Go to step 10.

NO – Repair open in the wire between the PCM (C7) and the MAP sensor. ■

10. Turn the ignition switch OFF.
11. Connect PCM connector terminals C7 and C17 with a jumper wire.

PCM CONNECTOR C (31P)



Wire side of female terminals

12. Turn the ignition switch ON (II).
13. Check the MAP with the scan tool.

    Is about 101 kPa (760 mmHg, 30 in.Hg) or higher, or about 2.9 V or higher indicated?

    YES – Substitute a known-good PCM and recheck (see page 11-5). If normal voltage is indicated, replace the original PCM. ■

    NO – Repair open in the wire between the PCM (C17) and the MAP sensor. ■

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DTC Troubleshooting (cont'd)

DTC P1128: MAP Sensor Signal Lower Than Expected

1. Turn the ignition switch ON (II).
2. Check the MAP with the scan tool.

   Is 54.1 kPa (406 mmHg, 16.0 in.Hg), 1.6 V, or higher indicated?

   YES – Intermittent failure, system is OK at this time. ■

   NO – Replace the MAP sensor. ■

DTC P1129: MAP Sensor Signal Higher Than Expected

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. Check the MAP with the scan tool.

   Is 36.9 kPa (277 mmHg, 10.9 in.Hg), 1.1 V, or less indicated?

   YES – Intermittent failure, system is OK at this time. ■

   NO – Replace the MAP sensor. ■

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DTC P0112: IAT Sensor Circuit Low Voltage

1. Turn the ignition switch ON (II).
2. Check the IAT with the scan tool.

   Is 302°F (150°C) or higher (or H-Limit in Honda mode of PGM Tester), or 0 V indicated?

   YES – Go to step 3.

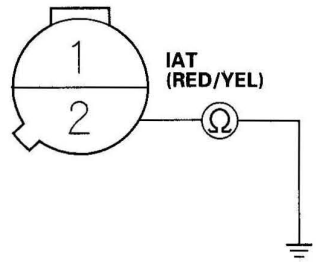
   NO – Go to step 8.
3. Disconnect the IAT sensor 2P connector.
4. Check the IAT with the scan tool.

   Is 302°F(150°C) or higher (or H-Limit in Honda mode of PGM Tester), or 0 V indicated?

   YES – Go to step 5.

   NO – Replace the IAT sensor. ■
5. Turn the ignition switch OFF.
6. Disconnect PCM connector C (31P).
7. Check for continuity between IAT sensor 2P connector terminal No. 2 and body ground.

   IAT SENSOR 2P CONNECTOR



   Wire side of female terminals

   Is there continuity?

   YES – Repair short in the wire between the PCM (C25) and the IAT sensor. ■

   NO – Substitute a known-good PCM and recheck (see page 11-5). If normal voltage is indicated, replace the original PCM. ■
8. Check the temperature reading on the scan tool. Be aware that if the engine is warm, the reading will be higher than ambient temperature. If the engine is cold, the IAT and ECT will have the same value.

   Is the correct ambient temperature indicated?

   YES – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the IAT sensor and at the PCM. ■

   NO – Replace the IAT sensor. ■

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DTC Troubleshooting (cont'd)

DTC P0113: IAT Sensor Circuit High Voltage

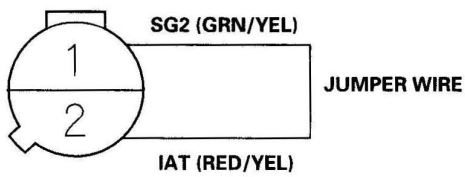
1. Turn the ignition switch ON (II).
2. Check the IAT with the scan tool.

   Is −4°F (−20°C) or less (or L-Limit in Honda mode of PGM Tester), or 5 V indicated?

   YES − Go to step 3.

   NO − Intermitent failure, system is OK at this time. Check for poor connections or loose wires at the IAT sensor and at the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the IAT sensor 2P connector.
5. Connect IAT sensor 2P connector terminals No. 1 and No. 2 with a jumper wire.

IAT SENSOR 2P CONNECTOR



Wire side of female terminals

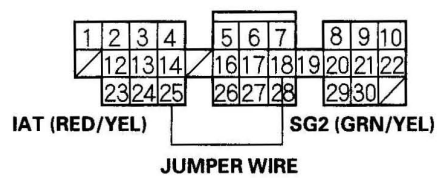
6. Turn the ignition switch ON (II).
7. Check the IAT with the scan tool.

   Is −4°F (−20°C) or less (or L-Limit in Honda mode of PGM Tester), or 5 V indicated?

   YES − Go to step 8.

   NO − Replace the IAT sensor. ■
8. Turn the ignition switch OFF.
9. Remove the jumper wire.
10. Connect PCM connector terminals C18 and C25 with a jumper wire.

PCM CONNECTOR C (31P)



Wire side of female terminals

11. Turn the ignition switch ON (II).
12. Check the IAT with the scan tool.

    Is −4°F (−20°C) or less (or L-Limit in Honda mode of PGM Tester), or 5 V indicated?

    YES − Substitute a known-good PCM and recheck (see page 11-5). If normal voltage is indicated, replace the original PCM. ■

    NO − Repair open in the wire between the PCM (C18, C25) and the IAT sensor. ■

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DTC P0116: ECT Sensor Range/Performance Problem

NOTE: If DTC P0117 and/or P0118 are stored at the same time as DTC P0116, troubleshoot those DTCs first, then recheck for DTC P0116.

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.

2. Check the ECT with the scan tool.

   Is 176–212°F (80–100°C) or 0.5–0.8 V indicated?

   YES—Intermittent failure, system is OK at this time. Check the thermostat and the cooling system. ■

   NO—Check the thermostat and the cooling system. If they are OK, replace the ECT sensor. ■

DTC P0117: ECT Sensor Circuit Low Voltage

1. Turn the ignition switch ON (II).

2. Check the ECT with the scan tool.

   Is 302°F (150°C) or higher (or H-Limit in Honda mode of PGM Tester), or 0 V indicated?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the ECT sensor and at the PCM. ■

3. Disconnect the ECT sensor 2P connector.

4. Check the ECT with the scan tool.

   Is 302°F (150°C) or higher (or H-Limit in Honda mode of PGM Tester), or 0 V indicated?

   YES—Go to step 5.

   NO—Replace the ECT sensor. ■

5. Turn the ignition switch OFF.

6. Disconnect PCM connector C (31P).

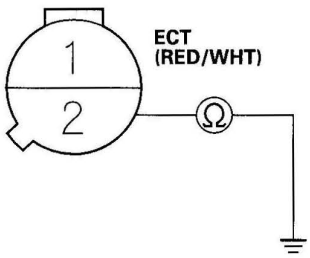
(cont'd)

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DTC Troubleshooting (cont'd)

7. Check for continuity between ECT sensor 2P connector terminal No. 2 and body ground.

ECT SENSOR 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the PCM (C26) and the ECT sensor. ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If normal voltage is indicated, replace the original PCM. ■

DTC P0118: ECT Sensor Circuit High Voltage

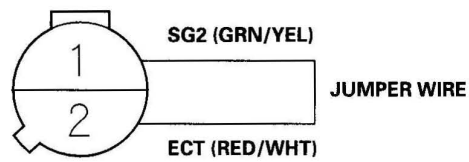
1. Turn the ignition switch ON (II).
2. Check the ECT with the scan tool.

   Is −4°F (−20°C) or less (or L-Limit in Honda mode of PGM Tester), or 5 V indicated?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the ECT sensor and at the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the ECT sensor 2P connector.
5. Connect ECT sensor 2P connector terminals No. 1 and No. 2 with a jumper wire.

ECT SENSOR 2P CONNECTOR



Wire side of female terminals

6. Turn the ignition switch ON (II).

BACK

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7. Check the ECT with the scan tool.

   Is −4°F (−20°C) or less (or L-Limit in Honda mode of PGM Tester) or 5 V indicated?

   YES − Go to step 8.

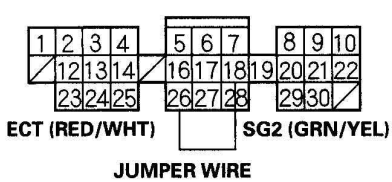
   NO − Replace the ECT sensor. ■

8. Turn the ignition switch OFF.

9. Remove the jumper wire.

10. Connect PCM connector terminals C18 and C26 with a jumper wire.

PCM CONNECTOR C (31P)



Wire side of female terminals

11. Turn the ignition switch ON (II).

12. Check the ECT with the scan tool.

    Is −4°F (−20°C) or less (or L-Limit in Honda mode of PGM Tester) or 5 V indicated?

    YES − Substitute a known-good PCM and recheck (see page 11-5). If normal voltage is indicated, replace the original PCM. ■

    NO − Repair open in the wire between the PCM (C18, C26) and the ECT sensor. ■

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DTC Troubleshooting (cont'd)

DTC P0122: TP Sensor Circuit Low Voltage

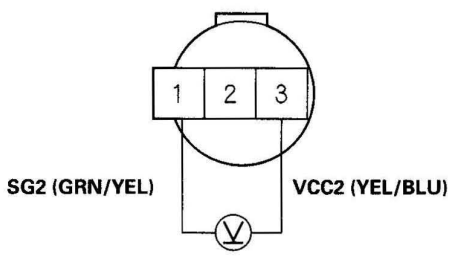
1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then turn the ignition switch OFF.
2. Turn the ignition switch ON(II).
3. Check the throttle position with the scan tool.

   Is there about 10 % or 0.5 V when the throttle is fully closed and about 90 % or 4.5 V when the throttle is fully opened?

   YES – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the TP sensor and at the PCM. ■

   NO – Go to step 4.
4. Turn the ignition switch OFF.
5. Disconnect the TP sensor 3P connector.
6. Turn the ignition switch ON (II).
7. Measure voltage between TP sensor 3P connector terminals No. 1 and No. 3.

TP SENSOR 3P CONNECTOR



Wire side of female terminals

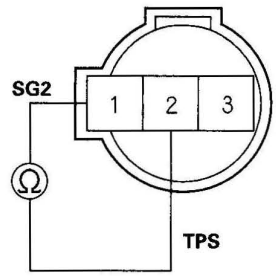
Is there about 5 V?

YES – Go to step 8.

NO – Go to step 15.

8. Turn the ignition switch OFF.
9. At the sensor side, measure resistance between TP sensor 3P connector terminals No. 1 and No. 2 with the throttle fully closed.

TP SENSOR 3P CONNECTOR



Terminal side of male terminals

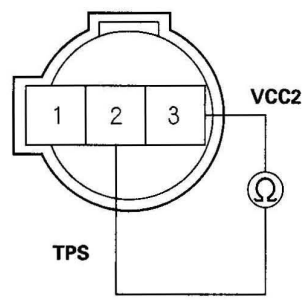
Is there about 0.5 – 0.9 kΩ ?

YES – Go to step 10.

NO – Replace the throttle body. ■

10. Measure resistance between TP sensor 3P connector terminals No. 2 and No. 3 with the throttle fully closed.

TP SENSOR 3P CONNECTOR



Terminal side of male terminals

Is there about 4.5 kΩ ?

YES – Go to step 11.

NO – Replace the throttle body. ■

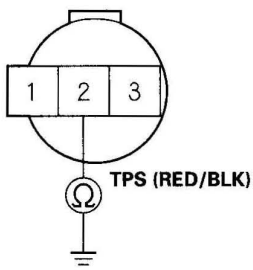
11. Disconnect PCM connector C (31P).

BACK

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12. At the wire harness side, check for continuity between TP sensor 3P connector terminal No. 2 and body ground.

TP SENSOR 3P CONNECTOR



Wire side of female terminals

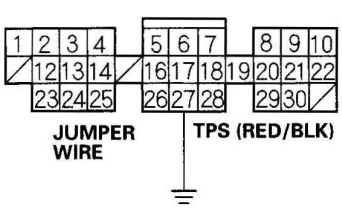
Is there continuity?

YES — Repair short in the wire between the PCM (C27) and the TP sensor. ■

NO — Go to step 13.

13. Connect PCM connector terminal C27 and body ground with a jumper wire.

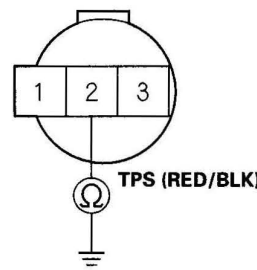
PCM CONNECTOR C (31P)



Wire side of female terminals

14. At the wire harness side, check for continuity between TP sensor 3P connector terminal No. 2 and body ground.

TP SENSOR 3P CONNECTOR



Wire side of female terminals

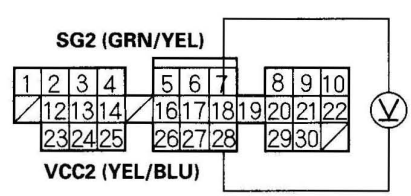
Is there continuity?

YES — Substitute a known-good PCM and recheck (see page 11-5). If prescribed voltage is now available, replace the original PCM. ■

NO — Repair open in the wire between the PCM (C27) and the TP sensor. ■

15. Measure voltage between PCM connector terminals C18 and C28.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there about 5 V?

YES — Repair open in the wire between the PCM (C28) and the TP sensor. ■

NO — Substitute a known-good PCM and recheck (see page 11-5). If voltage is normal, replace the original PCM. ■

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DTC Troubleshooting (cont'd)

DTC P0123: TP Sensor Circuit High Voltage

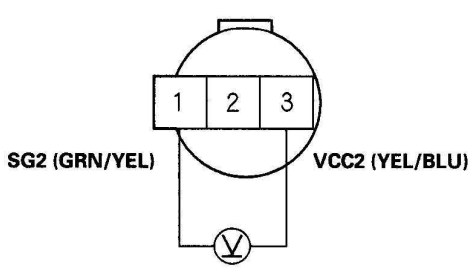
1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then turn the ignition switch OFF.
2. Turn the ignition switch ON (II).
3. Check the throttle position with the scan tool.

   Is there about 10 % or 0.5 V when the throttle is fully closed and about 90 % or 4.5 V when the throttle is fully opened?

   YES—Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the TP sensor and at the PCM.■

   NO—Go to step 4.
4. Turn the ignition switch OFF.
5. Disconnect the TP sensor 3P connector.
6. Turn the ignition switch ON (II).
7. At the wire harness side, measure voltage between TP sensor 3P connector terminals No. 1 and No. 3.

TP SENSOR 3P CONNECTOR



Wire side of female terminals

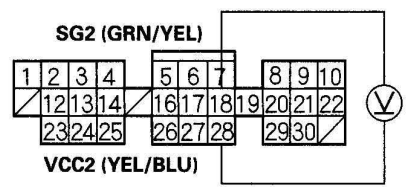
Is there about 5 V?

YES—Replace the throttle body.■

NO—Go to step 8.

8. Measure voltage between PCM connector terminals C18 and C28.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there about 5 V?

YES—Repair open in the wire between the PCM (C18) and the TP sensor.■

NO—Substitute a known-good PCM and recheck (see page 11-5). If voltage is normal, replace the original PCM.■

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DTC P1121: TP Sensor Signal Lower Than Expected

1. Turn the ignition switch ON (II).
2. Check the throttle position with the scan tool.

   Is 16.1 %, 0.8 V, or higher indicated when the throttle is fully opened?

   YES – Intermittent failure, system is OK at this time. ■

   NO – Replace the throttle body. ■

DTC P1122: TP Sensor Signal Higher Than Expected

1. Turn the ignition switch ON (II).
2. Check the throttle position with the scan tool.

   Is 17.6 %, 0.9 V, or less indicated when the throttle is fully closed?

   YES – Intermittent failure, system is OK at this time. ■

   NO – Replace the throttle body. ■

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DTC Troubleshooting (cont'd)

DTC P0128: Cooling System Malfunction

NOTE: If the DTCs listed below are stored at the same time as DTC P0128, troubleshoot those DTCs first, then recheck for P0128.

P0107, P0108, P1128, P1129: Manifold Absolute Pressure (MAP) sensor
P1106, P1107, P1108: Barometric Pressure (BARO) sensor
P1259: VTEC system
P0401: Exhaust Gas Recirculation (EGR) Flow
P0116, P0117, P0118: Engine Coolant Temperature (ECT) sensor
P0112, P0113: Intake Air Temperature (IAT) sensor
P0335, P0336: Crankshaft Position (CKP) sensor
P0300: Random misfire
P0301, P0302, P0303, P0304, P0305, P0306: No. 1, No. 2, No. 3, No. 4, No. 5 or No. 6 cylinder misfire
P0505: Idle control system
P1519: Idle Air Control (IAC) valve

DTC P0128 can occasionally set when the hood is opened while the engine is running.

1. Check the engine coolant level.

   Is the engine coolant level low?

   YES—Refill the engine coolant. If necessary, repair the cooling leakage.■

   NO—Go to step 2.

2. Turn the ignition switch ON (II).

3. Check the radiator fan.

   Does the radiator fan keep running?

   YES—Check the radiator fan circuit, (see page 10-17), the radiator fan switch circuit (see page 10-17), and the radiator fan switch (see page 10-17). If they are OK, substitute the PCM and recheck (see page 11-5). If the symptom/indicator goes away, replace the original PCM.■

   NO—Replace the thermostat (see page 10-10).■

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DTC P0131: Primary HO2S (Sensor 1) Circuit Low Voltage

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Check the primary HO2S (Sensor 1) output voltage with the scan tool during acceleration using wide open throttle.

   Does the voltage stay at 0.5 V or less?

   YES – Go to step 4.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the primary HO2S (Sensor 1) and at the PCM. ■
4. Check the fuel pressure (see page 11-118).

   Is it normal?

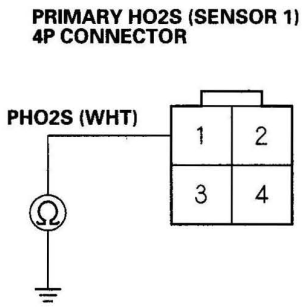
   YES – Go to step 5.

   NO – Repair the fuel supply system. ■
5. Turn the ignition switch OFF.
6. Disconnect the primary HO2S (Sensor 1) 4P connector.
7. Start the engine and let it idle.
8. Check the primary HO2S (Sensor 1) output voltage with the scan tool.

   Does it stay at 0.5 V or less?

   YES – Go to step 9.

   NO – Replace the primary HO2S (Sensor 1). ■
9. Turn the ignition switch OFF.
10. Disconnect PCM connector C (31P).
11. Check for continuity between primary HO2S (Sensor 1) 4P connector terminal No. 1 and body ground.



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the PCM (C16) and the primary HO2S (Sensor 1). ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

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DTC Troubleshooting (cont'd)

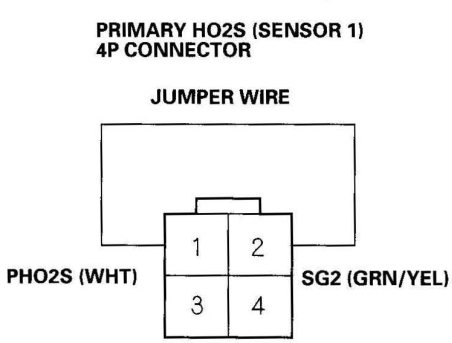
DTC P0132: Primary HO2S (Sensor 1) Circuit High Voltage

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Check the primary HO2S (Sensor 1) output voltage with the scan tool.

   Does the voltage stay at 0.9 V or more?

   YES—Go to step 4.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the primary HO2S (Sensor 1) and at the PCM.■
4. Turn the ignition switch OFF.
5. Disconnect the primary HO2S (Sensor 1) 4P connector.
6. Connect primary HO2S (Sensor 1) 4P connector terminals No. 1 and No. 2 with a jumper wire.



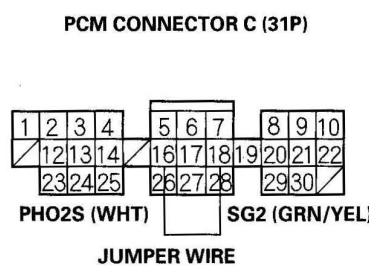
Wire side of female terminals

7. Turn the ignition switch ON (II).
8. Check the primary HO2S (Sensor 1) output voltage with the scan tool.

   Is there 0.9 V or more?

   YES—Go to step 9.

   NO—Replace the primary HO2S (Sensor 1).■
9. Turn the ignition switch OFF.
10. Connect PCM connector terminals C16 and C18 with a jumper wire.



Wire side of female terminals

11. Turn the ignition switch ON (II).
12. Check the primary HO2S (Sensor 1) output voltage with the scan tool.

    Is there 0.9 V or more?

    YES—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

    NO—Repair open in the wire between the PCM (C16, C18) and the primary HO2S (Sensor 1).■

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DTC P0133: Primary HO2S (Sensor 1) Slow Response

NOTE: If DTC P0131, P0132 and/or P0135 are stored at the same time as DTC P0133, troubleshoot those DTCs first, then recheck for DTC P0133.

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Test-drive under the following conditions:
   - 55 mph (89 km/h) steady speed
   - Transmission in D5 position
   - Until readiness code or Temporary DTC P0133 comes on
4. Check for a Temporary DTC with the scan tool.

   Is Temporary DTC P0133 indicated?

   YES—Replace the primary HO2S (Sensor 1). ■

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the primary HO2S (Sensor 1) and at the PCM. ■

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DTC Troubleshooting (cont'd)

DTC P0137: Secondary HO2S (Sensor 2) Circuit Low Voltage

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Check the secondary HO2S (Sensor 2) output voltage at 3,000 rpm with the scan tool.

   Does the voltage stay at 0.3 V or less?

   YES—Go to step 4.

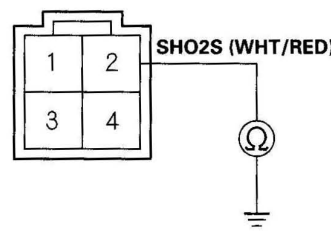
   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the secondary HO2S (Sensor 2) and at the PCM. ■
4. Turn the ignition switch OFF.
5. Disconnect the secondary HO2S (Sensor 2) 4P connector.
6. Start the engine.
7. Check the secondary HO2S (Sensor 2) output voltage with the scan tool.

   Does the voltage stay at 0.3 V or less?

   YES—Go to step 8.

   NO—Replace the secondary HO2S (Sensor 2). ■
8. Turn the ignition switch OFF.
9. Disconnect PCM connector A (32P).
10. Check for continuity between secondary HO2S (Sensor 2) 4P connector terminal No. 2 and body ground.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Terminal side of male terminals

Is there continuity?

YES—Repair short in the wire between the PCM (A1) and the secondary HO2S (Sensor 2). ■

NO—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

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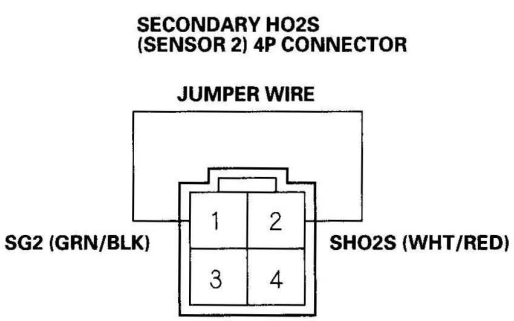
DTC P0138: Secondary HO2S (Sensor 2) Circuit High Voltage

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Check the secondary HO2S (Sensor 2) output voltage at 3,000 rpm with the scan tool.

   Does the voltage stay at 1.0 V or more?

   YES – Go to step 4.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the secondary HO2S (Sensor 2) and at the PCM. ■
4. Turn the ignition switch OFF.
5. Disconnect the secondary HO2S (Sensor 2) 4P connector.
6. Connect secondary HO2S (Sensor 2) 4P connector terminals No. 1 and No. 2 with a jumper wire.



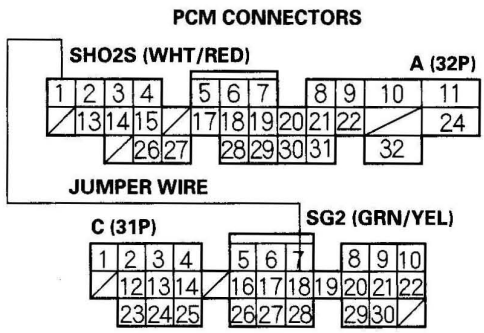
Terminal side of male terminals

7. Turn the ignition switch ON (II).
8. Check the secondary HO2S (Sensor 2) output voltage with the scan tool.

   Is there 1.0 V or more?

   YES – Go to step 9.

   NO – Replace the secondary HO2S (Sensor 2). ■
9. Turn the ignition switch OFF.
10. Connect PCM connector terminals A1 and C18 with a jumper wire.



Wire side of female terminals

11. Turn the ignition switch ON (II).
12. Check the secondary HO2S (Sensor 2) output voltage with the scan tool.

    Is there 1.0 V or more?

    YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

    NO – Repair open in the wire between the PCM (A1, C18) and the secondary HO2S (Sensor 2). ■

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DTC Troubleshooting (cont'd)

DTC P0139: Secondary HO2S (Sensor 2) Slow Response

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Check the Secondary HO2S (Sensor 2) output voltage at 3,000 rpm with the scan tool.

   Does the voltage stay within 0.3—0.8 V for 2 minutes?

   YES—Replace the Secondary HO2S (Sensor 2). ■

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the secondary HO2S (Sensor 2) and at the PCM. ■

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DTC P0135: Primary HO2S (Sensor 1) Heater Circuit Malfunction

DTC P0141: Secondary HO2S (Sensor 2) Heater Circuit Malfunction

NOTE: Information marked with an asterisk (*) applies to DTC P0141.

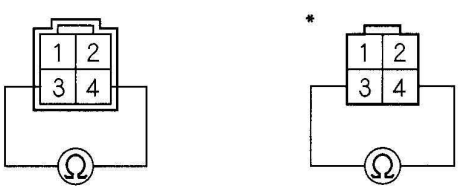
1. Reset the PCM (see page 11-4).
2. Start the engine.

   Is DTC P0135 or P0141 indicated?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the primary HO2S (Sensor 1), the secondary HO2S (Sensor 2), and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the HO2S (primary or secondary *) (Sensor 1 or Sensor 2 *) 4P connector.
5. At the HO2S side, measure resistance between HO2S 4P connector terminals No. 3 and No. 4.

PRIMARY/SECONDARY* HO2S (SENSOR 1/SENSOR 2*)4P CONNECTOR



Terminal side of male terminals

Wire side of female terminals

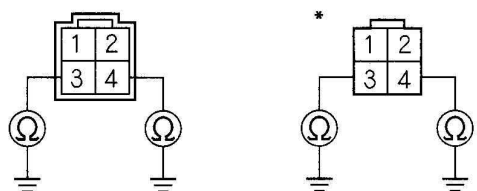
Is there 10 – 40 Ω ?

YES – Go to step 6.

NO – Replace the primary HO2S (Sensor 1) or secondary HO2S (Sensor 2) * . ■

6. Check for continuity between body ground and HO2S 4P connector terminals No. 3 and No. 4 individually.

PRIMARY/SECONDARY* HO2S (SENSOR 1/SENSOR 2*)4P CONNECTOR



Terminal side of male terminals

Wire side of female terminals

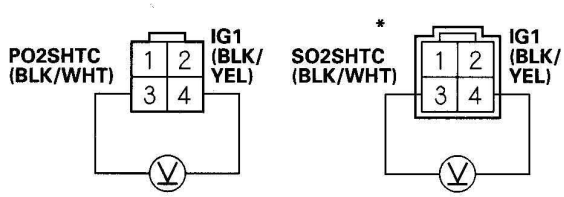
Is there continuity?

YES – Replace the HO2S (primary or secondary *) (Sensor 1 or Sensor 2 *). ■

NO – Go to step 7.

7. Turn the ignition switch ON (II).
8. At the wire harness side, measure voltage between HO2S 4P connector terminals No. 3 and No. 4.

PRIMARY/SECONDARY* HO2S (SENSOR 1/SENSOR 2*) 4P CONNECTOR



Wire side of female terminals

Terminal side of male terminals

Is there battery voltage?

YES – Go to step 9.

NO – Go to step 12.

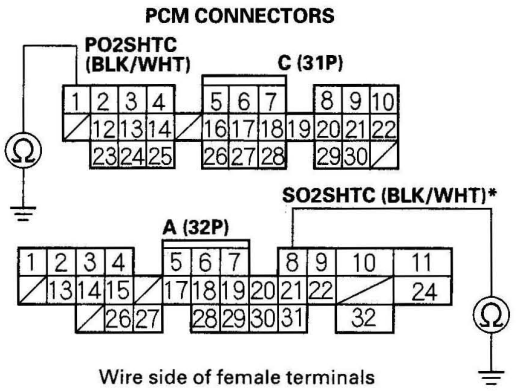
9. Turn the ignition switch OFF.
10. Disconnect PCM connector C (31P) (PCM connector A, 32P) * .

(cont'd)

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DTC Troubleshooting (cont'd)

11. Check for continuity between PCM connector terminal C1 (A8) * and body ground.

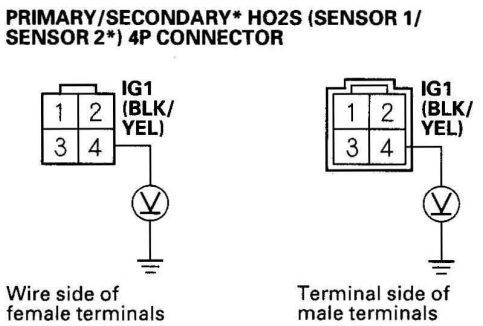


Is there continuity?

YES—Repair short in the wire between the PCM (C1, A8 *) and the HO2S (primary or secondary *) (Sensor 1, Sensor 2 *).■

NO—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

12. At the wire harness side, measure voltage between HO2S 4P connector terminal No. 4 and body ground.



Is there battery voltage?

YES—Go to step 13.

NO—Repair open in the wire between the primary HO2S (Sensor 1) (secondary HO2S (Sensor 2)) * and the No. 6 FI ECU (PCM) CRUISE CONTROL fuse.■

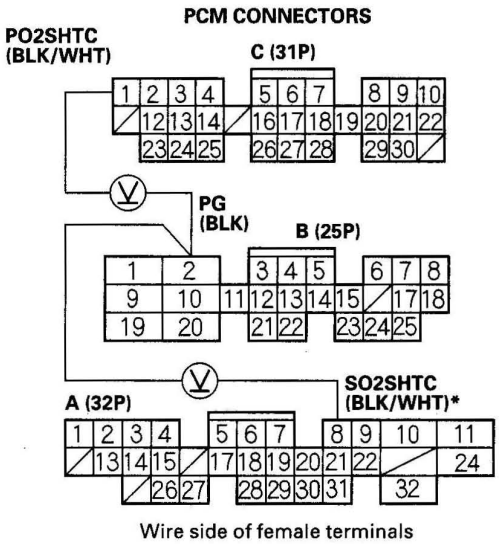
13. Turn the ignition switch OFF.

14. Reconnect the HO2S (Primary or Secondary *) (Sensor 1, Sensor 2 *) 4P connector.

15. Disconnect PCM connector C (31P) (PCM connector A, 32P) * .

16. Turn the ignition switch ON (II).

17. Measure voltage between PCM connector terminal C1 (A8) * and B2.



Is there 0.1 V or less?

YES—Repair open in the wire between the PCM (C1, A8 *) and the HO2S (Primary or Secondary *) (Sensor 1, Sensor 2 *).■

NO—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

BACK

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DTC P0171: Fuel System Too Lean

DTC P0172: Fuel System Too Rich

NOTE: If some of the DTCs listed below are stored at the same time as DTC P0171 and/or P0172, troubleshoot those DTCs first, then recheck for P0171 and/or P0172.

P0107, P0108, P1128, P1129: Manifold Absolute Pressure (MAP) sensor
P0135: Primary Heated Oxygen Sensor (primary HO2S) (Sensor 1) heater
P0137, P0138: Secondary HO2S (Sensor 2)
P0141: Secondary HO2S (Sensor 2) heater
P0401, P1491, P1498: Exhaust Gas Recirculation (EGR) system
P1259: VTEC system

1. Check the fuel pressure (see page 11-118).

   Is the fuel pressure OK?

   YES – Go to step 2.

   NO – Check these items:

   - If the pressure is too high, check the fuel pressure regulator, and the fuel return pipe. ■
   - If the pressure is too low, check the fuel pump, the fuel feed pipe, and the fuel filter, and the fuel pressure regulator. ■

2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.

3. Check the primary HO2S (Sensor 1) output with the scan tool.

   Does it stay less than 0.3 V or more than 0.6 V?

   YES – Replace the primary HO2S (Sensor 1). ■

   NO – Go to step 4.

4. Turn the ignition switch OFF.

5. With a vacuum pump, apply vacuum to the Evaporative Emission (EVAP) canister purge valve from the intake manifold side.

   Does it hold vacuum?

   YES – Check the valve clearances and adjust if necessary. If the valve clearances are OK, replace the injectors. ■

   NO – Replace the EVAP canister purge valve. ■

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DTC Troubleshooting (cont'd)

DTC P0300: Random Misfire and Any Combination of the Following:

DTC P0301: No. 1 Cylinder Misfire

DTC P0302: No. 2 Cylinder Misfire

DTC P0303: No. 3 Cylinder Misfire

DTC P0304: No. 4 Cylinder Misfire

DTC P0305: No. 5 Cylinder Misfire

DTC P0306: No. 6 Cylinder Misfire

NOTE:
- If the misfiring is frequent enough to trigger detection of increased emissions during 2 consecutive driving cycles, the MIL will come on, and DTC P0300 (and some combination of P0301 through P0306) will be stored.
- If the misfiring is frequent enough to damage the catalyst, the MIL will blink whenever the misfiring occurs, and DTC P0300 (and some combination of P0301 through P0306) will be stored. When the misfiring stops, the MIL will remain on.

1. Troubleshoot the following DTCs first if any of them were stored along with the random misfire DTC(s):
   P0107, P0108, P1128, P1129: Manifold Absolute Pressure (MAP) Sensor
   P0131, P0132: Primary Heated Oxygen Sensor (primary HO2S)
   P0171, P0172: Fuel system
   P0335, P0336: Crankshaft Position (CKP) sensor
   P0401, P1491, P1498: Exhaust Gas Recirculation (EGR) system
   P0505: Idle control system
   P1259: VTEC system
   P1361, P1362, P1366, P1367: Top Dead Center (TDC) 1/TDC 2 sensor
   P1519: Idle Air Control (IAC) valve

2. Test-drive the vehicle to verify the symptom.

3. Find the symptom in the chart below, and do the related procedures and checks, in the order listed, until you find the cause.

Symptom	Procedure(s)	Also check for:
Random misfire only at low RPM and under load	Check fuel pressure (see page 11-118).	• Low compression • Low quality fuel
Random misfire only during acceleration	Check fuel pressure (see page 11-118).	Malfunction in the VTEC system (see page 6-7)
Random misfire at high RPM, under load, or under random conditions	Check fuel pressure (see page 11-118).	Correct valve clearance (see page 6-11)

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DTC P0301: No. 1 Cylinder Misfire

DTC P0302: No. 2 Cylinder Misfire

DTC P0303: No. 3 Cylinder Misfire

DTC P0304: No. 4 Cylinder Misfire

DTC P0305: No. 5 Cylinder Misfire

DTC P0306: No. 6 Cylinder Misfire

1. Remove the intake manifold cover and the ignition coil cover (see step 4 on page 6-31).
2. After checking and recording the freeze data, reset the PCM (see page 11-4). If there is no freeze data of the misfire, just clear the DTC.
3. Start the engine, and listen to a clicking sound at the injector of the problem cylinder.

   Does it click?

   YES – Go to step 4.

   NO – Go to step 31.
4. Turn the ignition switch OFF, and reset the PCM.
5. Exchange the ignition coil from the problem cylinder with one from another cylinder.
6. Test-drive the vehicle several times in the range of the freeze data or under various conditions if there was no freeze data.
7. Check the DTC and the Temporary DTC with the scan tool.

   Is DTC P0301, P0302, P0303, P0304, P0305 or P0306, or Temporary DTC P1399 indicated?

   YES – Go to step 8.

   NO – Intermittent misfire due to poor contact at the ignition coil connector. (no misfire at this time). Check the terminal fit at each coil connector. ■
8. Determine which cylinder had the misfire.

   Does the misfire occur in the cylinder where the ignition coil was exchanged?

   YES – Replace the faulty ignition coil (see page 4-17). ■

   NO – Go to step 9.
9. Turn the ignition switch OFF, and reset the PCM.
10. Exchange the spark plug from the problem cylinder with one from another cylinder.
11. Test-drive the vehicle several times in the range of the freeze data or under various conditions if there was no freeze data.
12. Check the DTC and the Temporary DTC with the scan tool.

    Is DTC P0301, P0302, P0303, P0304, P0305 or P0306, or Temporary DTC P1399 indicated?

    YES – Go to step 13.

    NO – Intermittent misfire due to spark plug fouling (no misfire at this time). ■
13. Determine which cylinder had the misfire.

    Does the misfire occur in the other cylinder where the spark plug was exchanged?

    YES – Replace the faulty spark plug. ■

    NO – Go to step 14.
14. Turn the ignition switch OFF, and reset the PCM.
15. Exchange the injector from the problem cylinder with one from the another cylinder.
16. Let the engine idle for 2 minutes.
17. Test-drive the vehicle several times in the range of the freeze data or under various conditions if there was no freeze data.

(cont'd)

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DTC Troubleshooting (cont'd)

18. Check the DTC and the Temporary DTC with the scan tool.

    Is DTC P0301, P0302, P0303, P0304, P0305 or P0306, or Temporary DTC P1399 indicated?

    YES – Go to step 19.

    NO – Intermittent misfire due to bad contact in the injector connector (no misfire at this time). ■

19. Determine which cylinder had the misfire.

    Does the misfire occur in the other cylinder whose injector was exchanged?

    YES – Replace the faulty injector (see page 11-98). ■

    NO – Go to step 20.

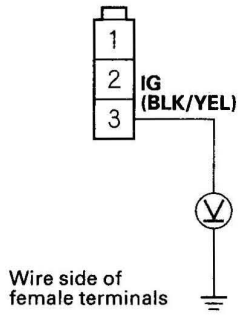
20. Turn the ignition switch OFF.

21. Disconnect the ignition coil 3P connector from the problem cylinder.

22. Turn the ignition switch ON (II).

23. Measure voltage between ignition coil 3P connector terminal No. 3 and body ground.

IGNITION COIL 3P CONNECTOR



Is there battery voltage?

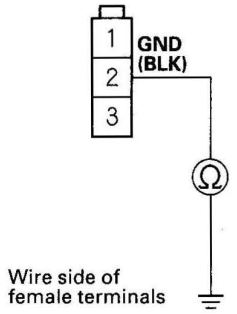
YES – Go to step 24.

NO – Repair open or short in the wire between the No. 11 COIL (15 A) fuse and the ignition coil. ■

24. Turn the ignition switch OFF.

25. Check for continuity between ignition coil 3P connector terminal No. 2 and body ground.

IGNITION COIL 3P CONNECTOR



Is there continuity?

YES – Go to step 26.

NO – Repair open in the wire between the ignition coil and G101 (or G102). ■

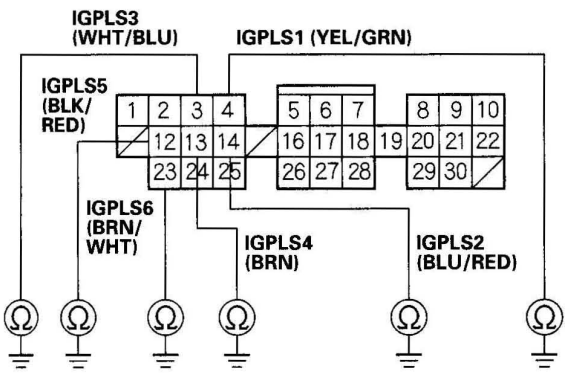
26. Disconnect PCM connector C (31P).

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27. Check for continuity between body ground and the appropriate PCM connector terminal (see table).

PCM CONNECTOR C (31P)



Wire side of female terminals

PROBLEM CYLINDER	DTC	PCM TERMINAL	WIRE COLOR
No. 1	P0301	C4	YEL/GRN
No. 2	P0302	C14	BLU/RED
No. 3	P0303	C3	WHT/BLU
No. 4	P0304	C13	BRN
No. 5	P0305	C12	BLK/RED
No. 6	P0306	C23	BRN/WHT

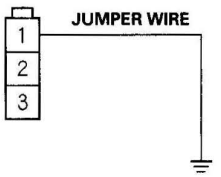
Is there continuity?

YES—Repair short in the wire between the PCM and the ignition coil. ■

NO—Go to step 28.

28. Connect the appropriate ignition coil 3P connector terminal No. 1 and body ground with a jumper wire (see table).

IGNITION COIL 3P CONNECTOR

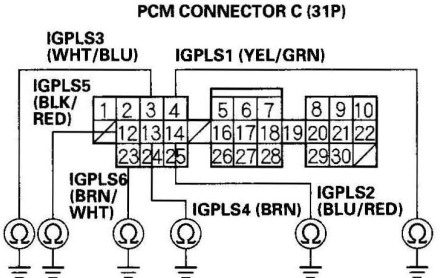


Wire side of female terminals

PROBLEM CYLINDER	DTC	WIRE COLOR
No. 1	P0301	YEL/GRN
No. 2	P0302	BLU/RED
No. 3	P0303	WHT/BLU
No. 4	P0304	BRN
No. 5	P0305	BLK/RED
No. 6	P0306	BRN/WHT

29. Check for continuity between body ground and the appropriate PCM connector terminal (see table).

PCM CONNECTOR C (31P)



Wire side of female terminals

PROBLEM CYLINDER	DTC	PCM TERMINAL	WIRE COLOR
No. 1	P0301	C4	YEL/GRN
No. 2	P0302	C14	BLU/RED
No. 3	P0303	C3	WHT/BLU
No. 4	P0304	C13	BRN
No. 5	P0305	C12	BLK/RED
No. 6	P0306	C23	BRN/WHT

Is there continuity?

YES—Go to step 30.

NO—Repair open in the wire between the PCM and the ignition coil. ■

(cont'd)

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DTC Troubleshooting (cont'd)

30. Check the engine compression (see page 6-6).

    Is the engine compression OK?

    YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

    NO – Repair the engine. ■

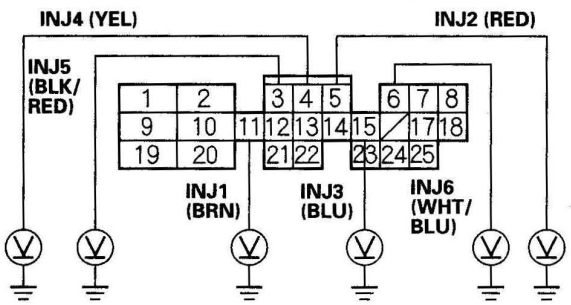
31. Turn the ignition switch OFF.

32. Disconnect PCM connector B (25P).

33. Turn the ignition switch ON (II).

34. Measure voltage between body ground and the appropriate PCM connector terminal (see table).

PCM CONNECTOR B (25P)



Wire side of female terminals

PROBLEM CYLINDER	DTC	PCM TERMINAL	WIRE COLOR
No. 1	P0301	B11	BRN
No. 2	P0302	B5	RED
No. 3	P0303	B15	BLU
No. 4	P0304	B4	YEL
No. 5	P0305	B3	BLK/RED
No. 6	P0306	B6	WHT/BLU

Is there battery voltage?

YES – Go to step 35.

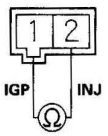
NO – Go to step 43.

35. Turn the ignition switch OFF.

36. Disconnect the injector 2P connector on the problem cylinder.

37. Measure resistance between injector 2P connector terminals No. 1 and No. 2.

INJECTOR 2P CONNECTOR



Terminal side of male terminals

Is there 13 Ω – 15 Ω ?

YES – Go to step 38.
NO – Replace the injector (see page 11-98). ■

38. Exchange the injector from the problem cylinder with one from another cylinder, and reset the PCM.

39. Let the engine idle for 2 minutes.

40. Test-drive the vehicle several times in the range of the freeze data or under various conditions if there was no freeze data.

41. Check the DTC and the Temporary DTC with the scan tool.

    Is DTC P0301, P0302, P0303, P0304, P0305 or P0306, or Temporary DTC P1399 indicated?

    YES – Go to step 42.
    NO – Intermittent misfire due to injector malfunction, etc. ■

42. Determine which cylinder had the misfire.

    Does the misfire occur in the other cylinder where the injector was exchanged?

    YES – Replace the faulty injector. ■
    NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

43. Turn the ignition switch OFF.

44. Disconnect the injector 2P connector from the problem cylinder.

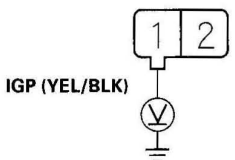
45. Turn the ignition switch ON (II).

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46. Measure voltage between injector 2P connector terminal No. 1 and body ground.

INJECTOR 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

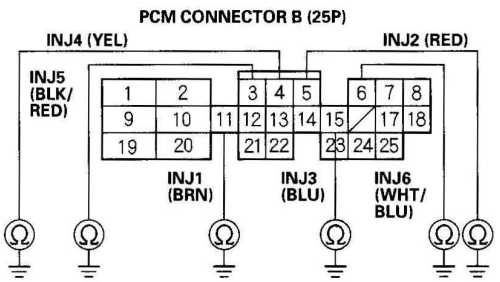
YES – Go to step 47.

NO – Repair open in the wire between the injector and the PGM-FI main relay. ■

47. Turn the ignition switch OFF.

48. Check for continuity between body ground and the appropriate PCM connector terminal (see table).

PCM CONNECTOR B (25P)



Wire side of female terminals

PROBLEM CYLINDER	DTC	PCM TERMINAL	WIRE COLOR
No. 1	P0301	B11	BRN
No. 2	P0302	B5	RED
No. 3	P0303	B15	BLU
No. 4	P0304	B4	YEL
No. 5	P0305	B3	BLK/RED
No. 6	P0306	B6	WHT/BLU

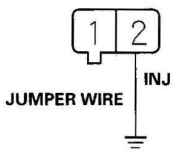
Is there continuity?

YES – Repair short in the wire between the PCM and the injector. ■

NO – Go to step 49.

49. Connect the the appropriate injector 2P connector terminal No. 2 to body ground with a jumper wire (see table).

INJECTOR 2P CONNECTOR

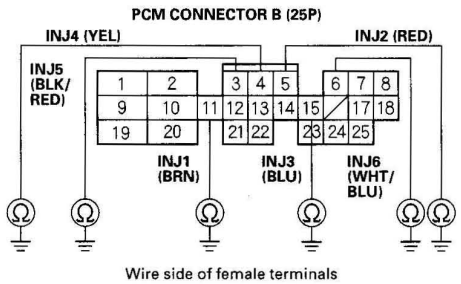


Wire side of female terminals

PROBLEM CYLINDER	DTC	WIRE COLOR
No. 1	P0301	BRN
No. 2	P0302	RED
No. 3	P0303	BLU
No. 4	P0304	YEL
No. 5	P0305	BLK/RED
No. 6	P0306	WHT/BLU

50. Check for continuity between body ground and the appropriate PCM connector terminals (see table).

PCM CONNECTOR B (25P)



Wire side of female terminals

PROBLEM CYLINDER	DTC	PCM TERMINAL	WIRE COLOR
No. 1	P0301	B11	BRN
No. 2	P0302	B5	RED
No. 3	P0303	B15	BLU
No. 4	P0304	B4	YEL
No. 5	P0305	B3	BLK/RED
No. 6	P0306	B6	WHT/BLU

Is there continuity?

YES – Replace the injector, then recheck. ■

NO – Repair open in the wire between the PCM and the injector. ■

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DTC Troubleshooting (cont'd)

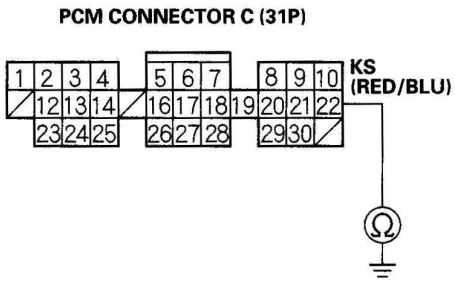
DTC P0325: Knock Sensor Circuit Malfunction

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
3. Hold the engine at 3,000 – 4,000 rpm for at least 60 seconds.

   Is DTC P0325 indicated?

   YES – Go to step 4.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the knock sensor and at the PCM.
4. Turn the ignition switch OFF.
5. Disconnect the knock sensor sub-harness connector (C161).
6. Disconnect the PCM connector C (31P).
7. Check for continuity between PCM connector terminal C22 and body ground.



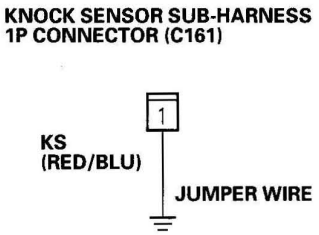
Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the PCM (C22) and the knock sensor sub-harness connector (C161).■

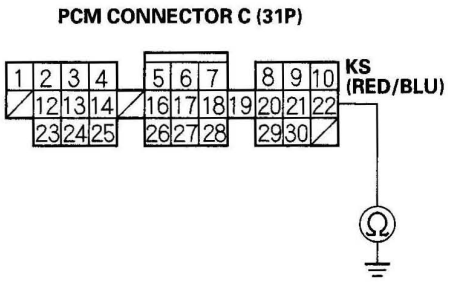
NO – Go to step 8.

8. Connect knock sensor sub-harness connector (C 161) terminal No. 1 to body ground with a jumper wire.



Wire side of female terminals

9. Check for continuity between PCM connector terminal C22 and body ground.



Wire side of female terminals

Is there continuity?

YES – Go to step 10.

NO – Repair open in the wire between the PCM (C22) and the knock sensor sub-harness connector (C161).■

10. Check the knock sensor sub-harness between C161 and the knock sensor for an open or short. If it's OK, substitute a known-good knock sensor and recheck.

    Is DTC P0325 indicated?

    YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

    NO – Replace the original knock sensor and/or the knock sensor sub-harness.■

BACK

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DTC P0335: CKP Sensor No Signal

DTC P0336: CKP Sensor Intermittent Interruption

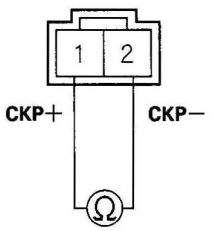
1. Reset the PCM (see page 11-4).
2. Start the engine.

   Is DTC P0335 and/or P0336 indicated?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the CKP sensor and at the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the CKP sensor 2P connector.
5. Measure resistance between CKP sensor 2P connector terminals No. 1 and No. 2.

CKP SENSOR 2P CONNECTOR



Terminal side of male terminals

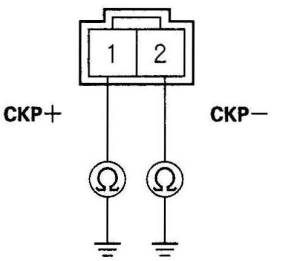
Is there 1,850 – 2,450 Ω ?

YES – Go to step 6.

NO – Replace the CKP sensor (see page 6-58). ■

6. Check for continuity between body ground and CKP sensor 2P connector terminals No. 1 and No. 2 individually.

CKP SENSOR 2P CONNECTOR



Terminal side of male terminals

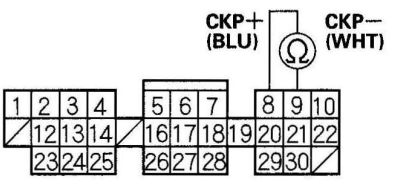
Is there continuity?

YES – Replace the CKP sensor (see page 6-58). ■

NO – Go to step 7.

7. Reconnect the CKP sensor 2P connector.
8. Disconnect PCM connector C (31P).
9. Measure resistance between PCM connector terminals C8 and C9.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there 1,850 – 2,450 Ω ?

YES – Go to step 10.

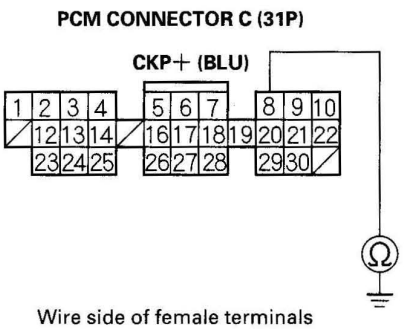
NO – Repair open in the wire between the PCM (C8, C9) and the CKP sensor. ■

(cont'd)

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DTC Troubleshooting (cont'd)

10. Check for continuity between body ground and PCM connector terminal C8.



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the PCM (C8) and the CKP sensor. ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

BACK

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DTC P1106: BARO Sensor Range/Perfomance Problem

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
3. Test-drive with the shift lever in the 2nd (2) position.
4. Accelerate for 5 seconds using wide open throttle.
5. Check for a Temporary DTC with the scan tool.

   Is Temporary DTC P1106 indicated?

   YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

   NO – Intermittent failure, system is OK at this time. ■

DTC P1107: BARO Sensor Circuit Low Voltage

DTC P1108: BARO Sensor Circuit High Voltage

1. Reset the PCM (see page 11-4).
2. Turn the ignition switch ON (II).

   Is DTC P1107 or P1108 indicated?

   YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

   NO – Intermittent failure, system is OK at this time. ■

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DTC Troubleshooting (cont'd)

DTC P1259: VTEC System Malfunction

Special Tools Required
- Pressure gauge adapter 07NAJ-P07010A
- A/T low pressure gauge w/panel 07406-0070300
- A/T pressure hose, 2,210 mm 07MAJ-PY4011A
- A/T pressure adapter 07MAJ-PY40120

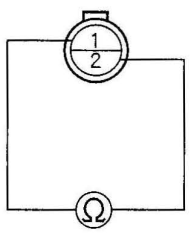
1. Check the engine oil level, and refill it if necessary.
2. Reset the PCM (see page 11-4).
3. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
4. Road Test the vehicle:
   Accelerate in 2 position to an engine speed over 4,500 rpm. Hold that engine speed for at least 2 seconds. If DTC P1259 is not repeated during the first road test, repeat this test 2 more times.

   Is DTC P1259 indicated?

   YES – Go to step 6.

   NO – Intermittent failure, the system is OK at this time. Check for poor connections or loose wires at the VTEC solenoid valve and at the PCM. ■
5. Turn the ignition switch OFF.
6. Disconnect the VTEC oil pressure switch 2P connector.
7. Check for continuity on the VTEC oil pressure switch between the VTEC oil pressure switch 2P connector terminals No. 1 and No. 2.

   VTEC OIL PRESSURE SWITCH 2P CONNECTOR



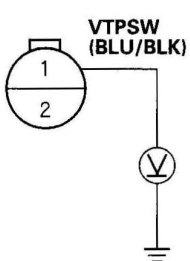
   Terminal side of male terminals

   Is there continuity?

   YES – Go to step 8.

   NO – Replace the VTEC oil pressure switch. ■
8. Turn the ignition switch ON (II).
9. Measure the voltage between VTEC oil pressure switch 2P connector terminal No. 1 and body ground.

   VTEC OIL PRESSURE SWITCH 2P CONNECTOR



   Wire side of female terminals

   Is there battery voltage?

   YES – Go to step 14.

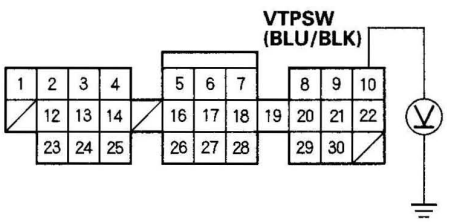
   NO – Go to step 10.

BACK

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10. Measure voltage between PCM connector terminal C10 and body ground.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there about battery voltage?

YES – Repair open in the wire between the VTEC oil pressure switch and the PCM (C10). ■

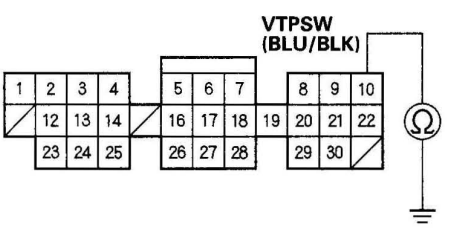
NO – Go to step 11.

11. Turn the ignition switch OFF.

12. Disconnect PCM connector C (31P).

13. Check for continuity between PCM connector terminal C10 and body ground.

PCM CONNECTOR C (31P)



Wire side of female terminals

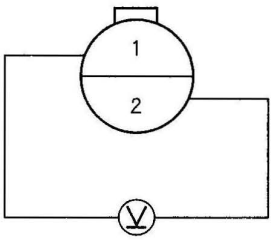
Is there continuity?

YES – Repair short in the wire between the VTEC oil pressure switch and the PCM (C10). ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original PCM. ■

14. Measure voltage across the VTEC oil pressure switch harness 2P connector.

VTEC OIL PRESSURE SWITCH HARNESS 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 12.

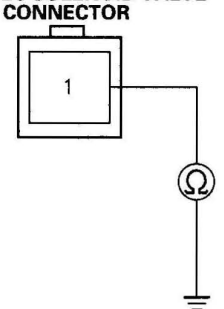
NO – Repair open in the wire between the VTEC oil pressure switch and G101, G102. ■

15. Turn the ignition switch OFF.

16. Disconnect the VTEC solenoid valve 1P connector.

17. Check for continuity on the VTEC solenoid valve between the solenoid valve 1P connector terminal and body ground.

VTEC SOLENOID VALVE 1P CONNECTOR



Terminal side of male terminal

Is there 14 – 30 Ω ?

YES – Go to step 18.

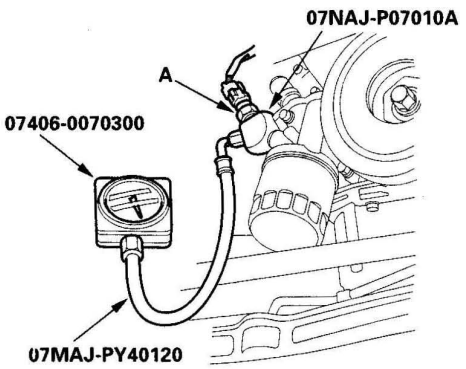
NO – Replace the VTEC solenoid valve. ■

(cont'd)

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DTC Troubleshooting (cont'd)

18. Remove the VTEC oil pressure switch (A) and install the special tools as shown. Then reinstall the VTEC oil pressure switch.



19. Reconnect the VTEC solenoid valve 1P connector and VTEC oil pressure switch 2P connector.

20. Connect a tachometer.

21. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.

22. Check oil pressure at engine speeds of 1,000, 2,000 and 3,000 rpm. Keep measuring time as short as possible because the engine is running with no load (less than 1 minute).

    Is pressure below 49 kPa (0.5 kgf/cm², 7 psi)?

    YES – Go to step 23.

    NO – Inspect the VTEC solenoid valve (see page 11-97). ■

23. Turn the ignition switch OFF.

24. Disconnect the VTEC solenoid valve 1P connector.

25. Attach the battery positive terminal to the VTEC solenoid valve terminal.

26. Start the engine and check oil pressure at an engine speed of 3,000 rpm.

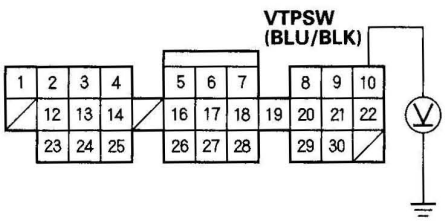
    Is pressure above 390 kPa (4.0 kgf/cm², 57 psi)?

    YES – Go to step 27.

    NO – Inspect the VTEC solenoid valve (see page 11-97). ■

27. With the battery positive terminal still connected to the VTEC solenoid valve, measure voltage between PCM connector C10 and body ground.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there battery voltage above 4,500 rpm?

YES – Go to step 28.

NO – Replace the VTEC oil pressure switch. ■

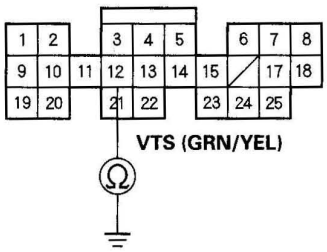
28. Turn the ignition switch OFF.

29. Disconnect the battery positive terminal from the VTEC solenoid valve terminal.

30. Disconnect the PCM connector B (25P).

31. Check for continuity between PCM connector terminal B12 and body ground.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the VTEC solenoid valve and the PCM (B12). ■

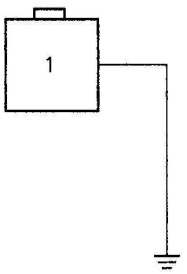
NO – Go to step 32.

BACK

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32. Connect the VTEC solenoid valve 1P connector terminal No. 1 and body ground with a jumper wire.

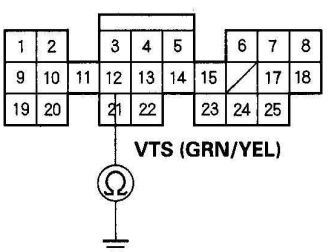
VTEC SOLENOID VALVE 1P CONNECTOR



Wire side of female terminal

33. Check for continuity between PCM connector terminal B12 and body ground.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES—Substitute a known-good PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original PCM.■

NO—Repair short in the wire between the VTEC solenoid valve and the PCM (B12).■

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DTC Troubleshooting (cont'd)

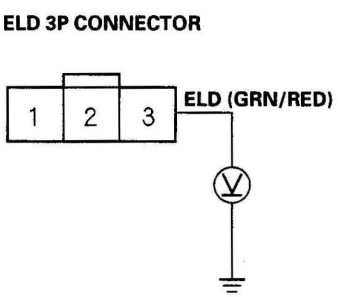
DTC P1297: ELD Circuit Low Voltage

1. Reset the PCM (see page 11-4).
2. Start the engine.
3. Turn on the headlights.

   Is DTC P1297 indicated?

   YES – Go to step 4.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the ELD and at the PCM. ■
4. Turn the ignition switch and the headlights OFF.
5. Disconnect the ELD 3P connector.
6. Turn the ignition switch ON (II).
7. Measure voltage between body ground and ELD 3P connector terminal No. 3.



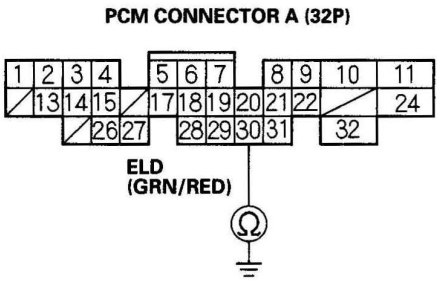
Wire side of female terminals

Is there about 5 V?

YES – Replace the ELD. ■

NO – Go to step 8.

8. Turn the ignition switch OFF.
9. Disconnect PCM connector A (32P).
10. Check for continuity between body ground and PCM connector terminal A30.



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the PCM (A30) and the ELD. ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

BACK

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DTC P1298: ELD Circuit High Voltage

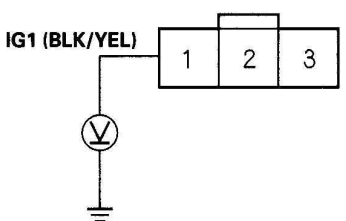
1. Reset the PCM (see page 11-4).
2. Start the engine.
3. Turn on the headlights.

   Is DTC P1298 indicated?

   YES—Go to step 4.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the ELD and at the PCM.■
4. Turn the ignition switch and headlights OFF.
5. Disconnect the ELD 3P connector.
6. Turn the ignition switch ON (II).
7. Measure voltage between body ground and ELD 3P connector terminal No. 1.

ELD 3P CONNECTOR



Wire side of female terminals

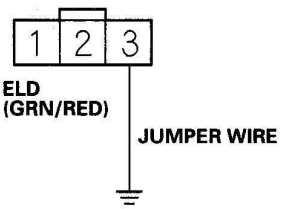
Is there battery voltage?

YES—Go to step 8.

NO—Repair open in the wire between the No. 6 ECU (PCM) CRUISE CONTROL (15 A) fuse and the ELD.■

8. Turn the ignition switch OFF.
9. Connect ELD 3P connector terminal No. 3 to body ground with a jumper wire.

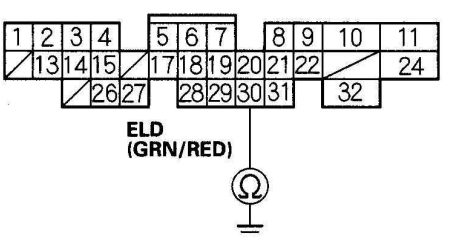
ELD 3P CONNECTOR



Wire side of female terminals

10. Disconnect PCM connector A (32P).
11. Check for continuity between body ground and PCM connector terminal A30.

PCM CONNECTOR A (32P)



Wire side of female terminals

Is there continuity?

YES—Go to step 12.

NO—Repair open in the wire between the PCM (A30) and the ELD.■

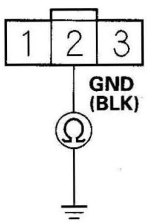
(cont'd)

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DTC Troubleshooting (cont'd)

12. Check for continuity between ELD 3P connector terminal No. 2 and body ground.

ELD 3P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Go to step 13.

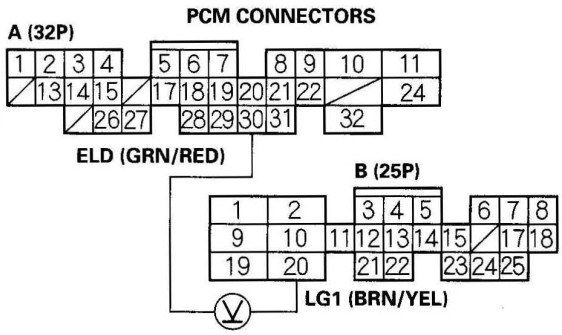
NO – Repair open in the wire between the ELD and G201. ■

13. Reconnect the ELD 3P connector and PCM connector A (32P).

14. Start the engine and let it idle.

15. While measuring voltage between PCM connector terminals A30 and B20, turn the headlights on (high).

PCM CONNECTORS



Wire side of female terminals

Does the voltage drop?

YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

NO – Replace the ELD. ■

BACK

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DTC P1361: TDC1 Sensor Intermittent Interruption

DTC P1362: TDC1 Sensor No Signal

DTC P1366: TDC2 Sensor Intermittent Interruption

DTC P1367: TDC2 Sensor No Signal

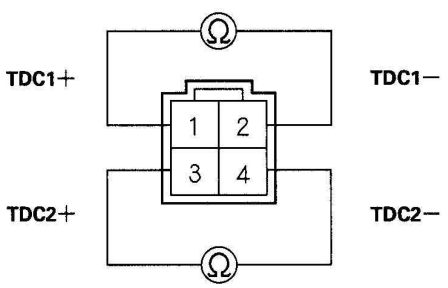
1. Reset the PCM (see page 11-4).
2. Start the engine.

   Is DTC P1361, P1362, P1366 or P1367 indicated?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the TDC 1/TDC 2 sensor and at the PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the TDC 1/TDC2 sensor 4P connector.
5. Measure resistance between the terminals of the indicated sensor (see table).

TDC1/TDC2 SENSOR 4P CONNECTOR



Terminal side of male terminals

SENSOR	DTC	SENSOR TERMINAL	PCM TERMINAL	WIRE COLOR
TDC1	P1361	1	C20	GRN
	P1362	2	C21	RED
TDC2	P1366	3	C29	YEL
	P1367	4	C30	BLK

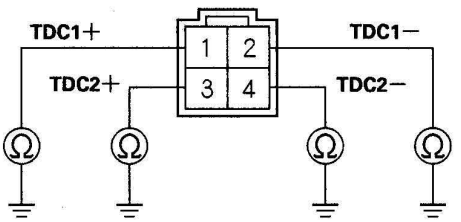
Is there 1,850—2,450 Ω ?

YES—Go to step 6.

NO—Replace the TDC 1/TDC 2 sensor (see page 6-57).■

6. Check for continuity to body ground on both terminals of the indicated sensor individually.

TDC1/TDC2 SENSOR 4P CONNECTOR



Terminal side of male terminals

Is there continuity?

YES—Replace the TDC 1/TDC 2 sensor (see page 6-57).■

NO—Go to step 7.

7. Reconnect the TDC 1/TDC 2 sensor 4P connector.
8. Disconnect PCM connector C (31P).

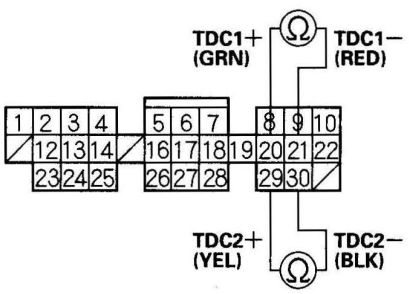
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

9. Measure resistance between the terminals of the indicated sensor on the PCM connector (see table).

PCM CONNECTOR C (31P)



Wire side of female terminals

SENSOR	DTC	PCM TERMINAL	WIRE COLOR
TDC1	P1361	C20	GRN
	P1362	C21	RED
TDC2	P1366	C29	YEL
	P1367	C30	BLK

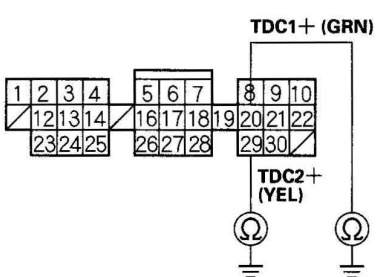
Is there 1,850–2,450 Ω ?

YES—Go to step 10.

NO—Repair open in the indicated sensor wires (see table).■

10. Check for continuity between body ground and PCM connector terminals C20 and/or C29 individually.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the indicated sensor wires.■

NO—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

DTC P1607: PCM Internal Circuit Malfunction

1. Reset the PCM (see page 11-4).
2. Turn the ignition switch ON (II).
3. Wait 30 seconds.

Is DTC P1607 indicated?

YES—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

NO—Go to step 4.

4. Turn the ignition switch OFF.
5. Turn the ignition switch ON (II).
6. Wait 10 seconds.

Is DTC P1607 indicated?

YES—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

NO—Intermittent failure, system is OK at this time. A low battery can cause this problem. Ask the customer if the engine ever had to be jump-started.■

BACK

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MIL Circuit Troubleshooting

1. Turn the ignition switch ON (II) and watch the Malfunction Indicator Lamp (MIL).

   Does the MIL come on and stay on for more than 20 seconds after turning the ignition switch ON (II)?

   YES – If the MIL always come on and stays on, go to step 20. But if the MIL sometimes works normally, first check for these problems. ■

   - An intermittent short in the wire between the PCM (A10) and the Data Link Connector (DLC).
   - An intermittent open in the wire between the PCM (A21) and the DLC.
   - An intermittent short in the wire between the PCM (A18) and the gauge assembly.

   NO – If the MIL is always off, go to step 2. But if the MIL sometimes works normally, first check for these problems. ■

   - A loose No. 9 BACK UP LIGHT, INSTRUMENT LIGHT (10 A) fuse in the driver's under-dash fuse/relay box.
   - A loose ACG S (15 A) fuse in the under-hood fuse/relay box.
   - A loose No. 1 FUEL PUMP (15 A) fuse in the driver's under-dash fuse/relay box.
   - A poor connection at PCM terminal A18.
   - An intermittent open in the GRN/ORN wire between the PCM (A18) and the gauge assembly.
   - An intermittent short in the wire between the PCM (C19), the manifold absolute pressure (MAP) sensor, and the countershaft speed sensor.
   - An intermittent short in the wire between the PCM (C28), the throttle position (TP) sensor, exhaust gas recirculation (EGR) valve position sensor, fuel tank pressure (FTP) sensor, and the mainshaft speed sensor.

2. Turn the ignition switch OFF and then ON (II) again.

   Is the low oil pressure indicator on?

   YES – Go to step 3.

   NO – Check for these problems. ■

   - A blown No. 9 BACK UP LIGHT, INSTRUMENT LIGHT (10 A) fuse in the driver's under-dash fuse/relay box.
   - A short or open in the wire between No. 9 BACK UP LIGHT, INSTRUMENT LIGHT (10 A) fuse and the gauge assembly.

3. Try to start the engine.

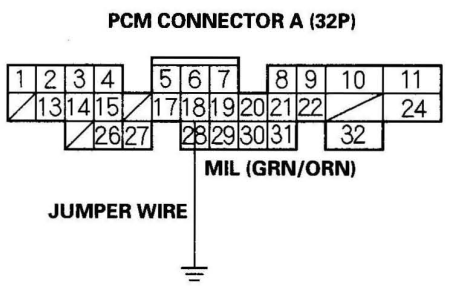
   Does the engine start?

   YES – Go to step 4.

   NO – Go to step 7.

4. Turn the ignition switch OFF.

5. Connect PCM connector terminal A18 and body ground with a jumper wire.



Wire side of female terminals

6. Turn the ignition switch ON (II).

   Is the MIL on?

   YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

   NO – Check for an open in the wires between the PCM (A18) and the gauge assembly. Also check for a blown MIL bulb. ■

(cont'd)

Protected by AR

MIL Circuit Troubleshooting (cont'd)

7. Turn the ignition switch OFF.

8. Inspect the ACG S (15 A) fuse in the under-hood fuse/relay box.

   Is the fuse OK?

   YES – Go to step 9.

   NO – Check for these problems. ■

   - A short in the wire between the ACG S (15 A) fuse and the PGM-FI main relay.
   - A short in the wire between the PGM-FI main relay and the PCM, injectors, or IAC valve.
   - A blown ACG S (15 A) fuse in the driver's under-dash fuse/relay box.

9. Inspect the No. 1 FUEL PUMP (15 A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

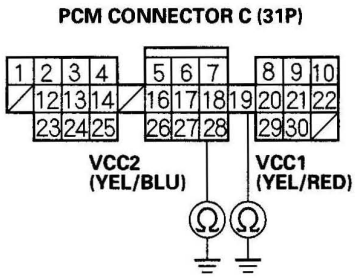
   YES – Go to step 10.

   NO – Check for these problems. ■

   - A blown the No. 1 FUEL PUMP (15 A) fuse in the driver's under-dash fuse/relay box.
   - A short in the wire between the No. 1 FUEL PUMP (15 A) fuse and the PGM-FI main relay.
   - A short in the wire between the PGM-FI main relay and the fuel pump.
   - A faulty PGM-FI main relay or faulty pump.

10. Disconnect PCM connector C (31P).

11. Check for continuity between body ground and PCM connector terminals C19 and C28 individually.



Wire side of female terminals

Is there continuity?

YES – Go to step 12.

NO – Go to step 13.

12. Disconnect the 3P connector from each of these sensors, one at a time, and check for continuity between body ground and PCM connector terminal C19 and C28 individually.

    - Manifold Absolute Pressure (MAP) sensor
    - Exhaust Gas Recirculation (EGR) valve position sensor
    - Fuel Tank Pressure (FTP) sensor
    - Throttle Position (TP) sensor
    - Mainshaft speed sensor
    - Countershaft speed sensor

    Is there continuity?

    YES – Repair short to body ground in the wire between the PCM (C19) and the MAP sensor or countershaft speed sensor, or the PCM (C28) and the TP sensor, EGR valve position sensor, FTP sensor, or mainshaft speed sensor. ■

    NO – Replace the sensor that made continuity to body ground go away when disconnected. ■

13. Disconnect the injectors and idle air control (IAC) valve connectors.

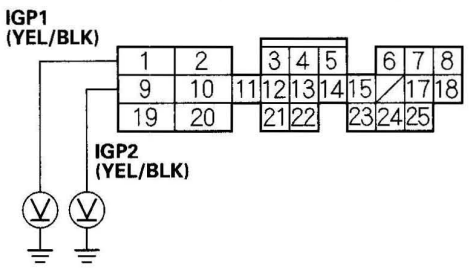
BACK

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14. Turn the ignition switch ON (II).

15. Measure voltage between body ground and PCM connector terminals B1 and B9 individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there battery voltage?

YES – Go to step 16.

NO – Check for these problems:

- An open in the wire(s) between the PGM-FI main relay and PCM connector terminals B1 and B9.
- Poor connections at the PGM-FI main relay.
- A faulty PGM-FI main relay (see page 11-114).

If necessary, repair or replace the part.■

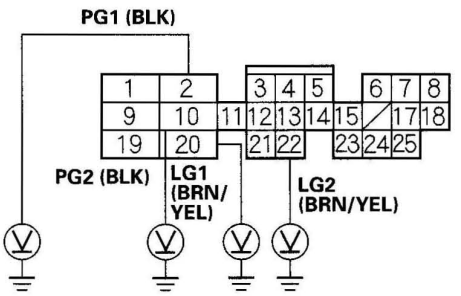
16. Turn the ignition switch OFF.

17. Reconnect the connectors to the sensors, then reconnect PCM connector C (31P).

18. Turn the ignition switch ON (II).

19. Measure voltage between body ground and PCM connector terminals B2, B10, B20, and B22 individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there less than 1.0 V?

YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

NO – Repair open in the wire(s) that had more than 1.0 V between G101 and the PCM (B2, B10, B20, B22).■

20. Turn the ignition switch OFF.

21. Connect an OBD II scan tool/Honda PGM Tester (see page 11-3).

22. Turn the ignition switch ON (II).

23. Read the OBD II scan tool/Honda PGM Tester.

Does the OBD II scan tool/Honda PGM Tester communicate with the PCM?

YES – Go to step 28.

NO – Go to step 24.

(cont'd)

Protected by AR

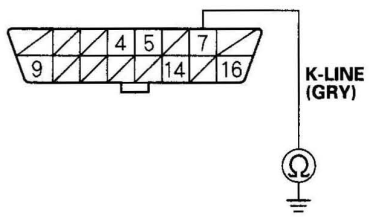
MIL Circuit Troubleshooting (cont'd)

24. Turn the ignition switch OFF.

25. Disconnect PCM connector A (32P).

26. Check for continuity between body ground and Data Link Connector (DLC) terminal No. 7.

DATA LINK CONNECTOR (DLC)



Terminal side of female terminals

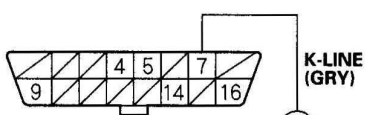
Is there continuity?

YES – Repair short in the wire between the DLC and the PCM (A21). After repairing it, check the DTC with the OBD II scan tool/Honda PGM Tester and go to the DTC Troubleshooting Index.

NO – Go to step 27.

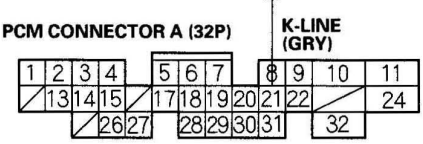
27. Check for continuity between PCM connector terminal A21 and DLC terminal No. 7.

DATA LINK CONNECTOR (DLC)



Terminal side of female terminals

PCM CONNECTOR A (32P)



Wire side of female terminals

Is there continuity?

YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM. ■

NO – Repair open in the wire between the DLC and the PCM (A21). After repairing it, check the DTC with the OBD II scan tool/Honda PGM Tester and go to the DTC Troubleshooting Index.

28. Check the OBD scan tool/Honda PGM Tester for DTCs.

Are any DTCs indicated?

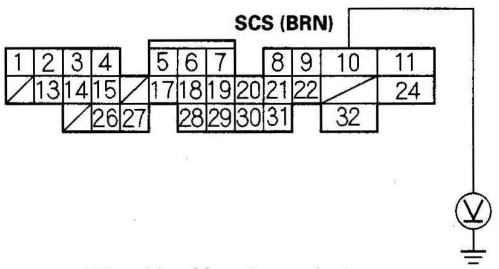
YES – Go to the DTC Troubleshooting Index.

NO – Go to step 29.

29. Turn the ignition switch OFF, then turn it back ON (II).

30. Measure voltage between PCM connector terminal A10 and body ground.

PCM CONNECTOR A (32P)



Wire side of female terminals

Is there about 5 V (or battery voltage)?

YES – Go to step 31.

NO – Repair short in the wire between the DLC and the PCM (A10). ■

31. Turn the ignition switch OFF.

32. Disconnect PCM connector A (32P).

33. Turn the ignition switch ON (II).

Is the MIL on?

YES – Repair short in the wire between the gauge assembly and the PCM (A18). ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

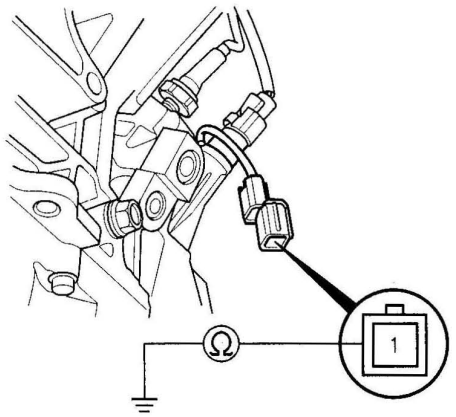
BACK

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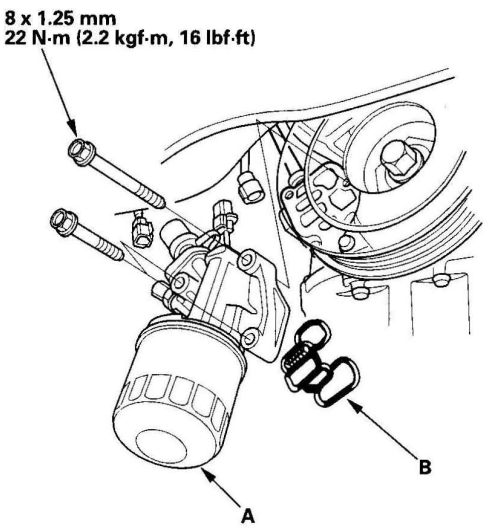
VTEC Solenoid Valve Test

1. Disconnect the VTEC solenoid valve 1P connector.
2. Measure resistance between the VTEC solenoid valve 1P connector terminal No. 1 and body ground.

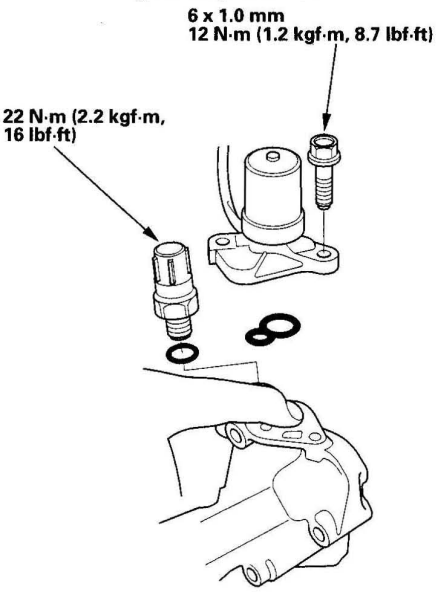
   Resistance: 14—30 Ω



3. If the resistance is within specifications, remove the VTEC solenoid valve/oil filter assembly (A) from the oil pump, and check the VTEC solenoid valve filter (B) for clogging. If there is clogging, replace the VTEC solenoid valve filter, the engine oil filter, and the engine oil.



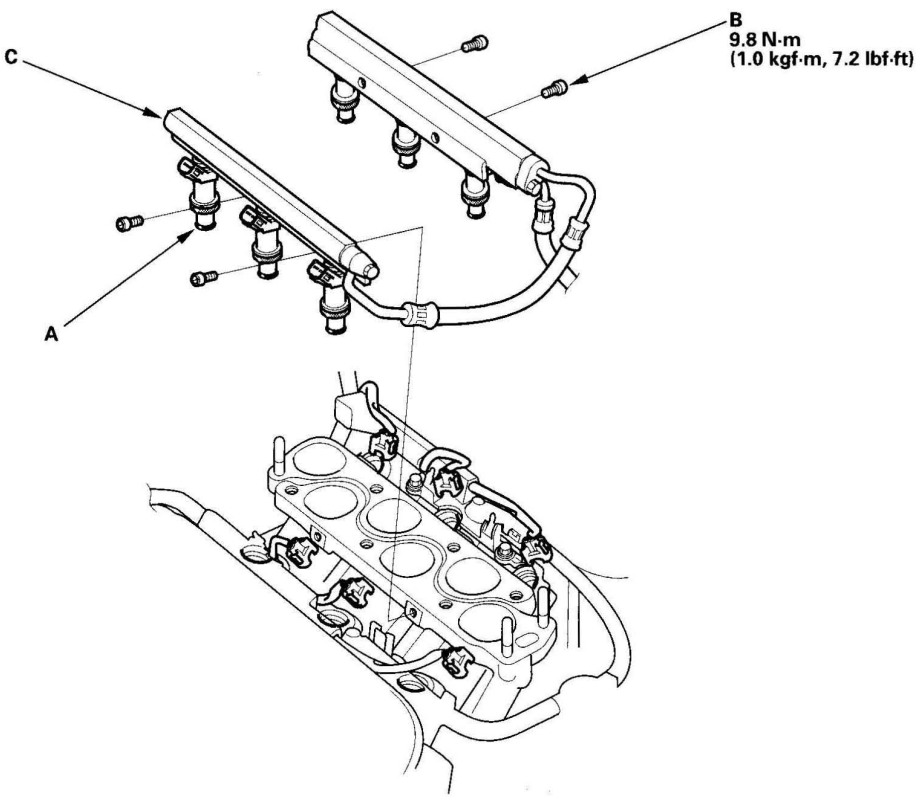
4. If the filter is not clogged, remove the VTEC solenoid valve and push it with your finger to check its movement. If the VTEC solenoid valve is normal, check the engine oil pressure.



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Injector Replacement

1. Relieve fuel pressure (see page 11-117).
2. Remove the intake manifold covers (see step 4 on page 6-31) and the intake manifold (see page 9-2).
3. Disconnect the connectors from the injectors (A).

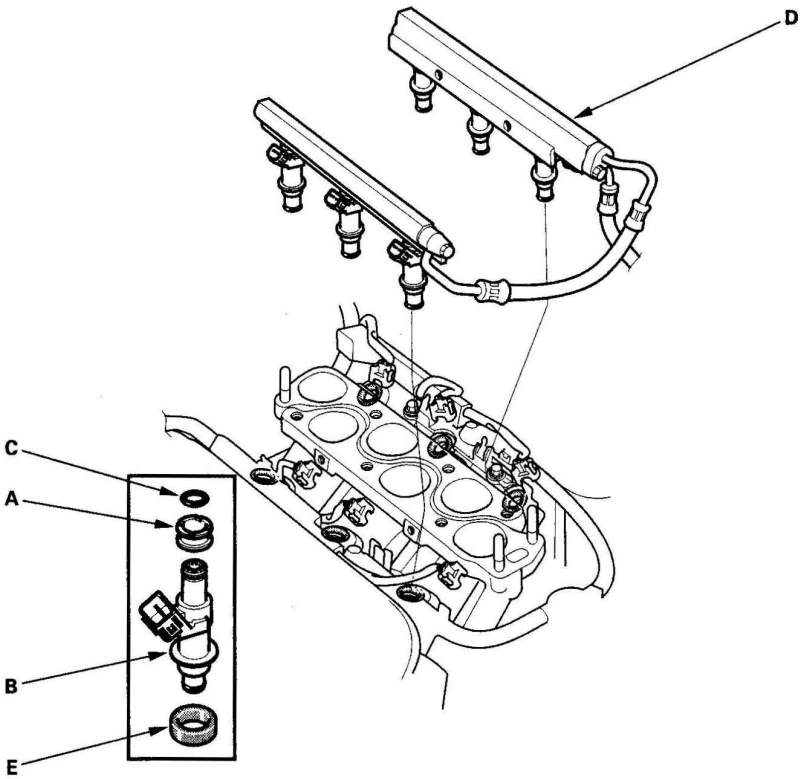


4. Remove the fuel rail mounting bolts (B) from the fuel rail (C).
5. Remove the fuel rails.
6. Remove the injectors from the fuel rails.

BACK

Protected by AR

7. Slide new cushion rings (A) onto the injectors (B).



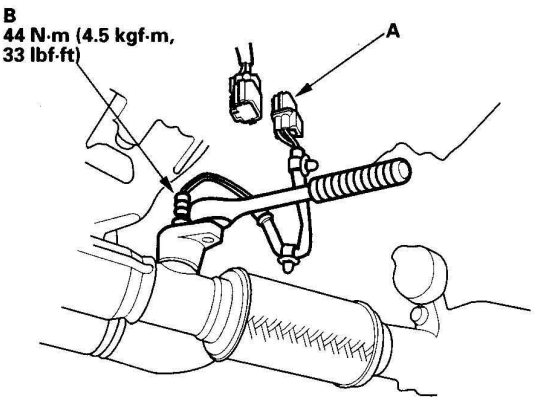
8. Coat the new O-rings (C) with clean engine oil, and put them on the injectors.
9. Insert the injectors into the rail (D) first.
10. Coat new seal rings (E) with clean engine oil, and press them into the intake manifold.
11. To prevent damage to the O-rings, install the fuel rails first, then install them in the intake manifold.
12. Install the fuel rail mounting bolts.
13. Install the connectors on the injectors.
14. Install the intake manifold and the intake manifold cover.
15. Turn the ignition switch ON (II), but do not operate the starter. After the fuel pump runs for about 2 seconds, the fuel pressure in the fuel line rises. Repeat this 2 or 3 times, then check for fuel leakage.

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Primary HO2S Replacement

Special Tools Required
O2 sensor wrench, Snap-on YA8875, SP Tools 93750, or equivalent, commercially available

1. Disconnect the primary HO2S 4P connector (A), then remove the primary HO2S (B).

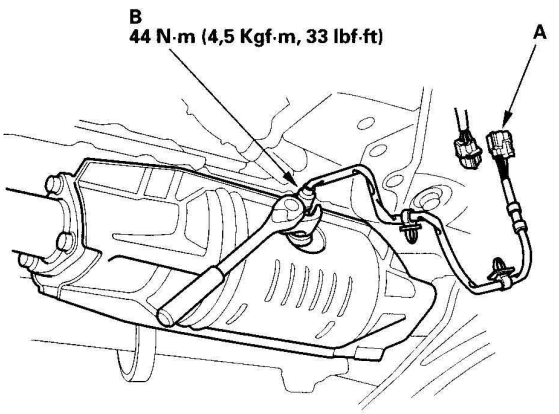


2. Install the primary HO2S in the reverse order of removal.

Secondary HO2S Replacement

Special Tools Required
O2 sensor wrench, Snap-on YA8875, SP Tools 93750, or equivalent, commercially available

1. Disconnect the secondary HO2S 4P connector (A), then remove the secondary HO2S (B).

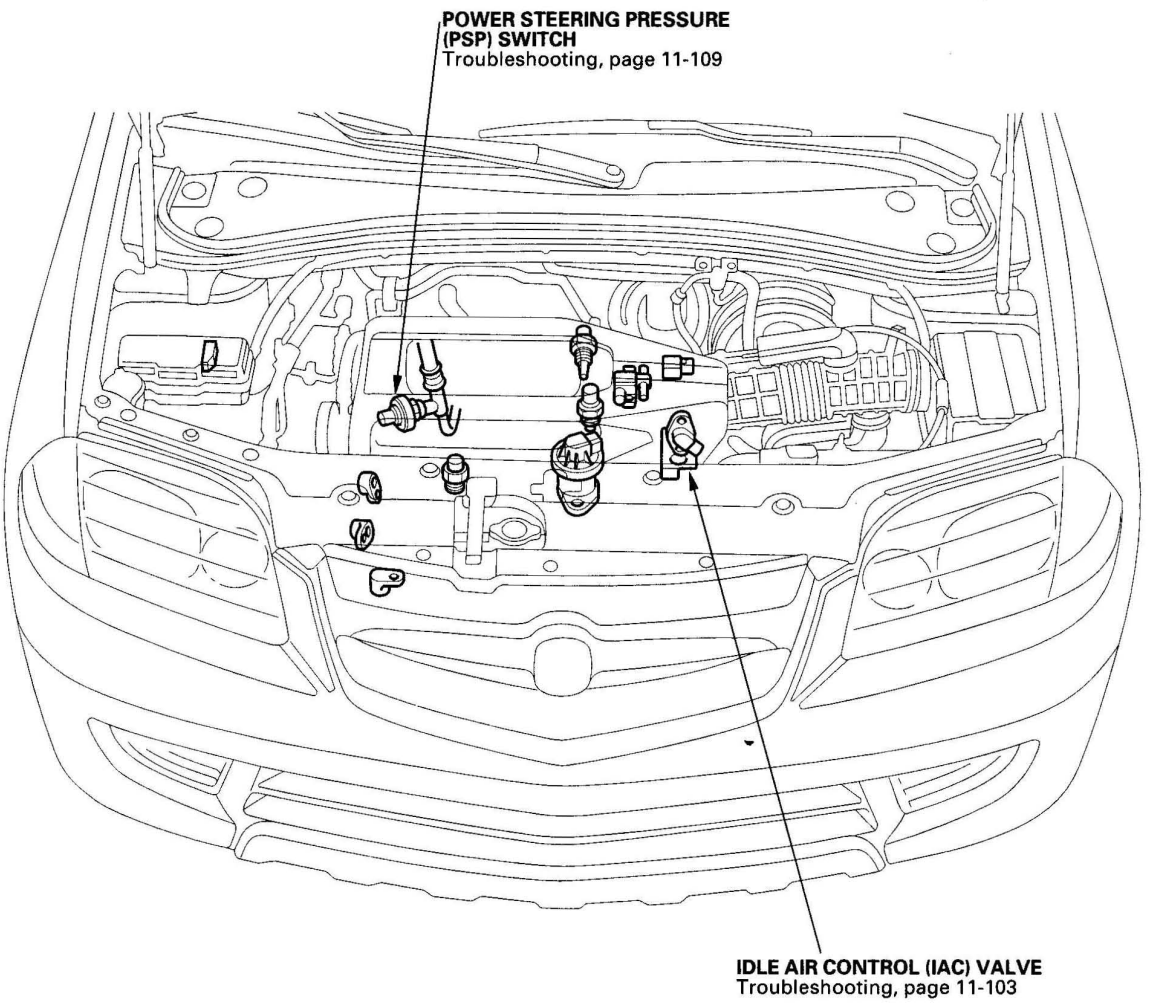


2. Install the secondary HO2S in the reverse order of removal.

BACK

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Component Location Index



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DTC Troubleshooting

DTC P0505: Idle Control System Malfunction

NOTE: If DTC P1519 is stored at same time as DTC P0505, troubleshooting DTC P1519 first, then recheck for DTC P0505.

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. Check the engine speed at idle with no-load conditions: headlights, blower fan, rear window defogger, radiator fan, and air conditioner are not operating.

   Is the engine running at 730±50 rpm?

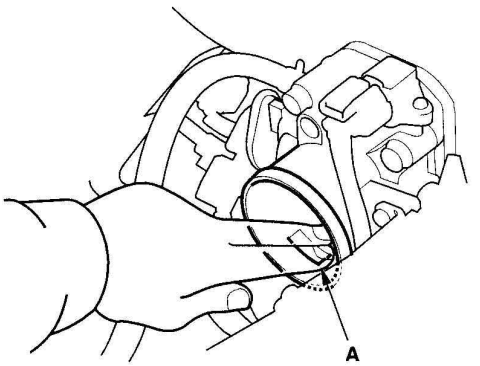
   YES—Intermittent failure, system is OK at this time. ■

   NO—If the idle speed is less than 680 rpm, go to step 3; if it's 780 rpm or higher, go to step 4.
3. Disconnect the idle air control (IAC) valve 3P connector.

   Does the engine speed increase or fluctuate?

   YES—Adjust the (base) idle speed (see page 11-112). If it's impossible, clean the ports in the throttle body. ■

   NO—Replace the IAC valve. ■
4. Turn the ignition switch OFF.
5. Remove the intake air duct from the throttle body.
6. Start the engine and let it idle.
7. Put your finger on the lower port (A) in the throttle body.



Does the engine speed drop below 780 rpm?

YES—Adjust the idle speed (see page 11-112). If it's impossible, replace the IAC valve. ■

NO—Check for vacuum leaks. Make sure the throttle valve is completely closed, and repair as necessary. ■

BACK

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DTC P1519: IAC Valve Circuit Malfunction

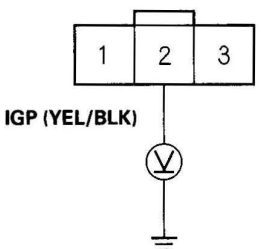
1. Reset the PCM (see page 11-4).
2. Turn the ignition switch ON (II).

   Is DTC P1519 indicated?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the IAC valve and at the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the IAC valve 3P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between IAC valve 3P connector terminal No. 2 and body ground.

IAC VALVE 3P CONNECTOR



Wire side of female terminals

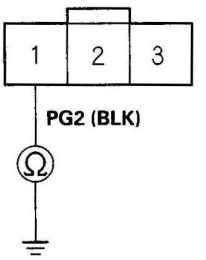
Is there battery voltage?

YES – Go to step 7.

NO – Repair open in the wire between the IAC valve and the PGM-FI main relay. ■

7. Turn the ignition switch OFF.
8. Check for continuity between body ground and IAC valve 3P connector terminal No. 1.

IAC VALVE 3P CONNECTOR



Wire side of female terminals

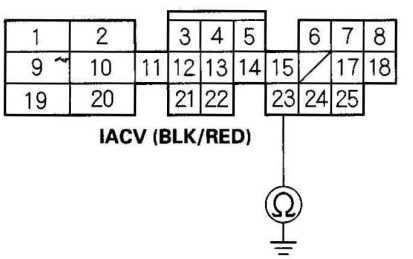
Is there continuity?

YES – Go to step 9.

NO – Repair open in the wire between the IAC valve and G101. ■

9. Disconnect PCM connector B (25P).
10. Check for continuity between body ground and PCM connector terminal B23.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the IAC valve and the PCM (B23). ■

NO – Go to step 11.

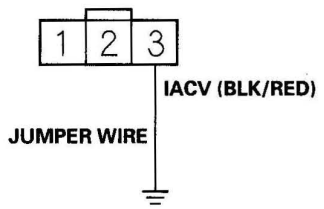
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DTC Troubleshooting (cont'd)

11. Connect IAC valve 3P connector terminal No. 3 to body ground with a jumper wire.

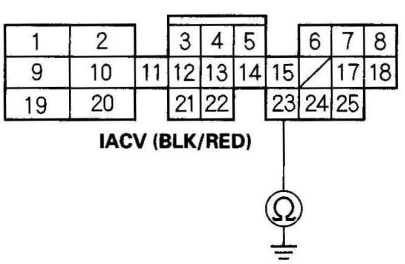
IAC VALVE 3P CONNECTOR



Wire side of female terminals

12. Check for continuity between PCM connector terminal B23 and body ground.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES – Go to step 13.

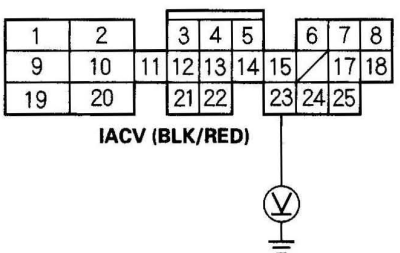
NO – Repair open in the wire between the IAC valve and the PCM (B23). ■

13. Remove the jumper wire from the IAC valve 3P connector, then reconnect the IAC valve 3P connector.

14. Turn the ignition switch ON (II).

15. Measure voltage between body ground and PCM connector terminal B23.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there battery voltage?

YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

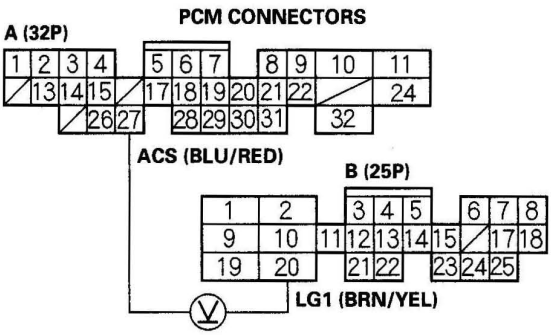
NO – Replace the IAC valve. ■

BACK

Protected by AR

A/C Signal Circuit Troubleshooting

1. Turn the ignition switch OFF.
2. Disconnect the A/C pressure switch 2P connector.
3. Turn the ignition switch ON (II).
4. Measure voltage between PCM connector terminals A27 and B20.



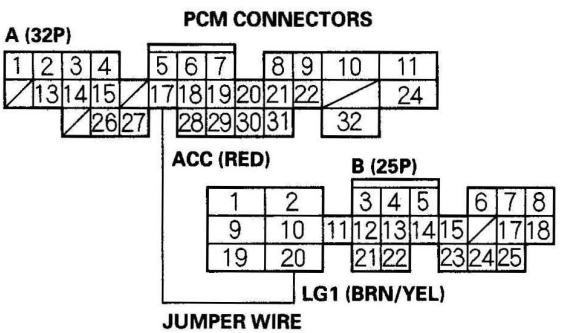
Wire side of female terminals

Is there about 5 V or battery voltage?

YES – Go to step 5.

NO – Go to step 12.

5. Turn the ignition switch OFF.
6. Reconnect the A/C pressure switch 2P connector.
7. Turn the ignition switch ON (II).
8. Momentarily connect PCM connector terminals A17 and B20 with a jumper wire several times.



Wire side of female terminals

Is there a clicking noise from the A/C compressor clutch?

YES – Go to step 9.

NO – Go to step 15.

9. Start the engine.
10. Turn the blower switch ON.
11. Turn the A/C switch ON.

Does the A/C operate?

YES – The air conditioning signal is OK. ■

NO – Go to step 16.

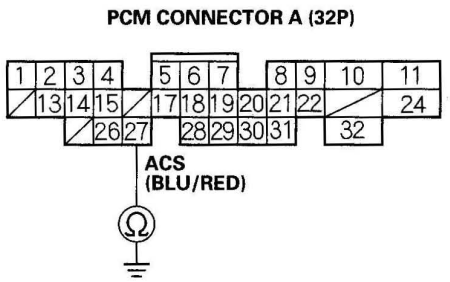
12. Turn the ignition switch OFF.
13. Disconnect PCM connector A (32P).

(cont'd)

Protected by AR

A/C Signal Circuit Troubleshooting (cont'd)

14. Check for continuity between body ground and PCM connector terminal A27.



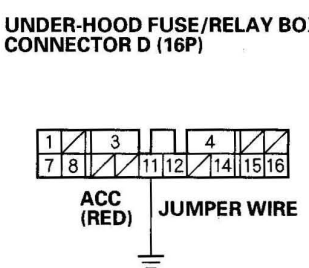
Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the PCM (A27) and the A/C pressure switch. ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If prescribed voltage is now available, replace the original PCM. If not, check the A/C system for other symptoms. ■

15. Momentarily connect under-hood fuse/relay box 16P connector terminal No. 11 to body ground with a jumper wire several times.



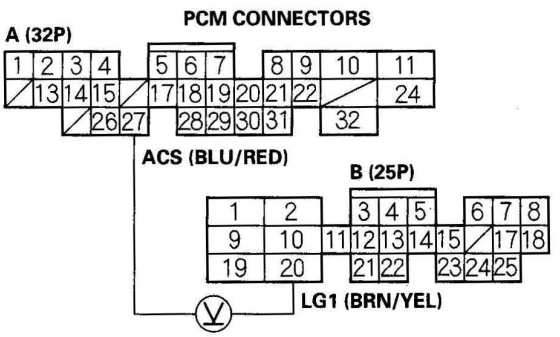
Wire side of female terminals

Is there a clicking noise from the A/C compressor clutch?

YES – Repair open in the wire between the PCM (A17) and the A/C clutch relay. ■

NO – Check the A/C system for other symptoms. ■

16. Measure voltage between PCM connector terminals A27 and B20.



Wire side of female terminals

Is there less than 1.0 V?

YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. If not, inspect the air conditioning system. ■

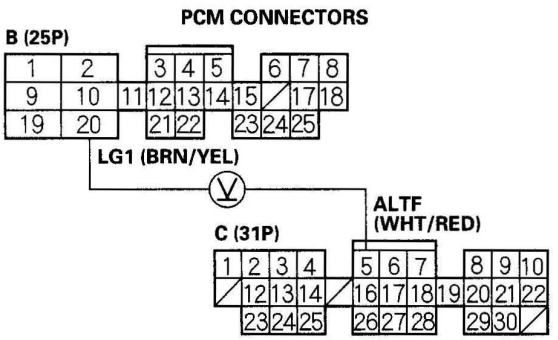
NO – Repair open in the wire between the PCM (A27) and the A/C pressure switch. ■

BACK

Protected by AR

Alternator FR Signal Circuit Troubleshooting

1. Disconnect the ALT 4P connector.
2. Turn the ignition switch ON (II).
3. Measure voltage between PCM connector terminals B20 and C5.



Wire side of female terminals

Is there about 5 V?

YES – Go to step 4.

NO – Go to step 14.

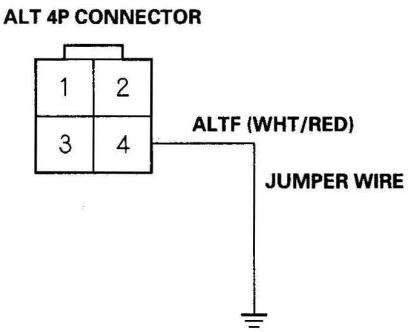
4. Turn the ignition switch OFF.
5. Reconnect the ALT 4P connector.
6. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
7. Measure voltage between PCM connector terminals B20 and C5.

Does the voltage decrease when the headlights and rear window defogger are turned on?

YES – The ALT FR signal is OK. ■

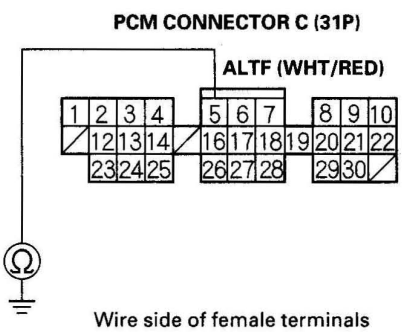
NO – Go to step 8.

8. Turn the ignition switch OFF.
9. Disconnect the negative cable from the battery.
10. Disconnect PCM connector C (31P).
11. Disconnect the ALT 4P connector.
12. Connect ALT 4P connector terminal No. 4 to body ground with a jumper wire.



Wire side of female terminals

13. Check for continuity between body ground and PCM connector terminal C5.



Wire side of female terminals

Is there continuity?

YES – Test the alternator (see step 1 on page 4-22). ■

NO – Repair open in the wire between the PCM (C5) and the ALT. ■

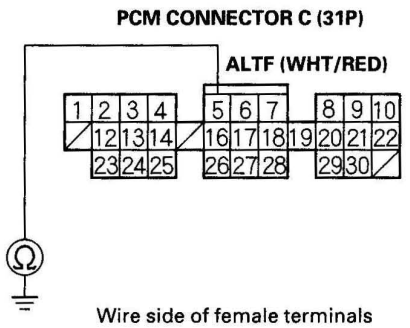
14. Turn the ignition switch OFF.
15. Disconnect the negative cable from the battery.
16. Disconnect PCM connector C (31P).

(cont'd)

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Alternator FR Signal Circuit Troubleshooting (cont'd)

17. Check for continuity between body ground and PCM connector terminal C5.



Wire side of female terminals

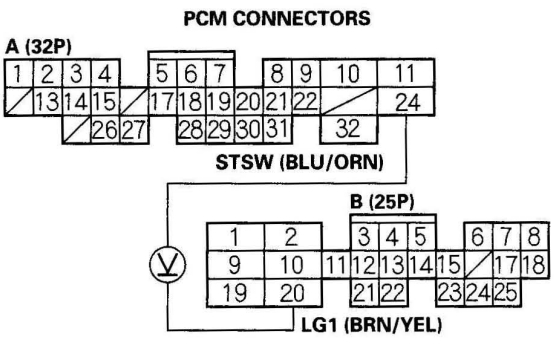
Is there continuity?

YES—Repair short in the wire between the PCM (C5) and the alternator. ■

NO—Substitute a known-good PCM and recheck (see page 11-5). If voltage is normal, replace the original PCM. ■

Starter Switch Signal Circuit Troubleshooting

1. Shift the transmission into Park or neutral.
2. Measure voltage between PCM connector terminals A24 and B20 with the ignition switch in the START (III) position.



Wire side of female terminals

Is there battery voltage?

YES—The starter switch signal is OK. ■

NO—Go to step 3.

3. Inspect the No. 13 STARTER SIGNAL (7.5 A) fuse in the driver's under-dash fuse/relay box.

Is the fuse OK?

YES—Repair open in the wire between the PCM (A24) and the No. 13 STARTER SIGNAL (7.5 A) fuse. ■

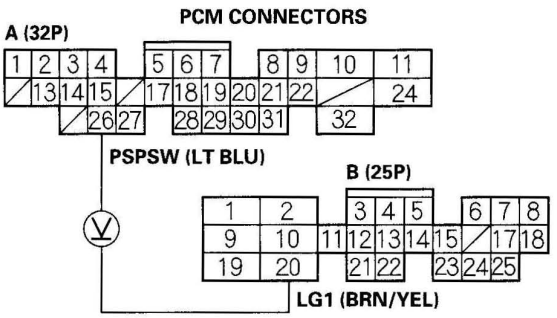
NO—Repair short in the wire between the PCM (A24) and the No. 13 STARTER SIGNAL (7.5 A) fuse or the PGM-FI main relay. Replace the No. 13 STARTER SIGNAL (7.5 A) fuse. ■

BACK

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PSP Switch Signal Circuit Troubleshooting

1. Turn the ignition switch ON (II).
2. Measure voltage between PCM connector terminals A26 and B20.



Wire side of female terminals

Is there less than 1.0 V?

YES – Go to step 3.

NO – Go to step 6.

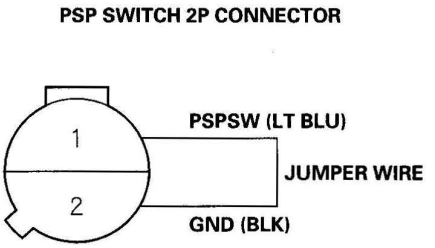
3. Start the engine.
4. Turn the steering wheel to the full lock position.
5. Measure voltage between PCM connector terminals A26 and B20.

Is there battery voltage?

YES – The PSP switch signal is OK. ■

NO – Go to step 11.

6. Turn the ignition switch OFF.
7. Disconnect the PSP switch 2P connector.
8. Turn the ignition switch ON (II).
9. At the harness side, connect PSP switch 2P connector terminals No. 1 and No. 2 with a jumper wire.



Wire side of female terminals

10. Measure voltage between PCM connector terminals A26 and B20.

Is there less than 1.0 V?

YES – Replace the PSP switch. ■

NO – Check for an open in the wire between the PCM (A26) and the PSP switch or, an open in wire between the PSP switch and G503. ■

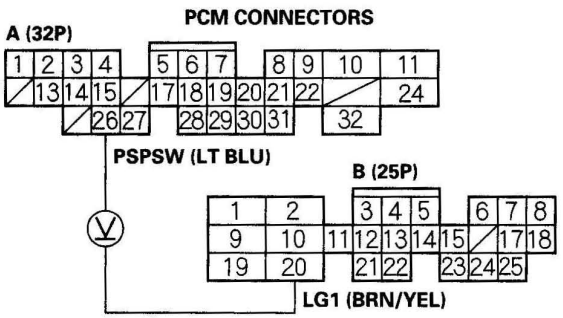
11. Turn the ignition switch OFF.
12. Disconnect the PSP switch 2P connector.
13. Turn the ignition switch ON (II).

(cont'd)

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PSP Switch Signal Circuit Troubleshooting (cont'd)

14. Measure voltage between PCM connector terminals A26 and B20.



Wire side of female terminals

Is there battery voltage?

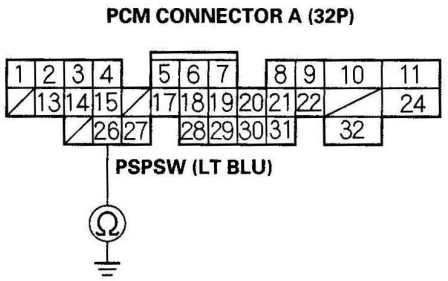
YES—Replace the PSP switch. ■

NO—Go to step 15.

15. Turn the ignition switch OFF.

16. Disconnect PCM connector A (32P).

17. Check for continuity between body ground and PCM connector terminal A26.



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (A26) and the PSP switch. ■

NO—Substitute a known-good PCM and recheck (see page 11-5). If voltage is normal, replace the original PCM. ■

BACK

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Brake Pedal Position Switch Signal Circuit Troubleshooting

1. Check the brake lights.

   Are the brake lights on without pressing the brake pedal?

   YES – Inspect the brake pedal position switch (see page 22-111). ■

   NO – Go to step 2.

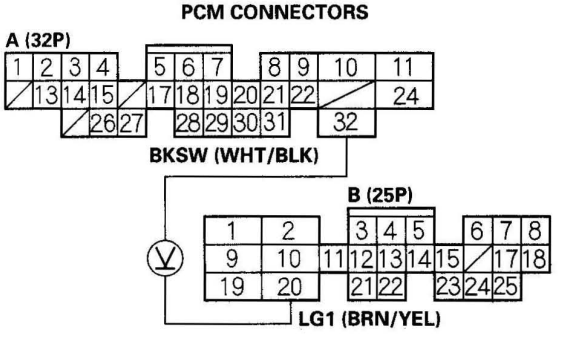
2. Press the brake pedal.

   Do the brake lights come on?

   YES – Go to step 3.

   NO – Go to step 4.

3. Measure voltage between PCM connector terminals A32 and B20 with the brake pedal pressed.



Wire side of female terminals

   Is there battery voltage?

   YES – The brake pedal position switch signal is OK. ■

   NO – Repair open in the wire between the PCM (A32) and the brake pedal position switch. ■

4. Inspect the STOP (20 A) fuse in the under-hood fuse/relay box.

   Is the fuse OK?

   YES – Repair open in the wire between the brake pedal position switch and the STOP (20 A) fuse. Inspect the brake pedal position switch (see page 22-111). ■

   NO – Repair short in the wire between the PCM (A32) and the STOP (20 A) fuse. Replace the STOP (20 A) fuse. ■

BACK

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Idle Speed Adjustment

Adjust the idle speed using the Honda PGM Tester procedure if possible. If not, use the following procedure:

NOTE:
- Leave the Idle Air Control (IAC) valve connected.
- Before setting the idle speed, check these items:
  - The Malfunction Indicator Lamp (MIL) has not been reported on.
  - Ignition timing
  - Spark plugs
  - Air cleaner
  - PCV system
- On Canadian models, press the parking brake pedal. Start the engine, and make sure the headlights are off.

1. Disconnect the Evaporative Emission (EVAP) canister purge valve 2P connector.

2. Connect a tachometer.

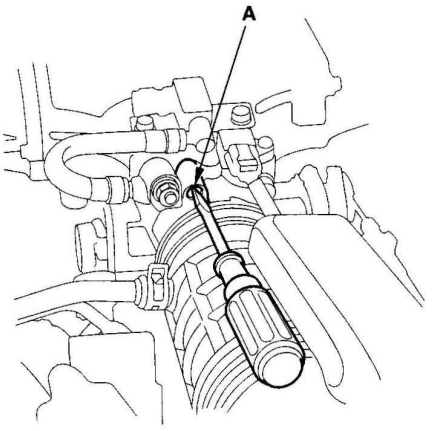
3. Start the engine. Hold the engine at 3,000 rpm with no load (transmission in Park or neutral position) until the radiator fan comes on, then let it idle.

4. Check the idle speed with no-load conditions: headlights, blower fan, rear window defogger, radiator fan, and air conditioner are off.

   Idle speed should be:
   730±50 rpm (in Park or neutral)

5. Adjust the idle speed, if necessary, by turning the idle adjusting screw (A) 1/4-turn clockwise or counterclockwise.

   NOTE: Do not turn the idle adjusting screw more than 1/4-turn without checking the idle speed.



6. After turning the idle adjusting screw 1/4-turn, check the idle speed again. If it is out of spec, turn the idle adjusting screw 1/4-turn again.

7. Idle the engine for 1 minute with the heater fan switch on HI and air conditioner on, then check the idle speed.

   Idle speed should be:
   730±50 rpm (in Park or neutral)

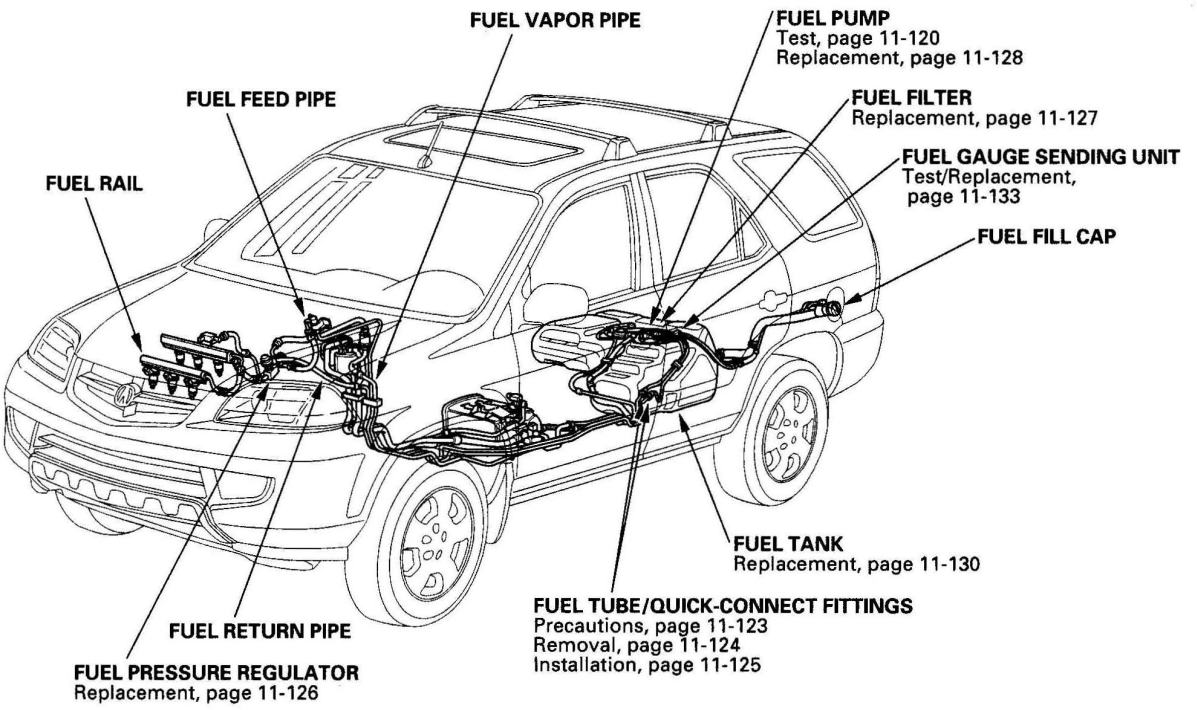
   NOTE:
   - Do not turn the idle adjusting screw when the air conditioner is on.
   - If the idle speed is not within specification, see the Symptom Troubleshooting Index.

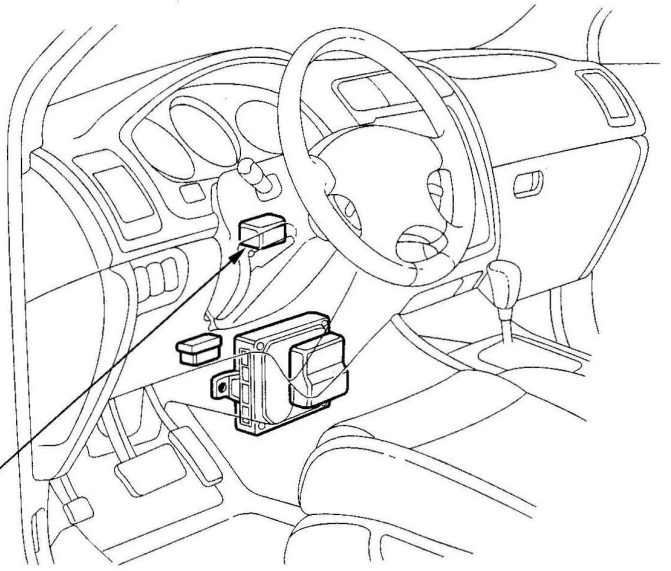
8. Reconnect the EVAP canister purge valve 2P connector.

BACK

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Component Location Index





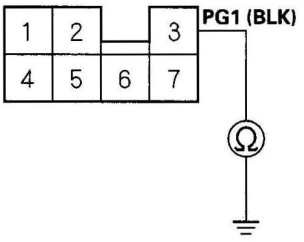
BACK

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PGM-FI Main Relay Circuit Troubleshooting

1. Turn the ignition switch OFF.
2. Disconnect the PGM-FI main relay 7P connector.
3. Check for continuity between body ground and PGM-FI main relay 7P connector terminal No. 3.

PGM-FI MAIN RELAY 7P CONNECTOR



Wire side of female terminals

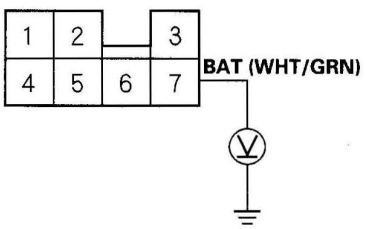
Is there continuity?

YES – Go to step 4.

NO – Repair open in the wire between the PGM-FI main relay and G101. ■

4. Measure voltage between body ground and PGM-FI main relay 7P connector terminal No. 7.

PGM-FI MAIN RELAY 7P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 6.

NO – Go to step 5.

5. Check for a blown ACG S (15 A) fuse in the under-hood fuse/relay box.

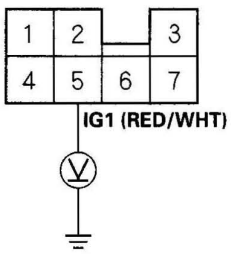
Is the fuse blown?

YES – Repair short in the wire between the PGM-FI main relay and the ACG S (15 A) fuse. ■

NO – Repair open in the wire between the PGM-FI main relay and the ACG S (15 A) fuse. ■

6. Turn the ignition switch ON (II), and measure voltage between body ground and PGM-FI main relay 7P connector terminal No. 5.

PGM-FI MAIN RELAY 7P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 8.

NO – Go to step 7.

7. Check for a blown No. 1 FUEL PUMP (15 A) fuse in the driver's under-dash fuse/relay box.

Is the fuse blown?

YES – Repair short in the wire between the PGM-FI main relay and the No. 1 FUEL PUMP (15A) fuse. ■

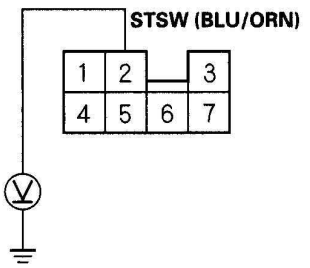
NO – Repair open in the wire between the PGM-FI main relay and the No. 1 FUEL PUMP (15 A) fuse. ■

BACK

Protected by AR

8. Shift to Park, then turn the ignition switch to the START (III) position, and measure voltage between body ground and PGM-FI main relay 7P connector terminal No. 2.

PGM-FI MAIN RELAY 7P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 10.

NO – Go to step 9.

9. Check for a blown No. 13 STARTER SIGNAL (7.5 A) fuse in the driver's under-dash fuse/relay box.

Is the fuse blown?

YES – Repair short in the wire between the PGM-FI main relay and the No. 13 STARTER SIGNAL (7.5 A) fuse. ■

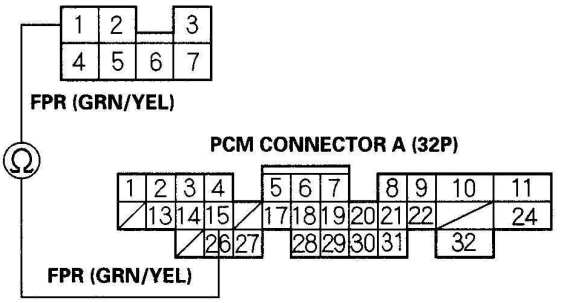
NO – Repair open in the wire between the PGM-FI main relay and the No. 13 STARTER SIGNAL (7.5 A). ■

10. Turn the ignition switch OFF.

11. Disconnect PCM connector A (32P).

12. Check for continuity between PGM-FI main relay 7P connector terminal No. 1 and PCM connector terminal A15.

PGM-FI MAIN RELAY 7P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Go to step 13.

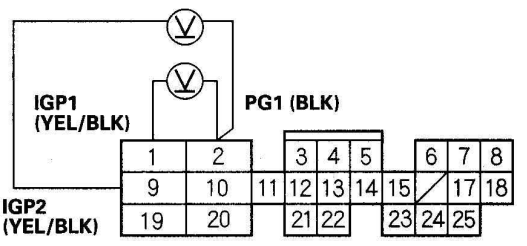
NO – Repair open in the wire between the PGM-FI main relay and the PCM (A15). ■

13. Reconnect PCM connector A (32P) and the PGM-FI main relay 7P connector.

14. Turn the ignition switch ON (II).

15. Measure voltage between PCM connector terminals B1 and B2, and between B9 and B2.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there battery voltage?

YES – Go to step 16.

NO – Check for an open in the wires between the PGM-FI main relay and the PCM (B1, B9). If the wires are OK, replace the PGM-FI main relay. ■

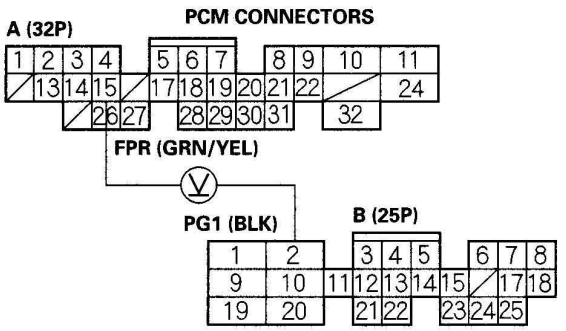
(cont'd)

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PGM-FI Main Relay Circuit Troubleshooting (cont'd)

16. Turn the ignition switch OFF, then ON (II) again.

17. Measure voltage between PCM connector terminals A15 and B2 within the first 2 seconds after the ignition switch is turned ON (II).



Wire side of female terminals

Is there 1.0 V or less?

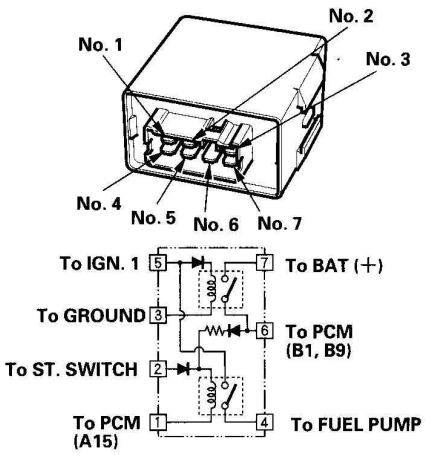
YES – PGM-FI main relay may be faulty; go to step 18.

NO – Substitute a known-good PCM and recheck (see page 11-5). If prescribed voltage is now available, replace the original PCM. ■

18. Remove the PGM-FI main relay.

19. Connect battery power to PGM-FI main relay 7P connector terminal No. 2 and connect ground to PGM-FI main relay 7P connector terminal No. 1. Then check for continuity between PGM-FI main relay 7P connector terminals No. 5 and No. 4.

NOTE: Use the terminal number shown. Ignore the terminal numbers molded into the relay.



Is there continuity?

YES – Go to step 19.

NO – Replace the PGM-FI main relay and reset. ■

20. Connect battery power to PGM-FI main relay 7P connector terminal No. 5, and connect ground to PGM-FI main relay 7P connector terminal No. 3. Then check for continuity between PGM-FI main relay 7P connector terminals No. 7 and No. 6.

Is there continuity?

YES – Go to step 21.

NO – Replace the PGM-FI main relay and reset. ■

21. Connect battery power to PGM-FI main relay 7P connector terminal No. 6, and connect ground to PGM-FI main relay 7P connector terminal No. 1. Then check for continuity between PGM-FI main relay 7P connector terminals No. 5 and No. 4.

Is there continuity?

YES – The PGM-FI main relay is OK. ■

NO – Replace the PGM-FI main relay and retest. ■

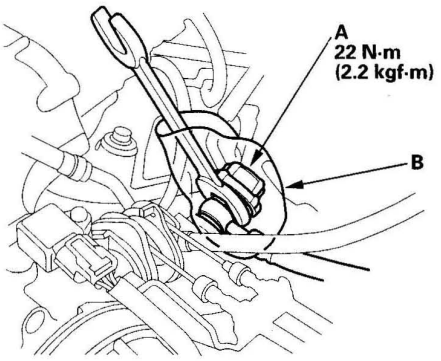
BACK

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Fuel Pressure Relieving

Before disconnecting fuel pipes or hoses, release pressure from the system by loosening the fuel pulsation damper on top of the fuel rail.

1. Make sure you have the anti-theft codes for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative cable from the battery.
3. Remove the fuel fill cap.
4. Use a wrench on the fuel pulsation damper (A).



5. Place a rag or shop towel (B) over the fuel pulsation damper.
6. Slowly loosen the fuel pulsation damper one complete turn.

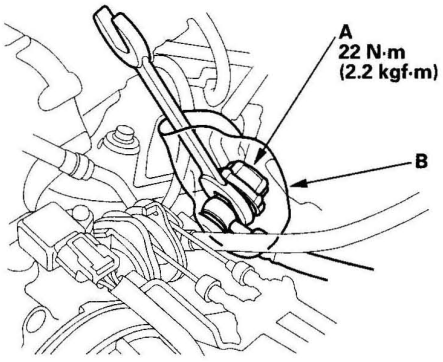
   NOTE: Replace all washers whenever the fuel pulsation damper is loosened or removed.

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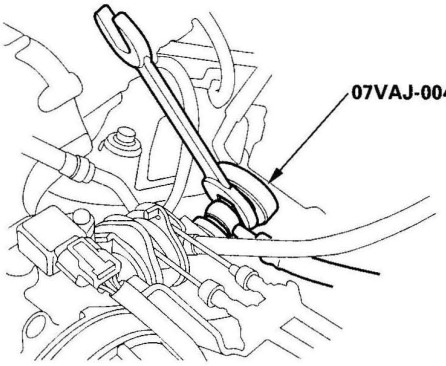
Fuel Pressure Test

Special Tools Required
- Fuel pressure gauge 07406-004000A
- Fuel pressure gauge attachment 07VAJ-0040100

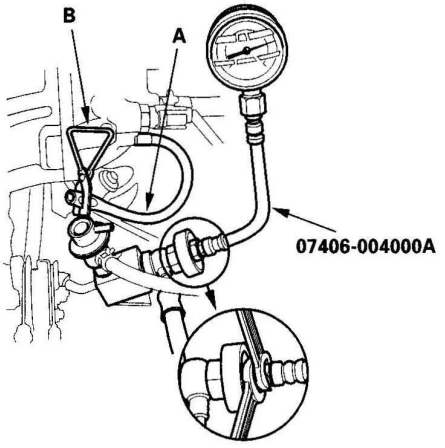
1. Make sure you have the anti-theft codes for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative cable from the battery.
3. Remove the fuel fill cap.
4. Use a wrench on the fuel pulsation damper (A) at the fuel rail.



5. Place a rag or shop towel (B) over the fuel pulsation damper.
6. Slowly loosen the fuel pulsation damper one complete turn.
7. Remove the fuel pulsation damper from its fitting, and attach the fuel pressure gauge attachment.



8. Attach the fuel pressure gauge.



9. Disconnect the vacuum hose (A) from the fuel pressure regulator, and pinch it closed with a clamp (B).
10. Reconnect the negative battery cable, and start the engine and let it idle.
    - If the engine starts, go to step 12.
    - If the engine does not start, go to step 11.
11. Check to see if the fuel pump is running: listen to the injector rails underneath the intake manifold cover while an assistant turns the ignition switch ON (II). You should hear the fuel flow through the injector rails for about 2 seconds when the ignition switch is turned ON (II).
    - If the pump runs, go to step 12.
    - If the pump does not run, test the fuel pump (see page 11-120).■

BACK

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12. Read the pressure gauge (with the fuel pressure regulator vacuum hose disconnected and clamped). The pressure should be 330 – 382 kPa (3.4 – 3.9 kgf/cm², 48 – 56 psi).

    - If the pressure is OK and engine is running, the test is complete. If not running, repair the cause, then continue this test.
    - If the pressure is too high, check for a pinched or clogged fuel return hose or line.
    - If the pressure is too low, check for a clogged fuel filter and for leaks in the fuel lines.
    - If the pressure is out of spec and the fuel lines are OK, replace the pressure regulator (see page 11-126).

13. Reconnect the vacuum hose, remove the pressure gauge, and reinstall the fuel pulsation damper with a new washer. Tighten the fuel pulsation damper to 22 N·m (2.2kgf·m, 16 lbf·ft).

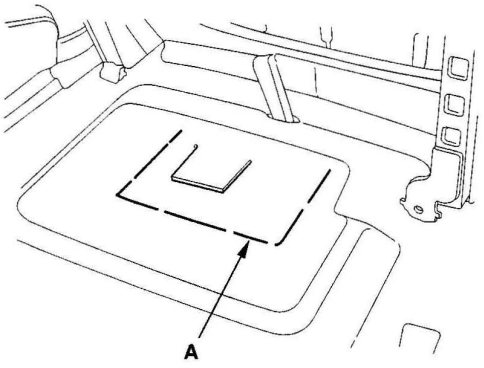
    NOTE: Disassemble and clean the fuel pressure gauge attachment thoroughly after use.

Protected by AR

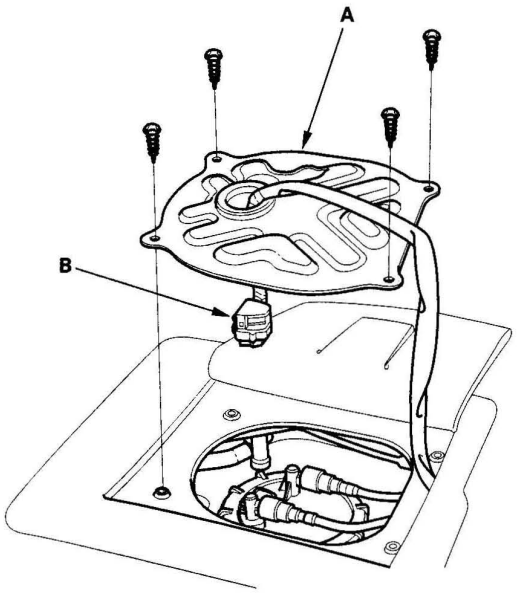
Fuel Pump Test

If you suspect a problem with the fuel pump, check that the fuel pump actually runs; when it is ON, you will hear fuel flow if you listen to the injector rails underneath the intake manifold cover. The fuel pump should run for 2 seconds when the ignition switch is first turned ON(II). If the fuel pump does not make noise, check as follows:

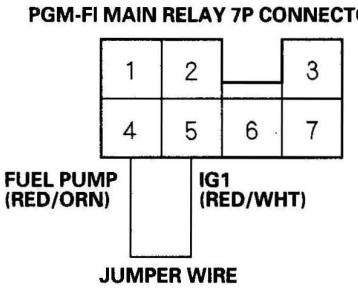
1. Turn the ignition switch OFF.
2. Remove the driver's side second row seat (see page 20-86).
3. Cut the carpet at the dotted line (A). Be careful not to cut the wire harness under the carpet.



4. Remove the access panel (A) from the floor, then disconnect the fuel pump 5P connector (B).

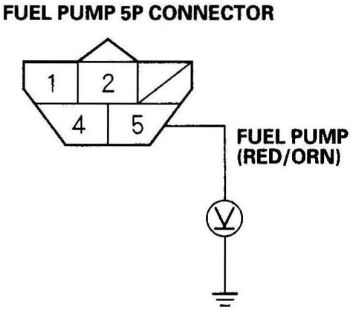


5. Connect PGM-FI main relay 7P connector terminals No. 4 and No. 5 with a jumper wire.



Wire side of female terminals

6. Turn the ignition switch ON (II).
7. Check that battery voltage is available between the fuel pump 5P connector terminal No. 5 and body ground when the ignition switch is turned ON (II).
   - If battery voltage is available, check the fuel pump ground. If the ground is OK, replace the fuel pump (see page 11-128).
   - If there is no voltage, check the wire harness (see page 11-114).



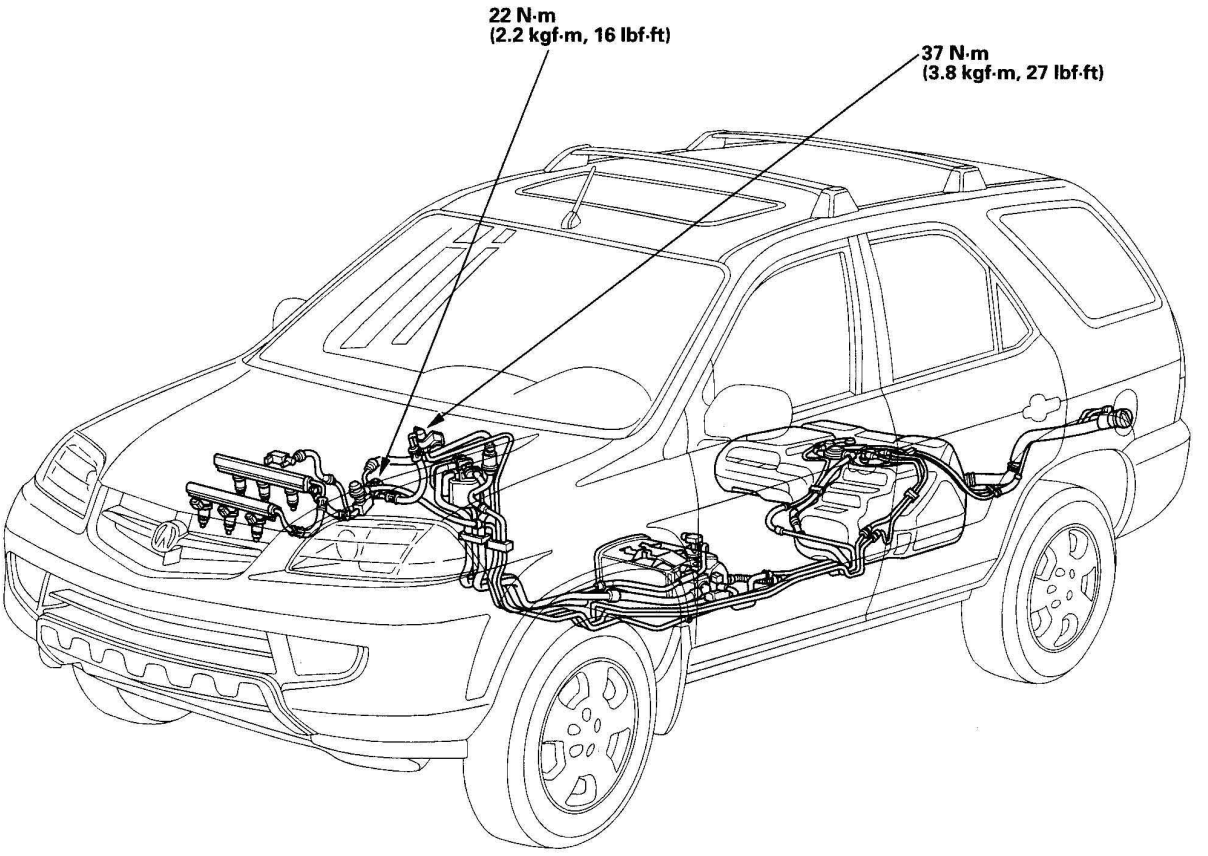
Wire side of female terminals

BACK

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Fuel Line Inspection

Check the fuel system lines, hoses, and fuel filter for damage, leaks, and deterioration. Replace any damaged parts.

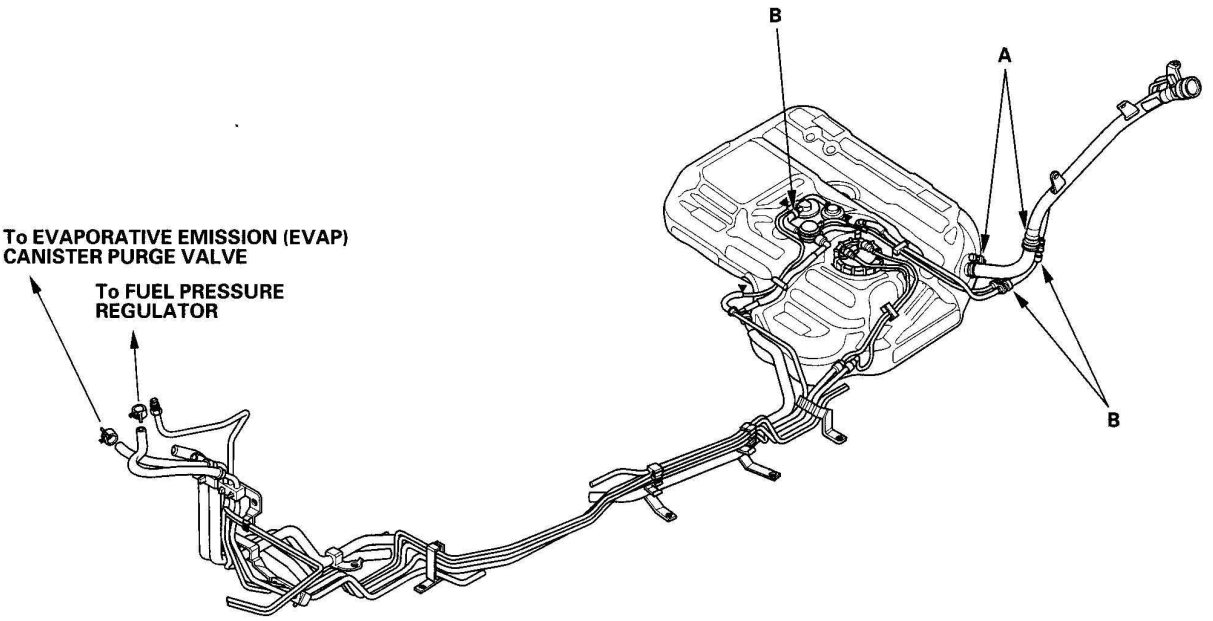


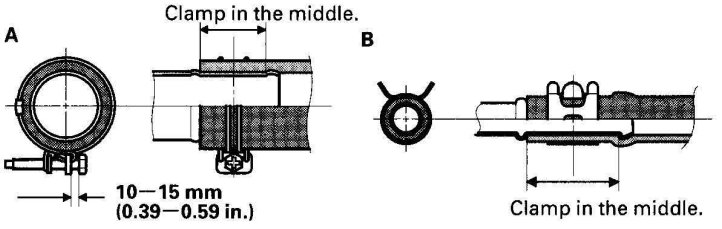
(cont'd)

Protected by AR

Fuel Line Inspection (cont'd)

Check all clamps and retighten if necessary.
▲: Do not disconnect the hose from the pipe at these joints.





BACK

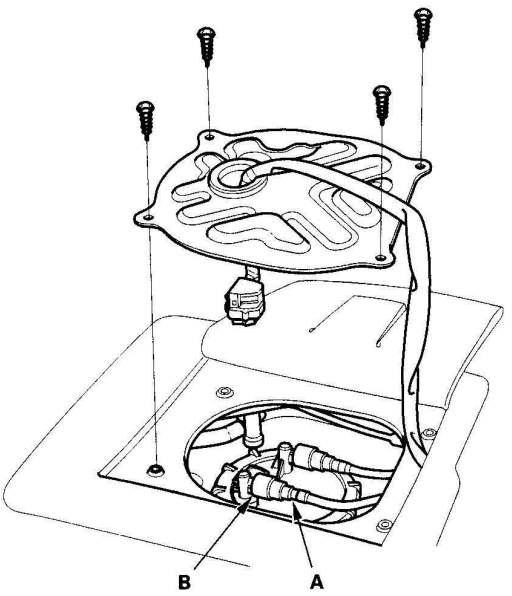
Protected by AR

Fuel Tube/Quick-Connect Fittings Precaution

The fuel tube/quick-connect fittings assembly connects the in-tank fuel pump to the fuel feed pipe and the fuel return pipe. When removing or installing the fuel pump and fuel tank, it is necessary to disconnect or connect the quick-connect fittings. Pay attention to the following:

- The fuel tubes (A) and quick-connect fittings (B) are not heat-resistant; be careful not to damage them during welding or other heat-generating procedures.
- The fuel tubes (A) and quick-connect fittings (B) are not acid-proof; do not touch them with a shop towel which was used for wiping battery electrolyte. Replace them if they came into contact with electrolyte or something similar.
- When connecting or disconnecting the fuel tubes (A) and quick-connect fittings (B), be careful not to bend or twist them excessively. Replace them if damaged.

A disconnected quick-connect fitting can be reconnected, but the retainer on the mating pipe cannot be reused once it has been removed from the pipe. Replace the retainer when
- replacing the fuel pump.
- replacing the fuel filter.
- replacing the fuel feed pipe.
- replacing the fuel return pipe.
- it has been removed from the pipe.
- it is damaged.



TUBE		MANUFACTURER	TUBE COLOR	RETAINER COLOR
FEED TUBE	PIPE SIDE	TOKAI	BLACK	BLUE GREEN
	FUEL PUMP SIDE			ORANGE
RETURN TUBE	PIPE SIDE	TOKAI	BLACK	GREEN
	FUEL PUMP SIDE			BLUE GREEN

Protected by AR

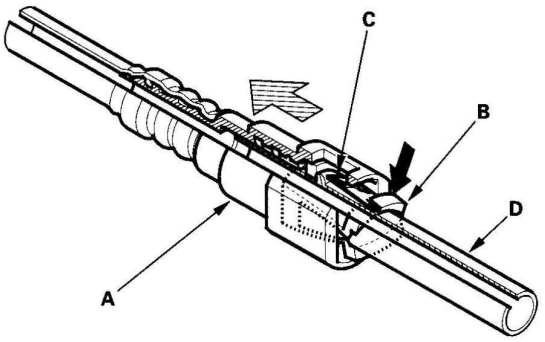
Fuel Tube/Quick-Connect Fittings Removal

1. Relieve fuel pressure (see page 11-117).

2. Check the fuel quick-connect fittings for dirt, and clean if necessary.

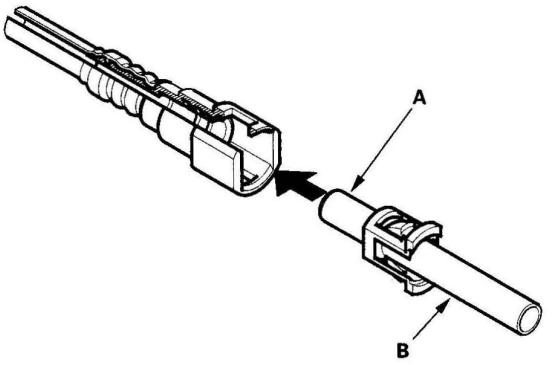
3. Hold the connector (A) with one hand and squeeze the retainer tabs (B) with the other hand to release them from the locking pawls (C). Pull the connector off.

   NOTE:
   - Be careful not to damage the pipe (C) or other parts.
     Do not use tools.
   - If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.
   - Do not remove the retainer from the pipe; once removed, the retainer must be replaced with a new one.



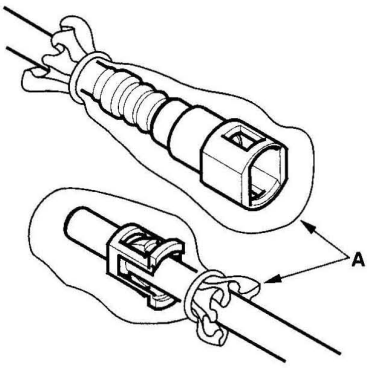
4. Check the contact area (A) of the pipe (B) for dirt and damage.

   - If the surface is dirty, clean it.
   - If the surface is rusty or damaged, replace the fuel pump, fuel filter, fuel feed pipe, or fuel return pipe.



5. To prevent damage and keep foreign matter out, cover the disconnected connector and pipe end with plastic bags (A).

   NOTE:
   - The retainer cannot be reused once it has been removed from the pipe.
     Replace the retainer when
     - replacing the fuel pump.
     - replacing the fuel filter.
     - replacing the fuel feed pipe.
     - replacing the fuel return pipe.
     - it has been removed from the pipe.
     - it is damaged.

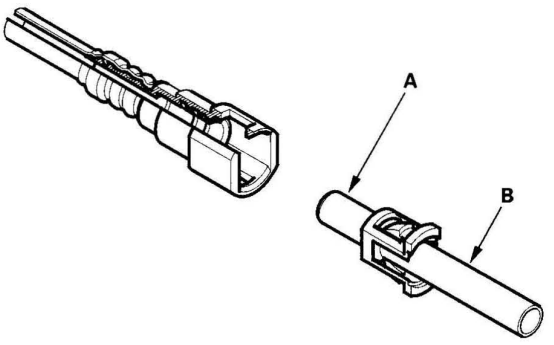


BACK

Protected by AR

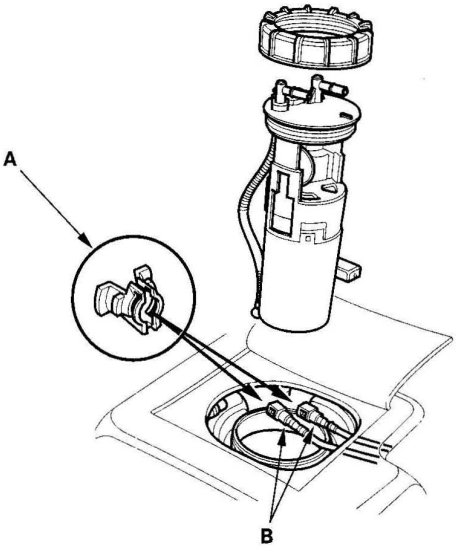
Fuel Tube/Quick-Connect Fittings Installation

1. Check the contact area (A) of the pipe (B) for dirt and damage, and clean if necessary.

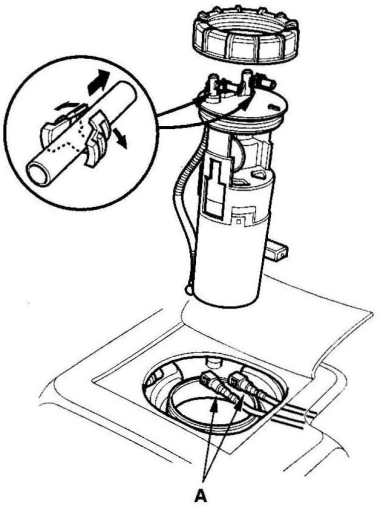


2. Insert a new retainer (A) into the connector (B) if the retainer is damaged, or after

   - replacing the fuel pump.
   - replacing the fuel filter.
   - replacing the fuel feed pipe.
   - replacing the fuel return pipe.
   - removing the retainer from the pipe.



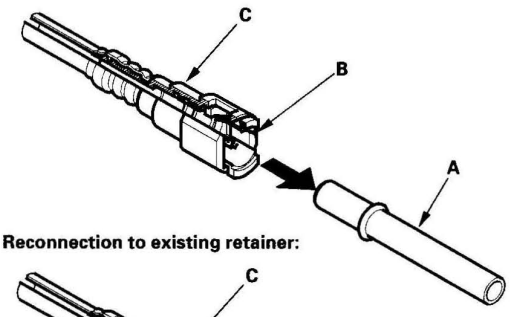
3. Before connecting a new fuel tube/quick-connect fitting assembly (A), remove the old retainer from the mating pipe.



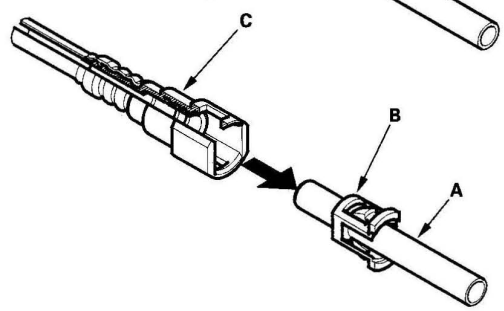
4. Align the quick-connect fittings with the pipe (A), and align the retainer (B) locking pawls with the connector (C) grooves. Then press the quick-connect fittings onto the pipe until both retainer pawls lock with a clicking sound.

   NOTE: If it is hard to connect, put a small amount of new engine oil on the pipe end.

Connection with new retainer:



Reconnection to existing retainer:

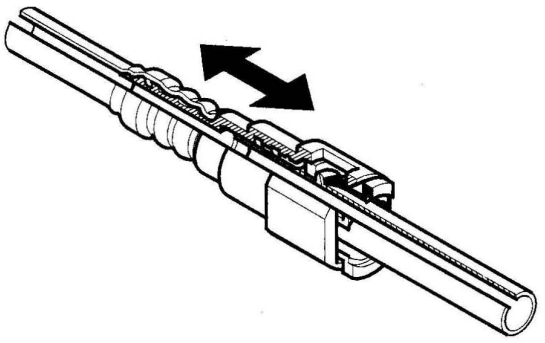


(cont'd)

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Fuel Tube/Quick-Connect Fittings Installation (cont'd)

5. Make sure the connection is secure and that the pawls are firmly locked into place; check visually and by pulling the connector.

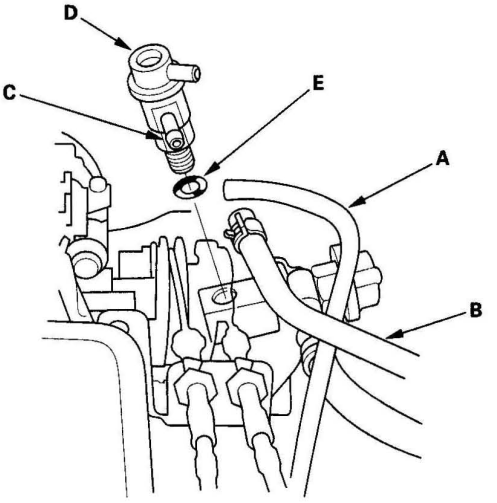


6. Reconnect the battery negative cable, and turn the ignition switch ON (II). The fuel pump will run for about 2 seconds, and fuel pressure will rise. Repeat 2 or 3 times, and check that there is no leakage in the fuel supply system.

Fuel Pressure Regulator Replacement

1. Place a shop towel under the fuel pressure regulator, then relieve fuel pressure (see page 11-117).

2. Disconnect the vacuum hose (A) and fuel return hose (B).



3. Loosen the locking nut (C), and remove the fuel pressure regulator (D).

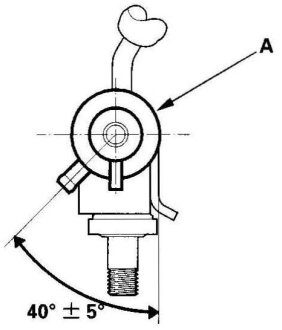
4. Apply clean engine oil to a new O-ring (E), and carefully install it into its proper position.

5. Install the fuel pressure regulator in the fuel joint. Turn it by hand until stops.

BACK

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6. Turn the fuel pressure regulator (A) counterclockwise to set the angle as shown.



7. Tighten the locking nut to 29 N·m (3.0 kgf·m, 22 lbf·ft).

NOTE:
- Replace the O-ring.
- When assembling the fuel pressure regulator, apply clean engine oil to the O-ring and assemble it into its proper position, taking care not to damage the O-ring.

8. Reconnect the vacuum hose and fuel return hose.

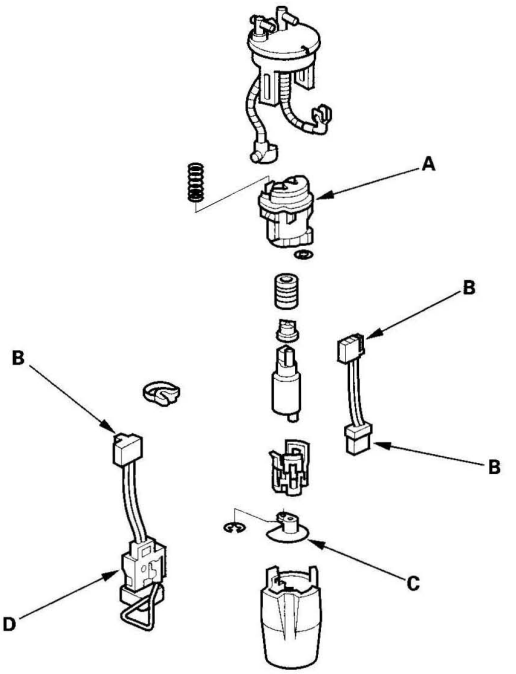
9. Turn the ignition switch ON (II), but do not operate the starter. After the fuel pump runs for about 2 seconds, the fuel pressure in the fuel line rises. Repeat this 2 or 3 times, then check whether there is any fuel leakage.

Fuel Filter Replacement

The fuel filter should be replaced whenever the fuel pressure drops below the specified value (330—382 kPa, 3.4—3.9 kgf/cm², 48—56 psi with the fuel pressure regulator vacuum hose disconnected and pinched) after making sure that the fuel pump and the fuel pressure regulator are OK.

1. Remove the fuel tank unit (see page 11-128).

2. Remove the fuel filter (A).



3. Install the part in the reverse order of removal with a new base gasket, then check these items:

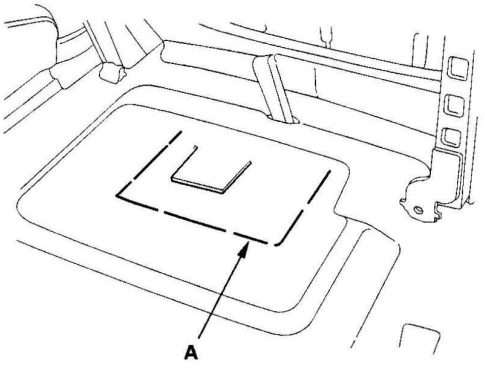
- Install the new base gasket on the fuel tank, then install the fuel tank unit.
- When installing the fuel tank unit, align the marks on the unit and the fuel tank.
- When connecting the wire harness, make sure the connection is secure and the terminal (B) is firmly locked into place.
- Do not push the lower part of the suction filter (C).
- When installing the fuel gauge sending unit (D), make sure the connection is secure and the connector is firmly locked into place. Be careful not to bend or twist it excessively.

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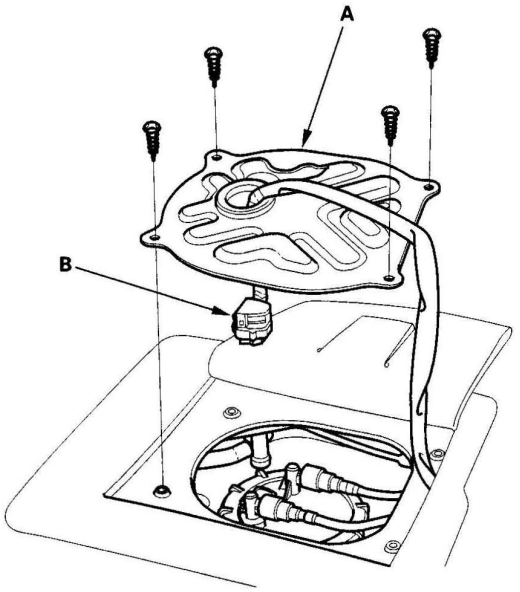
Fuel Pump Replacement

Special Tools Required
Fuel tank assembly wrench 07XAA-001010A

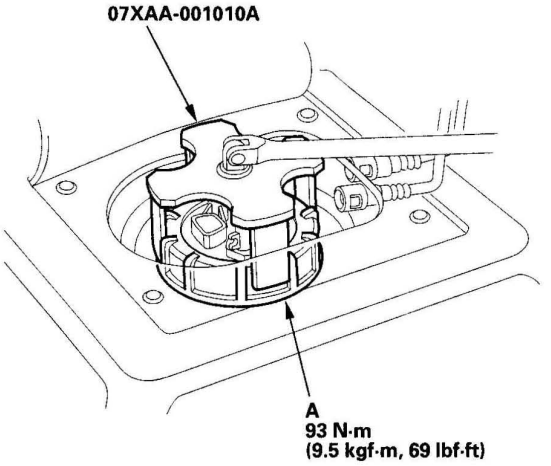
1. Turn the ignition switch OFF.
2. Remove the driver's side second row seat (see page 20-86).
3. Cut the carpet at the dotted line (A). Be careful not to cut the wire harness under the carpet.



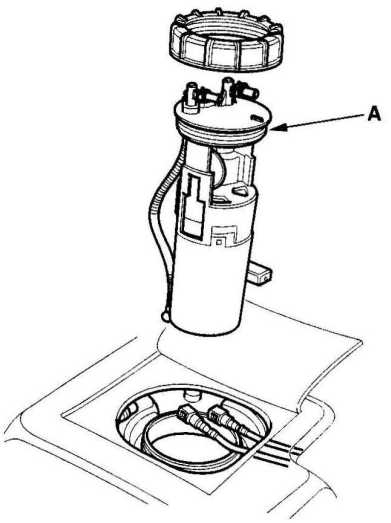
4. Remove the access panel (A) from the floor, then disconnect the fuel pump 5P connector (B).



5. Remove the fuel fill cap.
6. Relieve fuel pressure (see page 11-117).
7. Disconnect the quick-connect fittings from the fuel tank unit.
8. Using the tool, loosen the fuel tank unit locknut (A).



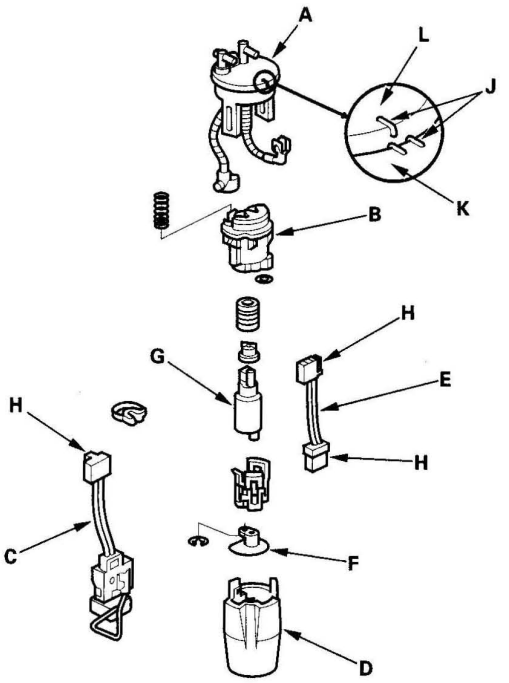
9. Remove the fuel tank unit (A).



BACK

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10. Remove the bracket (A), the fuel filter (B), the fuel gauge sending unit (C), the housing (D), and the wire harness (E).



11. When connecting the fuel pump, make sure the connection is secure and the suction filter (F) is firmly connected to the fuel pump (G).

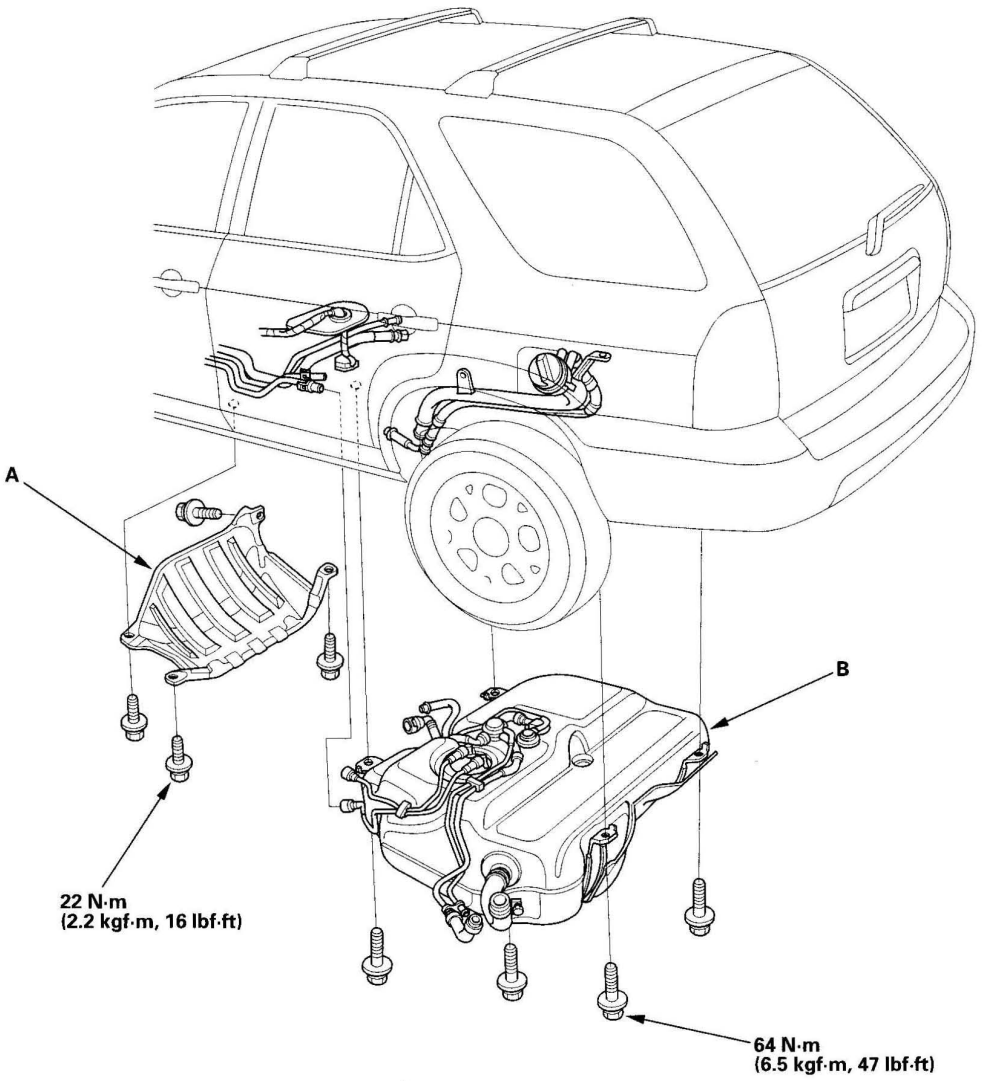
12. Install the unit in the reverse order of removal with a new base gasket, then check these items:

- Install the new base gasket on the fuel tank, then install the fuel tank unit.
- When connecting the wire harness, make sure the connection is secure and the connector (H) is firmly locked into the place.
- Do not push the lower part of the suction filter.
- When installing the fuel gauge sending unit, make sure the connection is secure and the connector is firmly locked into place. Be careful not to bend or twist it excessively.
- When installing the fuel tank unit, align the marks (J) on the fuel tank (K) and the fuel tank unit (L).

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Fuel Tank Replacement

Exploded-view



BACK

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1. Relieve the fuel pressure (see page 11-117).
2. Remove the fuel fill cap.
3. Remove the driver's side second row seat (see page 20-86) and cut the carpet (see page 11-128).
4. Remove the access panel from the floor, and disconnect the fuel tank 5P connector.
5. Remove the fuel tank unit (see page 11-128).
6. Siphon the fuel from the fuel tank into a suitable container with a hand pump.
7. Jack up the vehicle, and support it with jackstands.
8. Remove the propeller shaft (see page 16-34).
9. Remove the fuel tank shield (A).
10. Disconnect the fuel return hose, fuel vapor hose and quick-connect fittings. Disconnect the hoses. Slide back the clamps, then twist the hoses as you pull to avoid damaging them.
11. Place a jack, or other support, under the tank.
12. Remove the strap bolts.
13. Remove the fuel tank (B). If it sticks to the undercoat on its mount, carefully pry it off the mount.
14. Install the remaining parts in the reverse order of removal.

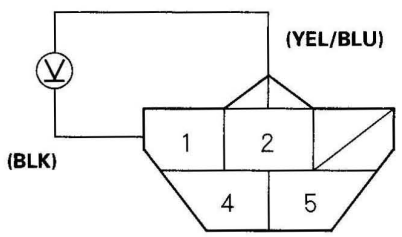
Protected by AR

Fuel Gauge Test

NOTE: For the fuel gauge system circuit diagram, refer to the Gauges Circuit Diagram (see page 22-73).

1. Check the No. 9 BACK UP LIGHT INSTRUMENT LIGHT (10 A) fuse in the driver's under-dash fuse/relay box before testing.
2. Turn the ignition switch OFF.
3. Remove the driver's side second row seat (see page 20-86).
4. Cut the carpet, then remove the access panel from the floor (see page 11-128).
5. Disconnect the fuel pump 5P connector.
6. Measure voltage between fuel pump 5P connector terminals No. 1 and No. 2 with the ignition switch ON (II). There should be 8 V or more.
   - If the voltage is as specified, go to step 7.
   - If the voltage is not as specified, check for:
     - an open in the YEL/BLU or BLK wire.
     - poor ground (G501).

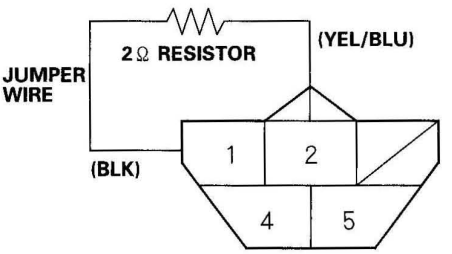
FUEL PUMP 5P CONNECTOR



Wire side of female terminals

7. Turn the ignition switch OFF.
8. Install a 2 Ω resistor between fuel pump 5P connector terminals No. 1 and No. 2.

FUEL PUMP 5P CONNECTOR



Wire side of female terminals

9. Turn the ignition switch ON (II).
10. Check that the pointer of the fuel gauge indicates "F".
    - If the pointer of the fuel gauge does not indicate "F", replace the gauge.
    - If the gauge is OK, inspect the fuel gauge sending unit (see page 11-133).

    NOTE: The pointer of the fuel gauge returns to the bottom on the gauge dial when the ignition switch is OFF regardless of the fuel level.

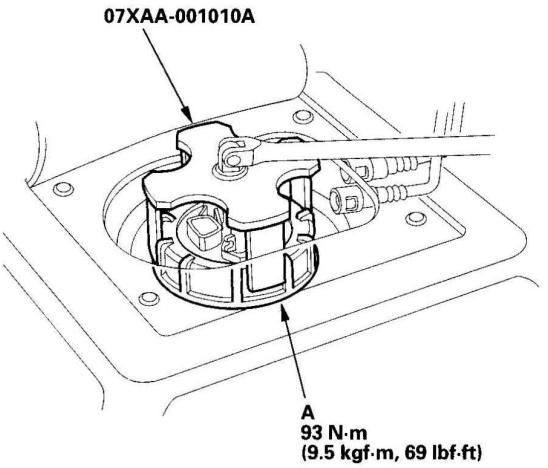
BACK

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Fuel Gauge Sending Unit Test/Replacement

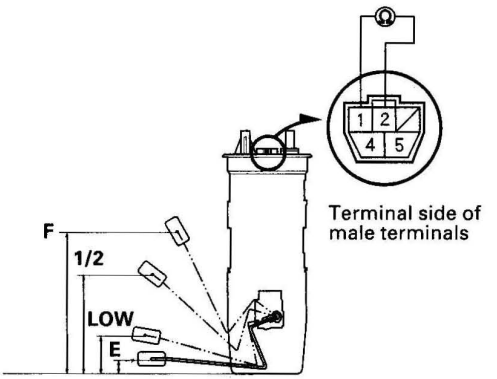
Special Tools Required
Fuel tank assembly wrench 07XAA-001010A

1. Turn the ignition switch OFF.
2. Remove the driver's side second row seat.
3. Cut the carpet (be careful not to cut the wire harness), then remove the access panel from the floor (see page 11-128).
4. Disconnect the fuel pump 5P connector.
5. Remove the fuel fill cap.
6. Relieve the fuel pressure (see page 11-117).
7. Disconnect the quick-connect fittings from the fuel tank unit.
8. Using the special tool, loosen the fuel tank unit locknut (A). Remove the fuel tank unit.



9. Measure the resistance between the No. 1 and No. 2 terminals with the float at E (EMPTY), L (LOW), 1/2 (HALF FULL), and F (FULL) positions.
If you do not get the following readings, replace the fuel gauge sending unit (A).

Float Position	Resistance (Ω)
F	11–13
1/2	52.3–58.3
LOW	107–118.7
E	130–132



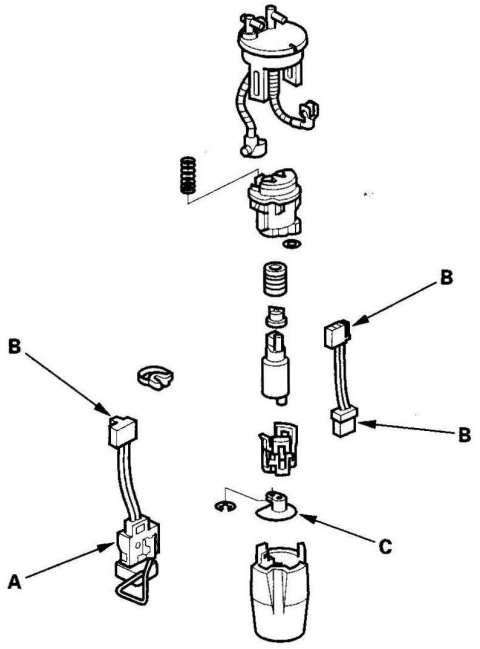
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Fuel Gauge Sending Unit Test/ Replacement (cont'd)

10. Install the fuel tank unit in the reverse order of removal with a new base gasket and new quick connect retainers, then check these items:

    - Install the new base gasket on the fuel tank, then install the fuel tank unit.
    - When installing the fuel tank unit, align the marks on the unit and the fuel tank.
    - When connecting the wire harness, make sure the connection is secure and the terminal (B) is firmly locked into place.
    - Do not fold over the lower part of the suction filter (C).
    - When installing the fuel gauge sending unit (A), make sure the connection is secure and the connector is firmly locked into place. Be careful not to bend or twist it excessively.



Low Fuel Indicator Light Test

1. Do the fuel gauge sending unit test (see page 11-133).

    - If the system is OK, go to step 2.
    - If the system has any malfunction, repair it.

2. Turn the ignition switch ON (II) with the float at the E (EMPTY) position.

    - If the low fuel indicator light is on, go to step 3.
    - If the low fuel indicator light is not on, refer to the low fuel indicator Circuit Diagram (see page 22-73) and check the circuit.

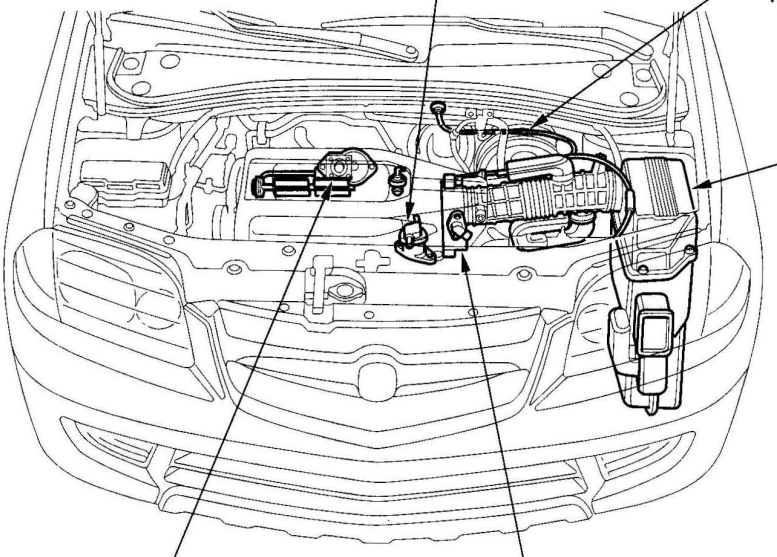
3. Lift the float above the LOW position.

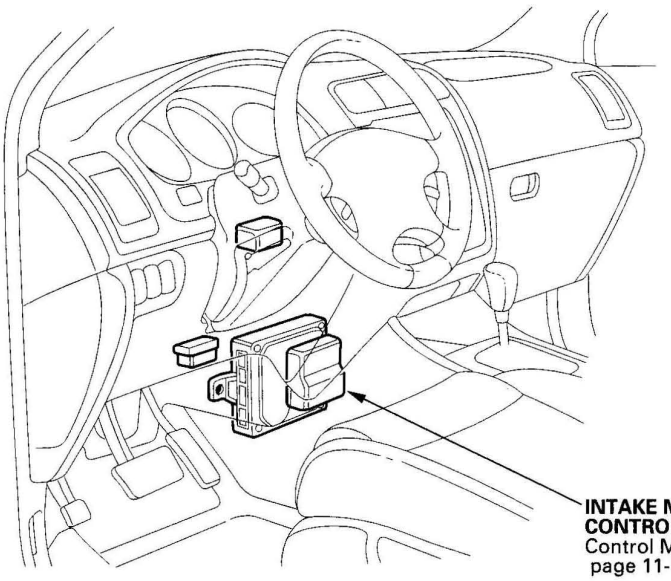
    - If the low fuel indicator light goes off, the system is OK.
    - If the low fuel indicator light is still on, refer to the low fuel indicator Circuit Diagram (see page 22-73) and check the circuit.

BACK

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Component Location Index





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Throttle Body Test

NOTE:
- Do not adjust the throttle stop screw. It is preset at the factory.
- If the Malfunction Indicator Lamp (MIL) has been reported on, check for Diagnostic Trouble Codes DTCs (see page 11-3).

1. With the engine off, check the throttle cable operation. The cable should move without binding or sticking.

   - If the cable operates OK, go to step 2.
   - If the cable binds or sticks, check it and its routing. If it's faulty, reroute it or replace it (see page 11-140) and adjust it (see page 11-139), then go to step 2.

2. Operate the throttle lever by hand to see if the throttle valve and/or shaft are too loose or too tight.

   - If there is excessive play in the throttle valve shaft, or any binding in the throttle valve at the fully closed position, replace the throttle body (see page 11-141).
   - If the throttle valve and shaft are OK, go to step 3.

3. Connect the scan tool to the Data Link Connector (DLC).

4. Turn the ignition switch ON (II).

5. Check the throttle position with the scan tool. There should be about 10 % when the throttle is fully closed and about 90 % when the throttle is fully opened.

   - If the throttle position is correct, the throttle body is OK.
   - If the throttle position is not correct, replace the throttle body (see page 11-141).

BACK

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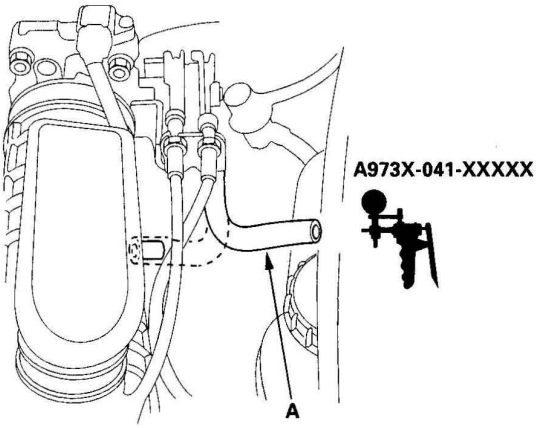
Intake Air Bypass Control Valve Test

Special Tools Required:
Vacuum pump gauge, 0—30 in.Hg
A973X-041-XXXXX

1. Start the engine, and let it idle.

   NOTE: Engine coolant temperature must be below 104°F (40°C).

2. Remove the vacuum hose (A) from the install pipe, and connect a vacuum gauge to the hose.



3. Raise and lower the engine speed, and make sure the vacuum gauge reading changes as the rpm changes.

   If the vacuum reading does not change, check for these problems:

   - Misrouted, leaking, broken, or clogged intake air bypass system vacuum lines.
   - A cracked or defective intake air bypass control valve.

4. Hold the engine at 3,000 rpm with no load (transmission in Park or neutral position) until the radiator fan comes on, then let it idle.

5. Raise and lower the engine speed, and make sure the vacuum gauge reading does not change as the rpm changes.

   If the vacuum reading changes, check for these problems:

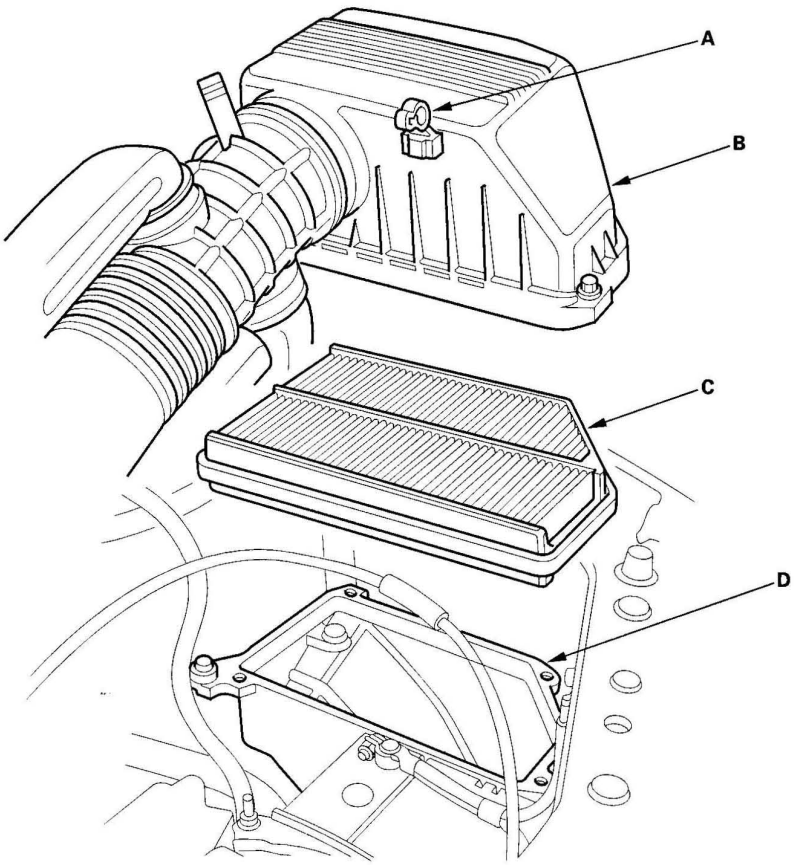
   - Misrouted, leaking, broken, or clogged intake air bypass system vacuum lines.
   - A cracked or defective intake air bypass control valve.

BACK

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Air Cleaner Element Replacement

1. Open the cable clamp (A), and remove the throttle cable from the air cleaner housing cover (B).



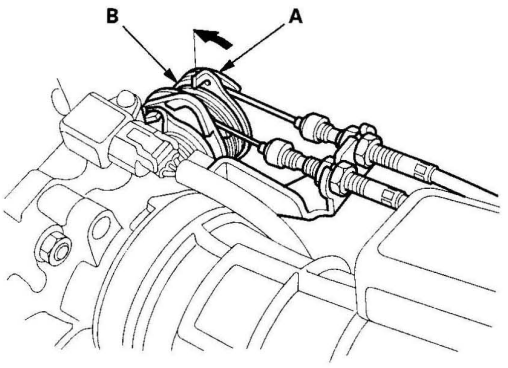
2. Remove the air cleaner element (C) from the air cleaner housing (D).
3. Install the parts in the reverse order of removal.

BACK

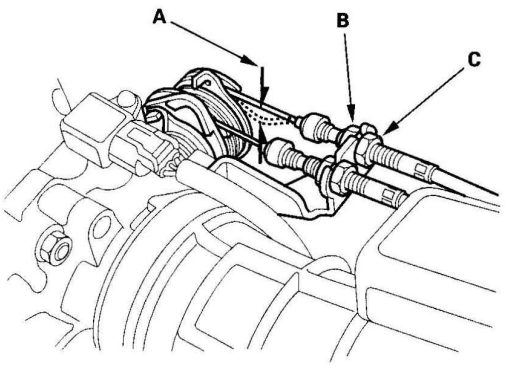
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Throttle Cable Adjustment

1. Hold the throttle link (A) to the throttle lever (B). There should be no clearance.



2. Check cable free play at the throttle linkage. Cable deflection (A) should be 10 – 12 mm (3/8 – 1/2 in.)



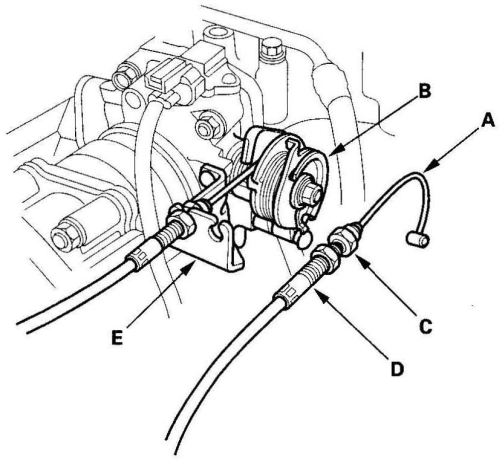
3. If deflection is not within specs (10 – 12 mm, 3/8 – 1/2 in.), loosen the locknut (B), turn the adjusting nut (C) until the deflection is as specified, then retighten the locknut.

4. With the cable properly adjusted, check the throttle valve to be sure it opens fully when you push the accelerator pedal to the floor. Also check the throttle valve to be sure it returns to the idle position whenever you release the accelerator pedal.

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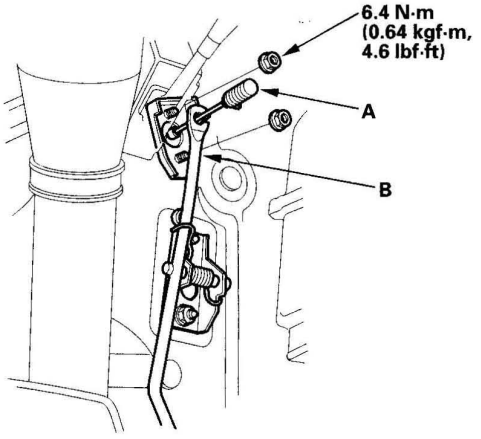
Throttle Cable Removal/Installation

1. Fully open the throttle valve, then remove the throttle cable (A) from the throttle link (B).



2. Loosen the locknut (C), and remove the cable adjuster (D) from the cable bracket (E).

3. Remove the throttle cable (A) from the accelerator pedal (B).

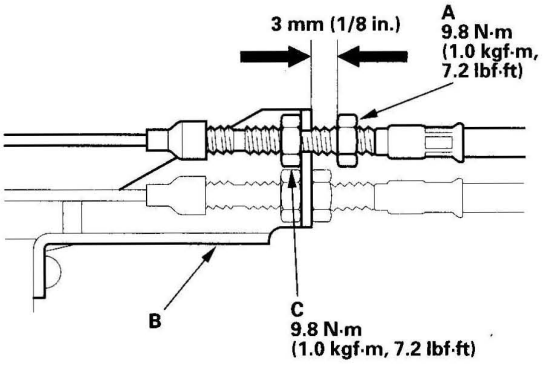


4. Pull off the throttle cable from the vehicle.

5. Install in the reverse order of removal.

6. Remove any slack from the cable while holding the cable adjuster.

7. Turn the adjusting nut (A) until it is 3 mm (1/8 in.) away from the cable bracket (B).



8. Tighten the locknut (C). The cable deflection should be 4—6 mm (3/16—1/4 in.). If deflection is not within spec, readjust the nuts.

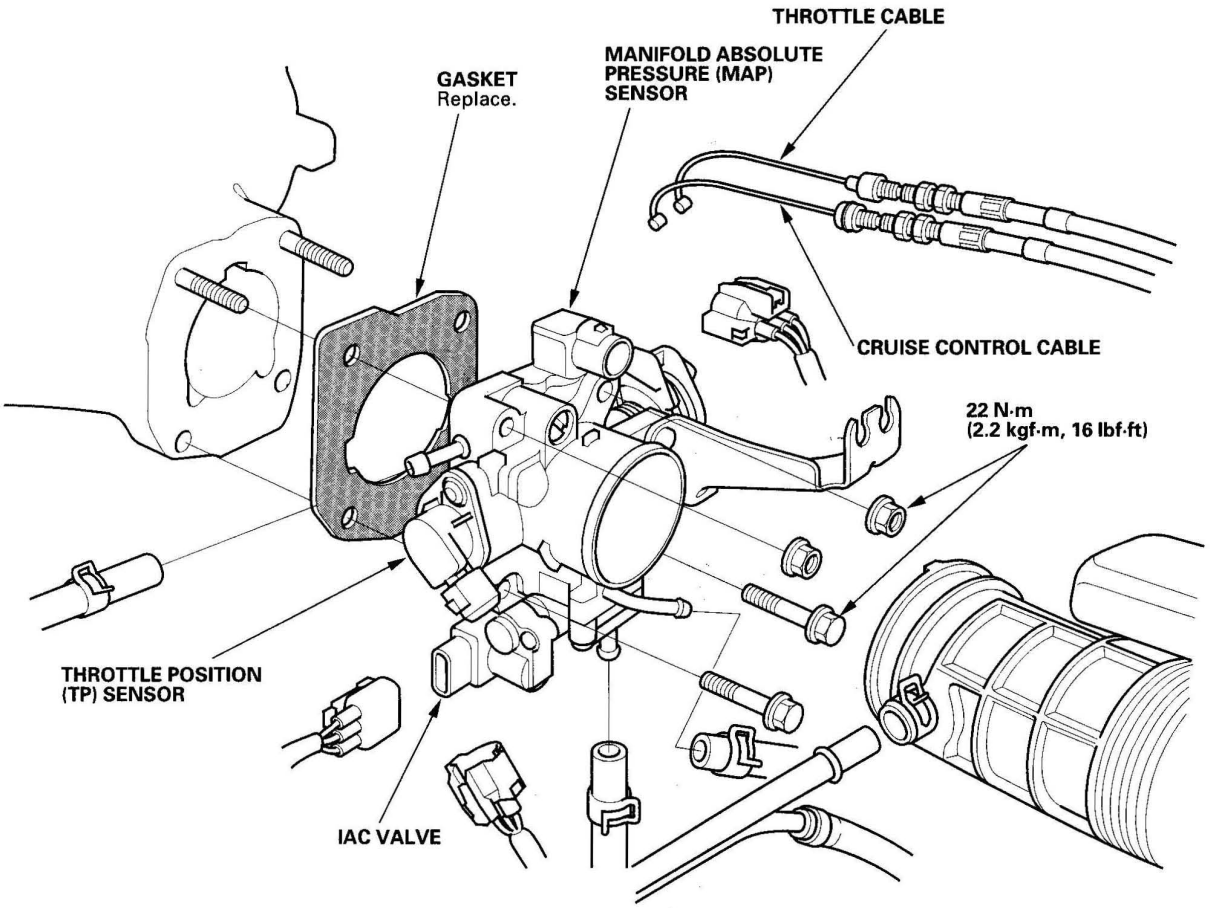
9. After the cable is adjusted properly, check the throttle valve to see whether it is able to fully open and close smoothly.

BACK

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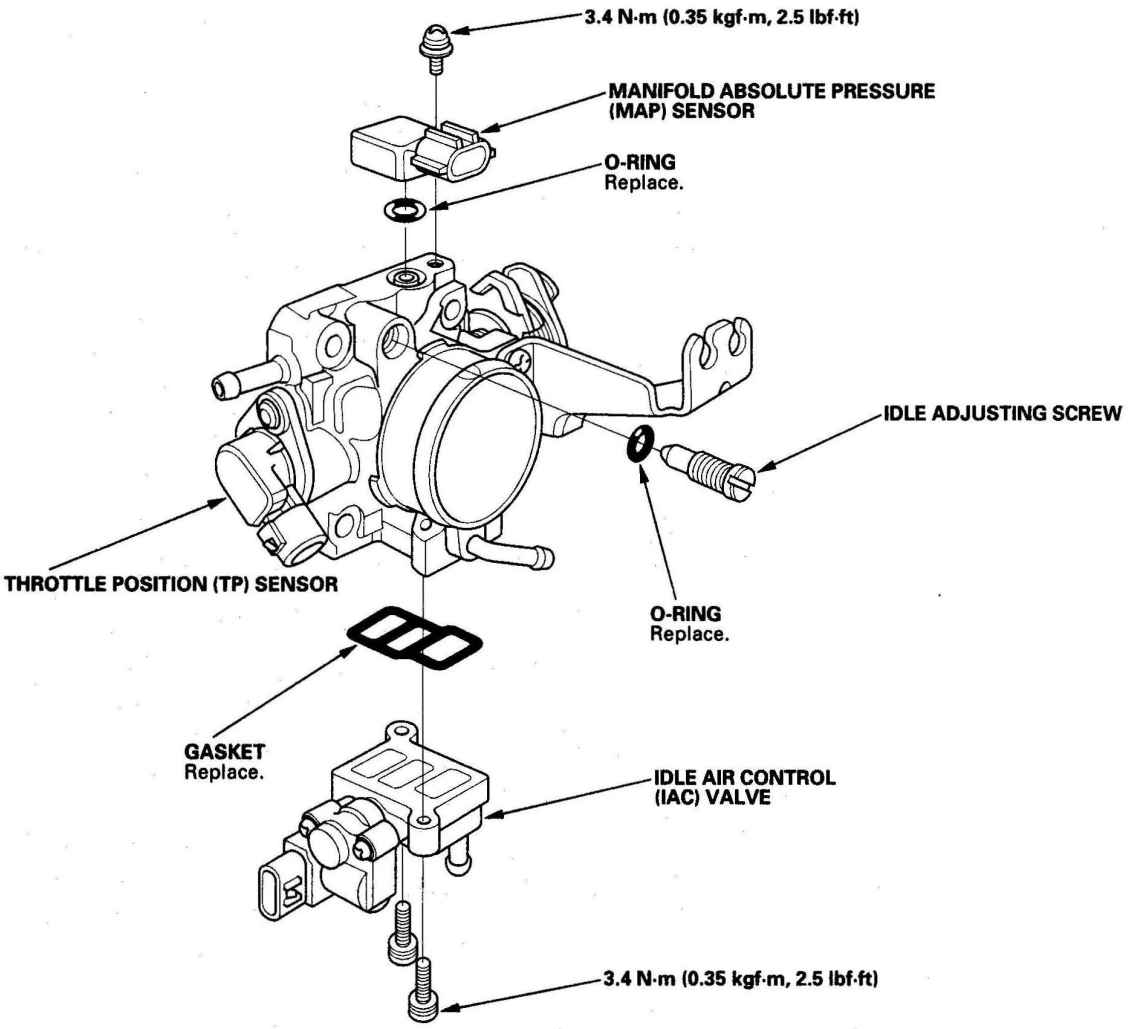
Throttle Body Removal/Installation

NOTE:
- Do not adjust the throttle stop screw.
- After reassembly, adjust the cruise control cable (see page 4-42) and the throttle cable (see page 11-139).
- The Throttle Position (TP) sensor is not removable or adjustable.



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Throttle Body Disassembly/Reassembly



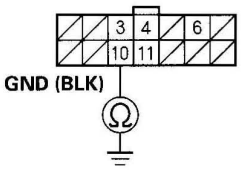
BACK

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IMRC System Troubleshooting

1. Disconnect the IMRC module 14P connector (see page 11-142).
2. Check for continuity between IMRC module 14P connector terminal No. 10 and body ground.

IMRC MODULE 14P CONNECTOR



Wire side of female terminals

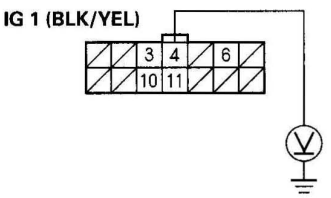
Is there continuity?

YES – Go to step 3.

NO – Repair open in the wire between the IMRC module 14P connector and G501. ■

3. Turn the ignition switch ON (II).
4. Measure voltage between IMRC module 14P connector terminal No. 4 and body ground.

IMRC MODULE 14P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 6.

NO – Go to step 5.

5. Check the No. 6 FI ECU (PCM) CRUISE CONTROL (15 A) fuse in the driver's under-dash fuse/relay box.

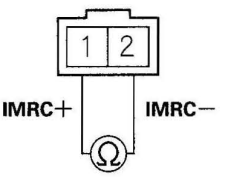
Is the fuse blown?

YES – Replace the No. 6 FI ECU (PCM) CRUISE CONTROL (15 A) fuse in the driver's under-dash fuse/relay box. If the fuse is blown again, repair short in the wire between the IMRC module and the No. 6 FI ECU (PCM) CRUISE CONTROL (15 A) fuse in the driver's under-dash fuse/relay box. ■

NO – Repair open in the wire between the IMRC module and the No. 6 FI ECU (PCM) CRUISE CONTROL (15 A) fuse in the driver's under-dash fuse/relay box. ■

6. Turn the ignition switch OFF.
7. Disconnect the IMRC actuator 2P connector.
8. Measure resistance between IMRC actuator 2P connector terminals No. 1 and No. 2.

IMRC ACTUATOR TERMINALS



Terminal side of male terminals

Is there 2 – 7 Ω ?

YES – Go to step 9.

NO – Replace the IMRC actuator. ■

9. Reconnect the IMRC actuator 2P connector.

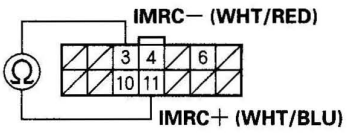
(cont'd)

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IMRC System Troubleshooting (cont'd)

10. Measure resistance between IMRC module 14P connector terminals No. 3 and No. 11.

IMRC MODULE 14P CONNECTOR



Wire side of female terminals

Is there about 2–7 Ω ?

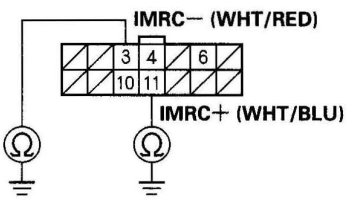
YES–Go to step 13.

NO–Go to step 11.

11. Disconnect the IMRC actuator 2P connector.

12. Check for continuity between body ground and IMRC module 14P connector terminals No. 3 and No. 11 individually.

IMRC MODULE 14P CONNECTOR



Wire side of female terminals

Is there continuity?

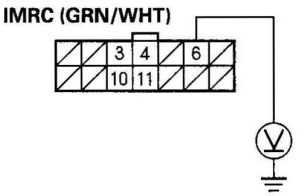
YES–Repair short in the wire between the IMRC module and the IMRC actuator.■

NO–Repair open in the wire between the IMRC module and the IMRC actuator.■

13. Reconnect the IMRC module 14P connector, and start the engine.

14. Measure voltage between IMRC module 14P connector terminal No. 6 and body ground.

IMRC MODULE 14P CONNECTOR



Wire side of female terminals

Is there about 5 V with engine speed below 3,200 rpm, and 1 V or less with engine speed above 3,400 rpm?

YES–Replace the IMRC module.■

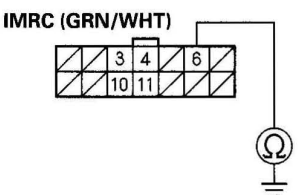
NO–Go to step 15.

15. Turn the ignition switch OFF.

16. Disconnect PCM connector A (32P) and the IMRC module 14P connector.

17. Check for continuity between the IMRC module 14P connector No. 6 terminal and body ground.

IMRC MODULE 14P CONNECTOR



Wire side of female terminals

Is there continuity?

YES–Repair short in the wire between the IMRC module and the PCM.■

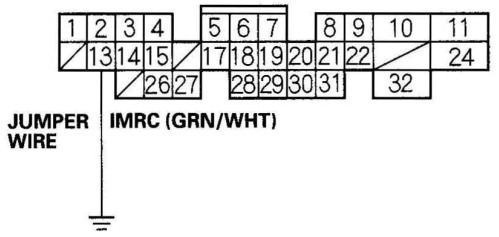
NO–Go to step 18.

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18. Connect PCM connector terminal A13 and body ground with a jumper wire.

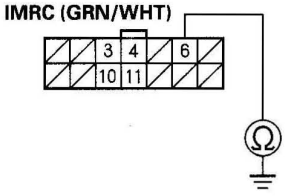
PCM CONNECTOR A (32P)



Wire side of female terminals

19. Check for continuity between IMRC module 14P connector terminal No. 6 and body ground.

IMRC CONTROL MODULE 14P CONNECTOR



Wire side of female terminals

Is there continuity?

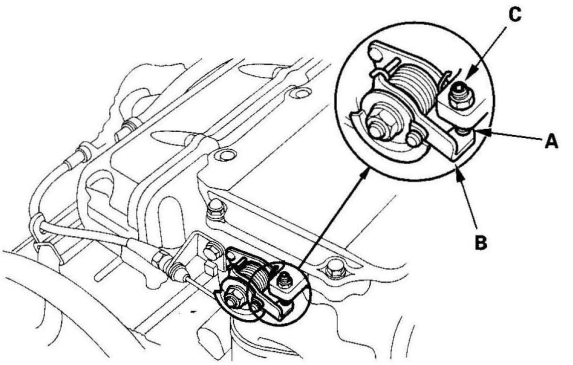
YES—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

NO—Repair open in the wire between the IMRC module and the PCM.■

Intake Manifold Runner Control (IMRC) Valve Inspection

NOTE: Do not adjust the IMRC adjusting screw (C).

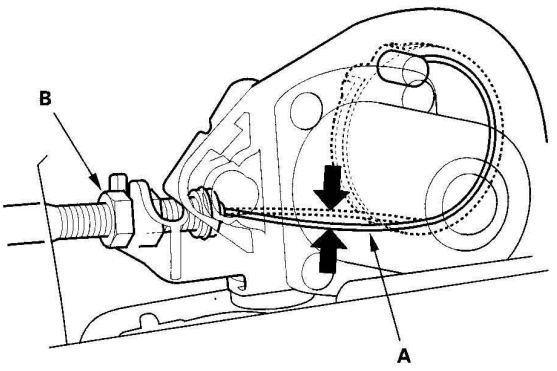
1. Check for the clearance (A) between the stop (B) and the screw (C). There should be no clearance.
   - If there is clearance, check and adjust the IMRC actuator cable.
   - If still there is still clearance after adjusting the IMRC actuator cable, the linkage may be stuck. Remove the intake manifold (see page 9-2), then check the IMRC valve.



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Intake Manifold Runner Control (IMRC) Cable Adjustment

1. Inspect the IMRC actuator cable (A). If there is damage, replace the IMRC cable.



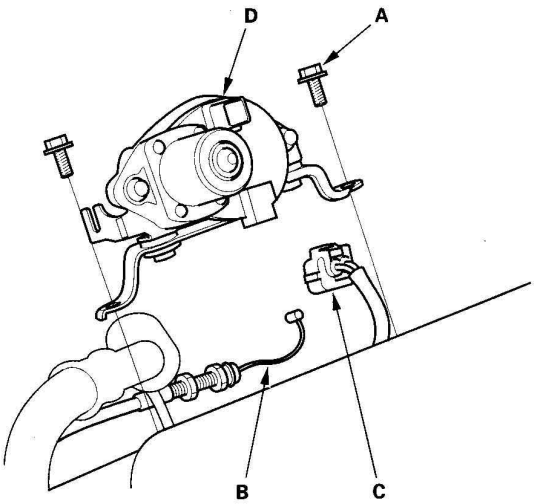
2. Inspect the cable free play.

   Cable free play should be: 3±2 mm (1/8 ± 1/16 in.)

   If the cable free play is out of specification, loosen the locknut (B), then adjust the free play.

Intake Manifold Runner Control (IMRC) Actuator Removal/ Installation

1. Remove the bolts (A), IMRC actuator cable (B), and IMRC actuator 2P connector (C).
2. Remove the IMRC actuator (D).



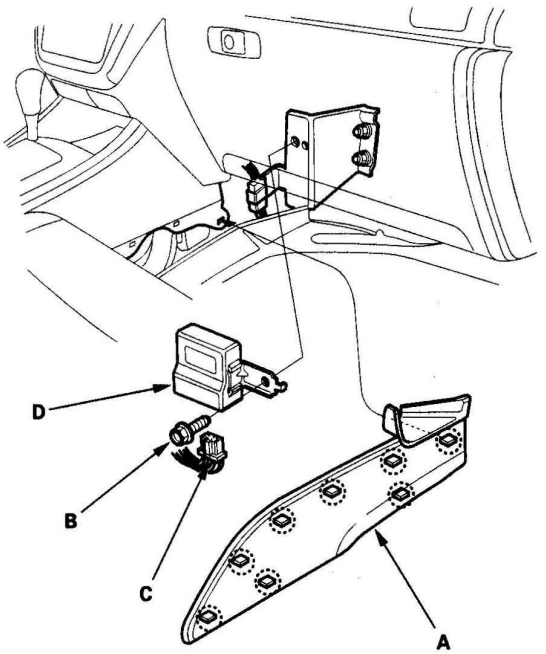
3. Install the parts in the reverse order of removal.

BACK

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Intake Manifold Runner Control (IMRC) Module Removal/Installation

1. Remove the passenger's center console side trim (A).



2. Remove the bolt (B) and the IMRC module 14P connector (C).
3. Remove the IMRC module (D).
4. Install the parts in the reverse order of removal.

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DTC Troubleshooting

DTC P0420: Catalytic System Efficiency Below Threshold

NOTE: If some of the DTCs listed below are stored at the same time as DTC P0420, troubleshoot those DTCs first, then recheck for DTC P0420.

P0137, P0138: Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2)
P0141: Secondary HO2S (Sensor 2) heater

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Drive on a highway or freeway for about 10 minutes without stopping. Your speed can vary.
4. With the transmission in D5 position, drive at a steady speed between 50—62 mph (80—100 km/h) for 30 seconds.
5. Repeat step 4 three times. Between each repetition, close the throttle completely for 1—2 seconds. If the engine is stopped during this part of the procedure, go to step 3 and do the procedure again.
6. Check for a Temporary DTC with the scan tool.

   Does the scan tool indicate Temporary DTC P0420?

   YES—Check the three way catalytic converter (TWC). If necessary, replace the TWC.■

   NO—Check for readiness code completion. If the readiness code is complete, it was an intermittent failure, and the system is OK at this time. If the readiness code is incomplete, repeat steps 2 through 6.■

Tailpipe Emissions Test

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. Connect a tachometer.
3. Check and, if necessary, adjust the idle speed (see page 11-112).
4. Warm up and calibrate the CO meter according to the meter manufacturer's instructions.
5. Check idle CO with the headlights, heater blower, rear window defogger, cooling fan, and air conditioner off.

   On Canadian models, pull up the parking brake lever, start the engine, then check that the headlights are off.

   The CO meter should indicate 0.1 % maximum.

BACK

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DTC Troubleshooting

DTC P0401: EGR System Insufficient Flow

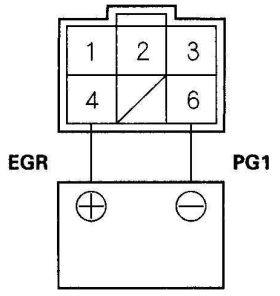
1. Reset the PCM (see page 11-4).
2. Test-drive under the following conditions.
   - Without any electrical load.
   - Decelerate from 55 mph (88 km/h) for at least 5 seconds.
3. Check the Temporary DTC with the scan tool.

   Is Temporary DTC P0401 indicated?

   YES – Clean the intake manifold EGR port with carburetor cleaner. Clean the passage inside the EGR valve with carburetor cleaner or replace the EGR valve. ■

   NO – Intermittent failure, go to step 4.
4. Turn the ignition switch OFF.
5. Disconnect the EGR valve 6P connector.
6. Connect the battery positive terminal to EGR valve connector terminal No. 4.

EGR VALVE 6P CONNECTOR



Terminal side of male terminals

7. Start the engine and let it idle, then connect the battery negative terminal to EGR valve connector terminal No. 6.

   Did the engine stall or run rough?

   YES – Intermittent failure, system is OK at this time. ■

   NO – Clean the intake manifold EGR port with caburetor cleaner. Clean the passage inside the EGR valve with carburetor cleaner or replace the EGR valve. ■

DTC Troubleshooting

DTC P1491: EGR Valve Insufficient Lift

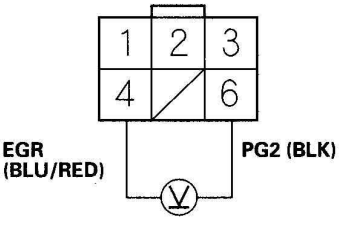
1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Drive the vehicle under load for about 10 minutes. Try to keep the engine speed in the 1,700 – 2,500 rpm range.
4. Check the Temporary DTC with the scan tool.

   Is Temporary DTC P1491 indicated?

   YES – Go to step 5.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the EGR valve and at the PCM. ■
5. Turn the ignition switch OFF.
6. Disconnect the EGR valve 6P connector.
7. Start the engine and let it idle.
8. Measure voltage between EGR valve 6P connector terminals No. 4 and No. 6.

EGR VALVE 6P CONNECTOR



Wire side of female terminals

Is there about 9 – 10 V?

YES – Substitute a known-good PCM, and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

NO – Go to step 9.

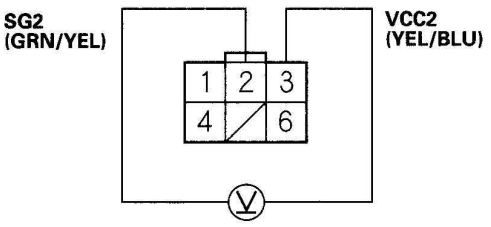
(cont'd)

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DTC Troubleshooting (cont'd)

9. Turn the ignition switch OFF.
10. Turn the ignition switch ON (II).
11. Measure voltage between EGR valve 6P connector terminals No. 2 and No. 3.

EGR VALVE 6P CONNECTOR



Wire side of female terminals

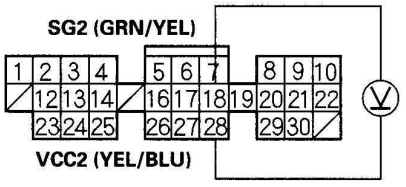
Is there about 5 V?

YES – Go to step 13.

NO – Go to step 12.

12. Measure voltage between PCM connector terminals C18 and C28.

PCM CONNECTOR C (31P)



Wire side of female terminals

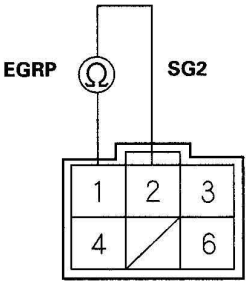
Is there about 5 V?

YES – Repair open in the wire between the EGR valve and the PCM (C18, C28). ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

13. Turn the ignition switch OFF.
14. At the sensor side, measure resistance between EGR valve 6P connector terminals No. 1 and No. 2.

EGR VALVE 6P CONNECTOR



Terminal side of male terminals

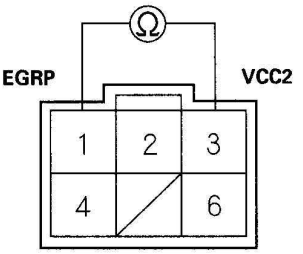
Is there continuity or resistance of 100 kΩ or higher?

YES – Replace the EGR valve. ■

NO – Go to step 15.

15. Measure resistance between EGR valve 6P connector terminals No. 1 and No. 3.

EGR VALVE 6P CONNECTOR



Terminal side of male terminals

Is there 100 kΩ or higher?

YES – Replace the EGR valve. ■

NO – Go to step 16.

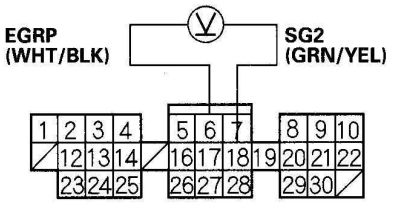
16. Reconnect the EGR valve connector.
17. Turn the ignition switch ON (II).

BACK

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18. Measure voltage between PCM connector terminals C6 and C18.

PCM CONNECTOR C (31P)



Wire side of female terminals

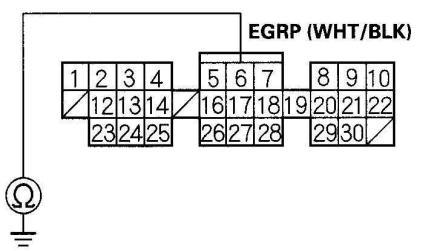
Is there about 1.2 V?

YES – Go to step 22.

NO – Go to step 19.

19. Turn the ignition switch OFF.
20. Disconnect PCM connector C (31P) and the EGR valve 6P connector.
21. Check for continuity between PCM connector terminal C6 and body ground.

PCM CONNECTOR C (31P)



Wire side of female terminals

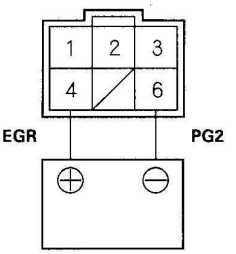
Is there continuity?

YES – Repair short in the wire between the EGR valve and PCM (C6). ■

NO – Repair open in the wire between the EGR valve and PCM (C6). ■

22. Turn the ignition switch OFF.
23. Disconnect the EGR valve 6P connector, and connect the battery positive terminal to EGR valve 6P connector terminal No. 4.

EGR VALVE 6P CONNECTOR



Terminal side of male terminals

24. Start the engine and let it idle, then connect the battery negative terminal to EGR valve 6P connector terminal No. 6.

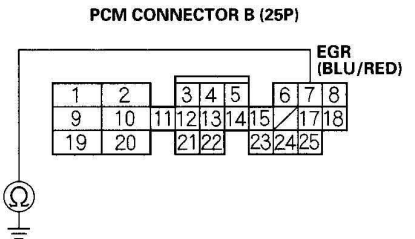
Does the engine stall or run rough?

YES – Go to step 25.

NO – Replace the EGR valve. ■

25. Turn the ignition switch OFF.
26. Disconnect PCM connector B (25P).
27. Check for continuity between PCM connector terminal B7 and body ground.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the EGR valve and the PCM (B7). ■

NO – Go to step 28.

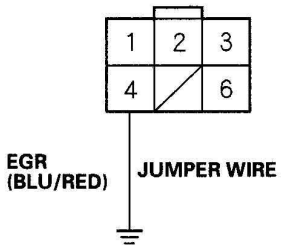
(cont'd)

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DTC Troubleshooting (cont'd)

28. Connect EGR valve 6P connector terminal No. 4 to body ground with a jumper wire.

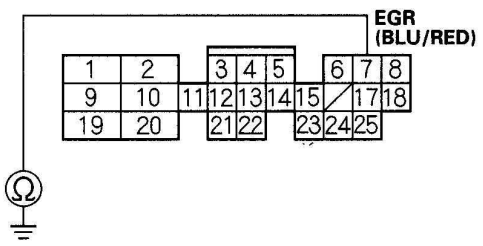
EGR VALVE 6P CONNECTOR



Wire side of female terminals

29. Check for continuity between PCM connector terminal B7 and body ground.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

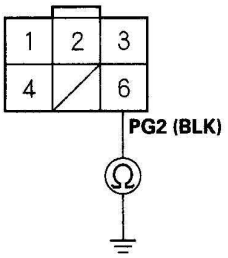
YES—Go to step 30.

NO—Repair open in the wire between the EGR valve and the PCM (C7).■

30. Disconnect the jumper wire from the EGR valve 6P connector.

31. Check for continuity between EGR valve 6P connector terminal No. 6 and body ground.

EGR VALVE 6P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

NO—Repair open in the wire between the EGR valve and G101.■

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DTC P1498: EGR Valve Position Sensor Circuit High Voltage

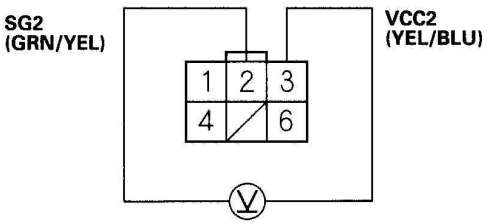
1. Reset the PCM (see page 11-4).
2. Start the engine.

   Is DTC P1498 indicated?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the EGR valve and at the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the EGR valve 6P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between EGR valve 6P connector terminals No. 2 and No. 3.

EGR VALVE 6P CONNECTOR



Wire side of female terminals

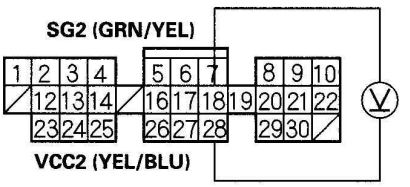
Is there about 5 V?

YES – Replace the EGR valve. ■

NO – Go to step 7.

7. Measure voltage between PCM connector terminals C18 and C28.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there about 5 V?

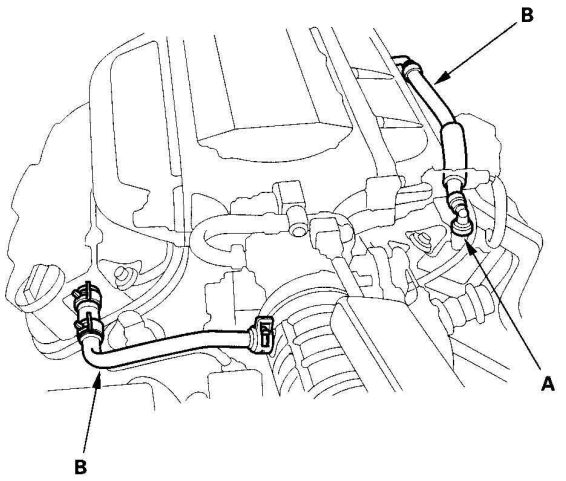
YES – Repair open in the wire between the EGR valve and the PCM (C18). ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

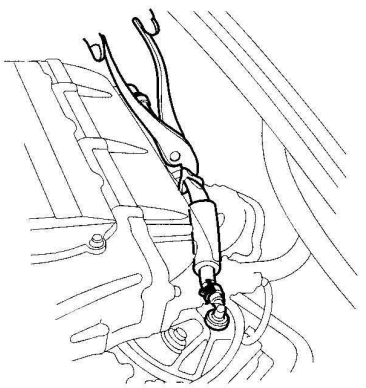
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PCV Valve Inspection and Test

1. Check the PCV valve (A), hoses (B), and connections for leaks or restrictions.



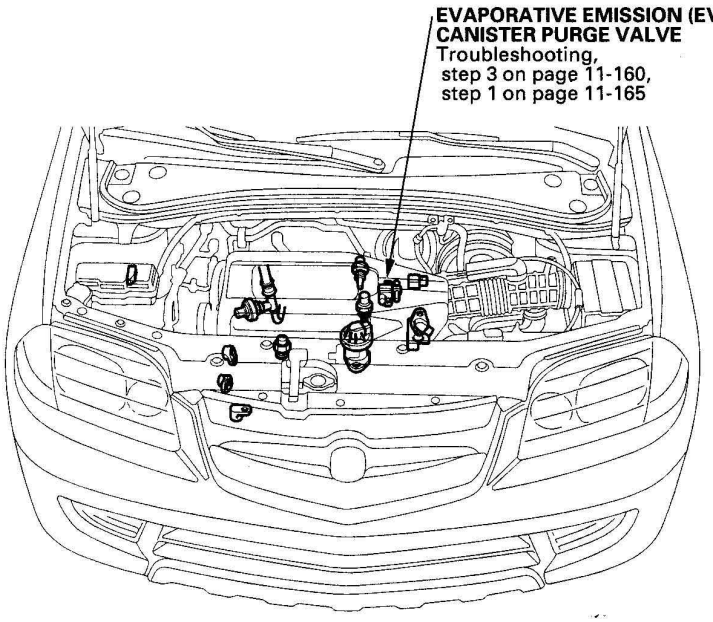
2. At idle, make sure there is a clicking sound from the PCV valve when the hose between the PCV valve and intake manifold is lightly pinched with your fingers or pliers.
   If there is no clicking sound, check the PCV valve grommet for cracks or damage. If the grommet is OK, replace the PCV valve and recheck.

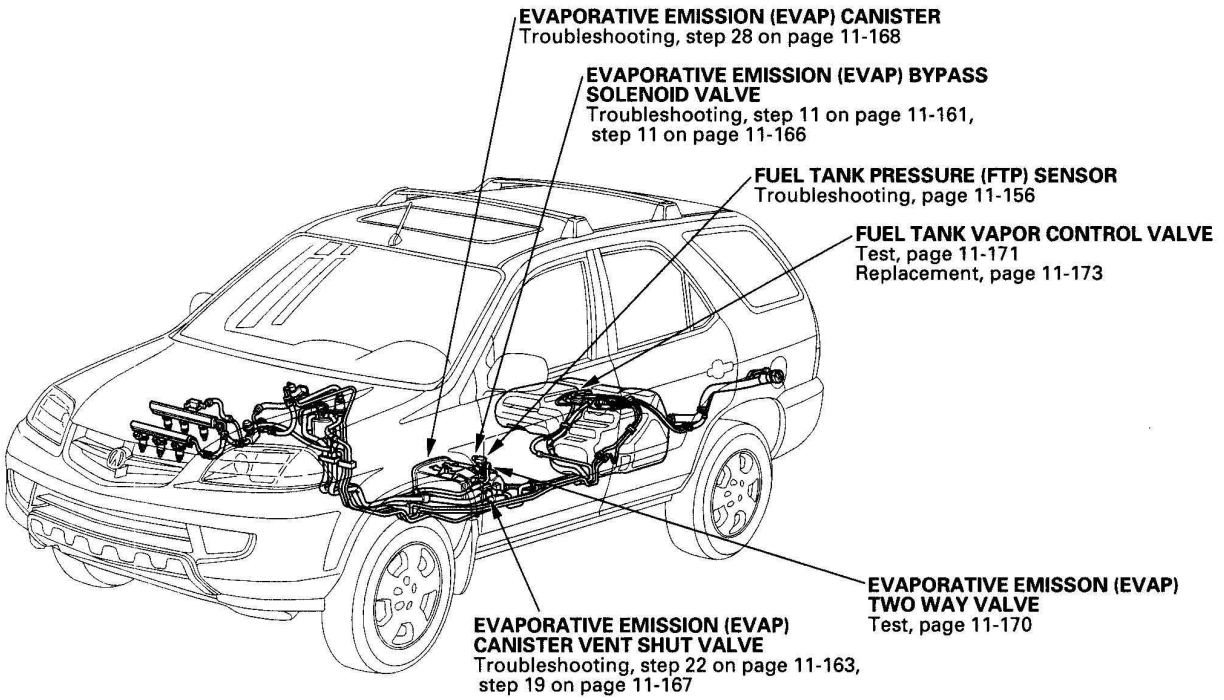


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Component Location Index





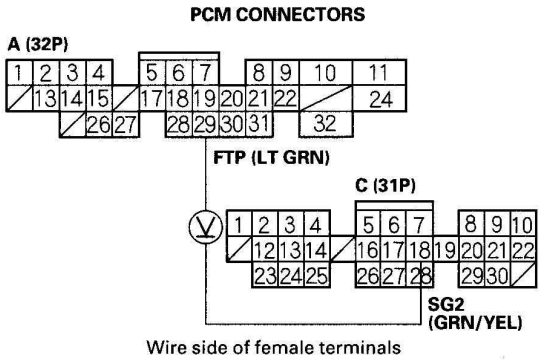
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DTC Troubleshooting

DTC P0451: FTP Sensor Range/Performance Problem

Special Tools Required
Vacuum Pump/Gauge, 0—30 in. Hg A973X-041-XXXXX

1. Remove the fuel fill cap.
2. Turn the ignition switch ON(II).
3. Monitor the FTP sensor voltage with the Honda PGM Tester, or measure voltage between PCM connector terminals A29 and C18.

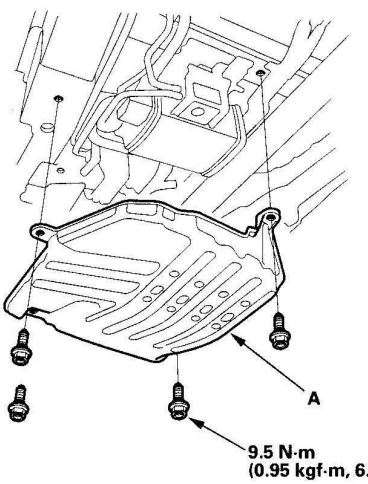


Is there about 2.5V?

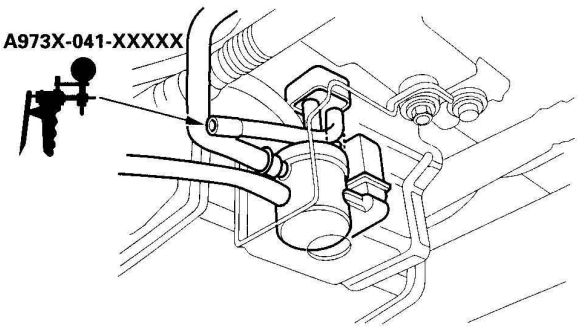
YES—Go to step 4.

NO—Replace the FTP sensor.■

4. Turn the ignition switch OFF.
5. Remove the four bolts and the canister cover (A).



6. Disconnect the hose between the EVAP two way valve and the FTP sensor at the EVAP two way valve end.
7. Connect a vacuum pump to the open end of that hose.



8. Turn the ignition switch ON (II).
9. Monitor the FTP sensor voltage with the Honda PGM Tester, or measure voltage between PCM connector terminals A29 and C18, and slowly squeeze the vacuum pump a little while watching the voltage.
10. The voltage should smoothly drop from about 2.5 V down to about 1.5 V. STOP applying vacuum when the voltage drops to about 1.5 V or damage to the FTP sensor may occur.

Does the voltage drop to about 1.5 V and hold?

YES—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

NO—Replace the FTP sensor.■

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DTC P0452: FTP Sensor Circuit Low Voltage

1. Check the vacuum lines at the FTP sensor for misrouting, leakage, breakage and clogging.

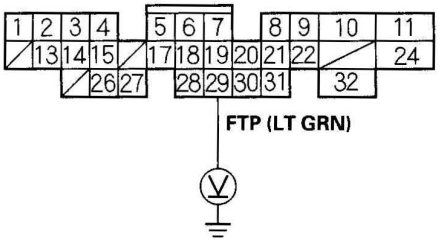
   Are the vacuum lines OK?

   YES – Go to step 2.

   NO – Repair or replace vacuum lines as necessary. ■

2. Reset the PCM (see page 11-4).
3. Remove the fuel fill cap.
4. Turn the ignition switch ON (II).
5. Monitor the FTP sensor voltage with the Honda PGM Tester, or measure voltage between body ground and PCM connector terminal A29.

PCM CONNECTOR A (32P)



Wire side of female terminals

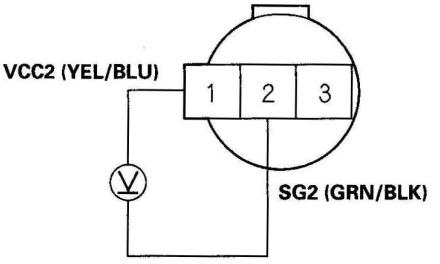
Is there about 2.5 V?

YES – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the FTP sensor and at the PCM. ■

NO – Go to step 6.

6. Turn the ignition switch OFF.
7. Reinstall the fuel fill cap.
8. Disconnect the FTP sensor 3P connector.
9. Turn the ignition switch ON (II).
10. Measure voltage between FTP sensor 3P connector terminals No. 1 and No. 2.

FTP SENSOR 3P CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES – Go to step 11.

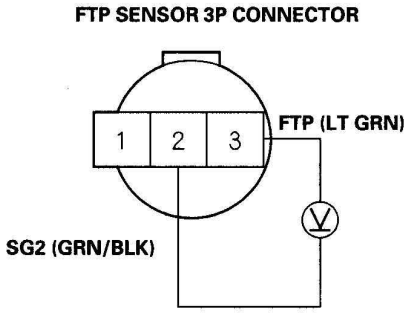
NO – Repair open in the wire between the FTP sensor and the PCM (C28). ■

(cont'd)

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DTC Troubleshooting (cont'd)

11. Measure voltage between FTP sensor 3P connector terminals No. 2 and No. 3.

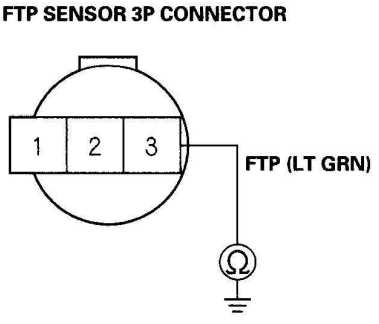


Is there about 5 V?

YES—Replace the FTP sensor. ■

NO—Go to step 12.

12. Turn the ignition switch OFF.
13. Disconnect PCM connector A (32P).
14. Check for continuity between FTP sensor 3P connector terminal No. 3 and body ground.



Is there continuity?

YES—Repair short in the wire between the FTP sensor and the PCM (A29). ■

NO—Substitute a known-good PCM and recheck (see page 11-5). If normal voltage is indicated, replace the original PCM. ■

DTC P0453: FTP Sensor Circuit High Voltage

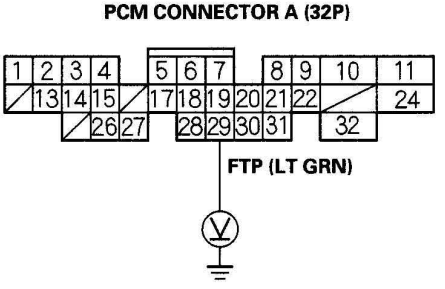
1. Check the vacuum lines of the FTP sensor for misrouting, leakage, breakage, and clogging.

   Are the vacuum lines OK?

   YES—Go to step 2.

   NO—Repair or replace vacuum lines as necessary. ■

2. Reset the PCM (see page 11-4).
3. Remove the fuel fill cap.
4. Turn the ignition switch ON (II).
5. Monitor the FTP sensor voltage with the Honda PGM Tester, or measure voltage between body ground and PCM connector terminal A29.



Is there about 2.5 V?

YES—Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the FTP sensor and at the PCM. ■

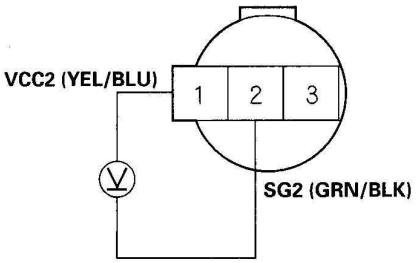
NO—Go to step 6.

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6. Turn the ignition switch OFF.
7. Reinstall the fuel fill cap.
8. Disconnect the FTP sensor 3P connector.
9. Turn the ignition switch ON (II).
10. Measure voltage between FTP sensor 3P connector terminals No. 1 and No. 2.

FTP SENSOR 3P CONNECTOR



Wire side of female terminals

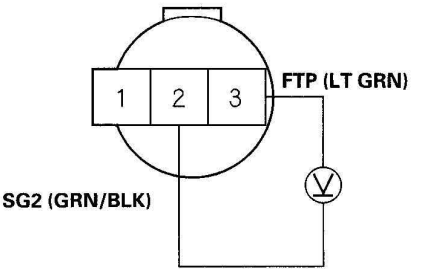
Is there about 5 V?

YES—Go to step 11.

NO—Repair open in the wire between the FTP sensor and the PCM (C18).■

11. Measure voltage between FTP sensor 3P connector terminals No. 2 and No. 3.

FTP SENSOR 3P CONNECTOR



Wire side of female terminals

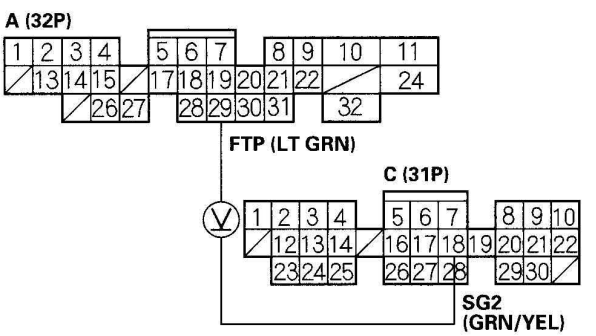
Is there about 5 V?

YES—Replace the FTP sensor.■

NO—Go to step 12.

12. Measure voltage between PCM connector terminals A29 and C18.

PCM CONNECTORS



Wire side of female terminals

Is there about 5 V?

YES—Repair open in the wire between the FTP sensor and the PCM (A29).■

NO—Substitute a known-good PCM and recheck (see page 11-5). If normal voltage is indicated, replace the original PCM.■

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DTC Troubleshooting (cont'd)

DTC P1456: EVAP Control System Leakage (Fuel Tank System)

NOTICE

The fuel system is designed to allow specified maximum vacuum and pressure conditions. Do not deviate from the vacuum and pressure tests as indicated in these procedures. Excessive pressure/vacuum would damage the EVAP components or cause eventual fuel tank failure.

Special Tools Required

Vacuum Pump/Gauge, 0 – 30 in. Hg A973X-041-XXXXX

Please note that this is a two-trip code; once cleared, it cannot be reproduced in one trip. Also, certain specific driving and ambient conditions must occur before the PCM will complete the system checks. Additional test drives may still not meet the specific conditions needed to reproduce the code.

Therefore, follow these troubleshooting procedures carefully to ensure the integrity of the system and to comfirm the cause of the problem or code.

NOTE: Fresh fuel has a higher volatility that will create greater pressure/vacuum. The optimum condition for testing is fresh fuel, and must be less than a full tank of gas. If possible, to assist in leak detection, add 1 gallon of fresh fuel to the tank (as long as it will not fill the tank), just before starting these procedures.

Fuel Fill Cap Check

1. Check the fuel fill cap (the cap must say "It not tightened 3 clicks check engine light may come on").

   Is proper fuel fill cap installed and properly tightened?

   YES – Go to step 2.

   NO – Replace or tighten the cap. ■

2. Check the fuel fill cap seal.

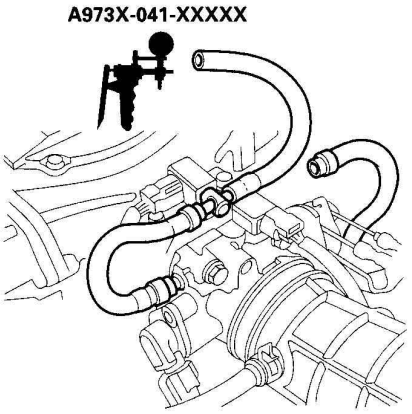
   Is the fuel fill cap seal missing or damaged?

   YES – Replace the fuel fill cap (gray or black colored cap). ■

   NO – Fuel fill cap is OK. Go to step 3.

EVAP Canister Purge Valve Test

3. Disconnect the vacuum hose from the EVAP canister purge valve (A), and connect a vacuum pump to the hose.



4. Turn the ignition switch ON (II).

5. Apply vacuum to the hose.

   Does the valve hold vacuum?

   YES – EVAP canister purge valve is OK. Go to step 11.

   NO – Go to step 6.

6. Turn the ignition switch OFF.

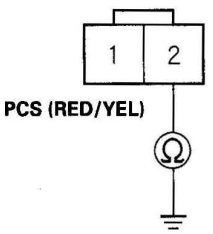
7. Disconnect the EVAP canister purge valve 2P connector.

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8. Check for continuity between EVAP canister purge valve 2P connector terminal No. 2 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

Is there continuity?

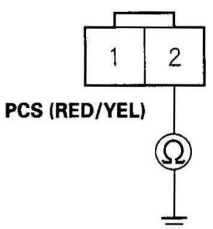
YES – Go to step 9.

NO – Replace the EVAP canister purge valve. ■

9. Disconnect PCM connector A (32P).

10. Check for continuity between EVAP canister purge valve 2P connector terminal No. 2 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

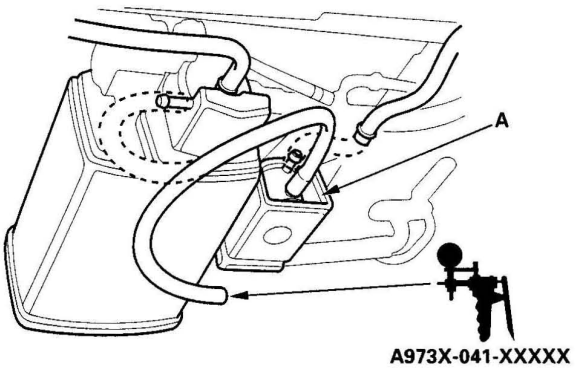
Is there continuity?

YES – Repair short in the wire between the EVAP canister purge valve and the PCM (A6). ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

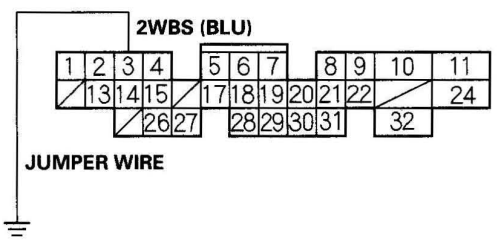
EVAP Bypass Solenoid Valve Test

11. Disconnect both vacuum hoses from the EVAP two way valve (A), and connect a vacuum pump to the canister port on the two way valve.



12. Turn the EVAP bypass solenoid valve ON with the Honda PGM Tester, or connect ECM/PCM connecter terminal A3 to body ground with a jumper wire.

PCM CONNECTOR A (32P)



Wire side of female terminals

13. Turn the ignition switch ON(II).

14. Apply vacuum to the hose.

Does the valve hold vacuum?

YES – Go to step 15.

NO – Go to step 20.

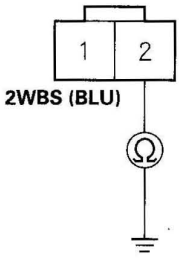
(cont'd)

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DTC Troubleshooting (cont'd)

15. Turn the ignition switch OFF.
16. Disconnect the EVAP bypass solenoid valve 2P connector.
17. Check for continuity between EVAP bypass solenoid valve 2P connector terminal No. 2 and body ground.

EVAP BYPASS SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals

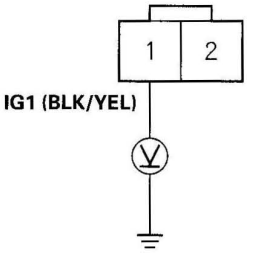
Is there continuity?

YES – Go to step 18.

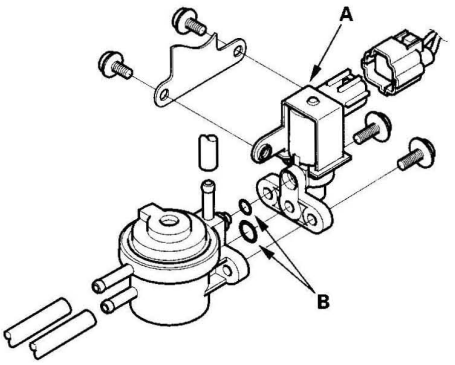
NO – Repair open in the wire between the EVAP bypass solenoid valve and the PCM (A3).■

18. Turn the ignition switch ON (II).
19. Measure voltage between EVAP bypass solenoid valve 2P connector terminal No. 1 and body ground.

EVAP BYPASS SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals



Is there battery voltage?

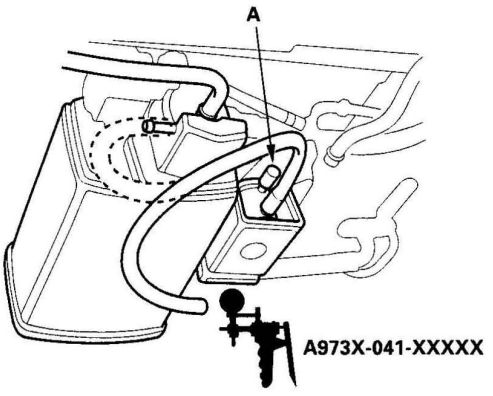
YES – Replace the EVAP bypass solenoid valve (A) and the O-rings (B).■

NO – Repair open in the wire between the EVAP bypass solenoid valve and the No. 6 ECU (PCM) CRUISE CONTROL (15 A) fuse.■

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20. Plug the upper port (A) of the EVAP two way valve.



21. While monitoring the FTP sensor voltage with the Honda PGM Tester, or measuring the voltage between PCM connector terminals A29 and C18, slowly pump the vacuum pump until the voltage drops to about 1.5 volts.

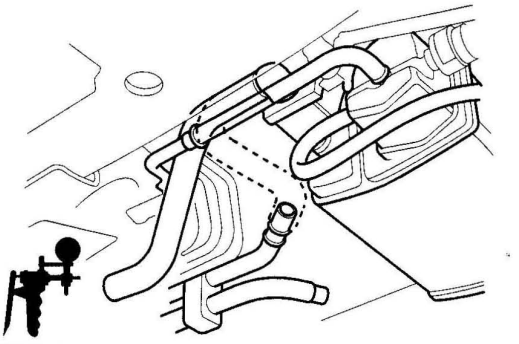
Does the voltage drop to 1.5 V and hold for at least 20 seconds?

YES – EVAP bypass solenoid valve/EVAP two way valve is OK. Go to step 22.

NO – Repair leak from EVAP bypass solenoid valve, EVAP two way valve, FTP sensor and O-rings. ■

EVAP Canister Vent Shut Valve Test

22. Disconnect the vacuum hose from the EVAP canister filter, and connect a vacuum pump to the hose.



23. Turn the ignition switch ON (II).

24. Apply vacuum to the hose with 5 strokes of the pump.

Does the valve hold vacuum?

YES – Go to step 25.

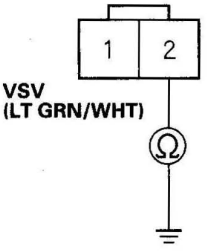
NO – EVAP canister vent shut valve is OK. Go to step 30.

25. Turn the ignition switch OFF.

26. Disconnect the EVAP canister vent shut valve 2P connector.

27. Check for continuity between EVAP canister vent shut valve 2P connector terminal No. 2 and body ground.

EVAP CANISTER VENT SHUT VALVE 2P CONNECTOR

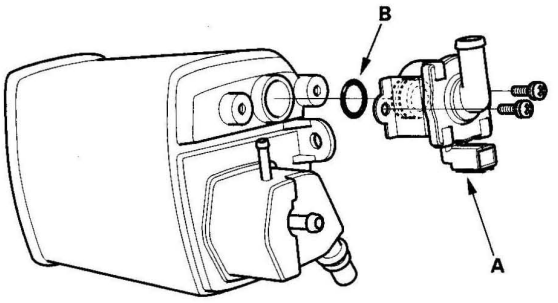


Wire side of female terminals

(cont'd)

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DTC Troubleshooting (cont'd)



Is there continuity?

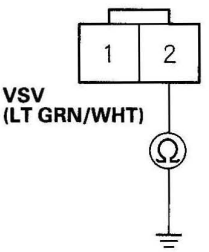
YES – Go to step 28.

NO – Replace the EVAP canister vent shut valve (A) and O-ring (B). ■

28. Disconnect PCM connector A (32P).

29. Check for continuity between EVAP canister vent shut valve 2P connector terminal No. 2 and body ground.

EVAP CANISTER VENT SHUT VALVE 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the EVAP canister vent shut valve and the PCM (A4) ■.

NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

Vacuum Hoses and Connections Test

30. Perform the fuel tank vapor control valve test (see page 11-171).

Is the fuel tank vapor control valve OK?

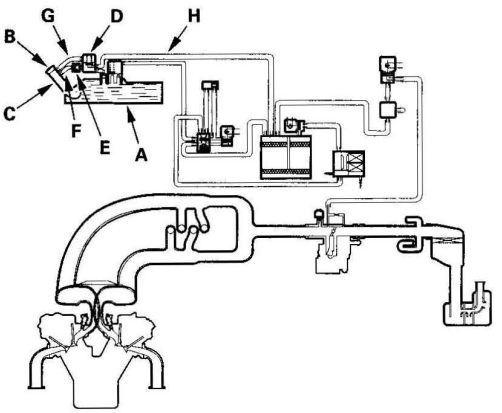
YES – Go to step 31.

NO – Replace the fuel tank vapor control valve. ■

31. Tighten the fuel cap 3 "clicks", then monitor the FTP readings with the Honda PGM Tester.

32. Start the engine and let the engine idle for 5 minutes.

33. Check the FTP sensor readings.



Is the reading above 4 mmHg pressure or below – 4 mmHg vacuum?

YES – Substitute a known-good PCM and retest. If the symptom/indication goes away, replace the original PCM. ■

NO – Check the following parts for leaks: ■

- Fuel tank (A)
- Fuel fill cap (B)
- Fuel fill pipe (C)
- Fuel tank vapor control valve (D)
- Fuel tank vapor recirculation valve (E)
- Fuel tank vapor recirculation tube (F)
- Fuel tank vapor signal tube (G)
- Fuel tank vapor control vent tube (H)
  – If necessary, repair or replace the parts.

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DTC P1457: EVAP Control System Leakage (EVAP Canister System)

NOTICE

The fuel system is designed to allow specified maximum vacuum and pressure conditions. Do not deviate from the vacuum and pressure tests as indicated in these procedures. Excessive pressure/vacuum would damage the EVAP components or cause eventual fuel tank failure.

Special Tools Required

- Vacuum pump/gauge, 0—30 in.Hg A973X-041-XXXXX
- Vacuum/pressure gauge, 0—4 in.Hg 07JAZ-001000B

Please note that this is a two-trip code; once cleared, it cannot be reproduced in one trip. Also, certain specific driving and ambient conditions must occur before the PCM will complete the system checks. Additional test drives may still not meet the specific conditions needed to reproduce the code.

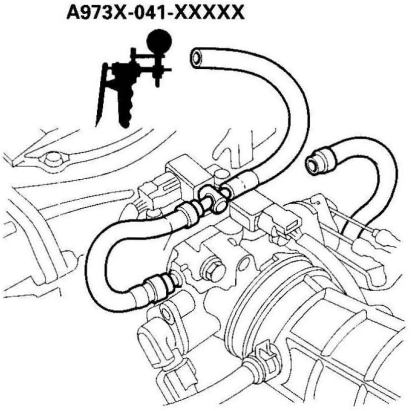
Therefore, follow these troubleshooting procedures carefully to ensure the integrity of the system and to comfirm the cause of the problem or code.

NOTE: Fresh fuel has a higher volatility that will create greater pressure/vacuum. The optimum condition for testing is fresh fuel, at least half, but less than a full tank. If possible, to assist in leak detection, add 1 gallon of fresh fuel to the tank (as long as it will not fill the tank), just before starting these procedures.

EVAP Canister Purge Valve Test

1. Disconnect the vacuum hose from the EVAP canister purge valve (A), and connect a vacuum pump to the hose.

A973X-041-XXXXX



2. Apply vacuum to the hose.

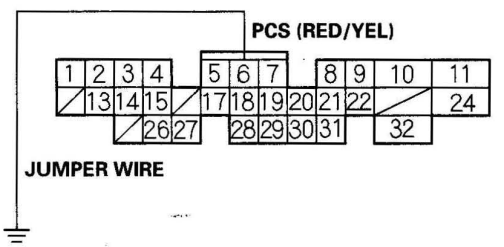
   Does the valve hold vacuum?

   YES—Go to step 3.

   NO—Replace the EVAP canister purge valve. If the valve is contaminated with charcoal particles, replace the canister, and blow out the hoses.

3. Turn the EVAP canister purge valve ON with the Honda PGM Tester, or connect ECM/PCM connector terminal A6 to body ground with a jumper wire.

PCM CONNECTOR A (32P)



Wire side of female terminals

4. Turn the ignition switch ON (II).

5. Apply vacuum to the hose.

   Does the valve hold vacuum?

   YES—Go to step 6.

   NO—EVAP canister purge valve is OK. Go to step 11.

6. Turn the ignition switch OFF.

(cont'd)

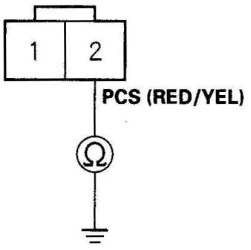
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DTC Troubleshooting (cont'd)

7. Disconnect the EVAP canister purge valve 2P connector.

8. Check for continuity between EVAP canister purge valve 2P connector terminal No. 2 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

Is there continuity?

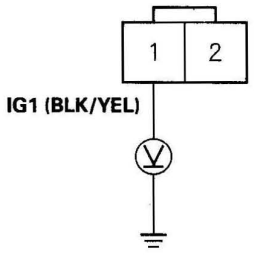
YES – Go to step 9.

NO – Repair open in the wire between the EVAP canister purge valve and the PCM (A6). ■

9. Turn the ignition switch ON (II).

10. Measure voltage between EVAP canister purge valve 2P connector terminal No. 1 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

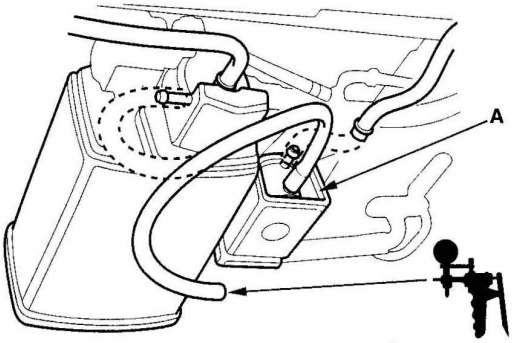
Is there battery voltage?

YES – Replace the EVAP canister purge valve. ■

NO – Repair open in the wire between the EVAP canister purge valve and the No. 6 ECU (PCM) CRUISE CONTROL (15 A) fuse. ■

EVAP Bypass Solenoid Valve Test

11. Disconnect the vacuum hose from the EVAP two way valve (A), and connect a vacuum pump to the canister port on the two way valve.



A973X-041-XXXXX

12. Turn the ignition switch ON (II).

13. Apply vacuum to the hose.

Does the valve hold vacuum?

YES – EVAP bypass solenoid valve/EVAP two way valve is OK. Go to step 19.

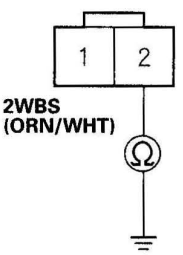
NO – Go to step 14.

14. Turn the ignition switch OFF.

15. Disconnect the EVAP bypass solenoid valve 2P connector.

16. Check for continuity between EVAP bypass solenoid valve 2P connector terminal No. 2 and body ground.

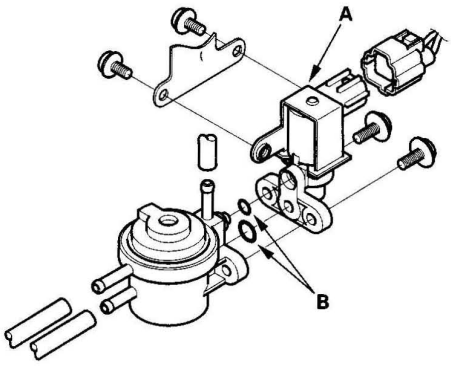
EVAP BYPASS SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals

BACK

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Is there continuity?

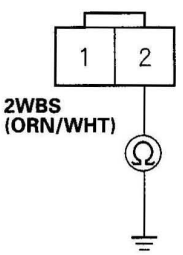
YES – Go to step 17.

NO – Replace the EVAP bypass solenoid valve (A) and O-rings (B). ■

17. Disconnect PCM connector A (32P).

18. Check for continuity between EVAP bypass solenoid valve 2P connector terminal No. 2 and body ground.

EVAP BYPASS SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals

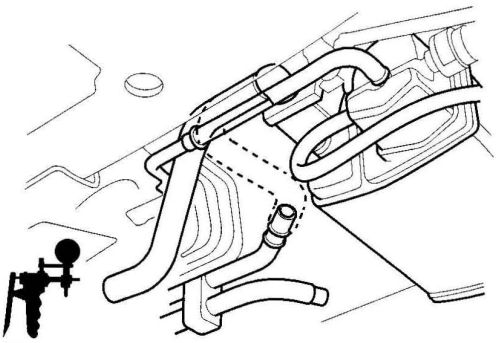
Is there continuity?

YES – Repair the short in the wire between the EVAP bypass solenoid valve and the PCM (A3). ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

EVAP Canister Vent Shut Valve Test

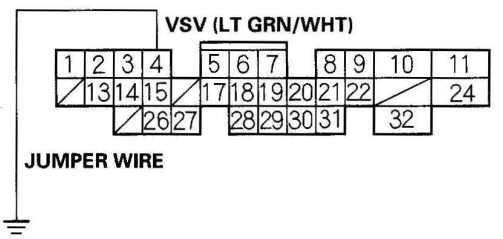
19. Disconnect the vacuum hose from the EVAP canister vent filter, and connect a vacuum pump to the hose.



A973X-041-XXXXX

20. Turn the EVAP canister vent shut valve ON with the Honda PGM Tester, or connect PCM connector terminal A4 to body ground with a jumper wire.

PCM CONNECTOR A (32P)



Wire side of female terminals

21. Turn the ignition switch ON (II)

22. Apply vacuum to the hose.

Does the valve hold vacuum?

YES – EVAP canister vent shut valve is OK. Go to step 28.

NO – Go to step 23.

23. Turn the ignition switch OFF.

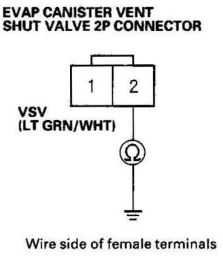
24. Disconnect the EVAP canister vent shut valve 2P connector.

(cont'd)

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DTC Troubleshooting (cont'd)

25. Check for continuity between EVAP canister vent shut valve 2P connector terminal No. 2 and body ground.



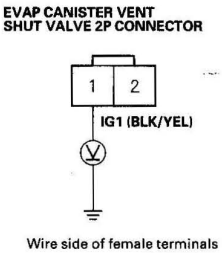
Is there continuity?

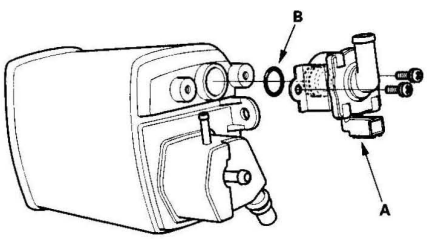
YES – Go to step 26.

NO – Repair open in the wire between the EVAP canister vent shut valve and the PCM (A4). ■

26. Turn the ignition switch ON (II).

27. Measure voltage between EVAP canister vent shut valve 2P connector terminal No. 1 and body ground.





Is there battery voltage?

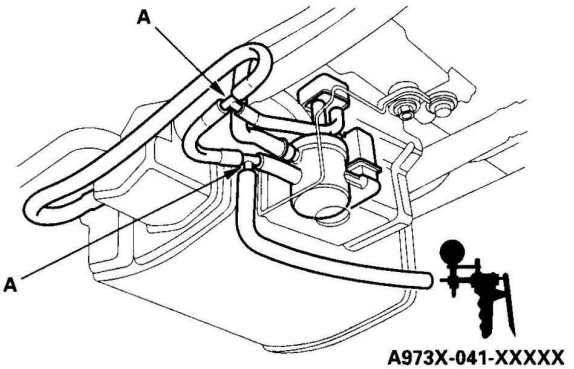
YES – Replace the EVAP canister vent shut valve (A) and the O-ring (B). ■

NO – Repair open in the wire between the EVAP canister vent shut valve and the No. 6 ECU (PCM) CRUISE CONTROL (15 A) fuse. ■

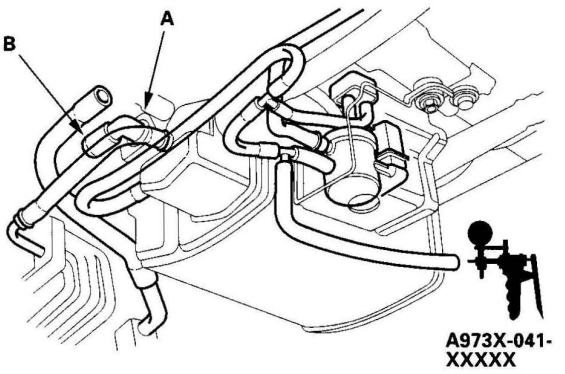
Canister System Leak Test

28. Turn the ignition switch OFF.

29. Connect two three-way T-fittings (A) into the hose from the EVAP canister to the EVAP two way valve. Connect the FTP sensor to one of the tee T-fittings and the vacuum pump to the other.



30. Remove the vent hose from the EVAP canister vent shut valve (A) and cap (B) the port to seal the fresh air vent for the EVAP canister.



31. Turn the ignition switch ON (II).

32. While monitoring the FTP sensor voltage with the Honda PGM Tester, or measuring voltage between PCM connector terminals A29 and C18, slowly pump the vacuum pump.

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33. Continue to pump vacuum until the voltage drops to about 1.5 V. Make sure that the engine coolant temperature is still above 95°F (35°C) and your vacuum pump has no leak.

34. Check the voltage for 20 seconds.

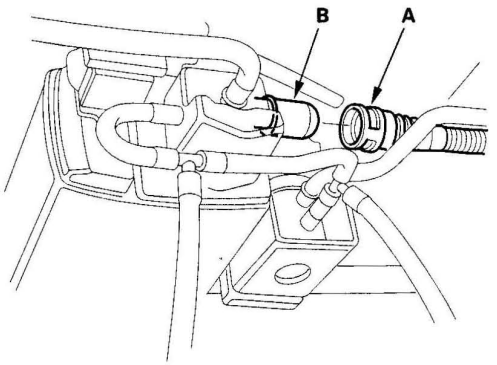
    Does the voltage drop to 1.5 V and hold for at least 20 seconds?

    YES – Inspect the EVAP canister vent shut valve line and connections. ■

    NO – Go to step 35.

35. Turn the ignition switch OFF.

36. Disconnect the quick-connect fitting (A) from the EVAP canister, and plug (B) the canister port.



37. Turn the ignition switch ON (II).

38. While monitoring the FTP sensor voltage with the Honda PGM Tester, or measuring voltage between PCM connector terminals A29 and C18, slowly pump the vacuum pump.

39. Continue to pump vacuum until the voltage drops to about 1.5 V. Make sure the engine coolant temperature is still above 95°F (35°C) and your vacuum pump has no leak.

40. Monitor the voltage continuously for 20 seconds.

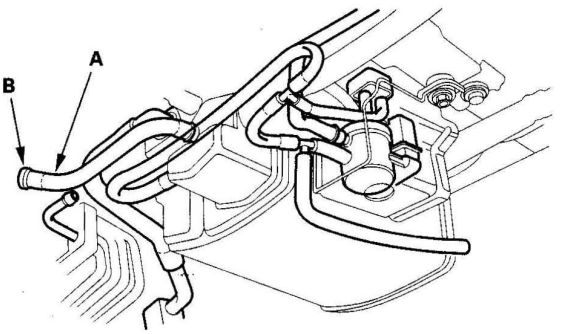
    Does the voltage drop to 1.5 V and hold for at least 20 seconds?

    YES – Inspect the fuel tank vapor control line and connections. ■

    NO – Go to step 41.

41. Turn the ignition switch OFF.

42. Disconnect the purge line hose (A) from the canister at the metal line and plug (B) the hose.



43. Turn the ignition switch ON (II).

44. While monitoring the FTP sensor voltage with the Honda PGM Tester, or measuring voltage between PCM connector terminals A29 and C18 slowly pump the vacuum pump.

45. Continue to pump vacuum until the voltage drops to about 1.5 V. Make sure that the engine coolant temperature is still above 95°F (35°C) and your vacuum pump has no leak.

46. Monitor the voltage continuously for 20 seconds.

    Does the voltage drop to 1.5V and hold for at least 20 seconds?

    YES – Inspect EVAP purge control solenoid valve line and connections. ■

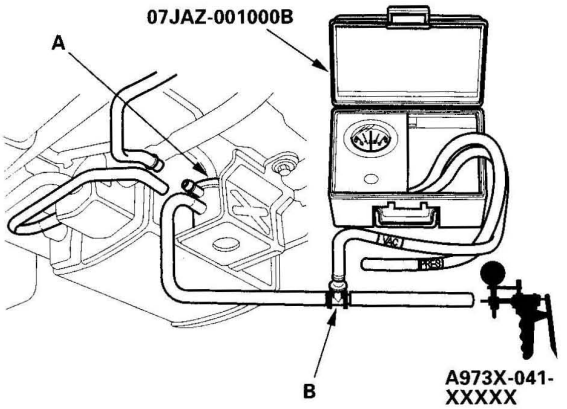
    NO – Replace the EVAP canister, and repeat steps 43 through 46. If the system holds vacuum, the repair is complete. ■

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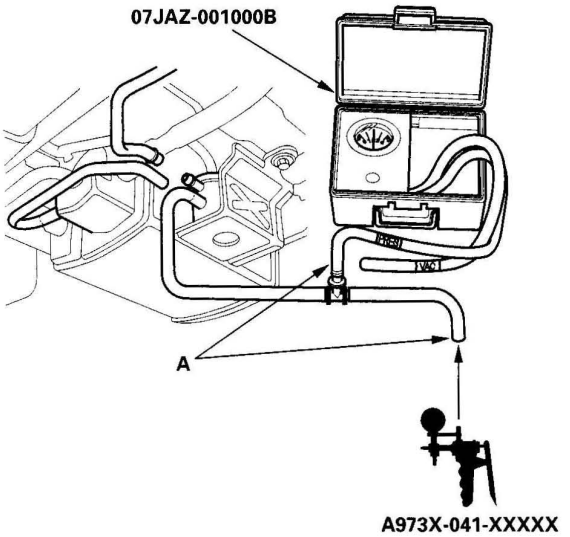
EVAP Two Way Valve Test

Special Tools Required
- Vacuum pump/gauge, 0—30 in.Hg A973X-041-XXXXX
- Vacuum/pressure gauge, 0—4 in.Hg 07JAZ-001000B

1. Remove the fuel fill cap.
2. Disconnect the vapor line from the EVAP two way valve (A). Connect it to a T-fitting (B) from the vacuum gauge and the vacuum pump as shown.



3. Apply vacuum slowly and continuously while watching the gauge. The vacuum should stabilize momentarily at 0.8—2.1 kPa (6—16 mmHg, 0.2—0.6 in.Hg). If the vacuum stabilizes (valve opens) below 0.8 kPa (6 mmHg, 0.2 in.Hg) or above 2.1 kPa (16 mmHg, 0.6 in.Hg), install a new valve and retest.
4. Move the vacuum pump hose from the vacuum fitting to the pressure fitting, and move the vacuum gauge hose from the vacuum side to the pressure side (A) as shown.



5. Slowly pressurize the vapor line while watching the gauge. The pressure should stabilize momentarily above 1.0 kPa (8 mmHg, 0.3 in.Hg).
   - If the pressure momentarily stabilizes (valve opens) above 1.0 kPa (8 mmHg, 0.3 in.Hg), the valve is OK.
   - If the pressure stabilizes below 1.0 kPa (8 mmHg, 0.3 in.Hg), install a new valve and retest.

BACK

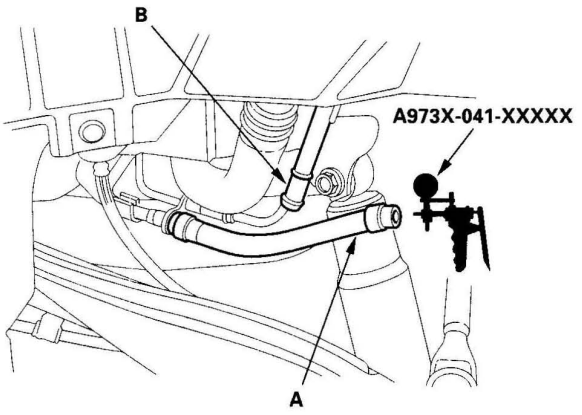
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Fuel Tank Vapor Control Valve Test

Special Tools Required
Vacuum Pump/Gauge, 0—30 in.Hg A973X-041-XXXXX

Float Test

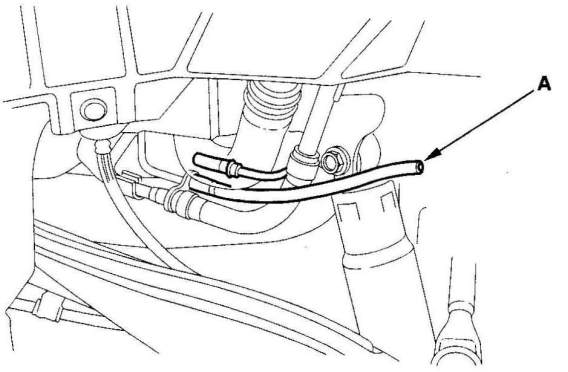
1. Make sure the fuel tank is less than half full.
2. Remove the fuel fill cap to relieve fuel tank pressure, then reinstall the cap.
3. Disconnect the fuel tank vapor recirculation tube (A), and connect a vacuum pump to the vapor recirculation tube.



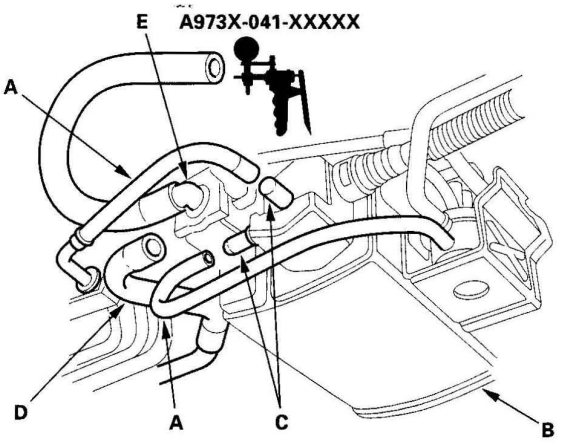
4. Plug the pipe (B).
5. Apply vacuum to the fuel tank vapor recirculation tube (A).
   - If the vacuum holds, replace the fuel tank vapor control valve (see page 11-173).
   - If the vacuum does not hold, the float is OK. Perform the valve test.

Valve Test

1. Make sure the fuel tank is less than half full.
2. Remove the fuel fill cap.
3. Disconnect the fuel tank vapor signal tube (A).



4. Disconnect the vacuum hoses (A) from the EVAP canister (B), then plug the ports with plugs (C).



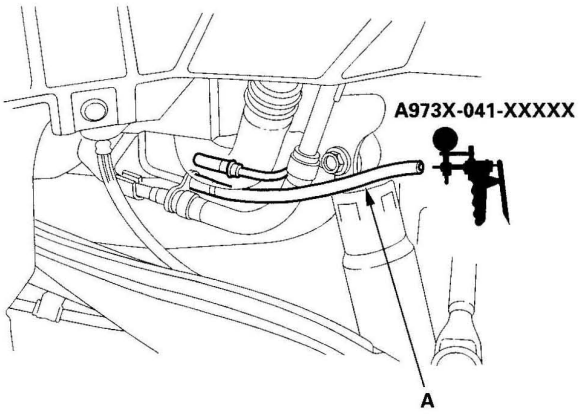
5. Disconnect the vacuum hose (D) from the EVAP canister vent shut valve (E), and connect a vacuum pump to the vacuum hose.
6. Pump the vacuum pump 80 times.
   - If the vacuum holds, go to step 7.
   - If the vacuum does not hold, go to step 10.

(cont'd)

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Fuel Tank Vapor Control Valve Test (cont'd)

7. Connect a second vacuum pump to the fuel tank vapor signal tube (A).



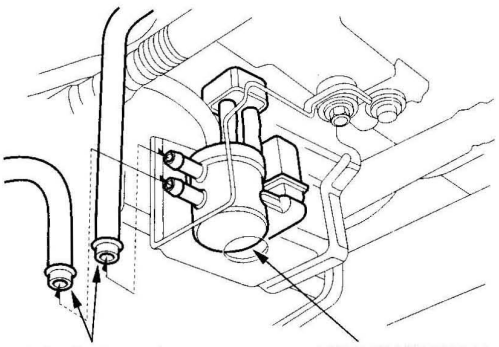
8. Apply vacuum (1 pump) to the fuel tank vapor signal tube (A), then check the vacuum on the pump in step 6.

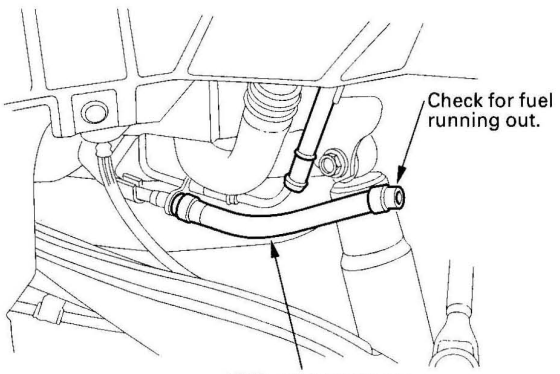
   - If the vacuum holds, replace the fuel tank vapor control valve (see page 11-173).
   - If the vacuum is released, the EVAP canister vent shut valve is OK. Go to step 9.

9. Fill the gas tank with fuel, then check for fuel in the two way valve and fuel tank vapor recirculation hose.

   NOTE: At either location, tiny droplets of fuel are normal.

   - If fuel runs out of the hoses at either location, replace the fuel tank vapor control valve.
   - If the fuel does not run out of the hoses at either location, the fuel tank vapor system function is normal.





10. Disconnect the fuel tank vapor quick disconnect from the EVAP canister, then plug the port on the canister. Reapply vacuum (80 pumps).

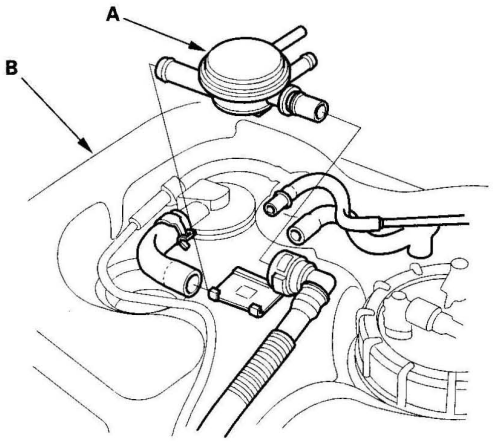
    - If the vacuum holds, replace the EVAP canister vent shut valve (see step 27 on page 11-163).
    - If the vacuum does not hold, inspect the EVAP canister vent shut valve O-ring. If the O-ring is OK, replace the EVAP canister and repeat step 4.

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Fuel Tank Vapor Control Valve Replacement

1. Remove the fuel tank (see page 11-130).
2. Remove the fuel tank vapor control valve (A) from the fuel tank (B).



3. Install the fuel tank vapor control valve.
4. Install the fuel tank (see page 11-130).

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BACK

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Automatic Transmission

Automatic Transmission
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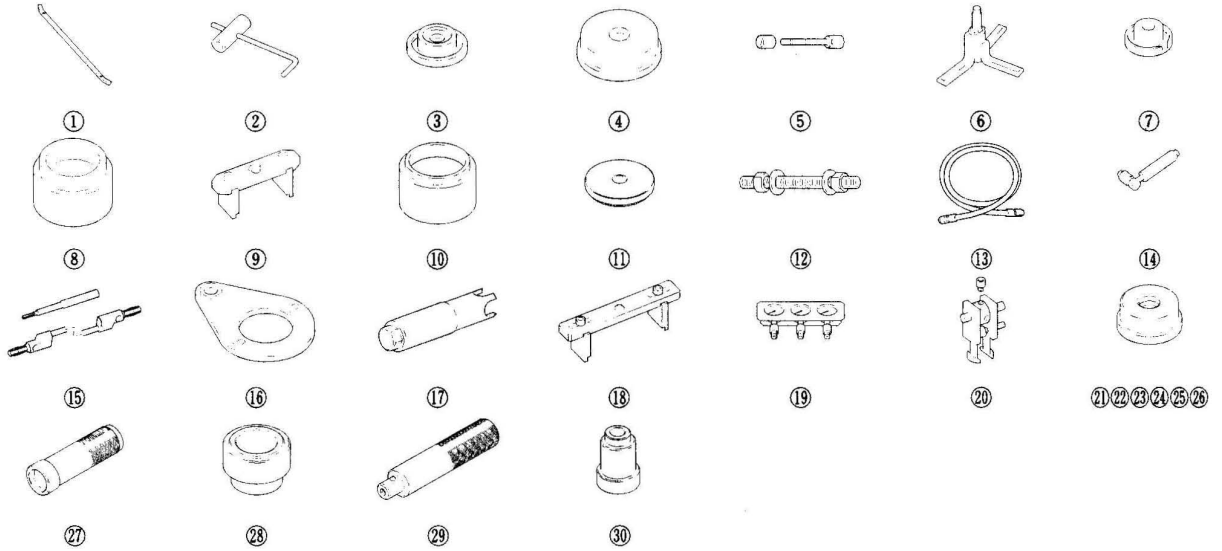
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Special Tools

Ref.No.	Tool Number	Description	Qty
①	07AAK-S3VA00	Engine Hanger Support Bar	1
②	07GAB-PF50101 or 07GAB-PF50100	Mainshaft Holder	1
③	07GAD-PG40100 or 07GAD-PG40101	Seal Driver Attachment	1
④	07GAD-SD40101	Attachment, 78 x 90 mm	1
⑤	07GAE-PG40200 or 07GAE-PG4020A	Clutch Spring Compressor Bolt Assembly	1
*⑥	07HAC-PK40102	Housing Puller	1
⑦	07JAD-PH80101	Oil Seal Driver Attachment	1
⑧	07LAD-PW50601	Attachment, 40 x 50 mm	1
**⑨	07LAE-PX40100	Clutch Spring Compressor Attachment	2
⑩	07MAD-PR90100	Attachment, 45 x 55 mm	1
⑪	07MAF-SP0011A	Tapered Bearing Race Installer	1
⑫	07MAF-SP0013A	Installer Shaft	1
⑬	07MAJ-PY4011A	A/T Pressure Hose, 2,210 mm	4
⑭	07MAJ-PY40120	A/T Pressure Hose Adapter	4
⑮	07SAZ-001000A	Backprobe Set	2
⑯	07XAB-0020100	Companion Flange Holder	1
⑰	07YAJ-S3V0100	Preload Inspection Tool	1
⑱	07ZAE-PRP0100	Clutch Compressor Attachment	1
⑲	07406-0020400 or 07406-0020401	A/T Oil Pressure Gauge Set w/Panel	1
***⑳	07736-A01000B or 07736-A01000A	Adjustable Bearing Puller, 25 — 40 mm	1
㉑	07746-0010300	Attachment, 42 x 47 mm	1
㉒	07746-0010400	Attachment, 52 x 55 mm	1
㉓	07746-0010500	Attachment, 62 x 68 mm	1
㉔	07746-0010600	Attachment, 72 x 75 mm	1
㉕	07746-0010700	Attachment, 24 x 26 mm	1
㉖	07746-0010800	Attachment, 22 x 24 mm	1
㉗	07746-0030100	Driver, 40 mm I.D.	1
㉘	07746-0030400	Attachment, 35 mm I.D.	1
㉙	07749-0010000	Driver	1
㉚	07947-6340500	Driver Attachment	1

* If the top arm is too short, replace it with 07SAC-P0Z01001.
** 07HAE-PL50101 may be used to substitute one of these tools.
*** Must be used with commercially available 3/8''-16 slide hammer.



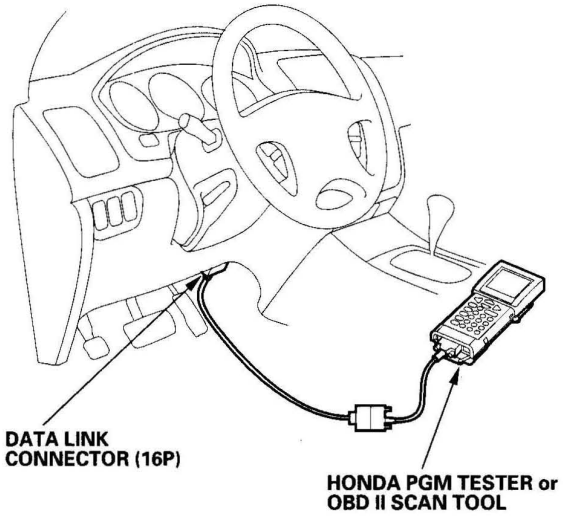
BACK

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General Troubleshooting Information

How to Check for DTCs - Honda PGM Tester/ Scan Tool Method

When the PCM senses an abnormality in the input or output systems, the D5 indicator in the gauge assembly will blink and/or the Malfunction Indicator Lamp (MIL) will come on. When the 16P Data Link Connector (DLC) (located behind the driver's dashboard lower cover) is connected to the OBD II Scan Tool or Honda PGM Tester as shown, it will indicate the Diagnostic Trouble Code (DTC) when the ignition switch is turned ON (II).



If the D5 indicator or MIL has been reported on, or if a driveability problem is suspected, follow this procedure:

1. Connect the OBD II Scan Tool (conforming to SAE J1978) or Honda PGM Tester to the 16P DLC. (See the OBD II Scan Tool or Honda PGM Tester user's manual for specific instructions. If you are using the Honda PGM Tester, make sure it is set to the SAE DTC type.)
2. Turn the ignition switch ON (II), and observe the DTC on the screen.
3. Record all fuel and emissions DTCs, A/T DTCs, and freeze data.
4. If there is a fuel and emissions DTC, first check the fuel and emissions system as indicated by the DTC (except for DTC P0700). DTC P0700 means there is one or more A/T DTC, and no problems were detected in the fuel and emissions circuit of the PCM.
5. Get the customer's radio and navigation system anti-theft codes, and write down the radio station presets.
6. Reset the memory with the PGM Tester or by removing the BACK UP fuse in the passenger's under-dash fuse/relay box for more than 10 seconds.
7. Drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, and then recheck for DTC. If the A/T DTC returns, go to the DTC Troubleshooting Index. If the DTC does not return, there was an intermittent problem within the circuit. Make sure all pins and terminals in the circuit are tight, and then go to step 8.
8. Enter the radio and navigation system codes, reset the preset stations, and set the clock.

(cont'd)

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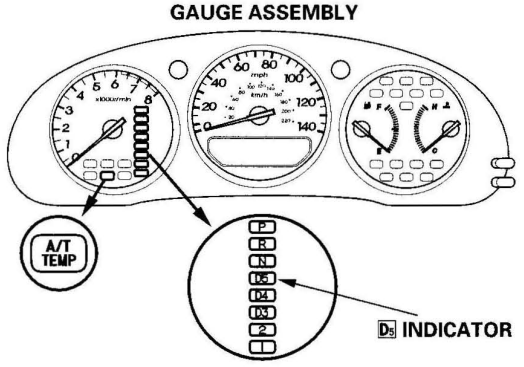
General Troubleshooting Information (cont'd)

How to Check for DTCs - Service Check Signal Method

When the PCM senses an abnormality in the input or output systems, the D5 indicator in the gauge assembly will usually blink and/or the MIL may come on. When the 16P Data Link Connector (DLC) (located behind the driver's dashboard lower cover) is connected to the Honda PGM Tester, the D5 indicator will blink the Diagnostic Trouble Code (DTC) when the ignition switch is turned ON (II).

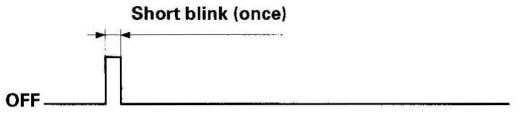
When the D5 indicator has been reported on, connect the Honda PGM Tester to the DLC (16P). Turn the ignition switch ON (II), select Honda Systems, and then the SCS mode, then observe the D5 indicator.

If a PGM Tester is not available, jump DLC terminal 1 (BRN) to terminal 12 (BLK), then turn the ignition switch ON (II) and observe the D5 indicator.

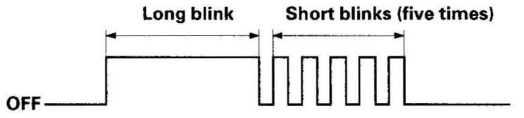


Codes 1 through 9 are indicated by individual short blinks. Code 10 and above are indicated by a series of long and short blinks. One long blink equals 10 short blinks. Add the long and short blinks together to determine the code. After determining the code, refer to the DTC Troubleshooting Index.

Example: DTC 1



Example: DTC 15



If the D5 indicator or the MIL (Malfunction Indicator Lamp) has been reported on, or if a driveability problem is suspected, follow this procedure:

1. Record all fuel and emissions DTCs, A/T DTCs, and freeze data.
2. If there is a fuel and emissions DTC, first check the fuel and emissions system as indicated by the DTC (except for DTC 70). DTC 70 means there is one or more A/T DTC, and no problems were detected in the fuel and emissions circuit of the PCM.
3. Get the customer's radio and navigation system anti-theft codes, and write down the radio station presets.
4. Reset the memory by removing the BACK UP fuse in the passenger's under-dash fuse/relay box for more than 10 seconds.
5. Drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, and then recheck for DTCs. If the A/T DTC returns, go to the DTC Troubleshooting Index. If the DTC does not return, there was an intermittent problem within the circuit. Make sure all pins and terminals in the circuit are tight, then go to step 6.
6. Enter the radio and navigation system codes, reset the preset stations, and set the clock.

BACK

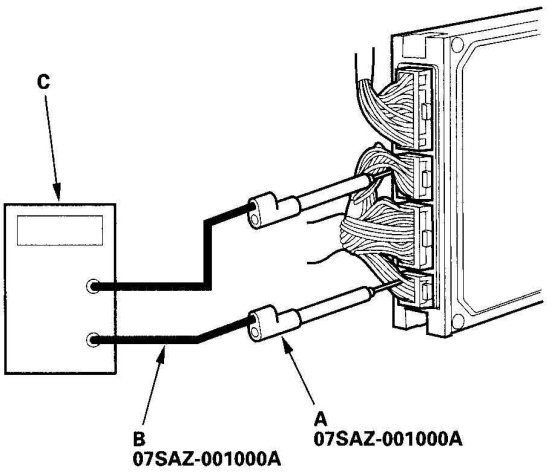
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How to Troubleshoot Circuits at the PCM

Special Tools Required
Backprobe set 07SAZ-001000A (Two required)

SRS components are located in this area. Review the SRS components locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

1. Remove both sides of the center console lower panel.
2. Remove the intake manifold runner control (IMRC) module and the PCM (see page 11-4).
3. Inspect the circuit on the PCM, according to the DTC troubleshooting, with the special tools and digital multimeter.
4. Connect the backprobe adapters (A) to the stacking patch cords (B), and connect the cords to a multimeter (C).



5. Using the wire insulation as a guide for the contoured tip of the backprobe adapter, gently slide the tip into the connector from the wire side until it comes in contact with the terminal end of the wire.

   NOTE: Failure to use the appropriate backprobe tools can cause connector and/or terminal damage.

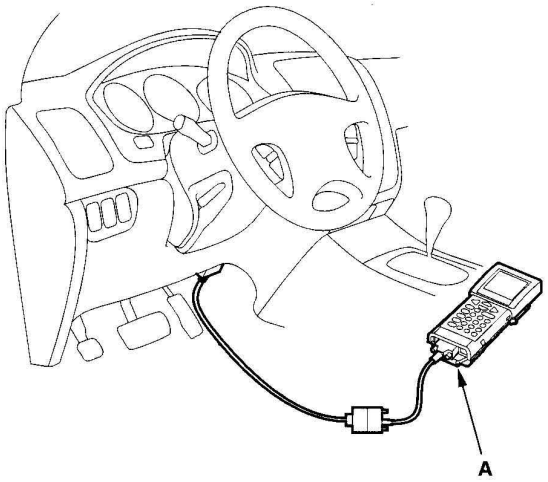
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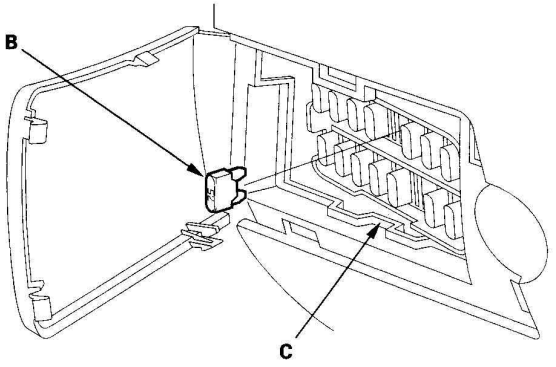
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General Troubleshooting Information (cont'd)

How to Reset Procedures

1. Make sure you have the anti-theft code for the radio and navigation system, then write down the radio station presets.
2. Turn the ignition switch OFF.
3. Use one of these methods to reset the PCM memory:
   - Use the OBD II Scan Tool or the Honda PGM Tester (A).
   - Remove the BACK-UP fuse (7.5A) (B) from the passenger's under-dash fuse/relay box (C) for more than 10 seconds.

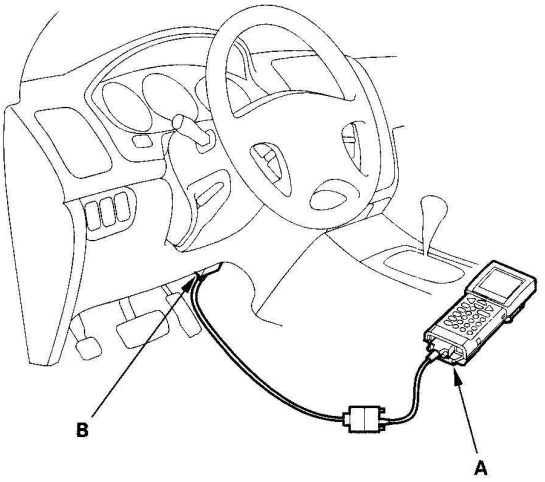




How to End a Troubleshooting Session

This procedure must be done after any troubleshooting.

1. Reset the PCM.
2. Turn the ignition switch OFF.
3. Disconnect the OBD II Scan Tool or the Honda PGM Tester (A) from the Data Link Connector (16P) (B).
4. Turn the ignition switch ON (II).
5. Enter the radio and navigation system codes, reset the preset stations, and set the clock.
6. Verify that the problem is repaired; test-drive the vehicle for several minutes in freeze data conditions at speeds over 30 mph (50km/h).



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DTC Troubleshooting Index

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

DTC*	D5 Indicator	MIL (CHECK)	Detection Item	Page
P0710 (28)	Blinks	OFF	ATF temperature sensor	(see page 14-74)
P0715 (15)	Blinks	ON	Mainshaft speed sensor	(see page 14-76)
P0720 (9)	Blinks	ON	Countershaft speed sensor	(see page 14-79)
P0730 (41)	OFF	ON	Shift control system	(see page 14-82)
P0740 (40)	OFF	ON	Lock-up control system	(see page 14-83)
P0753 (7)	Blinks	ON	Shift solenoid valve A	(see page 14-84)
P0758 (8)	Blinks	ON	Shift solenoid valve B	(see page 14-86)
P0763 (22)	Blinks	ON	Shift solenoid valve C	(see page 14-88)
P0780 (45)	Blinks	ON	Mechanical problem in hydraulic system	(see page 14-90)
P1656 (37)	OFF	OFF	PCM-to-VTM-4 control unit communication circuit	(see page 14-91)
P1705 (5)	Blinks	ON	Transmission range switch (short to ground)	(see page 14-92)
P1706 (6)	OFF	ON	Transmission range switch (open)	(see page 14-95)
P1710 (63)	OFF	OFF	1st-hold switch	(see page 14-98)
P1739 (26)	OFF	OFF	3rd clutch pressure switch	(see page 14-100)
P1740 (27)	OFF	OFF	4th clutch pressure switch	(see page 14-102)
P1750 (46)	Blinks	ON	Mechanical problem in hydraulic system	(see page 14-104)
P1751(47)	Blinks	ON	Mechanical problem in hydraulic system	(see page 14-105)
P1753 (1)	Blinks	ON	Torque converter clutch solenoid valve	(see page 14-106)
P1768 (16)	Blinks	ON	A/T clutch pressure control solenoid valve A	(see page 14-108)
P1773 (23)	Blinks	ON	A/T clutch pressure control solenoid valve B	(see page 14-110)
P1778 (29)	Blinks	ON	A/T clutch pressure control solenoid valve C	(see page 14-112)

*The DTC in parentheses is the flash code the D5 indicator indicates when the Data Link Connector is connected to the Honda PGM Tester, and the Tester is in the SCS mode.

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Symptom Troubleshooting Index

These symptoms DO NOT trigger Diagnostic Trouble Codes (DTCs) or cause the D5 indicator to blink. If the MIL was reported ON or the D5 indicator has been blinking, check for DTCs. But if the vehicle has one of the symptoms in the following chart, check the probable cause(s) for it, in the sequence listed, until you find the problem.

Symptom	Probable cause(s)	Notes
When you turn the ignition switch ON (II), the D5 indicator light comes on and stays on or never comes on at all	A problem in the D5 indicator circuit	Check the D5 indicator circuit (see page 14-172).
Shift lever cannot be moved from the P position while you're pushing on the brake pedal	A problem in the shift lock system of the interlock system	Check the interlock system — shift lock system circuit (see page 14-183).
Ignition key cannot be moved from ACC (I) position to LOCK (0) position while you push it in with the shift lever in the P position	A problem in the key interlock system of the interlock system	Check the interlock system — key interlock system circuit (see page 14-187).
Shift lever cannot pass through the R position from N position	A problem in the reverse lock system of the interlock system	Check the interlock system — reverse lock system circuit (see page 14-185).
When you turn the ignition switch ON (II), the A/T TEMP indicator comes on and stays on or never comes on at all	A problem in the A/T TEMP indicator circuit	Check the A/T TEMP indicator circuit (see page 14-114).

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Symptom	Probable cause(s)	Notes
Engine runs, but vehicle does not move in any gear	1. Low ATF level 2. Shift cable broken or out of adjustment 3. Shift cable worn 4. ATF pump worn or binding 5. Regulator valve stuck or spring worn 6. ATF strainer clogged 7. Mainshaft worn or damaged 8. Final gears worn or damaged 9. Transmission-to-engine assembly error 10. Axle disengaged	• Check the ATF level and check the ATF cooler lines for leakage and loose connections. If necessary, flush the ATF cooler lines. • Check for a loose shift cable at the shift lever and the transmission control shaft. • Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Measure line pressure. • If the strainer is clogged, find the damaged components that caused debris. • Inspect the differential pinion gears for wear. If the differential pinion gears are worn, replace the differential assembly, replace the ATF strainer, thoroughly clean the transmission, and flush the cooler and lines. Replace the torque converter. • Be careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the main valve body. This will result in ATF pump seizure if not detected. Use the proper tools. • Install the main seal flush with the torque converter housing. If you push it into the torque converter housing until it bottoms out, it will block the fluid return passage and result in damage.
Vehicle moves in R, but not in D5, D4, D3, 2, or 1 position	1. 1st accumulator defective 2. 1st clutch defective	• Inspect 1st clutch pressure. • Inspect the secondary shaft and 1st/1st-hold/2nd clutch assembly for wear and damage. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Vehicle moves in 2 and R, but not in the D5, D4, D3, or 1 position	1. 1st gear one-way clutch defective 2. 1st gears worn or damaged 3. 1st clutch defective	• Inspect 1st clutch pressure. • Inspect the secondary shaft and 1st/1st-hold/2nd clutch assembly for wear and damage. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.

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Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Vehicle moves in D5, D4, D3, 2, and R, but not in the 1 position	1. 1st-hold accumulator defective 2. 1st-hold clutch defective	• Inspect 1st-hold clutch pressure. • Inspect the secondary shaft and 1st/1st-hold/2nd clutch assembly for wear and damage. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Vehicle moves in D5, D4, D3, 1, R, but not in the 2 position	1. 2nd accumulator defective 2. 2nd gears worn or damaged 3. 2nd clutch defective	• Inspect the secondary shaft and 1st/1st-hold/2nd clutch assembly for wear and damage. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Vehicle moves in D5, D4, D3, 2, 1, but not in the R position (or moves forward in the R position)	1. Shift fork shaft stuck 2. Modulator valve defective 3. Reverse CPC valve defective 4. 5th accumulator defective 5. 5th clutch defective 6. Reverse gears worn or damaged	• Measure line pressure and 5th clutch pressure. • Check for a missing shift fork bolt on the shift fork shaft. • If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, and no cause for the contamination is found, replace the torque converter. • Inspect the reverse selector gear teeth chamfers, and inspect the engagement teeth chamfers of the countershaft 5th and reverse gear. Replace the reverse gears and the reverse selector if they are worn or damaged. If the transmission makes clicking, grinding, or whirring noises, also replace the mainshaft 5th gear, reverse idler gear, and countershaft 5th gear. • If the 5th clutch feed pipe guide in the end cover is scored by the mainshaft, inspect the ball bearing for excessive movement in the transmission housing. If the ball bearing is OK, replace the end cover as it is dented. The O-ring under the guide is probably worn. • Replace the mainshaft if the bushing for the 4th and 5th clutch feed pipes are loose or damaged. If the 5th clutch feed pipe is damaged or out of round, replace the end cover. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clearance with the clutch end plate.

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Symptom	Probable cause(s)	Notes
Poor acceleration; flares on starting off in the D5, D4, and D3 positions: Stall speed high in the D5, D4, D3, 2, and 1 positions	1. Low ATF level 2. Shift cable broken or out of adjustment 3. ATF pump worn or binding 4. Regulator valve stuck or spring worn 5. ATF strainer clogged 6. Torque converter check valve defective	• Check ATF level and check ATF cooler lines for leakage and loose connections. If necessary, flush ATF cooler lines. • Check for a loose shift cable at the shift lever and the transmission control shaft. • Check line pressure. • Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptom is mostly an rpm-ticking noise or a high pitched squeak. • Be careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the main valve body. This will result in ATF pump seizure if not detected. Use the proper tools.
Poor acceleration; flares on starting off in the D5, D4, and D3 positions: Stall speed high in the 2 position	2nd clutch defective	• Check 2nd clutch pressure. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Poor acceleration; flares on starting off in the R position: Stall speed high in the R position	1. Shift cable broken or out of adjustment 2. 5th clutch defective	• Check for a loose shift cable at the shift lever and the transmission control shaft. • Check 5th clutch pressure. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.

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Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Poor acceleration; flares on starting off in the D5, D4, and D3 positions: Stall speed low	1. Torque converter clutch solenoid valve defective 2. Torque converter one-way clutch defective 3. Engine output low 4. Lock-up clutch piston defective 5. Lock-up shift valve defective 6. Restricted ATF cooler	• Check the ATF cooling system for restriction. • Check for a stuck lock-up valve in the valve body.
Engine idle vibration	1. Low ATF level 2. Torque converter clutch solenoid valve defective 3. Drive plate defective or transmission misassembled 4. Engine output low 5. Lock-up clutch piston defective 6. ATF pump worn or binding 7. Lock-up shift valve defective 8. Restricted ATF cooler	• Set the idle rpm in gear to the specified idle speed. If it still is not good, adjust the engine and transmission mounts as outlined in the engine section of this service manual. • Check the ATF level and check the ATF cooler lines for leakage and loose connections. If necessary, flush the ATF cooler lines. • Check the ATF cooling system for restriction.
Vehicle moves in the N position	1. Excessive ATF 2. Foreign material in separator plate orifice 3. Relief valve defective 4. 1st-hold clutch defective 5. 1st clutch defective 6. 2nd clutch defective 7. 3rd clutch defective 8. 4th clutch defective 9. 5th clutch defective 10. Clutch end plate clearance incorrect 11. Needle bearing seized up, worn, or damaged 12. Thrust washer seized up, worn, or damaged	• Check the ATF level, and drain the ATF if necessary. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance. • Check for clutch pressure in neutral.

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Symptom	Probable cause(s)	Notes
Late shift from the N position to the D5, D4, and D3 positions	1. Shift solenoid valve C defective 2. A/T clutch pressure control solenoid valves A and B defective 3. A/T clutch pressure control solenoid valve C defective 4. Shift cable broken or out of adjustment 5. Joint in shift cable and transmission or body worn 6. Mainshaft speed sensor defective 7. Countershaft speed sensor defective 8. ATF temperature sensor defective 9. CPC valve C stuck 10. Foreign material in separator plate orifice 11. Shift valve C defective 12. Shift valve E defective 13. Servo control valve defective 14. 1st accumulator defective 15. 1st check ball stuck 16. 1st clutch defective	• Check the D5 indicator indication, and check for loose connectors. Inspect the O-ring, and check the shift solenoid valve for seizure. • Inspect the A/T clutch pressure control solenoid valve body gasket and ATF feed pipes for wear and damage. If the A/T clutch pressure control solenoid valve is stuck, inspect the CPC valves. • Check for a loose shift cable at the shift lever and the transmission control shaft. • If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, and no cause for the contamination is found, replace the torque converter. • Check 1st clutch pressure. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Late shift from the N position to the R position	1. Shift solenoid valve C defective 2. A/T clutch pressure control solenoid valves A and B defective 3. A/T clutch pressure control solenoid valve C defective 4. Shift cable broken or out of adjustment 5. Joint in shift cable and transmission or body worn 6. Mainshaft speed sensor defective 7. Countershaft speed sensor defective 8. ATF temperature sensor defective 9. Shift fork shaft stuck 10. CPC valve C stuck 11. Reverse CPC valve defective 12. Foreign material in separator plate orifice 13. Shift valve E defective 14. 5th accumulator defective 15. 5th clutch defective	• Check the D5 indicator indication, and check for loose connectors. Inspect the O-ring, and check the shift solenoid valve assembly for seizure. • Inspect the A/T clutch pressure control solenoid valve body gasket and ATF feed pipes for wear and damage. If the A/T clutch pressure control solenoid valve is stuck, inspect the CPC valves. • Check for a loose shift cable at the shift lever and the transmission control shaft. • If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, and no cause for the contamination is found, replace the torque converter. • Check 5th clutch pressure. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.

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Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
No shift	1. Mainshaft speed sensor defective 2. Countershaft speed sensor defective 3. Modulator valve defective	• Check the D5 indicator indication, and check for loose connectors. • Measure line pressure.
Erratic shifting gears: Fails to shift in the D5, D4, and D3 positions; starts off in 5th. Fails to shift in the 2 position; starts off in 4th	1. Shift solenoid valve B defective 2. Shift valve B defective	Check the D5 indicator indication, and check for loose connectors. Inspect the O-ring, and check the shift solenoid valve for seizure.
Erratic shifting gears: Fails to shift in the D5, D4, D3, and 1 positions; starts off in 3rd	1. Shift solenoid valve A defective 2. Shift valve A defective	Check the D5 indicator indication, and check for loose connectors. Inspect the O-ring, and check the shift solenoid valve for seizure.
Excessive shock, or flares on all upshifts and downshifts	1. A/T clutch pressure control solenoid valves A and B defective 2. Mainshaft speed sensor defective 3. Countershaft speed sensor defective 4. ATF temperature sensor defective 5. CPC valve A defective 6. Foreign material in separator plate orifice	Check the D5 indicator indication, and check for loose connectors. Inspect the A/T clutch pressure control solenoid valve body gasket and ATF feed pipes for wear and damage. If the A/T clutch pressure control solenoid valve is stuck, inspect the CPC valves. Inspect the sensor O-rings.
Excessive shock, or flares on 1-2 upshift or 2-1 downshift	1. Foreign material in separator plate orifice 2. 2nd accumulator defective 3. 2nd check ball stuck 4. 2nd clutch defective	• Check 1st and 2nd clutch pressures. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.

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Symptom	Probable cause(s)	Notes
Excessive shock, or flares on 2-3 upshift or 3-2 downshift	1. Shift solenoid valve C defective 2. A/T clutch pressure control solenoid valves A and B defective 3. 3rd clutch pressure switch defective 4. CPC valve B defective 5. Foreign material in separator plate orifice 6. Shift valve C defective 7. 2nd accumulator defective 8. 3rd accumulator defective 9. 2nd check ball stuck 10. 2nd clutch defective 11. 3rd clutch defective	• Check the D5 indicator indication, and check for loose connectors. Inspect the O-rings, and check the shift solenoid valve for seizure. • Check for clogged orifice in the clutch pressure switch connector. If the orifice is clogged, remove it and clean the connector. • Check 2nd and 3rd clutch pressures. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Excessive shock, or flares on 3-4 upshift or 4-3 downshift	1. Shift solenoid valve C defective 2. A/T clutch pressure control solenoid valves A and B defective 3. 4th clutch pressure switch defective 4. CPC valve B defective 5. Foreign material in separator plate orifice 6. Shift valve C defective 7. 3rd accumulator defective 8. 4th accumulator defective 9. 3rd clutch defective 10. 4th clutch defective	• Check the D5 indicator indication, and check for loose connectors. Inspect the O-rings, and check the shift solenoid valve for seizure. • Check for clogged orifice in the clutch pressure switch connector. If the orifice is clogged, remove it and clean the connector. • Check 3rd and 4th clutch pressures. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Excessive shock, or flares on 4-5 upshift or 5-4 downshift	1. Shift solenoid valve C defective 2. A/T clutch pressure control solenoid valves A and B defective 3. A/T clutch pressure control solenoid valve C defective 4. CPC valve B defective 5. CPC valve C defective 6. Foreign material in separator plate orifice 7. Shift valve C defective 8. Shift valve E defective 9. Kick-down valve or kick-down short valve defective 10. 4th accumulator defective 11. 5th accumulator defective 12. 4th clutch defective 13. 5th clutch defective	• Check the D5 indicator indication, and check for loose connectors. Inspect the O-rings, and check the shift solenoid valve for seizure. • Check 4th and 5th clutch pressures. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.

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Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Noise from transmission in all shift lever positions	1. ATF pump worn or binding 2. Torque converter housing or transmission housing bearing worn or damaged	• Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Inspect the contact of the countershaft and secondary shaft with the bearings. Check the ATF guide plates for damage and wear. Inspect the 1st clutch feed pipe for damage and out of round. If the 1st clutch feed pipe is damaged or out of round, replace it. Replace the secondary shaft if the bushing for the 1st clutch feed pipe is damaged or out of round.
Vehicle does not accelerate more than 31 mph (50 km/h)	Torque converter one-way clutch defective	Replace torque converter.
Vibration in all shift lever positions	Drive plate defective or transmission misassembled	• Set the idle rpm in gear to the specified idle speed. If it still is not good, adjust the engine and transmission mounts as described in the engine section of this service manual. • Check the stall speed.
Shift lever does not operate smoothly	1. Transmission range switch defective or out of adjustment 2. Shift cable broken or out of adjustment 3. Joint in shift cable and transmission or body worn	• Check the D5 indicator indication, and check for loose connectors. Inspect the transmission range switch. If the transmission range switch is faulty, replace it. If the transmission range switch is out of adjustment, adjust it and the shift cable. • Check for a loose shift cable at the shift lever and the transmission control shaft.
Transmission does not shift into the P position	1. Shift cable broken or out of adjustment 2. Joint in shift cable and transmission or body worn 3. Park mechanism defective	• Check for a loose shift cable at the shift lever and the transmission control shaft. • Check the park pawl spring and the park lever spring installation. If installation is incorrect, install the spring correctly. Make sure that the park lever stop is not installed upside down. Check the distance between the park pawl and the park lever roller pin. If the distance is out of tolerance, adjust the distance with the park lever stop.
Lock-up clutch does not disengage	1. Torque converter clutch solenoid valve defective 2. A/T clutch pressure control solenoid valve C defective 3. Lock-up clutch piston defective 4. Lock-up shift valve defective 5. Lock-up control valve defective 6. Lock-up timing valve defective 7. Restricted ATF cooler	• Check the D5 indicator indication, and check for loose connectors. Inspect the A/T clutch pressure control solenoid valve C body gasket for wear and damage. If the A/T clutch pressure control solenoid valve C is stuck, inspect the CPC valves. • Check the ATF cooling system for restriction.

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Symptom	Probable cause(s)	Notes
Lock-up clutch does not operate smoothly	1. Torque converter clutch solenoid valve defective 2. A/T clutch pressure control solenoid valve C defective 3. Lock-up clutch piston defective 4. Torque converter check valve defective 5. Lock-up shift valve defective 6. Lock-up control valve defective 7. Lock-up timing valve defective 8. Non-Honda ATF used	• Check the D5 indicator indication, and check for loose connectors. Inspect the A/T clutch pressure control solenoid valve C body gasket for wear and damage. If the A/T clutch pressure control solenoid valve C is stuck, inspect the CPC valves. • Center all engine mounts.
Lock-up clutch does not engage	1. Torque converter clutch solenoid valve defective 2. A/T clutch pressure control solenoid valve C defective 3. Mainshaft speed sensor defective 4. Countershaft speed sensor defective 5. Lock-up clutch piston defective 6. Torque converter check valve defective 7. Lock-up shift valve defective 8. Lock-up control valve defective	Check the D5 indicator indication, and check for loose connectors. Inspect the A/T clutch pressure control solenoid valve C body gasket for wear and damage. If the A/T clutch pressure control solenoid valve C is stuck, inspect the CPC valves.
A/T gear position indicator does not indicate shift lever positions	1. Transmission range switch defective or out of adjustment 2. Shift cable broken or out of adjustment 3. Joint in shift cable and transmission or body worn	• Check the D5 indicator indication, and check for loose connectors. Inspect the transmission range switch. If the transmission range switch is faulty, replace it. If the transmission range switch is out of adjustment, adjust it and the shift cable. • Check for a loose shift cable at the shift lever and the transmission control shaft.
Speedometer and odometer do not operate	Countershaft speed sensor defective	Check the D5 indicator indication, and check for loose connectors.
Engine does not rev up to high speed, and the transmission shifts up during low-rev condition (Engine at normal operating temperature.)	VTEC rocker arms defective	Check the engine rocker arms as described in the engine section of this service manual.

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System Description

General Operation

The automatic transmission is a combination of a 3-element torque converter and triple-shaft electronically controlled unit which provides 5 speeds forward and 1 reverse. The entire unit is positioned in line with the engine.

Torque Converter, Gears, and Clutches

The torque converter consists of a pump, turbine, and stator assembly in a single unit. They are connected to the engine crankshaft so they turn together as the engine turns. Around the outside of the torque converter is a ring gear which meshes with the starter pinion when the engine is being started. The entire torque converter assembly serves as a flywheel, transmitting power to the transmission mainshaft. The transmission has three parallel shafts: the mainshaft, the countershaft, and the secondary shaft. The mainshaft is in line with the engine crankshaft. The mainshaft includes the 4th and 5th clutches, and gears for 3rd, 4th, 5th, and reverse (reverse gear is integral with the 5th gear). The countershaft includes the 3rd clutch, and gears for the final drive, 1st, 4th, 5th, reverse, 2nd, park, and 3rd (the final drive gear is integral with the countershaft). The secondary shaft includes the 1st, 1st-hold and 2nd clutches, and gears for 1st, 2nd, and idler. The countershaft 5th gear and the countershaft reverse gear can be locked to the countershaft at its center, providing 5th gear or reverse, depending with which way the selector is moved. The gears on the mainshaft and the secondary shaft are in constant mesh with those on the countershaft. When certain combinations of gears in the transmission are engaged by the clutches, power is transmitted from the mainshaft and the secondary shaft to the countershaft to provide D5, D4, D3, 2, 1, and R positions.

Electronic Control

The electronic control system consists of the powertrain control module (PCM), sensors, and seven solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions. The PCM is located below the dashboard, under the front lower panel behind the center console.

Hydraulic Control

The valve bodies include the main valve body, the regulator valve body, the servo body, and the accumulator body. They are bolted to the torque converter housing. The main valve body contains the manual valve, the modulator valve, the shift valve C, the shift valve D, the kick-down valve, the servo control valve, the torque converter check valve, the reverse CPC valve, the lock-up shift valve, the relief valve, the cooler check valve, and the ATF pump gears. The regulator valve body contains the regulator valve, the lock-up timing valve, and the lock-up control valve. The servo body contains the servo valve, the shift valve A, the shift valve B, the CPC valves A and B. The top accumulator body contains shift valve E, CPC valve C, 1st-hold accmulator piston, 4th accumulator piston, and 5th accumulator piston. The accumulator body contains the 1st and 2nd accumulators and lubrication check valve. Fluid from the regulator passes through the manual valve to the various control valves. The 1st/1st-hold, 3rd, 4th, and 5th clutches receive fluid from their respective feed pipes, and the 2nd clutch receives fluid from the internal hydraulic circuit.

Shift Control Mechanism

The PCM controls shift solenoid valve assemblies A, B, and C, and automatic transaxle (A/T) clutch pressure control solenoid valve assembly A and B, while receiving input signals from various sensors and switches located throughout the vehicle. The shift solenoid valves shift the positions of the shift valves to switch the port leading hydraulic pressure to the clutch. The A/T clutch pressure control solenoid valves A and B control the CPC valves A and B to shift smoothly between lower gear and higher gear. This pressurizes a line to one of the clutches, engaging the clutch and its corresponding gear.

Lock-up Mechanism

In the D5 position (2nd, 3rd, 4th, and 5th), in the D4 position (2nd, 3rd, and 4th) and D3 position (2nd and 3rd), pressurized fluid is drained from the back of the torque converter through a fluid passage, causing the lock-up piston to be held against the torque converter cover. As this takes place, the mainshaft rotates at the same speed as the engine crankshaft. Together with hydraulic control, the PCM optimizes the timing of the lock-up mechanism. When the torque converter clutch solenoid valve activates, modulator pressure changes to switch lock-up on and off. The lock-up control valve and the lock-up timing valve control the range of lock-up according to A/T clutch pressure control solenoid valve C. The torque converter clutch solenoid valve is mounted on the torque converter housing, and A/T clutch pressure control solenoid valve C is mounted on the transmission housing. They are all controlled by the PCM.

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Gear Selection
The shift lever has eight positions: [P] PARK, [R] REVERSE, [N] NEUTRAL, [D5] 1st through 5th gear ranges, [D4] 1st through 4th gear ranges, [D3] 1st through 3rd gear ranges, [2] 2nd gear, and [1] 1st gear.

Position	Description
[P] PARK	Front wheels locked; park pawl engaged with park gear on countershaft. All clutches are released.
[R] REVERSE	Reverse; reverse selector engaged with countershaft reverse gear and 5th clutch locked.
[N] NEUTRAL	All clutches are released.
[D5] DRIVE (1st through 5th)	General driving; starts off in 1st, shifts automatically to 2nd, 3rd, 4th, then 5th, depending on vehicle speed and throttle position. Downshifts through 4th, 3rd, 2nd, and 1st on deceleration to stop. The lock-up mechanism operates in 2nd, 3rd, 4th, and 5th gear.
[D4] DRIVE (1st through 4th)	General driving; starts off in 1st, shifts automatically to 2nd, 3rd, then 4th, depending on vehicle speed and throttle position. Downshifts through 3rd, 2nd, and 1st on deceleration to stop. The lock-up mechanism operates in 2nd, 3rd, and 4th gear.
[D3] DRIVE (1st through 3rd)	Used for rapid acceleration at highway speeds and general driving; up-hill and down-hill driving; starts off in 1st, shifts automatically to 2nd, then 3rd, depending on vehicle speed and throttle position. Downshifts through 2nd to 1st on deceleration to stop. The lock-up mechanism operates in 2nd and 3rd gear.
[2] SECOND	Used for engine braking or better traction starting off on loose or slippery surfaces; stays in 2nd gear; does not shift up or down.
[1] FIRST	Used for engine braking; stays in 1st gear; does not shift up.

Starting is possible only in the [P] and [N] positions because of a slide-type neutral-safety switch.

Automatic Transaxle (A/T) Gear Position Indicator
The A/T gear position indicator in the instrument panel shows which gear has been selected without having to look down at the console.

Transfer Mechanism
The transfer mechanism consists of the transfer drive gear on the differential, the transfer driven gear shaft in the transmission, the transfer drive gear (hypoid gear), the transfer shaft, the transfer driven gear shaft (hypoid gear), and the companion flange. The transfer mechanism assembly is on the rear side of the transmission, beside the differential. The transfer drive gear on the differential drives the transfer driven gear shaft in the transmission. The transfer driven gear shaft in the transmission is connected to the transfer drive gear (hypoid gear) by splines. Power is transmitted from the transfer drive gear on the differential to the rear differential via the transfer and the propeller shaft.

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System Description (cont'd)

Clutches

The five-speed automatic transmission uses hydraulically-actuated clutches to engage or disengage the transmission gears. When hydraulic pressure is introduced into the clutch drum, the clutch piston moves. This presses the friction discs and steel plates together, locking them so they don't slip. Power is then transmitted through the engaged clutch pack to its hub-mounted gear. Likewise, when the hydraulic pressure is bled from the clutch pack, the piston releases the friction discs and the steel plates, and they are free to slide past each other. This allows the gear to spin independently on its shaft, transmitting no power.

1st Clutch
The 1st clutch engages/disengages 1st gear, and is located at the middle of the secondary shaft. The 1st clutch is joined back-to-back to the 2nd clutch. The 1st clutch is supplied hydraulic pressure by its ATF feed pipe within the secondary shaft.

1st-hold Clutch
The 1st-hold clutch engages/disengages 1st-hold or 1 position, and is located in the 1st clutch drum. The 1st-hold clutch is supplied hydraulic pressure through the orifice inside the secondary shaft by a circuit connected to the internal hydraulic circuit.

2nd Clutch
The 2nd clutch engages/disengages 2nd gear, and is located at the middle of the secondary shaft. The 2nd clutch is joined back-to-back to the 1st clutch. The 2nd clutch is supplied hydraulic pressure through the secondary shaft by a circuit connected to the internal hydraulic circuit.

3rd Clutch
The 3rd clutch engages/disengages 3rd gear, and is located at the end of the countershaft, just behind the end cover. The 3rd clutch is supplied hydraulic pressure by its ATF feed pipe in the countershaft.

4th Clutch
The 4th clutch engages/disengages 4th gear, and is located at the middle of the mainshaft. The 4th clutch is joined back-to-back to the 5th clutch. The 4th clutch is supplied hydraulic pressure by its ATF feed pipe within the mainshaft.

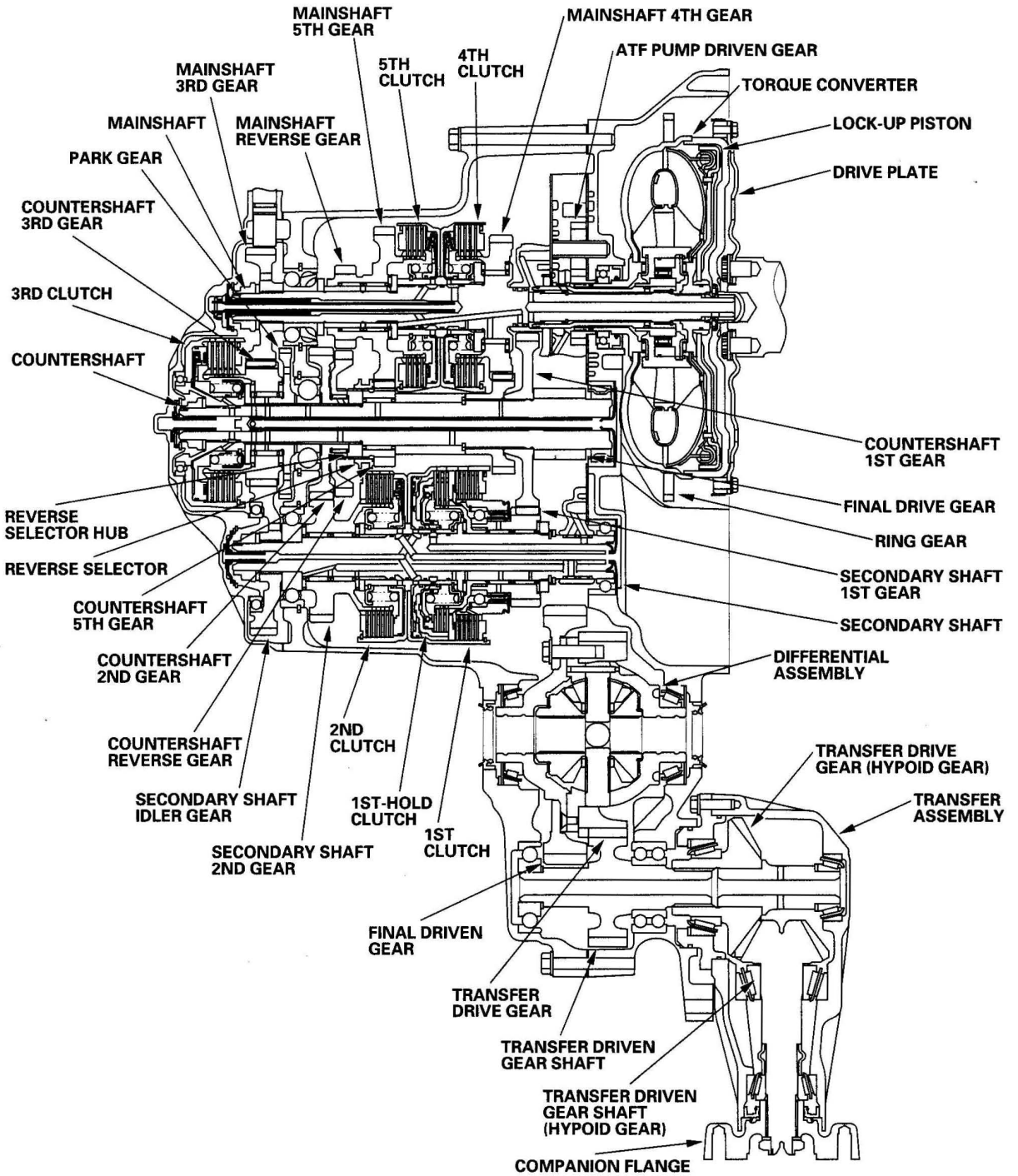
5th Clutch
The 5th clutch engages/disengages 5th gear, as well as reverse gear, and is located at the middle of the mainshaft. The 5th clutch is joined back-to-back to the 4th clutch. The 5th clutch is supplied hydraulic pressure by its ATF feed pipe within the mainshaft.

One-way Clutch
The one-way clutch is positioned between the 1st clutch hub and the secondary shaft 1st gear. The secondary shaft 1st gear is splined to the 1st-hold clutch hub, with the 1st-hold clutch hub splined to the secondary shaft. The secondary shaft 1st gear provides the outer race surface, and the 1st clutch hub provides the inner race surface. The one-way clutch locks when power is transmitted from the secondary shaft 1st gear to the countershaft 1st gear. The 1st clutch and gears remain engaged in the 1st, 2nd, 3rd, 4th, and 5th gear ranges in the D5, D4, D3, or 2 position.
However, the one-way clutch disengages when the 2nd, 3rd, 4th, or 5th clutches and gears are applied in the D5, D4, D3, or 2 position. This is because the increased rotational speed of the gears on the secondary shaft overrides the locking "speed range" of the one-way clutch. Thereafter, the one-way clutch free-wheels with the 1st clutch still engaged.

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Transmission Sectional View



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System Description (cont'd)

Power Flow

Gear operation

Gears on the mainshaft:

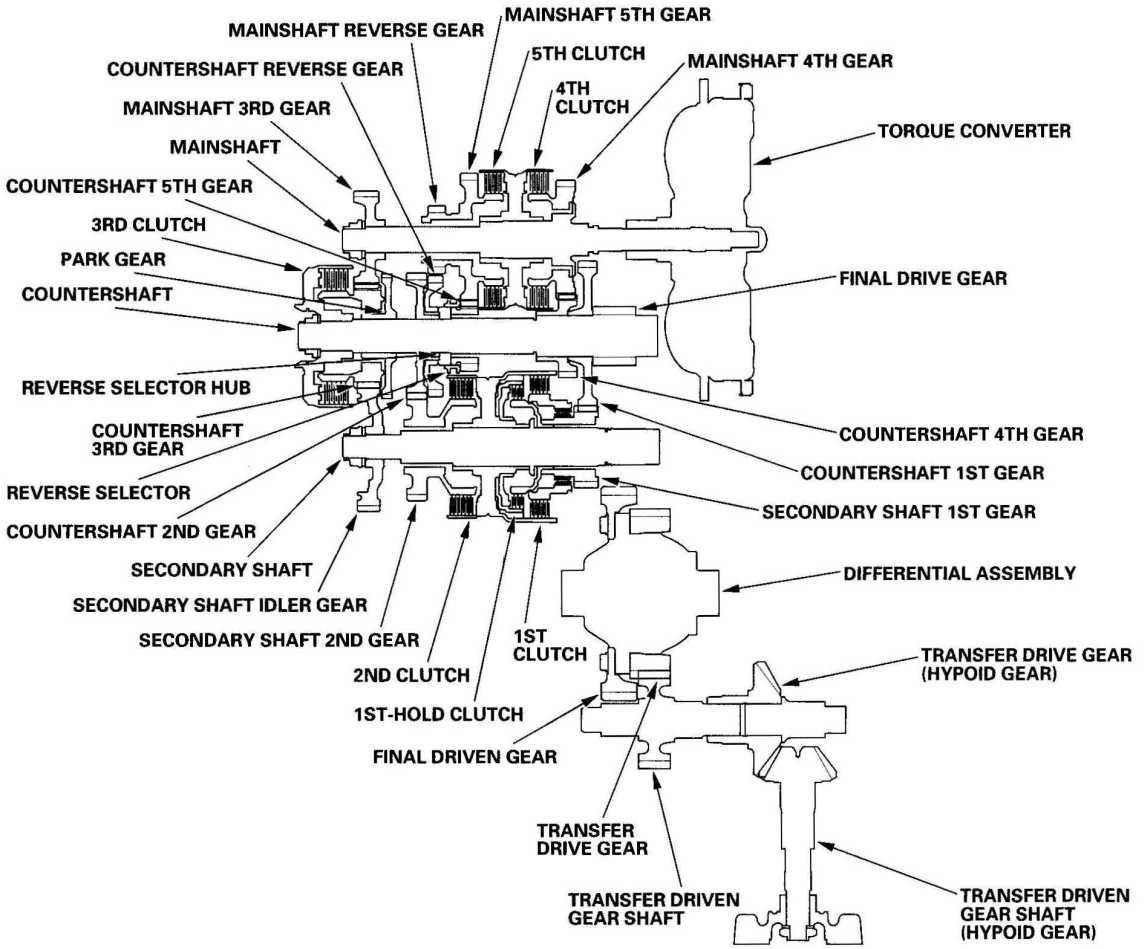
- 4th gear is engaged/disengaged with the mainshaft by the 4th clutch.
- 5th gear is engaged/disengaged with the mainshaft by the 5th clutch.
- Reverse gear is engaged/disengaged with the mainshaft by the 5th clutch.
- 3rd gear is splined with the mainshaft and rotates with the mainshaft.

Gears on the countershaft:

- Final gear is integral with the countershaft.
- 1st gear, 4th gear, 2nd gear, and park gear are splined with the countershaft, and rotate with the countershaft.
- 5th gear and reverse gear rotate freely from the countershaft. The reverse selector engages 5th gear and reverse gear with the reverse selector hub. The reverse selector hub is splined to the countershaft so 5th gear and reverse gear engage with the countershaft.
- Countershaft 3rd gear is engaged/disengaged with the countershaft by the 3rd clutch.

Gears on the secondary shaft:

- 1st gear is engaged/disengaged with the secondary shaft by the 1st clutch. 1st gear is engaged with the secondary shaft by the one-way clutch and the 1st-hold clutch when decelerating for engine braking.
- 2nd gear is engaged/disengaged with the secondary shaft by the 2nd clutch.
- The idler gear is splined with the secondary shaft, and rotates with the secondary shaft.

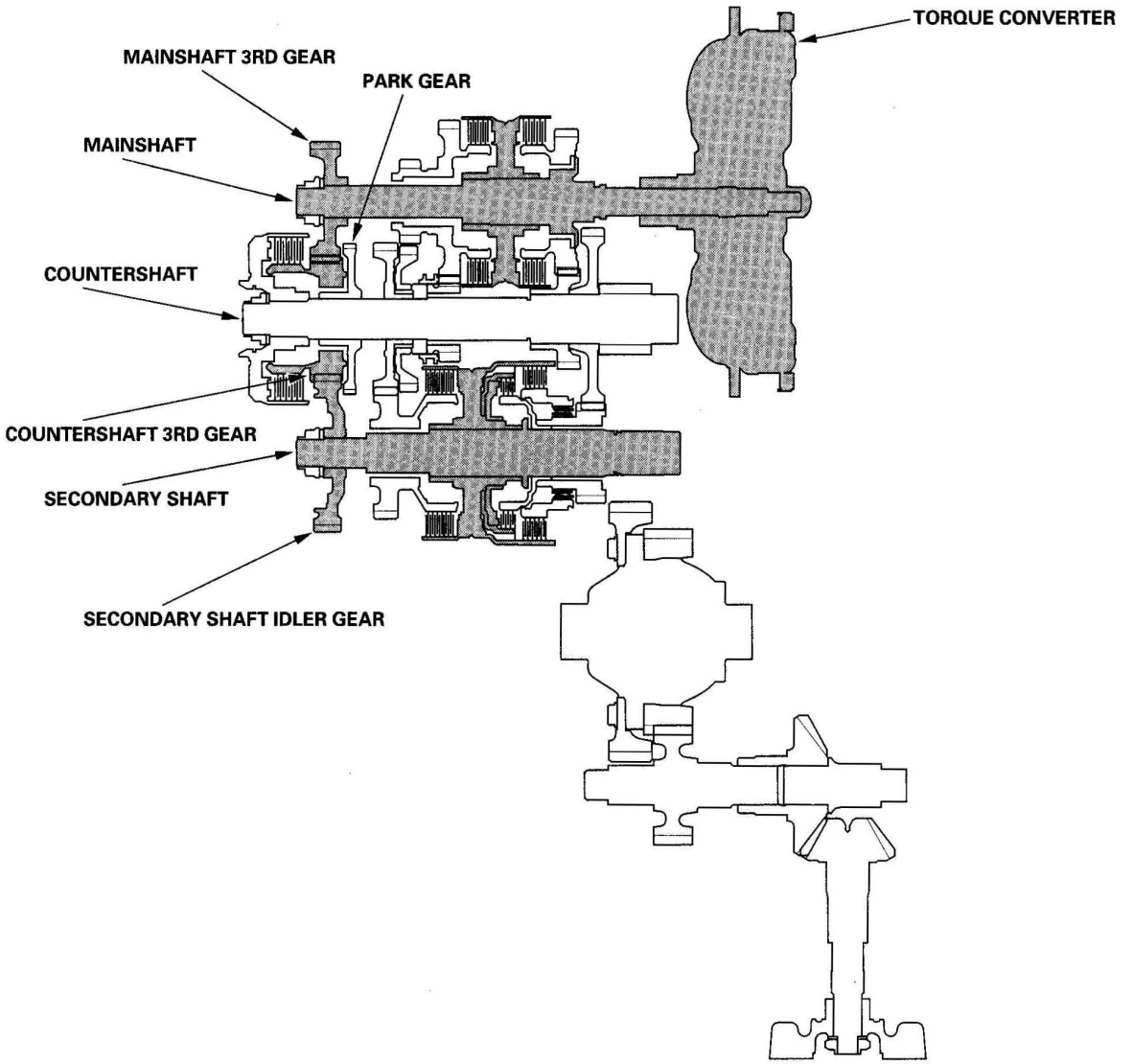


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P Position
Hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft. The countershaft is locked by the park pawl interlocking the park gear.

N Position
Engine power transmitted from the torque converter drives the mainshaft 3rd gear, the countershaft 3rd gear, and the secondary shaft idler gear, but hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft. The countershaft 5th gear is engaged with the reverse selector hub and the countershaft by the reverse selector, when the shift lever is shifted in the N position from the forward range (D5, D4, D3, 2, 1 positions). The countershaft reverse gear is engaged when shifted from the R position.



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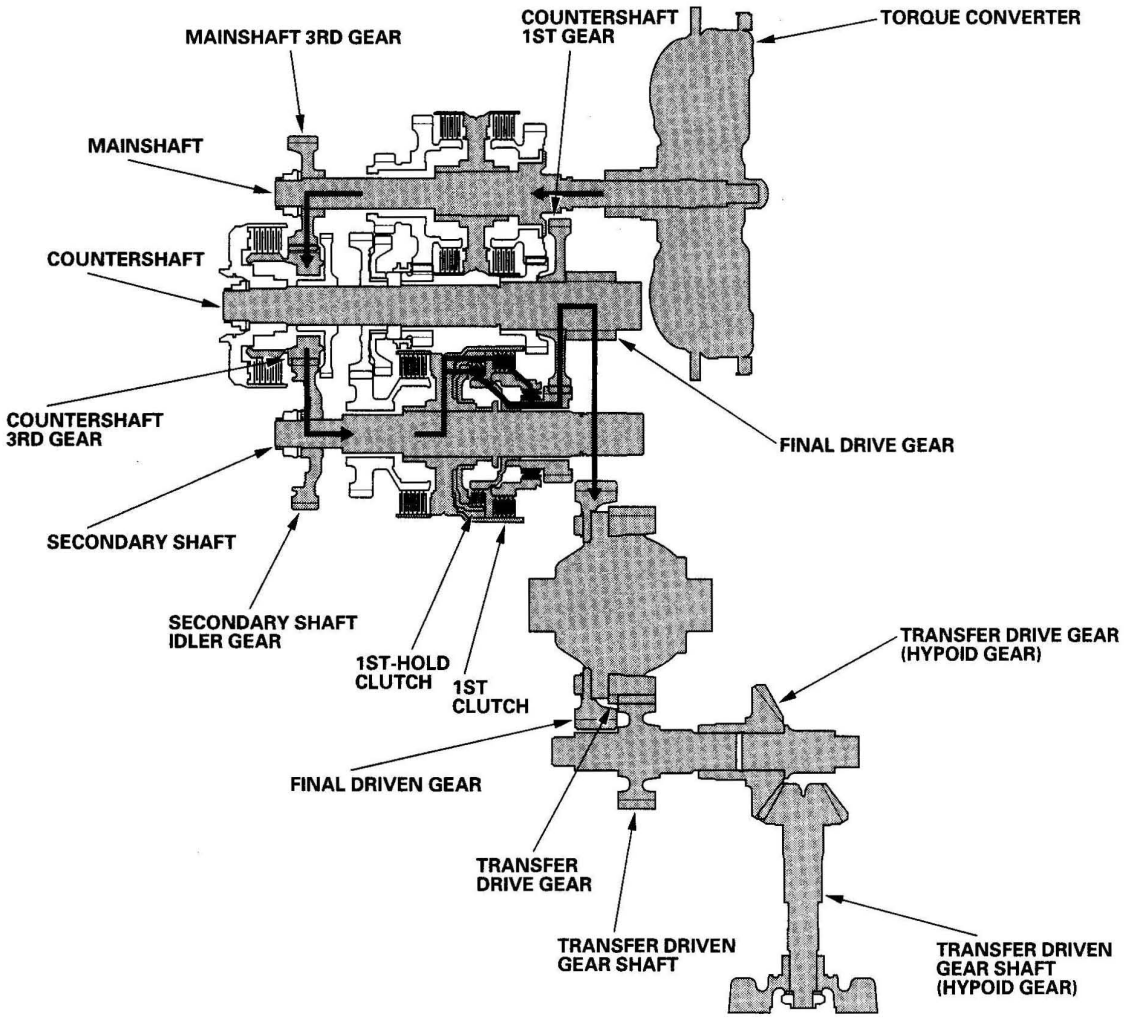
System Description (cont'd)

Power Flow (cont'd)

1 Position

In the 1 position, hydraulic pressure is applied to the 1st clutch and the 1st-hold clutch.
The power flow when accelerating is as follows:

- Hydraulic pressure is applied to the 1st clutch, then the 1st clutch engages the secondary shaft 1st gear with the secondary shaft by the one-way clutch.
- Hydraulic pressure is also applied to the 1st-hold clutch, and the 1st-hold clutch engages the secondary shaft 1st gear with the secondary shaft.
- The mainshaft 3rd gear drives the secondary shaft via the countershaft 3rd gear and the secondary shaft idler gear.
- The secondary shaft 1st gear drives the countershaft 1st gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- The transfer driven gear shaft drives the transfer drive gear (hypoid gear) and the transfer driven gear shaft (hypoid gear).



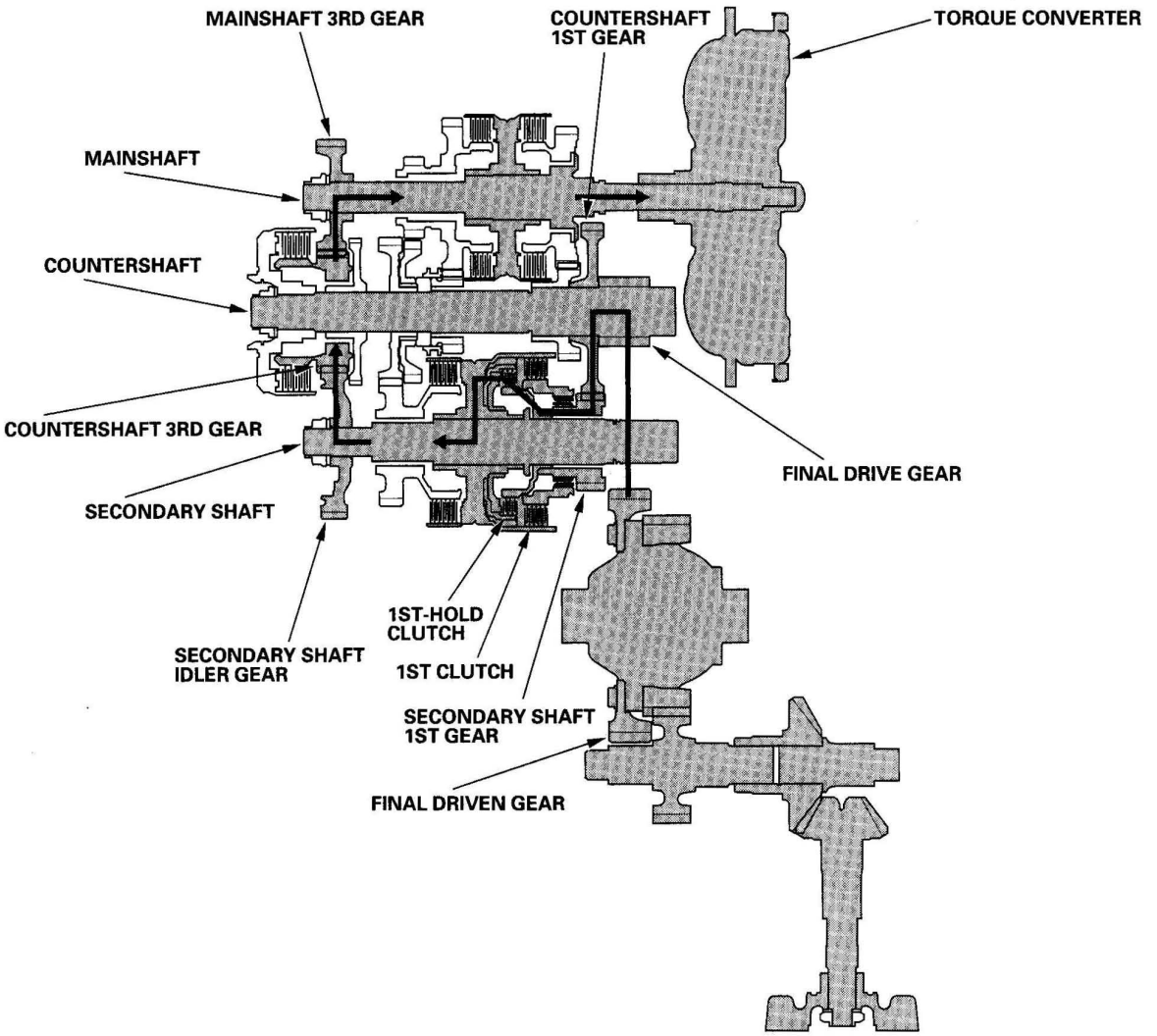
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1 Position

The power flow when decelerating is as follows:

- Hydraulic pressure is applied to the 1st clutch and the 1st-hold clutch. Rolling resistance from the road surface goes through the front and rear wheels to the final drive gear, then to the secondary shaft idler gear.
- The one-way clutch disengages because the application of torque is reversed.
- The counterforce conveyed to the secondary shaft idler gear turns the mainshaft 3rd gear via the countershaft 3rd gear. As a result, engine braking can be obtained with 1st gear.



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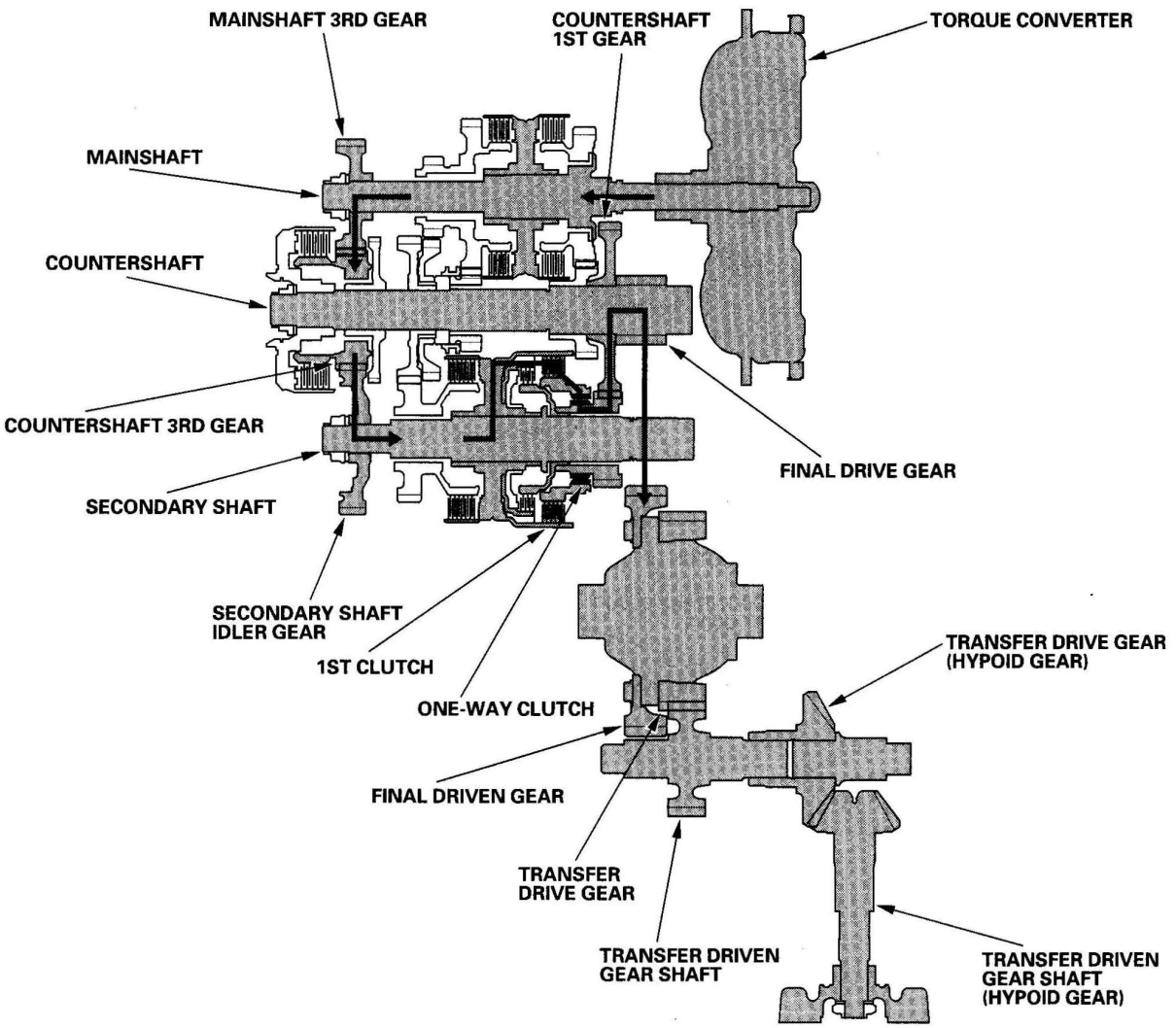
System Description (cont'd)

Power Flow (cont'd)

In the D5, D4, or D3 position, the optimum gear is automatically selected from the 1st, 2nd, 3rd, 4th, and 5th gears according to conditions such as the balance between the throttle opening (engine loading) and vehicle speed.

D5, D4, or D3 Position in 1st gear

- Hydraulic pressure is applied to the 1st clutch, then the 1st clutch engages the secondary shaft 1st gear with the secondary shaft by the one-way clutch.
- The mainshaft 3rd gear drives the secondary shaft via the countershaft 3rd gear and secondary shaft idler gear.
- The secondary shaft 1st gear drives the countershaft 1st gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- The transfer driven gear shaft drives the transfer drive gear (hypoid gear) and the transfer driven gear shaft (hypoid gear).

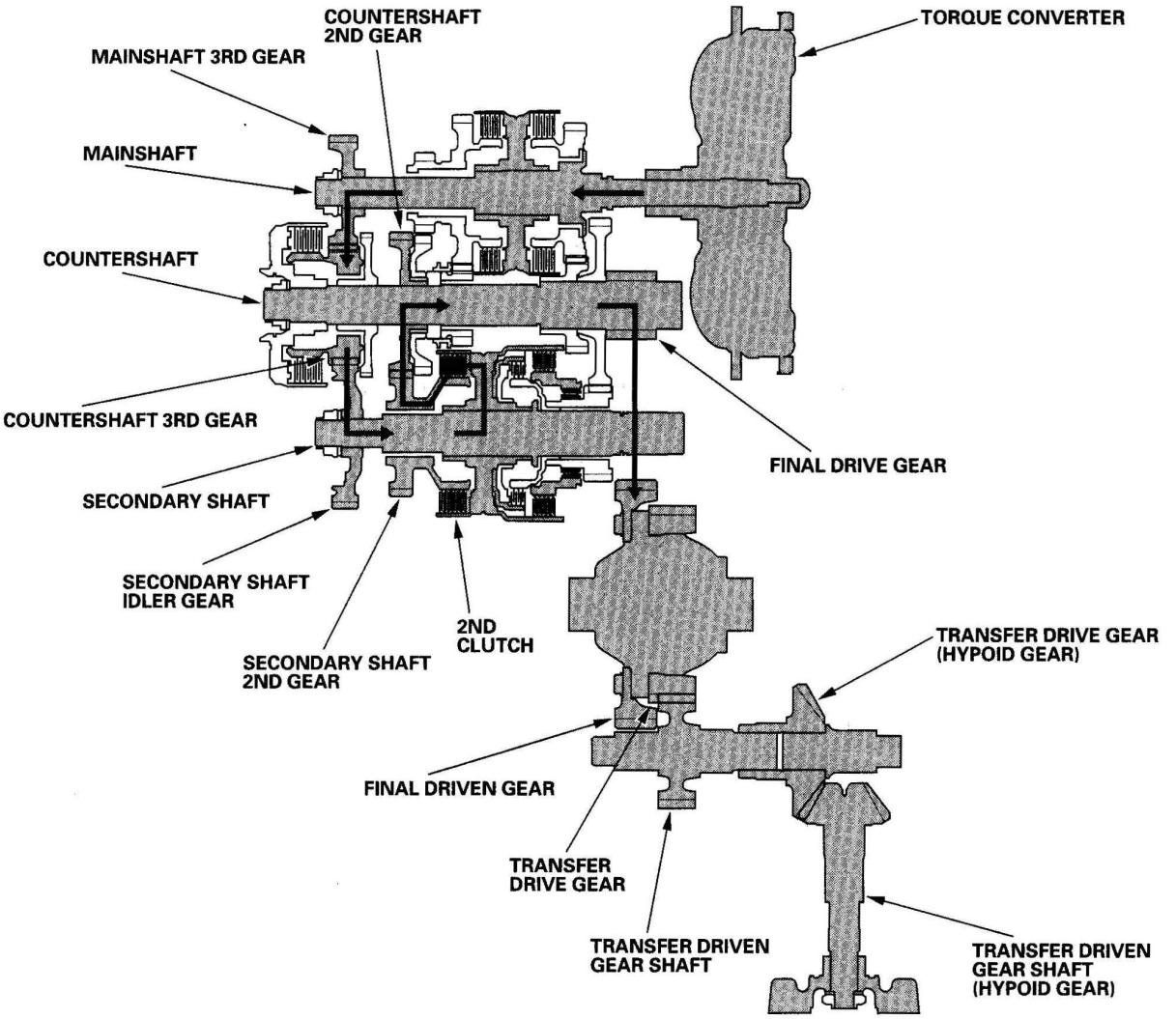


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D5, D4, or D3 Position in 2nd gear and 2 Position

- Hydraulic pressure is applied to the 2nd clutch, then the 2nd clutch engages the secondary shaft 2nd gear with the secondary shaft.
- The mainshaft 3rd gear drives the secondary shaft via the countershaft 3rd gear and secondary shaft idler gear.
- The secondary shaft 2nd gear drives the countershaft 2nd gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- The transfer driven gear shaft drives the transfer drive gear (hypoid gear) and the transfer driven gear shaft (hypoid gear).
- Hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 2nd gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.



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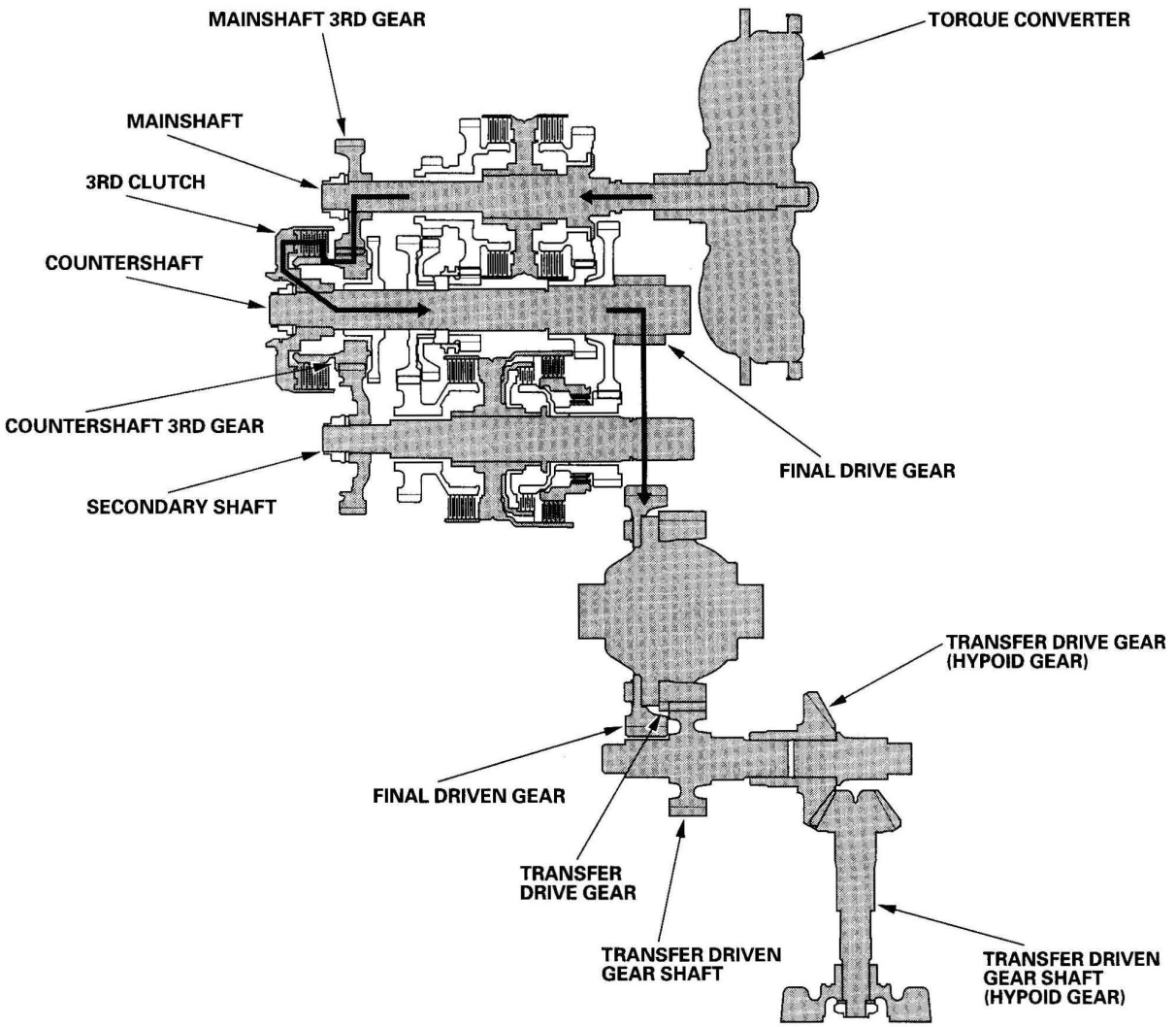
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System Description (cont'd)

Power Flow (cont'd)

D5, D4, or D3 Position in 3rd gear

- Hydraulic pressure is applied to the 3rd clutch, then the 3rd clutch engages the countershaft 3rd gear with the countershaft.
- The mainshaft 3rd gear drives the countershaft 3rd gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- The transfer driven gear shaft drives the transfer drive gear (hypoid gear) and the transfer driven gear shaft (hypoid gear).
- Hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 3rd gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.

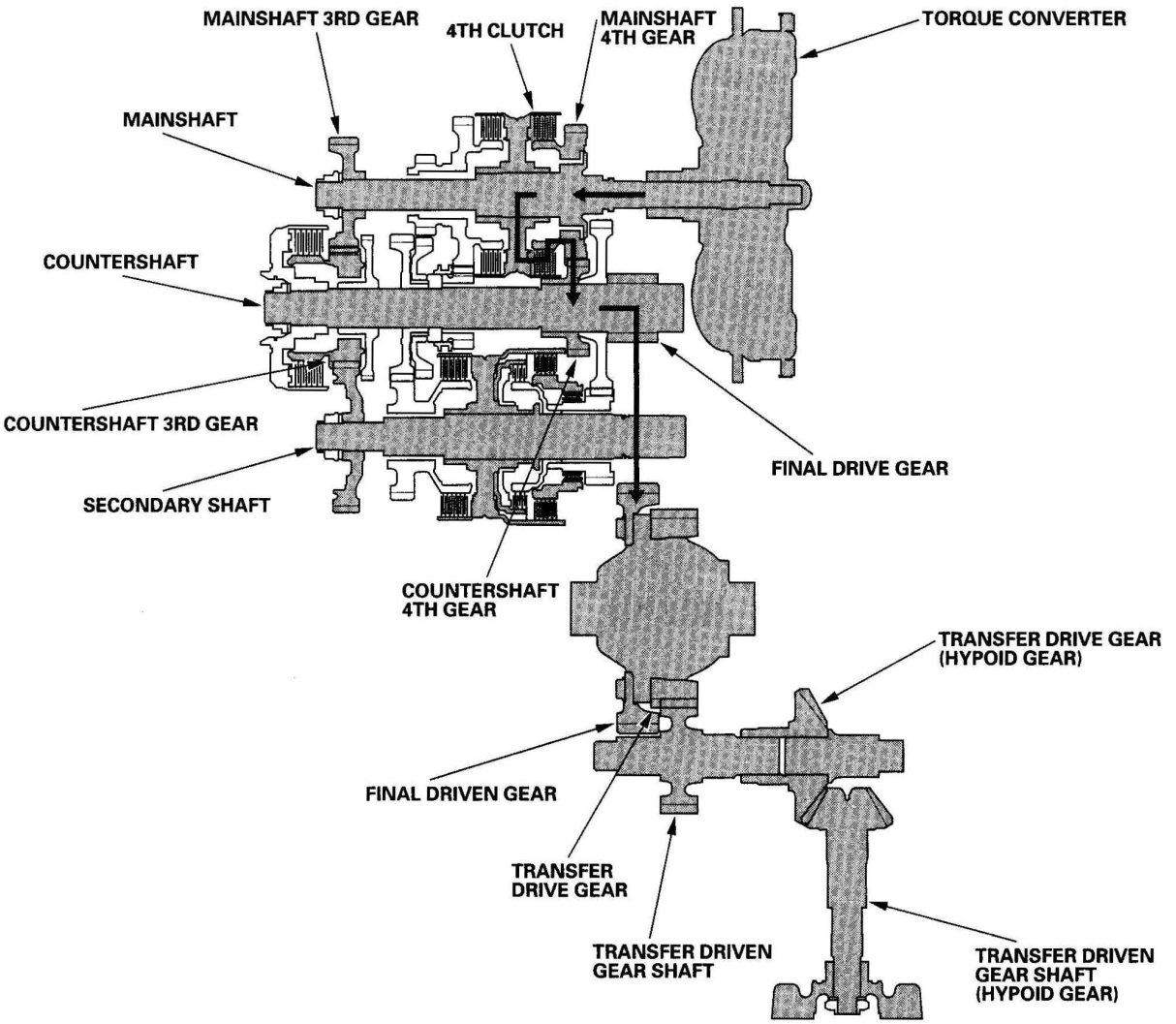


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D5 or D4 Position in 4th gear

- Hydraulic pressure is applied to the 4th clutch, then the 4th clutch engages the mainshaft 4th gear with the mainshaft.
- The mainshaft 4th gear drives the countershaft 4th gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- The transfer driven gear shaft drives the transfer drive gear (hypoid gear) and the transfer driven gear shaft (hypoid gear).
- Hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 4th gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.



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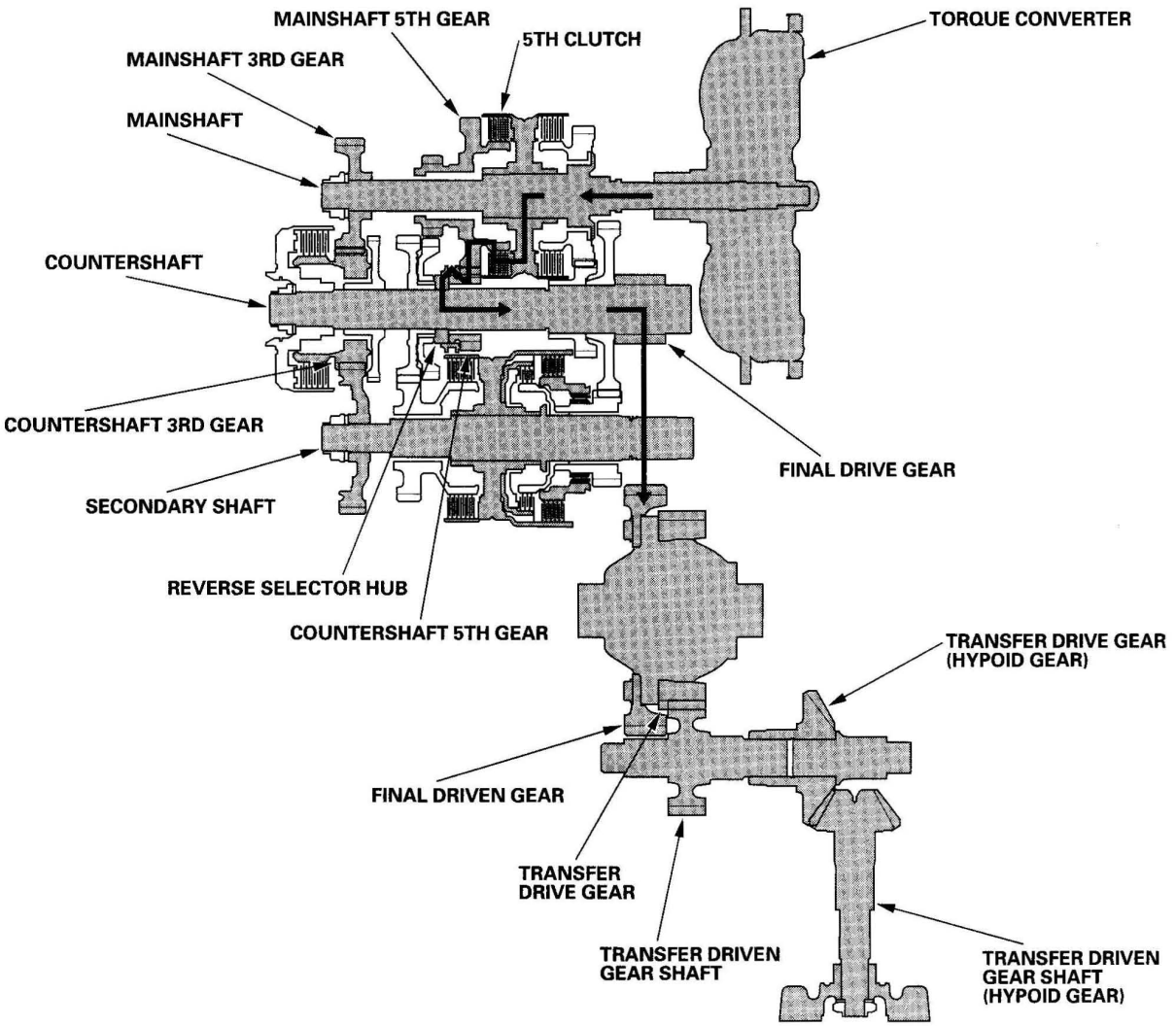
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System Description (cont'd)

Power Flow (cont'd)

D6 Position in 5th gear

- Hydraulic pressure is applied to the servo valve to engage the reverse selector with the countershaft 5th gear while the shift lever is in the forward range (D5, D4, D3, 2, and 1 position).
- Hydraulic pressure is also applied to the 5th clutch, then the 5th clutch engages the mainshaft 5th gear with the mainshaft.
- The mainshaft 5th gear drives the countershaft 5th gear, which drives the reverse selector hub and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- The transfer driven gear shaft drives the transfer drive gear (hypoid gear) and the transfer driven gear shaft (hypoid gear).
- Hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 5th gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.

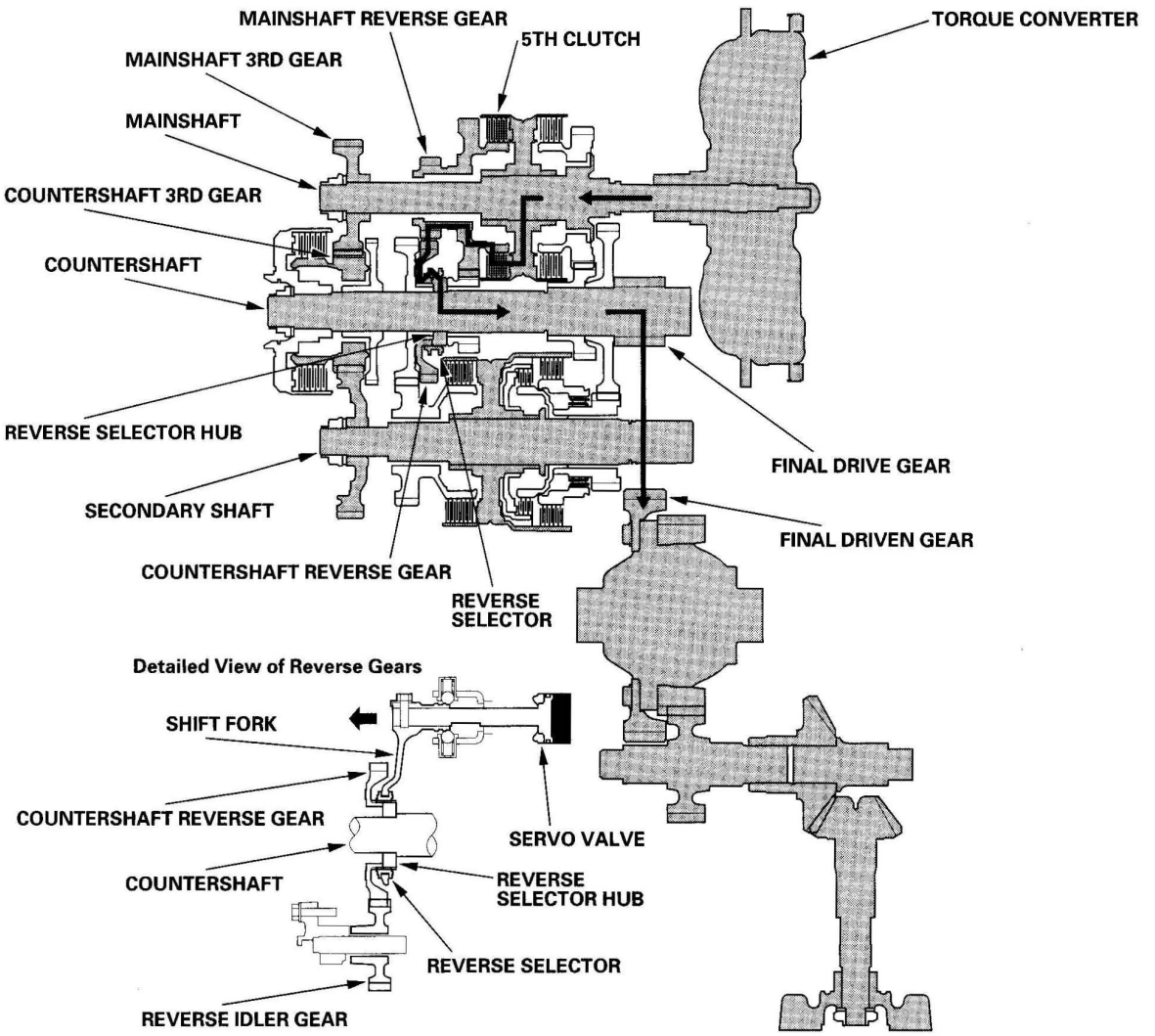


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R Position

- Hydraulic pressure is applied to the servo valve to engage the reverse selector with the countershaft (reverse gear while the shift lever is in the R position).
- Hydraulic pressure is also applied to the 5th clutch, then the 5th clutch engages the mainshaft reverse gear with the mainshaft.
- The mainshaft reverse gear drives the countershaft reverse gear via the reverse idler gear.
- The rotation direction of the countershaft reverse gear is changed via the reverse idler gear.
- The countershaft reverse gear drives the countershaft via the reverse selector which drives the reverse selector hub.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- The transfer driven gear shaft drives the transfer drive gear (hypoid gear) and the transfer driven gear shaft (hypoid gear).



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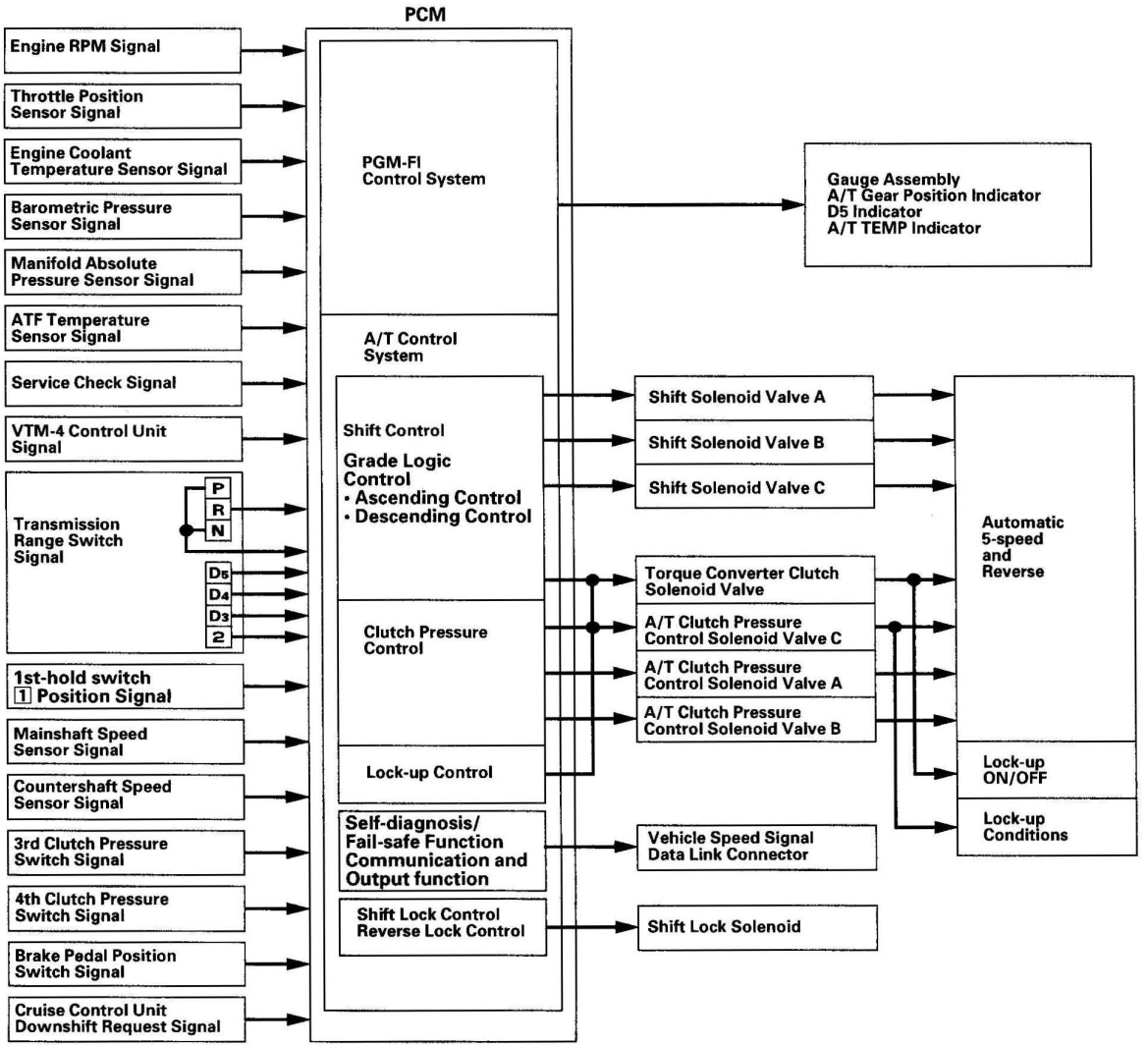
System Description (cont'd)

Electronic Control System

Functional Diagram

The electronic control system consists of the powertrain control module (PCM), sensors, and solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions.

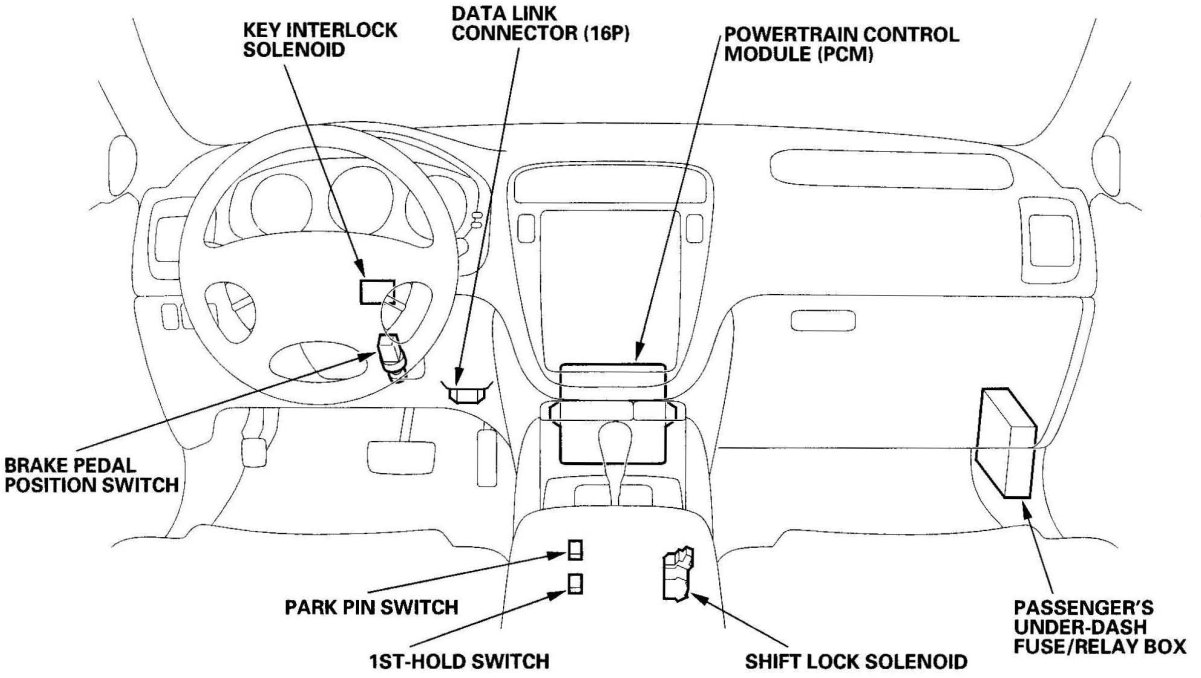
The PCM receives input signals from the sensors, switches, and other control units, perform processing data, and outputs signals for the engine control system and A/T control system. The A/T control system includes shift control, grade logic control, clutch pressure control, and lock-up control is stored in the PCM. The PCM switches the shift solenoid valves and the A/T clutch pressure control solenoid valves to control shifting transmission gears and lock-up torque converter clutch.

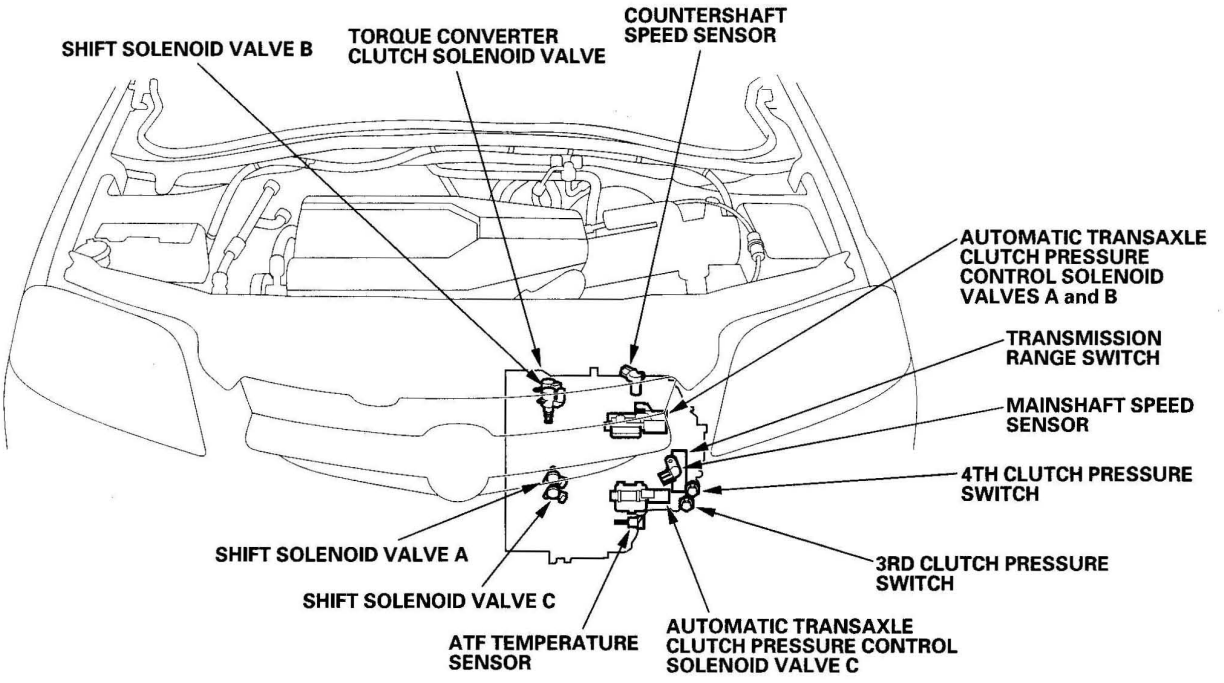


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Electronic Controls Location





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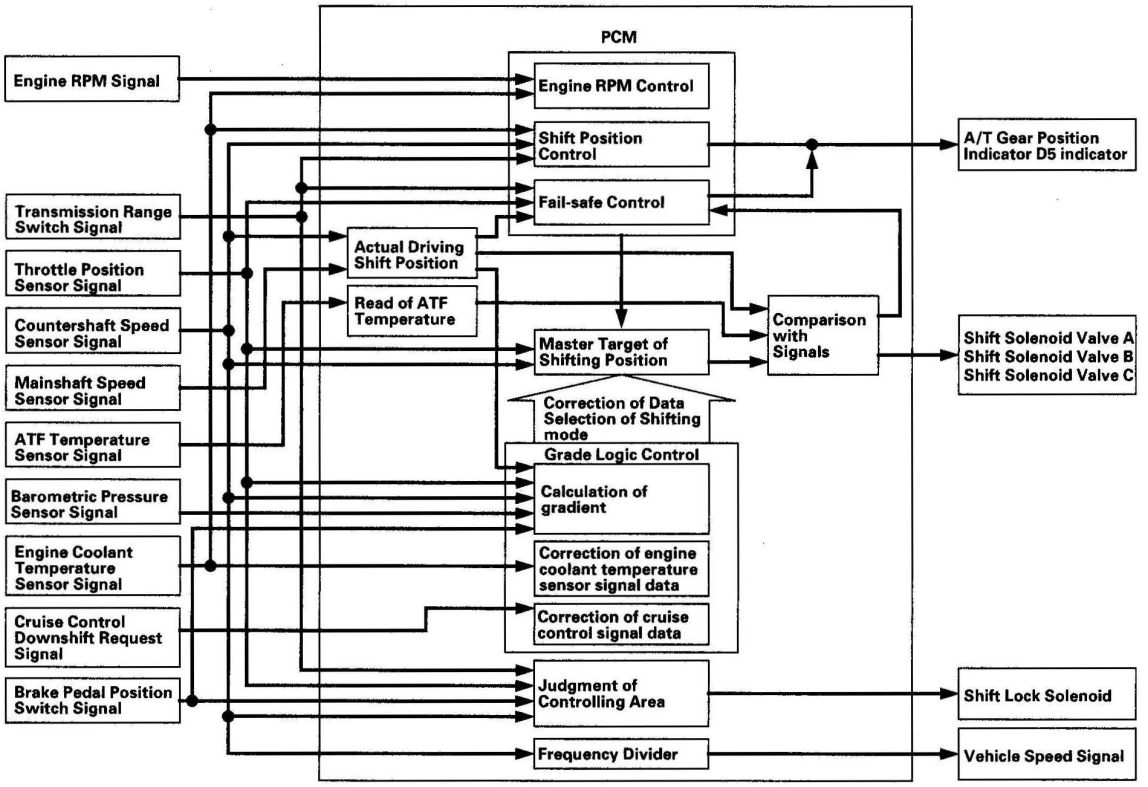
System Description (cont'd)

Electronic Control System

Shift Control

The PCM instantly determines which gear should be selected by various signals sent from sensors and switches, and it actuates the shift solenoid valves A, B, and C to control shifting.

Also, as Grade Logic Control System has been adopted to control shifting in the D5, D4 and D3 positions. The PCM compares actual driving conditions with memorized driving conditions, based on the input from the throttle position sensor, the engine coolant temperature sensor, the barometric pressure sensor, the brake pedal position switch signal, and the shift lever position signal, to control shifting while the vehicle is ascending or descending a slope.



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The PCM turns on the shift solenoid valves A, B, and C to control shifting transmission gear.
The combination of driving signals to shift solenoid valves A, B, and C are shown in the table below.

Position	Gear position	Shift solenoid valves		
		A	B	C
D5, D4, D3	Shifting from the N position	OFF	ON	OFF
	Stays in 1st	ON	ON	ON
	Shifting gears between 1st and 2nd	ON	ON	ON
	Stays in 2nd	ON	ON	OFF
	Shifting gears between 2nd and 3rd	OFF	ON	OFF
	Stays in 3rd	OFF	ON	ON
D5, D4	Shifting gears between 3rd and 4th	OFF	OFF	ON
	Stays in 4th	OFF	OFF	OFF
D5	Shifting gears between 4th and 5th	ON	OFF	OFF
	Stays in 5th	ON	OFF	ON
2	2nd	ON	ON	OFF
1	1st	ON	ON	ON
R	Shifting from the P and N position	OFF	ON	ON
	Stays in reverse	OFF	ON	OFF
	Reverse inhibit	ON	ON	ON
P	Park	OFF	ON	OFF
N	Neutral	OFF	ON	OFF

NOTE: For a description of the reverse inhibit mode, refer to page 14-63.

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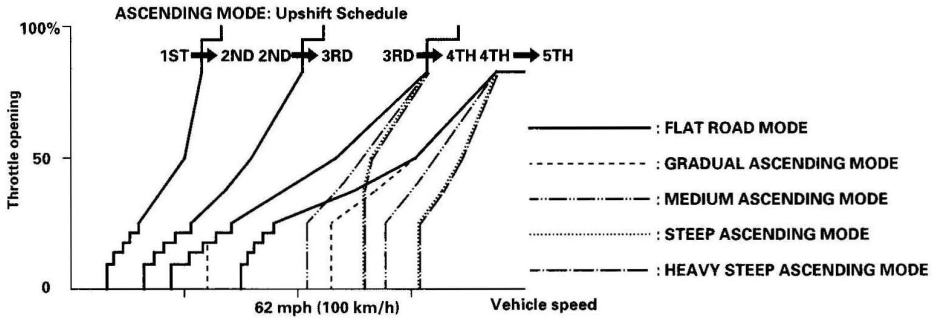
System Description (cont'd)

Electronic Control System (cont'd)

Ascending Control

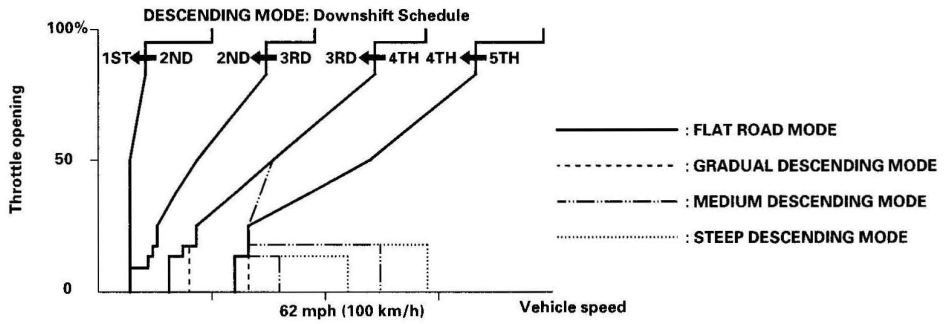
When the PCM determines that the vehicle is climbing a hill in the D5, D4, and D3 positions, the system extends the engagement area of 2nd gear, 3rd gear, and 4th gear to prevent the transmission from frequently shifting between 2nd and 3rd gears, between 3rd and 4th gears, and between 4th and 5th gears, so the vehicle can run smooth and have more power when needed.

NOTE: Shift schedules stored in the PCM between 2nd and 3rd gears, between 3rd and 4th gears, and between 4th and 5th gears, enable the PCM to automatically select the most suitable gear according to the magnitude of a gradient.



Descending Control

When the PCM determines that the vehicle is going down a hill in the D5, D4, and D3 positions, the shift-up speed from 4 th to 5th gear, 3rd to 4th gear, and from 2nd to 3rd (when the throttle is closed) becomes faster than the set speed for flat road driving to widen the 4th gear, 3rd gear, and 2nd gear driving areas. This, in combination with engine braking from the deceleration lock-up, achieves smooth driving when the vehicle is descending. There are three descending modes with different 4th gear driving areas, 3rd gear driving areas and 2nd gear driving areas according to the magnitude of a gradient stored in the PCM. When the vehicle is in 5th or 4th gear and you are decelerating while applying the brakes on a steep hill, the transmission will downshift to a lower gear. When you accelerate, the transmission will then return to a higher gear.



Deceleration Control

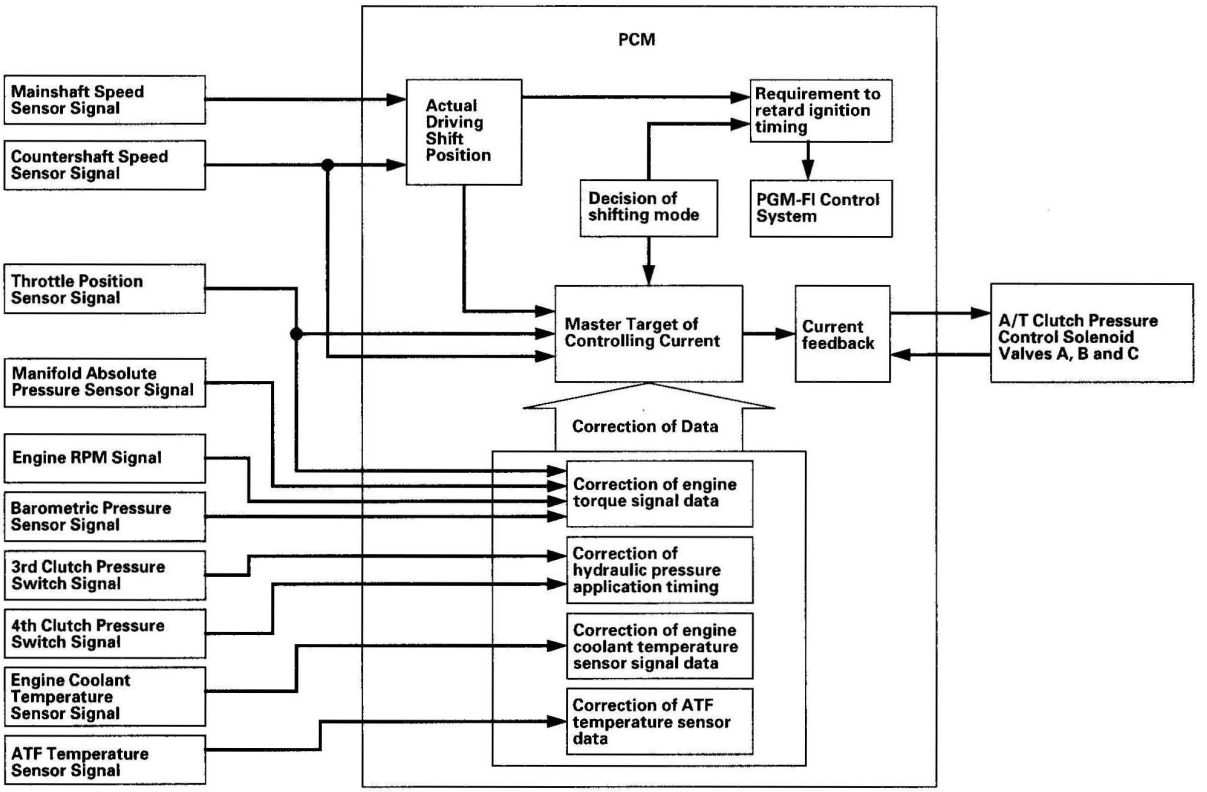
When the vehicle goes around a corner and needs to decelerate first and then accelerate, the PCM sets the data for deceleration control to reduce the number of times the transmission shifts. When the vehicle is decelerating from speeds above 27 mph (43 km/h), the PCM shifts the transmission from 5th or 4th to 2nd earlier than normal to cope with upcoming acceleration.

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Clutch Pressure Control

The PCM actuates the A/T clutch pressure control solenoid valves A, B, and C to control the clutch pressure. When shifting between lower and higher gears, the clutch pressure regulated by the A/T clutch pressure control solenoid valves A, B, and C engages and disengages the clutch smoothly.
The PCM receives input signals from the various sensors and switches, performs processing data, and outputs a current to the A/T clutch pressure control solenoid valves A, B, and C.



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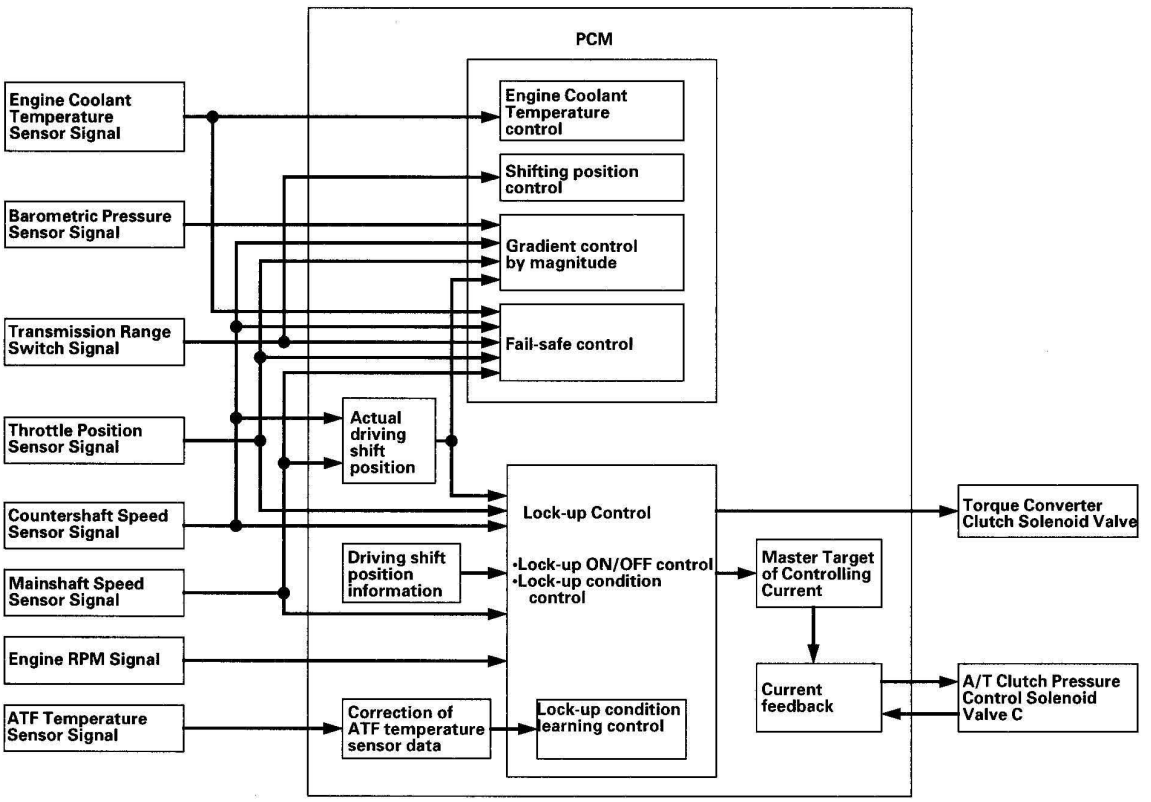
System Description (cont'd)

Electronic Control System (cont'd)

Lock-up Control

The torque converter clutch solenoid valve controls the hydraulic pressure to switch the lock-up shift valve and lock-up ON and OFF. The PCM actuates the torque converter clutch solenoid valve and the A/T clutch pressure control solenoid valve ON, the condition of the lock-up starts. The A/T clutch pressure control solenoid valve C regulates and apply the hydraulic pressure to the lock-up control valve to control the volume of the lock-up.

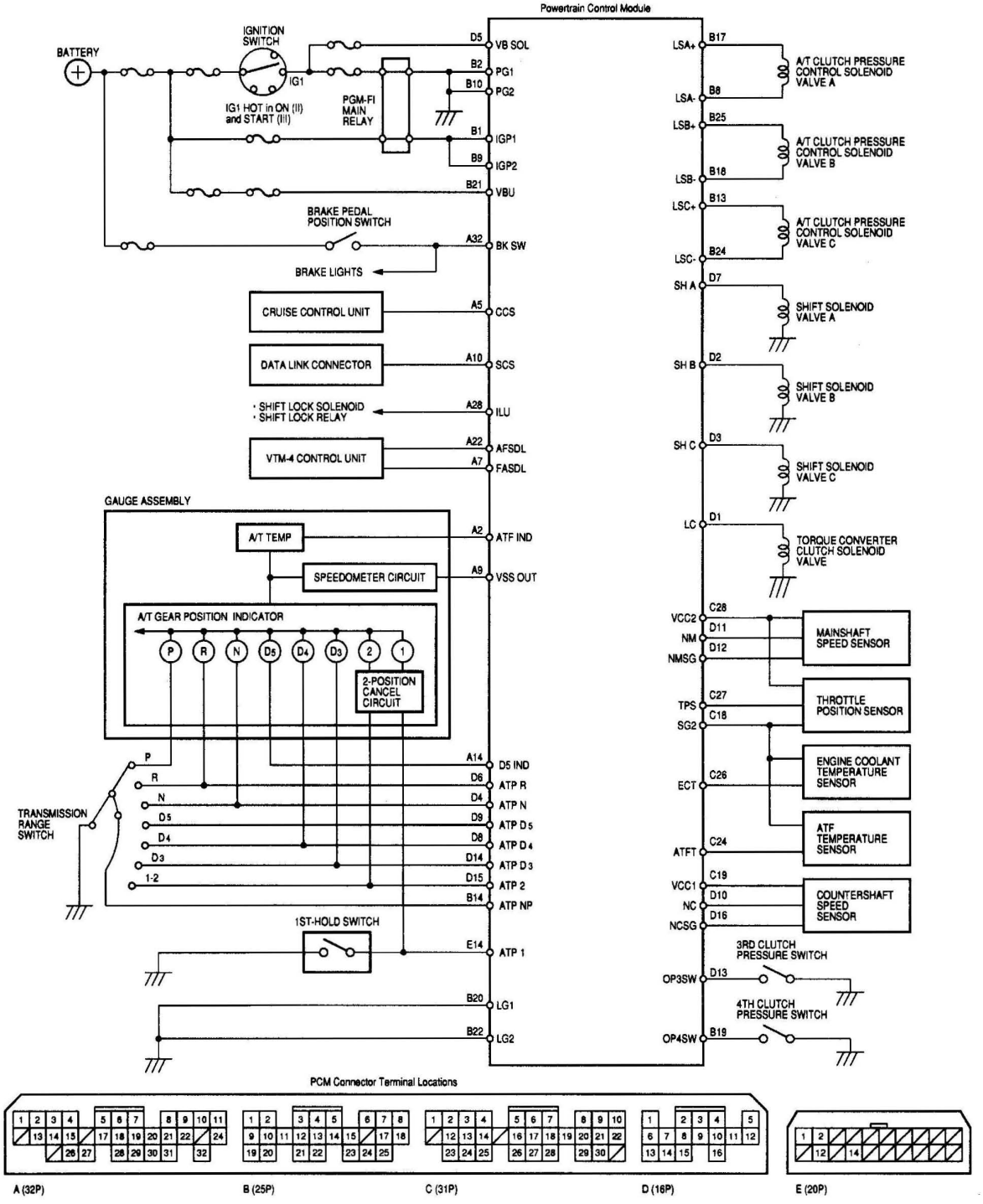
The lock-up mechanism operates in the D6 position (2nd, 3rd, 4th, and 5th), in the D4 position (2nd, 3rd, and 4th), and in the D3 position (2nd and 3rd).



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PCM Terminal Connections



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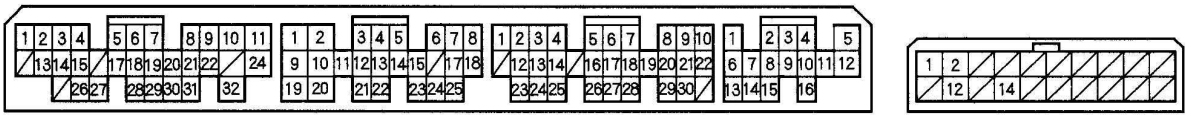
System Description (cont'd)

Electronic Control System (cont'd)

PCM Inputs and Outputs

The PCM terminal voltage and measuring conditions for the A/T control system are shown. Other PCM terminal voltage and measuring conditions are described in section 11.

PCM Connector Terminal Locations



PCM CONNECTOR A (32P)

Terminal Number	Wire	Signal	Description	Measuring Conditions/Terminal Voltage
A2	RED/GRN	ATF IND	ATF indicator light control	When ignition switch is first turned ON (II): 0 V for 2 seconds ATF in torque converter temperature is under normal operating conditions (A/T TEMP indicator OFF): Battery voltage
A5	BLU/GRN	CCS	Downshift signal input from cruise control unit	When cruise control is used: About 1 V
A7	BLK	FASDL	Serial signal output to VTM-4 control unit	With ignition switch ON (II): Pulsing signal
A9	BLU/WHT	VSS OUT	Vehicle speed signal detected from countershaft speed sensor, and sent to speedometer and odometer	Depending on vehicle speed: Pulsing signal
A10	BRN	SCS	Detects service check signal	With ignition switch ON (II) and data link connector open: 5 V With ignition switch ON (II) and data link connector connected with Honda PGM tester in SCS mode: 0 V
A14	GRN/BLK	D5 IND	D5 indicator control	When ignition switch is first turned ON (II): About 7 V for 2 seconds In the D5 position: About 7 V
A22	WHT	AFSDL	Serial signal input to VTM-4 control unit	With ignition switch ON (II): Pulsing signal
A28	WHT/GRN	ILU	Interlock control	With ignition switch ON (II), brake pedal pressed, and accelerator pedal released: Battery voltage
A32	WHT/BLK	BK SW	Brake pedal position switch signal input	Brake pedal pressed: Battery voltage Brake pedal released: 0 V

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PCM CONNECTOR B (25P)

Terminal Number	Wire	Signal	Description	Measuring Conditions/Terminal Voltage
B1	YEL/BLK	IGP1	Power supply circuit from main relay	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
B2	BLK	PG1	Ground	
B8	WHT	LS A−	A/T clutch pressure control solenoid valve A power supply negative electrode	
B9	YEL/BLK	IGP2	Power supply circuit from main relay	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
B10	BLK	PG2	Ground	
B13	GRN/RED	LS C+	A/T clutch pressure control solenoid valve C power supply positive electrode	With ignition switch ON (II): Pulsing signal
B14	BLU/WHT	ATP NP	Transmission range switch P and N positions input	In the P and N positions: 0 V In other than the P and N position: 5 V
B17	RED	LS A+	A/T clutch pressure control solenoid valve A power supply positive electrode	With ignition switch ON (II): Pulsing signal
B18	GRN	LS B−	A/T clutch pressure control solenoid valve B power supply negative electrode	
B19	BLU/YEL	OP4SW	A/T 4th clutch pressure switch signal input	With ignition switch ON (II): Battery voltage (No 4th clutch pressure) With 4th clutch pressure: About 0V
B20	BRN/YEL	LG1	Ground	
B21	WHT/RED	VBU	Back-up power supply	Always battery voltage
B22	BRN/YEL	LG2	Ground	
B24	RED/BLU	LS C−	A/T clutch pressure control solenoid valve C power supply negative electrode	
B25	BRN/WHT	LS B+	A/T clutch pressure control solenoid valve B power supply positive electrode	With ignition switch ON (II): Pulsing signal

PCM CONNECTOR C (31P)

Terminal Number	Wire	Signal	Description	Measuring Conditions/Terminal Voltage
C18	GRN/YEL	SG2	Sensor ground	
C19	YEL/RED	VCC1	Power supply for sensors	With ignition switch ON (II): 5 V With ignition switch OFF: 0 V
C24	BLU/YEL	ATFT	ATF temperature sensor signal input	With ignition switch ON (II): About 0.1 − 4.2 V depending on ATF temperature With ignition switch OFF: 0 V
C28	YEL/BLU	VCC2	Power supply for sensors	With ignition switch ON (II): 5 V With ignition switch OFF: 0 V

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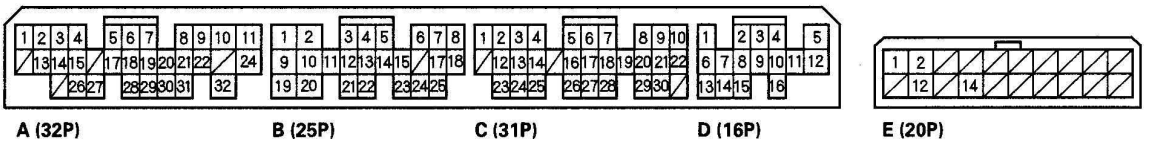
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System Description (cont'd)

Electronic Control System (cont'd)

PCM Inputs and Outputs

PCM Connector Terminal Locations



PCM CONNECTOR D (16P)

Terminal Number	Wire	Signal	Description	Measuring Conditions/Terminal Voltage
D1	YEL	LC	Torque converter clutch solenoid valve control	During lock-up condition: Battery voltage During no lock-up condition: 0 V
D2	GRN/WHT	SH B	Shift solenoid valve B control	Battery voltage in these positions: • 1, 2 • D5, D4, and D3 in 1st , 2nd, and 3rd gear • P, R, and N 0 V in these positions: • D5 and D4 in 4th gear • D5 in 5th gear
D3	GRN	SH C	Shift solenoid valve C control	Battery voltage in these positions: • 1 • D5, D4, and D3 in 1st, 3rd, and 5th gear 0 V in these positions: • 2 • D5, D4, and D3 in 2nd gear • D5 and D4 in 4th gear • P, R, and N
D4	RED/BLK	ATP N	Transmission range switch N position input	In the N position: 0 V In other than the N position: Battery voltage
D5	BLK/YEL	VB SOL	Power supply for solenoid valves (Fuse No. 6 in driver's under-dash fuse/relay box)	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
D6	WHT	ATP R	Transmission range switch R position input	In the R position: 0 V In other than the R position: Battery voltage
D7	BLU/YEL	SH A	Shift solenoid valve A control	Battery voltage in these positions: • 1, 2 • D5, D4, and D3 in 1st and 2nd gear • D5 in 5th gear 0 V in these positions: • D5, D4, and D3 in 3rd gear • D5 and D4 in 4th gear • P, R, and N

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PCM CONNECTOR D (16P)

Terminal Number	Wire	Signal	Description	Measuring Conditions/Terminal Voltage
D8	YEL	ATP D4	Transmission range switch D4 position input	In the D4 position: 0 V In other than the D4 position: Battery voltage
D9	YEL/GRN	ATP D5	Transmission range switch D5 position input	In the D5 position: 0 V In other than the D5 position: 5 V
D10	BLU	NC	Countershaft speed sensor input	Depending on vehicle speed: Pulsing signal When vehicle is stopped: About 0 V
D11	RED	NM	Mainshaft speed sensor input	Depending on vehicle speed: Pulsing signal When engine is stopped: About 0 V
D12	WHT	NMSG	Mainshaft speed sensor ground	
D13	BLU/WHT	OP3SW	A/T 3rd clutch pressure switch signal input	With ignition switch ON (II): Battery voltage (No 3rd clutch pressure) With 3rd clutch pressure: About 0V
D14	RED	ATP D3	Transmission range switch D3 position input	In the D3 position: 0 V In other than the D3 position: Battery voltage
D15	BLU	ATP 2	Transmission range switch 2 position input	In the 2 position: 0 V In other than the 2 position: Battery voltage
D16	GRN	NCSG	Countershaft speed sensor ground	

PCM CONNECTOR E (20P)

Terminal Number	Wire	Signal	Description	Measuring Conditions/Terminal Voltage
E14	BRN	ATP 1	1st-hold switch 1 position input	In the 1 position: 0 V In other than the 1 position: Battery voltage

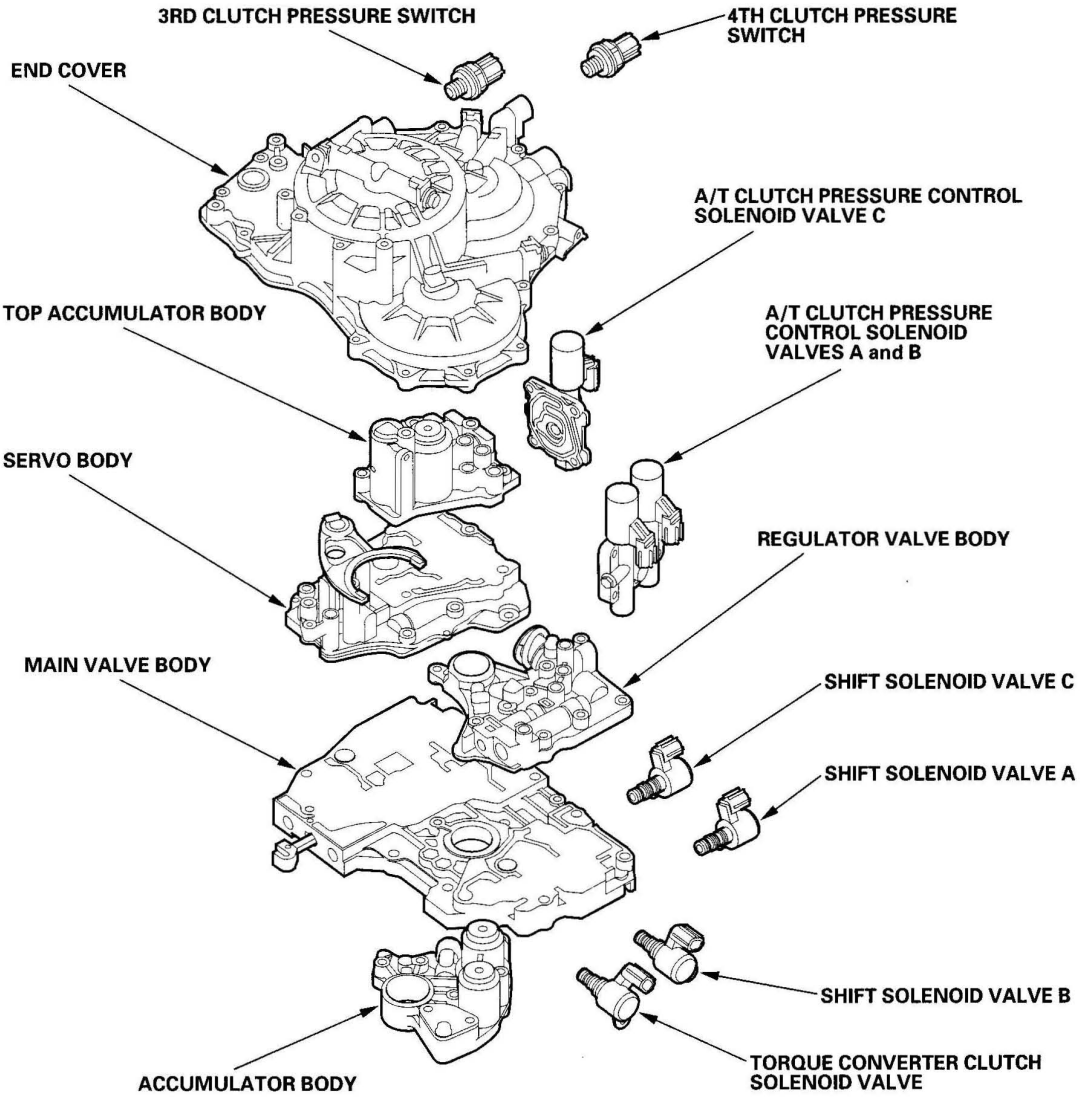
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System Description (cont'd)

Hydraulic Controls

The valve body includes the main valve body, the regulator valve body, the servo body, the top accumulator body, and the accumulator body. The ATF pump is driven by splines on the left end of the torque converter which is attached to the engine. Fluid flows through the regulator valve to maintain specified pressure through the main valve body to the manual valve, directing pressure to each of the clutches. The shift solenoid valves A and C are mounted on the outside of the torque converter housing. The shift solenoid valve B and the torque converter clutch solenoid valve are mounted on the torque converter housing. The A/T clutch pressure control solenoid valves A and B, and the A/T clutch pressure control solenoid valve C are mounted on the transmission housing.

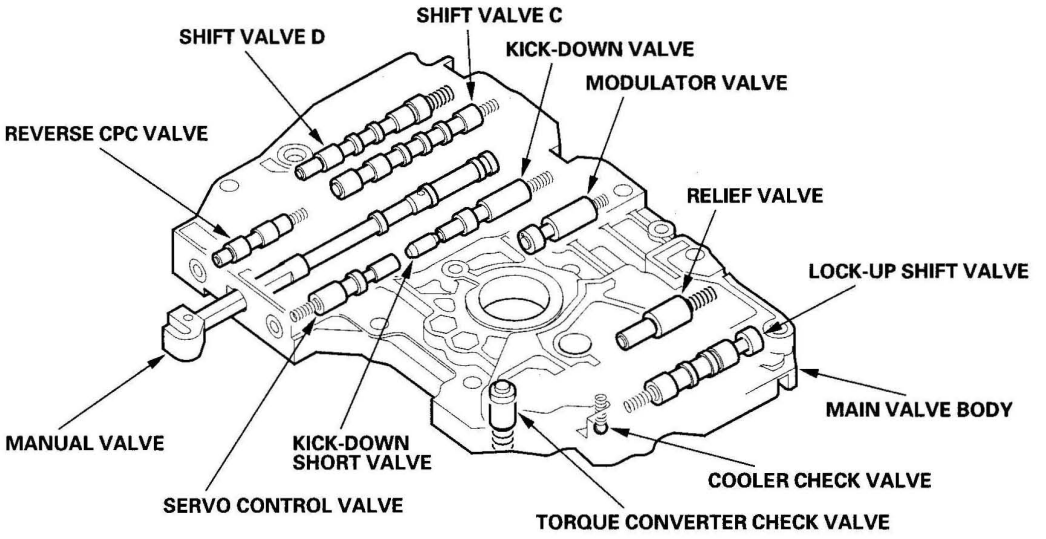


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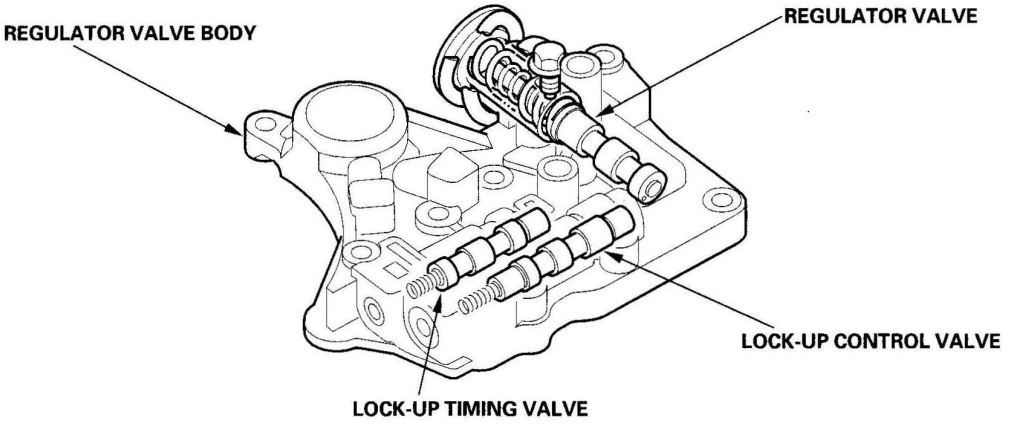
Main Valve Body

The main valve body contains the manual valve, the modulator valve, the shift valve C, the shift valve D, the servo control valve, the cooler check valve, the torque converter check valve, the reverse CPC valve, the lock-up shift valve, the relief valve, the kick-down valve, the kick-down short valve, and the ATF pump gears. The primary function of the main valve body is to switch fluid pressure on and off and to control hydraulic pressure going to the hydraulic control system.



Regulator Valve Body

The regulator valve body is located on the main valve body. The regulator valve body contains the regulator valve, the lock-up timing valve, and the lock-up control valve.



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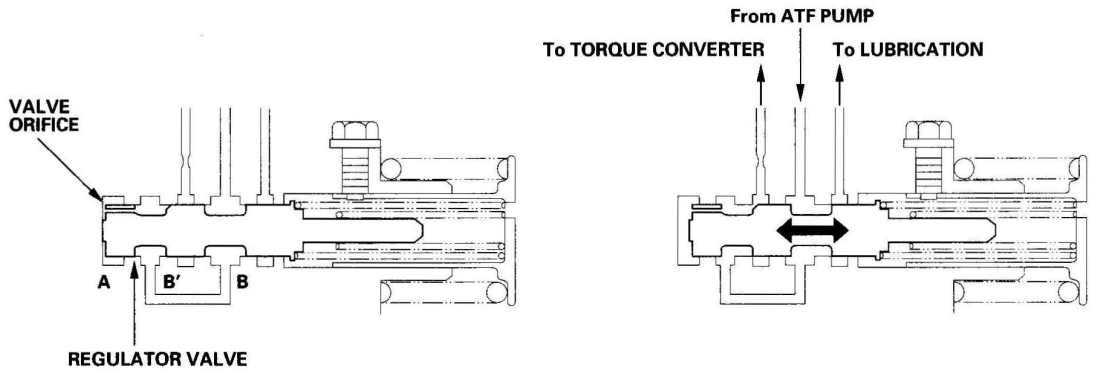
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System Description (cont'd)

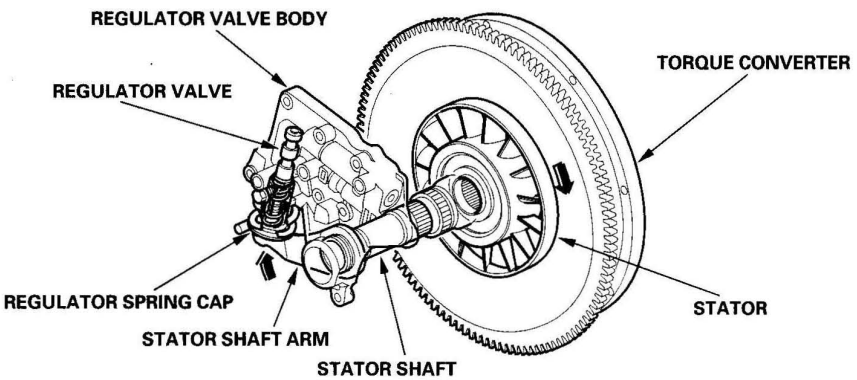
Hydraulic Controls (cont'd)

Regulator Valve

The regulator valve maintains constant hydraulic pressure from the ATF pump to the hydraulic control system, while also furnishing fluid to the lubricating system and torque converter. Fluid from the ATF pump flows through B and B'. Fluid entering from B flows through the valve orifice to the A cavity. This pressure of the A cavity pushes the regulator valve to the right side, and this movement of the regulator valve uncovers the fluid port to the torque converter and the relief valve. The fluid flows out to the torque converter and the relief valve, and the regulator valve moves to the left side. According to the level of the hydraulic pressure through B, the position of the regulator valve changes, and the amount of fluid from B' through the torque converter changes. This operation is continued, maintaining the line pressure.



Increases in hydraulic pressure according to torque are performed by the regulator valve using stator torque reaction. The stator shaft is splined to the stator in the torque converter, and its arm end contacts the regulator spring cap. When the vehicle is accelerating or climbing (torque converter range), stator torque reaction acts on the stator shaft, and the stator arm pushes the regulator spring cap in the direction of the arrow in proportion to the reaction. The stator reaction spring compresses, and the regulator valve moves to increase the line pressure which is regulated by the regulator valve. The line pressure reaches its maximum when the stator torque reaction reaches its maximum.

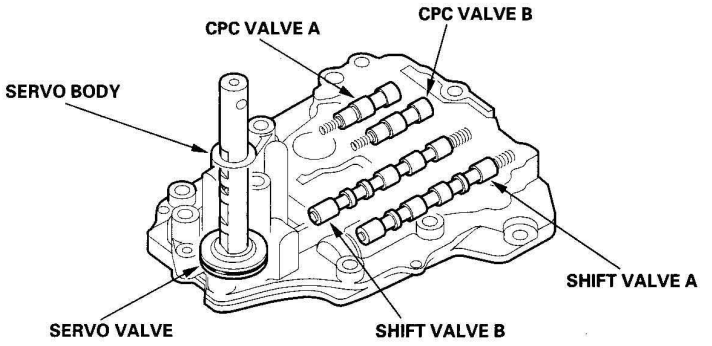


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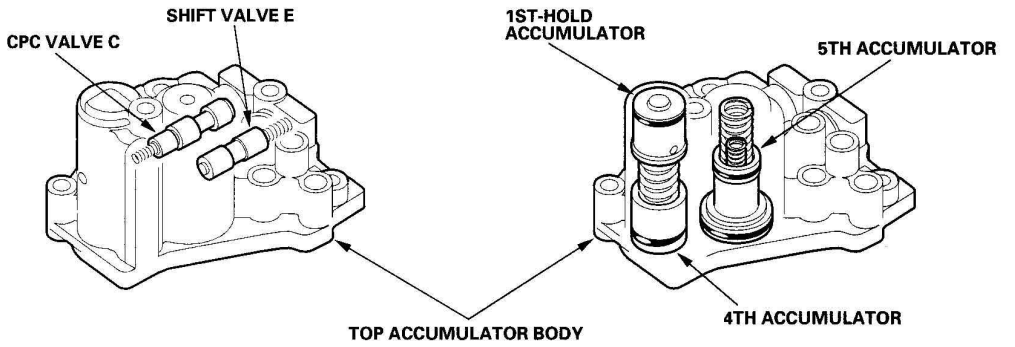
Servo Body

The servo body is on the main valve body. It contains the servo valve, shift valve A, shift valve B, and CPC valves A and B.



Top Accumulator Body

The top accumulator body contains shift valve E, CPC valve C, 4th/1st-hold accumulator, and 5th accumulator.

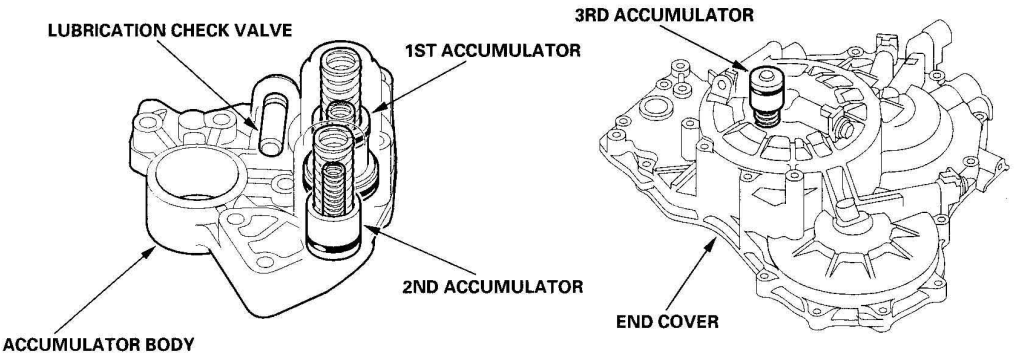


Accumulator Body

The accumulator body is on the torque converter housing, next to the main valve body. It contains the 1st and 2nd accumulators and the lubrication check valve.

3rd Accumulator

The 3rd accumulator is in the end cover.



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System Description (cont'd)

Hydraulic Flow

Distribution of Hydraulic Pressure

As the engine turns, the ATF pump starts to operate. Automatic transmission fluid (ATF) is drawn through the ATF strainer (filter) and discharged into the hydraulic circuit. Then, ATF flowing from the ATF pump becomes line pressure that's regulated by the regulator valve. Torque converter pressure from the regulator valve enters the torque converter through the lock-up shift valve and it is discharged from the torque converter. The torque converter check valve prevents torque converter pressure from rising.

The PCM controls the shift solenoid valves ON and OFF, and the shift solenoid valves control shift solenoid pressure to the shift valves. Applying shift solenoid pressure to the shift valves moves the position of the shift valve, and switches the port of hydraulic pressure. The PCM also controls A/T clutch pressure control solenoid valves A and B. The A/T clutch pressure control solenoid valves A and B regulate the A/T clutch pressure control solenoid pressure and apply the A/T clutch pressure control solenoid pressure to CPC valves A and B.

When shifting between upper gear and lower gear, the clutch is engaged by pressure from the CPC pressure mode. The PCM controls one of the shift solenoid valves to move the position of the shift valve. This movement switches the port of the CPC and line pressure. Line pressure is then applied to the clutch, and the CPC pressure is intercepted. Engaging the clutch with line pressure happens when shifting is completed.

Hydraulic pressure at the ports is as follows:

PORT NO.	DESCRIPTION OF PRESSURE	PORT NO.	DESCRIPTION OF PRESSURE	PORT NO.	DESCRIPTION OF PRESSURE
1	LINE	5N	CPC A or LINE	56	LS A
2	LINE	5D	CPC B or LINE	57	LS B
3	LINE	5G	CPC B or LINE	58	LS C
3'	LINE	5K	CPC B or LINE	90	TORQUE CONVERTER
3''	LINE	6	MODULATE	90'	TORQUE CONVERTER
4	LINE	SA	SH A	91	TORQUE CONVERTER
4'	LINE	SB	SH B	91'	TORQUE CONVERTER
4''	LINE	SC	SH C	92	TORQUE CONVERTER
4A	CPC A	LA	LC A	93	ATF COOLER
4B	CPC B	9	LINE	94	TORQUE CONVERTER
4C	CPC C	10	1ST CLUTCH	95	LUBRICATION
5B	CPC A	15	1ST-HOLD CLUTCH	95'	LUBRICATION
5C	CPC B	20	2ND CLUTCH	96	TORQUE CONVERTER
5H	CPC B	25	LINE	99	SUCTION
5J	CPC B	30	3RD CLUTCH	X	DRAIN
5A	CPC A or LINE	40	4TH CLUTCH	HX	HIGH POSITION DRAIN
5E	CPC A or LINE	50	5TH CLUTCH	AX	AIR DRAIN
5F	CPC A or LINE	51	5TH CLUTCH		
5M	CPC A or LINE	55	CPC C or LINE		

NOTE:

- CPC: Clutch Pressure Control pressure
- SH: Shift Solenoid pressure
- LS A: A/T Clutch Pressure Control Solenoid A pressure
- LS B: A/T Clutch Pressure Control Solenoid B pressure
- LS C: A/T Clutch Pressure Control Solenoid C pressure
- LC: Torque Converter Clutch Solenoid pressure

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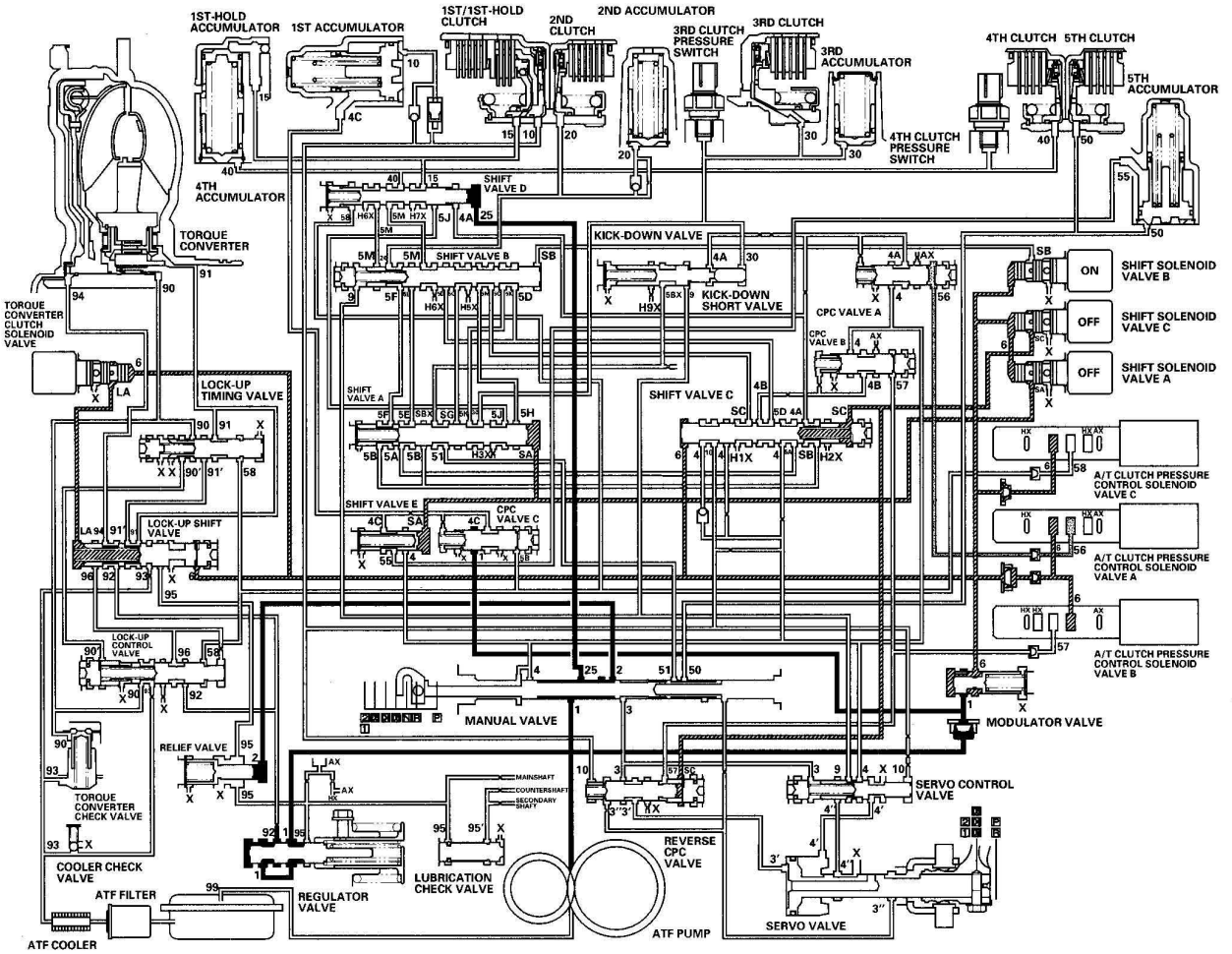
[N] Position

The PCM controls the shift solenoid valves. The conditions of the shift solenoid valves and positions of the shift valve are as follows:

- The shift solenoid valve A is turned OFF, and the shift valve A is moved to the left side.
- The shift solenoid valve B is turned ON, and the shift valve B remains in the right side.
- The shift solenoid valve C is turned OFF, and the shift valve C remains in the left side.

Line pressure (1) passes through the manual valve and becomes line pressure (25). Line pressure (25) stops at shift valve D. Line pressure (1) also flows to the modulator valve and becomes modulator pressure (6). Modulator pressure (6) flows to the shift solenoid valves, the A/T clutch pressure control solenoid valves A and B, and the A/T clutch pressure control solenoid valve C. Under this condition, hydraulic pressure is not applied to the clutches.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



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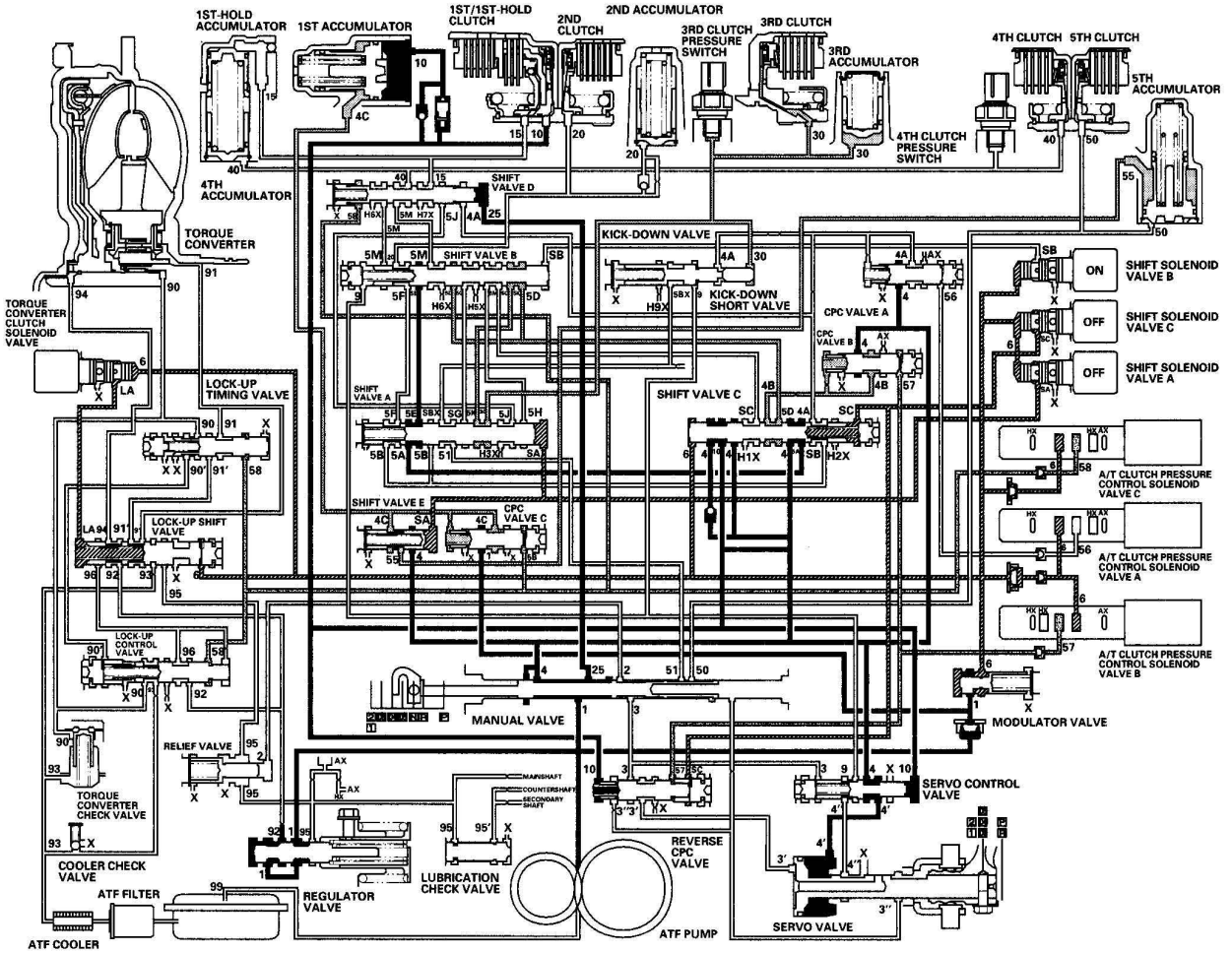
System Description (cont'd)

Hydraulic Flow (cont'd)

D5 Position: 1st gear shifting from the N position

Shift solenoid valves remain the same as in the N position when shifting to the D5 position from the N position. The manual valve moves to D5 position and switches the port of line pressure (4) leading to shift valve C and CPC valve B. Line pressure (4) flows to the 1st clutch via the orifice. Line pressure (1) becomes CPC C pressure (4C) at CPC valve C, then goes to the 1st accumulator back side. Line pressure (4) also becomes CPC B pressure (4B) at the CPC B valve. CPC B pressure goes to the 3rd clutch, via the shift valves C, B, and A, and the 3rd clutch is engaged. The 1st clutch is engaged gently when shifting to the D5 position from the N position.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



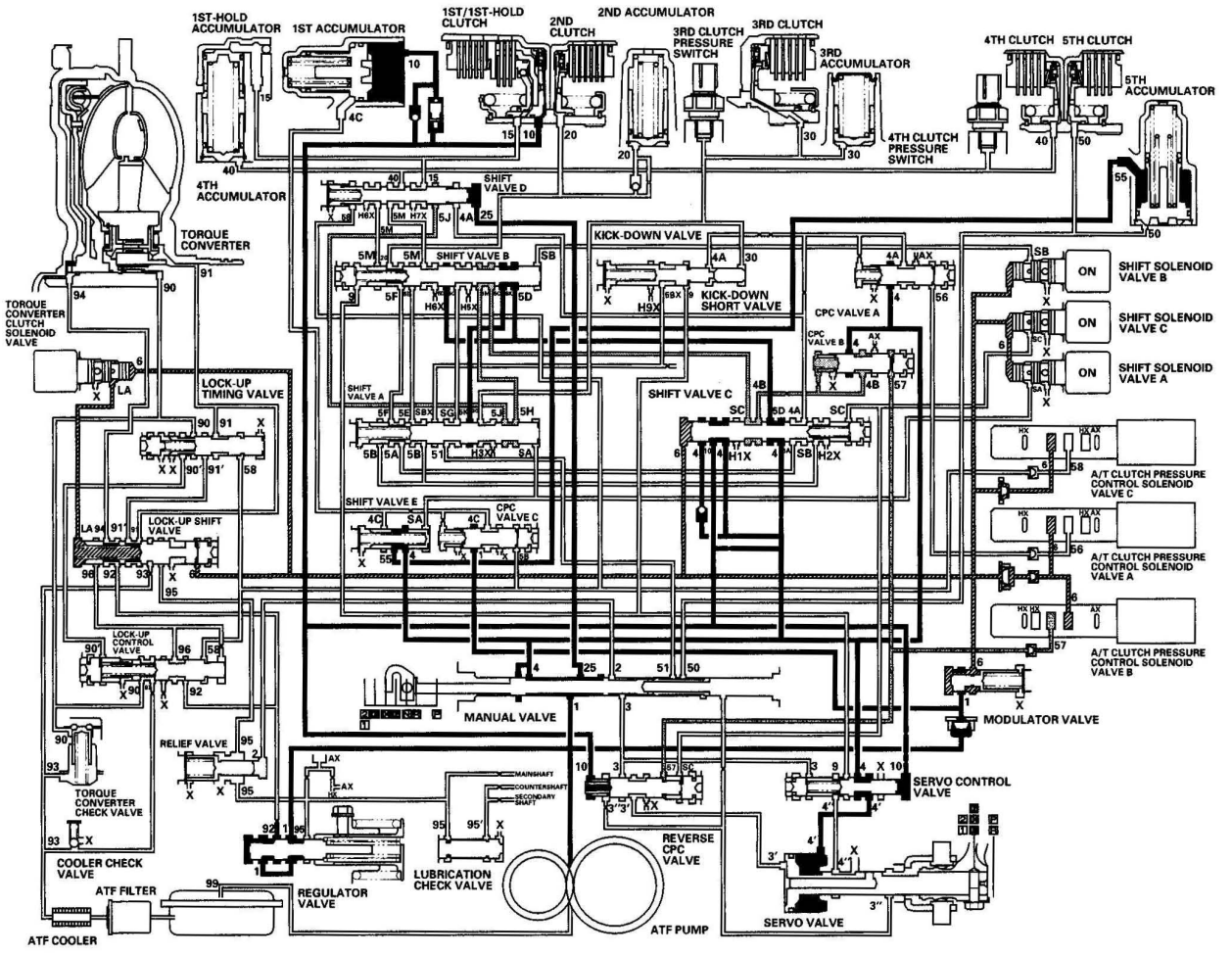
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D6 Position: Driving in 1st gear

The PCM turns shift solenoid valves A and C ON, and shift solenoid valve B remains ON. SH A pressure (SA) in the right side of shift valves A and E is released, and shift valves A and E are moved to the right side. SH C pressure (SC) in the right side of shift valve C is released, and modulator pressure (6) is applied to the left side of shift valve C. Shift valve C is moved to the right side. These valve movements release CPC C pressure (4C) from the back of the 1st accumulator and the 3rd clutch, and the 1st clutch is engaged securely.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



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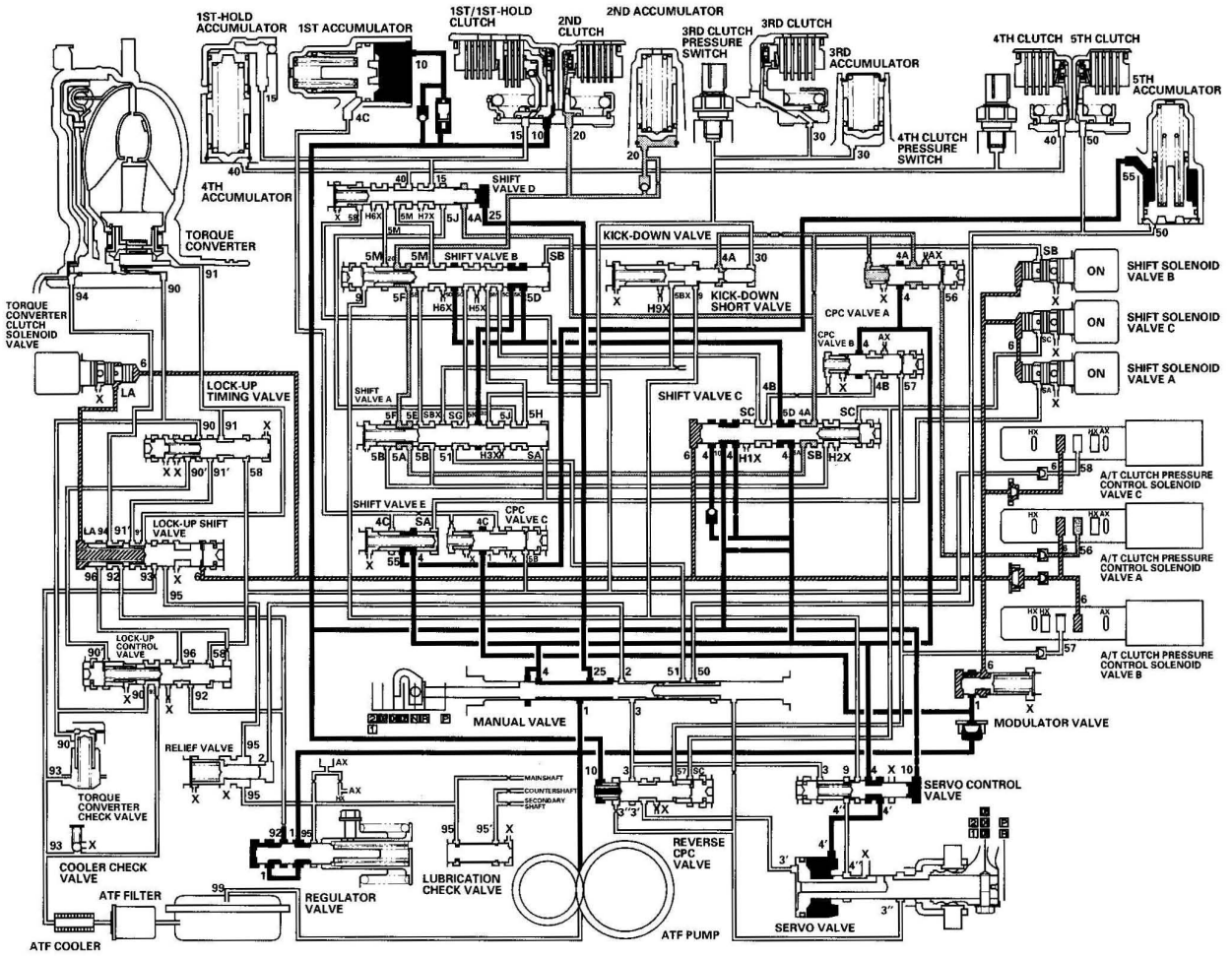
System Description (cont'd)

Hydraulic Flow (cont'd)

D5 Position: Shifting between 1st gear and 2nd gear

As the speed of the vehicle reaches the prescribed value, the PCM controls the A/T clutch pressure control solenoid valves A and B. LS B pressure (57) in the right side of CPC valve B is released, and LS A pressure (56) is applied to the right side of CPC valve A. Line pressure (4) becomes CPC A pressure (4A) at CPC valve A, and CPC A pressure passes through shift valves C, A, and B, to become 2nd clutch pressure. The 2nd clutch is engaged with CPC pressure, and the 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



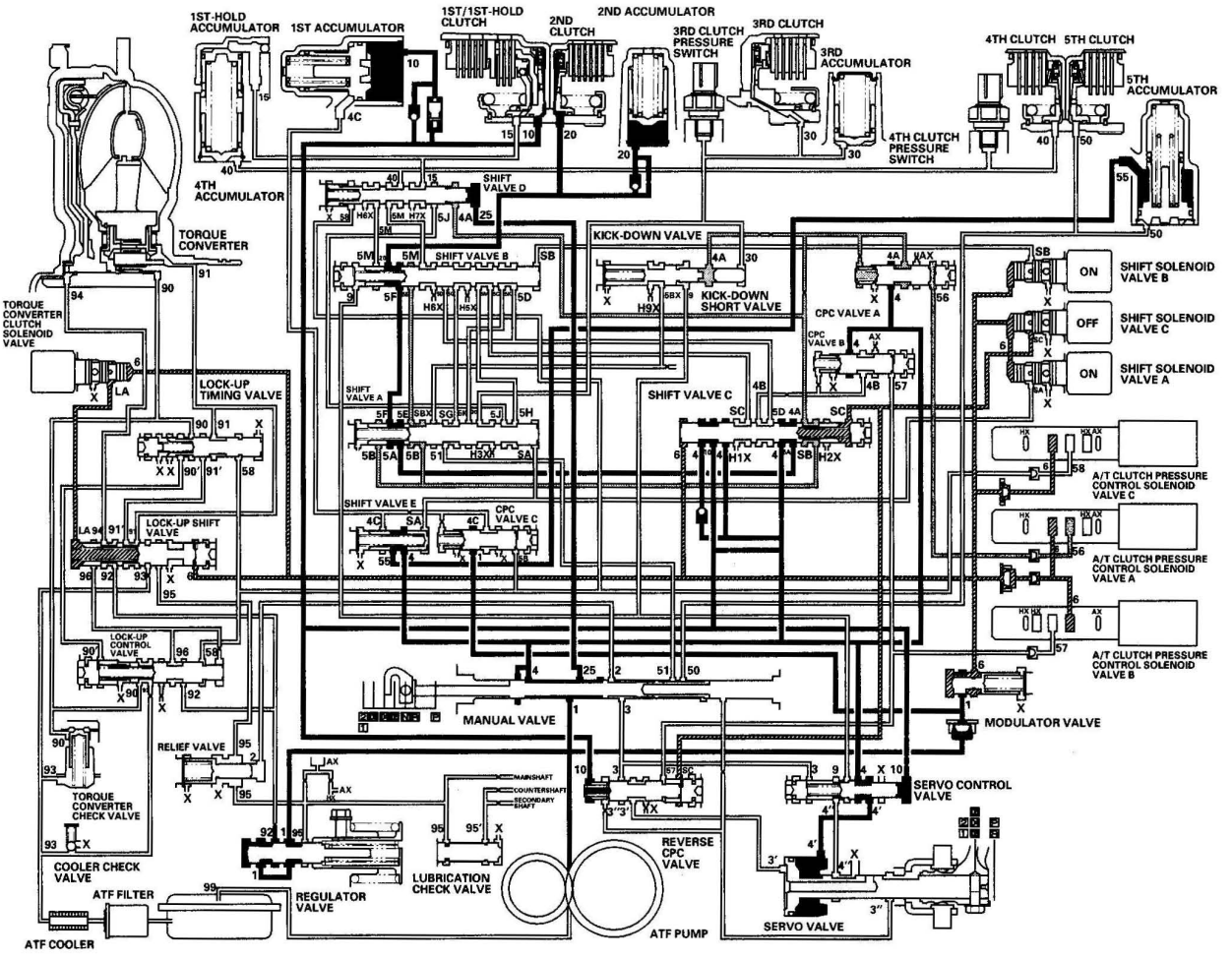
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D5 Position: Driving in 2nd gear

The PCM turns shift solenoid valve C OFF, and shift solenoid valves A and B remain ON. Shift solenoid valve C is turned OFF, and SH C pressure (SC) is applied to the right side of shift valve C. Then shift valve C is moved to the left side to switch the port of line pressure and CPC pressure. The 2nd clutch pressure is changed to line pressure mode, and the 2nd clutch is engaged securely. The 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



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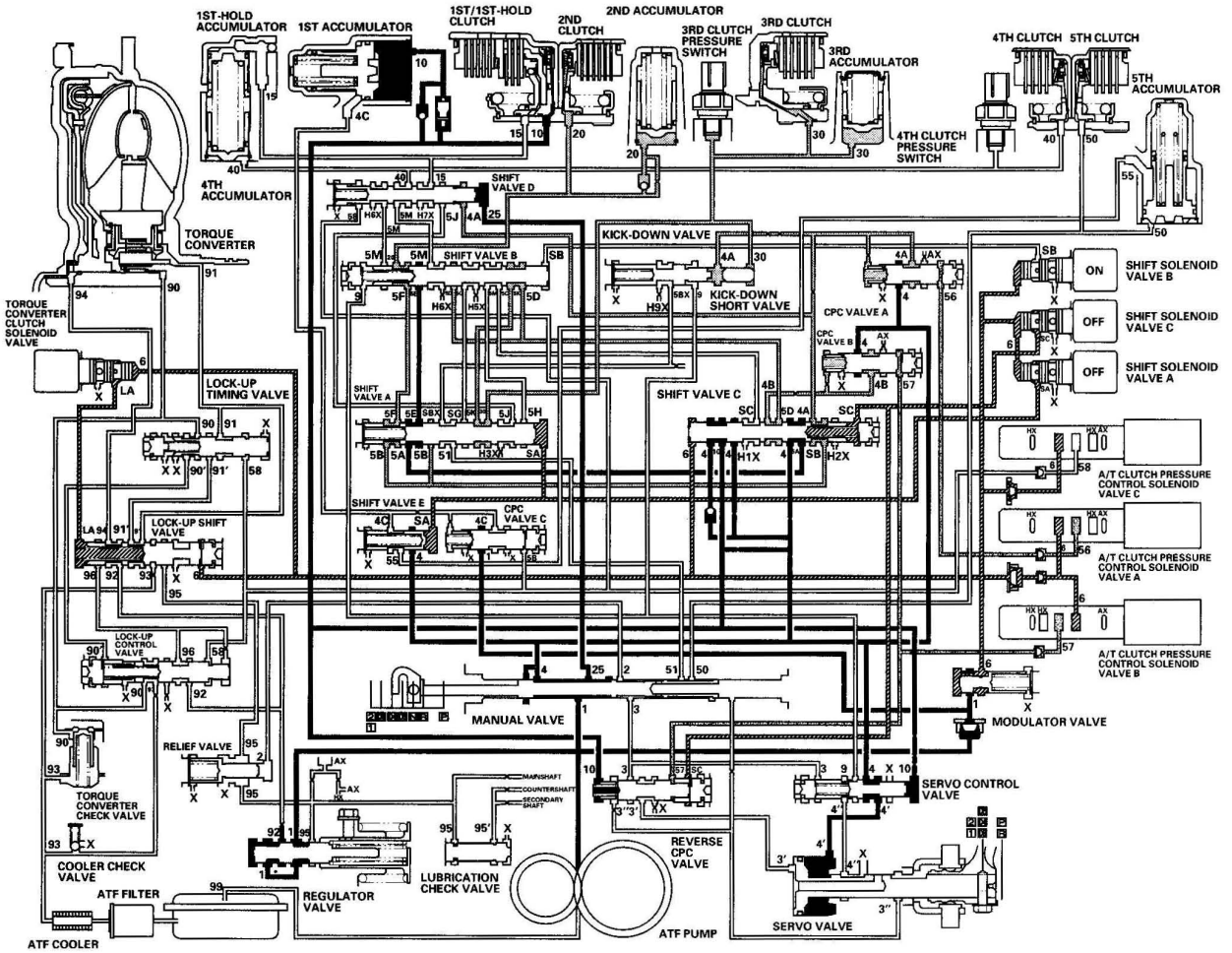
System Description (cont'd)

Hydraulic Flow (cont'd)

D5 Position: Shifting between 2nd gear and 3rd gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift solenoid valve A OFF. The PCM also controls the A/T clutch pressure control solenoid valve B to apply LS B pressure (57) to CPC valve B. Shift solenoid valve B remains ON, and C remains OFF. Shift solenoid valve A is turned OFF, and SH A pressure (SA) is applied to the right side of shift valves A and E. Then shift valves A and E are moved to the left side to switch the port of line pressure and CPC pressure. Line pressure (4) becomes CPC A pressure (4A) at CPC valve A, and becomes CPC B pressure (4B) at CPC valve B. CPC B pressure (4B) becomes 3rd clutch pressure (30) at shift valve A via shift valves C and B, and flows to the 3rd clutch. The 2nd clutch pressure is changed to CPC pressure mode by switching the position of shift valve A. The 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



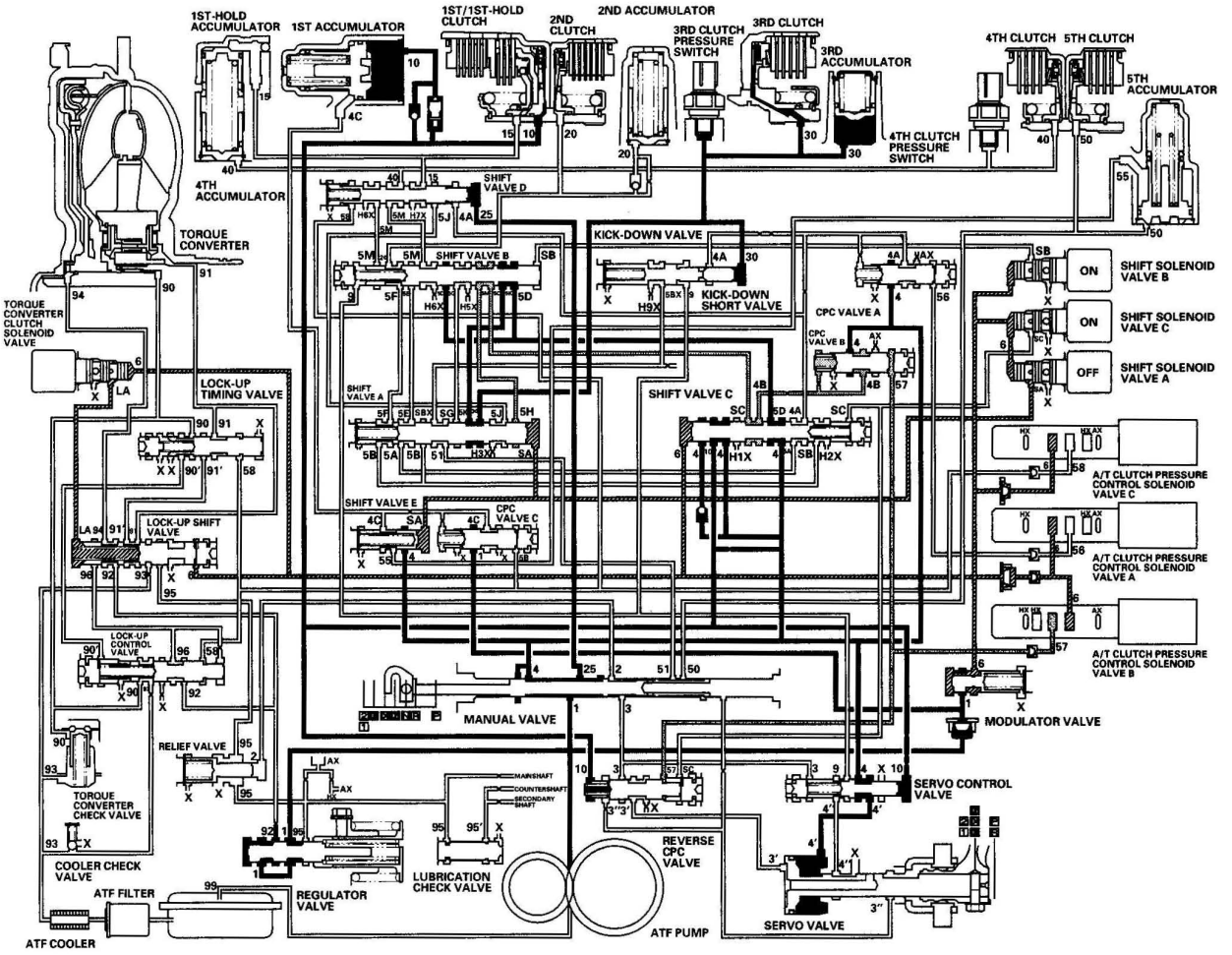
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D5 Position: Driving in 3rd gear

The PCM turns shift solenoid valve C ON, and controls A/T clutch pressure control solenoid valve A to release LS A pressure (56) in CPC valve A. Shift solenoid valve A remains OFF, and B remains ON. Releasing LS A pressure (56) in CPC valve A releases CPC A pressure in the 2nd clutch pressure circuit. Shift solenoid valve C is turned ON, and SH C pressure (SC) in the right side of shift valve C is released. Then shift valve C is moved to the right side to switch the port of line pressure and CPC pressure. The 3rd clutch pressure is changed to line pressure mode, and the 3rd clutch is engaged securely. The 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



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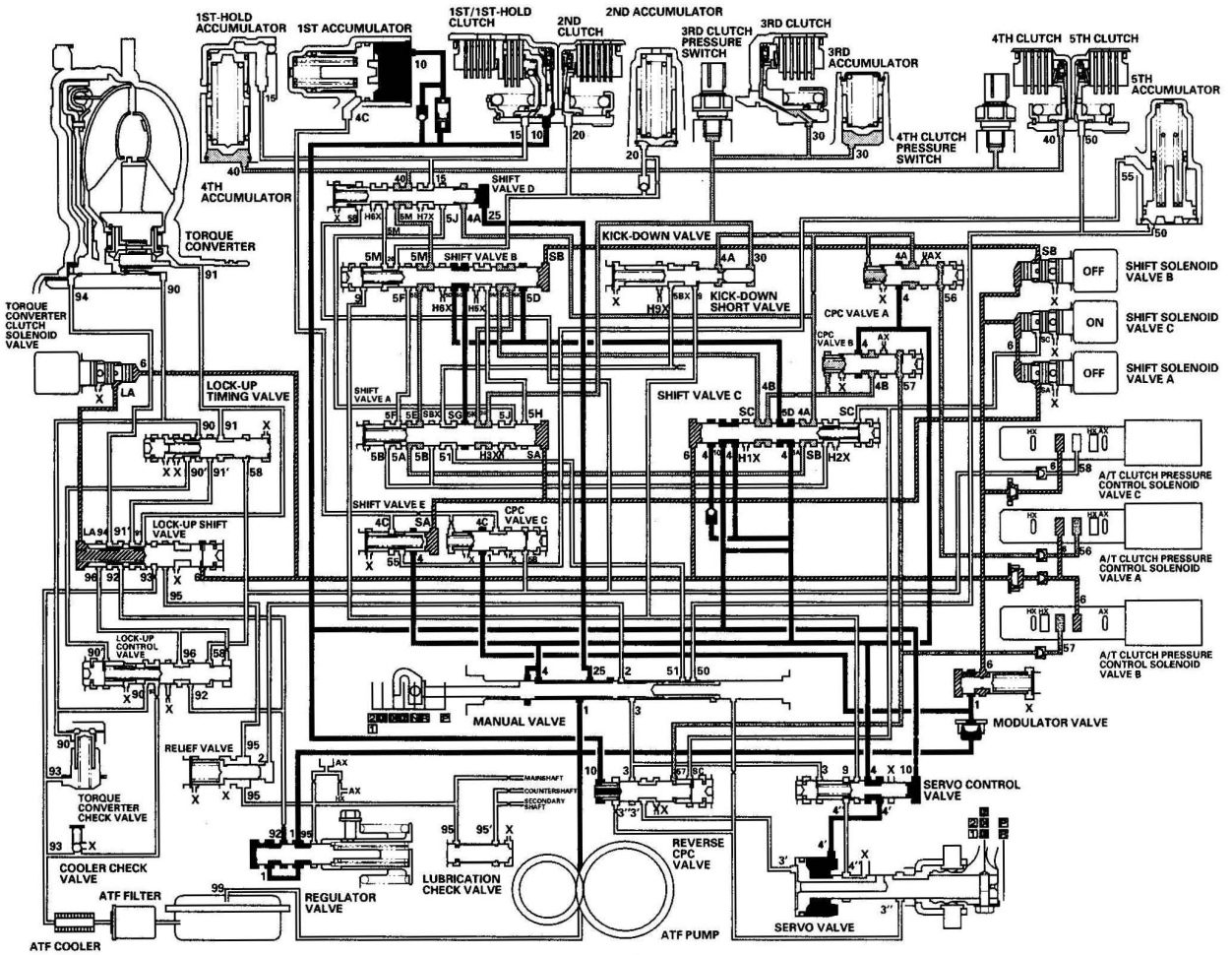
System Description (cont'd)

Hydraulic Flow (cont'd)

D5 Position: Shifting between 3rd gear and 4th gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift solenoid valve B OFF. The PCM also controls the A/T clutch pressure control solenoid valve A to apply LS A pressure (56) to CPC valve A. Shift solenoid valve A remains OFF, and C remains ON. Shift solenoid valve B is turned OFF, and SH B pressure (SB) is applied to the right side of shift valve B. Then shift valve B is moved to the left side to switch the port of line pressure and CPC pressure. Line pressure (4) becomes CPC A pressure (4A) at CPC valve A, and becomes CPC B pressure (4B) at CPC valve B. CPC A pressure (4A) becomes 4th clutch pressure (40) at shift valve D via shift valves C, A, and B, and flows to the 4th clutch. The 3rd clutch pressure is changed to CPC pressure mode by switching the position of shift valve B. The 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



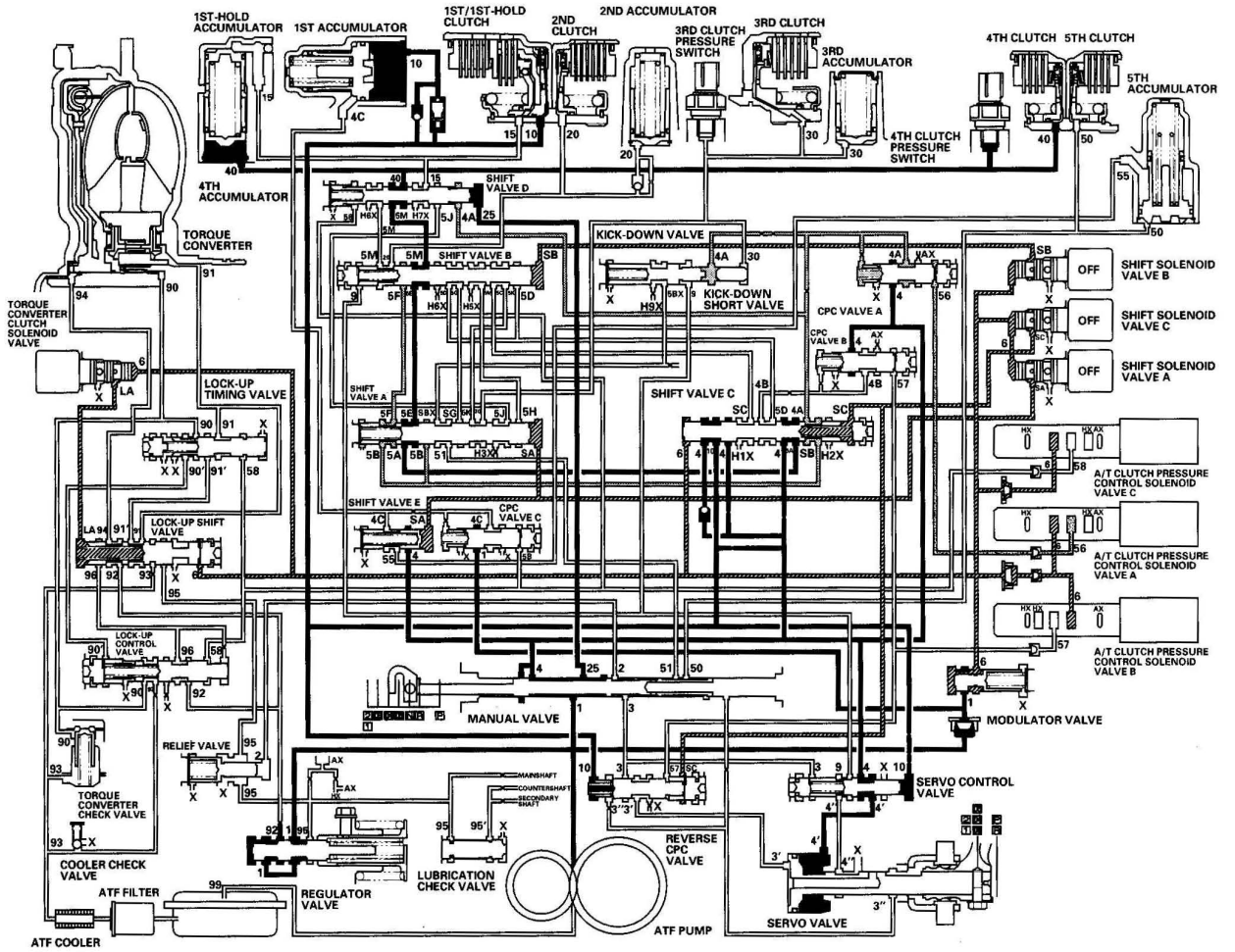
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D5 Position: Driving in 4th gear

The PCM turns shift solenoid valve C OFF, and controls A/T clutch pressure control solenoid valve B to release LS B pressure (57) in CPC valve B. Shift solenoid valves A and B remain OFF. Releasing LS B pressure (57) in CPC valve B releases CPC B pressure in the 3rd clutch pressure circuit. Shift solenoid valve C is turned OFF, and SH C pressure (SC) is applied to the right side of shift valve C. Then shift valve C is moved to the left side to switch the port of line pressure and CPC pressure. Line pressure (4) from the manual valve becomes 4th clutch pressure (40) at shift valve D via shift valves C, A, and B, and flows to the 4th clutch. The 4th clutch pressure is changed to line pressure mode by switching the position of shift valve C, and the 4th clutch is engaged securely. The 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



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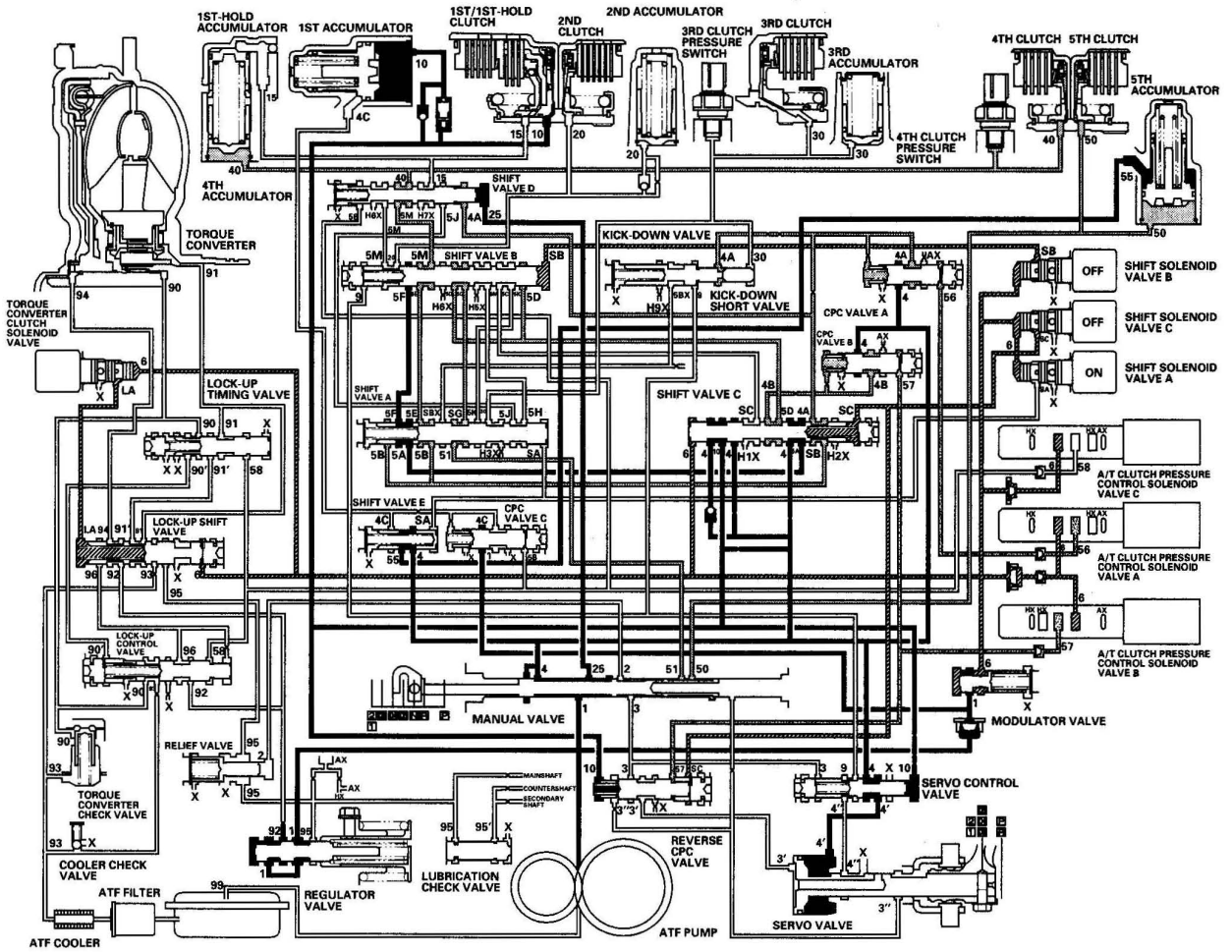
System Description (cont'd)

Hydraulic Flow (cont'd)

D5 Position: Shifting between 4th gear and 5th gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift solenoid valve A ON. The PCM also controls the A/T clutch pressure control solenoid valve B to apply LS B pressure (57) to CPC valve B.
Shift solenoid valves B and C remain OFF. Shift solenoid valve A is turn ON, and SH A pressure (SA) in the right side of shift valves A and E is released. Then shift valves A and E are moved to the left side to switch the port of line pressure and CPC pressure. Line pressure (4) becomes CPC A pressure (4A) at CPC valve A, and becomes CPC B pressure (4B) at CPC valve B. CPC B pressure (4B) becomes 5th clutch pressure (50) at shift valve C, and flows to the 5th clutch via shift valves B and A and the manual valve. The 4th clutch pressure is changed to CPC pressure mode by switching the position of shift valve A. The 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



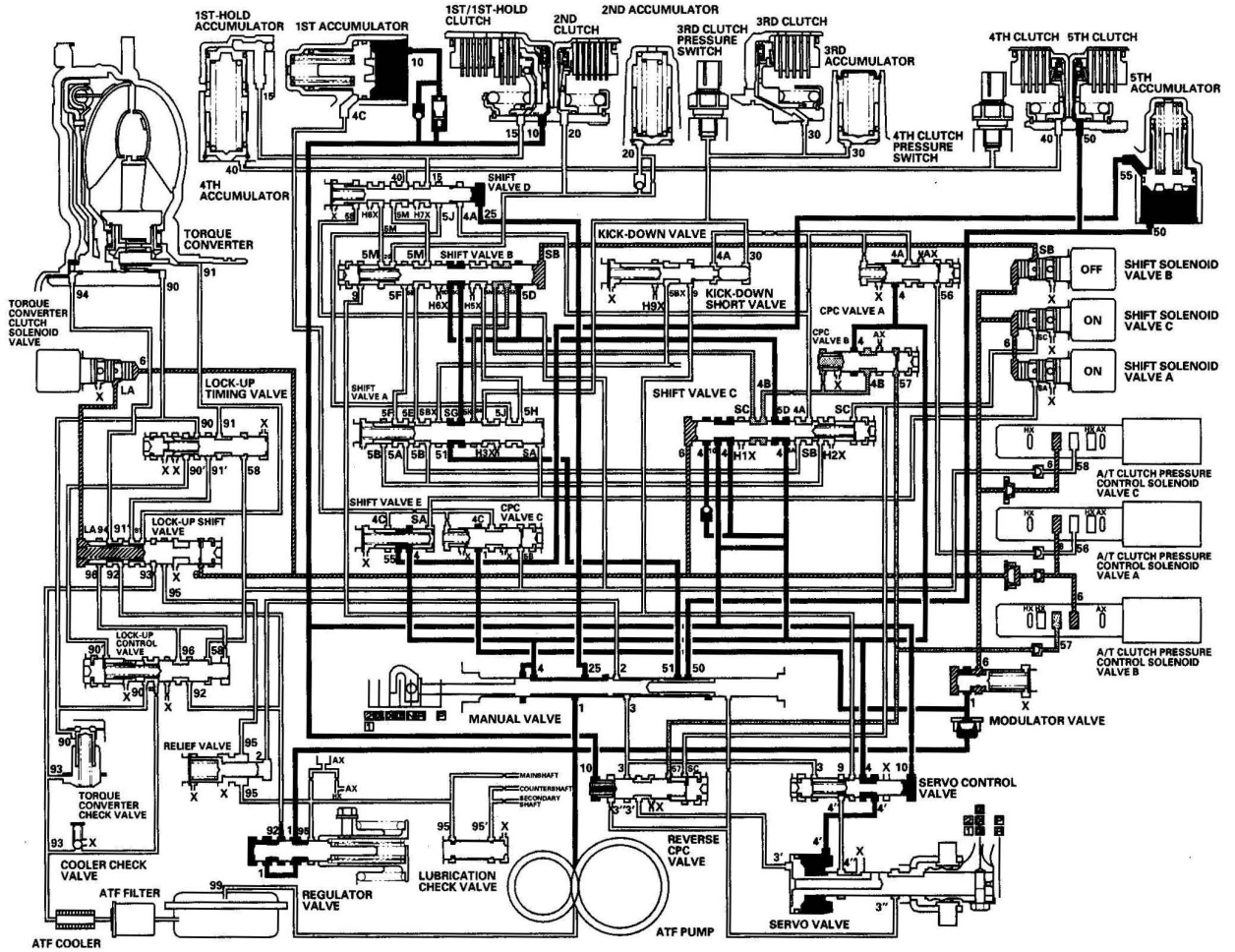
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D5 Position: Driving in 5th gear

The PCM turns shift solenoid valve C ON, and controls A/T clutch pressure control solenoid valve A to release LS A pressure (56) in CPC valve A. Shift solenoid valve A remains ON, and B remains OFF. Releasing LS A pressure (56) in CPC valve A releases CPC A pressure in the 4th clutch pressure circuit. Shift solenoid valve C is turned ON, and SH C pressure (SC) in the right side of shift valve C is released. Then shift valve C is moved to the right side to switch the port of line pressure and CPC pressure. Line pressure (4) from the manual valve becomes 5th clutch pressure (50) at the manual valve, via shift valves C, B, and A, and flows to the 5th clutch. The 5th clutch pressure is changed to line pressure mode by switching the position of shift valve C. The 5th clutch is engaged securely, and the 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

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System Description (cont'd)

Hydraulic Flow (cont'd)

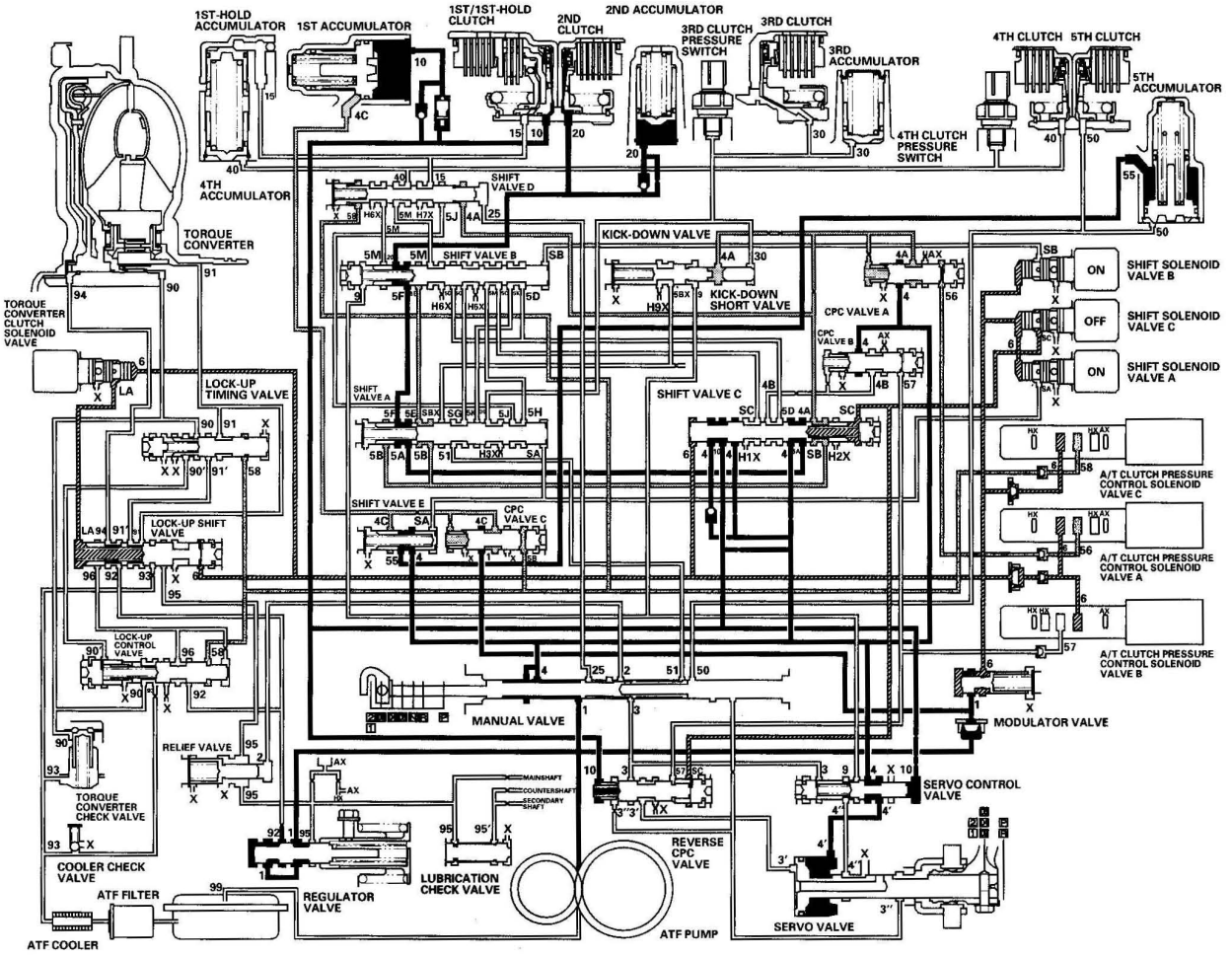
2 Position

The PCM controls the shift solenoid valves and the A/T clutch pressure control solenoid valves A and B. The conditions of the shift solenoid valves and the position of the shift valves are as follows:

- Shift solenoid valve A is turned ON, and shift valve A is in the right side.
- Shift solenoid valve B is turned ON, and shift valve B is in the right side.
- Shift solenoid valve C is turned OFF, and shift valve C is in the left side.

The PCM also controls A/T clutch pressure control solenoid valve A to apply LS A pressure (56) to CPC valve A. Line pressure (4) from the manual valve becomes 2nd clutch pressure (20) at shift valve B, via shift valves C and A. 2nd clutch pressure (20) is applied to the 2nd clutch, and the 2nd clutch is engaged. The 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



BACK

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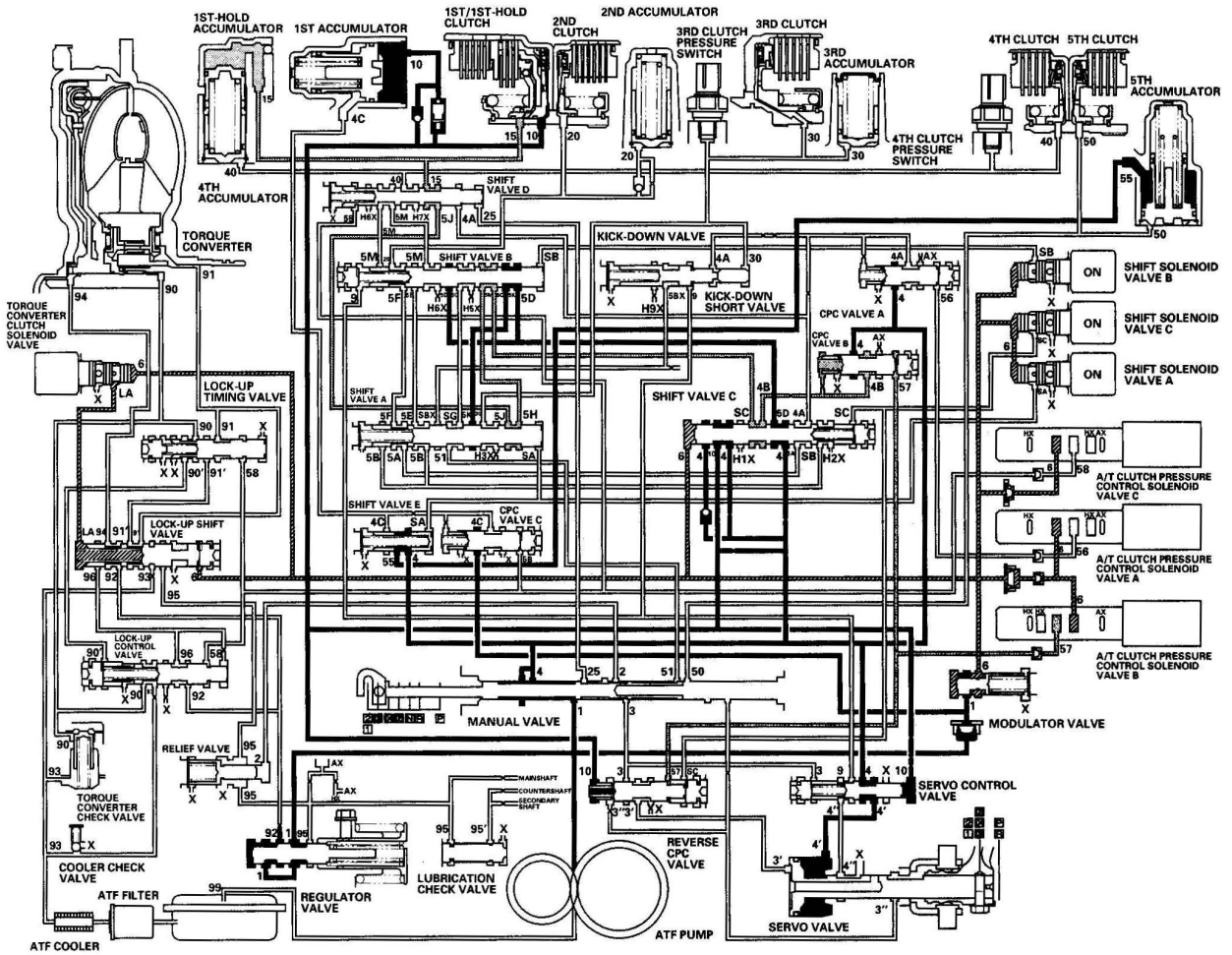
1 Position

The PCM controls the shift solenoid valves and the A/T clutch pressure control solenoid valves A and B. The conditions of the shift solenoid valves and the position of the shift valves are as follows:

- Shift solenoid valve A is turned ON, and shift valve A is in the right side.
- Shift solenoid valve B is turned ON, and shift valve B is in the right side.
- Shift solenoid valve C is turned ON, and shift valve C is moved to the right side by modulator pressure (6).

The PCM also controls A/T clutch pressure control solenoid valve B to apply LS B pressure (57) to CPC valve B. Line pressure (4) from the manual valve becomes 1st clutch pressure (10) at shift valve C. 1st clutch pressure (10) is applied to the 1st clutch, and the 1st clutch is engaged. Line pressure (4) also flows to CPC valve B, and becomes CPC B pressure (4B). CPC B pressure (4B) becomes 1st-hold clutch pressure (15) at shift valve D, via shift valves C, B, and A. 1st-hold clutch pressure (15) is applied to the 1st-hold clutch, and the 1st-hold clutch is engaged.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Protected by AR

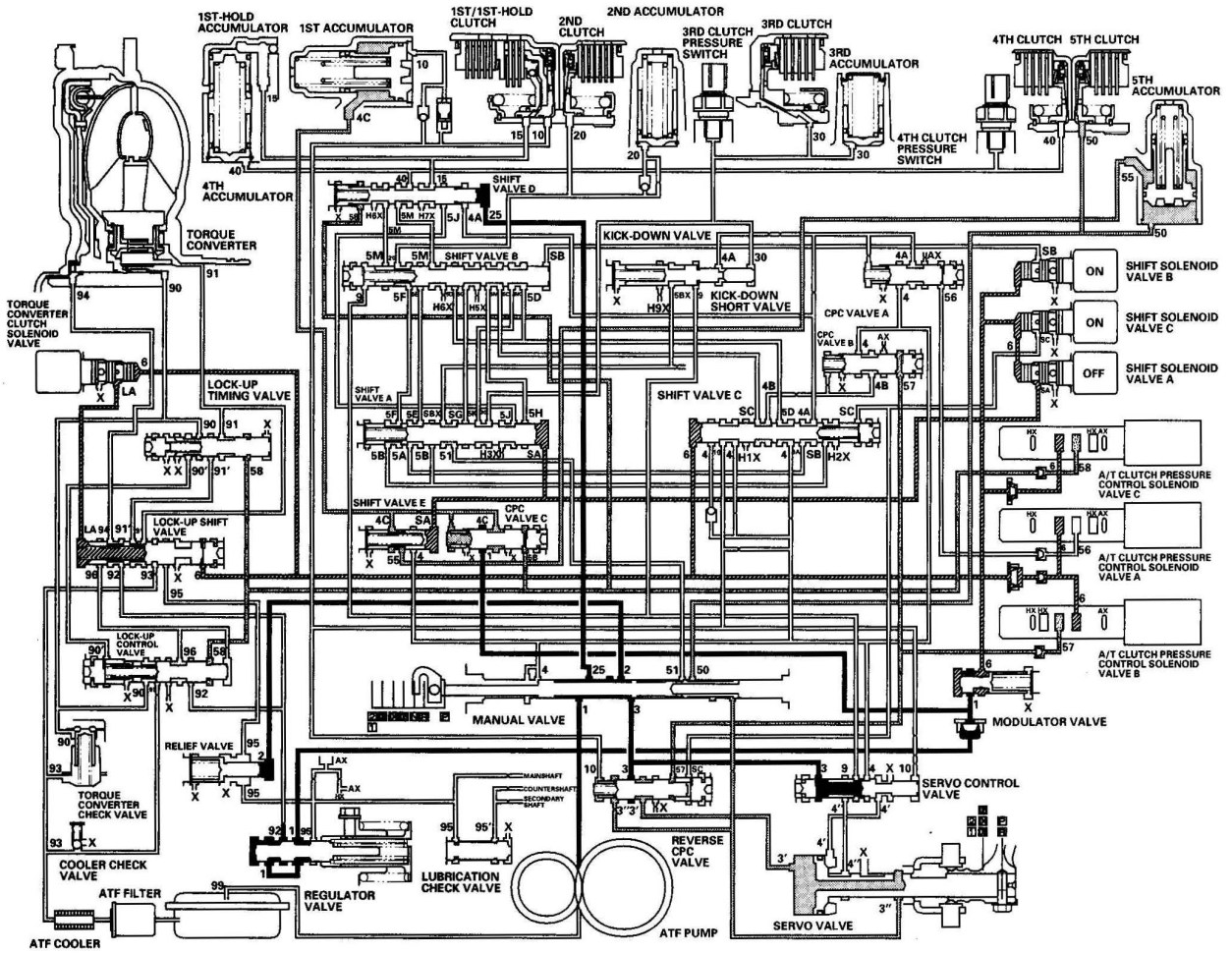
System Description (cont'd)

Hydraulic Flow (cont'd)

[R] Position: Shifting to the [R] position from the [P] or [N] position

Line pressure (1) becomes line pressure (3) at the manual valve, and flows to the reverse CPC valve. Line pressure (3) is regulated by the reverse CPC valve and becomes line pressure (3'). Line pressure (3') pushes the servo valve to the reverse position, passes through the servo valve, and flows to the manual valve. Line pressure (3'') becomes 5th clutch pressure (50). The 5th clutch pressure (50) is applied to the 5th clutch, and 5th clutch is engaged with reverse CPC pressure.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



BACK

Protected by AR

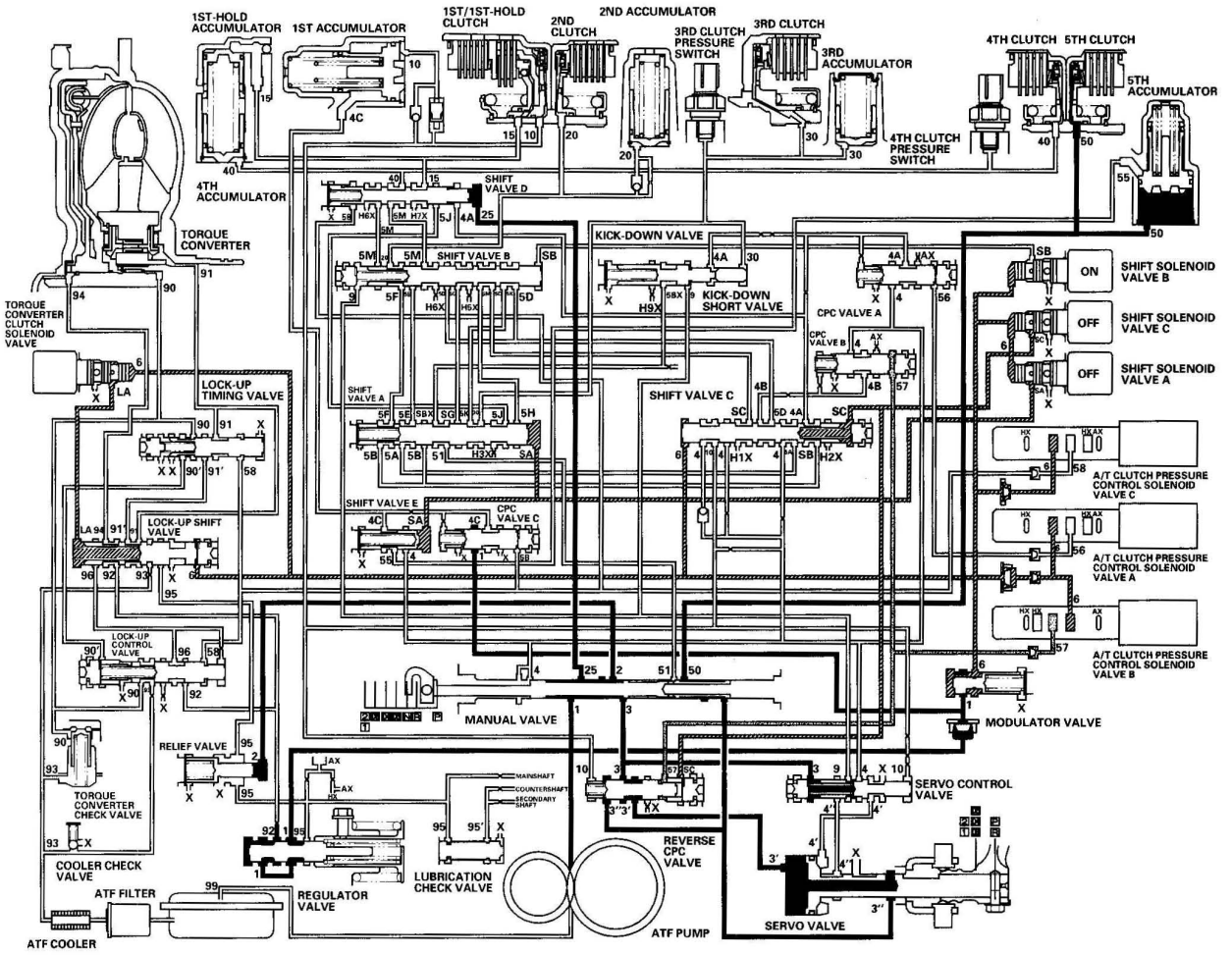
R Position: Driving in reverse gear

The PCM turns shift solenoid valve C OFF. Shift solenoid valve A remains OFF and B remains ON. Shift solenoid valve C is turned OFF, and SH C pressure (SC) is applied to the right side of the reverse CPC valve. Then the reverse CPC valve moves to the left side, creating full line pressure. Line pressure to the 5th clutch is the same as when shifting to the R position, and 5th clutch pressure increases. The 5th clutch is engaged with line pressure.

Reverse Inhibitor Control

When the R position is selected while the vehicle is moving forward at speed over 6 mph (10 km/h), the PCM outputs to turn the shift solenoid valves A and C ON, and shift solenoid valve B remains ON. The reverse CPC valve is moved to right side and covers the port to stop the line pressure (3') to the servo valve. The line pressure (3') is not applied to the servo valve, and the 5th clutch pressure (50) is not applied to the 5th clutch, as a result, power is not transmitted to the reverse direction.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Protected by AR

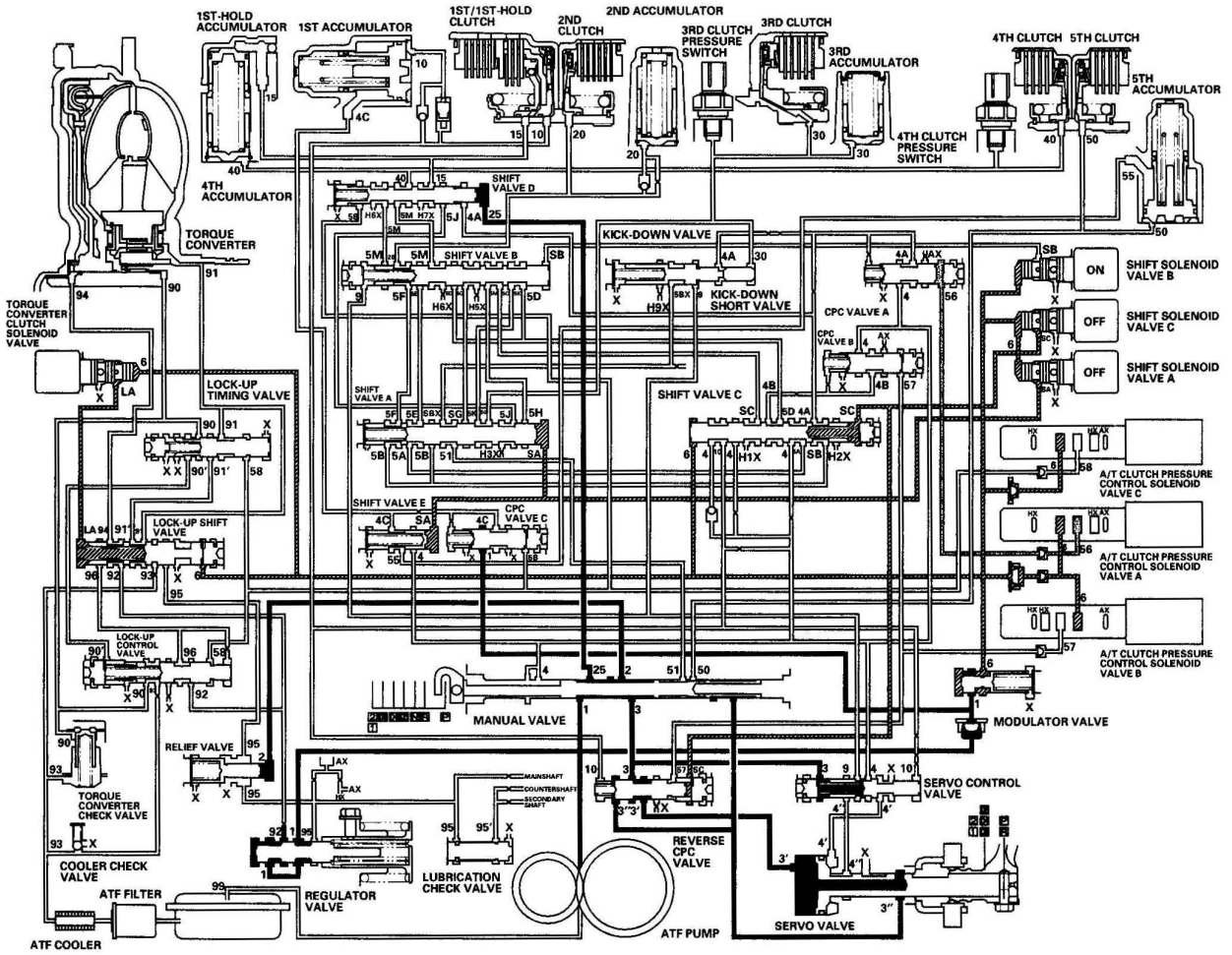
System Description (cont'd)

Hydraulic Flow (cont'd)

P Position

Shift solenoid valve C is turned OFF by the PCM, and SH C pressure (SC) is applied to the right side of the reverse CPC valve. Then the reverse CPC valve is moved to the left side to uncover the port leading line pressure (3) to the servo valve. Line pressure (3') passes through the servo valve and flows to the manual valve. Line pressure (3'') is intercepted at the manual valve, and is not applied to the clutches.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



BACK

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Lock-up System

In the D5 position (2nd, 3rd, 4th, and 5th), in the D4 position (2nd, 3rd and 4th), and D3 position (2nd and 3rd), pressurized fluid is drained from the back of the torque converter through a fluid passage, causing the lock-up piston to be held against the torque converter cover. As this takes place, the mainshaft rotates at the same speed as the engine crankshaft. Together with hydraulic control, the PCM optimizes the timing of the lock-up mechanism. When the torque converter clutch solenoid valve activates, modulator pressure changes to switch lock-up ON and OFF. The lock-up control valve and the lock-up timing valve control the range of lock-up according to A/T clutch pressure control solenoid valve C. The torque converter clutch solenoid valve is mounted on the torque converter housing, and A/T clutch pressure control solenoid valve C is mounted on the transmission housing. They are controlled by the PCM.

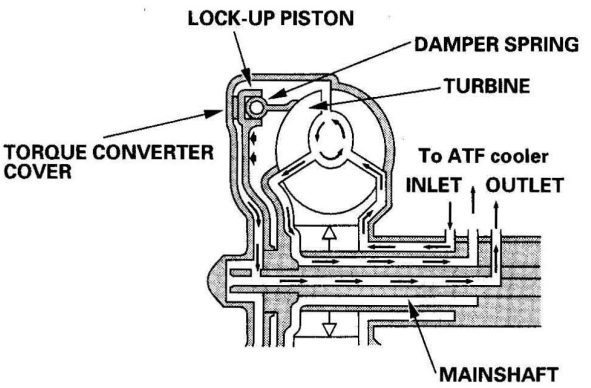
General Operation

1. Operation (clutch on)
   With the lock-up clutch on, fluid in the chamber between the torque converter cover and the lock-up piston is drained off, and the converter fluid exerts pressure through the piston against the torque converter cover. As a result, the converter turbine is locked to the converter cover. The effect is to bypass the converter, placing the vehicle in direct drive.

Power flow

The power flows by way of:

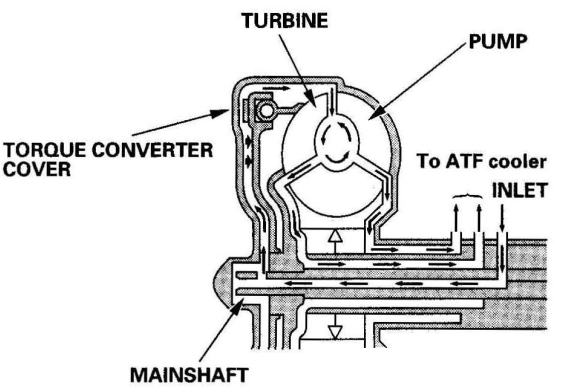
Engine
↓
Drive plate
↓
Torque converter cover
↓
Lock-up piston
↓
Damper spring
↓
Turbine
↓
Mainshaft



2. Operation (clutch off)
   With the lock-up clutch off, fluid flows in the reverse of CLUTCH ON. As a result, the lock-up piston moves away from the converter cover, and torque converter lock-up is released.

Power flow

Engine
↓
Drive plate
↓
Torque converter cover
↓
Pump
↓
Turbine
↓
Mainshaft



(cont'd)

BACK

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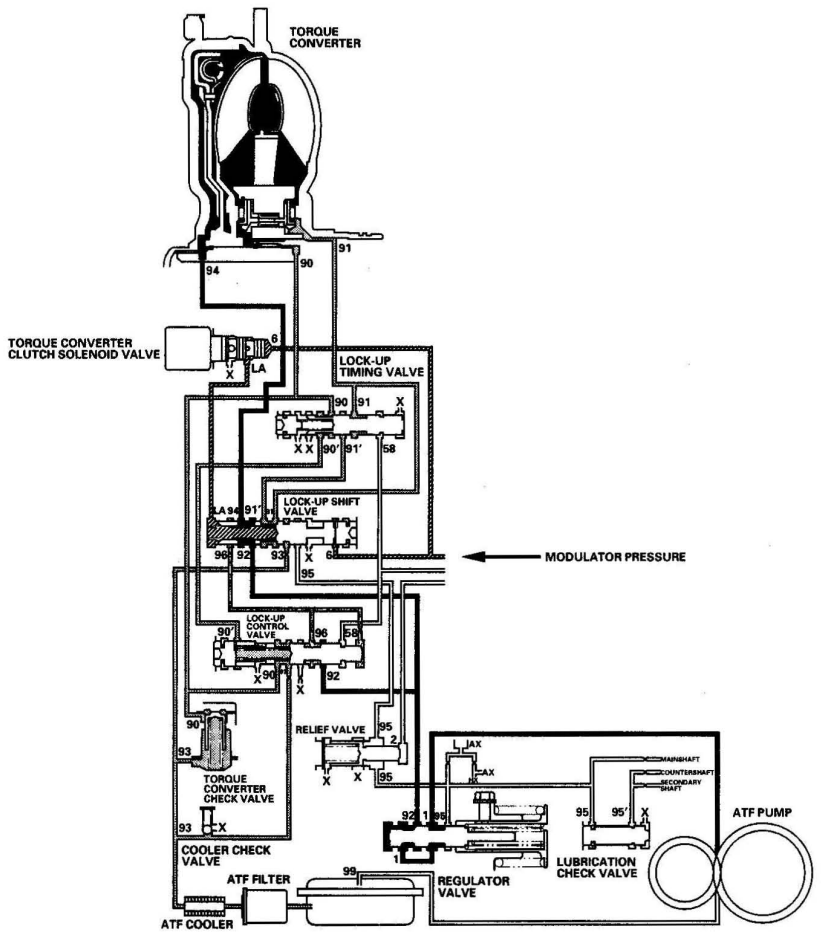
System Description (cont'd)

Lock-up System (cont'd)

No Lock-up

The torque converter clutch solenoid valve is turned OFF by the PCM. The lock-up shift valve receives LC pressure (LA) on the left side, and modulator pressure (6) on the right side. The lock-up shift valve is in the right side to uncover the port leading torque converter pressure (92) to the left side of the torque converter. Torque converter pressure (92) becomes torque converter pressure (94), and enters into the left side of the torque converter to disengage the lock-up clutch. The lock-up clutch is OFF.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



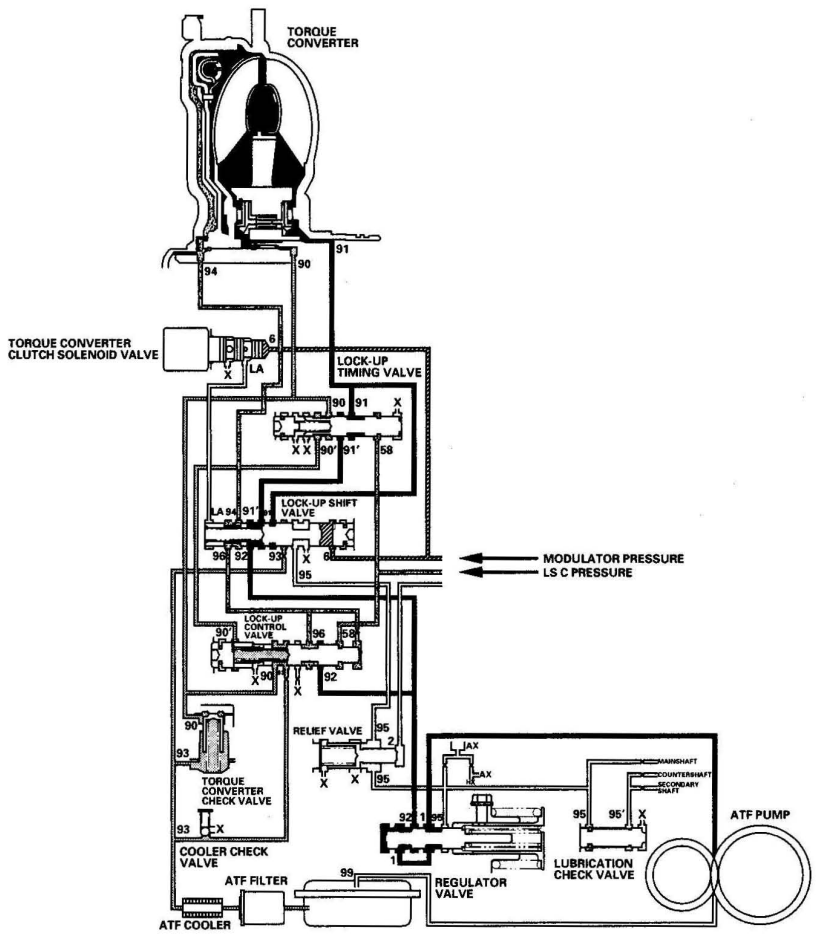
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Partial Lock-up

As the speed of the vehicle reaches the prescribed value, the torque converter clutch solenoid valve is turned ON by the PCM to release LC pressure (LA) in the left cavity of the lock-up shift valve. Modulator pressure (6) is applied to the right side of the lock-up shift valve, then the lock-up shift valve is moved in the left side to switch the port leading torque converter pressure to the right side of the torque converter. Torque converter pressure (91) is applied to the right side of the torque converter to engage the lock-up clutch. The PCM also controls A/T clutch pressure control solenoid valve C, and LS C pressure (58) is applied to the lock-up control valve and the lock-up timing valve. When LS C pressure (58) is lower, torque converter pressure (91) from the lock-up timing valve is lower. The lock-up clutch is engaged partially. LS C pressure (58) increases, and the lock-up timing valve is moved to the left side to uncover the port leading torque converter pressure to high. The lock-up clutch is then engaged securely. Under this condition, the lock-up clutch is engaged by pressure from the right side of the torque converter; this condition is partial lock-up.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

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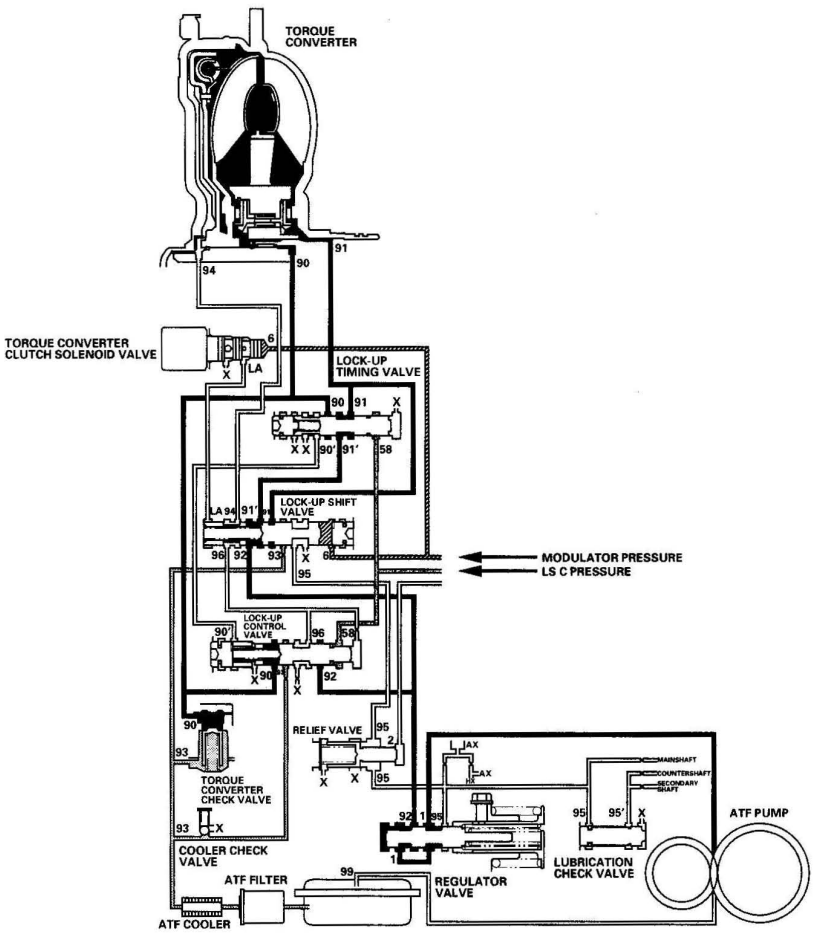
System Description (cont'd)

Lock-up System (cont'd)

Full Lock-up

When the vehicle speed further increases, the PCM controls A/T clutch pressure control solenoid valve C to increase LS C pressure (58). The LS C pressure (58) is applied to the lock-up control valve and the lock-up timing valve, and moves them to the left side. Under this condition, torque converter back pressure is released fully, causing the lock-up clutch to be fully engaged.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.

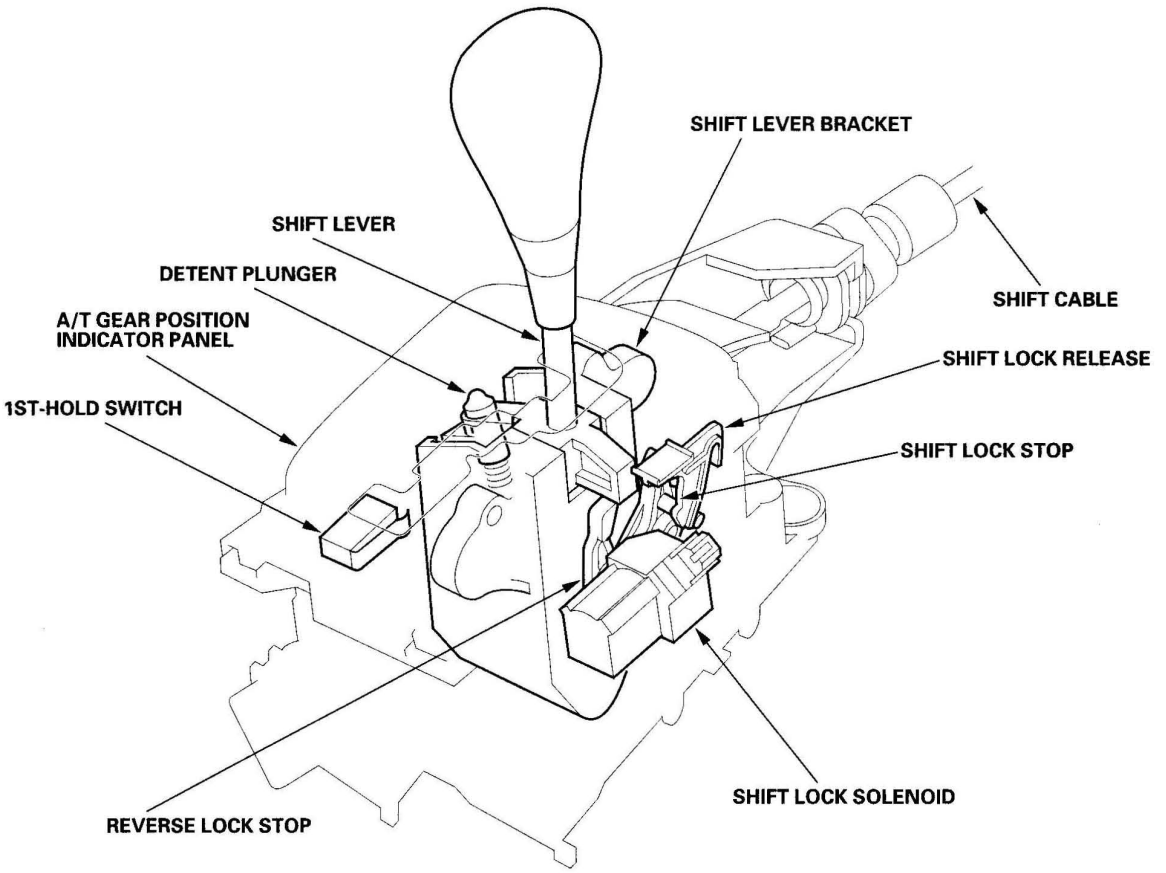


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Shift Lever

The shift lever has eight positions: [P], [R], [N], [D5], [D4], [D3], [2], [1] positions. The shift lever shifts between positions along the gate in the A/T gear position indicator panel. The shift lever can shift out of the [P] position and into the [R] position without pressing the shift lever. The shift lock/reverse lock mechanism is an additional shift lever lockout mechanism.



(cont'd)

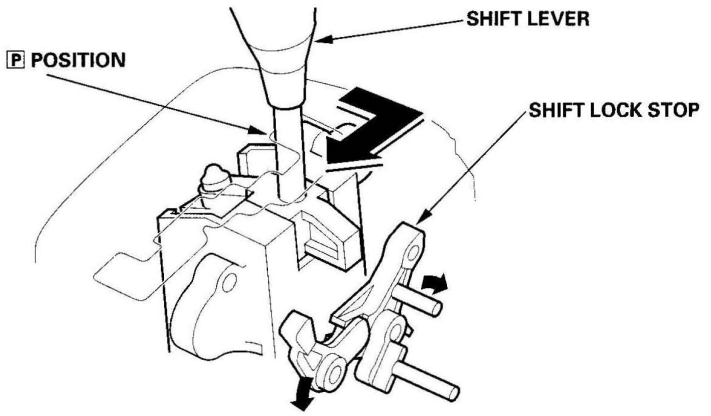
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System Description (cont'd)

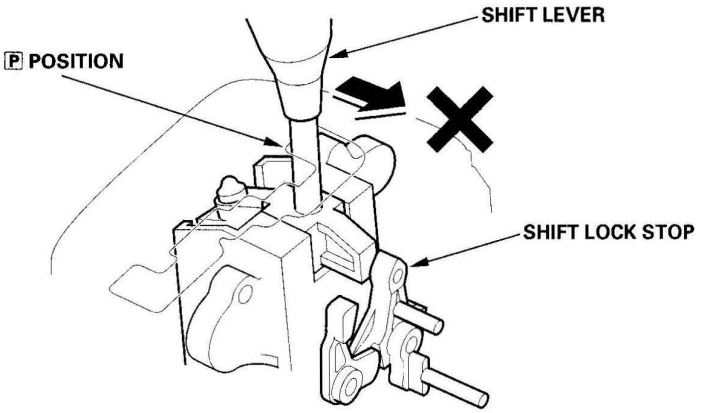
Shift Lock/Reverse Lock Mechanism

The shift lock system reduces the risk of unintentional engine starting. Starting the engine is possible only in the P and N positions. The shift lock system and the key interlock system make up the interlock control system. The key interlock mechanism is located in the steering lock assembly.
The shift lock mechanism consists of the shift lock solenoid, shift lock stop, shift lock release, and related parts. The reverse lock mechanism shares the shift lock solenoid with the shift lock mechanism. The reverse lock stop and the shift lock stop are interlocked with the shift lock solenoid operation. The shift lock solenoid is electronically controlled by these shift lock control system signals: brake pedal position switch signal, interlock control signal, and transmission range switch P position signal. If the shift lock solenoid does not operate, the shift lock/reverse lock mechanism can be released by pressing the shift lock release.

In the P position while pressing the brake pedal, the shift lock solenoid is turned ON, and the shift lock solenoid plunger is retracted to release the shift lock stop. This allows the shift lever to be moved.



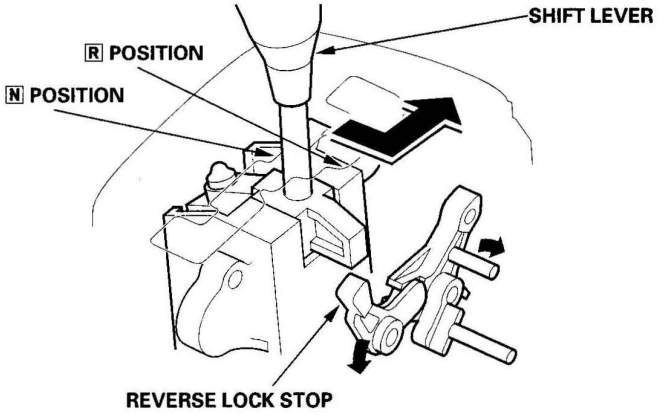
When the brake pedal is released, the shift lock solenoid remains OFF, and the shift lock stop locks to block the shift lever in the P position.



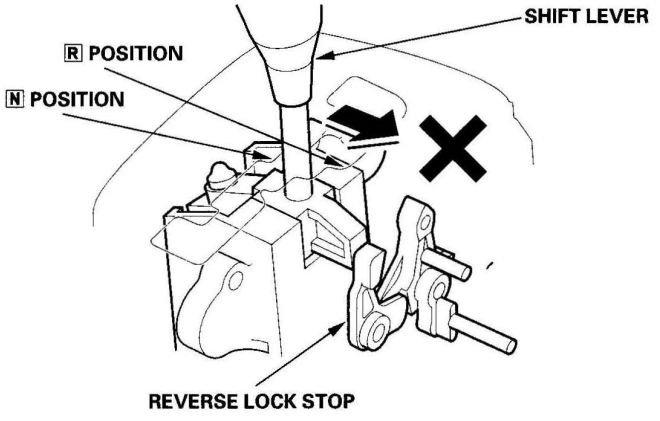
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When the shift lever is shifted to the R position from the D5 position and N position (under certain conditions), the shift lock solenoid is turned ON, and the shift lock solenoid plunger is retracted to release the reverse lock stop. This allows the shift lever to be moved to the R position.



If the allowable conditions of turning ON the solenoid are not met, the shift lock solenoid remains OFF, and the reverse lock stop locks to block the shift lever in the N position.

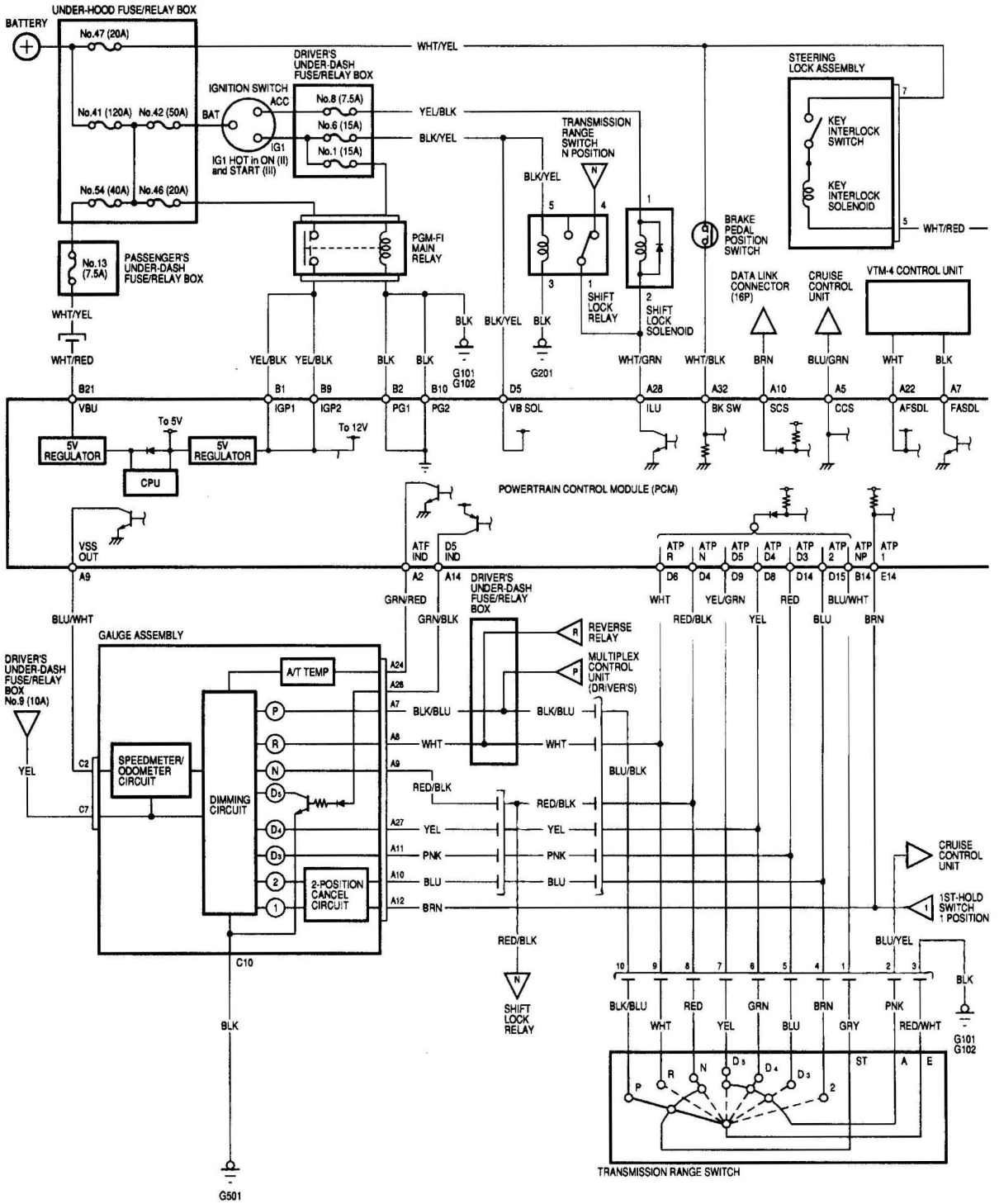


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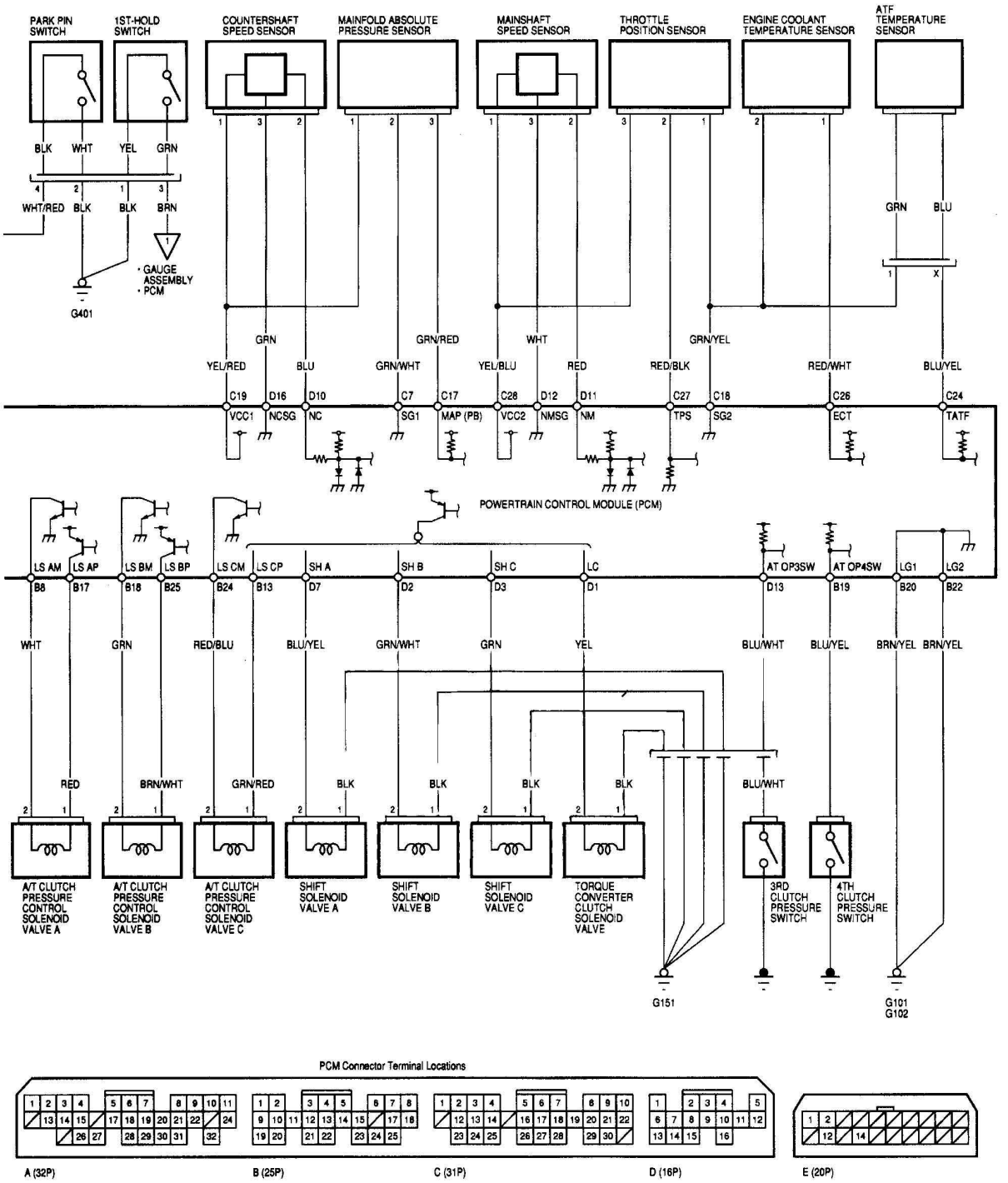
System Description (cont'd)

Circuit Diagram



BACK

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BACK

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DTC Troubleshooting

DTC P0710: A Problem in ATF Temperature Sensor Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Check whether the OBD II scan tool indicates a code for the fuel and emissions system.

   Does the OBD II scan tool indicate a code for the fuel and emissions system?

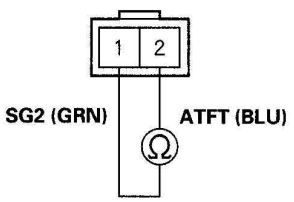
   YES – Perform the troubleshooting flowchart for the fuel and emissions system code. Recheck for code P0710 after troubleshooting. ■

   NO – Go to step 2.

2. Disconnect the 2P connector from the ATF temperature sensor harness.

3. Measure ATF temperature sensor resistance at the sensor connector terminals.

ATF TEMPERATURE SENSOR CONNECTOR



Terminal side of male terminals

Is the resistance 50 Ω – 2.5 kΩ ?

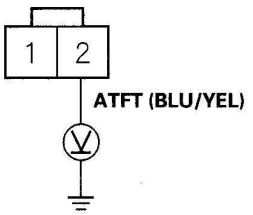
YES – Go to step 4.

NO – Replace the ATF temperature sensor. ■

4. Turn the ignition ON (II).

5. Measure the voltage between the No. 2 terminal of the ATF temperature sensor connector and body ground.

ATF TEMPERATURE SENSOR CONNECTOR



Wire side of female terminals

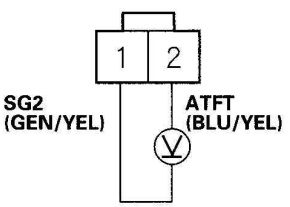
Is there about 5 V?

YES – Go to step 6.

NO – Go to step 7.

6. Measure the voltage between the No. 1 and No. 2 terminals of the ATF temperature sensor connector.

ATF TEMPERATURE SENSOR CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES – Check for loose terminal fit at the PCM connector terminals C24, C18 and at the ATF temperature sensor. If necessary, substitute a known-good PCM and recheck. If the DTC recurrs, substitute a know-good ATF temperature sensor. ■

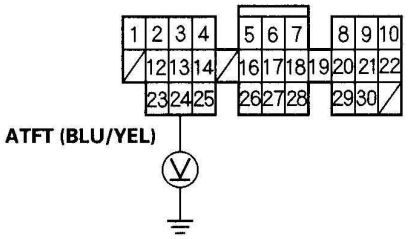
NO – Repair open in the wire between PCM connector terminal C18 and the ATF temperature sensor. ■

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7. Measure the voltage between PCM connector terminal C24 and body ground.

PCM CONNECTOR C (31P)



Wire side of female terminals

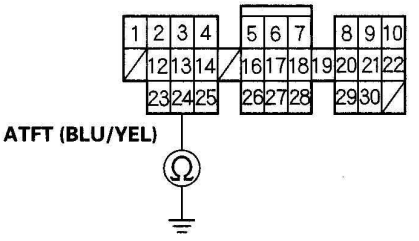
Is there about 5 V?

YES—Repair open in the wire between PCM connector terminal C24 and the ATF temperature sensor. Check fit at all terminals from C24 to the sensor.■

NO—Go to step 8.

8. Turn the ignition switch OFF.
9. Disconnect the battery negative terminal.
10. Disconnect PCM connector C (31P).
11. Check for continuity between PCM connector terminal C24 and body ground.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal C24 and the ATF temperature sensor.■

NO—Check for loose terminal fit in the PCM connector terminal C24 and C18, or ATF temperature sensor. If necessary, substitute a known-good PCM and recheck only if the code resets after being cleared.■

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DTC Troubleshooting (cont'd)

DTC P0715: Problem in Mainshaft Speed Sensor Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

Code P0715 (15) doesn't always mean there's an electrical problem in the mainshaft or countershaft speed sensor circuit; code P0715 (15) may also indicate a mechanical problem in the transmission. Any problem causing irregular countershaft-to-mainshaft speed difference can cause this code.
A mainshaft speed 0 mph (0 km/h) in the freege data usually means there is an electrical problem in the mainshaft speed sensor circuit. A mainshaft speed that is higher or lower than countershaft speed usually means a hydraulic problem caused the DTC.

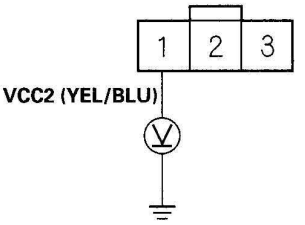
1. Turn the ignition switch ON (II).
2. Check whether the OBD II scan tool indicates the code for the throttle position (TP) sensor or the engine coolant temperature (ECT) sensor.

   Does the OBD II scan tool indicate the code for the TP sensor or the ECT sensor?

   YES – Perform the troubleshooting flowchart for the TP sensor (see page 11-60) or the ECT sensor (see page 11-57). Recheck for code P0715 after troubleshooting.■

   NO – Go to step 3.
3. Turn the ignition switch OFF.
4. Disconnect the mainshaft speed sensor connector.
5. Turn the ignition switch ON (II).
6. Measure the voltage between the No. 1 terminal of the mainshaft speed sensor connector and body ground.

   MAINSHAFT SPEED SENSOR CONNECTOR



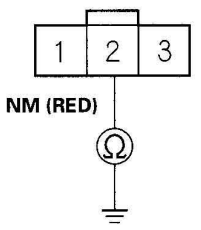
   Wire side of female terminals

   Is there about 5 V?

   YES – Go to step 7.

   NO – Go to step 15.
7. Turn the ignition switch OFF.
8. Disconnect PCM connector D (16P).
9. Check for continuity between the No. 2 terminal of the mainshaft speed sensor connector and body ground.

   MAINSHAFT SPEED SENSOR CONNECTOR



   Wire side of female terminals

   Is there continuity?

   YES – Repair short to ground in the wire between PCM connector terminal D11 and the mainshaft speed sensor.■

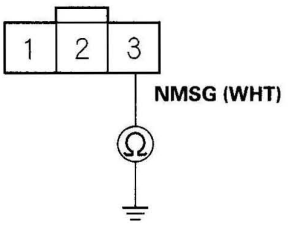
   NO – Go to step 10.
10. Reconnect PCM connector D.

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11. Check for continuity between the No. 3 terminal of the mainshaft speed sensor connector and body ground.

MAINSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals

Is there continuity?

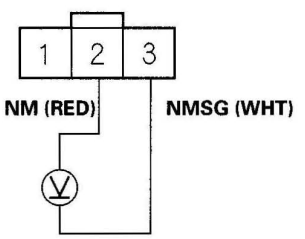
YES – Go to step 12.

NO – Repair open in the wire between PCM connector terminal D12 and the mainshaft speed sensor. ■

12. Turn the ignition switch ON (II).

13. Measure the voltage between the No. 2 and No. 3 terminals of the mainshaft speed sensor connector.

MAINSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals

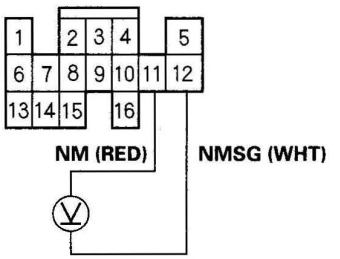
Is there about 5 V?

YES – Go to step 16.

NO – Go to step 14.

14. Measure the voltage between PCM connector terminals D11 and D12.

PCM CONNECTOR D (16P)



Wire side of female terminals

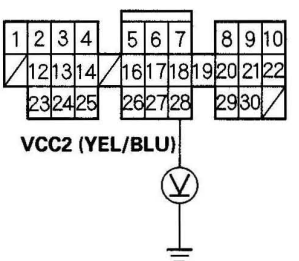
Is there about 5 V?

YES – Repair open in the wire between PCM connector terminals D11 and the mainshaft speed sensor. ■

NO – Check for loose terminal fit in the PCM connector terminals D11, D12 and C28. If necessary, substitute a known-good PCM and recheck only if the DTC recodes after it is cleared. ■

15. Measure the voltage between PCM connector terminal C28 and body ground.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there 4.75 – 5.25 V?

YES – Repair open in the wire between PCM connector terminal C28 and the mainshaft speed sensor. ■

NO – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

(cont'd)

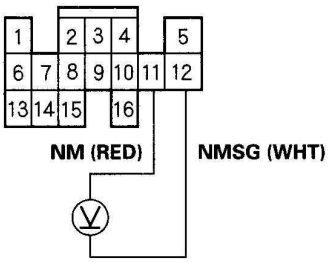
Protected by AR

DTC Troubleshooting (cont'd)

16. Connect the mainshaft speed sensor connector.

17. Measure the voltage between PCM connector terminals D11 and D12.

PCM CONNECTOR D (16P)



Wire side of female terminals

Is there about 0 V to 5 V?

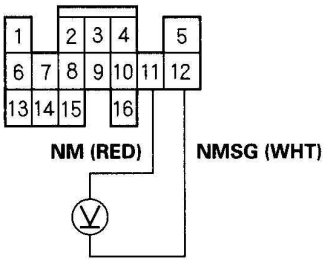
YES – Go to step 18.

NO – Replace the mainshaft speed sensor. ■

18. Start the engine, and run it at idle in [P] position.

19. With the engine at idle, measure the voltage between PCM connector terminals D11 and D12.

PCM CONNECTOR D (16P)



Wire side of female terminals

Is there 1.5 – 3.5 V?

YES – Check for loose terminal fit in the PCM connector terminals D11, D12 and C28. If necessary, substitute a known-good PCM and recheck only if the DTC recodes after it is cleared. ■

NO – Replace the mainshaft speed sensor. ■

BACK

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DTC P0720: Problem in Countershaft Speed Sensor Circuit

NOTE: Record all freeze data and review General Troubleshooting Infomation (see page 14-3) before you troubleshoot.

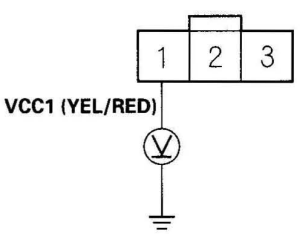
1. Turn the ignition switch ON (II).
2. Check whether the OBD II scan tool indicates the code for the manifold absolute pressure (MAP) sensor.

   Does the OBD II scan tool indicate the code for the MAP sensor?

   YES – Perform the troubleshooting flowchart for the MAP sensor (see page 11-52). Recheck for code P0720 after troubleshooting. ■

   NO – Go to step 3.
3. Turn the ignition switch OFF.
4. Disconnect the countershaft speed sensor connector.
5. Turn the ignition switch ON (II).
6. Measure the voltage between the No. 1 terminal of the countershaft speed sensor connector and body ground.

COUNTERSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals

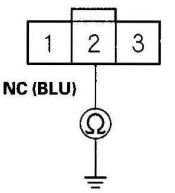
Is there about 5 V?

YES – Go to step 7.

NO – Go to step 13.

7. Turn the ignition switch OFF.
8. Disconnect the PCM connector D (16P).
9. Check for continuity between the No. 2 terminal of the countershaft speed sensor connector and body ground.

COUNTERSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals

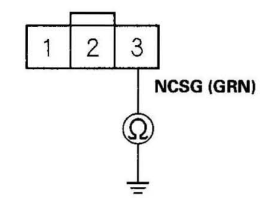
Is there continuity?

YES – Repair short to ground in the wire between PCM connector terminal D10 and the countershaft speed sensor. ■

NO – Go to step 10.

10. Reconnect PCM connector D.
11. Check for continuity between the No. 3 terminal of the countershaft speed sensor connector and body ground.

COUNTERSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Go to step 12.

NO – Repair open in the wire between PCM connector terminal D16 and the countershaft speed sensor. ■

(cont'd)

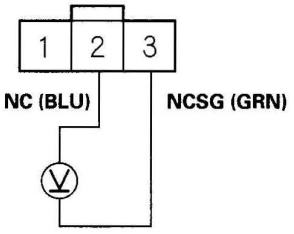
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DTC Troubleshooting (cont'd)

12. Turn the ignition switch ON (II).

13. Measure the voltage between the No. 2 and No. 3 terminals of the countershaft speed sensor connector.

COUNTERSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals

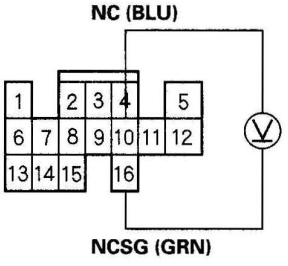
Is there about 5 V?

YES – Go to step 16.

NO – Go to step 14.

14. Measure the voltage between PCM connector terminals D10 and D16.

PCM CONNECTOR D (16P)



Wire side of female terminals

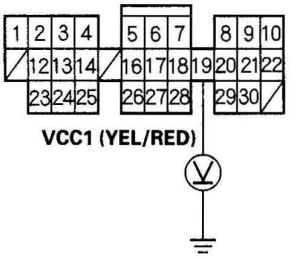
Is there about 5 V?

YES – Repair open in the wire between PCM connector terminal D10 and the countershaft speed sensor. ■

NO – Check for loose terminal fit in the PCM connector terminals D10, D16 and C19. If necessary, substitute a known-good PCM and recheck only if the DTC recodes after it is cleared. ■

15. Measure the voltage between PCM connector terminal C19 and body ground.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there 4.75 – 5.25 V?

YES – Repair open in the wire between PCM connector terminal C19 and the countershaft speed sensor. ■

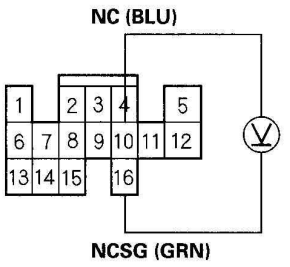
NO – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

BACK

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16. Connect the countershaft speed sensor connector.
17. Measure the voltage between PCM connector terminals D10 and D16.

PCM CONNECTOR D (16P)



Wire side of female terminals

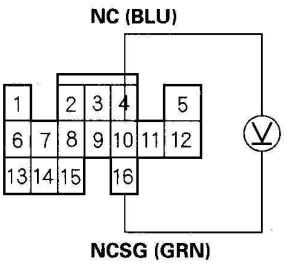
Is there about 0 V to 5 V?

YES — Go to step 18.

NO — Replace the countershaft speed sensor. ■

18. Raise the vehicle, and allow the wheels to rotate freely.
19. Start the engine, then shift to D5 position and let the wheels spin.
20. Measure the voltage between PCM connector terminals D10 and D16.

PCM CONNECTOR D (16P)



Wire side of female terminals

Is there 1.5 — 3.5 V?

YES — Check for loose terminal fit in the PCM connector terminals D10, D16 and C19. If necessary, substitute a known-good PCM and recheck only if the DTC recodes after it is cleared. ■

NO — Replace the countershaft speed sensor. ■

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DTC Troubleshooting (cont'd)

DTC P0730: Problem in Shift Control System

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- Keep these replacement solenoid valves on hand:
  - Shift solenoid valves A, B, and C
  - A/T clutch pressure control solenoid valves A and B

1. Check whether the OBD II scan tool indicates another code.

   Does the OBD II scan tool indicate another code?

   YES—Perform the troubleshooting flowchart for the indicated code(s). Recheck for code P0730 after troubleshooting. ■

   NO—Go to step 2.

   NOTE: Do not continue with this troubleshooting until the causes of any other DTCs have been corrected.

2. Measure the 1st, 2nd, 3rd, 4th, and 5th clutch pressure (see page 14-119).

   Is each clutch pressure within the service limit?

   YES—Go to step 3.

   NO—Repair the hydraulic system as necessary. ■

3. Replace the shift solenoid valve B (see page 14-122).

4. Replace the shift solenoid valves A and C (see page 14-123).

5. Replace the A/T clutch pressure control solenoid valves A and B (see page 14-125).

6. Turn the ignition switch OFF, and reset the PCM memory with the PGM Tester or by removing the No. 13 fuse in the passenger's under-dash fuse/relay box for more than 10 seconds.

7. Drive the vehicle under the same conditions as those indicated by the freeze data for more than 30 seconds, or over 12 mph (20 km/h) in 1st, 2nd, 3rd, 4th, and 5th gear in D5 position for more than 30 seconds.

8. Recheck for code P0730.

   Does the OBD II scan tool indicate code P0730?

   YES—Replace the transmission. ■

   NO—The system is OK at this time. ■

BACK

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DTC P0740: Problem in Lock-up Control System

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- Keep these replacement solenoid valves on hand:
  - Torque converter clutch solenoid valve
  - A/T clutch pressure control solenoid valve C

1. Check whether the OBD II scan tool indicates another code.

   Does the OBD II scan tool indicate another code?

   YES – Perform the troubleshooting flowchart for the indicated code(s). Recheck for code P0740 after troubleshooting. ■

   NO – Go to step 2.

   NOTE: Do not continue with this troubleshooting until the causes of any other DTCs have been corrected.

2. Measure the line pressure (see page 14-119).

   Is the line pressure within the service limit?

   YES – Go to step 3.

   NO – Repair the hydraulic system as necessary (see page 14-119). ■

3. Replace the torque converter clutch solenoid valve (see page 14-121).

4. Replace the A/T clutch pressure control solenoid valve C (see page 14-127).

5. Turn the ignition switch OFF, and reset the PCM memory with the PGM Tester or by removing the No. 13 fuse in the passenger's under-dash fuse/relay box for more than 10 seconds.

6. Using the scan tool, check to be sure that the engine coolant temperature is 176°F (80°C) or above.

7. Drive the vehicle under the same conditions as those indicated by the freeze data for more than 1 minute, or drive the vehicle at 55 mph (88 km/h) with TPS voltage 0.8 V for more than 1 minute.

8. Recheck for code P0740.

   Does the OBD II scan tool indicate code P0740?

   YES – Inspect the O-ring on the torque converter. ■

   - If the O-ring is damaged or missing, replace the O-ring.
   - If the O-ring is OK, replace the transmission and torque converter.

   NO – The system is OK at this time. ■

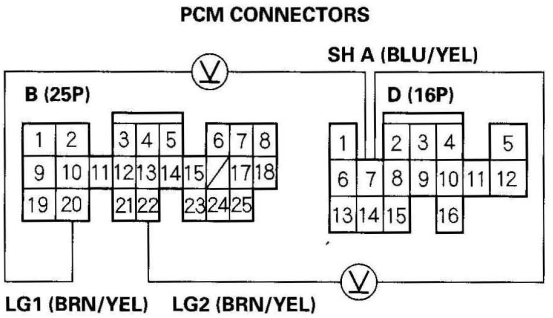
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DTC Troubleshooting (cont'd)

DTC P0753: Problem in Shift Solenoid Valve A Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect the battery negative terminal.
3. Disconnect PCM connectors B (25P) and D (16P).
4. Reconnect the battery negative terminal.
5. Turn the ignition switch ON (II).
6. Measure the voltage between PCM connector terminals D7 and B20 or B22.



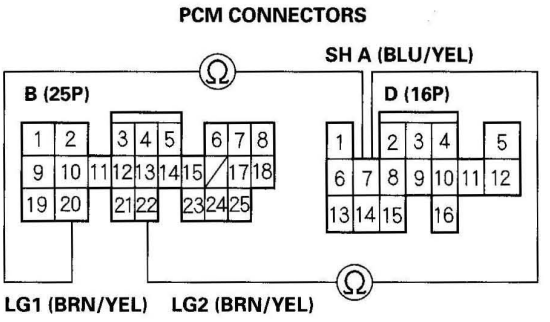
Wire side of female terminals

Is there voltage?

YES – Repair short to power in the wire between PCM connector terminal D7 and the shift solenoid valve A. ■

NO – Go to step 7.

7. Turn the ignition switch OFF.
8. Measure the resistance between PCM connector terminals D7 and B20 or B22.



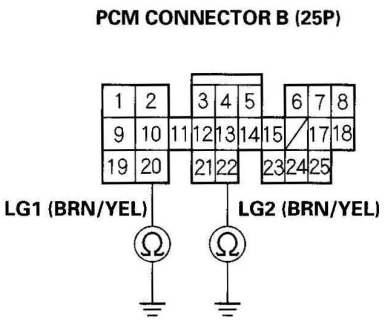
Wire side of female terminals

Is the resistance 12–25 Ω ?

YES – Go to step 13.

NO – Go to step 9.

9. Check for continuity between body ground and PCM connector terminals B20 and B22 individually.



Wire side of female terminals

Is there continuity?

YES – Go to step 10.

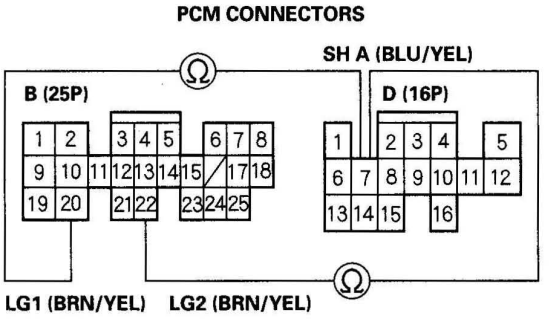
NO – Repair open in the wires between grounds G101, G102 and PCM connector terminals B20 and B22, or repair poor ground (G101, G102). ■

BACK

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10. Disconnect the 2P connector from shift solenoid valve A (black connector).

11. Check for continuity between PCM connector terminals D7 and B20 or B22.



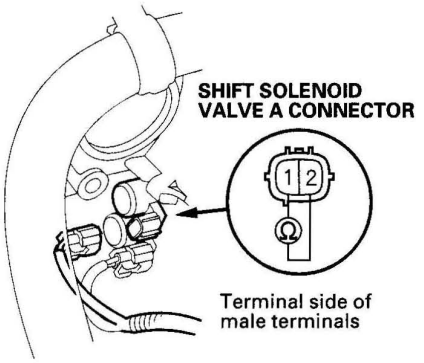
Wire side of female terminals

Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminals D7 and shift solenoid valve A. ■

NO—Go to step 12.

12. Measure shift solenoid valve A resistance at the solenoid valve connector terminals.



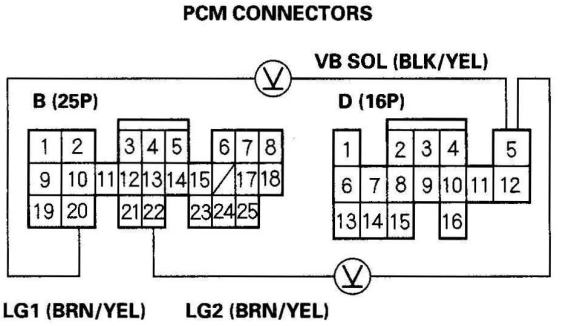
Is the resistance 12—25 Ω ?

YES—Check for an open in the wire between PCM connector terminal D7 and shift solenoid valve A, and between the No. 1 terminal of the shift solenoid valve A connector and ground (G101, G102). ■

NO—Replace shift solenoid valve A. ■

13. Turn the ignition switch ON (II).

14. Measure the voltage between PCM connector terminals D5 and B20 or B22.



Wire side of female terminals

Is there battery voltage?

YES—Check for loose terminal fit in the PCM connector terminals D5 and D7. If necessary, substitute a known-good PCM and recheck. ■

NO—Check for blown No. 6 (15 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal D5 and the driver's under-dash fuse/relay box. ■

BACK

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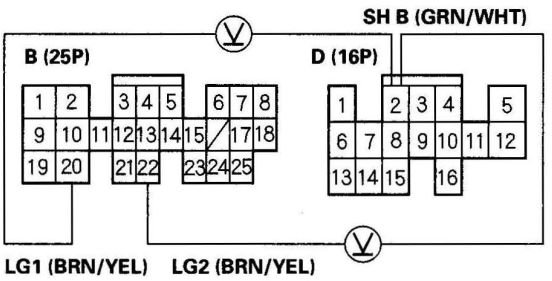
DTC Troubleshooting (cont'd)

DTC P0758: Problem in Shift Solenoid Valve B Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect the battery negative terminal.
3. Disconnect PCM connectors B (25P) and D (16P).
4. Reconnect the battery negative terminal.
5. Turn the ignition switch ON (II).
6. Measure the voltage between PCM connector terminals D2 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

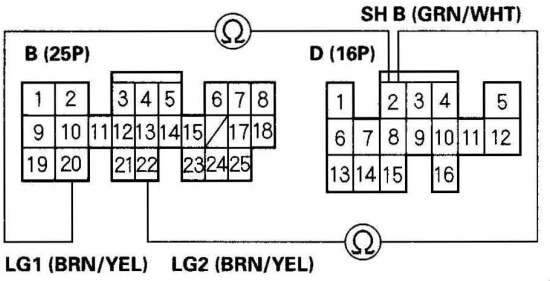
Is there voltage?

YES—Repair short to power in the wire between PCM connector terminal D2 and the shift solenoid valve B.■

NO—Go to step 7.

7. Turn the ignition switch OFF.
8. Measure the resistance between PCM connector terminals D2 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

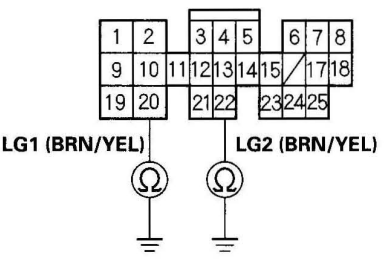
Is the resistance 12—25 Ω ?

YES—Go to step 13.

NO—Go to step 9.

9. Check for continuity between body ground and PCM connector terminals B20 and B22 individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES—Go to step 10.

NO—Repair open in the wires between grounds G101, G102 and PCM connector terminals B20 and B22, or repair poor ground (G101, G102).■

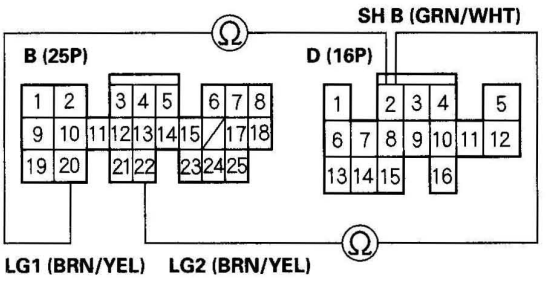
BACK

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10. Disconnect the 2P connector from shift solenoid valve B.

11. Check for continuity between PCM connector terminals D2 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

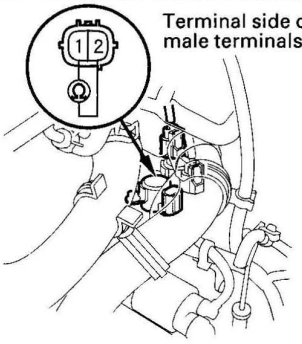
Is there continuity?

YES – Repair short to ground in the wire between PCM connector terminal D2 and shift solenoid valve B. ■

NO – Go to step 12.

12. Measure shift solenoid valve B resistance at the solenoid valve connector terminals.

SHIFT SOLENOID VALVE B CONNECTOR



Is the resistance 12 – 25 Ω ?

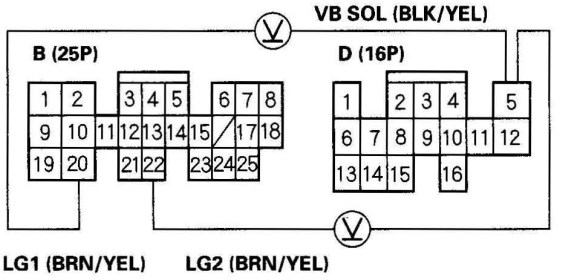
YES – Check for an open in the wires between PCM connector terminal D2 and the shift solenoid valve B, and between the No. 1 terminal of the shift solenoid valve B connector and ground (G101, G102). ■

NO – Replace shift solenoid valve B. ■

13. Turn the ignition switch ON (II).

14. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES – Check for loose terminal fit in the PCM connector terminals D2 and D5. If necessary, substitute a known-good PCM and recheck. ■

NO – Check for blown No. 6 (15 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal D5 and the driver's under-dash fuse/relay box. ■

BACK

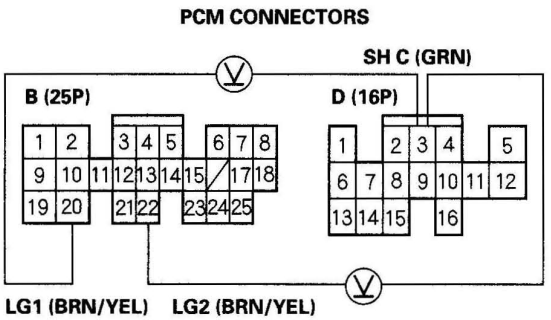
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DTC Troubleshooting (cont'd)

DTC P0763: Problem in Shift Solenoid Valve C Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect the battery negative terminal.
3. Disconnect PCM connectors B (25P) and D (16P).
4. Reconnect the battery negative terminal.
5. Turn the ignition switch ON (II).
6. Measure the voltage between PCM connector terminals D3 and B20 or B22.



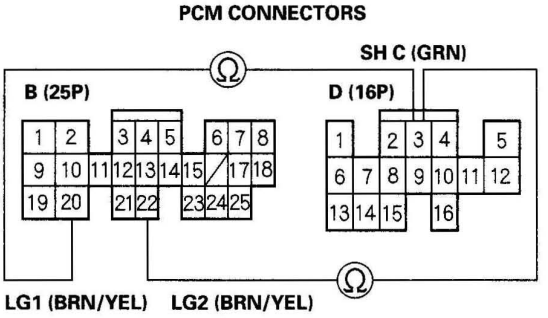
Wire side of female terminals

Is there voltage?

YES – Repair short to power in the wire between PCM connector terminal D3 and shift solenoid valve C. ■

NO – Go to step 7.

7. Turn the ignition switch OFF.
8. Measure the resistance between PCM connector terminals D3 and B20 or B22.



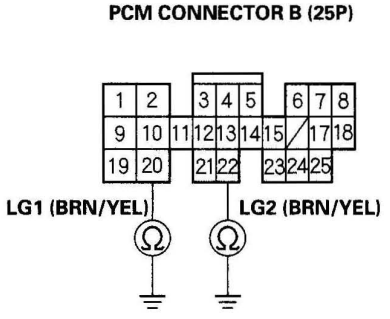
Wire side of female terminals

Is the resistance 12 – 25 Ω ?

YES – Go to step 13.

NO – Go to step 9.

9. Check for continuity between body ground and PCM connector terminals B20 and B22 individually.



Wire side of female terminals

Is there continuity?

YES – Go to step 10.

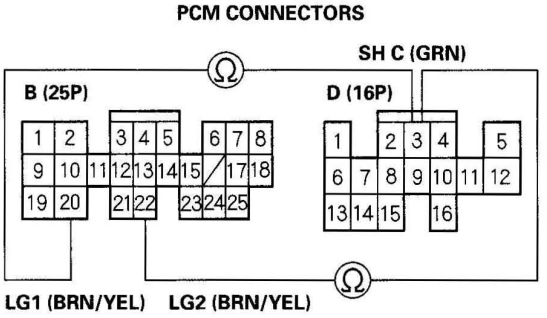
NO – Repair open in the wires between grounds G101, G102 and PCM connector terminals B20 and B22, or repair poor ground (G101, G102). ■

BACK

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10. Disconnect the 2P connector from shift solenoid valve C (brown connector).

11. Check for continuity between PCM connector terminals D3 and B20 or B22.



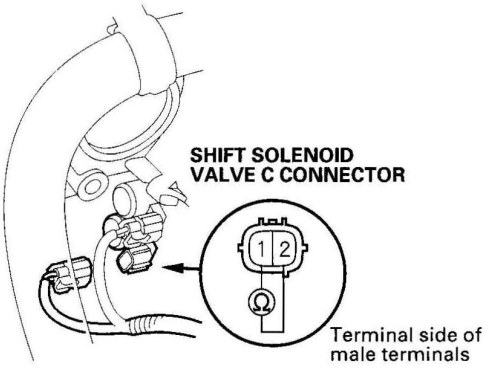
Wire side of female terminals

Is there continuity?

YES — Repair short to ground in the wire between PCM connector terminal D3 and shift solenoid valve C. ■

NO — Go to step 12.

12. Measure shift solenoid valve C resistance at the solenoid valve connector terminals.



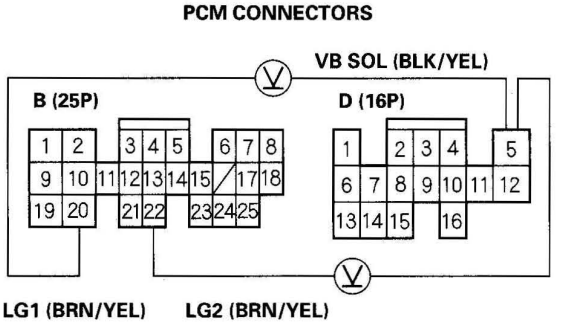
Is the resistance 12 – 25 Ω ?

YES — Check for open in the wires between PCM connector terminal D3 and shift solenoid valve C, and between the No. 1 terminal of the shift solenoid valve C connector and ground (G101, G102). ■

NO — Replace shift solenoid valve C. ■

13. Turn the ignition switch ON (II).

14. Measure the voltage between PCM connector terminals D5 and B20 or B22.



Wire side of female terminals

Is there battery voltage?

YES — Check for loose terminal fit in the PCM connector terminals D3 and D5. If necessary, substitute a known-good PCM and recheck. ■

NO — Check for blown No. 6 (15 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal D5 and the driver's under-dash fuse/relay box. ■

BACK

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DTC Troubleshooting (cont'd)

DTC P0780: Mechanical Problem in Hydraulic Control System of Shift Solenoid Valve A and A/T Clutch Pressure Control Solenoid Valves A and B, or Problem in Hydraulic Control System

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- Keep these replacement solenoid valves on hand:
  - Shift solenoid valve A
  - A/T clutch pressure control solenoid valves A and B

1. Check whether the OBD II scan tool indicates another code.

   Does the OBD II scan tool indicate another code?

   YES—Perform the troubleshooting flowchart for the indicated code(s). Recheck for code P0780 after troubleshooting. ■

   NO—Go to step 2.

2. Turn the ignition switch OFF.

3. Replace the shift solenoid valve A (see page 14-123) and A/T clutch pressure control solenoid valves A and B (see page 14-125).

4. Reset the PCM memory with the PGM Tester or by removing the BACK UP fuse in the passenger's under-dash fuse/relay box for more than 10 seconds.

5. Drive the vehicle for several minutes in 1st, 2nd, 3rd, 4th, and 5th gears in D6 position.

6. Recheck for code P0780.

   Does the OBD II scan tool indicate code P0780?

   YES—Replace the transmission. ■

   NO—The problem has been corrected. ■

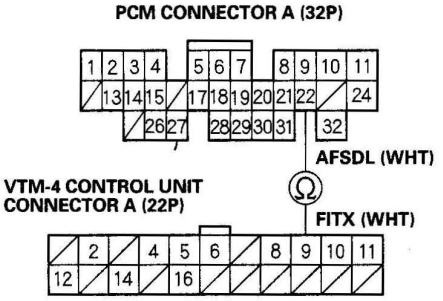
BACK

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DTC P1656: Problem in PCM-to-VTM-4 Control Unit Communications Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect the battery negative terminal.
3. Disconnect PCM connector A (32P) and the A (22P) connector from the VTM-4 control unit.
4. Check for continuity between PCM connector terminal A22 and the A9 terminal of the VTM-4 control unit.



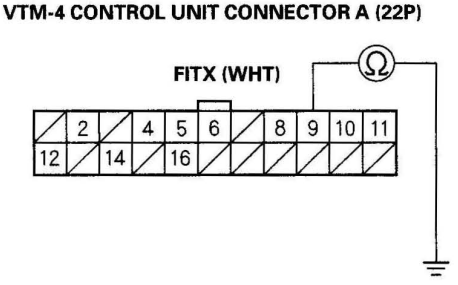
Wire side of female terminals

Is there continuity?

YES – Go to step 5.

NO – Repair open in the wire between PCM connector terminal A22 and the A9 terminal of the VTM-4 control unit. ■

5. Check for continuity between the A9 terminal of the VTM-4 control unit and body ground.



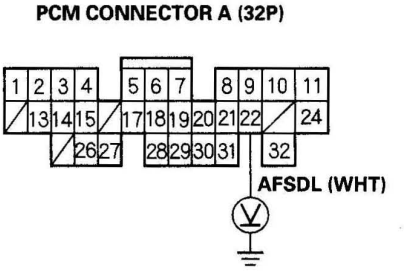
Wire side of female terminals

Is there continuity?

YES – Repair short to ground in the wire between PCM connector terminal A22 and the A9 terminal of the VTM-4 control unit. ■

NO – Go to step 6.

6. Connect PCM connector A (32P).
7. Connect the battery negative terminal.
8. Turn the ignition switch ON (II).
9. Check for voltage between PCM connector terminal A22 and body ground.



Wire side of female terminals

Is there about 10 V?

YES – Check for loose terminal fit in the PCM connectors and the VTM-4 control unit connectors. If necessary, substitute a known-good PCM and recheck. ■

NO – Replace the PCM. ■

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DTC Troubleshooting (cont'd)

DTC P1705: Short in Transmission Range Switch Circuit

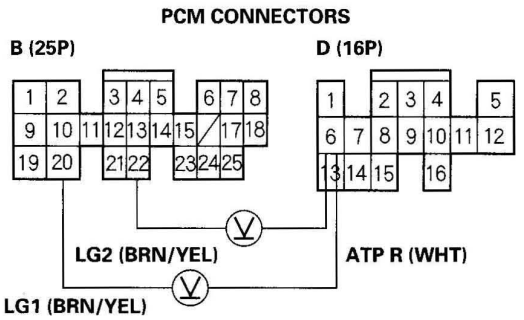
NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Turn the ignition switch ON (II).
2. Disconnect the transmission range switch connector.

   Do all gear position indicators except 1 go out?

   YES – Replace the transmission range switch. ■

   NO – Go to step 3.
3. Turn the ignition switch OFF, and connect the transmission range switch connector.
4. Turn the ignition switch ON (II).
5. Shift to all positions other than R.
6. Measure the voltage between PCM connector terminals D6 and B20 or B22.



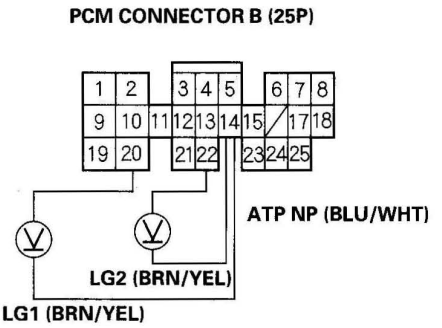
Wire side of female terminals

Is there battery voltage?

YES – Go to step 7.

NO – Check for a short in the wire between PCM connector terminal D6 and the transmission range switch or A/T gear position indicator, and check for an open in the wires between grounds G101, G102 and PCM connector terminals B20 and B22. If necessary, substitute a known-good PCM and recheck. ■

7. Shift to all positions other than P or N.
8. Measure the voltage between PCM connector terminals B14 and B20 or B22.



Wire side of female terminals

Is there about 5 V?

YES – Go to step 10.

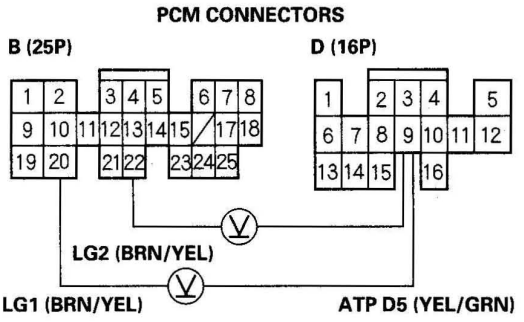
NO – Check for a short in the wire between PCM connector terminal B14 and the transmission range switch, and in the P and N position signal wires between the A/T gear position indicator and the transmission range switch. If necessary, substitute a known-good PCM and recheck. ■

BACK

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9. Shift to all positions other than D5.

10. Measure the voltage between PCM connector terminals D9 and B20 or B22.



Wire side of female terminals

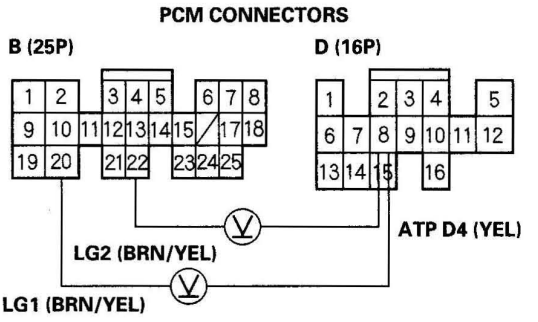
Is there about 5 V?

YES – Go to step 11.

NO – Check for a short in the wire between PCM connector terminal D9 and the transmission range switch. If necessary, substitute a known-good PCM and recheck. ■

11. Shift to all positions other than D4.

12. Measure the voltage between PCM connector terminals D8 and B20 or B22.



Wire side of female terminals

Is there battery voltage?

YES – Go to step 13.

NO – Check for a short in the wire between PCM connector terminal D8 and the transmission range switch or A/T gear position indicator. If necessary, substitute a known-good PCM and recheck. ■

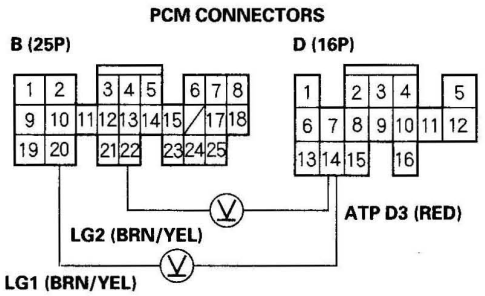
(cont'd)

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DTC Troubleshooting (cont'd)

13. Shift to all positions other than D3.

14. Measure the voltage between PCM connector terminals D14 and B20 or B22.



Wire side of female terminals

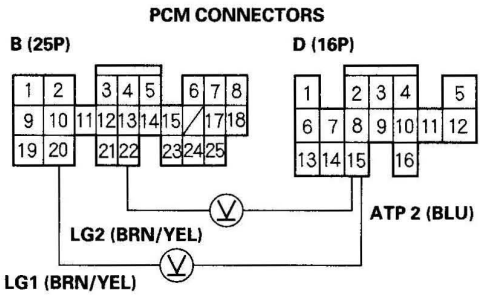
Is there battery voltage?

YES – Go to step 15.

NO – Check for a short in the wire between PCM connector terminal D14 and the transmission range switch or A/T gear position indicator. If necessary, substitute a known-good PCM and recheck. ■

15. Shift to all positions other than 2.

16. Measure the voltage between PCM connector terminals D15 and B20 or B22.



Wire side of female terminals

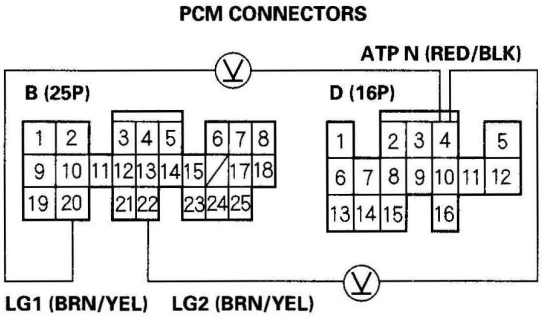
Is there battery voltage?

YES – Go to step 17.

NO – Check for a short in the wire between PCM connector terminal D15 and the transmission range switch or A/T gear position indicator. If necessary, substitute a known-good PCM and recheck. ■

17. Shift to all positions other than N.

18. Measure the voltage between PCM connector terminals D4 and B20 or B22.



Wire side of female terminals

Is there battery voltage?

YES – If necessary, substitute a known-good PCM and recheck. ■

NO – Check for a short in the wire between PCM connector terminal D4 and the transmission range switch or A/T gear position indicator. If necessary, substitute a known-good PCM and recheck. ■

BACK

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DTC P1706: Open in Transmission Range Switch Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before yo u troubleshoot.

1. Test the transmission range switch (see page 14-175).

   Is the switch OK?

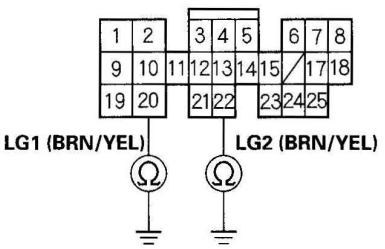
   YES – Go to step 2.

   NO – Replace the transmission range switch. ■

2. Turn the ignition switch OFF.

3. Check for continuity between body ground and PCM connector terminals B20 and B22 individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES – Go to step 4.

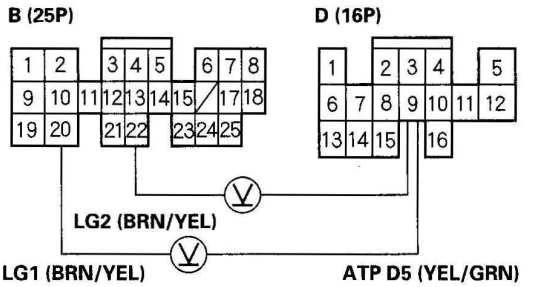
NO – Repair open in the wires between grounds G101, G102 and PCM connector terminals B20 and B22, or repair poor ground (G101, G102). ■

4. Turn the ignition switch ON (II).

5. Shift to D5 position.

6. Measure the voltage between PCM connector terminals D9 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there voltage?

YES – Repair open in the wire between PCM connector terminal D9 and the transmission range switch. ■

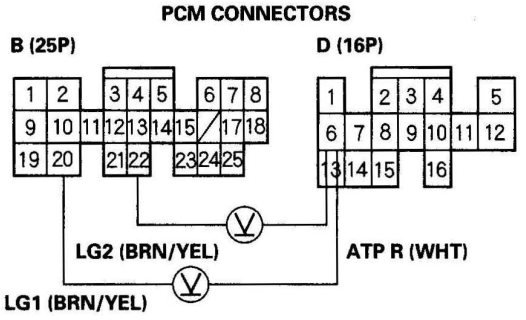
NO – Go to step 7.

(cont'd)

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DTC Troubleshooting (cont'd)

7. Shift to R position.
8. Measure the voltage between PCM connector terminals D6 and B20 or B22.



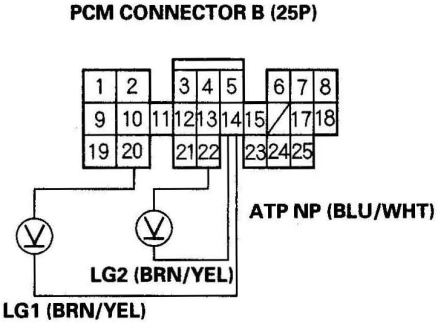
Wire side of female terminals

Is there voltage?

YES – Repair open in the wire between PCM connector terminal D6 and the transmission range switch. ■

NO – Go to step 9.

9. Shift to P or N position.
10. Measure the voltage between PCM connector terminals B14 and B20 or B22.



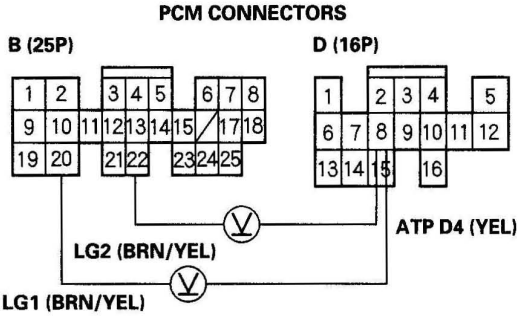
Wire side of female terminals

Is there voltage?

YES – Repair open in the wire between PCM connector terminal B14 and the transmission range switch. ■

NO – Go to step 11.

11. Shift to D4 position.
12. Measure the voltage between PCM connector terminals D8 and B20 or B22.



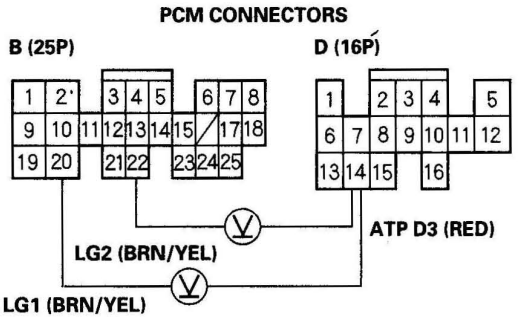
Wire side of female terminals

Is there voltage?

YES – Repair open in the wire between PCM connector terminal D8 and the transmission range switch. ■

NO – Go to step 13.

13. Shift to D3 position.
14. Measure the voltage between PCM connector terminals D14 and B20 or B22.



Wire side of female terminals

Is there voltage?

YES – Repair open in the wire between PCM connector terminal D14 and the transmission range switch. ■

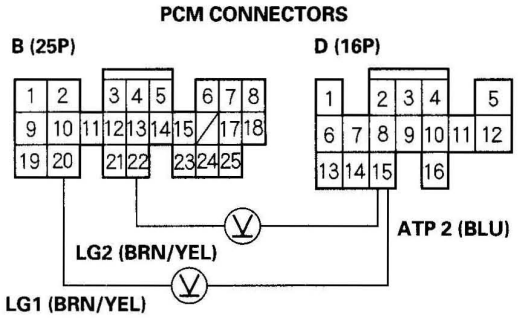
NO – Go to step 15.

BACK

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15. Shift to 2 position.

16. Measure the voltage between PCM connector terminals D15 and B20 or B22.



Wire side of female terminals

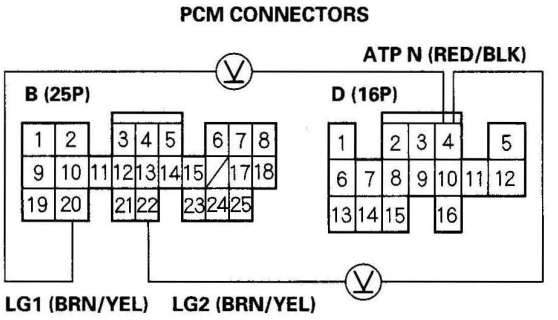
Is there voltage?

YES—Repair open in the wire between PCM connector terminal D15 and the transmission range switch. ■

NO—Go to step 17.

17. Shift to N position.

18. Measure the voltage between PCM connector terminals D4 and B20 or B22.



Wire side of female terminals

Is there voltage?

YES—Repair open in the wire between PCM connector terminal D4 and the transmission range switch. ■

NO—Check for loose terminal fit in the PCM connector terminals B14, D4, D6, D8, D9, D14 and D 15. If necessary, substitute a known-good PCM and recheck. ■

BACK

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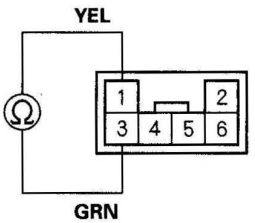
DTC Troubleshooting (cont'd)

DTC P1710: Problem in 1st-hold Switch Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Remove the center console.
2. Disconnect the switch assembly connector (6P).
3. Check for continuity between the No. 3 and No. 1 terminals of the switch assembly connector (6P) when the shift lever is in the 1 position, and then in all positions other than 1.

SWITCH ASSEMBLY CONNECTOR (6P)



Terminal side of male terminals

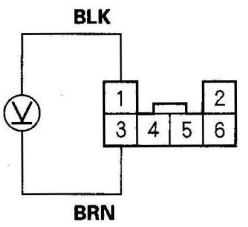
Is there continuity when the shift lever is in 1 position, and no continuity when the shift lever is in all positions other than 1?

YES – Go to step 4.

NO – Faulty 1st-hold switch. Replace the shift lever detent bracket assembly (see page 14-164). ■

4. Turn the ignition switch ON (II).
5. Measure the voltage between the No. 3 and No. 1 terminals of the switch assembly connector (6P).

SWITCH ASSEMBLY CONNECTOR (6P)



Wire side of female terminals

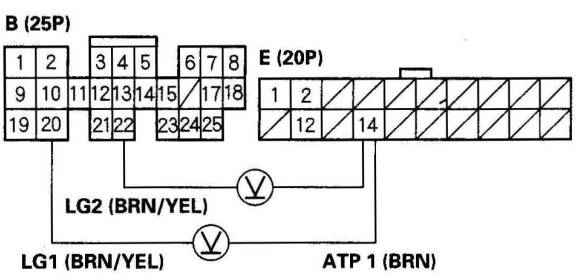
Is there battery voltage?

YES – Check for loose terminal fit in the switch assembly connector (6P) and the PCM connector terminal E14. If necessary, substitute a known-good PCM and recheck. ■

NO – Go to step 6.

6. Measure the voltage between PCM connector terminals E14 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES – Repair open in the wire between PCM connector terminal E14 and the 1st-hold switch. ■

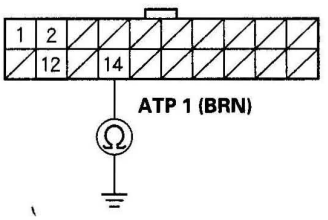
NO – Go to step 7.

BACK

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7. Turn the ignition switch off.
8. Disconnect PCM connector E (20P).
9. Check for continuity between PCM connector E terminal No. 14 and body ground.

PCM CONNECTOR E (20P)



Wire side of female terminals

Is there continuity?

YES – Check for a short in the wire between PCM connector terminal E14 and the 1st-hold switch. ■

NO – Replace the PCM. ■

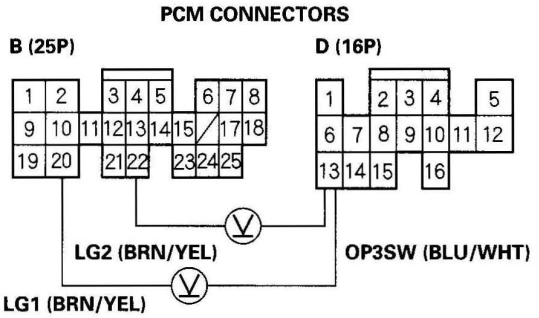
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DTC Troubleshooting (cont'd)

DTC P1739: Problem in 3rd Clutch Pressure Switch Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Turn the ignition switch ON (II).
2. Measure the voltage between PCM connector terminals D13 and B20 or B22.

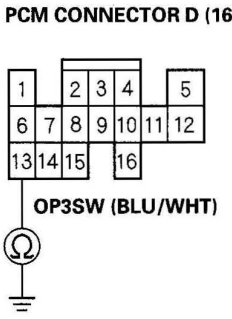


Is there battery voltage?

YES – Go to step 9.

NO – Go to step 3.

3. Turn the ignition switch OFF.
4. Disconnect the battery negative terminal.
5. Disconnect PCM connector D (16P).
6. Reconnect the battery negative terminal.
7. Disconnect the 3rd clutch pressure switch connector.
8. Check for continuity between PCM connector terminal D13 and body ground.



Is there continuity?

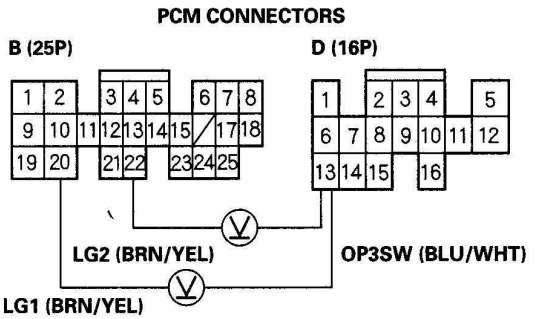
YES – Repair short to ground in the wire between PCM connector terminal D13 and the 3rd clutch pressure switch. ■

NO – Disconnect the 3rd clutch pressure switch connector, and go to step 16.

BACK

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9. Raise the vehicle, and allow the wheels to rotate freely.
10. Start the engine, then shift to the D3 position and let the wheels spin in 3rd gear for more than 5 seconds.
11. Measure the voltage between PCM connector terminals D13 and B20 or B22.



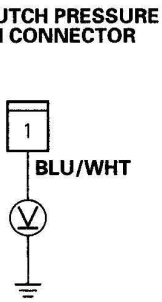
Wire side of female terminals

Is there about 0 V?

YES—Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

NO—Go to step 12.

12. Turn the ignition switch OFF.
13. Disconnect the 3rd clutch pressure switch connector.
14. Turn the ignition switch ON (II).
15. Measure the voltage between the 3rd clutch pressure switch connector terminal (harness side) and body ground.



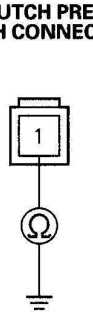
Wire side of female terminal

Is there battery voltage?

YES—Go to step 16.

NO—Repair open in the wire between the 3rd clutch pressure switch and the PCM.■

16. Measure the resistance between the 3rd clutch pressure switch connector terminal (switch side) and body ground.



Terminal side of male terminals

Is the resistance 10 MΩ or more?

YES—Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

NO—Replace the 3rd clutch pressure switch.■

BACK

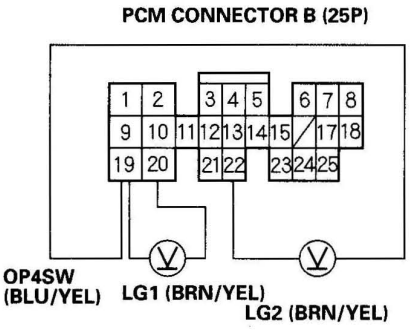
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DTC Troubleshooting (cont'd)

DTC P1740: Problem in 4th Clutch Pressure Switch Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Turn the ignition switch ON (II).
2. Measure the voltage between PCM connector terminals B19 and B20 or B22.



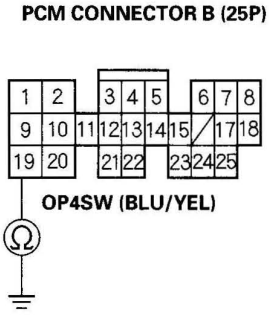
Wire side of female terminals

Is there battery voltage?

YES – Go to step 9.

NO – Go to step 3.

3. Turn the ignition switch OFF.
4. Disconnect the battery negative terminal.
5. Disconnect PCM connector B (25P).
6. Reconnect the battery negative terminal.
7. Disconnect the 4th clutch pressure switch connector.
8. Check for continuity between PCM connector terminal B19 and body ground.



Wire side of female terminals

Is there continuity?

YES – Repair short to ground in the wire between PCM connector terminal B19 and the 4th clutch pressure switch. ■

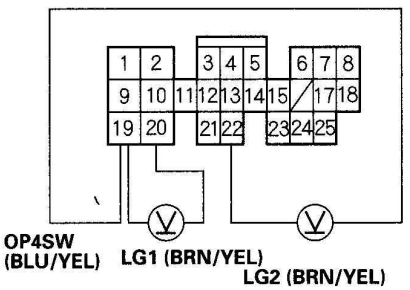
NO – Disconnect the 4th clutch pressure switch connector, and go to step 16.

BACK

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9. Raise the vehicle, and allow the wheels to rotate freely.
10. Start the engine, then shift to the D4 position and drive in 4th gear for more than 5 seconds.
11. Measure the voltage between PCM connector terminals B19 and B20 or B22.

PCM CONNECTOR B (25P)



Wire side of female terminals

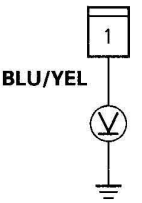
Is there about 0 V?

YES – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

NO – Go to step 12.

12. Turn the ignition switch OFF.
13. Disconnect the 4th clutch pressure switch connector.
14. Turn the ignition switch ON (II).
15. Measure the voltage between the 4th clutch pressure switch connector terminal (harness side) and body ground.

4TH CLUTCH PRESSURE SWITCH CONNECTOR



Wire side of female terminal

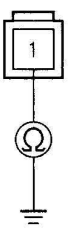
Is there battery voltage?

YES – Go to step 16.

NO – Repair open in the wire between the 4th clutch pressure switch and the PCM. ■

16. Measure the resistance between the 4th clutch pressure switch connector terminal (switch side) and body ground.

4TH CLUTCH PRESSURE SWITCH CONNECTOR



Terminal side of male terminal

Is the resistance 10 MΩ or more?

YES – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

NO – Replace the 4th clutch pressure switch. ■

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DTC Troubleshooting (cont'd)

DTC P1750: Mechanical Problem in Hydraulic Control System of A/T Clutch Pressure Control Solenoid Valve Assemblies A and B, or Problem in Hydraulic Control System

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- Keep these replacement solenoid valves on hand:
  - A/T clutch pressure control solenoid valves A and B

1. Check whether the OBD II scan tool indicates another code.

   Does the OBD II scan tool indicate another code?

   YES – Perform the troubleshooting flowchart for the indicated code(s). Recheck for code P1750 after troubleshooting. ■

   NO – Go to step 2.

2. Turn the ignition switch OFF.

3. Replace the A/T clutch pressure control solenoid valves A and B (see page 14-125).

4. Reset the PCM memory with the PGM Tester or by removing the BACK UP fuse in the passenger's under-dash fuse/relay box for more than 10 seconds.

5. Drive the vehicle for several minutes in 1st, 2nd, 3rd, 4th, and 5th gears in the D5 position.

6. Recheck for code P1750.

   Does the OBD II scan tool indicate code P1750?

   YES – Replace the transmission. ■

   NO – The problem has been corrected. ■

BACK

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DTC P1751: Mechanical Problem in Hydraulic Control System of Shift Solenoid Valve B and A/T Clutch Pressure Control Solenoid Valves A and B, or Problem in Hydraulic Control System

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- Keep these replacement solenoid valves on hand:
  - Shift solenoid valve B
  - A/T clutch pressure control solenoid valves A and B

1. Check whether the OBD II scan tool indicates another code.

   Does the OBD II scan tool indicate another code?

   YES – Perform the troubleshooting flowchart for the indicated code(s). Recheck for code P1751 after troubleshooting. ■

   NO – Go to step 2.

2. Turn the ignition switch OFF.

3. Replace the shift solenoid valve B (see page 14-122), and A/T clutch pressure control solenoid valves A and B (see page 14-125), then rest the PCM.

4. Reset the PCM memory with the PGM Tester or by removing the BACK UP fuse in the passenger's under-dash fuse/relay box for more than 10 seconds.

5. Drive the vehicle for several minutes in 1st, 2nd, 3rd, 4th, and 5th gears in the D5 position.

6. Recheck for code P1751.

   Does the OBD II scan tool indicate code P1751?

   YES – Replace the transmission. ■

   NO – The problem has been corrected. ■

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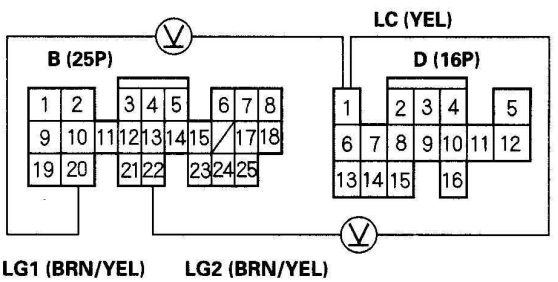
DTC Troubleshooting (cont'd)

DTC P1753: Problem in Torque Converter Clutch Solenoid Valve Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect the battery negative terminal.
3. Disconnect PCM connectors B (25P) and D (16P).
4. Reconnect the battery negative terminal.
5. Turn the ignition switch ON (II).
6. Measure the voltage between PCM connector terminals D1 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

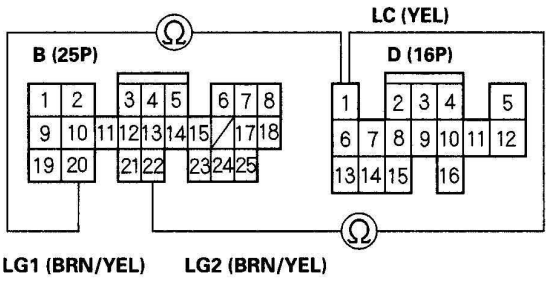
Is there voltage?

YES—Repair short to power in the wire between PCM connector terminal D1 and the torque converter clutch solenoid valve.■

NO—Go to step 7.

7. Turn the ignition switch OFF.
8. Measure the resistance between PCM connector terminals D1 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

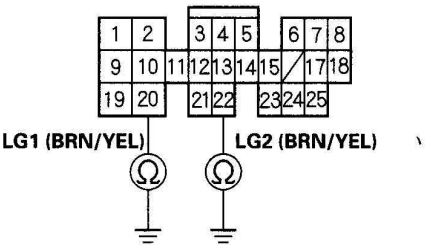
Is the resistance 12—25Ω ?

YES—Go to step 13.

NO—Go to step 9.

9. Check for continuity between body ground and PCM connector terminals B20 and B22 individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES—Go to step 10.

NO—Repair open in the wires between grounds G101, G102 and PCM connector terminals B20 and B22, or repair poor ground (G101, G102).■

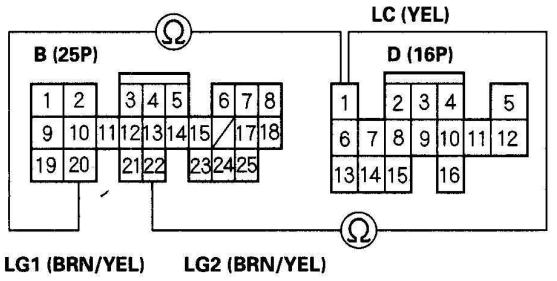
BACK

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10. Disconnect the 2P connector from the torque converter clutch solenoid valve.

11. Check for continuity between PCM connector terminals D1 and B20 or B22.

PCM CONNECTORS



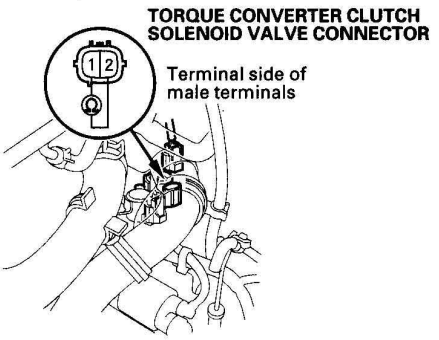
Wire side of female terminals

Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal D1 and the torque converter clutch solenoid valve.■

NO—Go to step 12.

12. Measure torque converter clutch solenoid valve resistance at the solenoid valve connector terminals.



Is the resistance 12—25Ω ?

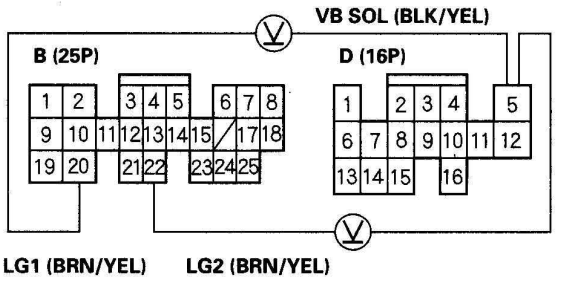
YES—Check for an open in the wires between PCM connector terminal D1 and the torque converter clutch solenoid valve, and between the No. 1 terminal of the torque converter clutch solenoid valve connector and ground (G101, G102).■

NO—Replace the torque converter clutch solenoid valve.■

13. Turn the ignition switch ON (II).

14. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES—Check for loose terminal fit in the PCM connector terminals D1 and D5. If necessary, substitute a known-good PCM and recheck.■

NO—Check for blown No. 6 (15 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal D5 and the driver's under-dash fuse/relay box.■

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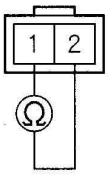
DTC Troubleshooting (cont'd)

DTC P1768: Problem in A/T Clutch Pressure Control Solenoid Valve A Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Disconnect the 2P connector from A/T clutch pressure control solenoid valve A.
2. Measure A/T clutch pressure control solenoid valve A resistance at the solenoid valve connector terminals.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A CONNECTOR



Terminal side of male terminals

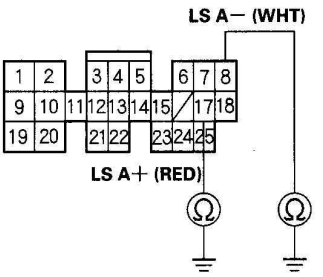
Is the resistance about 5 Ω ?

YES – Go to step 3.

NO – Replace the A/T clutch pressure control solenoid valve A. ■

3. Disconnect the battery negative terminal.
4. Disconnect PCM connector B (25P).
5. Check for continuity between body ground and PCM connector terminals B8 and B17 individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

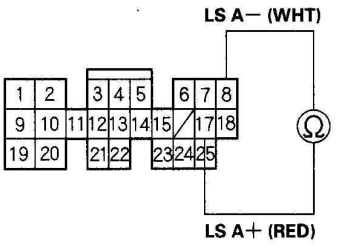
Is there continuity?

YES – Repair short to ground in the wires between A/T clutch pressure control solenoid valve A and PCM connector terminals B8 and B17. ■

NO – Go to step 6.

6. Connect the A/T clutch pressure control solenoid valve A connector.
7. Measure the resistance between PCM connector terminals B8 and B17.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is the resistance about 5 Ω ?

YES – Go to step 8.

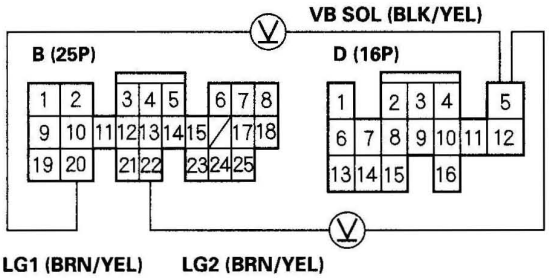
NO – Repair loose terminal or open in the wires between A/T clutch pressure control solenoid valve A and PCM connector terminals B8 and B17. ■

BACK

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8. Disconnect PCM connector D (16P).
9. Connect the battery negative terminal.
10. Turn the ignition switch ON (II).
11. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

NO – Check for blown No. 6 (15 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal D5 and the driver's under-dash fuse/relay box, or between grounds G101, G102 and PCM connector terminals B20 and B22. ■

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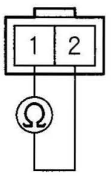
DTC Troubleshooting (cont'd)

DTC P1773: Problem in A/T Clutch Pressure Control Solenoid Valve B Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Disconnect the 2P connector from A/T clutch pressure control solenoid valve B.
2. Measure A/T clutch pressure control solenoid valve B resistance at the solenoid valve connector terminals.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B CONNECTOR



Terminal side of male terminals

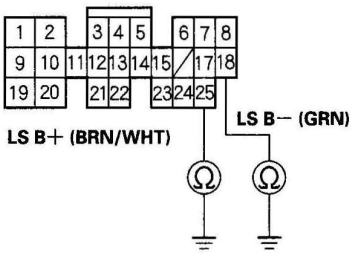
Is the resistance about 5 Ω ?

YES – Go to step 3.

NO – Replace the A/T clutch pressure control solenoid valve B.■

3. Disconnect the battery negative terminal.
4. Disconnect PCM connector B (25P).
5. Check for continuity between body ground and PCM connector terminals B18 and B25 individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

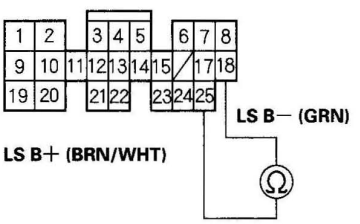
Is there continuity?

YES – Repair short to ground in the wires between A/T clutch pressure control solenoid valve B and PCM connector terminals B18 and B25.■

NO – Go to step 6.

6. Connect the A/T clutch pressure control solenoid valve B connector.
7. Measure the resistance between PCM connector terminals B18 and B25.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is the resistance about 5 Ω ?

YES – Go to step 8.

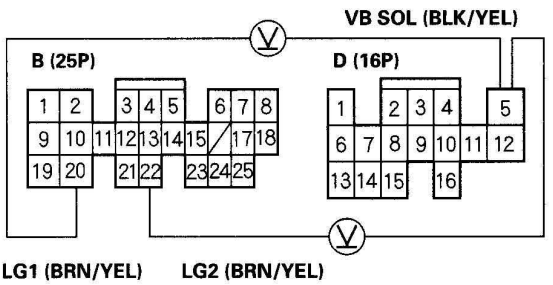
NO – Repair loose terminal or open in the wires between A/T clutch pressure control solenoid valve B and PCM connector terminals B18 and B25.■

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8. Disconnect PCM connector D (16P).
9. Connect the battery negative terminal.
10. Turn the ignition switch ON (II).
11. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES — Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

NO — Check for blown No. 6 (15 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal D5 and the driver's under-dash fuse/relay box. ■

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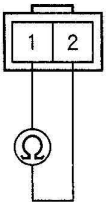
DTC Troubleshooting (cont'd)

DTC P1778: Problem in A/T Clutch Pressure Control Solenoid Valve C Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Disconnect the 2P connector from A/T clutch pressure control solenoid valve C.
2. Measure A/T clutch pressure control solenoid valve C resistance at the solenoid valve connector.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C CONNECTOR



Terminal side of male terminals

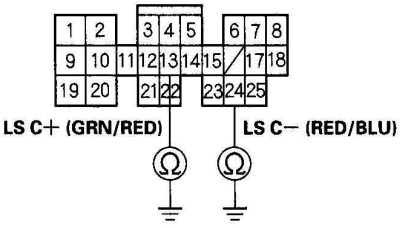
Is the resistance about 5 Ω ?

YES – Go to step 3.

NO – Replace A/T clutch pressure control solenoid valve C. ■

3. Disconnect the battery negative terminal.
4. Disconnect PCM connector B (25P).
5. Check for continuity between body ground and PCM connector terminals B13 and B24 individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

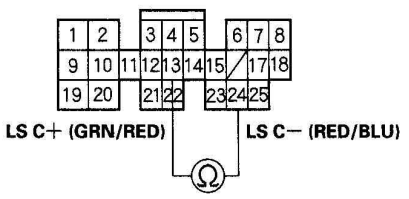
Is there continuity?

YES – Repair short to ground in the wires between A/T clutch pressure control solenoid valve C and PCM connector terminals B13 and B24. ■

NO – Go to step 6.

6. Connect the A/T clutch pressure control solenoid valve C connector.
7. Measure the resistance between PCM connector terminals B13 and B24.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is the resistance about 5 Ω ?

YES – Go to step 8.

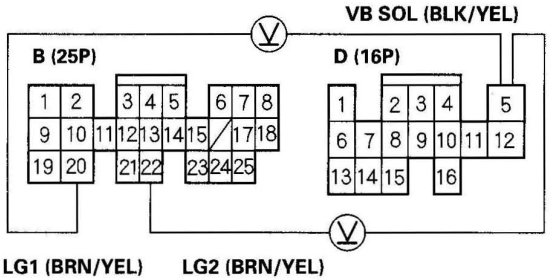
NO – Repair loose terminal or open in the wires between A/T clutch pressure control solenoid valve C and PCM connector terminals B13 and B24. ■

BACK

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8. Disconnect PCM connector D (16P).
9. Connect the battery negative terminal.
10. Turn the ignition switch ON (II).
11. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

NO – Check for blown No. 6 (15 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal D5 and the driver's under-dash fuse/relay box, or between grounds G101, G102 and PCM connector terminals B20 and B22. ■

BACK

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A/T TEMP Indicator Circuit Troubleshooting

1. Turn the ignition switch ON (II), and watch the A/T TEMP indicator light.

   Does the A/T TEMP indicator light come on for about 2 seconds, go out in 0.5 second, then stay on?

   YES – Go to step 2.

   NO – If the indicator comes on for about 2 seconds and then goes off, it's normal. If it doesn't come on at all, go to step 7. If the indicator comes on for about 2 seconds, goes out for 0.5 second, then comes back on, the ATF temperature in torque converter is high. Cool the ATF temperature down, and recheck the indicator. ■

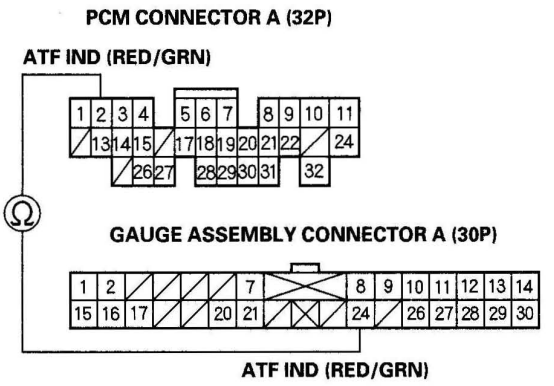
2. Turn the ignition switch OFF.
3. Disconnect the battery negative terminal.
4. Disconnect PCM connector A (32P).
5. Reconnect the battery negative terminal.
6. Turn the ignition switch ON (II), and watch the A/T TEMP indicator.

   Does the indicator remain on?

   YES – Repair short to ground in the wire between PCM connector terminal A2 and the gauge assembly. ■

   NO – Check for a faulty printed circuit board in the gauge assembly or a faulty PCM. If necessary, substitute a known-good PCM or gauge assembly, and recheck. ■

7. Turn the ignition switch OFF.
8. Disconnect the battery negative terminal.
9. Disconnect PCM connector A (32P).
10. Disconnect the A (30P) connector from the gauge assembly.
11. Check for continuity between PCM connector terminal A2 and the No. 24 terminal of the gauge assembly connector A (30P).



Wire side of female terminals

Is there continuity?

YES – Go to step 12.

NO – Repair open in the wire between PCM connector terminal A2 and the gauge assembly. ■

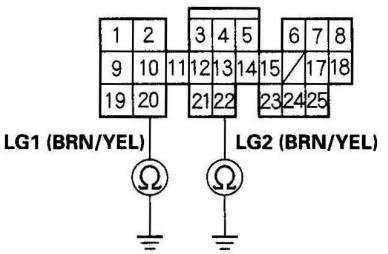
BACK

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12. Disconnect PCM connector B (25P).

13. Check for continuity between body ground and PCM connector terminals B20 and B22 individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity between the ground and each terminal?

YES — Go to step 14.

NO — Repair open in the wire(s) between grounds G101, G102 and PCM connector terminals B20 and B22, or repair poor ground (G101, G102). ■

14. Check whether the A/T TEMP indicator bulb is burned out.

Is the A/T TEMP indicator bulb burned out?

YES — Replace the A/T TEMP indicator bulb. ■

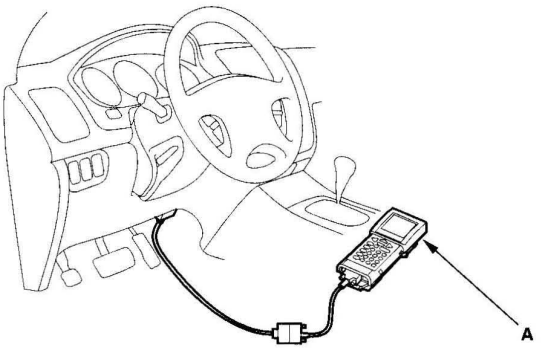
NO — Check for loose terminal fit in the PCM and gauge assembly connectors. If necessary, substitute a known-good PCM and recheck. ■

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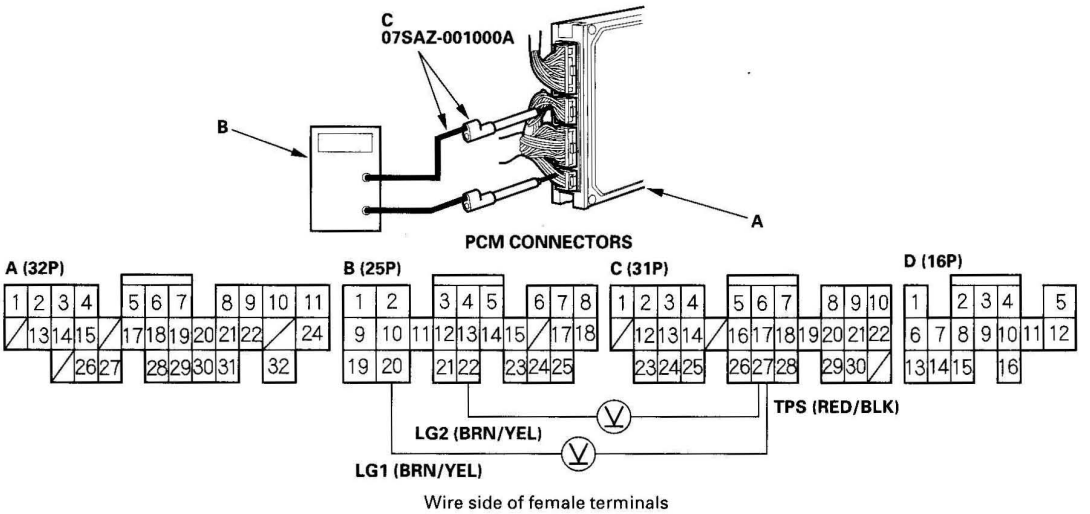
Road Test

Special Tools Required
Backprobe set 07SAZ-001000A (Two required)

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Apply the parking brake, and block rear wheels. Start the engine, then shift to the D5 position while pressing the brake pedal. Press the accelerator pedal, and release it suddenly. The engine should not stall.
3. Repeat step 2 in all shift lever positions.
4. Connect the Honda PGM Tester (A), and go to the PGM-FI Data List; then go to step 9. If you don't have a PGM Tester, go to step 5.



5. Remove both sides of the center console lower panel.
6. Remove the intake manifold runner control (IMRC) module (one bolt), PCM cover (two bolts), and PCM mounting nut.
7. Remove the PCM mounting bolt, and slide the PCM (A) out.
8. Connect a digital multimeter (B) and the special tools (C) to check voltage between the C27 (+) terminal and B20 (−) or B22 (−) terminal of the PCM.



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9. Test-drive the vehicle on a flat road in the D5 position. Check for abnormal noise and clutch slippage. While driving, check that the shift points occur at the proper speeds by monitoring the throttle position sensor voltage and comparing your shift point speeds and voltage to those in the table. (The throttle position sensor voltage represents the throttle opening.)

Upshift-D5 position

Throttle Opening	Unit of Speed	1st → 2nd	2nd → 3rd	3rd → 4th	4th → 5th	Lock-up ON
Throttle position sensor voltage: 0.75 V	mph	9—11	19—21	25—29	45—48	48—51
	km/h	15—17	31—34	41—47	72—78	78—82
Throttle position sensor voltage: 2.25 V	mph	27—29	44—48	64—68	84—88	89—93
	km/h	43—47	71—77	103—109	136—142	143—149
Fully-opened throttle. Throttle position sensor voltage: 4.5 V	mph	40—43	66—70	101—105	———	132—136
	km/h	64—70	107—113	163—169	———	213—219

Downshift-D5 position

Throttle Opening	Unit of Speed	Lock-up OFF	5th → 4th	4th → 3rd	3rd → 2nd	2nd → 1st
Throttle position sensor voltage: 0.75 V	mph	45—48	36—39	17—19	9—11	9—11
	km/h	73—77	58—62	27—31	15—17	15—17
Throttle position sensor voltage: 2.25 V	mph	78—82	64—68	41—45	22—26	9—11
	km/h	126—132	103—109	66—72	36—42	15—17
Fully-opened throttle. Throttle position sensor voltage: 4.5 V	mph	120—124	———	88—92	58—61	29—33
	km/h	193—199	———	142—148	93—99	47—53

10. Accelerate to about 35 mph (57 km/h) so the transmission is in 4th or 5th, then shift from the D4 position to the 2 position. The vehicle should immediately begin slowing down from engine braking.

11. Check for abnormal noise and clutch slippage in the following positions.

1 (1st Gear) Position
Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage. Upshifts should not occur with the shift lever in this position.

2 (2nd Gear) Position
Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage. Upshifts and downshifts should not occur with the shift lever in this position.

R (Reverse) Position
Accelerate from a stop at full throttle, and check for abnormal noise and clutch slippage.

12. Test in P (Park) Position.
Park the vehicle on a slope (about 16°), apply the parking brake, and shift into P position. Release the brake; the vehicle should not move.

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Stall Speed Test

1. Engage the parking brake, and block all four wheels.
2. Connect a tachometer to the engine, and start the engine.
3. Make sure the A/C switch is OFF.
4. After the engine has warmed up to normal operating temperature (the radiator fan comes on), shift to [2] position.
5. Fully press the brake pedal and accelerator pedal for 6 to 8 seconds, and note the engine speed. Do not move the shift lever while raising engine speed.
6. Allow 2 minutes for cooling, then repeat the test in [D5], [1], and [R] positions.

NOTE:
- Do not test stall speed for more than 10 seconds at a time.
- Stall speed tests should be used for diagnostic purposes only.
- Stall speed should be the same in [D5], [2], [1], and [R] positions.
- Do not test stall speed with the A/T pressure gauges installed.

Stall Speed rpm:
Specification: 2,400 rpm
Service Limit: 2,250 – 2,550 rpm

TROUBLE	PROBABLE CAUSE
Stall rpm high in the [D5], [2], [1], and [R] positions	• Low fluid level or ATF pump output • Clogged ATF strainer • Pressure regulator valve stuck closed • Slipping clutch
Stall rpm high in the [1] position	Slippage of 1st clutch or 1st gear one-way clutch
Stall rpm high in the [2] position	Slippage of 2nd clutch
Stall rpm high in the [R] position	Slippage of 5th clutch
Stall rpm low in the [D5], [2], [1], and [R] positions	• Engine output low • Torque converter one-way clutch slipping

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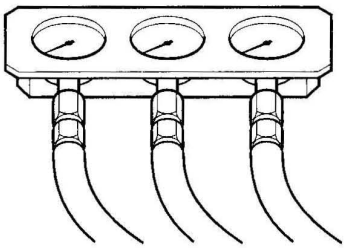
Pressure Tests

Special Tools Required
- A/T oil pressure gauge set 07406-0020400 or 07406-0020401
- A/T pressure hose, 2210 mm 07MAJ-PY4011A
- A/T pressure hose adapter 07MAJ-PY40120

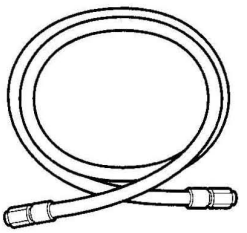
1. Before testing, be sure the transmission fluid is filled to the proper level.
2. Raise the vehicle, and make sure it is securely supported.
3. Allow all four wheels to rotate freely.
4. Warm up the engine (the radiator fan comes on), then stop it and connect a tachometer.
5. Connect the oil pressure gauges to each inspection hole securely, and do not allow dust or other foreign particles to enter the holes.

   TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

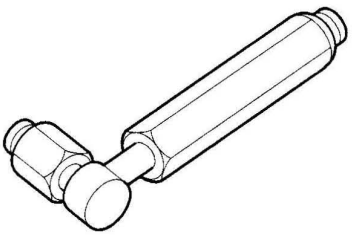
A/T OIL PRESSURE GAUGE SET W/PANEL 07406-0020400 or 07406-0020401

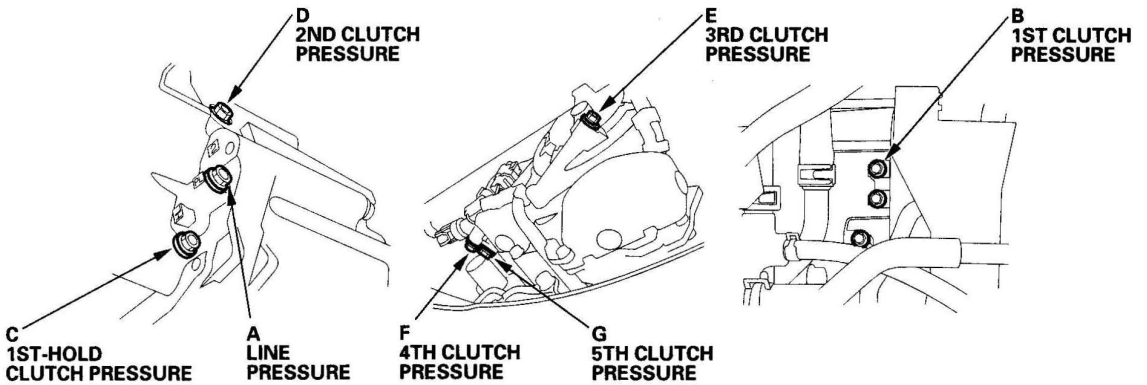


A/T PRESSURE HOSE, 2210 mm 07MAJ-PY4011A (4 Required)



A/T PRESSURE HOSE ADAPTER 07MAJ-PY40120 (4 Required)





(cont'd)

BACK

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Pressure Tests (cont'd)

6. Start the engine, and run it at 2,000 rpm in the [P] or [N] position.
7. Measure line pressure at line pressure inspection hole (A) in the [N] or [P] position.
   NOTE: Higher pressure may be indicated if measurements are made in shift lever positions other than [N] or [P].
8. Shift to the [1] position, and measure 1st clutch pressure at the 1st clutch pressure inspection hole (B) and 1st-hold clutch pressure at the1st-hold clutch inspection hole (C).
9. Shift to the [2] position, and measure 2nd clutch pressure at the 2nd clutch pressure inspection hole (D).
10. Shift to the [P] position, then press the brake pedal and hold it.
11. Shift to the [2] position, and release the brake pedal (the transmission should be in 2nd gear).
12. Press the accelerator very slowly to increase engine speed to 2,000 rpm gradually over 10 seconds, then hold it at 2,000 rpm.
13. Hold in the [2] position at 2,000 rpm, shift into the [N] for 1 second, then shift to the [D3] position (the transmission will shift to 3rd gear), and measure 3rd clutch pressure at the 3rd clutch pressure inspection hole (E).
14. Shift to the [D4] position (the transmission will shift to 4th gear at about 2,500 rpm), and measure 4th clutch pressure at the 4th clutch pressure inspection hole (F).
15. Shift to the [D5] position (the transmission will shift to 5th gear at about 2,500 rpm), and measure 5th clutch pressure at the 5th clutch pressure inspection hole (G).

PRESSURE	SHIFT LEVER POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
Line (A)	[N] or [P]	No (or low) line pressure	Torque converter, ATF pump, pressure regulator valve, torque converter check valve	900 – 960 kPa (9.2 – 9.8 kgf/cm², 130 – 140 psi)	850 kPa (8.7 kgf/cm², 120 psi)
1st clutch (B)	[1]	No or low 1st pressure	1st clutch	890 – 970 kPa (9.1 – 9.9 kgf/cm², 130 – 140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
2nd clutch (D)	[2]	No or low 2nd pressure	2nd clutch		
3rd clutch (E)	[D3]	No or low 3rd pressure	3rd clutch		
4th clutch (F)	[D4]	No or low 4th pressure	4th clutch		
5th clutch (G)	[D5]	No or low 5th pressure	5th clutch		
	[R]		Servo valve or 5th clutch		
1st-hold clutch (C)	[1]	No or low 1st-hold clutch	1st-hold clutch	760 – 830 kPa (7.7 – 8.5 kgf/cm², 110 – 120 psi)	710 kPa (7.2 kgf/cm², 100 psi)

16. Reinstall the sealing bolts with new sealing washers, and tighten the bolts to the specified torque.
    TORQUE: 18 N·m (1.8 kgf·m,13 lbf·ft)

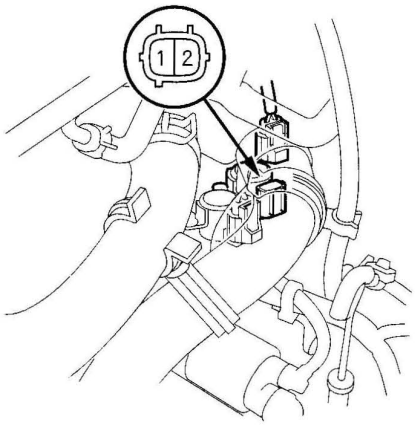
    NOTE: Do not reuse the old sealing washers.

BACK

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Torque Converter Clutch Solenoid Valve Test

1. Disconnect the connector from the torque converter clutch solenoid valve.



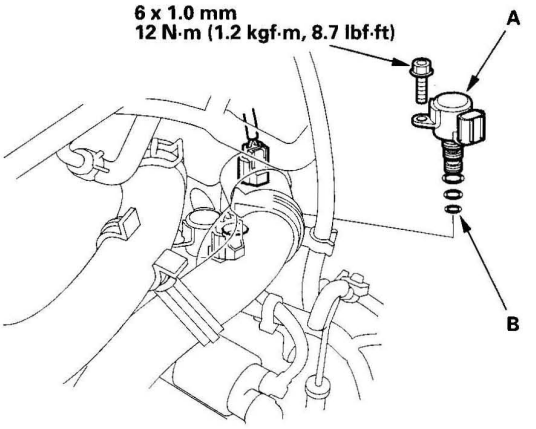
2. Remove the torque converter clutch solenoid valve.
3. Measure torque converter clutch solenoid valve resistance at the solenoid valve connector (black).

   STANDARD: 12 – 25 Ω

4. Replace the torque converter clutch solenoid valve if the resistance is out of standard.
5. If the resistance is within the standard, connect the No. 2 terminal of the torque converter clutch solenoid valve connector to the battery positive terminal and connect the No. 1 terminal to the battery negative terminal. A clicking sound should be heard. Replace the torque converter clutch solenoid valve if no clicking sound is heard.

Torque Converter Clutch Solenoid Valve Replacement

1. Remove the mounting bolt and the torque converter clutch solenoid valve.

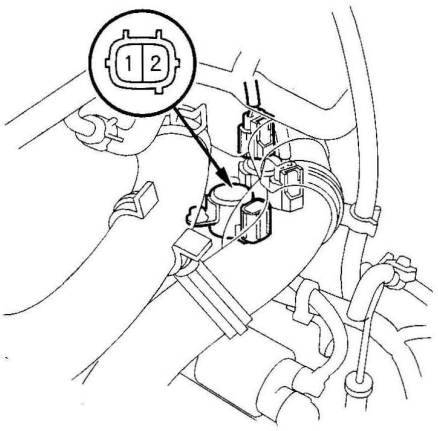


2. Install a new torque converter clutch solenoid valve (A) with new O-rings (B). When installing the solenoid valve, do not allow dust or other foreign particles to enter the transmission.
3. Check the connector for rust, dirt, or oil, then reconnect it.

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Shift Solenoid Valve B Test

1. Disconnect the connector from shift solenoid valve B.



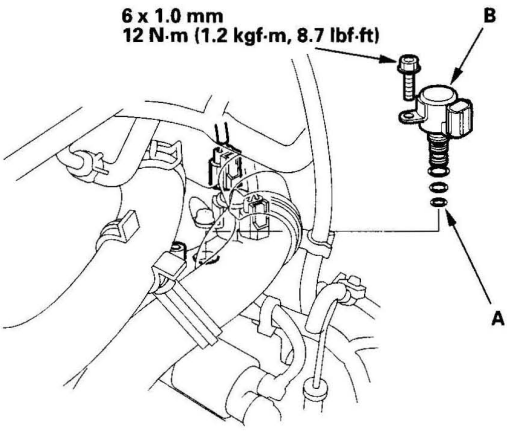
2. Remove shift solenoid valve B.
3. Measure shift solenoid valve B resistance at the solenoid valve connector (brown).

   STANDARD: 12—25 Ω

4. Replace the shift solenoid valve B if the resistance is out of standard.
5. If the resistance is within the standard, connect the No. 2 terminal of the shift solenoid valve B connector to the battery positive terminal, and connect the No. 1 terminal to the battery negative terminal. A clicking sound should be heard. Replace the shift solenoid valve B if no clicking sound is heard.

Shift Solenoid Valve B Replacement

1. Remove the mounting bolt and shift solenoid valve B.



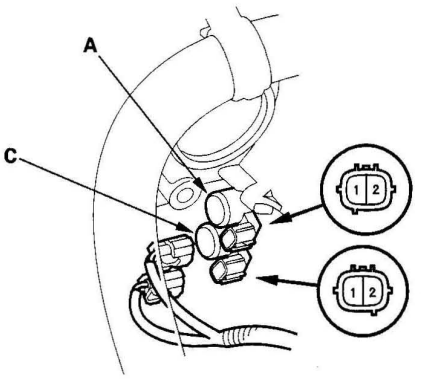
2. Install a new shift solenoid valve B with new O-rings (A). When installing the solenoid valve, do not allow dust or other foreign particles to enter the transmission.
3. Check the connector for rust, dirt, or oil, then reconnect it.

BACK

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Shift Solenoid Valves A and C Test

1. Remove the starter.
2. Disconnect the shift solenoid valves A (black) and C (brown) connector.



3. Measure the shift solenoid valves A and C resistance at each solenoid valve connector.

   STANDARD: 12–25 Ω

4. Replace shift solenoid valve A or C if the resistance is out of standard.
5. If the resistance is within the standard, connect the No. 2 terminal of the shift solenoid valve A or C connector to the battery positive terminal, and connect the No. 1 terminal to the battery negative terminal. A clicking sound should be heard. Replace shift solenoid valve A or C if no clicking sound is heard.

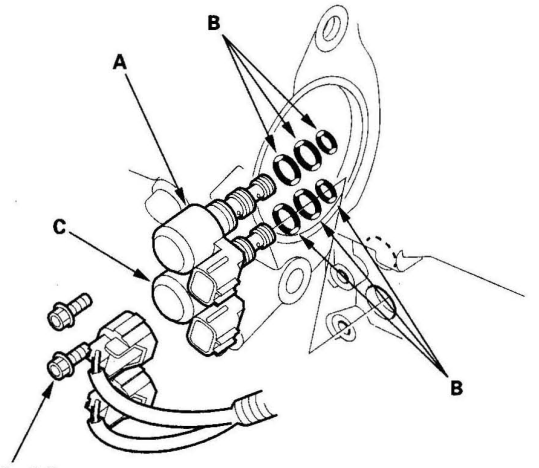
Shift Solenoid Valves A and C Replacement

NOTE: If shift solenoid valves A and C are replaced or removed at the same time, be sure to reinstall them correctly. The connector color of shift solenoid valve A is black, and the connector color of shift solenoid valve C is brown.

1. Remove the starter.

   NOTE: If you are only replacing shift solenoid valve C, starter removal is not needed.

2. Remove the mounting bolt and shift solenoid valve A.



6 x 1.0 mm
12 N·m (1.2 kgf·m, 8.7 lbf·ft)

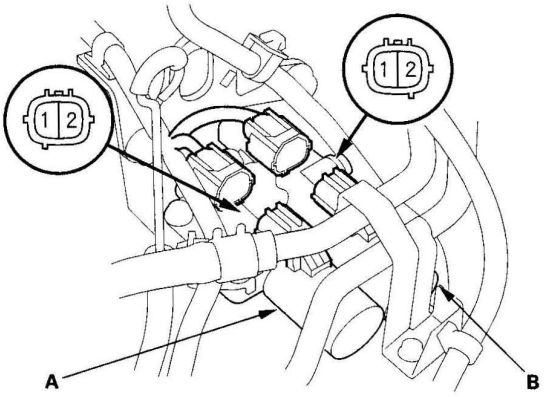
3. Remove the mounting bolt and shift solenoid valve C.
4. Install a new shift solenoid valve A or C with new O-rings (B). While installing the valves, do not allow dust or other foreign particles to enter the transmission.
5. Check the connector for rust, dirt, or oil, then reconnect it.
6. Install the starter, if removed.

BACK

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A/T Clutch Pressure Control Solenoid Valves A and B Test

1. Disconnect the 2P connectors from A/T clutch pressure control solenoid valves A and B.



2. Remove the A/T clutch pressure control solenoid valves A and B (see page 14-125).

3. Measure the A/T clutch pressure control solenoid valves A and B resistances at each solenoid valve connector.

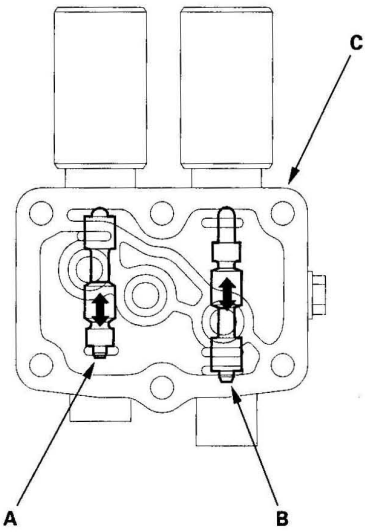
   STANDARD: About 5.0 Ω

4. If the resistance of either solenoid is out of standard, replace A/T clutch pressure control solenoid valves A and B.

5. Connect the No. 1 terminal of A/T clutch pressure control solenoid valves A and B to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. A clicking sound should be heard. Remove A/T clutch pressure control solenoid valves A and B if no sound is heard.

6. Check the fluid passage of the A/T clutch pressure control solenoid valves for dust and dirt, and clean the passage if necessary.

7. Connect the No. 1 terminal of A/T clutch pressure control solenoid valves A and B to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. Make sure A/T clutch pressure control solenoid valves A and B move.



8. Disconnect one of the battery terminals and check valve movement.

   NOTE: You can see valve movement through the fluid passage in the mounting surface of the assembly body (C).

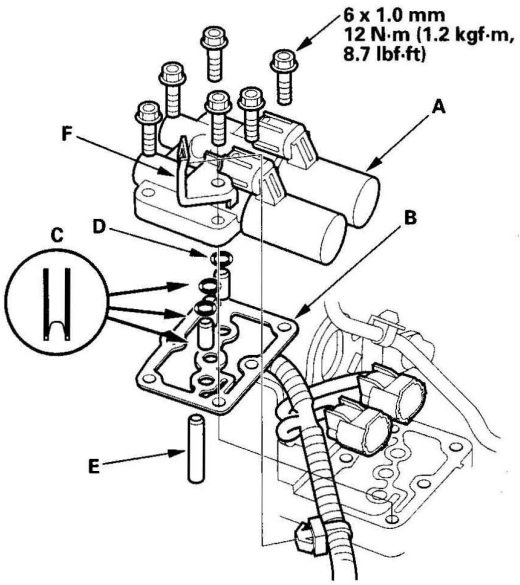
9. If either valve binds or moves sluggishly, or if the solenoid does not operate, replace A/T clutch pressure control solenoid valves A and B.

BACK

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A/T Clutch Pressure Control Solenoid Valves A and B Replacement

1. Remove the ATF cooler hose (outlet line) at the ATF cooler line. Turn the end of the cooler hose up to prevent ATF from flowing out, then plug the line and hose.
2. Remove the ATF cooler line (outlet line) from the transmission housing.
3. Remove the harness clamp from the clamp bracket, and disconnect the connectors from A/T clutch pressure control solenoid valves A and B.
4. Remove the mounting bolts and A/T clutch pressure control solenoid valves A and B (A).



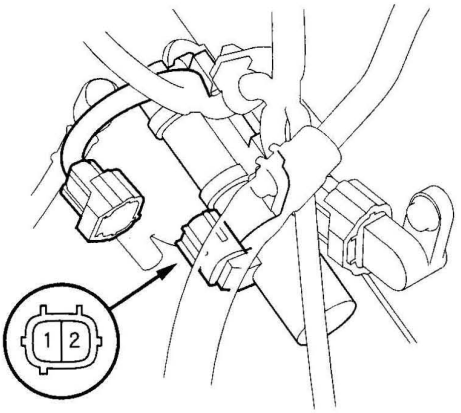
5. Clean the mounting surface and fluid passages of A/T clutch pressure control solenoid valves A and B and the transmission housing.
6. Place a new gasket (B) on the transmission housing, then install the 8 x 18 mm ATF feed pipes (C) with their filter side into the transmission housing.
7. Install new O-rings (D) over the feed pipes, and install the 8 x 40 mm ATF feed pipe (E).
8. Install the new A/T clutch pressure control solenoid valves A and B (A) and harness clamp bracket (F).
9. Check the A/T clutch pressure control solenoid valves A and B connectors for rust, dirt, or oil, then connect them securely.
10. Install harness clamp on the clamp bracket.
11. Install the ATF cooler line (outlet line), and connect the ATF cooler hose to the cooler line.

BACK

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A/T Clutch Pressure Control Solenoid Valve C Test

1. Disconnect the connector from A/T clutch pressure control solenoid valve C.



2. Measure A/T clutch pressure control solenoid valve C resistance at the solenoid valve connector.

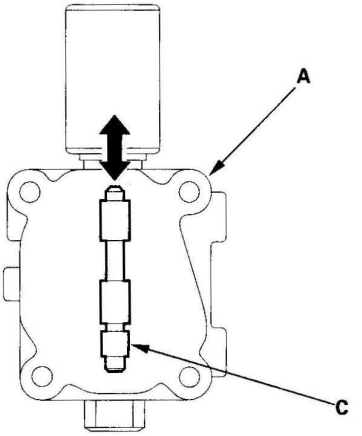
   STANDARD: About 5.0 Ω

3. If the resistance is out of standard, replace A/T clutch pressure control solenoid valve C.

4. Connect the No. 1 terminal of A/T clutch pressure control solenoid valve C to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. A clicking sound should be heard. Remove A/T clutch pressure control solenoid valve C if no sound is heard.

5. Check the fluid passage of A/T clutch pressure control solenoid valve C for dust and dirt.

6. Connect the No 1 terminal of A/T clutch pressure control solenoid valve C to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. Make sure A/T clutch pressure control solenoid valve C moves.



7. Disconnect one of the battery terminals and check valve movement.

   NOTE: You can see valve movement through the fluid passage in the mounting surface of the body (A).

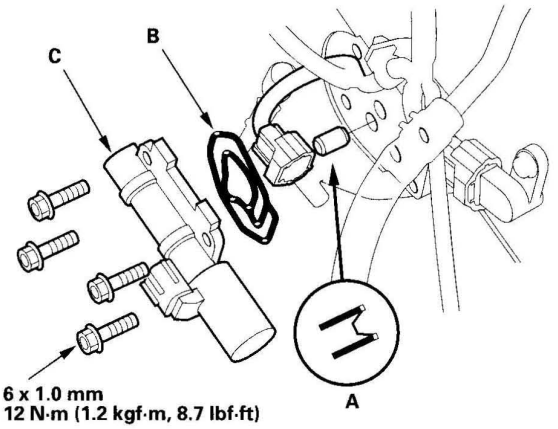
8. If the valve binds or moves sluggishly, or if the solenoid does not operate, replace A/T clutch pressure control solenoid valve C.

BACK

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A/T Clutch Pressure Control Solenoid Valve C Replacement

1. Disconnect the connector from A/T clutch pressure control solenoid valve C.
2. Remove A/T clutch pressure control solenoid valve C.

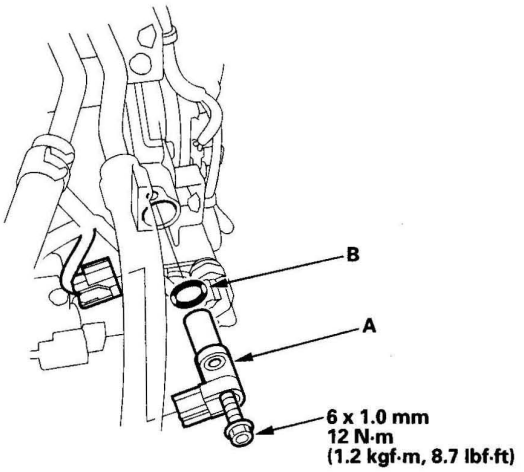


3. Clean the mounting surface and fluid passage of A/T clutch pressure control solenoid valve C and the transmission housing.
4. Install the 8 x 12 mm ATF feed pipe (A) with its filter side into the transmission housing.
5. Install the new gasket (B) in the mounting groove of the A/T clutch pressure control solenoid valve C body properly, then install them on the transmission housing. Do not pinch the gasket.
6. Check the solenoid connector for rust, dirt, or oil, and connect it securely.

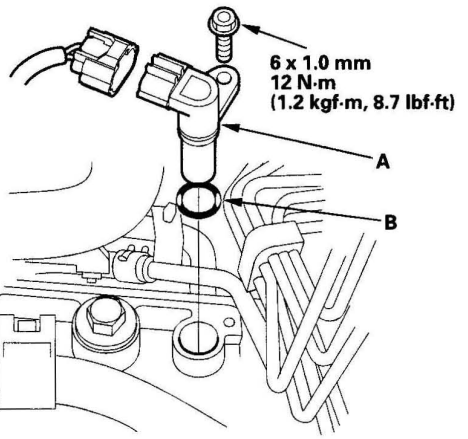
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Speed Sensor Replacement

1. Disconnect the connectors from the mainshaft and countershaft speed sensors.
2. Remove the bolt securing the mainshaft speed sensor, then remove the mainshaft speed sensor (A) from the end cover.



3. Remove the bolt securing the countershaft speed sensor, then remove the countershaft speed sensor (A) from the transmission housing.



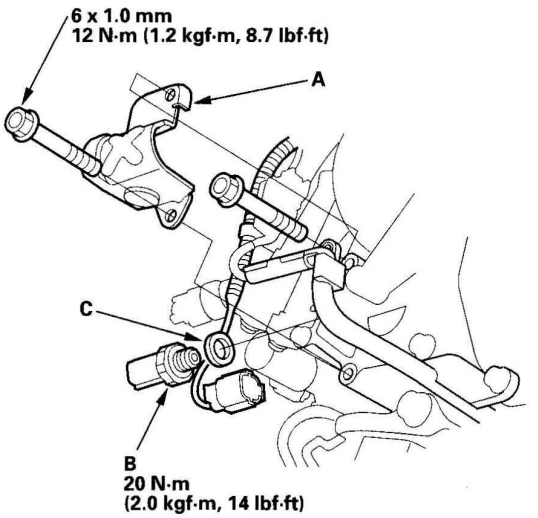
4. Install the new O-ring (B) on the mainshaft speed sensor, then install the mainshaft speed sensor in the end cover. When installing the speed sensor, do not allow dust or foreign particles to enter the transmission.
5. Install the new O-ring (B) on the countershaft speed sensor, then install the countershaft speed sensor in the transmission housing. When installing the speed sensor, do not allow dust or foreign particles to enter the transmission.
6. Check the connector for rust, dirt, or oil, then connect them securely.

BACK

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3rd Clutch Pressure Switch Replacement

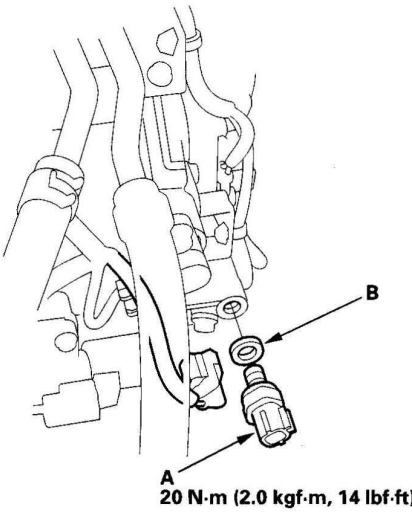
1. Remove the switch cover (A).



2. Disconnect the connector from the 3rd clutch pressure switch (B).
3. Replace the 3rd clutch pressure switch, then install a new one with a new sealing washer (C). Tighten the switch on the metal part, not the plastic part.
4. Reconnect the connector, making sure there is no water, oil, dust, or other foreign particles inside it.
5. Install the switch cover.

4th Clutch Pressure Switch Replacement

1. Disconnect the connector from the 4th clutch pressure switch (A).

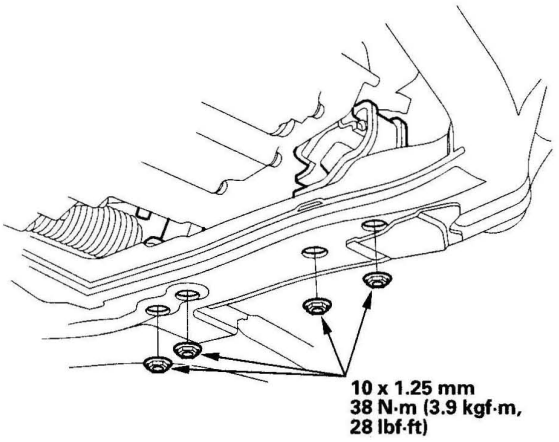


2. Replace the 4th clutch pressure switch, then install a new one with a new sealing washer (B). Tighten the switch on the metal part, not the plastic part.
3. Reconnect the connector, making sure there is no water, oil, dust, or other foreign particles inside it.

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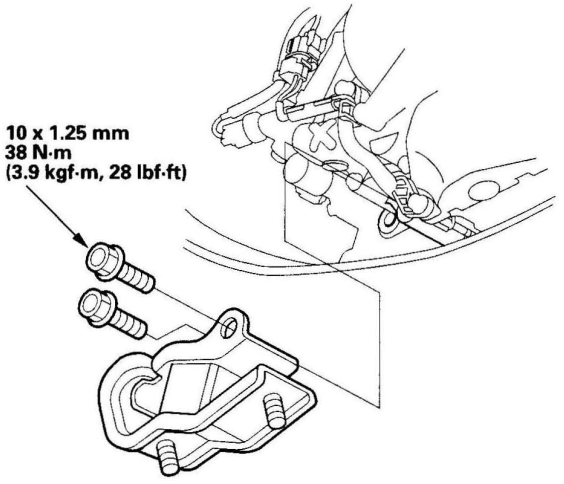
ATF Temperature Sensor Replacement

1. Remove the transmission lower mount nuts.

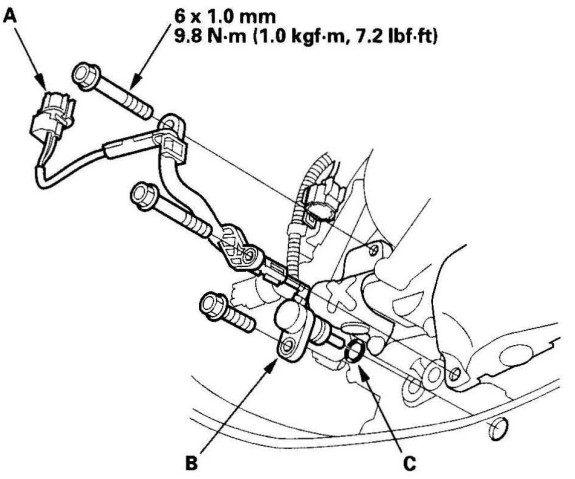


2. Place the transmission jack under the transmission, and lift it up until the studs of the transmission lower front mount clear the sub-frame. Do not lift the transmission to the limit.

3. Remove the transmission lower front mount.



4. Disconnect the connector (A) from the ATF temperature sensor.



5. Remove the bolts securing the sensor harness clamp and ATF temperature sensor, then remove the ATF temperature sensor (B).

6. Install the new ATF temperature sensor with a new O-ring (C).

7. Install the harness clamp, then connect the connector.

8. Install the transmission lower front mount.

9. Lower the transmission, then install the transmission lower mount nuts.

10. Remove the transmission jack.

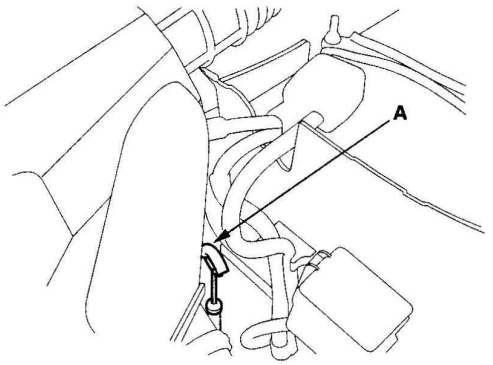
BACK

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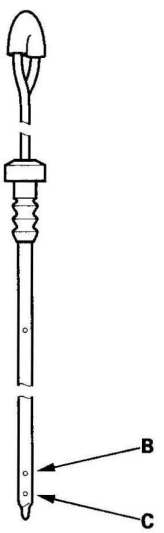
ATF Level Check

NOTE: Keep all foreign particles out of the transmission.

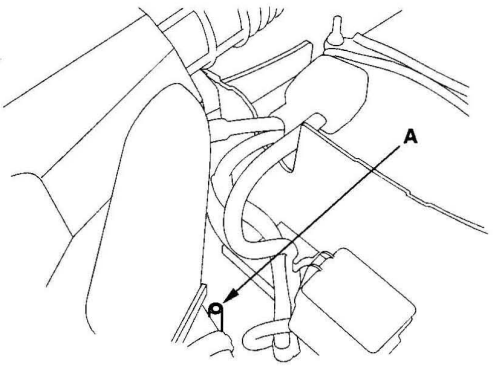
1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Park the vehicle on level ground, and turn the engine off.
3. Remove the dipstick (yellow loop) (A) from the transmission, and wipe it with a clean cloth.



4. Insert the dipstick into the transmission.
5. Remove the dipstick and check the fluid level. It should be between the upper mark (B) and lower mark (C).



6. If the level is below the lower mark, remove the dipstick and pour the recommended fluid into the dipstick guide hole (A) to bring it to the upper mark. Always use Honda ATF-Z1 Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.



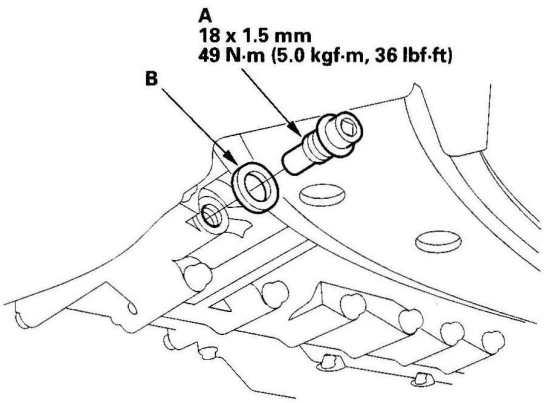
7. Insert the dipstick back into the transmission.

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ATF Replacement

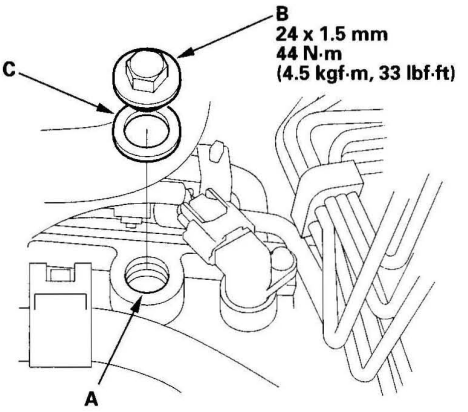
NOTE: Keep all foreign particles out of the transmission.

1. Bring the transmission up to operating temperature (the radiator fan comes on) by driving the vehicle.
2. Park the vehicle on level ground, and turn the engine off.
3. Remove the ATF filler bolt and drain plug (A), and drain the automatic transmission fluid (ATF).



4. Reinstall the drain plug with a new sealing washer (B).
5. Refill the transmission with the recommended fluid into the filler hole (A) to the upper mark on the dipstick. Always use Honda ATF-Z1 Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.

Automatic Transmission Fluid Capacity:
3.0 ℓ (3.2 US qt, 2.6 Imp qt) at changing
7.8 ℓ (8.2 US qt, 6.9 Imp qt) at overhaul



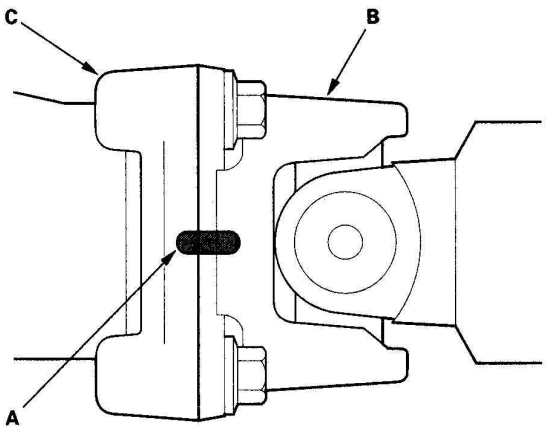
6. Install the ATF filler bolt (B) with a new sealing washer (C).

BACK

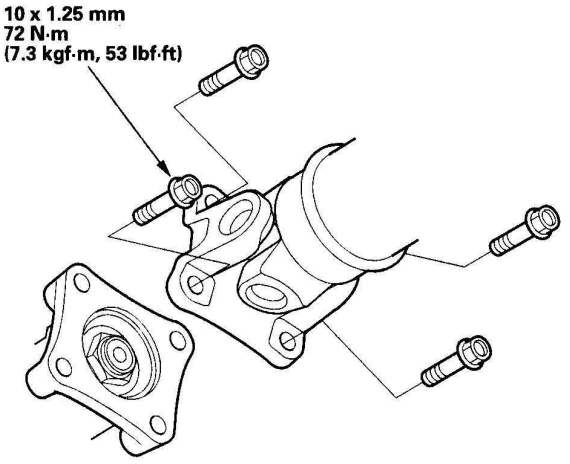
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Transfer Assembly Inspection

1. Raise the vehicle, and make sure it is supported securely.
2. Shift the transmission into the [N] position.
3. Make a reference mark (A) across the propeller shaft (B) and the transfer companion flange (C).

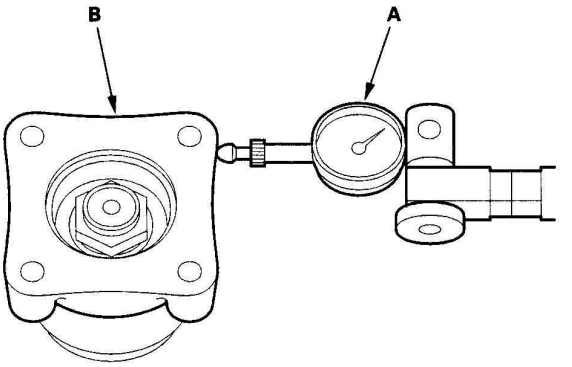


4. Separate the propeller shaft from the transfer assembly.



5. Set a dial indicator (A) on the transfer companion flange (B), and measure the transfer gear backlash.

STANDARD: 0.06 – 0.16 mm (0.02 – 0.06 in.)

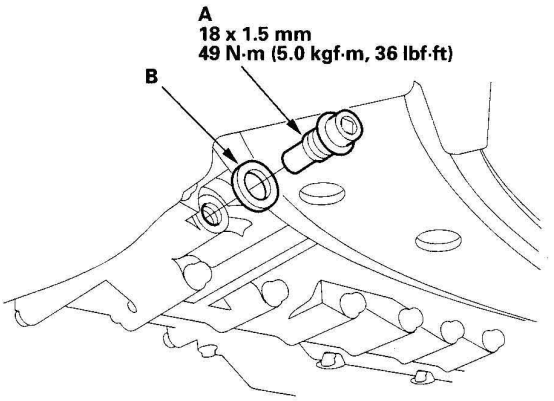


6. If the measurement is out of standard, remove the transfer assembly, and adjust the transfer gear backlash (see page 14-258).
7. Check for fluid leaks between the mating faces of the transfer assembly and transmission.
8. If there is a leak, remove the transfer assembly, and replace the O-ring. Also check for fluid leaks between the mating faces of the transfer housing and transfer cover. If there is a leak, remove the transfer cover, and replace the O-ring.
9. Check for leaks between the transfer companion flange and transfer oil seal.
10. If there is a leak, remove the transfer assembly from the transmission, and replace the transfer oil seal and O-ring on the transfer driven gear shaft. If oil seal and O-ring replacement is required, you will need to check and adjust the transfer gear tooth contact, transfer gear backlash, the tapered roller bearing starting torque, and the total starting torque (see page 14-266). Do not replace the oil seal with the transfer assembly on the transmission.

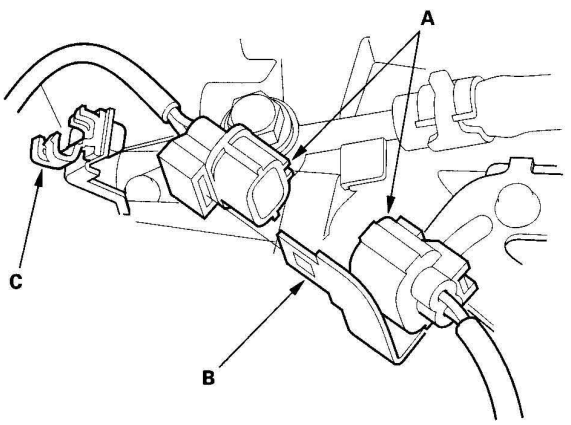
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Transfer Assembly Removal

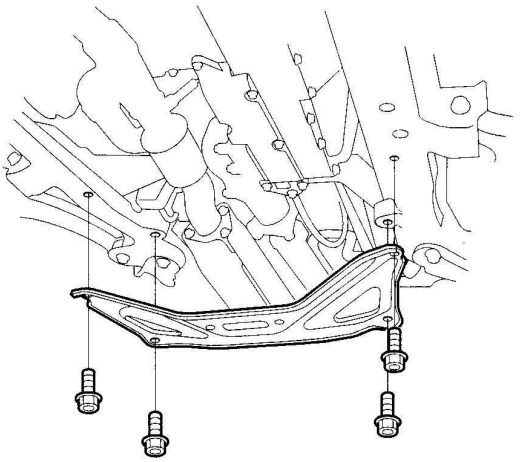
1. Raise the vehicle, and make sure it is securely supported.
2. Remove the drain plug (A), and drain the automatic transmission fluid (ATF). Reinstall the drain plug with a new sealing washer (B).



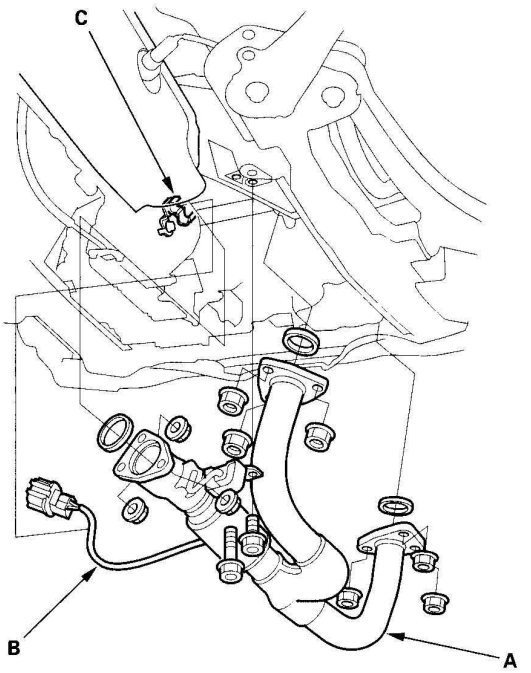
3. Remove the primary heated oxygen sensor (Primary HO2S) connector (A) from its connector bracket (B).



4. Disconnect the Primary HO2S connector (A), and remove the harness from the harness clamp (C).
5. Remove the front sub-frame stiffener.



6. Remove the Primary HO2S harness (B) from the clamp (C) on the transfer mounting bolt.

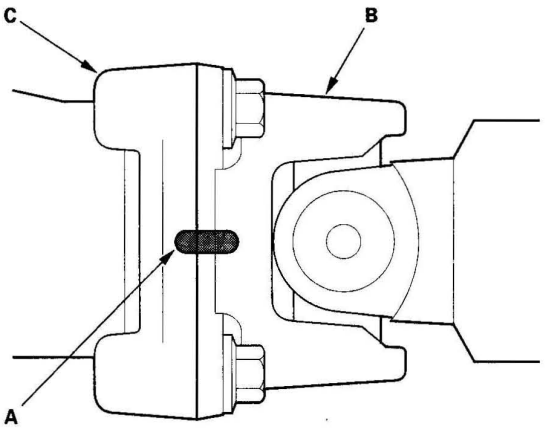


7. Remove exhaust pipe A.

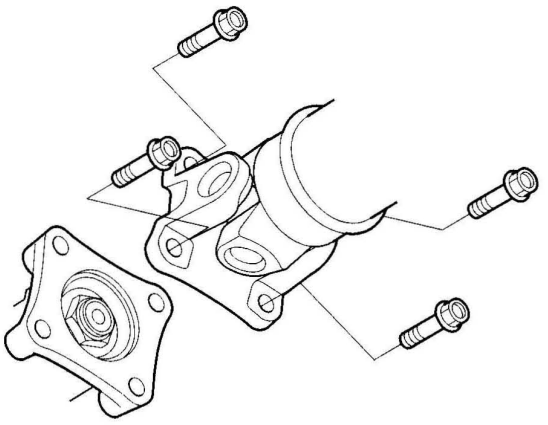
BACK

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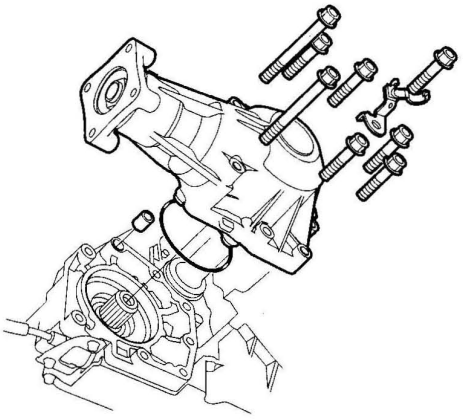
8. Make a reference mark (A) across the propeller shaft (B) and the transfer companion flange (C).



9. Separate the propeller shaft from the transfer assembly.



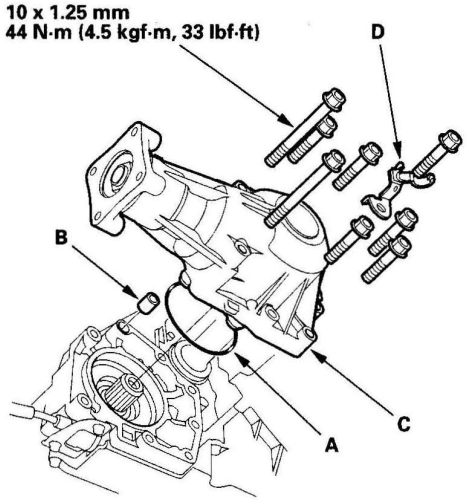
10. Remove the transfer assembly from the transmission.



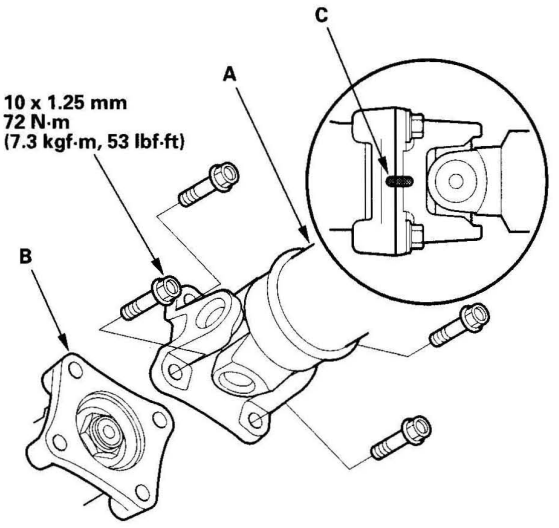
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Transfer Assembly Installation

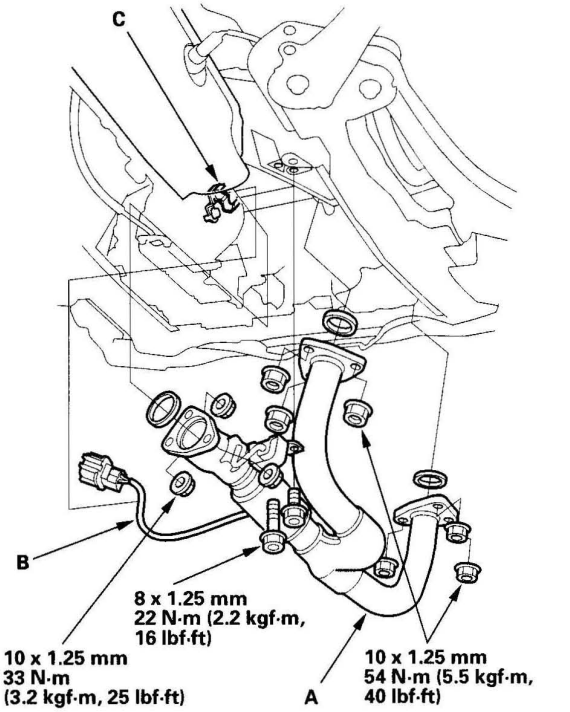
1. Clean the areas where the transfer assembly contacts the transmission with solvent or carburetor cleaner, and dry with compressed air. Then apply transmission fluid to the contact areas. When installing the transfer assembly, be sure not to allow dust or other foreign particles to enter the transmission.
2. Install the new O-ring (A) on the transfer cover.



3. Install the dowel pin (B) in the transfer assembly (C), then install the transfer assembly with the Primary HO2S harness clamp bracket (D).
4. Install the propeller shaft (A) to the transfer companion flange (B) by aligning the reference mark (C).



5. Install exhaust pipe A.

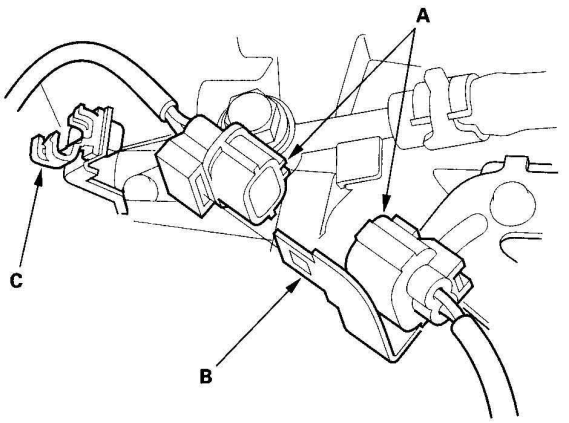


6. Install the Primary HO2S harness (B) to the clamp (C).

BACK

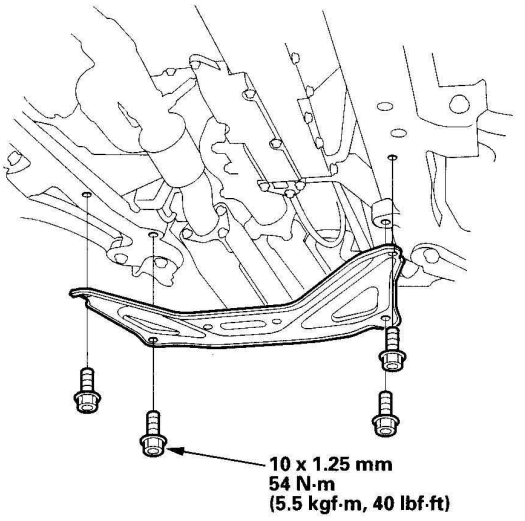
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7. Connect the Primary HO2S connector (A), and install it to its connector bracket (B).



8. Install the harness on the harness clamp (C).

9. Install the sub-frame stiffener.



10. Refill the transmission with transmission fluid (see page 14-132).

11. Start the engine, and run it to normal operating temperature (the radiator fan comes on). Turn the engine OFF, and check the fluid level (see page 14-131).

Protected by AR

Transmission Removal

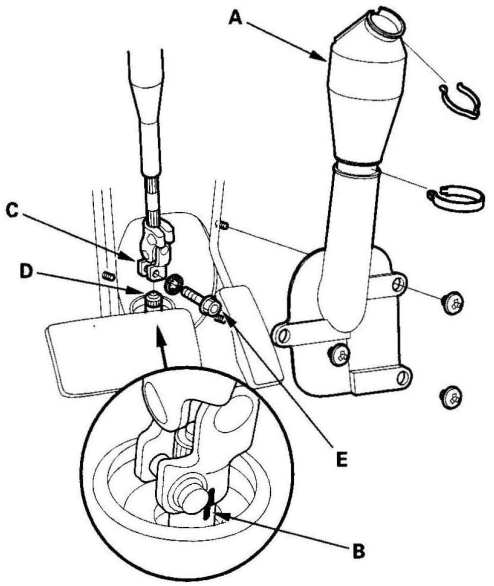
Special Tools Required
- Engine hanger support bar 07AAK-S3VA000
- Engine hanger, A and Reds AART 1256 or equivalent, commercially available
- Front sub-frame adapter EQS02BMDXSB0

NOTE: Use fender covers to avoid damaging painted surfaces.

1. Drain the power steering system fluid from the reservoir (see page 17-14).

2. Remove the center console lower panel (driver side), and pull the carpet to expose the steering joint cover.

3. Remove the steering joint cover (A).



4. Make a reference mark (B) across the steering joint (C) and steering gearbox pinion shaft (D). Remove the steering joint bolt (E), and disconnect the steering joint from the steering gearbox pinion shaft.

5. Before disconnect the battery, make sure you have the anti-theft code for the radio and the navigation system, then write down the frequencies for the radio's preset stations.

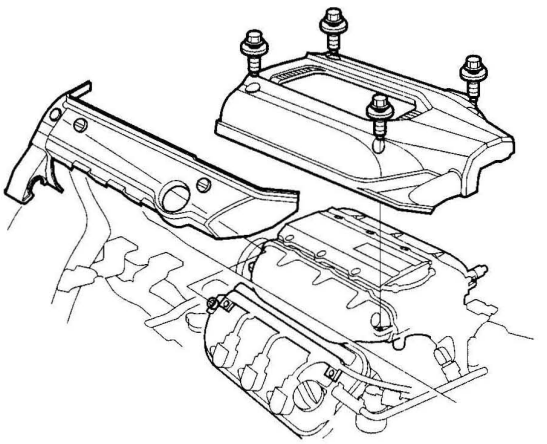
6. Remove the support struts at the ball joints on both sides hood. Secure the hood in a vertical position.

7. Disconnect the battery negative terminal, then remove the positive terminal.

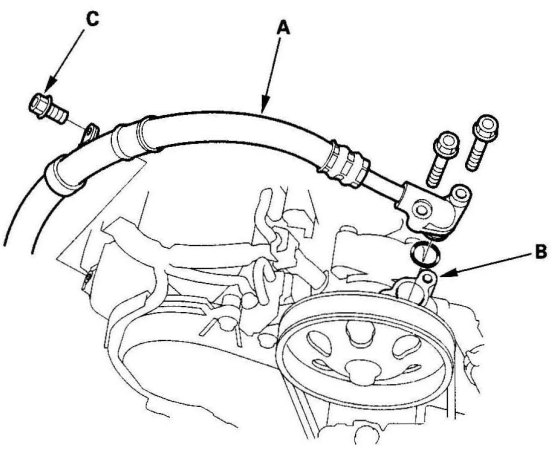
8. Remove the battery hold-down bracket, then disconnect the battery and battery tray.

9. Remove the harness clamps, connectors, and fuse box from the battery base. Remove the bolt securing the battery base from under the vehicle, and the remaining bolts (3) from the engine compartment, then remove the battery base.

10. Remove the engine covers and intake air duct.



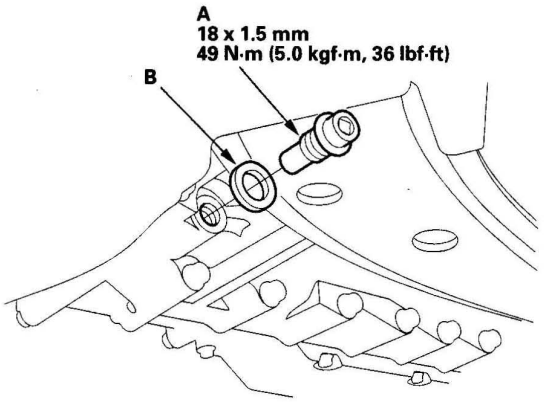
11. Remove the power steering pump outlet hose (A) at the pump (B), and remove the hose clamp bolt (C).



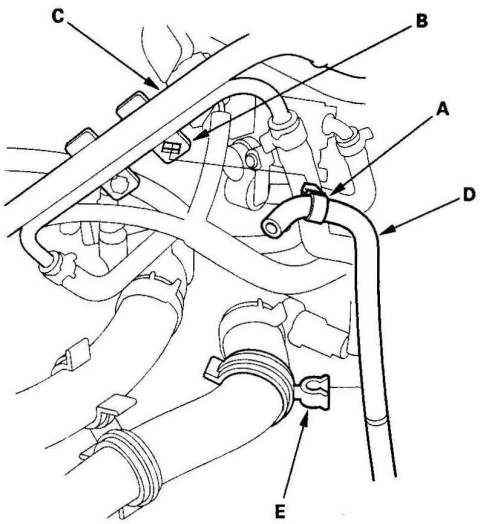
BACK

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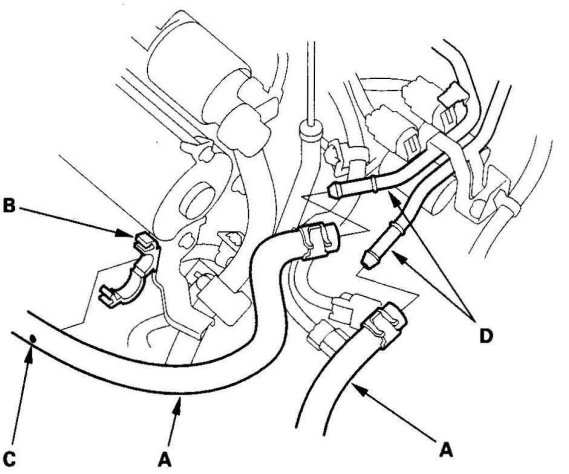
12. Raise the vehicle, and make sure it is securely supported. Remove the drain plug (A), and drain the automatic transmission fluid (ATF). Reinstall the drain plug with a new sealing washer (B).



13. Remove the transmission breather tube clamp (A) from the clamp bracket (B) on the coolant pipe (C), and remove the breather tube (D) from its clamp (E) on the radiator hose.



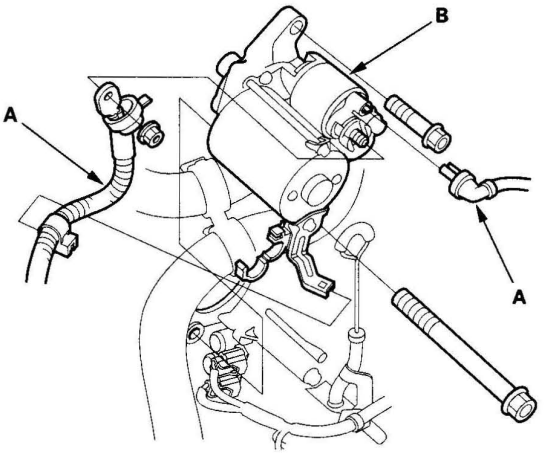
14. Remove the cooler hose (A) from the clamp (B) on the starter, and paint a white dot (C) on the hose where it came off the clamp if the white dot is not painted.



15. Remove the ATF cooler hoses (A) from the ATF cooler lines (D). Turn the ends of the ATF cooler hoses up to prevent ATF from flowing out, then plug the ATF cooler hoses and lines.

    NOTE: Check for any signs of leakage at the hose joints.

16. Remove the starter cables (A) from the starter (B), then remove the starter.

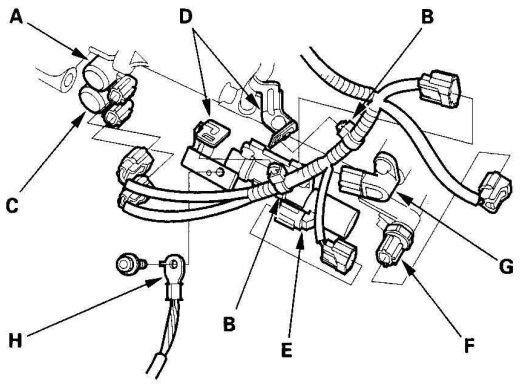


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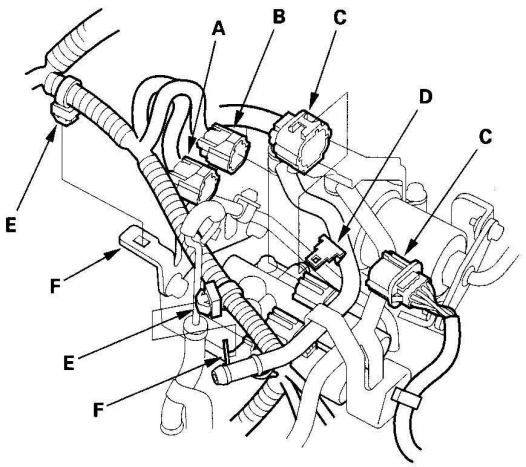
Transmission Removal (cont'd)

17. Remove the harness clips (B) from the brackets (D), then disconnect the connectors from the shift solenoid valves A and C, A/T clutch pressure control solenoid valve C (E), 4th clutch pressure switch (F), and mainshaft speed sensor (G).



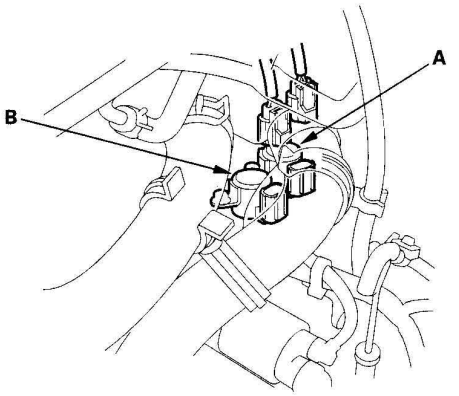
18. Remove the transmission ground cable (H).

19. Remove the 8P connector (C) from the connector bracket (D), then disconnect the connector.

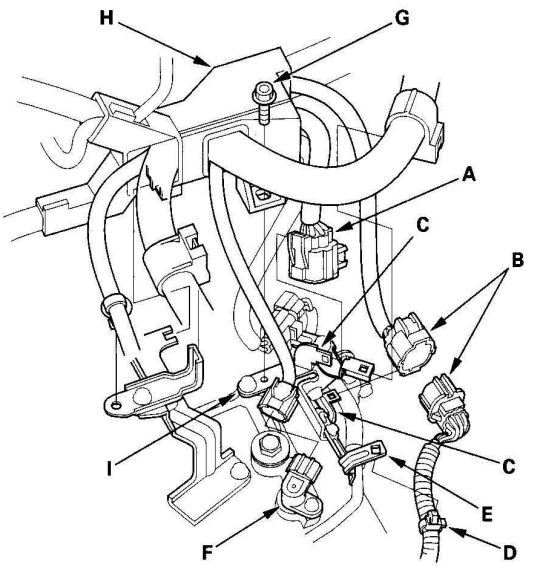


20. Remove the harness clips (E) from the brackets (F), then disconnect the connectors from the A/T clutch pressure control solenoid valves A and B.

21. Disconnect the connectors from the torque converter clutch solenoid valve (A) and shift solenoid valve B.



22. Remove the joint connector (A) and transmission range switch connector (B) from the connector brackets (C).



23. Disconnect the transmission range switch connector (B), then remove the harness clip (D) from the bracket (E).

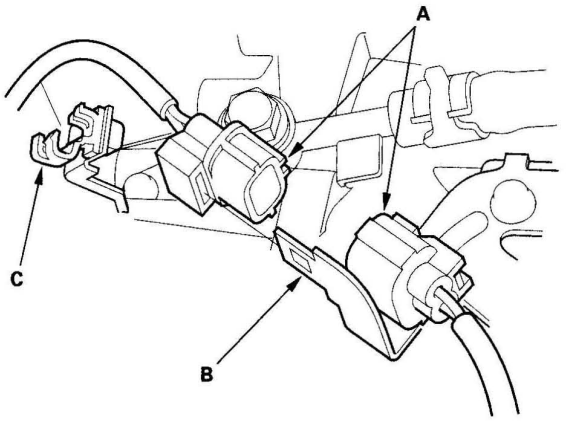
24. Disconnect the connector from the countershaft speed sensor (F).

25. Remove the bolt (G) securing the harness cover (H), then remove the harness cover from the mounting bracket (I).

BACK

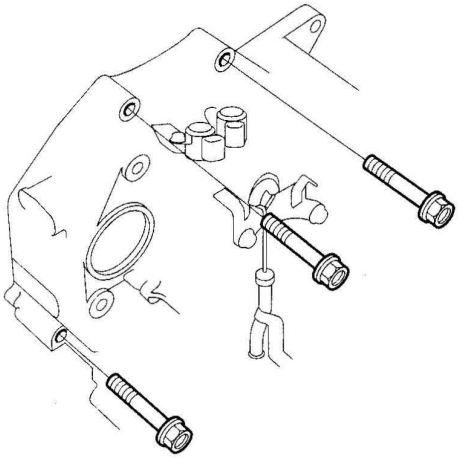
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26. Remove the primary heated oxygen sensor (Primary HO2S) connector (A) from its connector bracket (B).

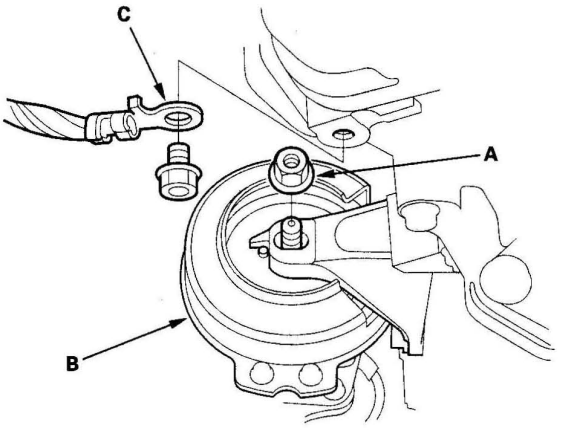


27. Disconnect the Primary HO2S connector (A), and remove the Primary HO2S harness from the harness clamp (C).

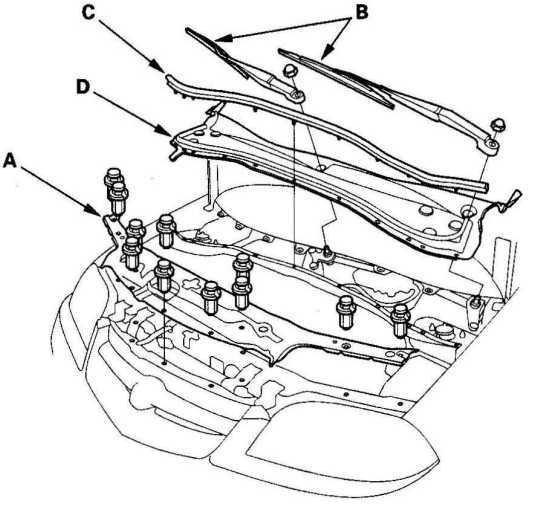
28. Remove the transmission housing mounting bolts (3).



29. Remove the nut (A) from the front mount (B), and remove the ground cable (C) from the engine.



30. Remove the front bulkhead cover (A), windshield wiper arms (B), cowl cover sealing (C), and cowl cover (D).

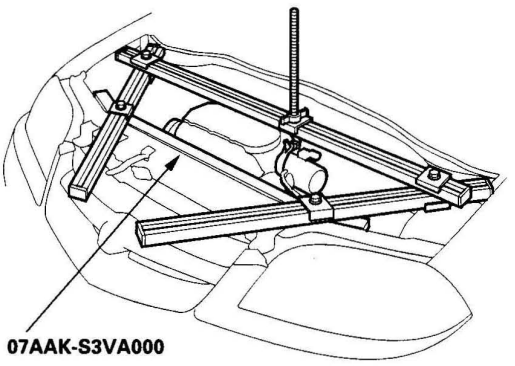


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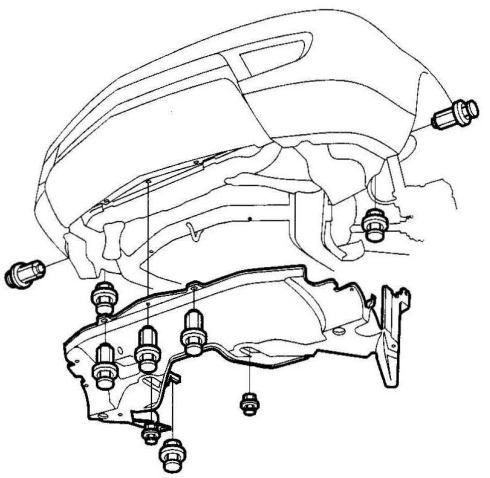
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Transmission Removal (cont'd)

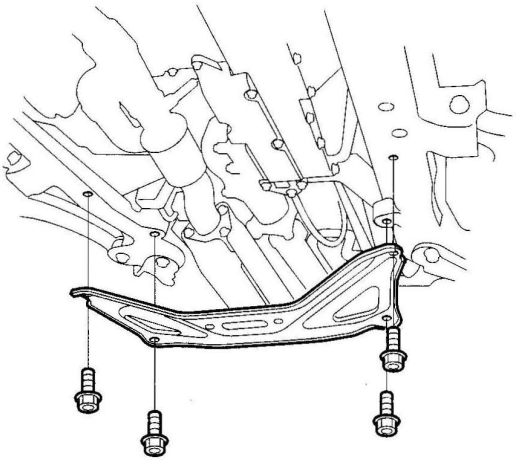
31. Lift and support the engine with an engine hanger, T/N AAR-T-12566, and support bar, T/N 07AAK-S3VA000, or equivalent. (The engine hanger and support bar are available through the American Honda Tool and Equipment Program.)



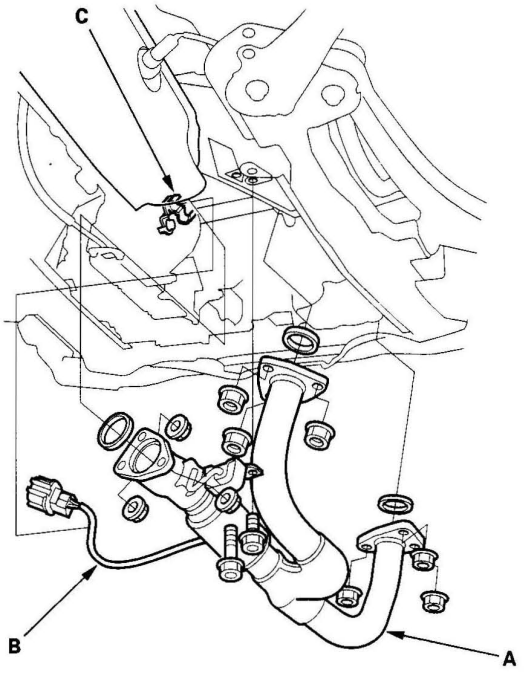
32. Remove the splash shield.



33. Remove the front sub-frame stiffener.



34. Remove the Primary HO2S harness (B) from the clamp (C) on the transfer mounting bolt.

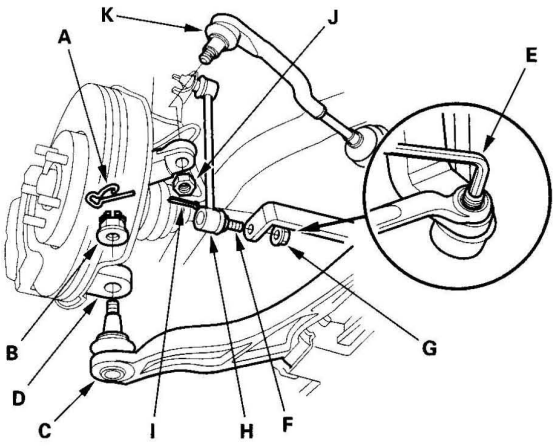


35. Remove exhaust pipe A.

BACK

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36. Remove the spring clips (A) and castle nuts (B), and separate the lower arms (C) from the knuckles (D) (see page 18-16).

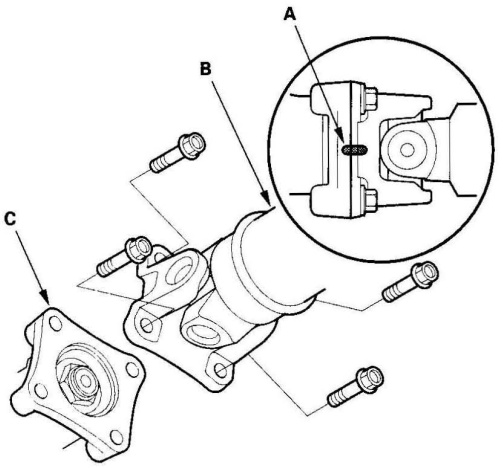


37. Insert a 6 mm Allen wrench (E) in the top of the ball joint pin (F), and remove the nut (G), then separate the stabilizer link (H).

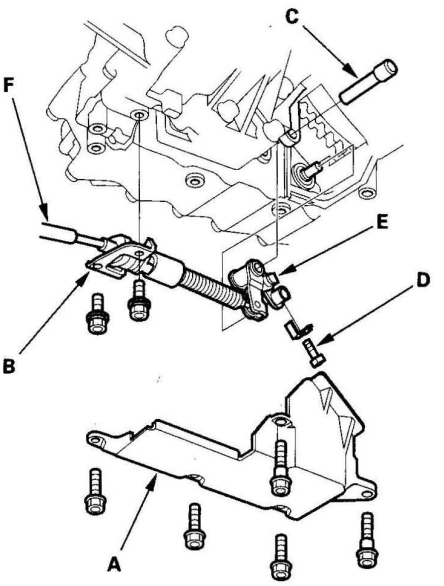
38. Remove the cotter pins (I) and nuts (J), and separate the tie-rod end ball joints (K) from the knuckles (see step 11 on page 17-31).

39. Pry the left driveshaft out of the differential and the right driveshaft from the intermediate shaft (see step 10 on page 16-4).

40. Make a reference mark (A) across the propeller shaft (B) and the transfer companion flange (C), then separate the propeller shaft from the companion flange.

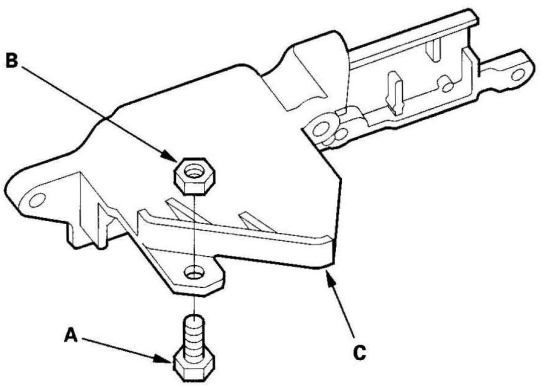


41. Remove the shift cable cover (A), then remove the bolts securing the shift cable holder (B).



42. Remove the change shaft (C) and the lock bolt (D) securing the control lever (E), then remove the shift cable (F) with the control lever. Do not bend the shift cable excessively.

43. Install a 6 x 1.0 x 14 mm bolt (A) and nut (B) on the shift cable cover (C), then reinstall the shift cable cover to the torque converter housing. If you don't do this, the bolt head of the cable cover may prevent you from removing the torque converter during transmission removal.

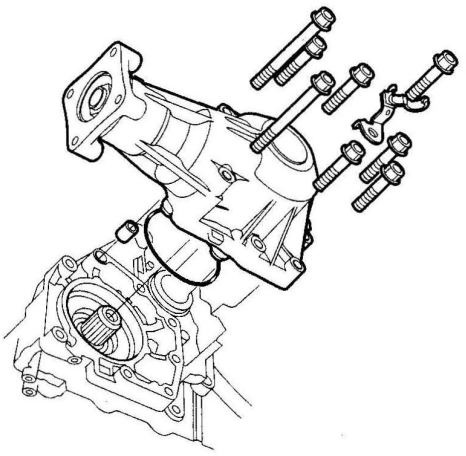


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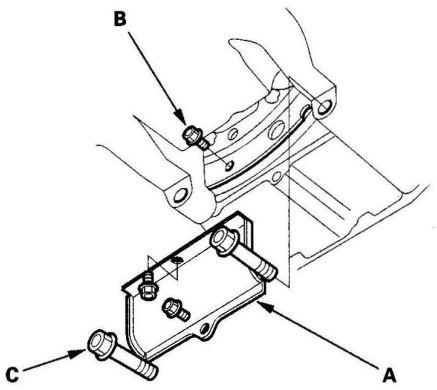
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Transmission Removal (cont'd)

44. Remove the transfer assembly from the transmission.

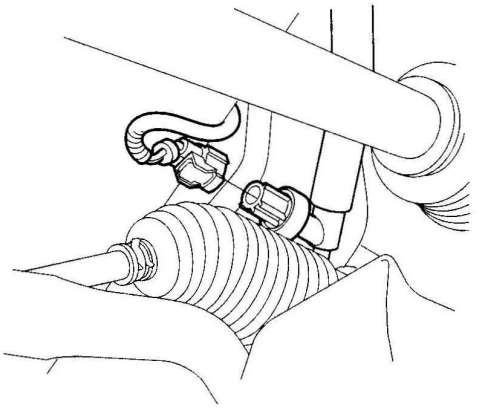


45. Remove the torque converter cover (A), then remove the eight drive plate bolts (B) one at a time while rotating the crankshaft pulley.

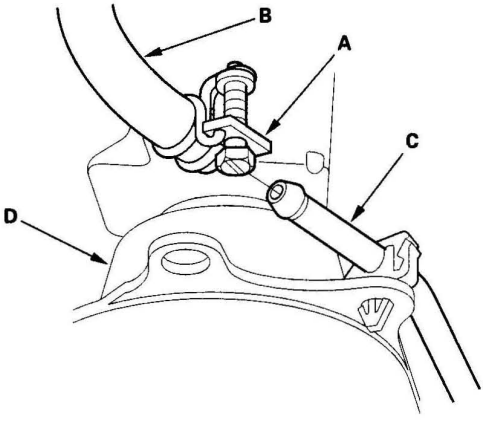


46. Remove the engine-to-torque converter housing mounting bolts (C).

47. Disconnect the power steering pressure switch connector.



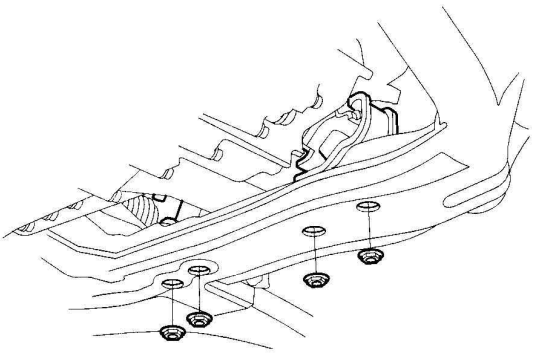
48. Remove the power steering hose clamp (A), then disconnect the hose (B) from the pipe (C) at the right front of the sub-frame (D).



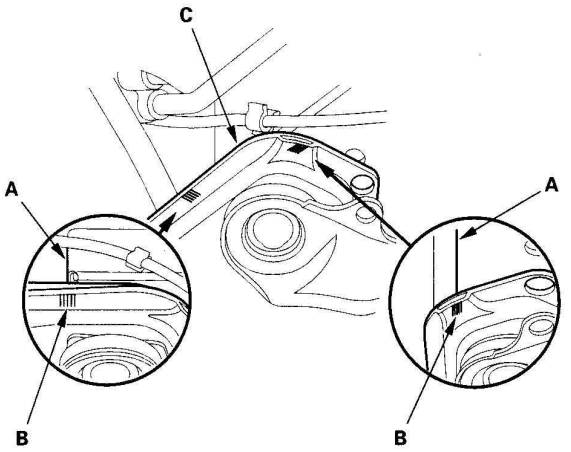
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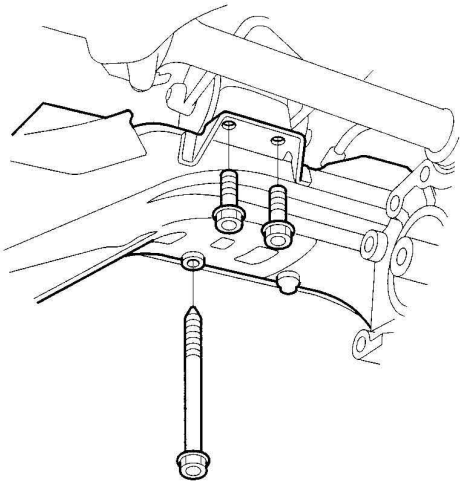
49. Remove the transmission lower mount nuts (four).



50. Make reference marks (A) on the body across the marks (B) on the edge of the front sub-frame (C).

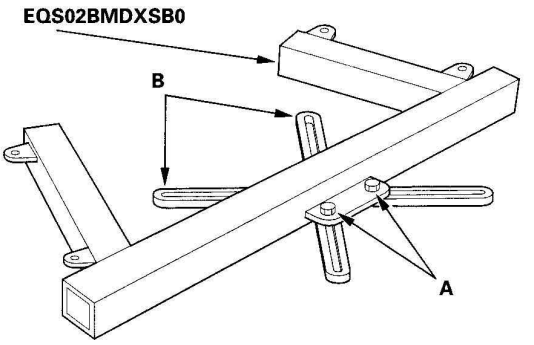


51. Remove the rear mount bracket bolts (three).



52. Loosen the four bolts (A) holding the adjustable arms (B) of the front sub-frame adapter (T/N EQS02BMDXB0) to its center plate.

NOTE: The adapter is designed to be use with the Acura transmission jack (model number LSL-W93714) or powertrain lift (model number OTC-1585), both available through the Acura Tool and Equipment Program. It will also work with most commercially available transmission jack.

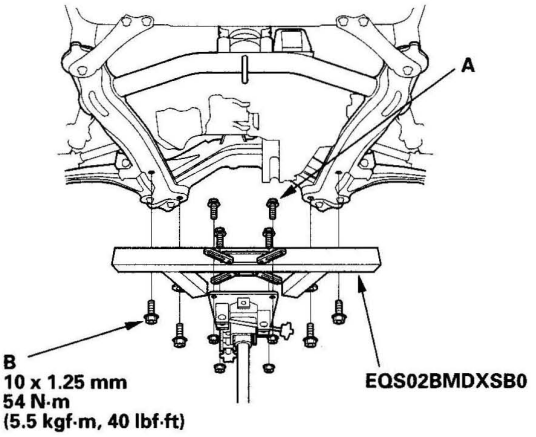


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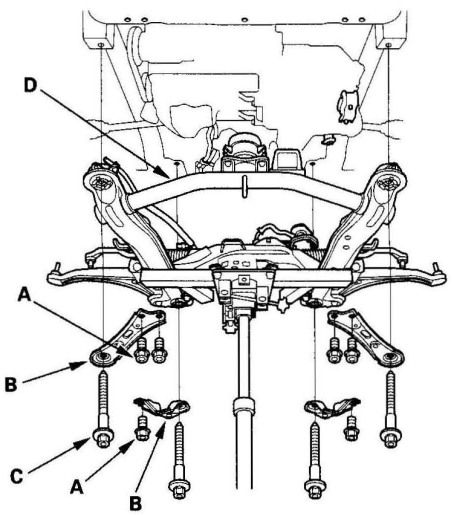
Transmission Removal (cont'd)

53. Line up the slots in the arms with the bolt holes on the corner of the jack base, then attach the adapter to the jack base with the bolts (A) that came with the jack. Tighten all bolts securely.

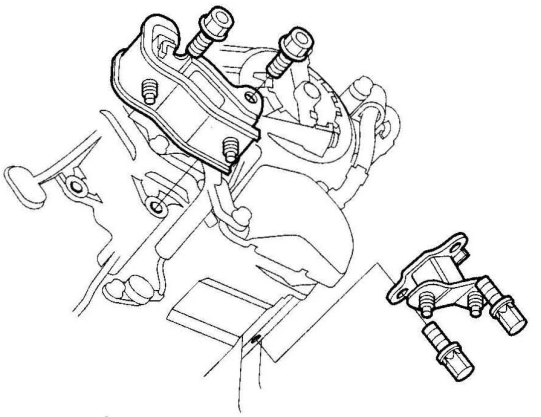


54. Raise the jack to vehicle height, then attach the adapter to the front sub-frame using the sub-frame stiffener mounting bolts (B) and bolt holes.

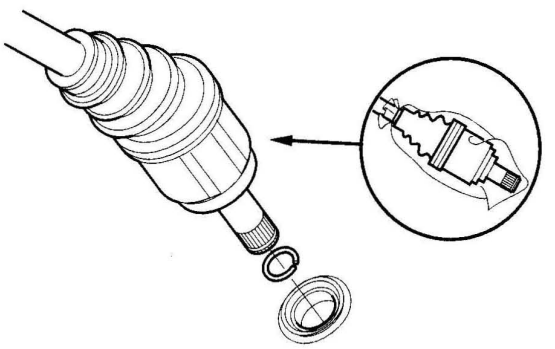
55. Remove the 12 × 1.25 mm bolts (6) (A) securing the sub-frame stiffeners (B), the four sub-frame mounting bolts (C), and the stiffeners, then lower the front sub-frame (D).



56. Remove the transmission lower mounts.



57. Remove the driveshafts from the differential and the intermediate shaft. Coat all precision finished surfaces with clean engine oil, then tie plastic bags over the driveshaft ends.

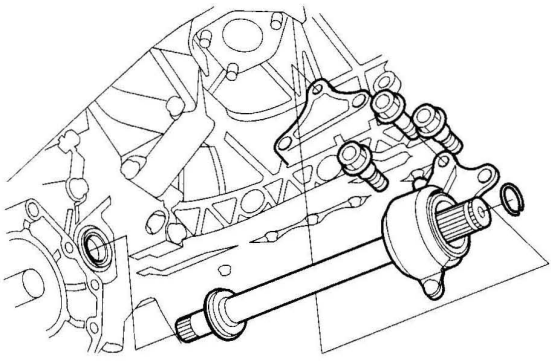


58. Move the left driveshaft to the front side.

BACK

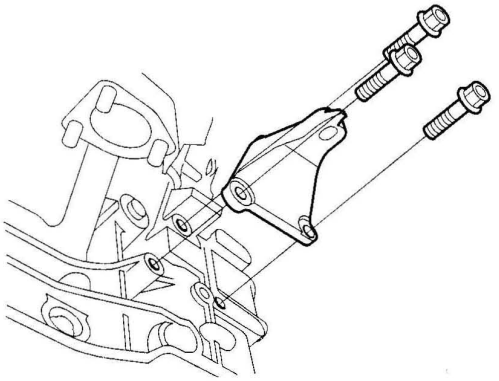
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59. Remove the intermediate shaft.

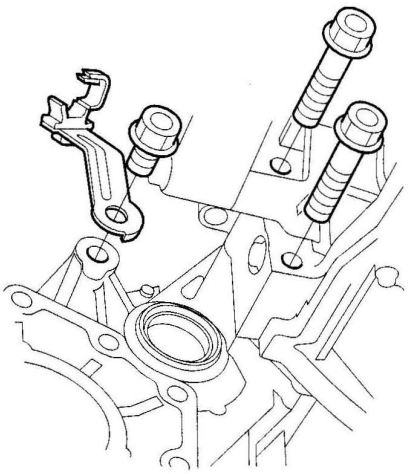


60. Coat all precision finished surfaces with clean engine oil, then tie plastic bags over both ends of the intermediate shaft.

61. Remove the front mount bracket.



62. Remove the transmission housing mounting bolts.



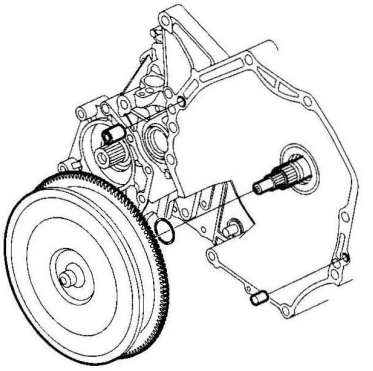
63. Lower the transmission, and tilt the engine just enough for the transmission to clear its end cover from the side frame.

64. Place a jack under the transmission.

65. Pull the transmission away from the engine until it clears the dowel pins, then lower it on the jack.

    NOTE: If the torque converter is stuck to the drive plate, pull it toward the transmission housing from the starter opening.

66. Remove the shift cable cover, then remove the torque converter assembly from the torque converter housing.

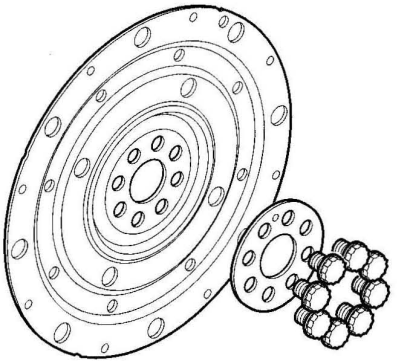


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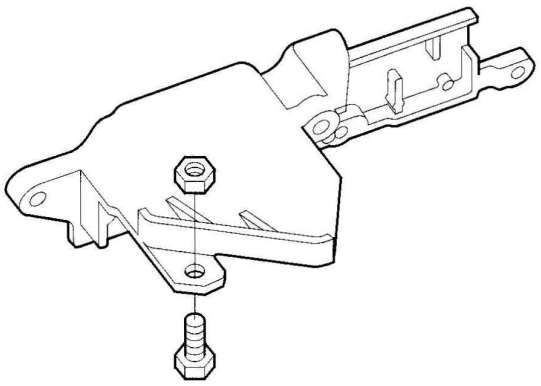
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Transmission Removal (cont'd)

67. Inspect the drive plate, and replace if it's damaged.



68. Remove the 6 × 1.0 × 14 mm bolt that you installed on the shift cable cover in step 43.



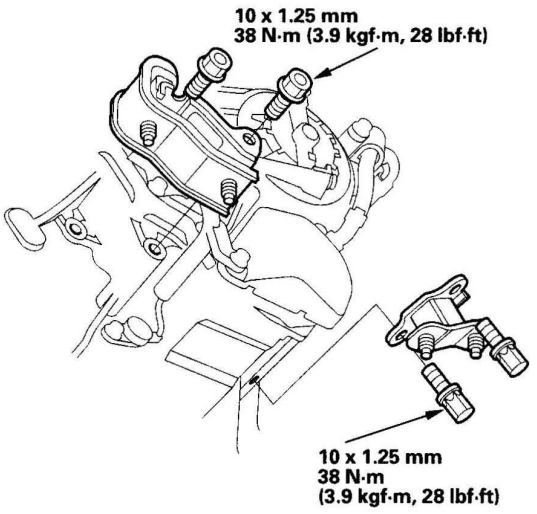
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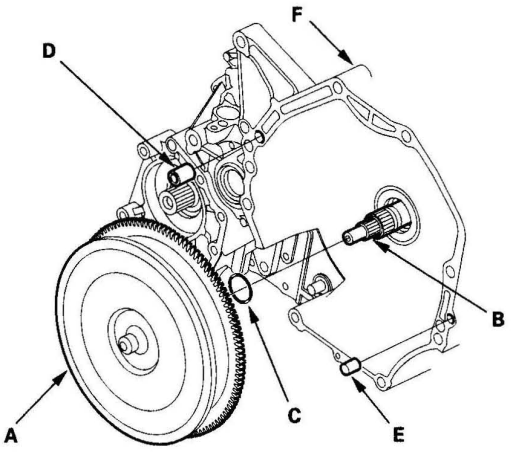
Transmission Installation

1. Flush the ATF cooler (see page 14-159).

2. Install the transmission lower mounts.



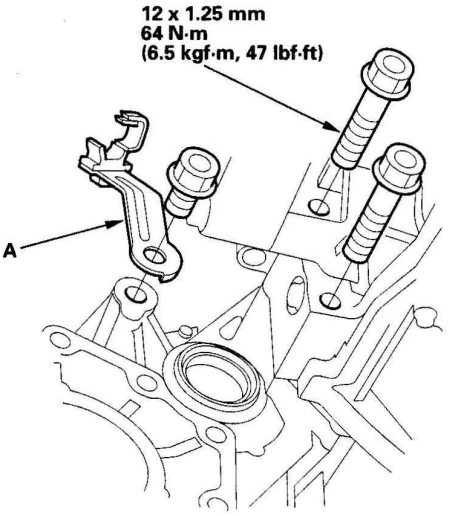
3. Install the torque converter assembly (A) on the mainshaft (B) with a new O-ring (C).



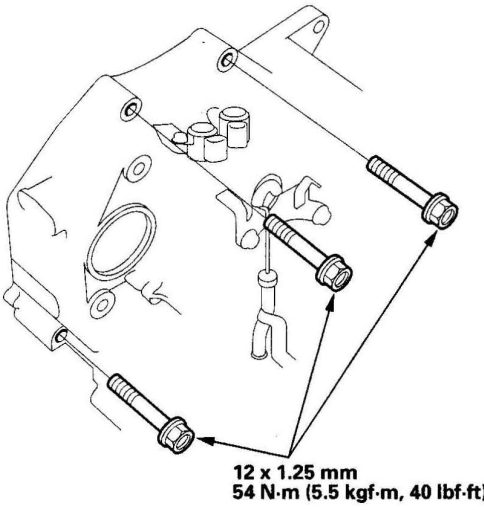
4. Install the 14 mm dowel pin (D) and 10 mm dowel pin (E) in the torque converter housing (F).

5. Place the transmission on a jack, and raise it to engine level.

6. Attach the transmission to the engine, then install the transmission housing mounting bolts and harness clamp bracket (A).



7. Install the transmission housing mounting bolts.

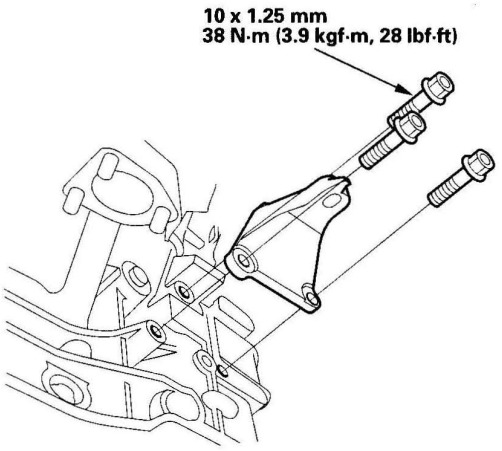


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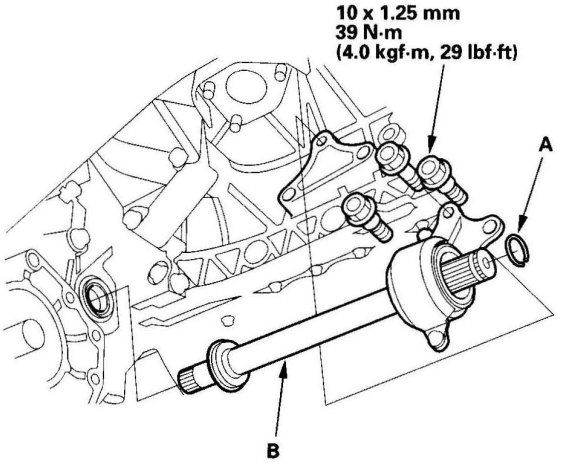
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Transmission Installation (cont'd)

8. Install the front mount bracket.

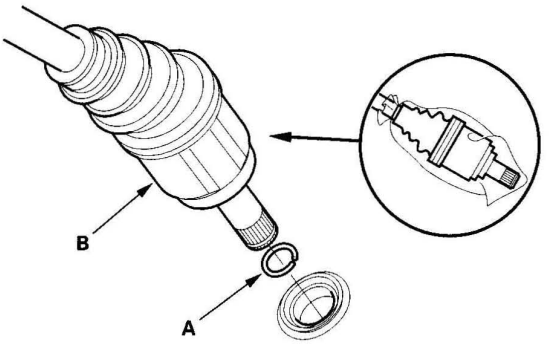


9. Install a new set ring (A) on the intermediate shaft (B).



10. Clean the areas where the intermediate shaft contacts the transmission (differential) with solvent or carburetor cleaner, and dry with compressed air. Then install the intermediate shaft in the differential. While installing the intermediate shaft, be sure not to allow dust or other foreign particles to enter the transmission.

11. Install a new set ring (A) on the left driveshaft (B).



12. Install the right and left driveshafts (see page 16-18). While installing the left driveshaft in the differential, be sure not to allow dust or other foreign particles to enter the transmission.

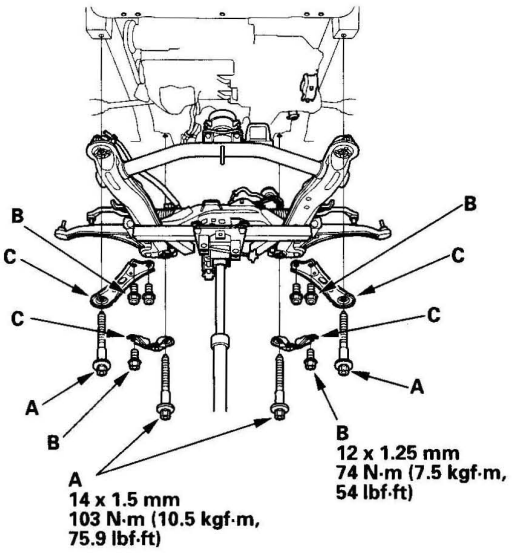
NOTE:
- Clean the areas where the left driveshaft contacts the transmission (differential) with solvent or carburetor cleaner, and dry with compressed air.
- Turn the right and left steering knuckle fully outward, and slide the left driveshaft into the differential until you feel its set ring engage the side gear. Slide the right driveshaft over the intermediate shaft splines until you feel the driveshaft engage the intermediate shaft set ring.

13. Support the front sub-frame with the front sub-frame adapter (T/N EQS02BMDXSB0) and a jack, and lift it up to the body.

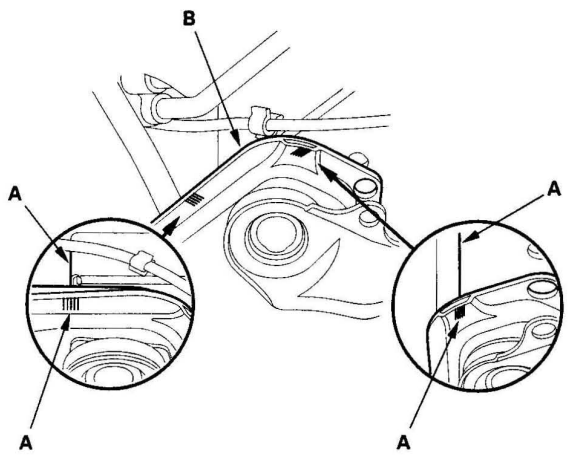
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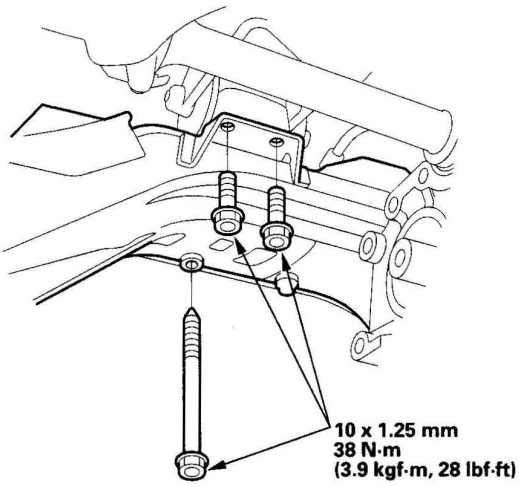
14. Loosely install the four front sub-frame mounting bolts (A) and the 12 x 1.25 mm bolts (six) (B) with the stiffeners (C).



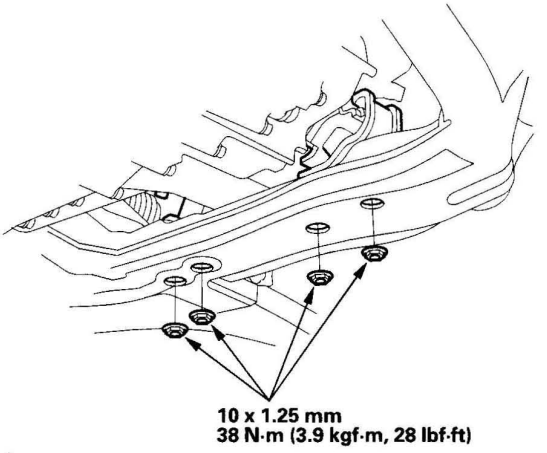
15. Align all reference marks (A) on the front sub-frame (B) with the body, then tighten the bolts on the front sub-frame to the specified torque.



16. Install the rear mount bracket bolts.



17. Install the transmission lower mount nuts.

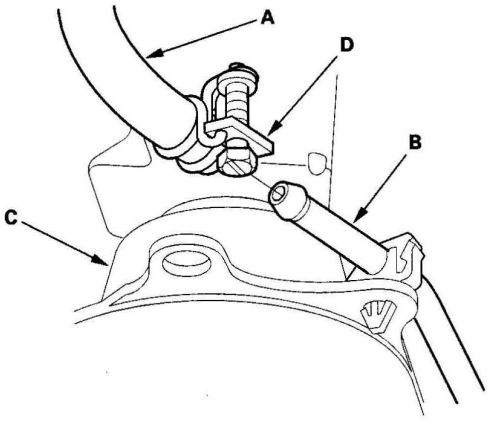


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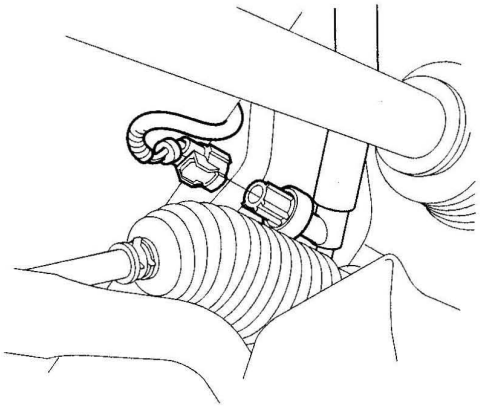
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Transmission Installation (cont'd)

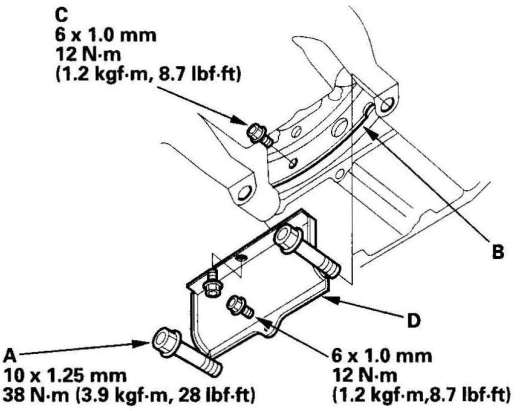
18. Connect the power steering fluid hose (A) to the pipe (B) at the right front of the sub-frame (C), then secure the hose with its hose clamp (D).



19. Connect the power steering pressure switch connector.



20. Install the engine-to-torque converter housing mounting bolts (A).

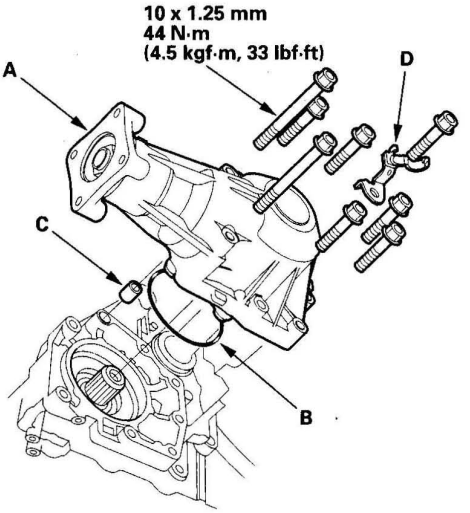


21. Attach the torque converter to the drive plate (B) with eight bolts (C). Rotate the crankshaft pulley as necessary to tighten the bolts to 1/2 of the specified torque, then to the final torque, in a crisscross pattern. After tightening the last bolt, check that the crankshaft rotates freely.

22. Install the torque converter cover (D).

23. Tighten the crankshaft pulley bolt as necessary (see page 6-18).

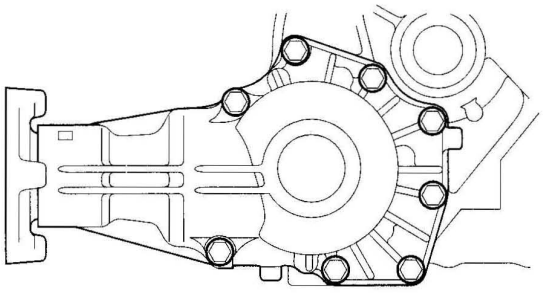
24. Install the transfer assembly (A) with the new O-ring (B), dowel pin (C), and Primary HO2S harness clamp bracket (D) on the transmission.



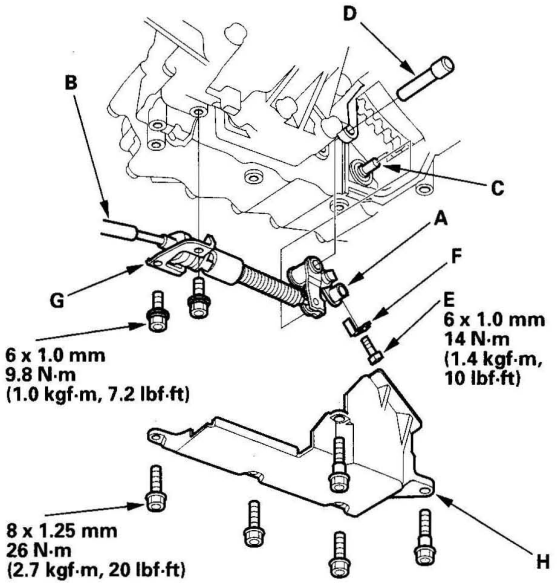
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25. Tighten the bolts in two or more steps.



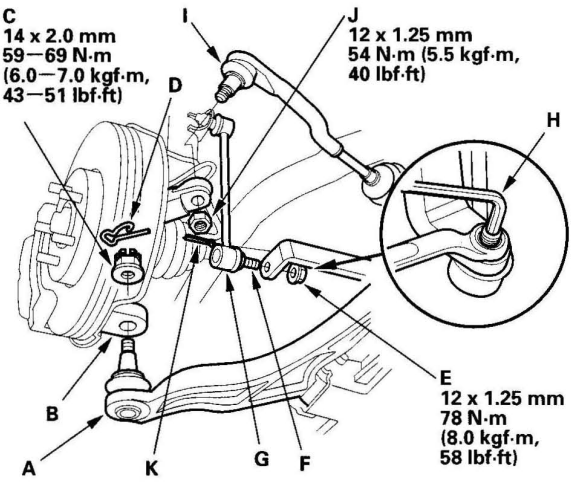
26. Install the control lever (A) with the shift cable (B) on the control shaft (C), and install the change shaft (D). Do not bend to shift cable excessively.



27. Install the lock bolt (E) with a new lock washer (F), then bend the lock washer tab against the bolt head.

28. Install the shift cable holder (G) and the shift cable cover (H).

29. Install the ball joints on each lower arm (A) to each knuckle (B) with the castle nuts (C) and spring clips (D).

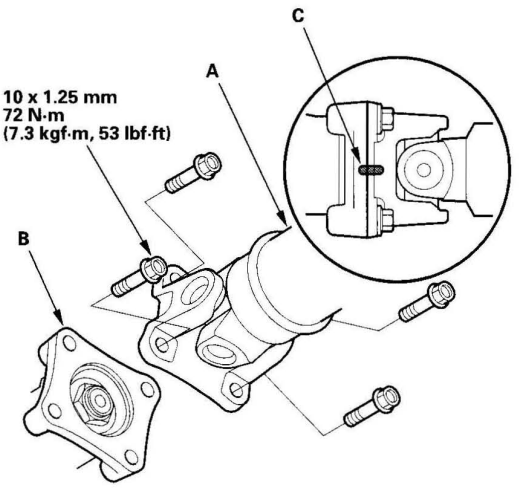


30. Install the nuts (E) to the ball joint pins (F) on each stabilizer link (G). Insert a 6 mm Allen wrench (H) in the top of the ball joint pins, and tighten the nuts to the specified torque.

31. Install the tie-rod end ball joints (I) to each knuckle with the nuts (J) and new cotter pins (K).

32. Remove the transmission jack from the transmission.

33. Install the propeller shaft (A) to the transfer companion flange (B) by aligning the reference mark (C).

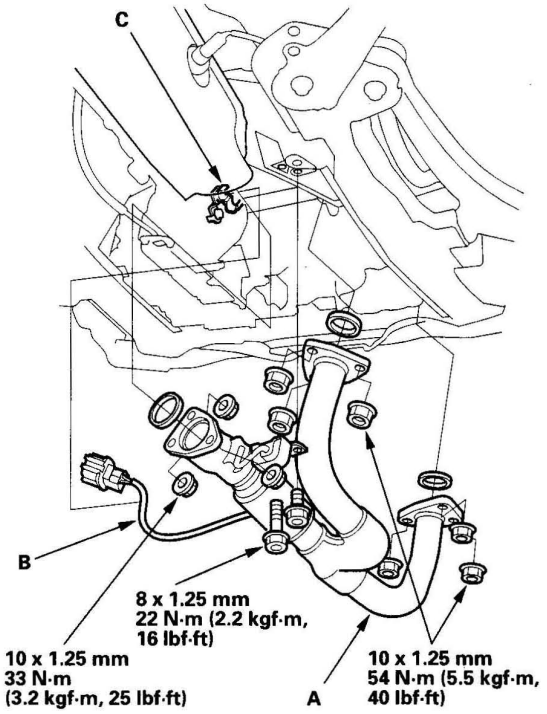


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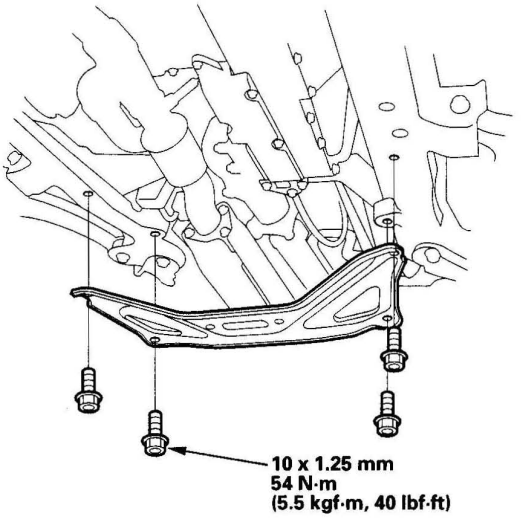
Transmission Installation (cont'd)

34. Install exhaust pipe A.

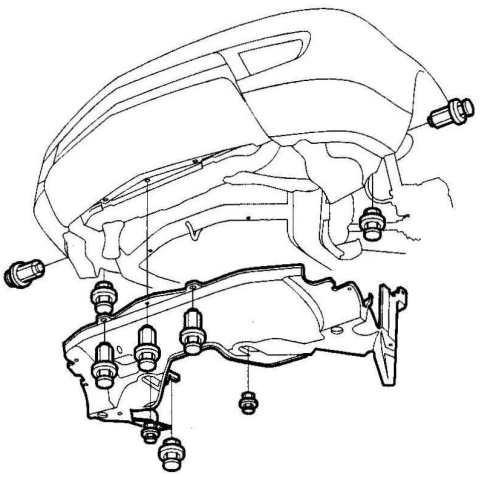


35. Install the primary HO2S harness (B) to the clamp (C) on the transfer assembly mounting bolt.

36. Install the front sub-frame stiffener.



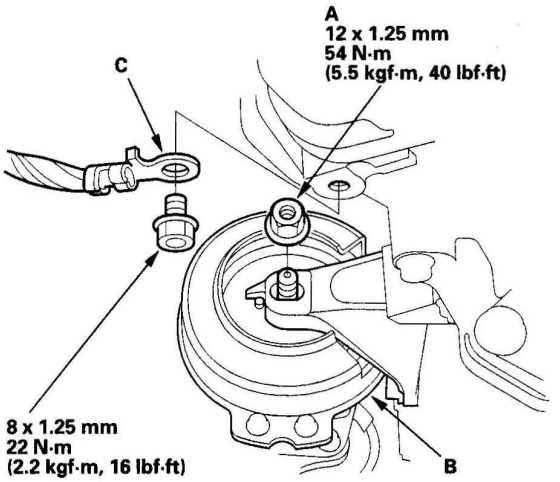
37. Install the splash shield.



BACK

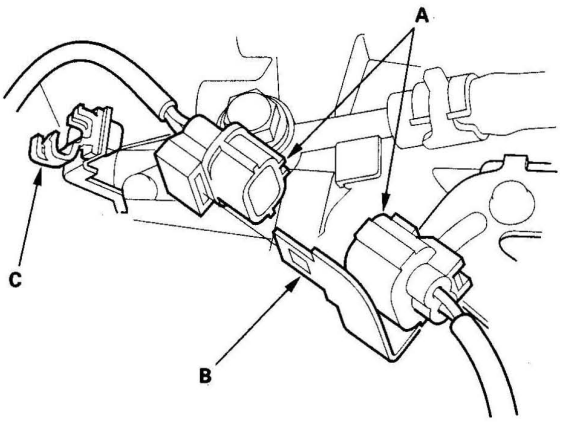
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38. Install and tighten the nut (A) on the front mount (B).

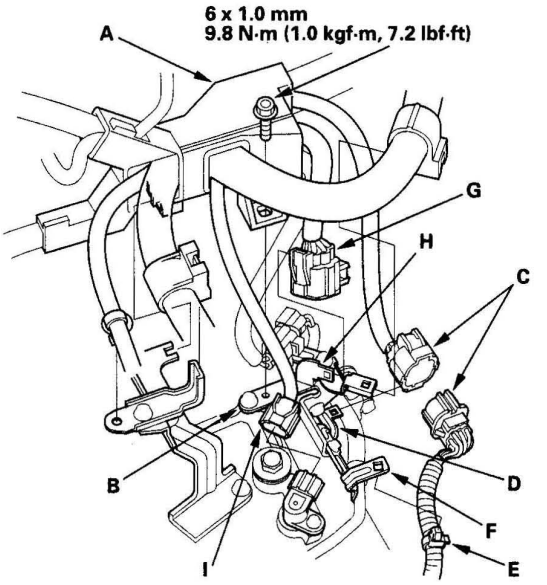


39. Remove the engine hanger from the engine, and install the ground cable (C) to the engine.

40. Connect the Primary HO2S connector (A), install it on its connector bracket (B), and clamp the harness in the clamp (C).



41. Install the harness cover (A) on the bracket (B).

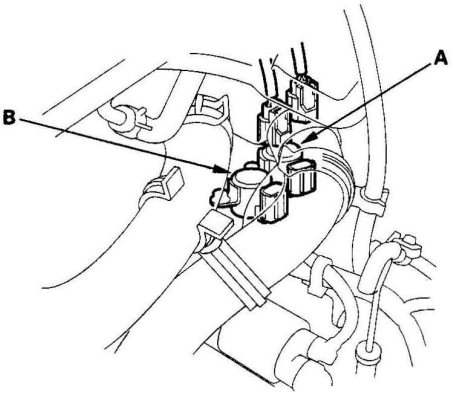


42. Connect the transmission range switch connector (C), then install it on its connector bracket (D). Install the harness clip (E) on the bracket (F).

43. Install the joint connector (G) on its connector bracket (H).

44. Connect the countershaft speed sensor connector (I).

45. Connect the connectors to the torque converter clutch solenoid valve (A) and the shift solenoid valve (B).

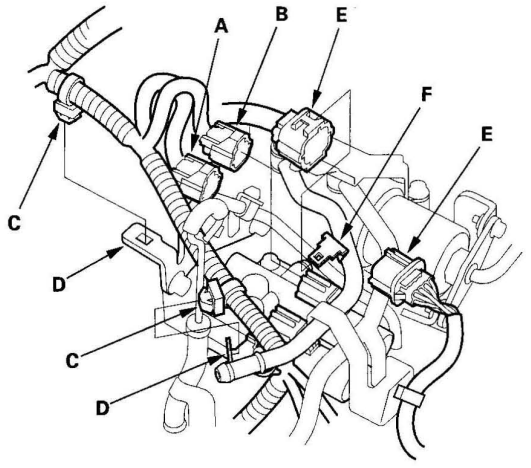


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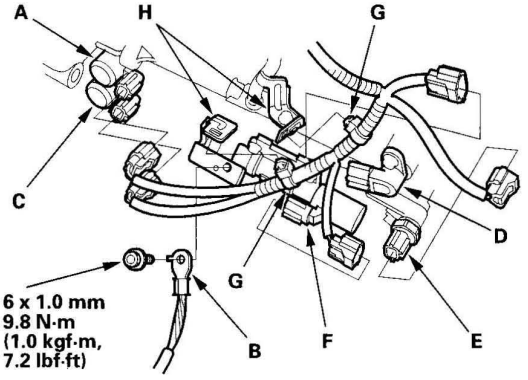
Transmission Installation (cont'd)

46. Connect the connectors to the A/T clutch pressure control solenoid valves A and B, then install the harness clips (C) on the brackets (D).



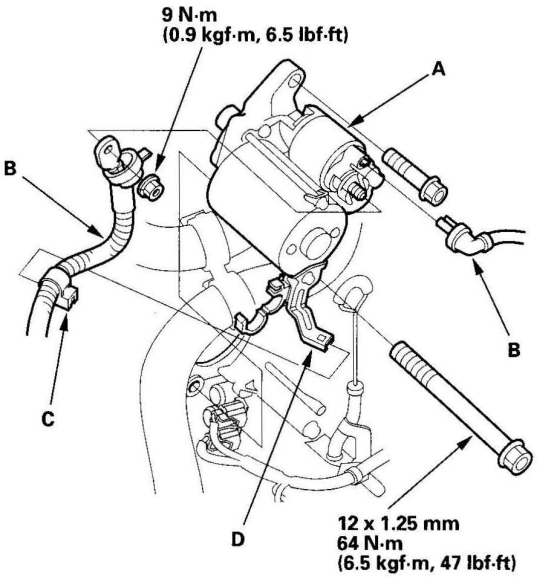
47. Connect the 8P connector (E), then install it on its connector bracket (F).

48. Install the transmission ground cable (B).

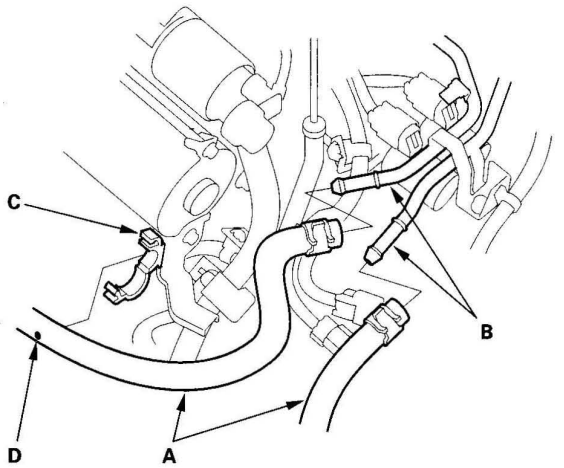


49. Connect the connectors to the mainshaft speed sensor (D), 4th clutch pressure switch (E), A/T clutch pressure control solenoid valve C (F), and shift solenoid valves A and C, then install the harness clips (G) on the brackets (H). Do not allow water, fluid, oil, dust, or other foreign particles to enter any of the connectors.

50. Install the starter (A) on the torque converter housing. Connect the starter cables (B) to the starter, and install the harness clip (C) on the bracket (D). Make sure the crimped side of the starter cable ring terminal is facing out.



51. Connect the ATF cooler hoses (A) to the ATF cooler lines (B) (see page 14-160). Clamp the ATF cooler hose with the clamp (C) on the starter by aligning the white dot (D) on the hose with the clamp.

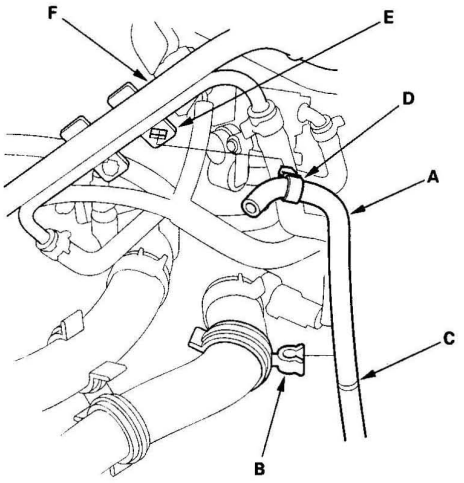


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52. Install the transmission breather tube clamp (A) into its clamp (B) on the lower radiator hose with the white stripe (C) on the tube just above the clamp.

53. Install the transmission breather tube clamp (D) to its bracket (E) on the coolant pipe (F).

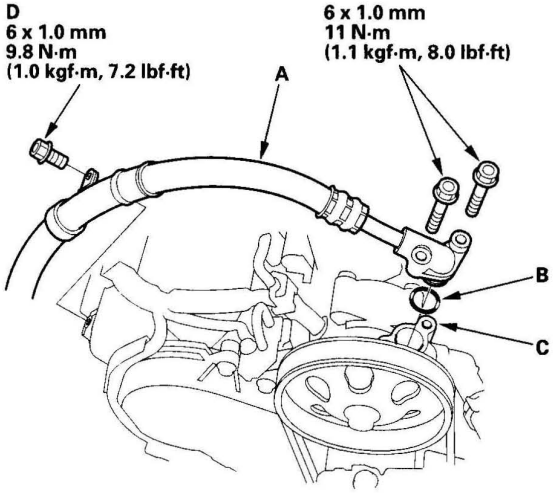


54. Install the battery base.

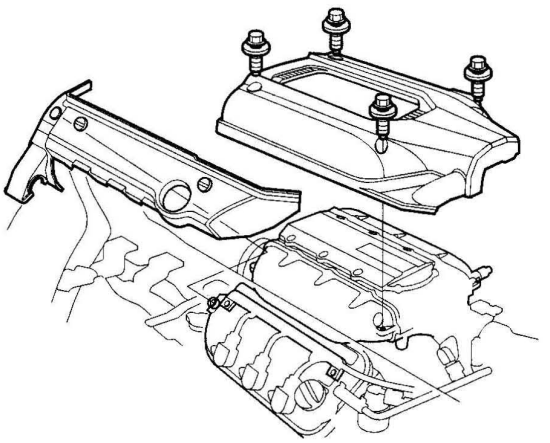
55. Install the harness clamps, connectors, and fuse box to the brackets on the battery base.

56. Install the battery tray and battery, then secure the battery with its hold-down bracket.

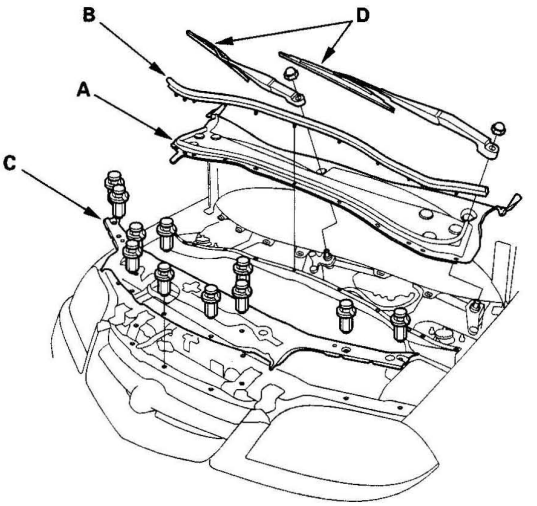
57. Install the power steering pump outlet hose (A) with a new O-ring (B) to the pump (C), and secure the hose clamp with the bolt (D).



58. Install the engine covers and the intake air duct.



59. Install the cowl cover (A), cowl cover sealing (B), front bulkhead cover (C) and windshield wiper arms (D).



(cont'd)

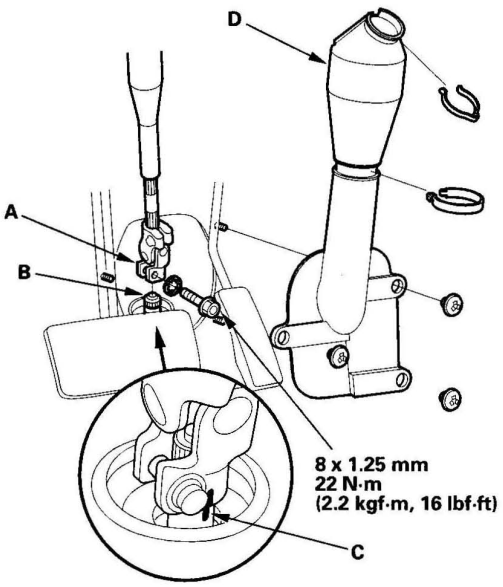
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Transmission Installation (cont'd)

60. Refill the transmission with ATF (see page 14-132).

61. Connect the battery positive terminal, then connect the negative terminal.

62. Connect the steering joint (A) to the steering gearbox pinion shaft (B) by aligning the reference mark (C), and secure them with the steering joint bolt.



63. Install the steering joint cover (D), put the carpet back, and reinstall the center console lower panel.

64. Refill the power steering system with fluid (see page 17-14).

65. Set the parking brake. Start the engine, and shift the transmission through all gears three times.

66. Check the shift lever operation, A/T gear position indicator operation, and shift cable adjustment.

67. Check and adjust the front wheel alignment (see page 18-5).

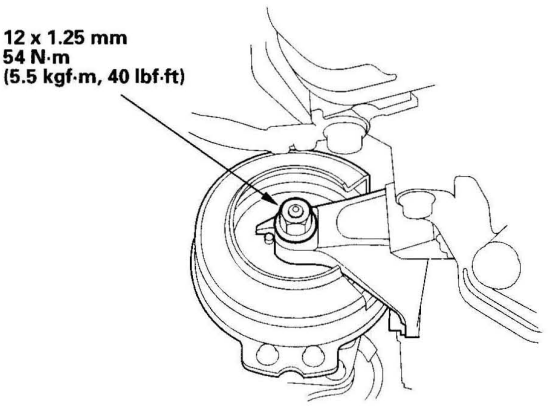
68. Reattach the right and left hood support struts.

69. Start the engine, and let it reach normal operating temperature (the radiator fan comes on) with the transmission in [P] or [N] position, then turn it off and check the ATF level (see page 14-131).

70. Perform a road test (see page 14-116).

71. Enter the anti-theft code for the radio and the navigation system, then enter the radio station presets, and set the clock.

72. Loosen the front mount nut after the road test, then retighten the nut to the specified torque.



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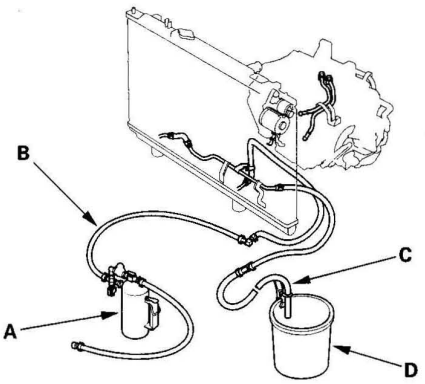
ATF Cooler Flushing

Special Tools Required
Commercially Available Transmission Cooler Flusher
Kent-Moore J38405-A or equivalent

This procedure should be performed before reinstalling the transmission.

1. Check the equipment for wear and cracks before using it. Replace any worn or cracked components.

2. Using the measuring cup, fill the flusher (A) with 21 ounces (approximately 2/3 full) of biodegradable flushing fluid (J35944-20). Do not substitute with any other fluid. Follow the handling procedure on the fluid container.



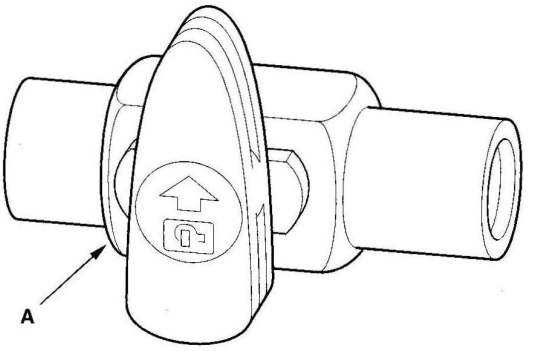
3. Secure the flusher filler cap, and pressurize the flusher with compressed air to 550 – 829 kpa (5.6 – 8.45 kgf/cm², 80 – 120 psi). The air line should be equipped with a water trap to ensure a dry air system.

4. Hang the flusher under the vehicle.

5. Attach the flusher discharge hose (B) to the return line of the ATF cooler using a clamp.

6. Connect the drain hose (C) to the inlet line on the ATF cooler using a clamp. Securely clamp the opposite end of the drain hose to a bucket (D) or floor drain.

7. With the water and air valves (A) off, attach the water and air supplies to the flusher. (Hot water if available.)



8. Turn on the water valve for 10 seconds. If water does not flow through the cooler, it is completely plugged, cannot be flushed, and must be replaced.

9. Depress the trigger to mix the flushing fluid into the water flow. Use the wire clip to hold the trigger down.

10. While flushing with the water and flushing fluid for 2 minutes, turn the air valve on for 5 seconds every 15 – 20 seconds to create a surging action.

    AIR PRESSURE: MAX 845 kPa (8.45 kgf/cm², 120 psi)

11. Turn the water valve off. Release the trigger, then reverse the hoses to the cooler so you can flush in the opposite direction. Repeat steps 8 through 10.

12. Release the trigger, and rinse the cooler with water for 1 minute.

13. Turn the water valve and the water supply off.

14. Turn the air valve on for 2 minutes, or until no moisture is visible leaving the drain hose. Residual moisture in the cooler or lines can damage the transmission.

15. Remove the flusher from the cooler line. Attach the drain hose to an ATF container.

16. Install the transmission, and leave the drain hose attached to the cooler line.

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ATF Cooler Flushing (cont'd)

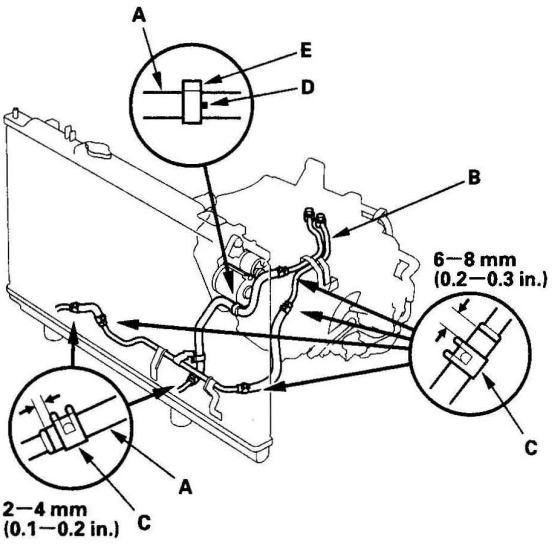
17. Make sure the transmission is in the [P] position. Fill the transmission with ATF, and run the engine for 30 seconds or until approximately 0.95ℓ (1.0 US qt., 0.8 Imp qt.) is discharged.

18. Remove the drain hose, and reconnect the cooler return hose to the transmission.

19. Refill the transmission with ATF to the proper level (see page 14-132).

ATF Cooler Hoses Replacement

1. Connect the cooler hoses (A) to the lines (B) and the ATF cooler, and secure them with the clips (C).



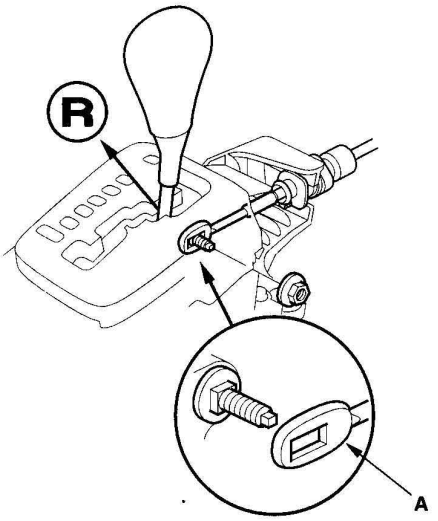
2. Clamp the ATF cooler hose with the yellow mark (D) on the clamp (E).

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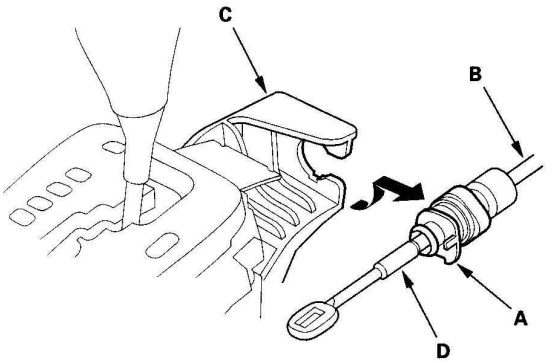
Shift Lever Removal

1. Shift the transmission into the R position.
2. Remove the console panel and center console (see page 20-65).
3. Remove the nut securing the shift cable end (A), then separate the end from the shift lever assembly.

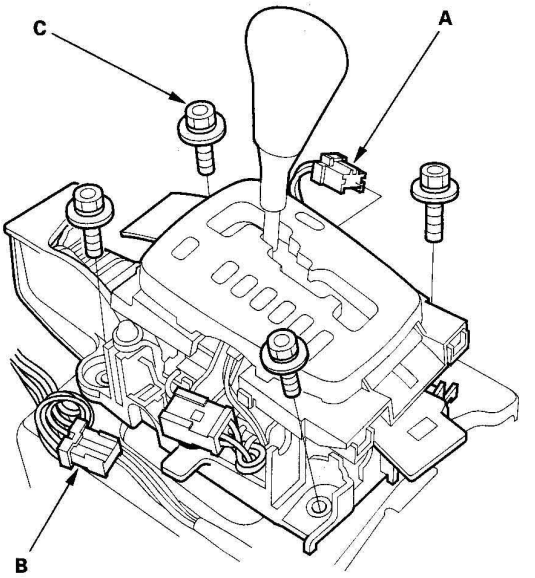


4. Rotate the socket holder (A) on the shift cable (B) counterclockwise a quarter turn, then slide the holder to remove the shift cable from the shift lever bracket base (C).

   NOTE: Do not remove the shift cable by twisting the shift cable guide (D).



5. Disconnect the shift lock solenoid connector (A) and the switch assembly connector (6P) (B).



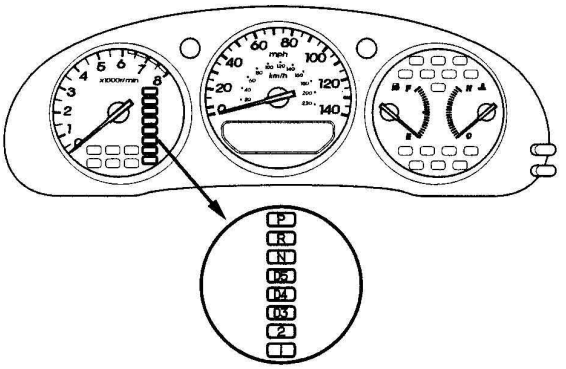
6. Remove the four bolts (C) securing the shift lever bracket base, then remove the shift lever assembly.

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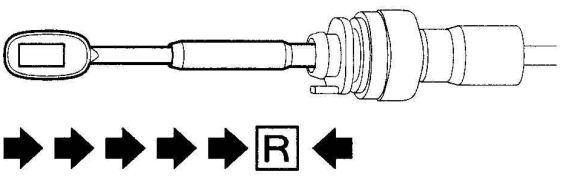
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Shift Lever Installation

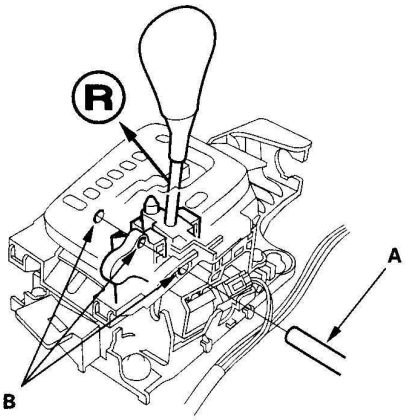
1. Install the shift lever assembly.
2. Turn the ignition switch ON (II), and verify that the R position indicator comes on.



3. If necessary, push the shift cable until it stops, then release your hand. Pull the shift cable back one step so that the shift position is in R.

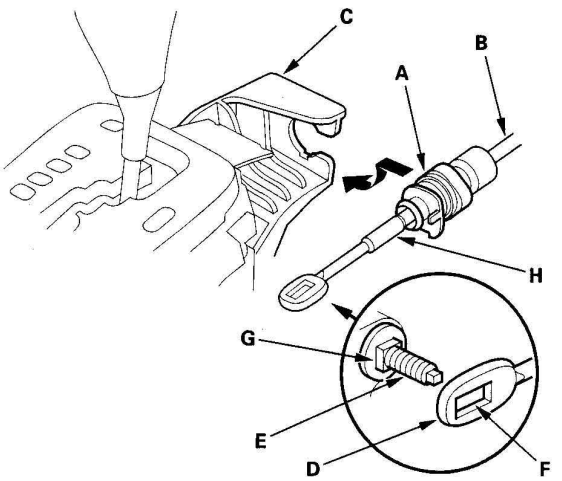


4. Turn the ignition switch OFF.
5. Insert a 6.0 mm (0.24 in.) pin (A) into the positioning hole (B) on the shift lever bracket base through the positioning hole on the shift lever assembly.



6. Rotate the socket holder (A) on the shift cable (B) counterclockwise a quarter turn, then slide the holder onto the shift lever bracket base (C). Install the shift cable end (D) over the mounting stud (E) by aligning its square hole (F) with the square shape (G) at the bottom of the stud. Rotate the holder clockwise a quarter turn to secure the shift cable.

   NOTE: Do not install the shift cable by twisting the shift cable guide (H).

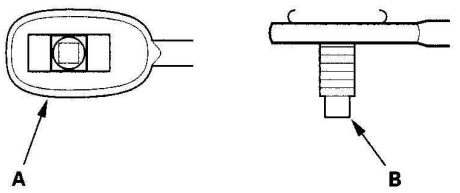


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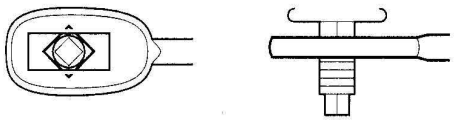
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7. Verify that the shift cable end (A) is properly installed on the mounting stud (B).

Properly Installed:



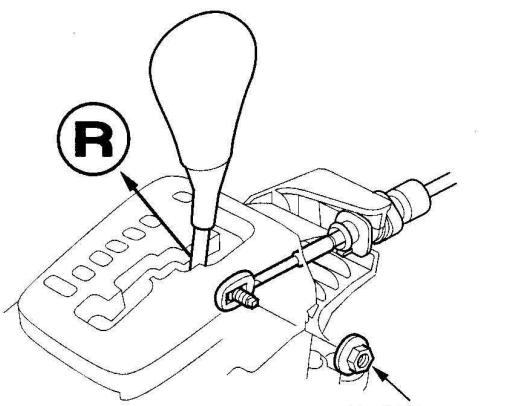
Improperly Installed:



Cable end rides on the bottom of the mounting stud.

8. If improperly installed, remove the shift cable from the shift lever bracket base, and reinstall the shift cable. Do not install the shift cable end on the mounting stud while the shift cable is on the shift cable bracket base.

9. Install and tighten the nut.



10. Remove the 6.0 mm (0.24 in.) pin that was installed to hold the shift lever.

11. Connect the shift lock solenoid connector and the switch assembly connector (6P).

12. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the transmission range switch.

13. Push the shift lock release, and verify that the shift lever releases.

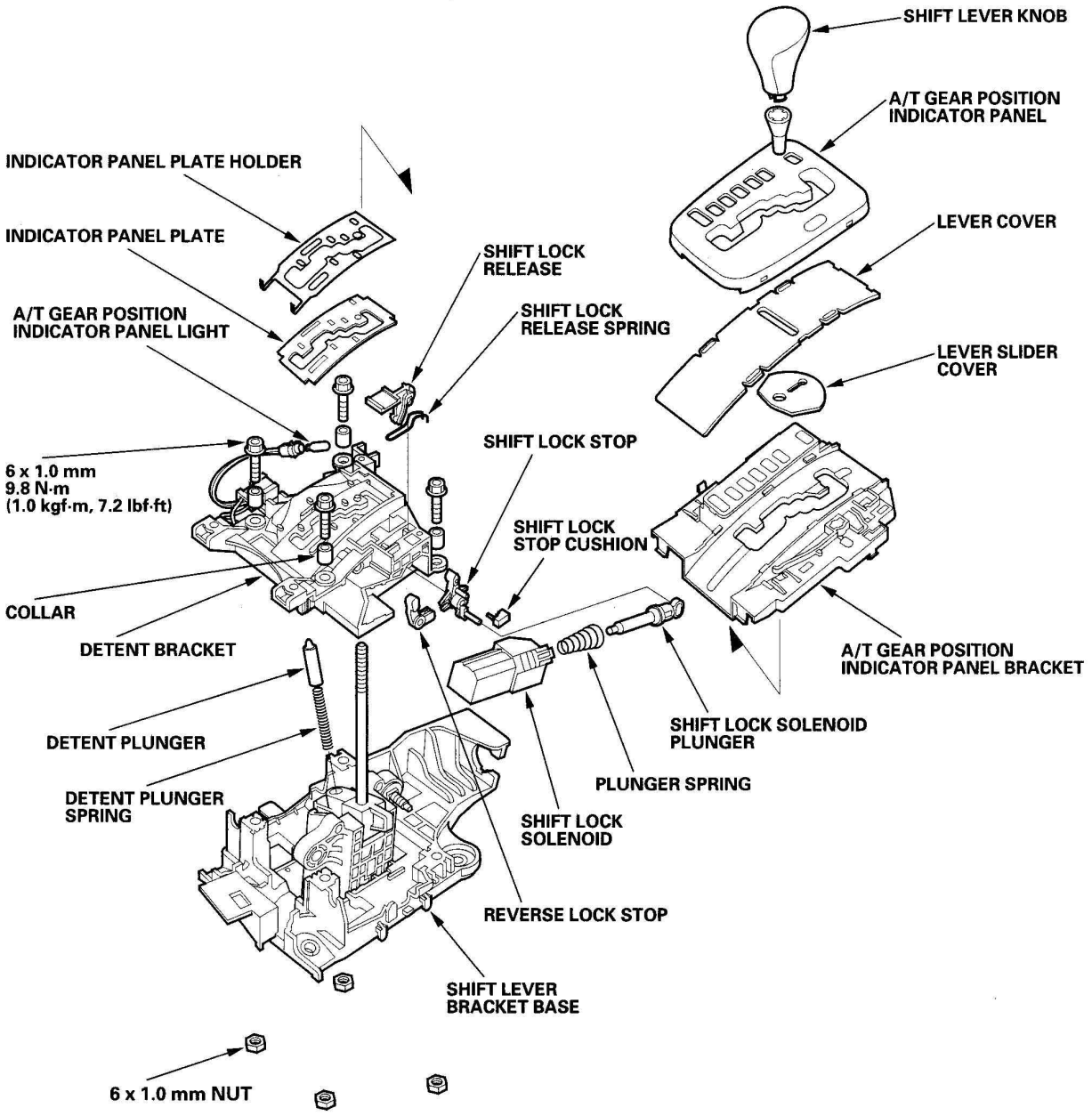
14. Reinstall the center console, console panel, and related parts (see page 20-65).

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Shift Lever Disassembly/Reassembly

Apply silicone grease to these parts:
- Movable parts of the shift lever.
- Movable parts of the shift lock/reverse lock mechanism.
- Sliding surfaces on the opening of the indicator panel and panel holder.
- Sliding surfaces on the detent plate.
- Contact surfaces between the shift lever assembly and the shift lock stop.
- Detent plunger and detent plunger spring.

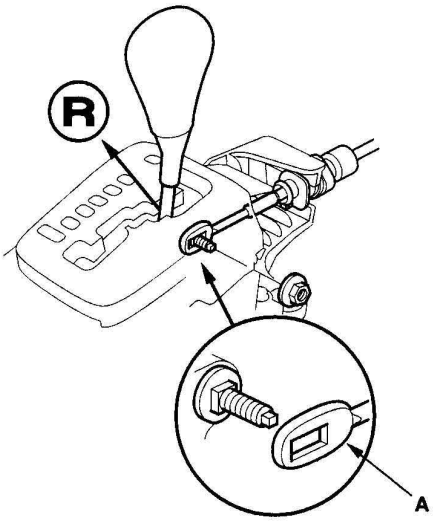


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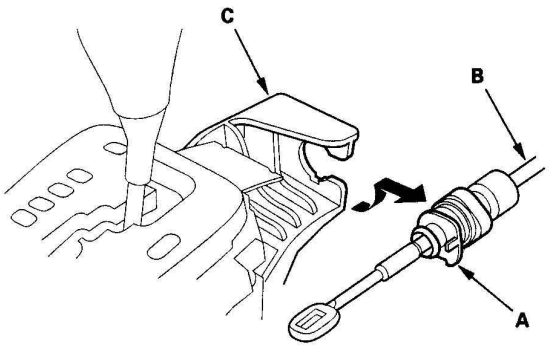
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Shift Cable Replacement

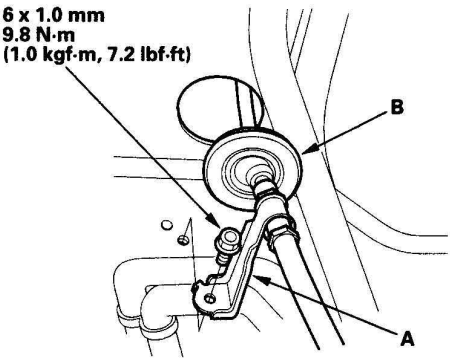
1. Raise the vehicle, and make sure it is securely supported (see page 1-8).
2. Shift the transmission into the R position.
3. Remove the console panel and center console (see page 20-65).
4. Remove the nut securing the shift cable end (A), then separate the end from the shift lever assembly.



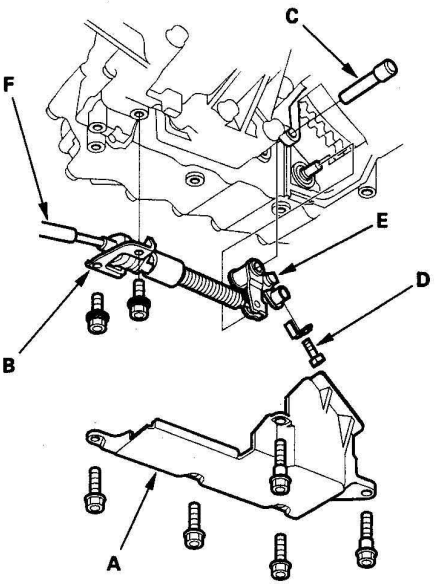
5. Rotate the socket holder (A) on the shift cable (B) countercolckwise a quarter turn, then slide the holder to remove the shift cable from the shift lever bracket base (C).



6. Remove the shift cable guide bracket (A) and grommet (B).



7. Remove the shift cable cover (A), then remove the bolts securing the shift cable holder (B).



8. Remove the change shaft (C) and the lock bolt (D) securing the control lever (E), then remove the shift cable (F) with the control lever.

(cont'd)

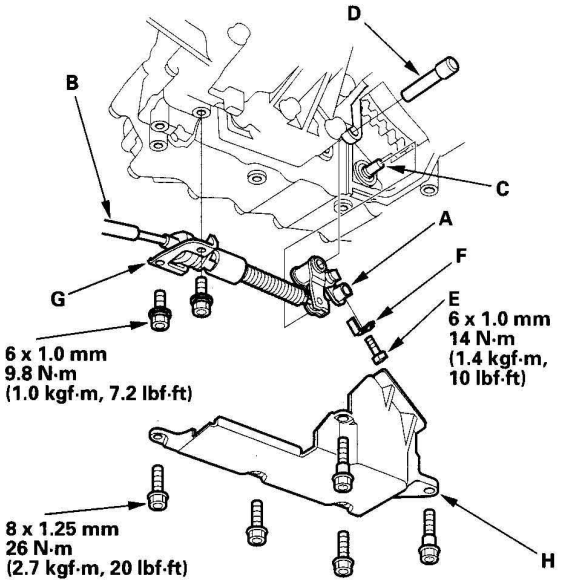
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Shift Cable Replacement (cont'd)

9. Insert the new shift cable through the grommet hole, then install the shift cable guide bracket.

10. Verify that the transmission is in the R position on the control shaft.

11. Install the control lever (A) with the shift cable (B) on the control shaft (C), and install the change shaft (D). Do not bend the shift cable excessively.

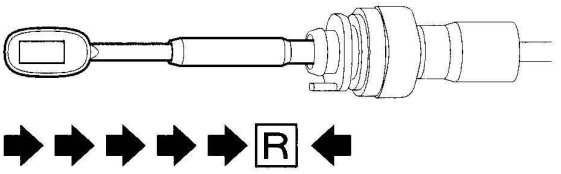


12. Install the lock bolt (E) with a new lock washer (F), then bend the lock washer tab against the bolt.

13. Install the shift cable holder (G) and the shift cable cover (H).

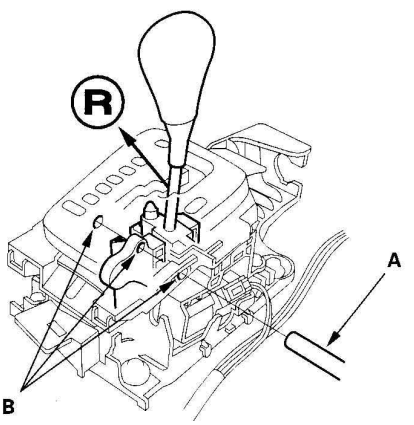
14. Turn the ignition switch ON (II), and verify that the R position indicator comes on.

15. If necessary, push the shift cable until stops, then release your hand. Pull the shift cable back one step so that the shift position is in R.



16. Turn the ignition switch OFF.

17. Insert a 6.0 mm (0.24 in.) pin (A) into the positioning hole (B) on the shift lever bracket base through the positioning hole on the shift lever assembly.

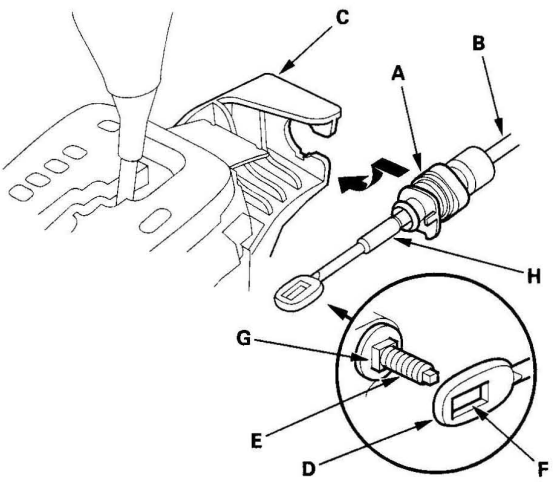


BACK

Protected by AR

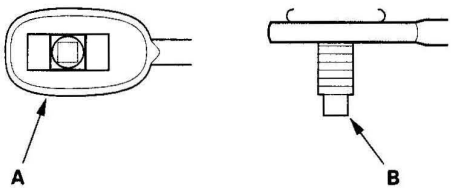
18. Rotate the socket holder (A) on the shift cable (B) counterclockwise a quarter turn, then slide the holder onto the shift lever bracket base (C). Install the shift cable end (D) over the mounting stud (E) by aligning its square hole (F) with the square shape (G) at the bottom of the stud. Rotate the holder clockwise a quarter turn to secure the shift cable.

    NOTE: Do not install the shift cable by twisting the shift cable guide (H).

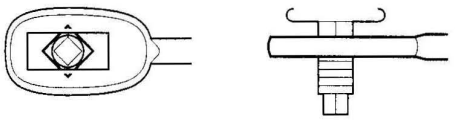


19. Verify that the shift cable end (A) is properly installed on the mounting stud (B).

Properly Installed:



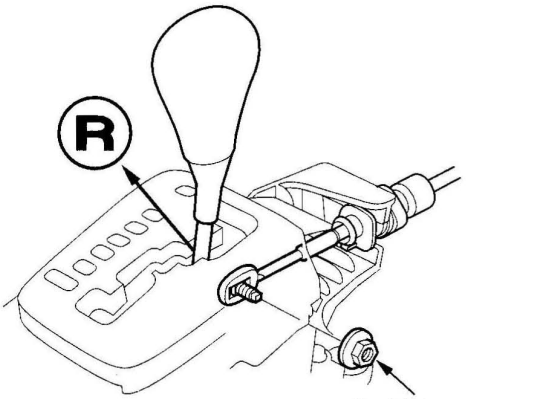
Improperly Installed:



Cable end rides on the bottom of the mounting stud.

20. If improperly installed, remove the shift cable from the shift lever bracket base, and reinstall the shift cable. Do not install the shift cable end on the mounting stud while the shift cable is on the shift cable bracket base.

21. Install and tighten the nut.



22. Remove the 6.0 mm (0.24 in.) pin that was installed to hold the shift lever.

23. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the transmission range switch.

24. Allow the wheels to rotate freely.

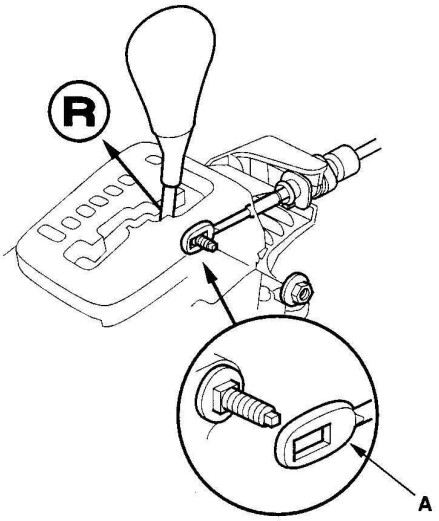
25. Start the engine, and check the shift lever operation in all gears.

26. Reinstall the center console, console panel, and related parts (see page 20-65).

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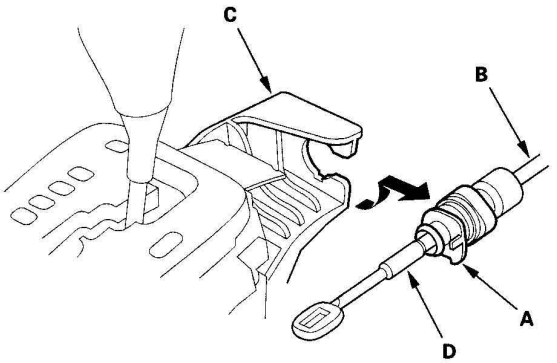
Shift Cable Adjustment

1. Shift the transmission into the [R] position.
2. Remove the console panel and center console (see page 20-65).
3. Remove the nut securing the shift cable end (A), then separate the end from the shift lever assembly.

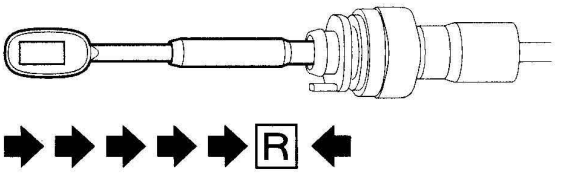


4. Rotate the socket holder (A) on the shift cable (B) counterclockwise a quarter turn, then slide the holder to remove the shift cable from the shift lever bracket base (C).

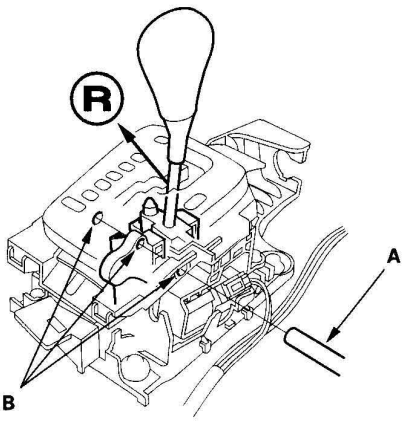
   NOTE: Do not remove the shift cable by twisting the shift cable guide (D).



5. Push the shift cable until it stops, then release your hand. Pull the shift cable back one step so that the shift position is in [R].



6. Turn the ignition switch ON (II), and verify that the [R] position indicator comes on.
7. Turn the ignition switch OFF.
8. Insert a 6.0 mm (0.24 in.) pin (A) into the positioning hole (B) on the shift lever bracket base through the positioning hole on the shift lever assembly.

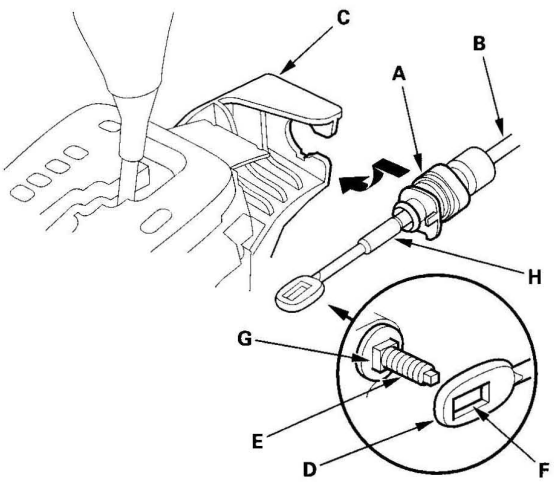


BACK

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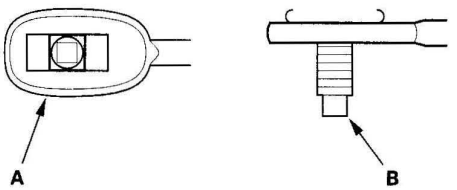
9. Rotate the socket holder (A) on the shift cable (B) counterclockwise a quarter turn, then slide the holder onto the shift lever bracket base (C). Install the shift cable end (D) over the mounting stud (E) by aligning its square hole (F) with the square shape (G) at the bottom of the stud. Rotate the holder clockwise a quarter turn to secure the shift cable.

   NOTE: Do not install the shift cable by twisting the shift cable guide (H).

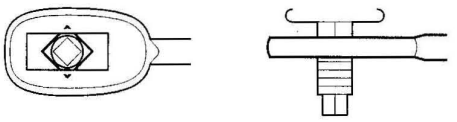


10. Verify that the shift cable end (A) is properly installed on the mounting stud (B).

Properly Installed:



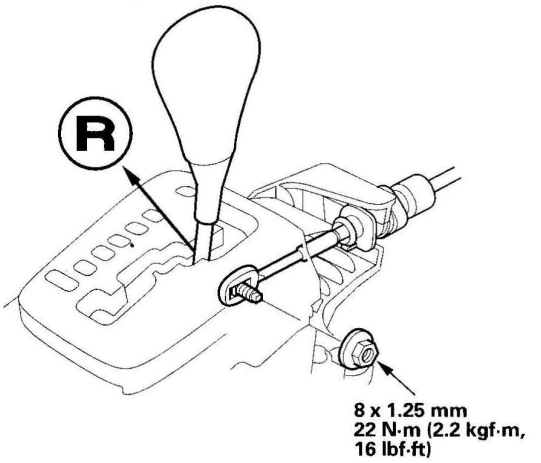
Improperly Installed:



Cable end rides on the bottom of the mounting stud.

11. If improperly installed, remove the shift cable from the shift lever bracket base, and reinstall the shift cable. Do not install the shift cable end on the mounting stud while the shift cable is on the shift cable bracket base.

12. Install and tighten the nut.



13. Remove the 6.0 mm (0.24 in.) pin that was installed to hold the shift lever.

14. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the transmission range switch.

15. Push the shift lock release, and verify that the shift lever releases.

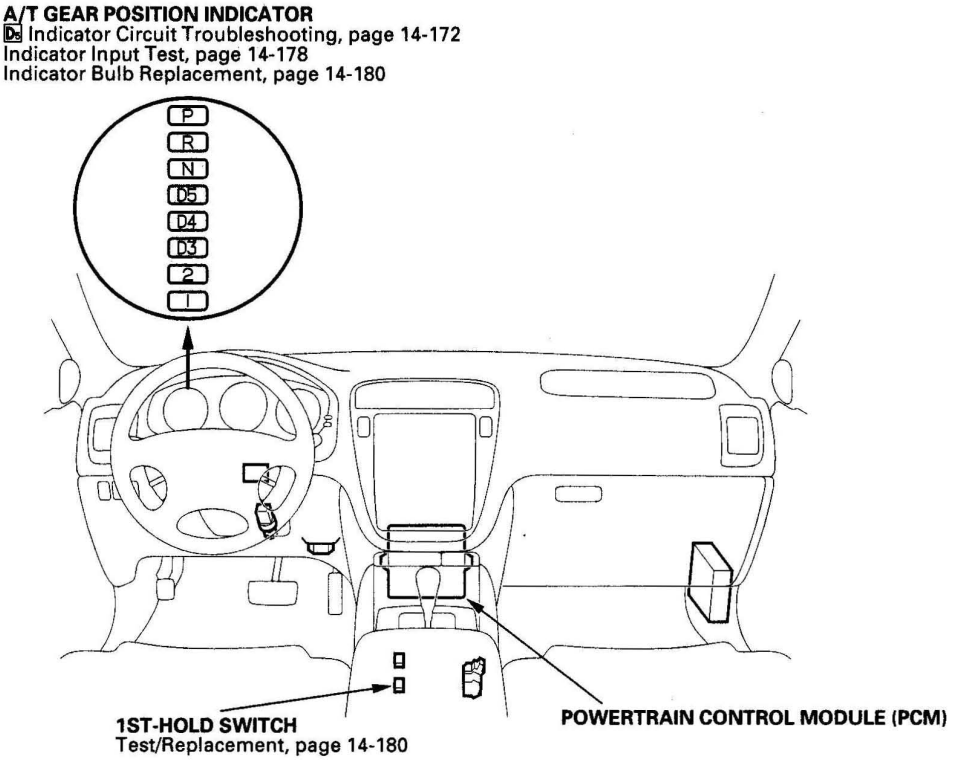
16. Reinstall the center console, console panel, and related parts (see page 20-65).

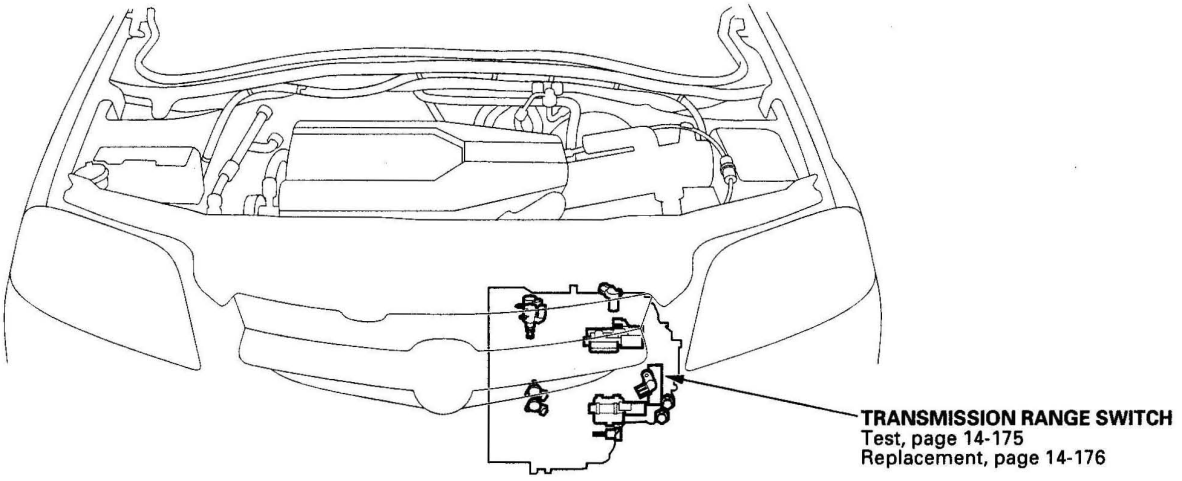
BACK

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A/T Gear Position Indicator

Component Location Index

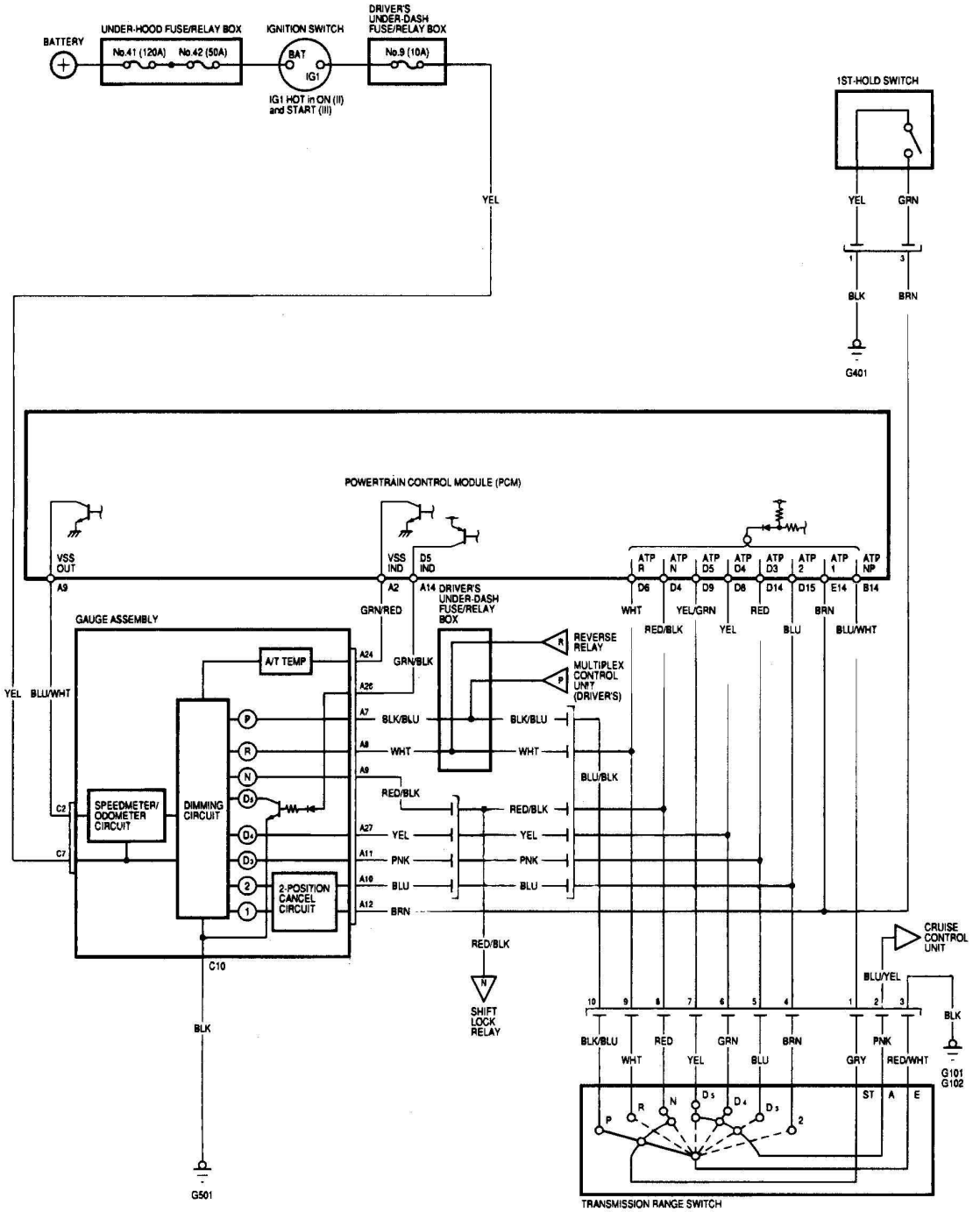




BACK

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Circuit Diagram



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A/T Gear Position Indicator

D5 Indicator Circuit Troubleshooting

1. Turn the ignition switch ON (II), and watch the D5 indicator.

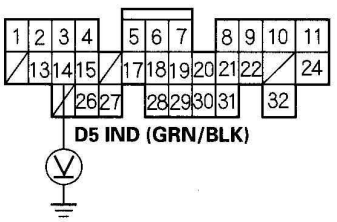
   Does the D5 indicator come on and stay on?

   YES – Go to step 2.

   NO – If the indicator comes on for about 2 seconds and then goes off, it's normal. If it doesn't come on at all, go to step 16.

2. Make sure the Honda PGM Tester is not connected to the data link connector.
3. Turn the ignition switch OFF.
4. Disconnect the battery negative terminal.
5. Disconnect PCM connector A (32P).
6. Reconnect the battery negative terminal.
7. Turn the ignition switch ON (II).
8. Measure the voltage between PCM connector terminal A14 and body ground.

PCM CONNECTOR A (32P)



Wire side of female terminals

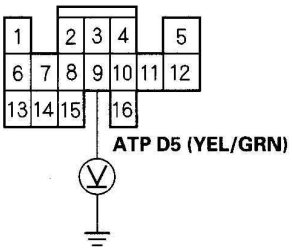
Is there voltage?

YES – Repair short to power in the wire between PCM connector terminal A14 and the gauge assembly. ■

NO – Go to step 9.

9. Turn the ignition switch OFF.
10. Disconnect the battery negative terminal.
11. Reconnect PCM connector A (32P).
12. Reconnect the battery negative terminal.
13. Turn the ignition switch ON (II).
14. Shift to any position other than D5.
15. Measure the voltage between PCM connector terminal D9 and body ground.

PCM CONNECTOR D (16P)



Wire side of female terminals

Is there voltage?

YES – Faulty PCM or gauge assembly. ■

NO – Check for a short to ground in the wire between PCM connector terminal D9 and the transmission range switch. If the wire is OK, check the transmission range switch. ■

16. Make sure the Honda PGM Tester is not connected to the data link connector.
17. Shift to D5 position.

    Does the D5 indicator come on?

    YES – Check for loose terminal fit in the PCM connector terminal A14 and recheck the D5 indicator several times. If the problem is intermittent, substitute a known-good PCM and recheck. If the indicator then works OK every time, replace the original PCM. ■

    NO – Go to step 18.

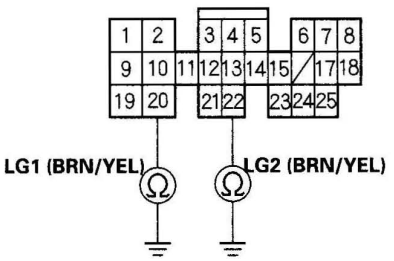
18. Turn the ignition switch OFF.
19. Disconnect the battery negative terminal.
20. Disconnect PCM connector B (25P).

BACK

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21. Check for continuity between body ground and PCM connector terminals B20 and B22 individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity between ground and each terminal?

YES – Go to step 22.

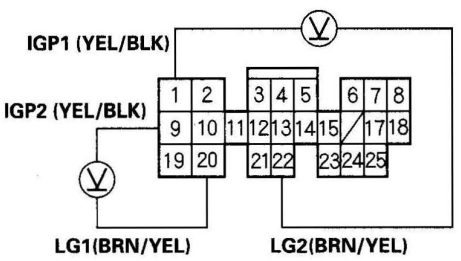
NO – Repair open in the wire(s) between grounds G101, G102 and PCM connector terminals B20 or B22, or repair poor ground (G101, G102).■

22. Connect the battery negative terminal.

23. Turn the ignition switch ON (II).

24. Measure the voltage between PCM connector terminals B1 and B22, and between B9 and B20.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there battery voltage?

YES – Go to step 25.

NO – Repair open or short in the wire between PCM connector terminals B1 or B9 and the PGM-FI main relay.■

25. Turn the ignition switch OFF.

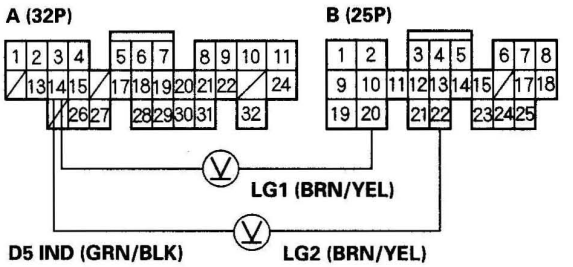
26. Disconnect the battery negative terminal.

27. Reconnect PCM connector B (25P).

28. Reconnect the battery negative terminal.

29. Connect a digital multimeter between PCM connector terminals A14 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

30. Turn the ignition switch ON (II).

Is there voltage for at least 2 seconds?

YES – Check for open in the wire between PCM connector terminal A14 and the gauge assembly. If the wire is OK, check for a faulty D5 indicator bulb or a faulty printed circuit board in the gauge assembly.■

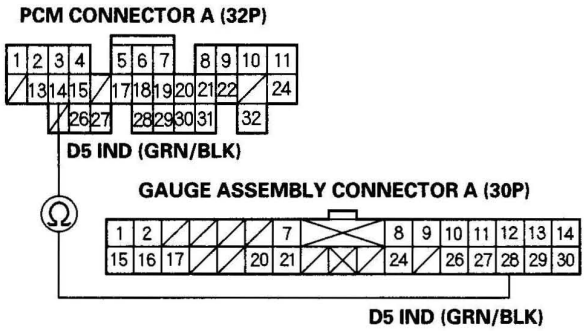
NO – Go to step 31.

(cont'd)

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D5 Indicator Circuit Troubleshooting (cont'd)

31. Turn the ignition switch OFF.
32. Disconnect the battery negative terminal.
33. Disconnect PCM connector A (32P).
34. Check for continuity between PCM connector terminal A14 and No. 28 terminal of the gauge assembly A (30P) connector.



Wire side of female terminals

Is there continuity?

YES – Check for loose terminal fit in the PCM connectors. Check the transmission range switch. If necessary, substitute a known-good PCM and recheck. ■

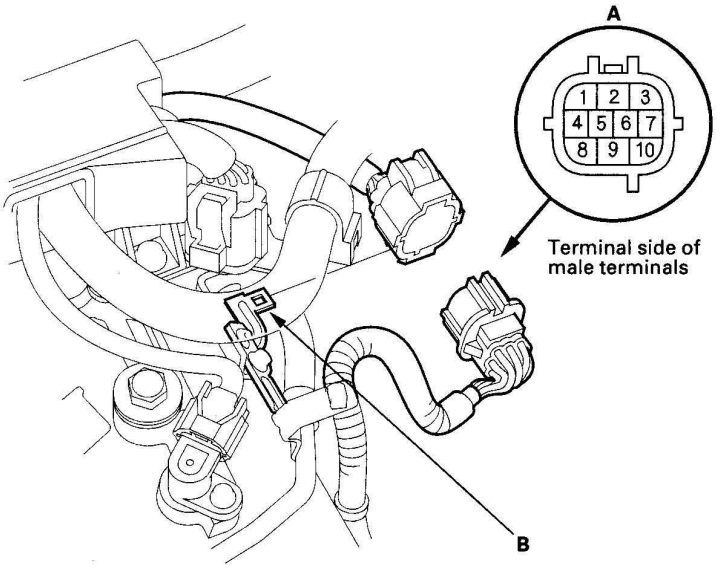
NO – Repair open in the wire between PCM connector terminal A14 and the gauge assembly. ■

BACK

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Transmission Range Switch Test

1. Remove the transmission range switch connector (A) from the connector bracket (B), then disconnect the connector.
2. Check for continuity between the terminals in each switch position according to the table below.



Transmission Range Switch Continuity Check

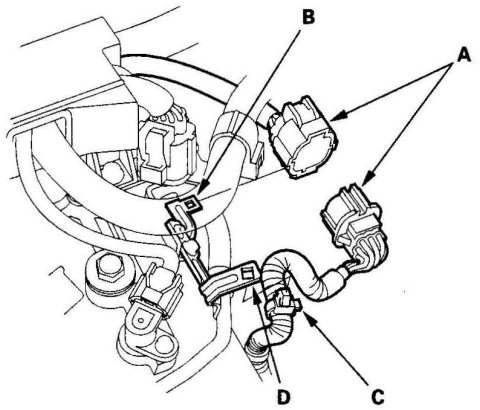
Terminal / Position	1	2	3	4	5	6	7	8	9	10
P	○		○							○
R			○						○	
N	○		○					○		
D5		○	○				○			
D4		○	○			○				
D3		○	○		○					
2 & 1			○	○						

BACK

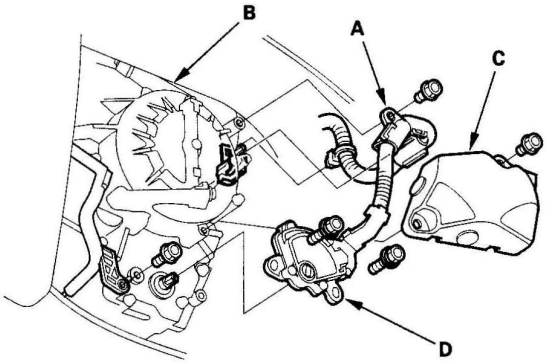
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Transmission Range Switch Replacement

1. Raise the vehicle, and make sure it is securely supported (see page 1-8).
2. Shift to the [N] position.
3. Remove the transmission range switch connector (A) from the connector bracket (B), then disconnect the connector.

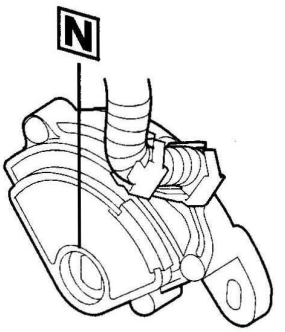


4. Remove the harness clamp (C) from its bracket (D).
5. Remove the clamp from the clamp bracket on the transmission housing, and remove the harness holder (A) from the end cover (B).



6. Remove the transmission range switch cover (C), then remove the transmission range switch (D) from the end cover.
7. Set the new transmission range switch to the [N] position.

   NOTE: The transmission range switch clicks in the [N] position.

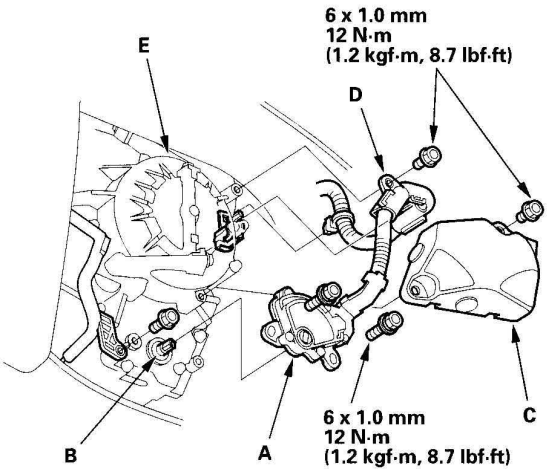


BACK

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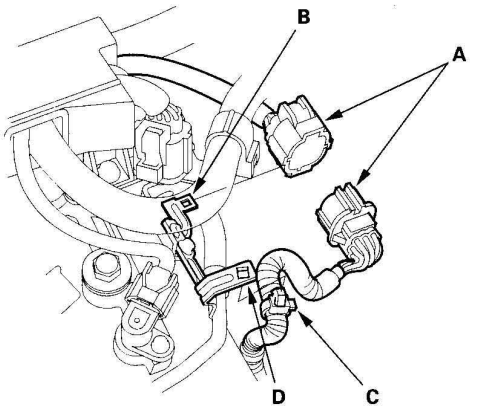
8. Install the transmission range switch (A) on the control shaft (B), then secure it with the bolts.

   NOTE: Do not move the transmission range switch when tightening the bolts.



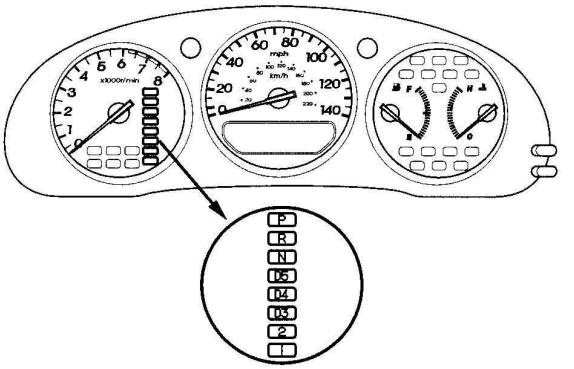
9. Install the transmission range switch cover (C), and the harness holder (D) on the end cover (E).

10. Connect the transmission range switch connector (A), then install it on the connector bracket (B).



11. Install the harness clamp (C) on its bracket (D).

12. Turn the ignition switch ON (II). Move the shift lever through all gears, and check the transmission range switch synchronization with the A/T gear position indicator.



13. Allow the wheels to rotate freely, then start the engine.

14. Move the shift lever through all gears, and verify the following:

    - The engine will not start in any position other than N or P.
    - The back-up lights come on when the shift lever is in the R position.

BACK

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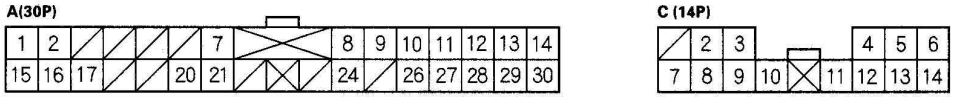
A/T Gear Position Indicator

Indicator Input Test

SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

1. Remove the gauge assembly from the dashboard (see page 22-80), then disconnect the A (30P) and C (14P) connectors from the gauge assembly.
2. Inspect the connectors and connector terminals to be sure they are making good contact.
3. If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
4. Perform the following input test at the gauge assembly A (30P) and C (14P) connectors.

GAUGE ASSEMBLY CONNECTORS



Wire side of female terminals

Cavity	Wire Color	Test Condition	Test: Desired Result	Possible Cause (If result is not obtained)
A7	BLK/BLU	Shift lever in P	Check for continuity to ground: There should be continuity and no continuity in any other shift lever position.	• Faulty transmission range switch • An open in the wire
A8	WHT	Ignition switch ON (II) and shift lever in R	Check for voltage to ground: There should be 1 V or less. NOTE: There should be battery voltage in any other shift lever position.	
A9	RED/BLK	Ignition switch ON (II) and shift lever in N	Check for voltage to ground: There should be 1 V or less. NOTE: There should be about 5 V in any other position.	
A10	BLU	Ignition switch ON (II) and shift lever in 2		
A11	PNK	Ignition switch ON (II) and shift lever in D3		
A12	BRN	Ignition switch ON (II) and shift lever in 1		• Faulty 1st-hold switch • An open in the wire
A27	YEL	Ignition switch ON (II) and shift lever in D4		• Faulty transmission range switch • An open in the wire
A28	GRN/BLK	Ignition switch ON (II) and shift lever in D5	Check for voltage to ground: There should be battery voltage.	• Faulty transmission range switch • Faulty PCM • An open or short in the wire

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Cavity	Wire Color	Test Condition	Test: Desired Result	Possible Cause (If result is not obtained)
C7	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10A) fuse in the driver's under-dash fuse/relay box • An open in the wire
C10	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire

5. Connect the A (30P) and C (14P) connectors to the gauge assembly.

6. If all the input tests prove OK but the indicator is faulty, replace the printed circuit board.

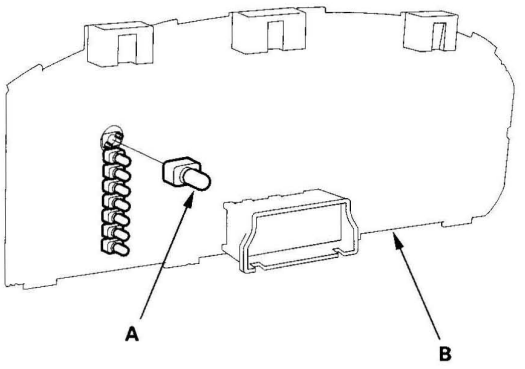
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A/T Gear Position Indicator

Indicator Bulb Replacement

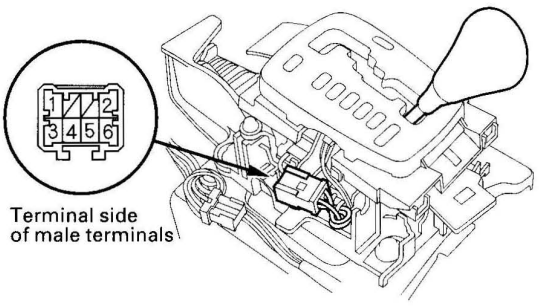
SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

1. Remove the gauge assembly (see page 22-80).
2. Disassemble the gauge assembly.
3. Replace the bulbs (A) in the gauge assembly (B).



1st-hold Switch Test/Replacement

1. Remove the console panel and center console (see page 20-65).
2. Disconnect the switch assembly connector (6P).
3. Shift the shift lever into the 1 position, then check for continuity between the No. 1 and No. 3 terminals. There should be continuity.

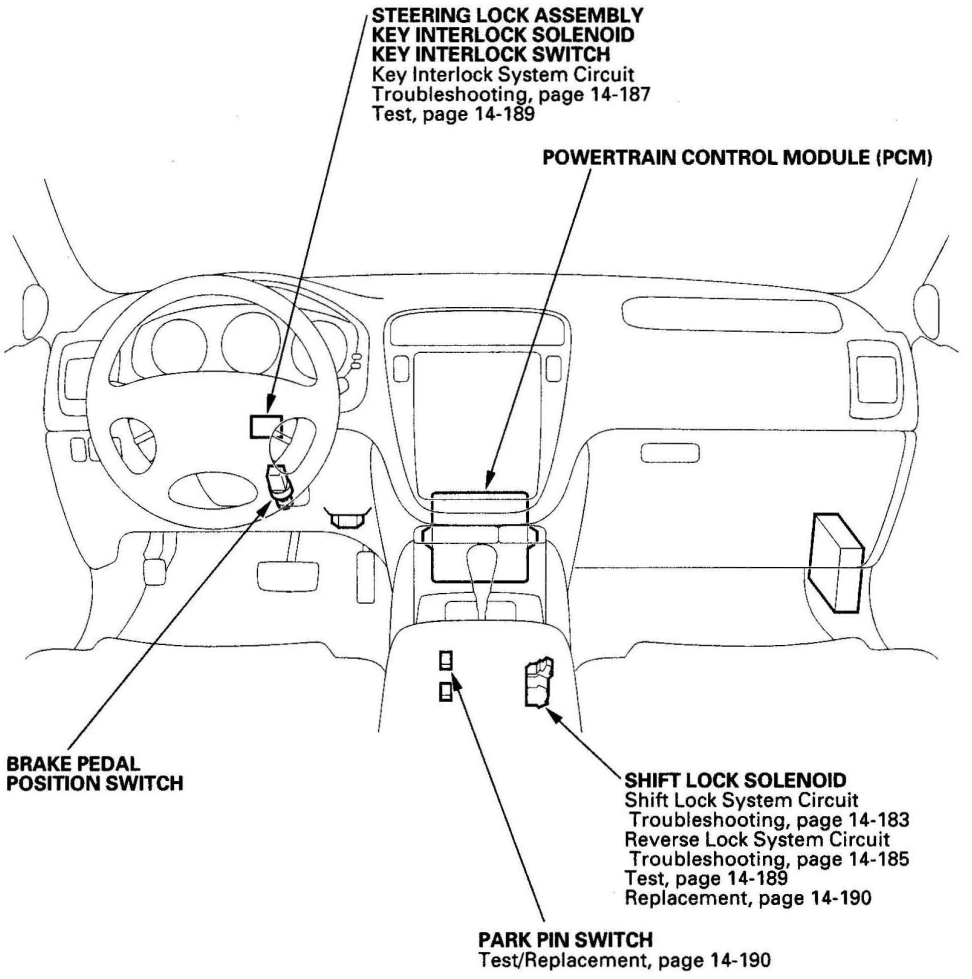


4. Shift the shift lever out of the 1 position, and check for continuity between the terminals in step 3. There should be no continuity.
5. If the 1st-hold switch is faulty, remove the shift lever assembly, and replace the detent bracket. (The 1st-hold switch is not available separately).

BACK

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Component Location Index

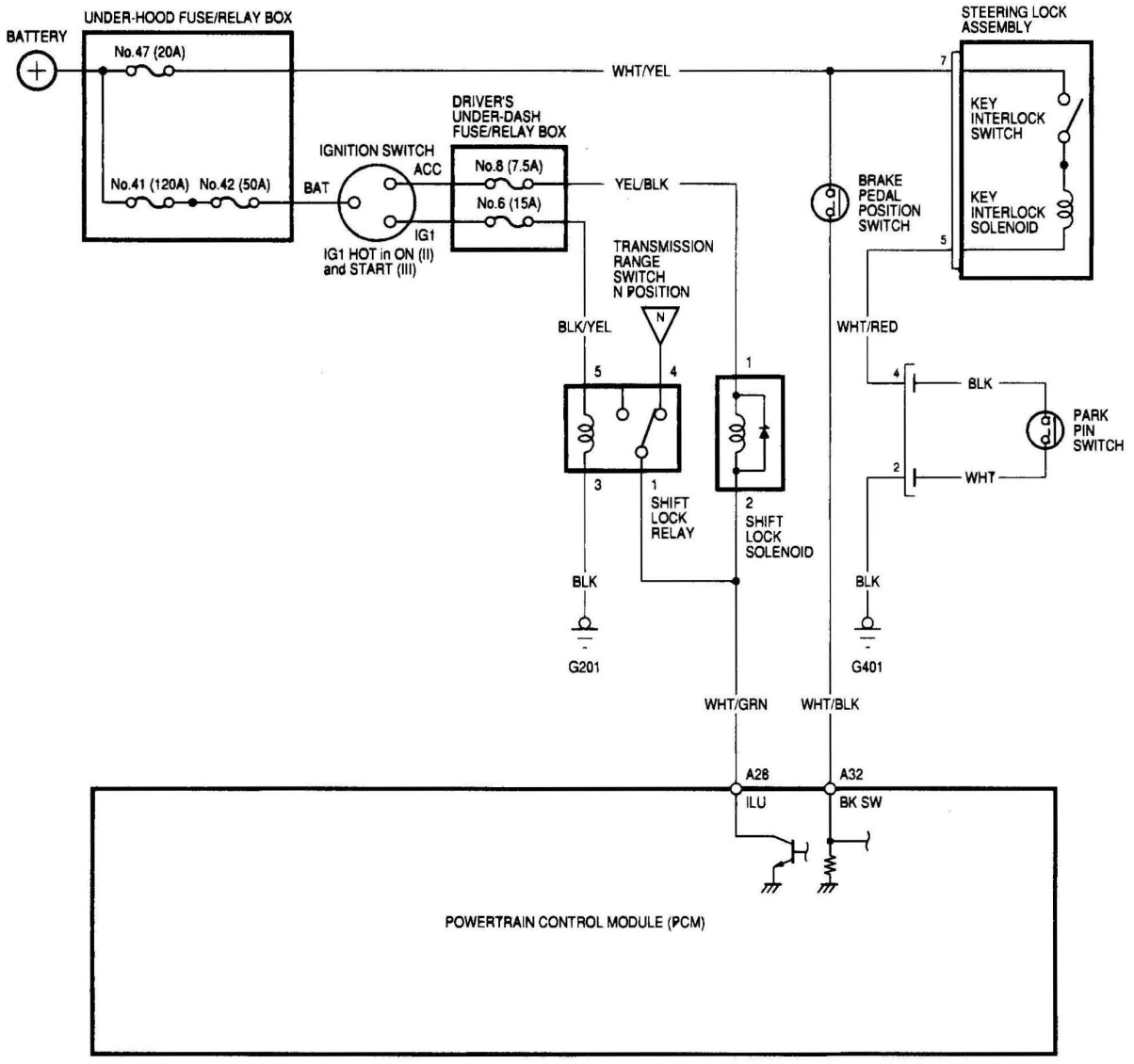


BACK

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A/T Interlock System

Circuit Diagram



BACK

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Shift Lock System Circuit Troubleshooting

1. Press the brake pedal.

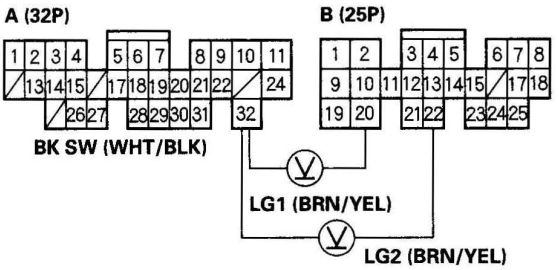
   Are the brake lights ON?

   YES – Go to step 2.

   NO – Repair faulty brake light circuit. ■

2. Turn the ignition switch ON (II), and shift to the [P] position.
3. Turn the ignition switch OFF.
4. Disconnect the battery negative terminal.
5. Disconnect PCM connectors A (32P) and B (25P).
6. Reconnect the battery negative terminal.
7. Press the brake pedal, and measure the voltage between PCM connector terminals A32 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

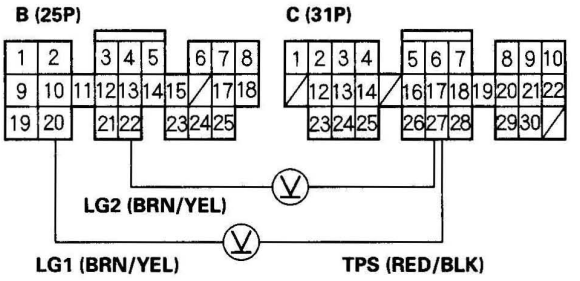
Is there battery voltage?

YES – Release the brake pedal and go to step 8.

NO – Repair open in the wire between PCM connector terminal A32 and the brake pedal position switch. ■

8. Disconnect the battery negative terminal.
9. Reconnect PCM connectors A (32P) and B (25P).
10. Reconnect the battery negative terminal.
11. Turn the ignition switch ON (II).
12. Measure the voltage between PCM connector terminals C27 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

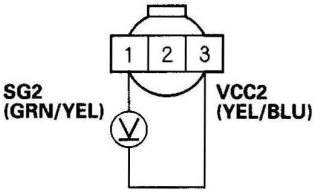
Is there about 0.5 V (throttle fully closed)?

YES – Turn the ignition switch OFF, and go to step 17.

NO – Go to step 13.

13. Turn the ignition switch OFF.
14. Disconnect the TPS (throttle position sensor) connector.
15. Measure the voltage between the No. 1 and No. 3 terminals of the TPS connector.

THROTTLE POSITION SENSOR CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES – Check for short or open in the wire between PCM connector terminal C27 and the TPS. If the wire is OK, replace the throttle body. ■

NO – Go to step 16.

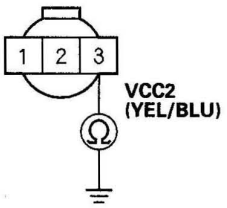
(cont'd)

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Shift Lock System Circuit Troubleshooting (cont'd)

16. Turn the ignition switch OFF, and disconnect PCM connector C (31P). Check for continuity between the No. 3 terminal and body ground.

THROTTLE POSITION SENSOR CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Check for a short to ground in the wire between the No. 3 terminal of the TPS connector and ground. If the wire is OK, replace the PCM. ■

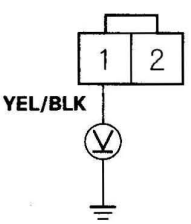
NO – Go to step 17.

17. Disconnect the shift lock solenoid connector.

18. Turn the ignition switch ON (II).

19. Measure the voltage between the No. 1 terminal of the shift lock solenoid connector and body ground.

SHIFT LOCK SOLENOID CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 20.

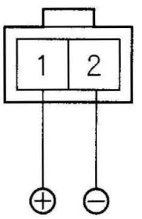
NO – Check for blown No. 8 (7.5 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open or short in the wire between the No. 1 terminal of the shift lock solenoid and the driver's under-dash fuse/relay box. ■

20. Connect the No. 1 terminal of the shift lock solenoid connector to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal.

NOTE: Do not connect the No. 2 terminal to the battery positive terminal or you will damage the diode inside the shift lock solenoid.

21. Check that the shift lock solenoid operates.

SHIFT LOCK SOLENOID CONNECTOR



Terminal side of male terminals

Does the shift lock solenoid operate properly?

YES – Check for open in the wire between PCM connector terminal A28 and the shift lock solenoid. ■

NO – Replace the shift lock solenoid. ■

BACK

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Reverse Lock System Circuit Troubleshooting

1. Check whether the OBD II scan tool indicates P1705 or P1706.

   Does the OBD II scan tool indicate either code?

   YES – Perform the troubleshooting flowchart for the indicated code(s). ■

   NO – Go to step 2.

2. Turn the ignition switch OFF.
3. Shift the shift lever into the [P] position while pushing the shift lock release.
4. Turn the ignition switch ON (II).
5. Press the brake pedal, and do not press the accelerator pedal.
6. Shift the shift lever out of the [P] position to check that the shift lock solenoid operates.

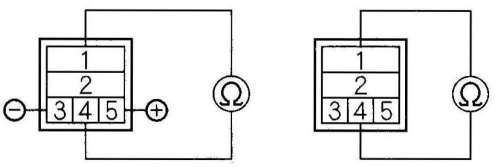
   Does the shift lever shift out of the [P] position?

   YES – Go to step 7.

   NO – Perform the troubleshooting flowchart for the Shift Lock System Circuit (see page 14-183). ■

7. Turn the ignition switch OFF.
8. Remove the shift lock relay.
9. Check for continuity between the No. 1 and No. 4 terminals of the shift lock relay while connecting the battery positive terminal to the No. 5 terminal of the shift lock relay, and connecting the negative terminal to the No. 3 terminal.

SHIFT LOCK RELAY



Terminal side of male terminals

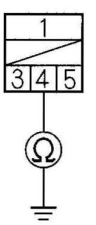
Is there no continuity when connecting the battery terminals, and continuity when disconnecting the battery terminals?

YES – Go to step 10.

NO – Replace the shift lock relay. ■

10. Shift the shift lever into the [N] position.
11. Check the continuity between the No. 4 terminal of the shift lock relay socket and body ground.

SHIFT LOCK RELAY SOCKET



Wire side of female terminals

Is there continuity?

YES – Go to step 12.

NO – Repair open in the wire between the No. 4 terminal of the shift lock relay and the transmission range switch. ■

(cont'd)

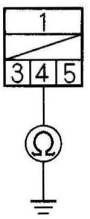
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Reverse Lock System Circuit Troubleshooting (cont'd)

12. Shift the shift lever out of the N position.

13. Check for continuity between the No. 4 terminal of the shift lock relay socket and body ground.

SHIFT LOCK RELAY SOCKET



Wire side of female terminals

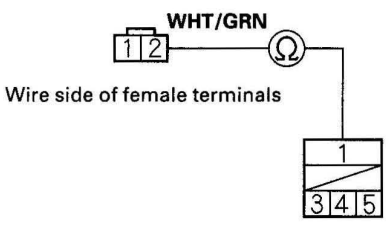
Is there continuity?

YES – Repair short to ground in the wire between the No. 4 terminal of the shift lock relay and the transmission range switch. ■

NO – Go to step 14.

14. Check for continuity between the No. 1 terminal of the shift lock relay socket and the No. 2 terminal of the shift lock solenoid connector.

SHIFT LOCK SOLENOID CONNECTOR



Is there continuity?

YES – Check for loose terminal fit in the connectors. Repair the reverse lock mechanism. ■

NO – Repair open in the wire between the No. 1 terminal of the shift lock relay and the shift lock solenoid connector. ■

BACK

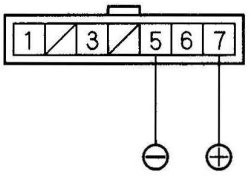
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Key Interlock System Circuit Troubleshooting

1. Disconnect the key switch connector (7P) from the steering lock assembly.

2. Connect the No. 7 terminal of the key switch connector to the battery positive terminal, and connect the No. 5 terminal to the battery negative terminal.

KEY SWITCH CONNECTOR (7P)



Terminal side of male terminals

3. Turn the ignition switch to ACC (I), then push the ignition key.

4. Check the key interlock solenoid operation. A clicking sound should be heard while pushing the ignition key, and you should not be able to turn it to the OFF position.

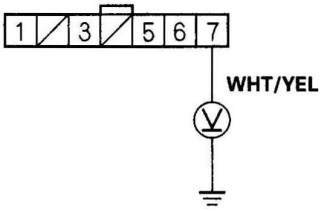
Does the key interlock solenoid operate properly?

YES – Go to step 5.

NO – Faulty key interlock solenoid/switch. Replace the ignition key cylinder/steering lock assembly. ■

5. Measure the voltage between the No. 7 terminal and body ground.

KEY SWITCH CONNECTOR (7P)



Wire side of female terminals

Is there battery voltage?

YES – Go to step 6.

NO – Check for a blown No. 47 (20A) fuse in the under-hood fuse/relay box. If the fuse is OK, repair open or short in the wire between the No. 7 terminal of the key switch connector and under-hood fuse/relay box. ■

(cont'd)

BACK

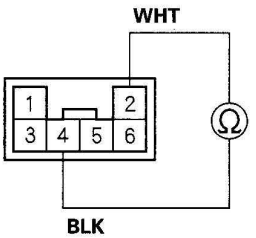
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Key Interlock System Circuit Troubleshooting (cont'd)

6. Disconnect the switch assembly connector (6P) on the rear of the shift lever.

7. With the shift lever in Park and pushed to the right, check for continuity between the No. 4 and No. 2 terminals of the switch assembly connector (6P).

SWITCH ASSEMBLY CONNECTOR (6P)



Terminal side of male terminals

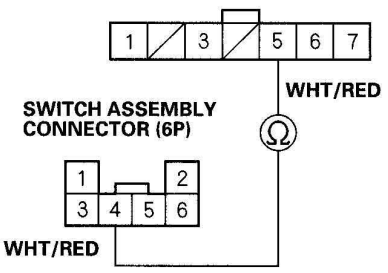
Is there continuity?

YES—Go to step 8.

NO—Repair open in the wires between the park pin switch and the switch assembly connector (6P). If the wires are OK, replace the shift lever detent bracket assembly.■

8. Check for continuity between the No. 4 terminal of the switch assembly connector (6P) and the No. 5 terminal of the key switch connector.

KEY SWITCH CONNECTOR (7P)



Wire side of female terminals

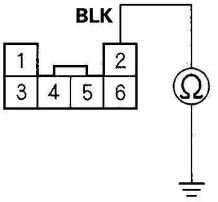
Is there continuity?

YES—Go to step 9.

NO—Repair open in the wire between No. 4 terminal of the switch assembly connector (6P) and the No. 5 terminal of the key switch connector.■

9. Check for continuity between the No. 2 terminal of the switch assembly connector (6P) and body ground.

SWITCH ASSEMBLY CONNECTOR (6P)



Wire side of female terminals

Is there continuity?

YES—Check for loose terminal fit in the key switch connector and switch assembly connector (6P). If necessary, substitute a known-good steering lock assembly.■

NO—Repair open in the wire between the No. 2 terminal of the switch assembly connector (6P) and ground (G401), or repair poor ground (G401).■

BACK

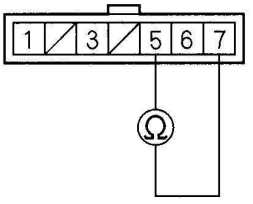
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Key Interlock Solenoid/Switch Test

SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

1. Remove the driver's dashboard lower cover (see page 20-67).
2. Disconnect the key switch connector (7P) from the steering lock assembly.
3. Check for continuity between the No. 5 and No. 7 terminals when the key is pushed, and check for no continuity when the key is released.

KEY SWITCH CONNECTOR (7P)

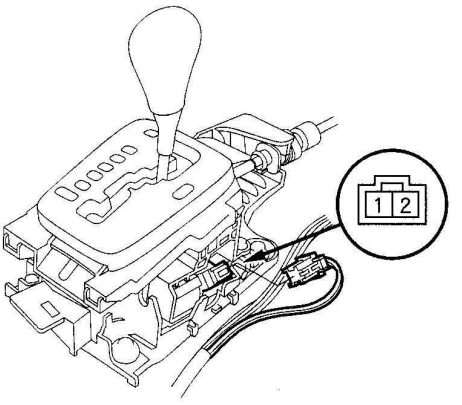


Terminal side of male terminals

4. Check that the key cannot be removed with power connected to the No. 7 terminal and ground connected to the No. 3 terminals.
   - If the key cannot be removed, the key interlock solenoid is OK.
   - If the key can be removed, replace the steering lock assembly (the key interlock solenoid is not available separately).

Shift Lock Solenoid Test

1. Remove the console panel and center console (see page 20-65).
2. Disconnect the shift lock solenoid 2P connector.



3. Connect the No. 1 terminal of the shift lock solenoid connector to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal.
4. Check that the shift lever can be moved from the P position. Release the battery terminals from the shift lock solenoid connector. Move the shift lever back to the P position, and make sure it locks.

   NOTE: Do not connect power to the No. 2 terminal (reverse polarity) or you will damage the diode inside the solenoid.
5. Check that the shift lock releases when the release lever is pushed, and check that it locks when the release lever is released.
6. If the solenoid does not work, replace the shift lock solenoid (see page 14-190).

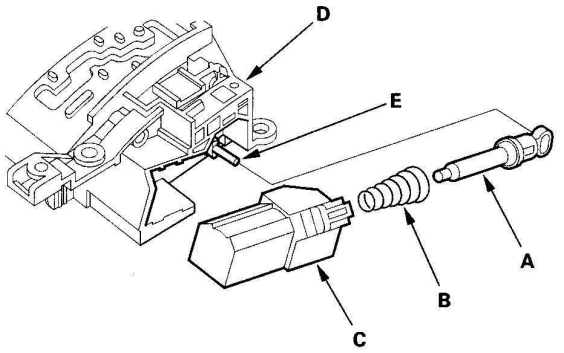
BACK

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A/T Interlock System

Shift Lock Solenoid Replacement

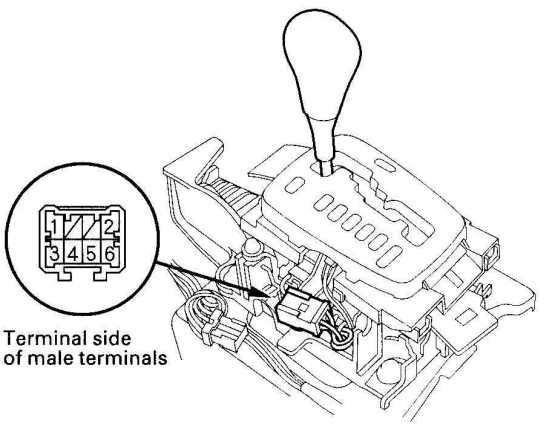
1. Remove the console panel and center console (see page 20-65).
2. Remove the shift lever assembly (see page 14-161).
3. Remove the shift lever knob and A/T gear position indicator panel/bracket assembly (see page 14-164).
4. Remove the bolts (four) securing the detent bracket and the shift lever bracket base, then separate them.
5. Remove the shift lock solenoid from the detent bracket.
6. Install the shift lock solenoid plunger (A) and plunger spring (B) in the new shift lock solenoid (C).



7. Install the shift lock solenoid on the detent bracket (D) by aligning the joint of the shift lock solenoid plunger with the tip of the shift lock stop (E).
8. Install the detent bracket on the shift lever bracket base with the bolts and nuts.
9. Install the A/T gear position indicator panel/bracket assembly and shift lever knob.
10. Install the shift lever assembly (see page 14-162).
11. Install the center console, console panel, and related parts (see page 20-65).

Park Pin Switch Test/Replacement

1. Remove the console panel and center console (see page 20-65).
2. Disconnect the switch assembly connector (6P).
3. Shift the shift lever into the [P] position, then check for continuity between the No. 2 and No. 4 terminals. There should be continuity.



4. Shift the shift lever out of the [P] position, and check for continuity between the terminals in step 3. There should be no continuity.
5. If the park pin switch is faulty, remove the shift lever assembly, and replace the detent bracket. (The park pin switch is not available separately.)

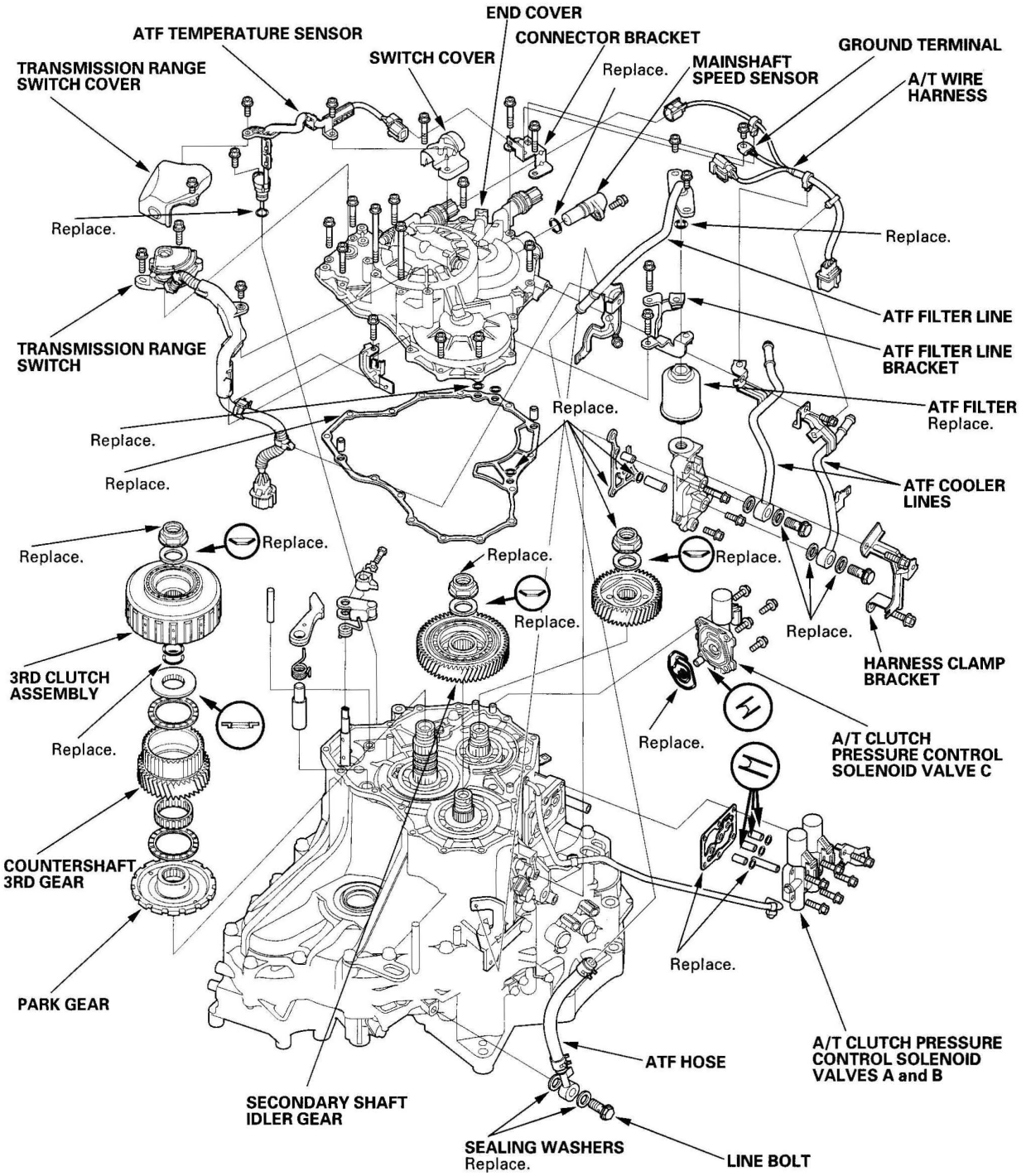
BACK

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Transmission End Cover

End Cover, 3rd Gears, Idler Gear, and 3rd Clutch Removal

Exploded View



(cont'd)

BACK

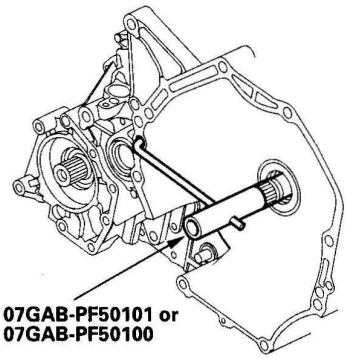
Protected by AR

End Cover, 3rd Gears, Idler Gear, and 3rd Clutch Removal (cont'd)

Special Tools Required
- Mainshaft holder
  07GAB-PF50101 or 07GAB-PF50100
- Adjustable bearing puller, 25—40 mm
  07736-A01000B or 07736-A01000A

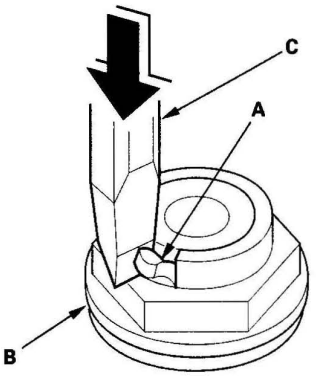
NOTE: Refer to the Exploded View as needed during the following procedure.

1. Remove the ATF temperature sensor connector from the connector bracket, then disconnect the connector.
2. Remove the ATF temperature sensor harness clamp bolts and the ATF temperature sensor, then remove the switch cover.
3. Remove the A/T wire harness ground terminal from the connector bracket, and disconnect the 3rd clutch pressure switch connector, then remove the connector bracket.
4. Remove the mainshaft speed sensor.
5. Remove the transmission range switch cover.
6. Remove the transmission range switch harness clamp bolts and harness clamp, then remove the transmission range switch.
7. Remove the harness clamp bracket, ATF cooler line bolts (two), and lines.
8. Remove the line bolt, the ATF hose, and the ATF filter line.
9. Remove the ATF filter line bracket and ATF filter. Remove the ATF passage body if necessary.
10. Remove the A/T clutch pressure control solenoid valve C.
11. Remove the remaining 11 bolts on the end cover, then remove the end cover.
12. Slip the special tool onto the mainshaft.



13. Engage the park pawl with the park gear.
14. Cut the lock tabs (A) of each shaft locknut (B) using a chisel (C). Then remove the locknuts and conical spring washers from each shaft.

    NOTE:
    - Countershaft and secondary shaft locknuts have left-hand threads.
    - Clean the old locknut; they are used to install the press fit mainshaft 3rd gear, secondary shaft idler gear, park gear, and 3rd clutch assembly on the countershaft.
    - Keep all of the chiseled particles out of the transmission.

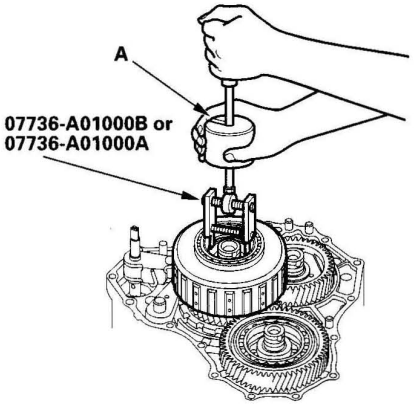


15. Remove the special tool from the mainshaft.

BACK

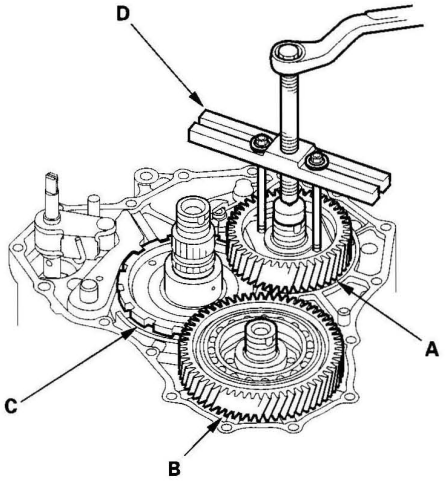
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16. Remove the 3rd clutch assembly using the special tool and a commercially available 3/8-16" slide hammer (A).



17. Remove the splined washer, thrust needle bearing, countershaft 3rd gear, needle bearing, and thrust needle bearing from the countershaft.

18. Remove the mainshaft 3rd gear (A), secondary shaft idler gear (B), and park gear (C) with a puller (D).



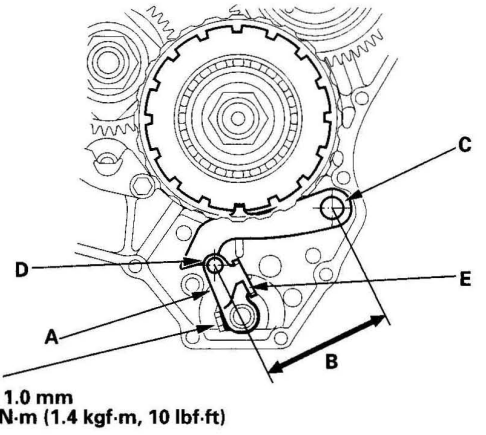
19. Remove the park pawl, park pawl spring, park pawl shaft, and stop shaft.

20. Remove the park lever from the control shaft.

21. Remove A/T clutch pressure control solenoid valves A and B.

Park Lever Stop Inspection and Adjustment

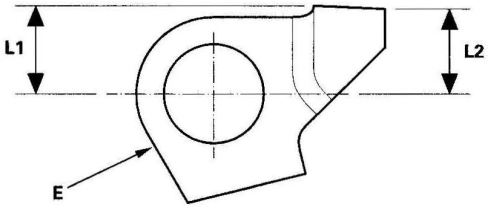
1. Set the park lever (A) in the [P] position.



2. Measure the distance (B) between the park pawl shaft (C) and the park lever roller pin (D).

STANDARD: 84.6 – 85.6 mm (3.33 – 3.37 in.)

3. If the measurement is out of tolerance, select and install the appropriate park lever stop (E) from the table below.



PARK LEVER STOP

Mark	Part Number	L1	L2
1	24537-PA9-003	11.00 mm (0.433 in.)	11.00 mm (0.433 in.)
2	24538-PA9-003	10.80 mm (0.425 in.)	10.65 mm (0.419 in.)
3	24539-PA9-003	10.60 mm (0.417 in.)	10.30 mm (0.406 in.)

4. After replacing the park lever stop, make sure the distance is within tolerance.

BACK

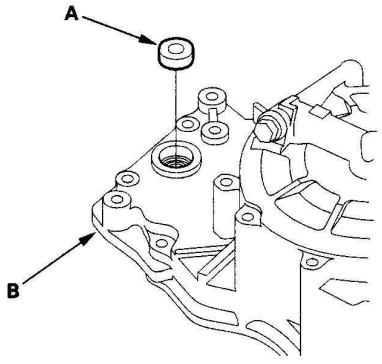
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Transmission End Cover

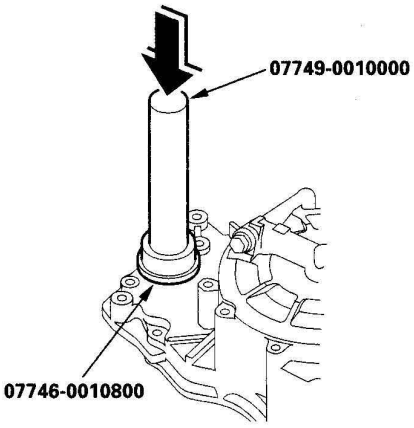
Control Shaft Oil Seal Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 22 x 24 mm 07746-0010800

1. Remove the oil seal (A) from the end cover (B).



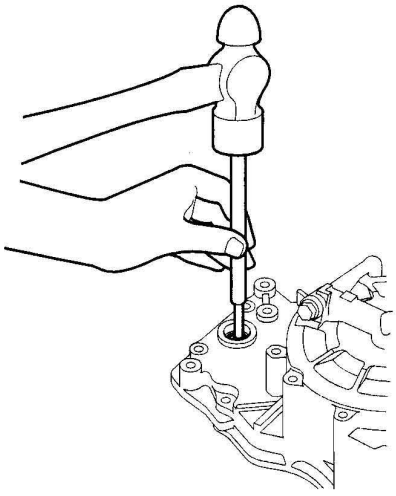
2. Install the new oil seal flush to the end cover with the special tools.



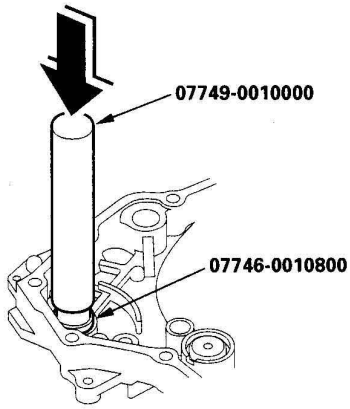
Control Shaft Bearing Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 22 x 24 mm 07746-0010800

1. Remove the oil seal from the end cover, then remove the bearing.



2. Install the new bearing flush to the end cover with the special tools.



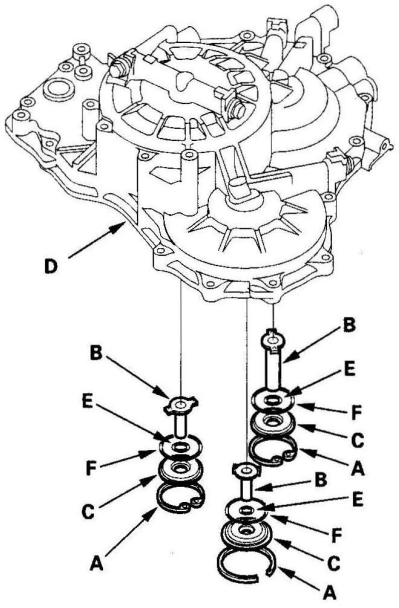
3. Install the new oil seal.

BACK

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ATF Feed Pipes Replacement

1. Remove the snap rings (A), ATF feed pipes (B), and feed pipe flanges (C) from the end cover (D).



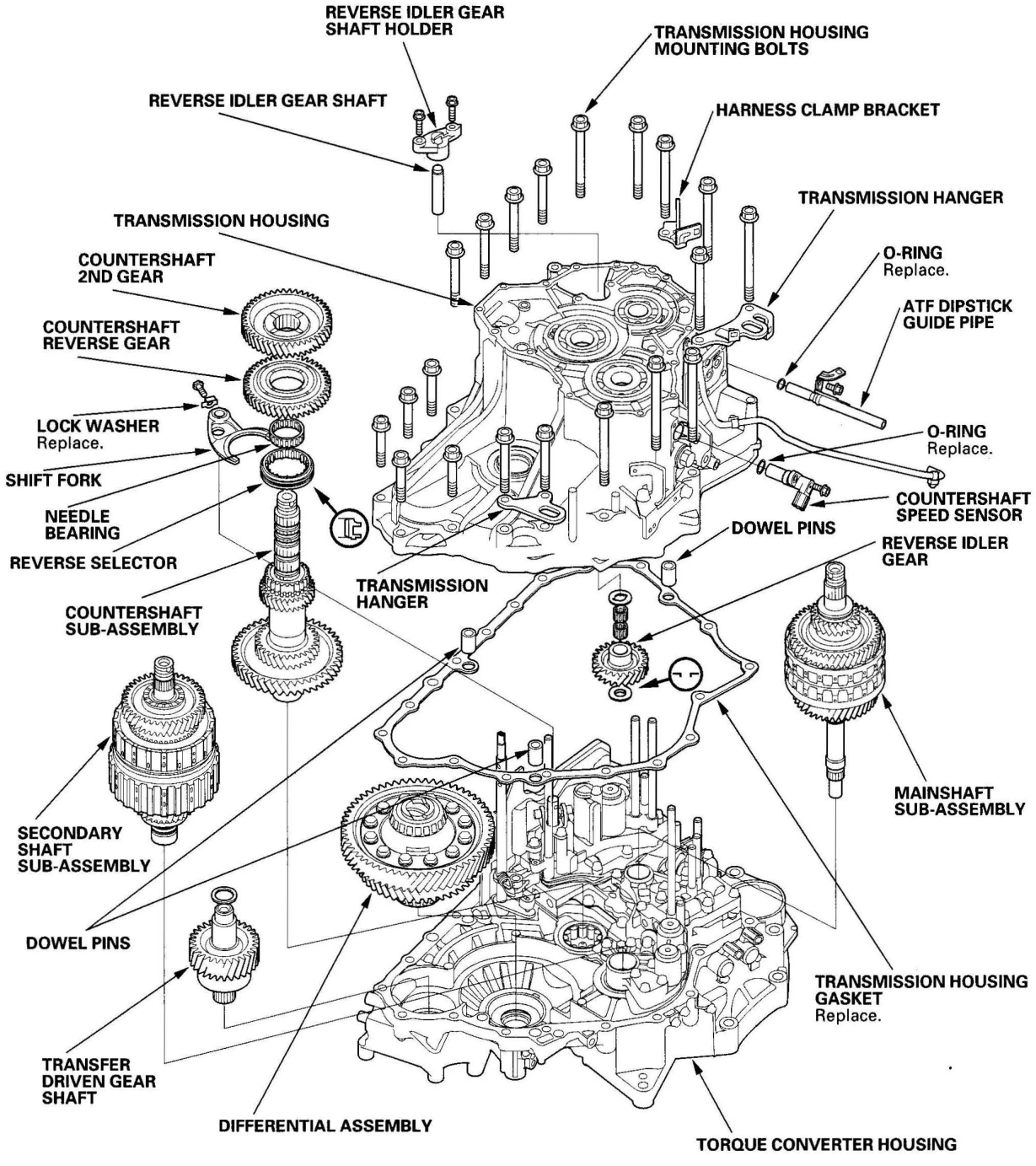
2. Install the new O-ring (E) over the ATF feed pipe.
3. Install ATF feed pipe in the end cover with aligning the feed pipe tabs with the indentations in the end cover.
4. Install the new O-ring (F) in the end cover, then install the feed pipe flange over the ATF feed pipe and O-rings.
5. Secure the ATF feed pipe and feed pipe flange with the snap ring.

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Transmission Housing

Housing and Shaft Assemblies Removal

Exploded View



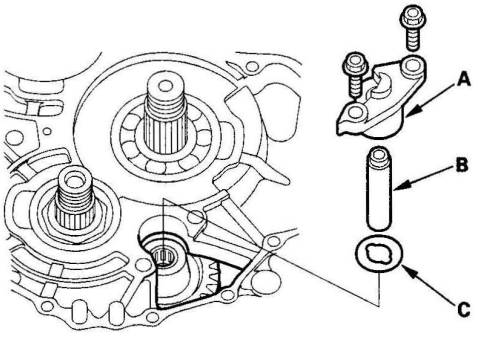
BACK

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Special Tools Required
Housing puller 07HAC-PK40102

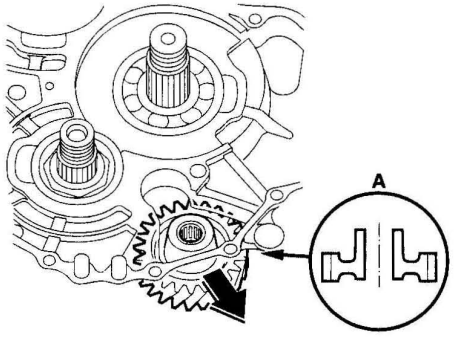
NOTE: Refer to the Exploded View as needed during the following procedure.

1. Remove the ATF dipstick guide pipe.
2. Remove the two bolts securing the reverse idler gear shaft holder, then remove the reverse idler gear shaft holder (A), shaft (B), and washer (C).

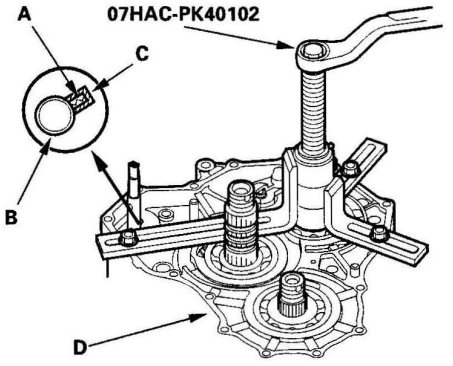


3. Remove the transmission housing mounting bolts, transmission hangers, and harness clamp bracket.
4. Move the reverse idler gear (A) to disengage it from the mainshaft and countershaft reverse gears.

   NOTE: The transmission housing will not separate from the torque converter housing if the reverse idler gear is not moved.



5. Align the spring pin (A) on the control shaft (B) with the transmission housing groove (C) by turning the control shaft.



6. Install the special tool over the mainshaft, then remove the transmission housing (D).

   NOTE: If the top arm of your housing puller is too short, replace it with Housing Puller Arm, 205 mm 07SAC-P0Z0101.

7. Remove the reverse idler gear, needle bearings, and thrust washer from the transmission housing.
8. Remove the countershaft 2nd gear, then remove the countershaft reverse gear and the needle bearing.
9. Remove the lock bolt securing the shift fork, then remove the shift fork with the reverse selector. If the reverse selector hub is not press-fitted, remove the reverse selector hub, countershaft 5th gear, and needle bearing from the countershaft.
10. Remove the secondary shaft sub-assembly. If the reverse selector hub is press-fitted, remove the secondary shaft sub-assembly, countershaft sub-assembly and mainshaft sub-assembly together.
11. Remove the countershaft sub-assembly.
12. Remove the mainshaft sub-assembly.
13. Remove the differential assembly.
14. Remove the transfer driven gear shaft.
15. Remove the countershaft speed sensor.

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Transmission Housing

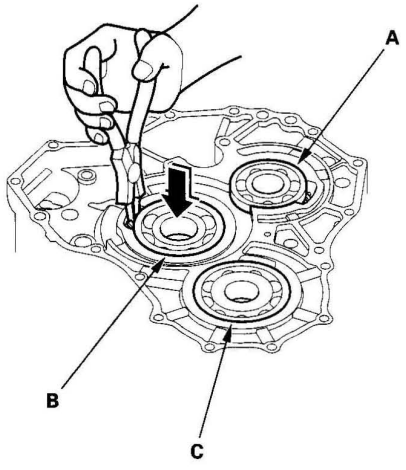
Bearing Removal and Installation

Special Tools Required
- Driver 07749-0010000
- Seal driver attachment 07GAD-PG40100 or 07GAD-PG40101
- Attachment, 62 x 68 mm 07746-0010500
- Attachment, 72 x 75 mm 07746-0010600

NOTE: Coat all parts with ATF before assembly.

1. To remove the mainshaft bearing (A), countershaft bearing (B), and secondary shaft bearing (C) from the transmission housing, expand each snap ring with the snap ring pliers, then push the bearing out.

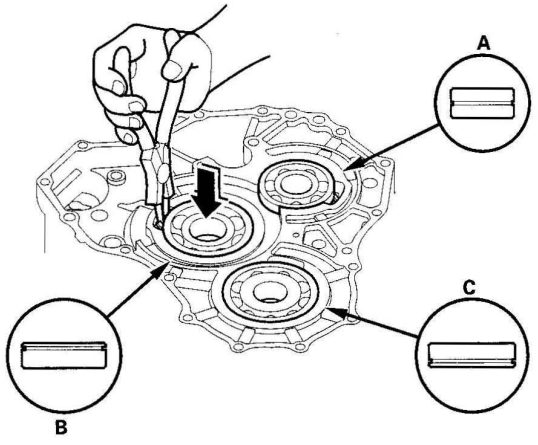
   NOTE: Do not remove the snap rings unless it's necessary to clean the grooves in the housing.



2. Install the bearings in the direction shown.

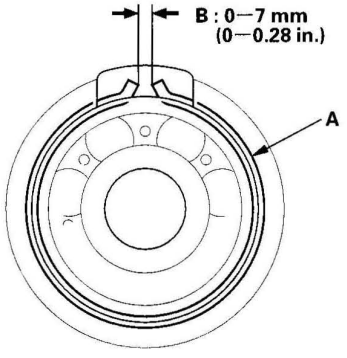
3. Expand each snap ring with the snap ring pliers, and insert the bearing part-way into the housing.

4. Release the pliers, then push the bearing down into the housing until the snap ring snaps in place around it.



5. After installing the bearings verify the following:

   - The snap rings (A) are seated in the bearing and housing grooves.
   - The ring end gaps (B) are correct.

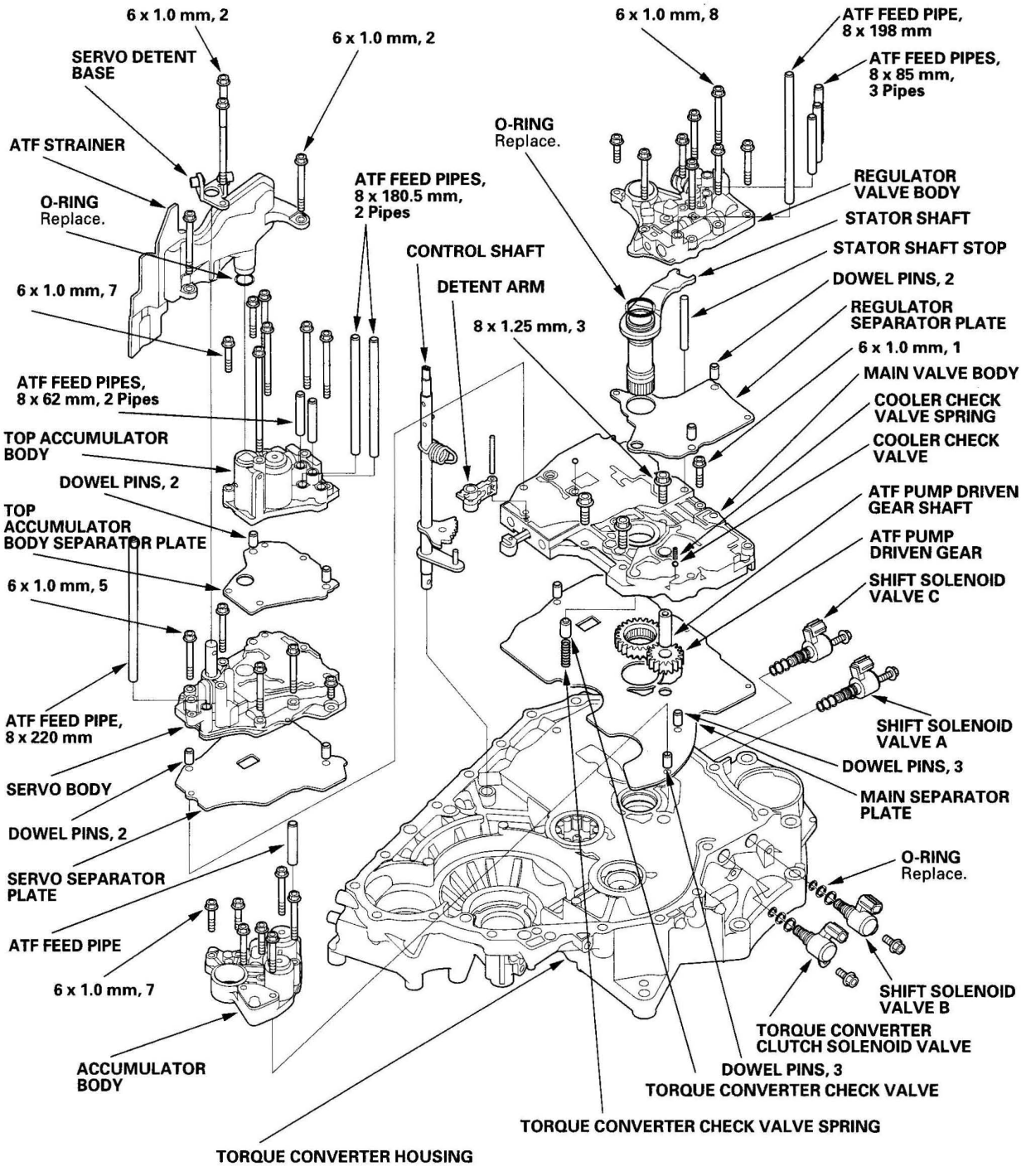


BACK

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Valve Bodies and ATF Strainer Removal

Exploded View



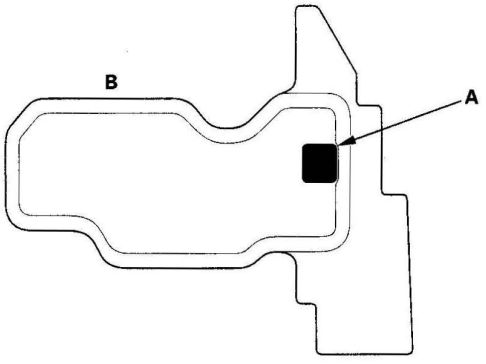
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Valve Bodies and ATF Strainer Removal (cont'd)

NOTE: Refer to the Exploded View as needed during the following procedure.

1. Remove the ATF feed pipes from the regulator valve body, servo body, top accumulator body, and accumulator body.
2. Remove the servo detent base (two bolts).
3. Remove the ATF strainer (two bolts).
4. Remove the top accumulator body (seven bolts), then remove the accumulator body separator plate and dowel pins (two).
5. Remove the servo body (five bolts), then remove servo separator plate and dowel pins (two).
6. Remove the regulator valve body (eight bolts).
7. Remove the stator shaft and stator shaft stop.
8. Remove the regulator separator plate and dowel pins (two).
9. Remove the accumulator body (seven bolts).
10. Unhook the detent spring from the detent arm, then remove the detent arm shaft, detent arm, and control shaft.
11. Remove the cooler check valve spring and cooler check valve (ball).
12. Remove the main valve body (four bolts).
13. Remove the torque converter check valve and spring.
14. Remove the ATF pump driven gear shaft, then remove the ATF pump gears.
15. Remove the main separator plate and dowel pins (three).
16. Clean the inlet opening (A) of the ATF strainer (B) thoroughly with compressed air, then check that it is in good condition, and the inlet opening is not clogged.



17. Test the ATF strainer by pouring clean ATF through the inlet opening, and replace it if it is clogged or damaged.

BACK

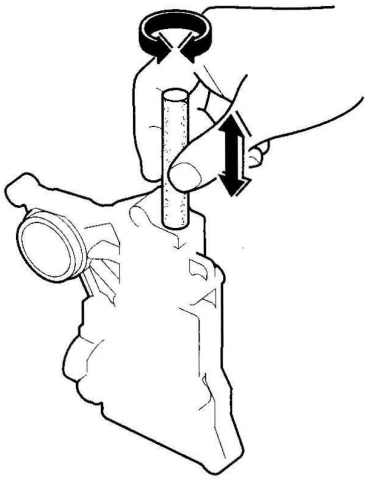
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Valve Body Repair

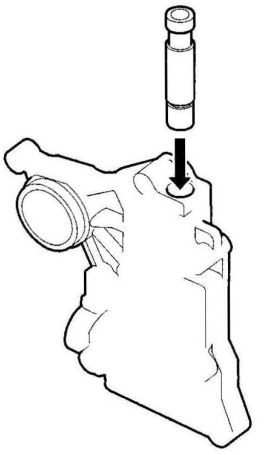
NOTE: This repair is only necessary if one or more of the valves in a valve body do not slide smoothly in their bores. Use this procedure to free the valves.

1. Soak a sheet of # 600 abrasive paper in ATF for about 30 minutes.
2. Carefully tap the valve body so the sticking valve drops out of its bore. It may be necessary to use a small screwdriver to pry the valve free. Be careful not to scratch the bore with the screwdriver.
3. Inspect the valve for any scuff marks. Use the ATF-soaked # 600 paper to polish off any burrs that are on the valve, then wash the valve in solvent and dry it with compressed air.
4. Roll up half a sheet of ATF-soaked # 600 paper and insert it in the valve bore of the sticking valve. Twist the paper slightly, so that it unrolls and fits the bore tightly, then polish the bore by twisting the paper as you push it in and out.

   NOTE: The valve body is aluminum and doesn't require much polishing to remove any burrs.



5. Remove the # 600 paper. Thoroughly wash the entire valve body in solvent, then dry it with compressed air.
6. Coat the valve with ATF, then drop it into its bore. It should drop to the bottom of the bore under its own weight. If not, repeat step 4 and 5, then retest. If the valve still sticks, replace the valve body.



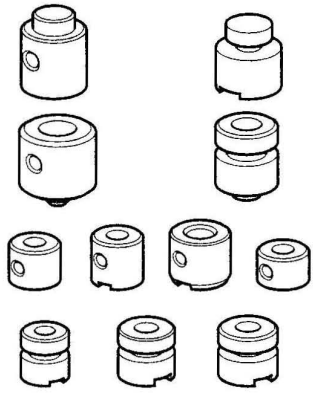
7. Remove the valve, and thoroughly clean it and the valve body with solvent. Dry all parts with compressed air, then reassemble using ATF as a lubricant.

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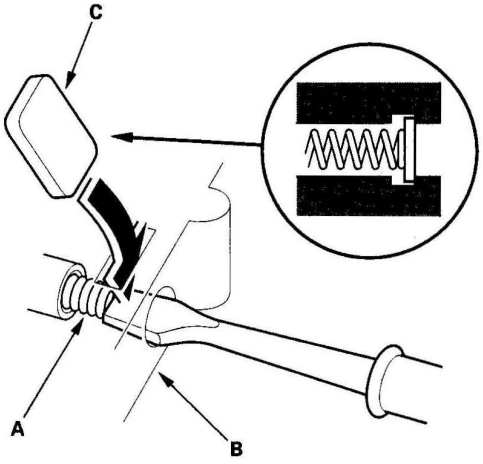
Valve Body Valve Installation

1. Coat all parts with ATF before assembly.

2. Install the valves and springs in the sequence shown for the main valve body (see page 14-203), regulator valve body (see page 14-206), servo body (see page 14-207), and top accumulator body (see page 14-208). Refer to the following valve cap illustrations, and install each valve cap so the end shown facing up will be facing the outside of the valve body.



3. Install all the springs and seats. Insert the spring (A) in the valve, then install the valve in the valve body (B). Push the spring in with a screwdriver, then install the spring seat (C).

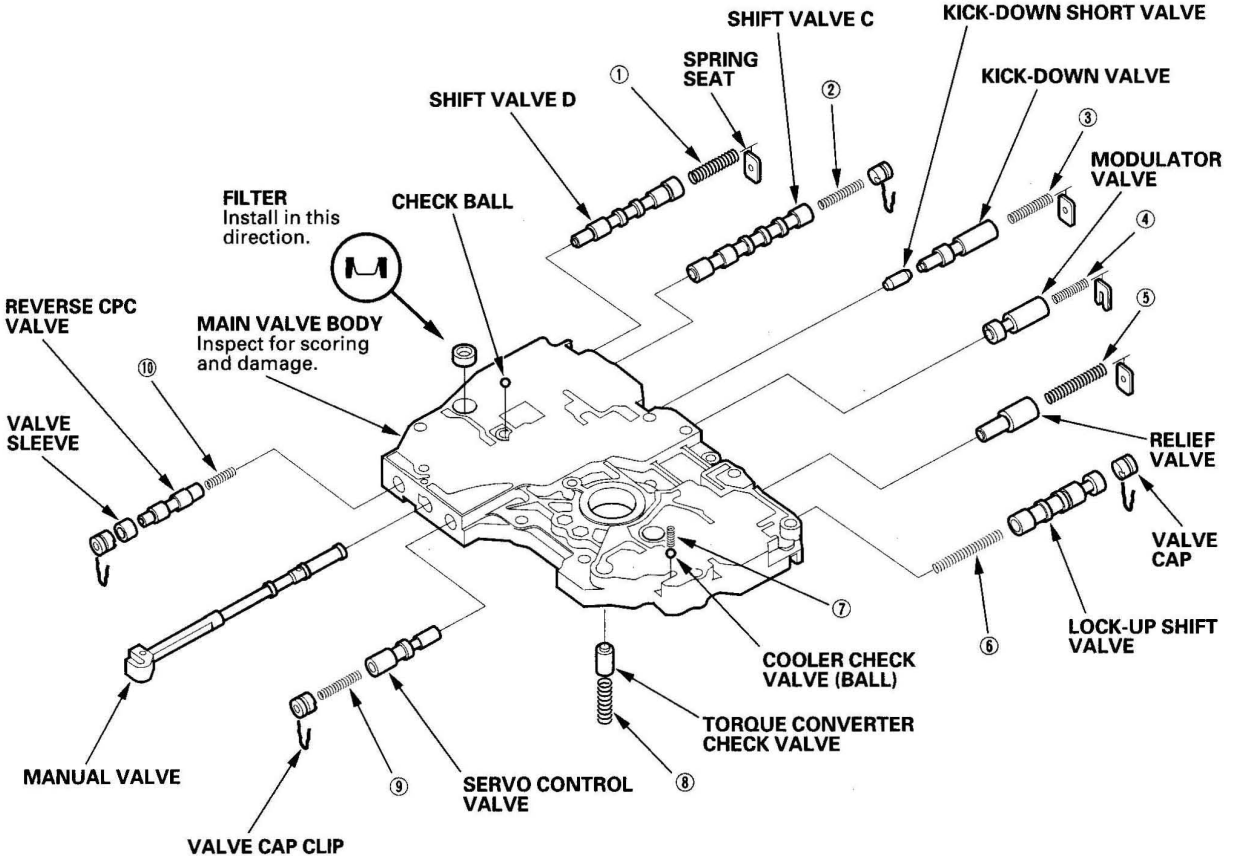


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Main Valve Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Do not use a magnet to remove the check ball, it may magnetize the ball.
3. Check all valves for free movement. If any fail to slide freely, refer to Valve Body Repair (see page 14-201).
4. Replace the valve body as an assembly if any parts are worn or damaged.
5. Coat all parts with ATF during assembly.
6. Install the filter in the direction shown.

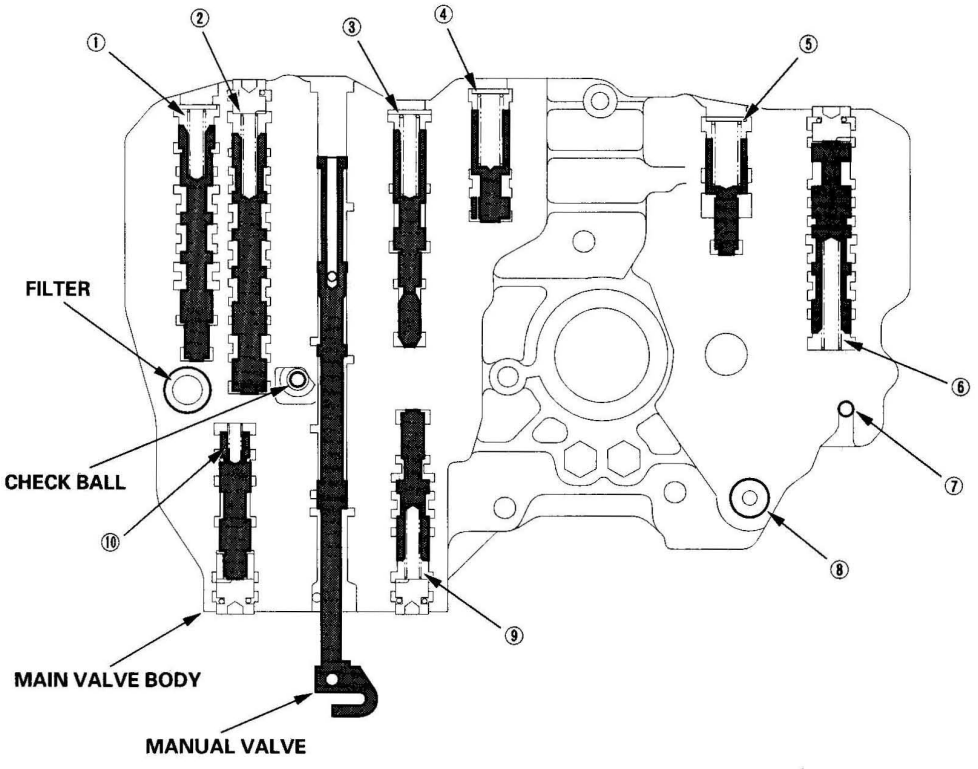


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Main Valve Body Disassembly, Inspection, and Reassembly (cont'd)

Sectional View



SPRING SPECIFICATIONS

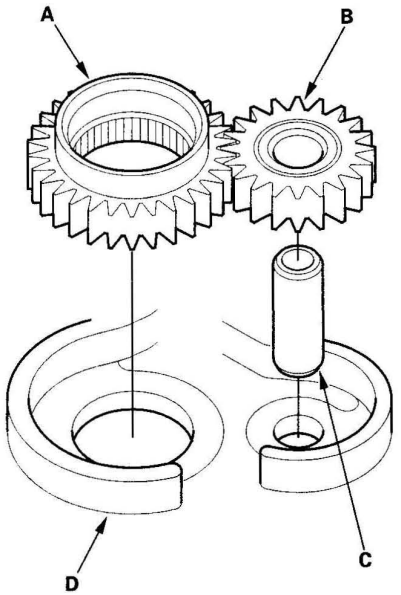
No.	Spring	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Shift valve D spring	0.7 (0.028)	6.6 (0.260)	33.7 (1.327)	11.6
②	Shift valve C spring	0.8 (0.031)	6.6 (0.260)	49.1 (1.933)	21.7
③	Kick-down valve spring	0.8 (0.031)	6.6 (0.260)	49.1 (1.933)	21.7
④	Modulator valve spring	1.6 (0.063)	10.4 (0.409)	33.5 (1.319)	9.8
⑤	Relief valve spring	1.2 (0.047)	11.1 (0.437)	39.0 (1.535)	9.9
⑥	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	63.0 (2.480)	22.4
⑦	Cooler check valve spring	0.6 (0.024)	5.8 (0.228)	14.5 (0.571)	6.8
⑧	Torque converter check valve spring	1.2 (0.047)	8.6 (0.339)	35.1 (1.382)	14.3
⑨	Servo control valve spring	0.9 (0.035)	6.4 (0.252)	32.5 (1.280)	17.5
⑩	Reverse CPC valve spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9

BACK

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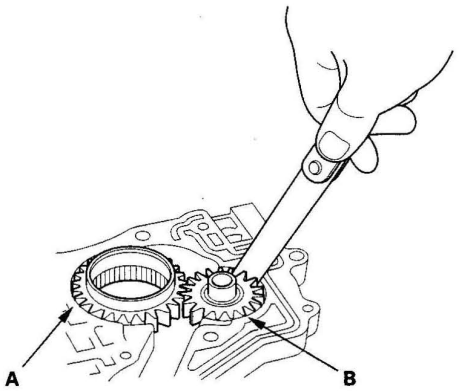
ATF Pump Inspection

1. Install the ATF pump drive gear (A), driven gear (B), and ATF pump driven gear shaft (C) in the main valve body (D). Lubricate all parts with ATF, and install the ATF pump driven gear with its grooved and chamfered side facing up.



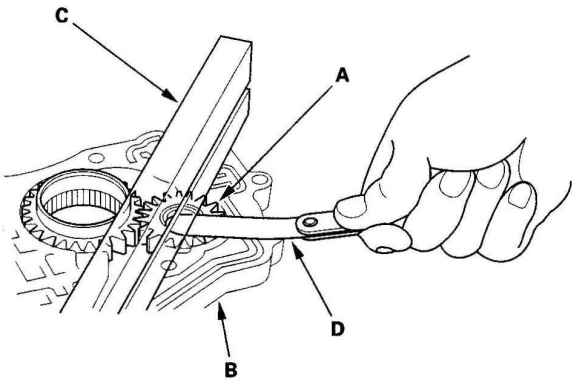
2. Measure the side clearance of the ATF pump drive gear (A) and driven gear (B).

ATF Pump Gears Side (Radial) Clearance:
Standard (New):
ATF Pump Drive Gear
0.210—0.265 mm (0.0083—0.00104 in.)
ATF Pump Driven Gear
0.070—0.125 mm (0.0028—0.0050 in.)



3. Remove the ATF pump driven gear shaft. Measure the thrust clearance between the ATF pump driven gear (A) and the valve body (B) with a straight edge (C) and a feeler gauge (D).

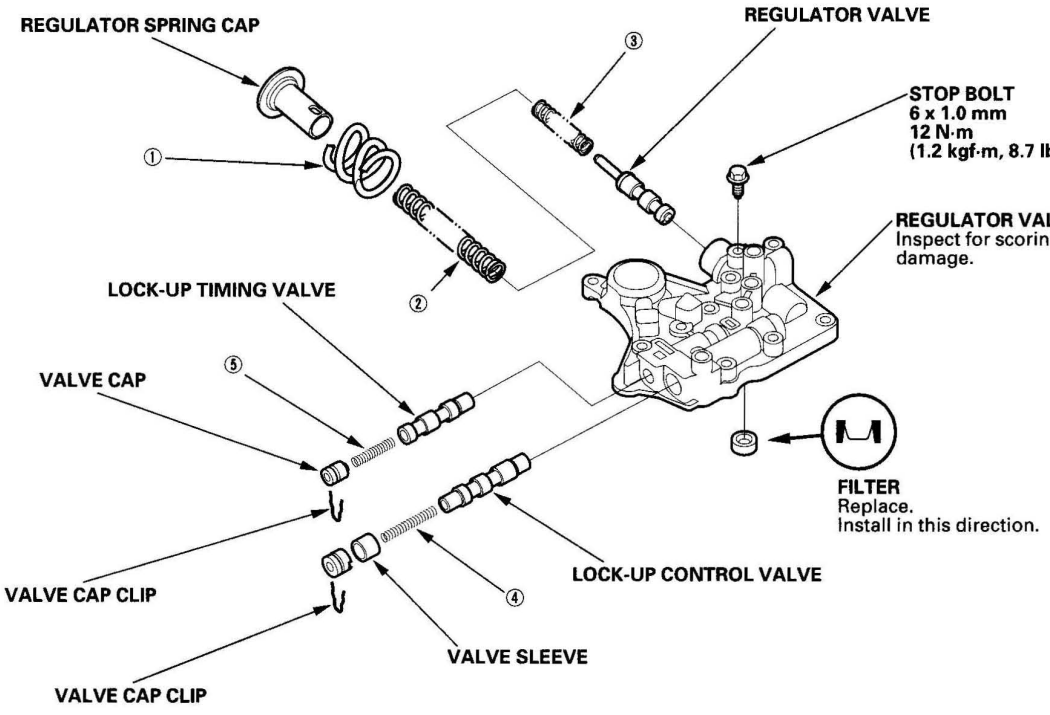
ATF Pump Drive/Driven Gear Thrust (Axial) Clearance:
Standard (New): 0.03—0.06 mm (0.001—0.002 in.)
Service Limit: 0.07 mm (0.003 in.)



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Regulator Valve Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Check all valves for free movement. If any fail to slide freely, refer to Valve Body Repair (see page 14-201).
3. Replace the valve body as an assembly if any parts are worn or damaged.
4. Hold the regulator spring cap in place while removing the stop bolt. The regulator spring cap is spring loaded. Once the stop bolt is removed, release the spring cap slowly so it does not pop out.
5. Reassembly is the reverse of the disassembly. Install the filter in the direction shown.
6. Coat all parts with ATF during assembly.
7. Align the hole in the regulator spring cap with the hole in the valve body, then press the spring cap into the valve body, and tighten the stop bolt.



SPRING SPECIFICATIONS

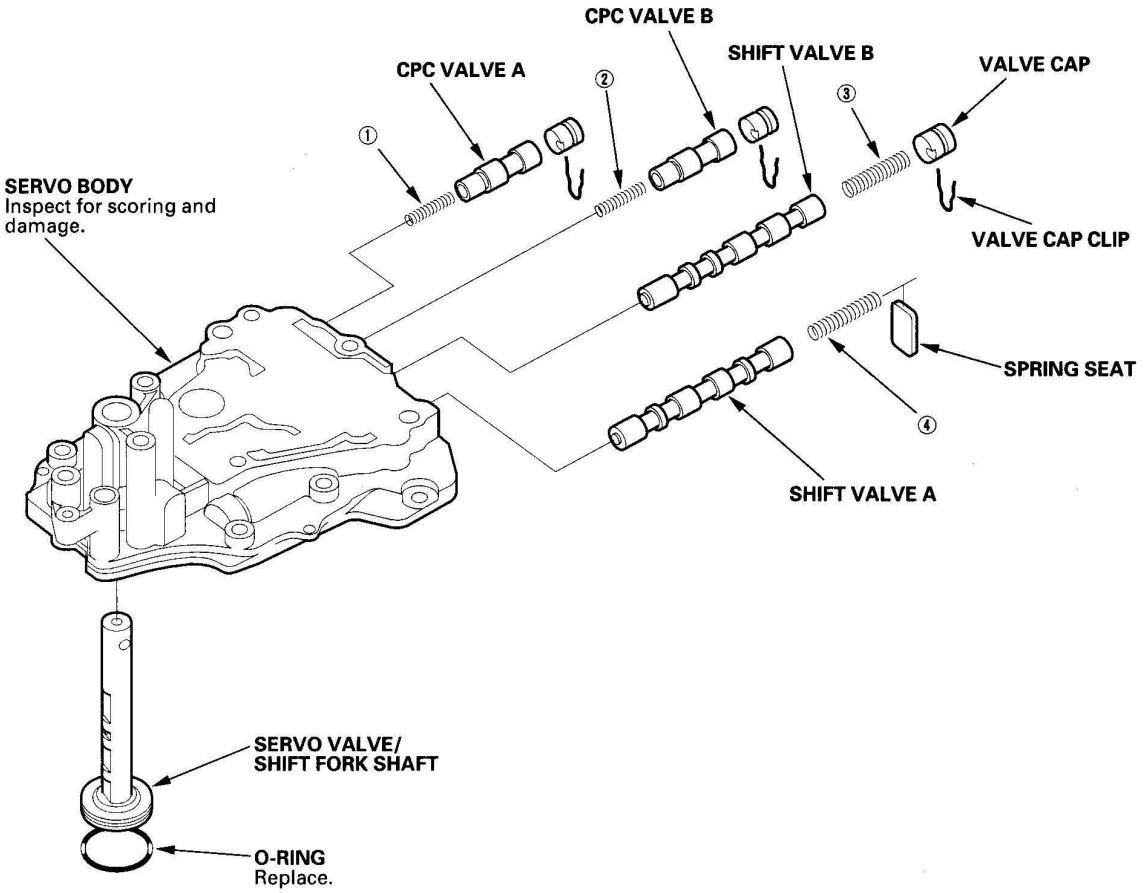
No.	Spring	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Stator reaction spring	5.5 (0.217)	37.4 (1.472)	30.3 (1.193)	2.1
②	Regulator valve spring A	1.9 (0.075)	14.7 (0.579)	80.6 (3.173)	16.1
③	Regulator valve spring B	1.4 (0.055)	8.8 (0.346)	44.0 (1.732)	12.0
④	Lock-up control valve spring	0.7 (0.028)	6.6 (0.260)	42.9 (1.689)	14.2
⑤	Lock-up timing valve spring	0.65 (0.026)	6.6 (0.260)	34.8 (1.370)	15.6

BACK

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Servo Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Check all valves for free movement. If any fail to slide freely, refer to Valve Body Repair (see page 14-201).
3. Replace the valve body as an assembly if any parts are worn or damaged.
4. Coat all parts with ATF during reassembly.



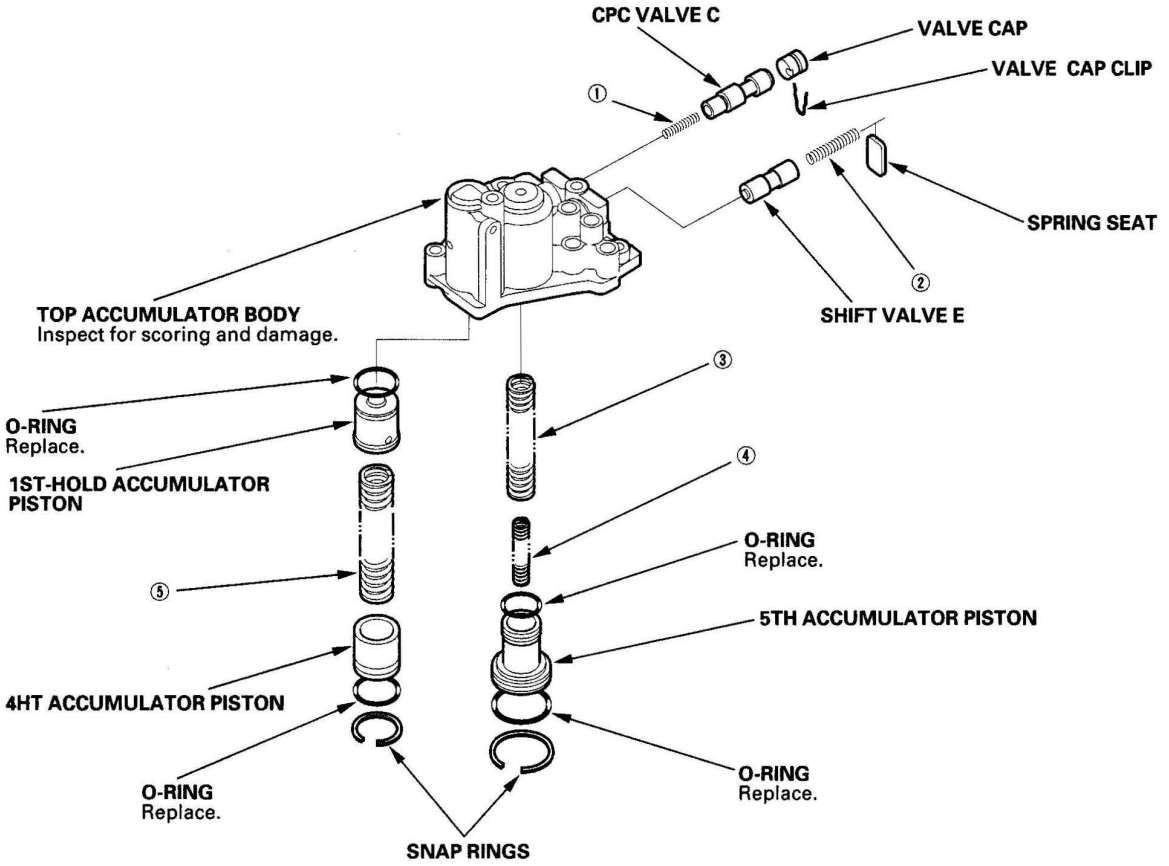
SPRING SPECIFICATIONS

No.	Spring	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	CPC valve A spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
②	CPC valve B spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
③	Shift valve B spring	0.8 (0.031)	6.6 (0.260)	49.1 (1.933)	21.7
④	Shift valve A spring	0.8 (0.031)	6.6 (0.260)	49.1 (1.933)	21.7

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Top Accumulator Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Check all valves for free movement. If any fail to slide freely, refer to Valve Body Repair (see page 14-201).
3. Replace the valve body as an assembly if any parts are worn or damaged.
4. Coat all parts with ATF during assembly.



SPRING SPECIFICATIONS

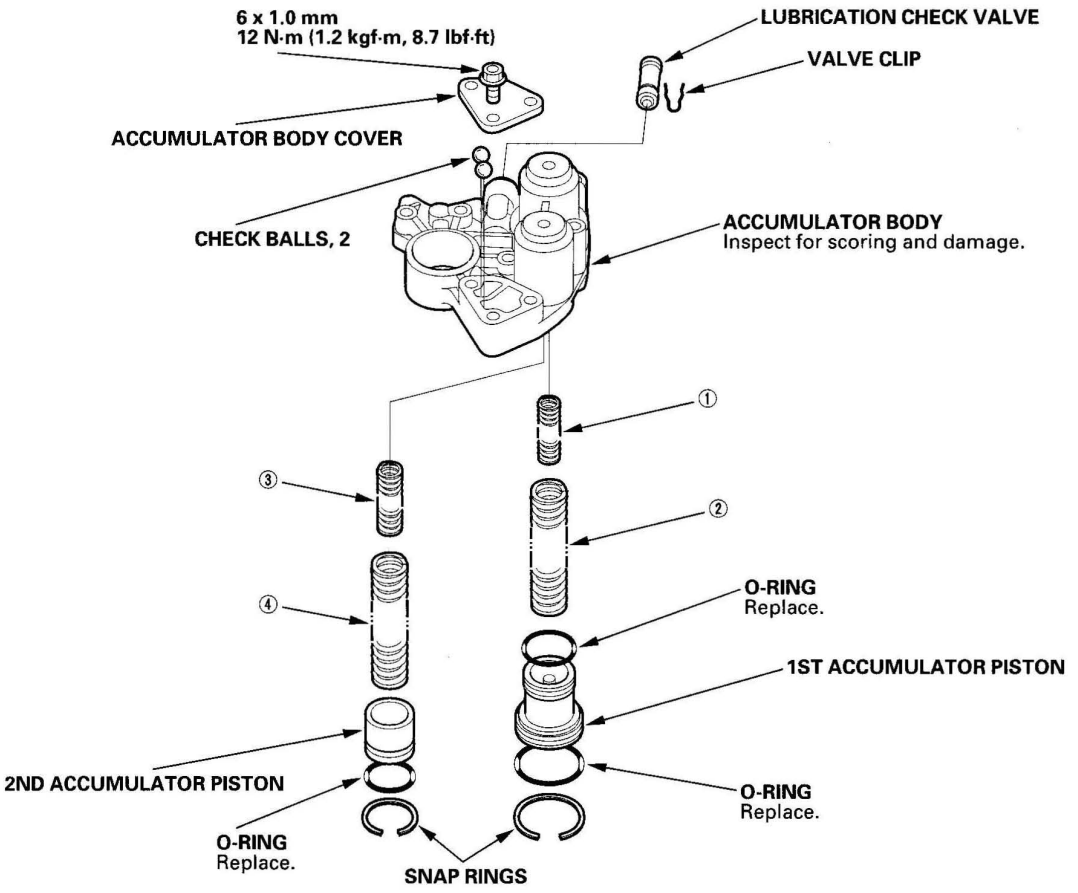
No.	Springs	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	CPC valve C spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
②	Shift valve E spring	0.8 (0.031)	7.1 (0.280)	49.0 (1.929)	17.2
③	5th accumulator spring A	2.2 (0.087)	16.4 (0.646)	75.7 (2.980)	14.2
④	5th accumulator spring B	2.0 (0.079)	10.0 (0.394)	45.5 (1.791)	11.6
⑤	4th/1st-hold accumulator spring	3.4 (0.134)	19.6 (0.772)	57.4 (2.260)	8.4

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Accumulator Body Disassembly, Inspection, and Reassembly

1. Do not use a magnet to remove the check balls; it may magnetize the balls.
2. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
3. Coat all parts with ATF during assembly.



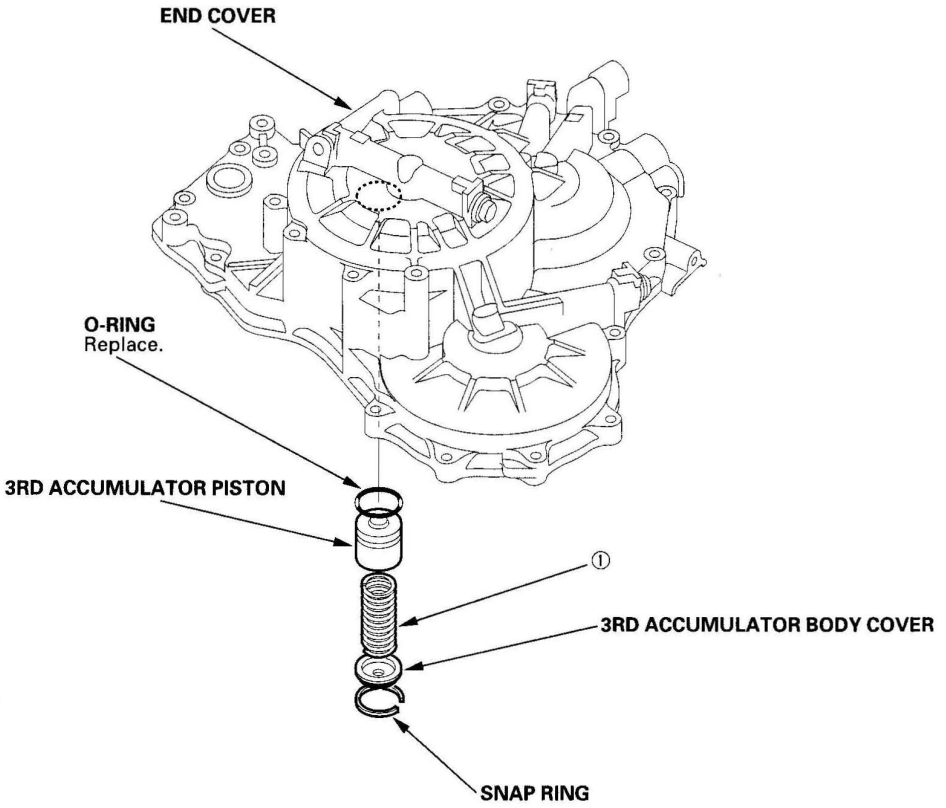
SPRING SPECIFICATIONS

No.	Springs	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	1st accumulator spring B	2.3 (0.091)	12.6 (0.496)	42.0 (1.654)	9.9
②	1st accumulator spring A	2.4 (0.094)	19.5 (0.768)	67.7 (2.665)	10.2
③	2nd accumulator spring B	2.6 (0.102)	13.0 (0.512)	44.0 (1.732)	9.0
④	2nd accumulator spring A	2.5 (0.098)	19.6 (0.772)	57.7 (2.272)	9.5

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3rd Accumulator/End Cover Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Coat all parts with ATF during assembly.



SPRING SPECIFICATIONS

No.	Springs	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	3rd accumulator spring	3.1 (0.122)	19.6 (0.772)	39.4 (1.551)	5.5

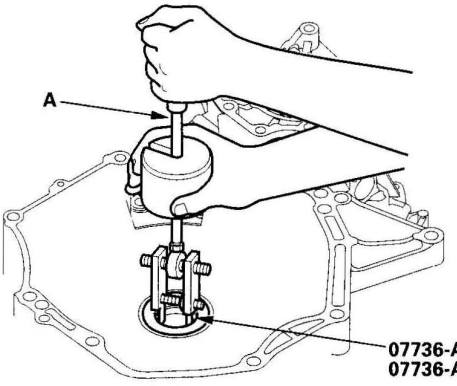
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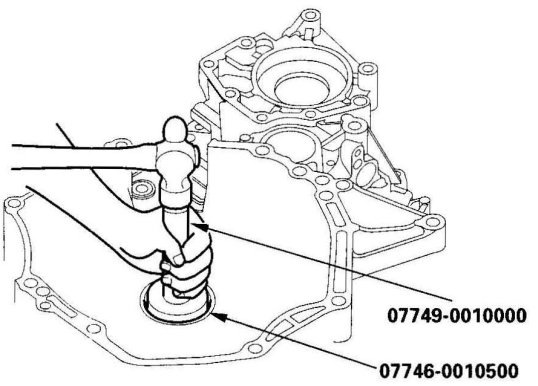
Mainshaft Bearing and Oil Seal Replacement

Special Tools Required
- Adjustable bearing puller, 25 – 40 mm 07736-A01000B or 07736-A01000A
- Driver 07749-0010000
- Attachment, 62 x 68 mm 07746-0010500
- Attachment, 72 x 75 mm 07746-0010600

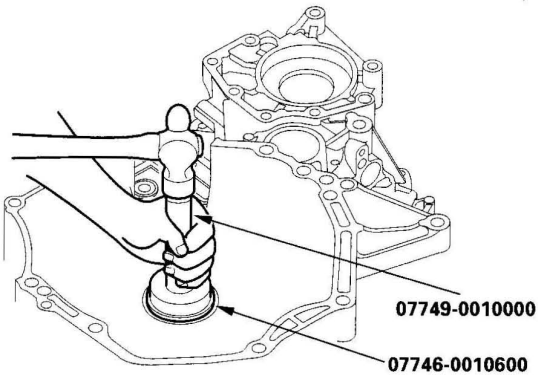
1. Remove the mainshaft bearing and oil seal with the special tool and a commercially available 3/8"-16 slide hammer (A).



2. Install the new mainshaft bearing until it bottoms in the housing with the special tools.



3. Install the new oil seal flush to the housing with the special tools.

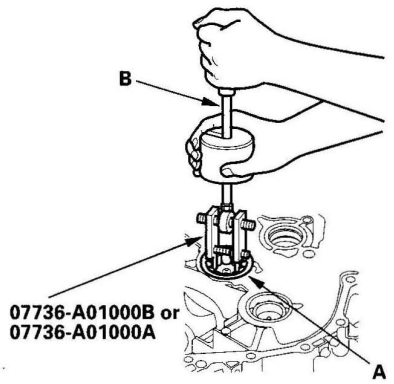


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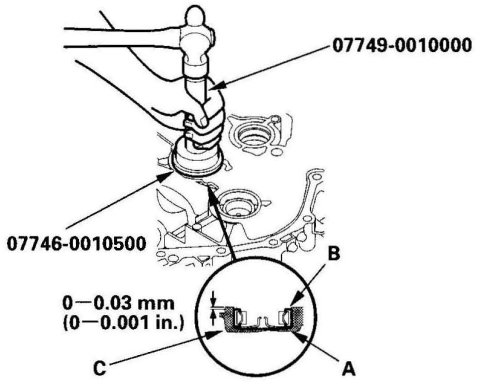
Countershaft Bearing Replacement

Special Tools Required
- Adjustable bearing puller, 25—40 mm 07736-A01000B or 07736-A01000A
- Driver 07749-0010000
- Attachment, 62 x 68 mm 07746-0010500

1. Remove the countershaft bearing (A) with the special tool and a commercially available 3/8''-16 slide hammer (B).



2. Install the ATF guide plate (A).

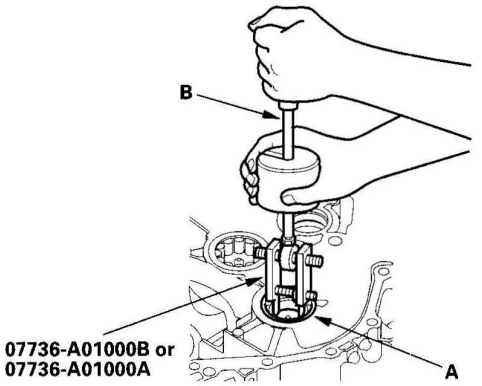


3. Install the new bearing (B) into the housing (C) with the special tools.

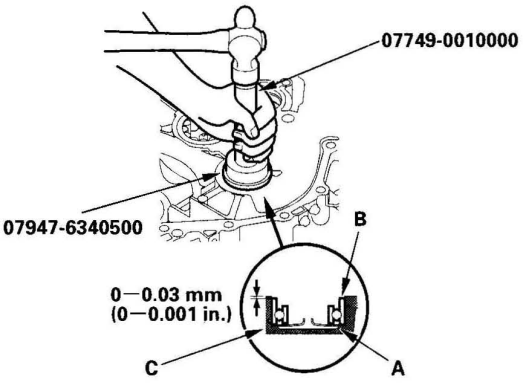
Secondary Shaft Bearing Replacement

Special Tools Required
- Adjustable bearing puller, 25—40 mm 07736-A01000B or 07736-A01000A
- Driver 07749-0010000
- Driver attachment 07947-6340500

1. Remove the secondary shaft bearing (A) with the special tool and a commercially available 3/8''-16 slide hammer (B).



2. Install the ATF guide plate (A).



3. Install the new bearing (B) into the housing (C) with the special tools.

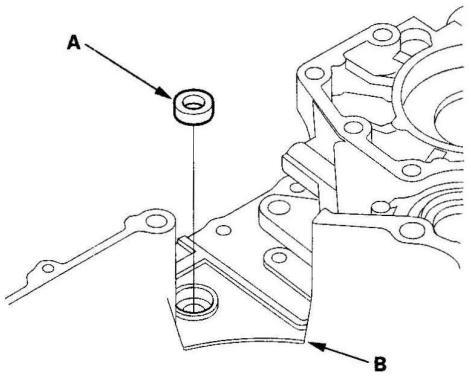
BACK

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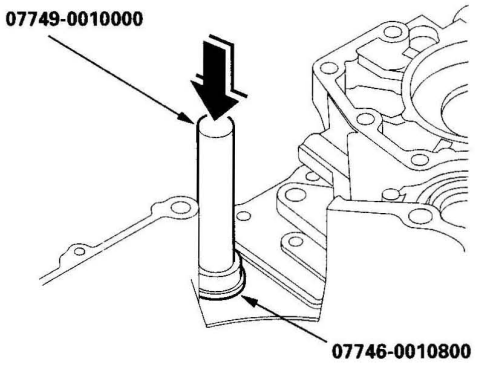
Control Shaft Oil Seal Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 22 x 24 mm
  07746-0010800

1. Remove the oil seal (A) from the torque converter housing (B).



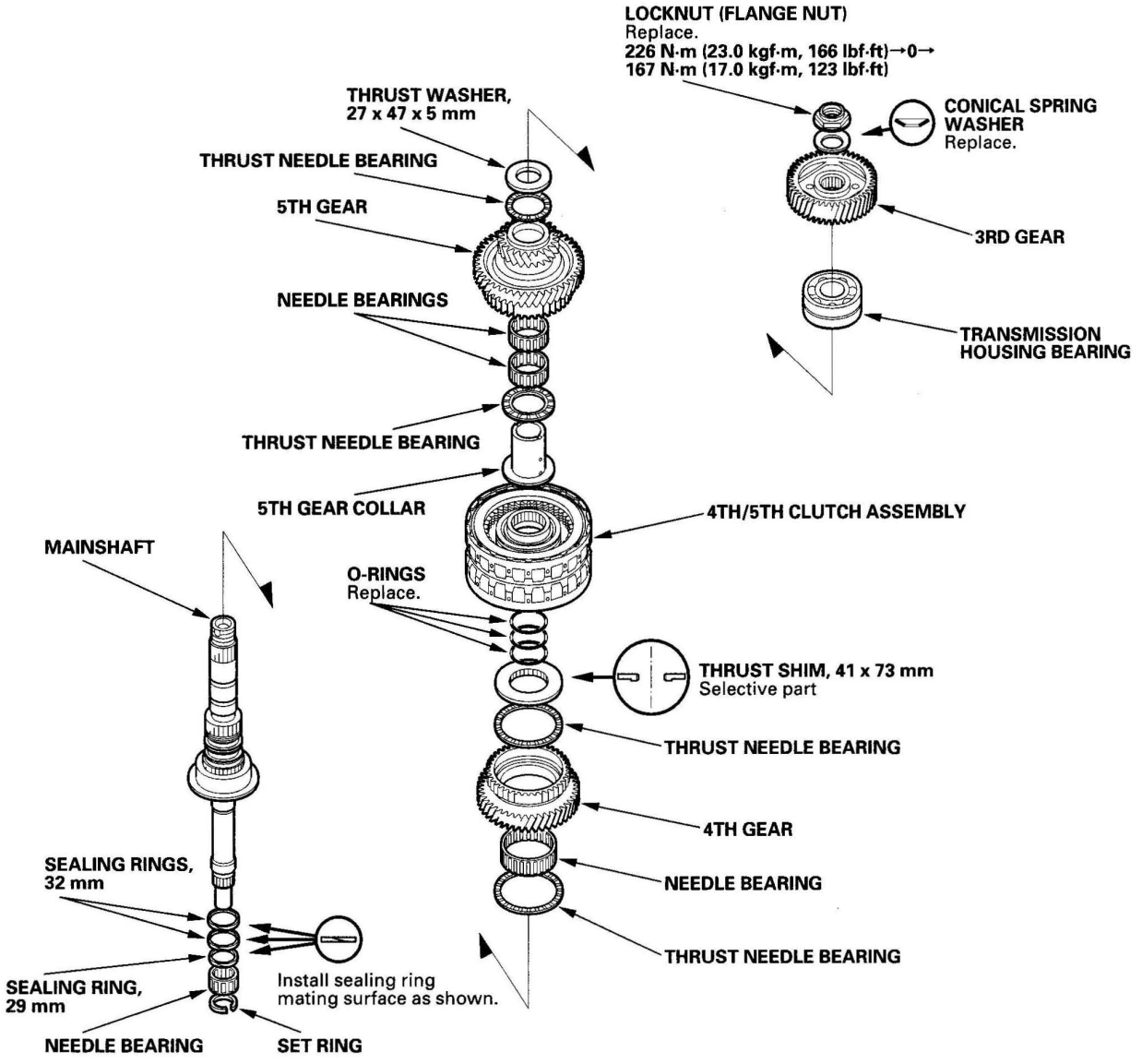
2. Install the new oil seal flush to the torque converter housing with the special tools.



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Mainshaft Disassembly, Inspection, and Reassembly

1. Lubricate all parts with ATF during assembly.



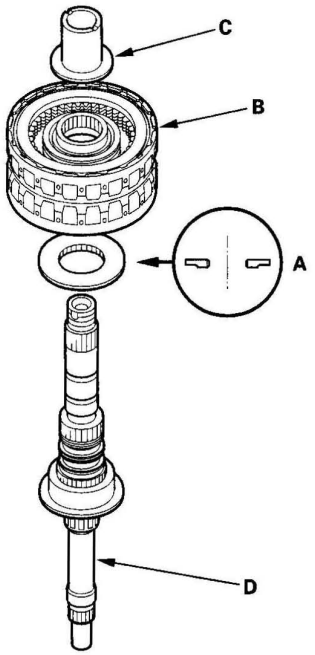
2. Check the clearance of the 4th/5th clutch assembly.
3. Inspect the thrust needle bearing and the needle bearing for galling and rough movement.
4. Inspect the splines for excessive wear and damage.
5. Check shaft bearing surfaces for scoring and excessive wear.
6. Before installing the O-rings, wrap the shaft splines with tape to prevent O-ring damage.
7. Install the conical spring washer in the direction shown.
8. Inspect the condition of the sealing rings. If the sealing rings are worn, distorted, or damaged, replace them (see page 14-216).

BACK

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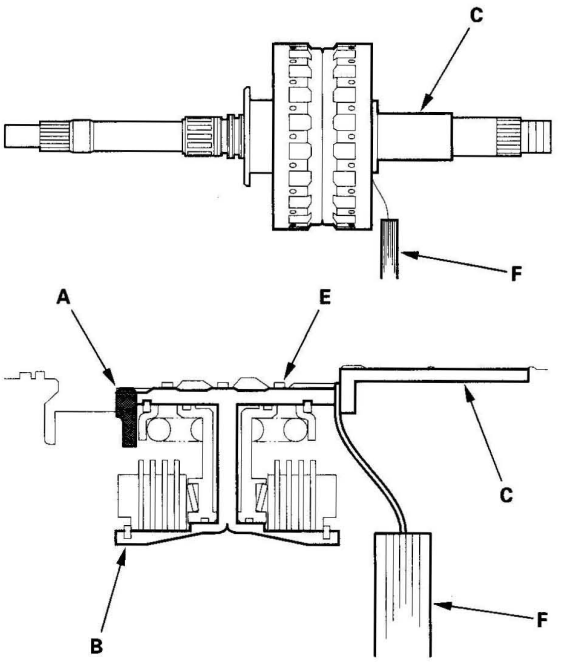
4th/5th Clutch Clearance Inspection

1. Remove the O-rings from the mainshaft.
2. Assemble the 41 x 73 mm thrust shim (A), 4th/5th clutch assembly (B), and 5th gear collar (C) on the mainshaft (D).



3. Hold the 5th gear collar (C) against the clutch assembly (B), then measure the clearance between the clutch guide (E) and the 5th gear collar with a feeler gauge (F) in at least three places. Use the average as the actual clearance.

STANDARD: 0.03–0.11 mm (0.001–0.004 in.)



4. If the clearance is out of standard, remove the thrust shim and measure its thickness.
5. Select and install a new shim, then recheck.

THRUST SHIM, 41 x 73 mm

No.	Part Number	Thickness
1	90414-P7W-000	7.85 mm (0.309 in.)
2	90415-P7W-000	7.90 mm (0.311 in.)
3	90416-P7W-000	7.95 mm (0.313 in.)
4	90417-P7W-000	8.00 mm (0.315 in.)
5	90418-P7W-000	8.05 mm (0.317 in.)
6	90419-P7W-000	8.10 mm (0.319 in.)

6. After replacing the thrust shim, make sure the clearance is within standard.

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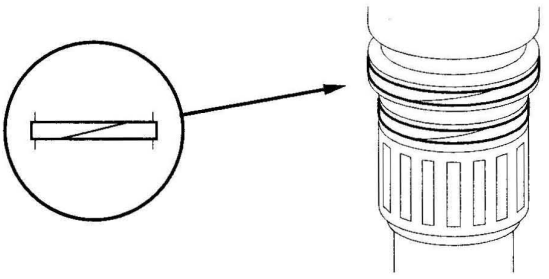
Mainshaft Sealing Rings Replacement

The sealing rings are synthetic resin with chamfered ends. Check the condition of the sealing rings, and replace them only if they are worn, distorted, or damaged.

1. For a better fit, squeeze sealing rings together slightly before installing them.



2. Apply ATF to the new sealing rings then install them on the mainshaft.



3. After installing the sealing rings, verify the following:

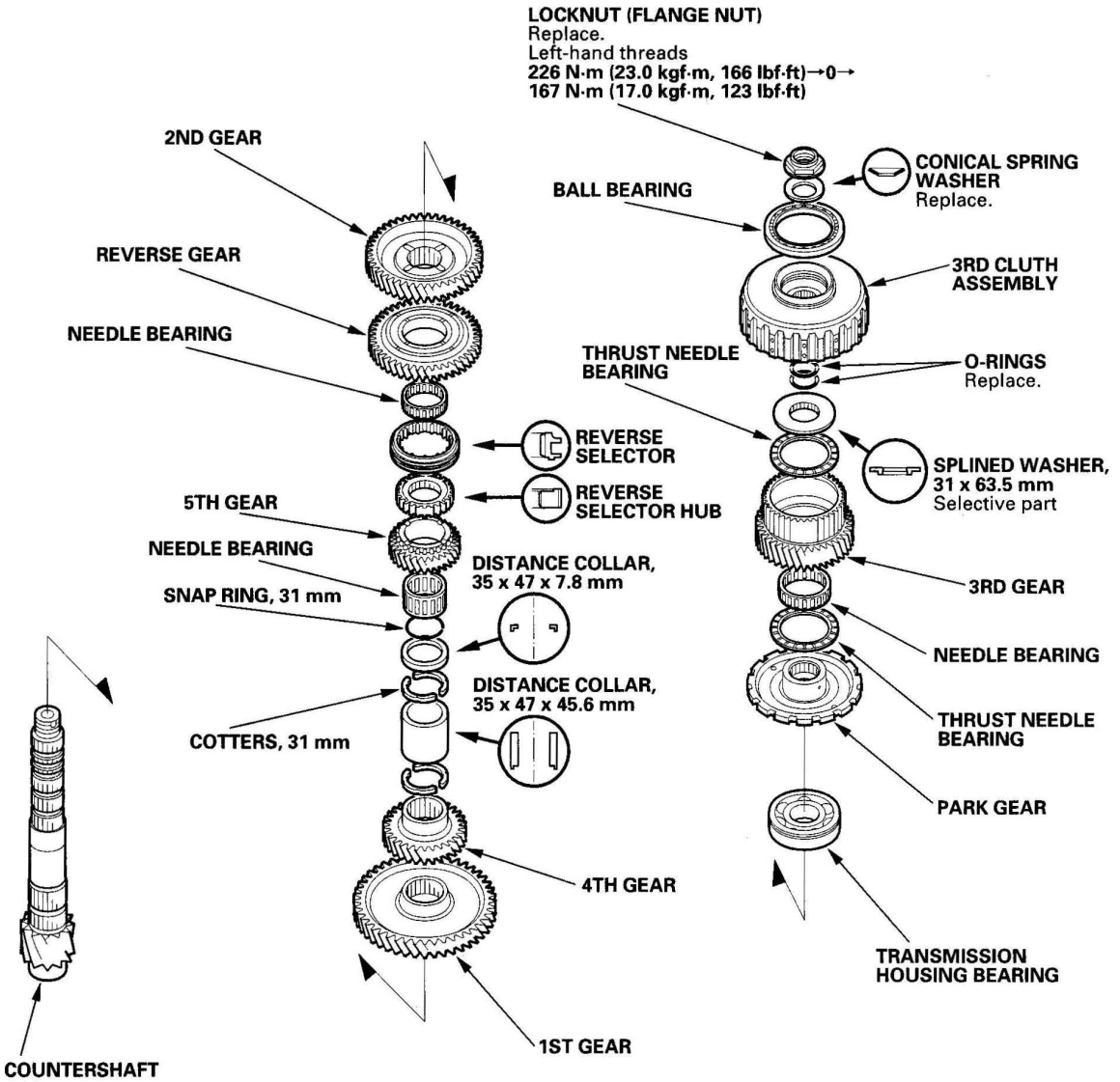
   - The rings are fully seated in the groove.
   - The rings are not twisted.
   - The chamfered ends of the rings are properly joined.

BACK

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Countershaft Disassembly, Inspection, and Reassembly

1. Remove the locknut, and take off components down to the reverse selector hub.



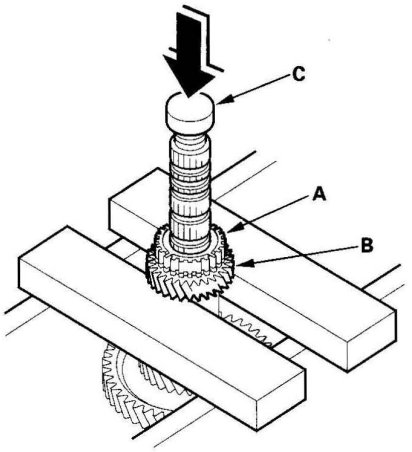
2. Remove the reverse selector hub, 4th gear, and 1st gear (see page 14-218).
3. Check the bearing on the 3rd clutch for wear and rough movement. If the bearing is worn or damaged, replace it (see page 14-220).
4. Inspect the thrust needle bearing and the needle bearing for galling and rough movement.
5. Check the splines for excessive wear and damage.
6. Check the shaft bearing surfaces for scoring and excessive wear.
7. Lubricate all parts with ATF, and reassemble the shaft and gears.
8. Install the distance collars, reverse selector hub, reverse selector, splined washer, and conical spring washer in the direction shown.

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Countershaft Reverse Selector Hub and 4th Gear Removal

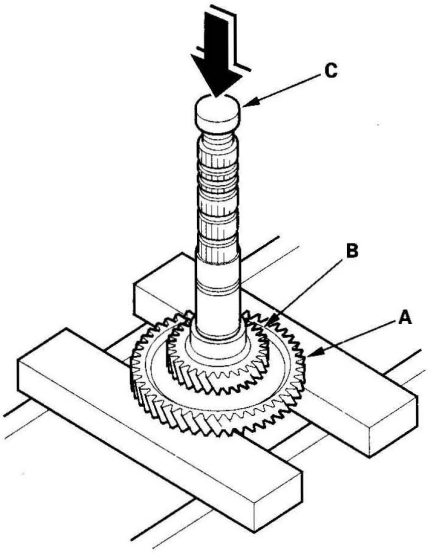
1. Remove the reverse selector hub (A) and the 5th gear (B) from the countershaft with a press. Place a shaft protector (C) between the countershaft and press to prevent damaging the countershaft.

   NOTE: Some reverse selector hubs are not press-fitted, and can be removed without using a press.



2. Remove the needle bearing, snap ring, 35 x 47 x 7.8 mm distance collar, 31 mm cotters, 35 x 47 x 45.6 mm distance collar, and 31 mm cotters from the countershaft.

3. Remove the 1st gear (A) and 4th gear (B) from the countershaft with a press. Place a shaft protector (C) between the countershaft and press to prevent damaging the countershaft.



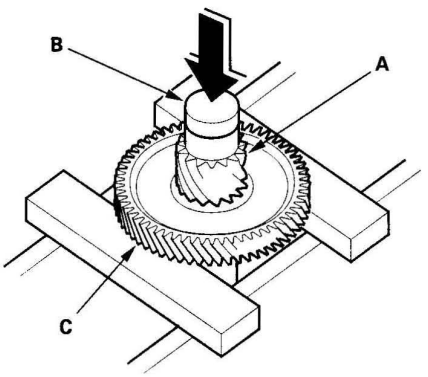
BACK

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Countershaft 4th Gear and Reverse Selector Hub Installation

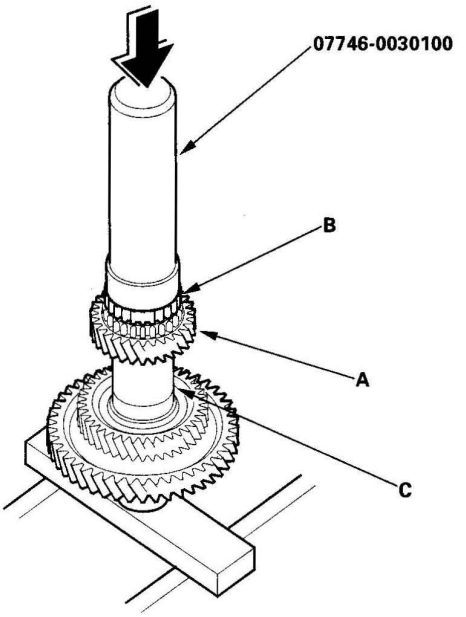
Special Tools Required
Driver, 40 mm I.D. 07746-0030100

1. Apply ATF to the parts.
2. Install the 1st gear on the countershaft by hand.
3. Align the shaft splines with those on 4th gear, then press the countershaft (A) into the 4th gear with a press. Place a shaft protector (B) between the countershaft and press to prevent damaging the countershaft.



4. Stop pressing the countershaft when the 4th gear contacts the 1st gear (C).
5. Install the 31 mm cotters, 35 x 47 x 45.6 mm distance collar, 31 mm cotters, 35 x 47 x 7.8 mm distance collar, snap ring, needle bearing, and 5th gear (A) on the countershaft.
6. Slide the reverse selector hub (B) over the countershaft (C), then press it into place with the special tool and a press.

   NOTE: Some reverse selector hubs are not press fitted, and can be installed without using the special tool and a press.



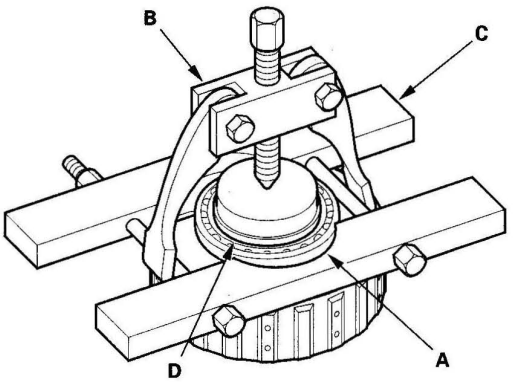
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3rd Clutch Ball Bearing Replacement

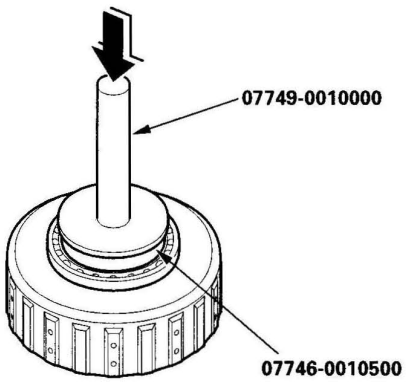
Special Tools Required
- Driver 07749-0010000
- Attachment, 62 x 68 mm 07746-0010500

NOTE: Check the bearing for wear and rough movement. If the bearing is OK, removal is not necessary.

1. Remove the ball bearing (A) from the 3rd clutch with a commercially available bearing puller (B), bearing separator (C), and stepper adapter (D).



2. Install the new bearing on the 3rd clutch with the special tools and a press.

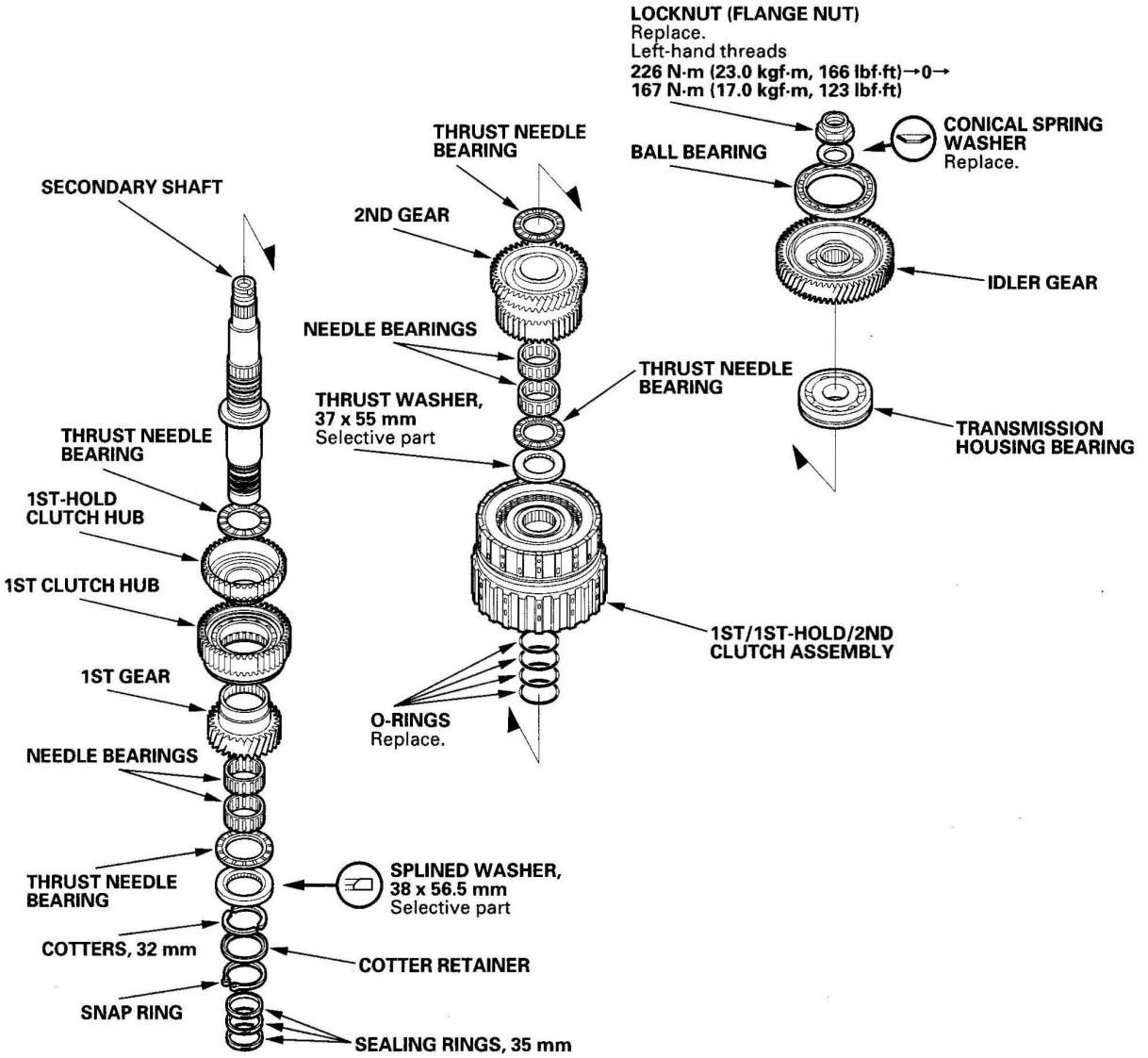


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Secondary Shaft Disassembly, Inspection, and Reassembly

1. Remove the locknut, and disassemble the shaft and gears.

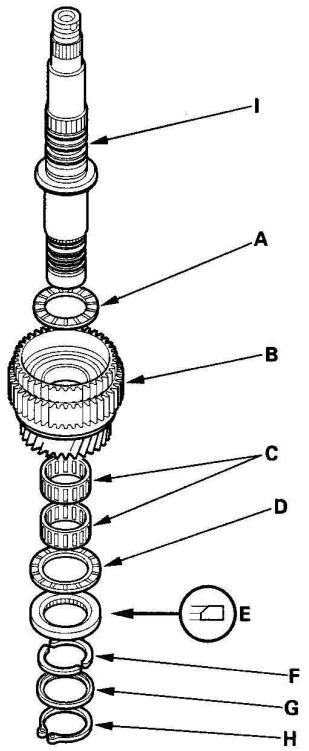


2. Inspect the thrust needle bearing and needle bearing for galling and rough movement.
3. Check the clearance of the secondary shaft assembly.
4. Check the splines for excessive wear and damage.
5. Check the shaft bearing surfaces for scoring and excessive wear.
6. Check the idler gear bearing for wear and rough movement. If the bearing is worn or damaged, replace it (see page 14-224).
7. Before installing the O-rings, wrap the shaft splines with tape to prevent damage to the O-rings.
8. Lubricate all parts with ATF during reassembly.
9. Install the conical spring washer and splined washer in the direction shown.

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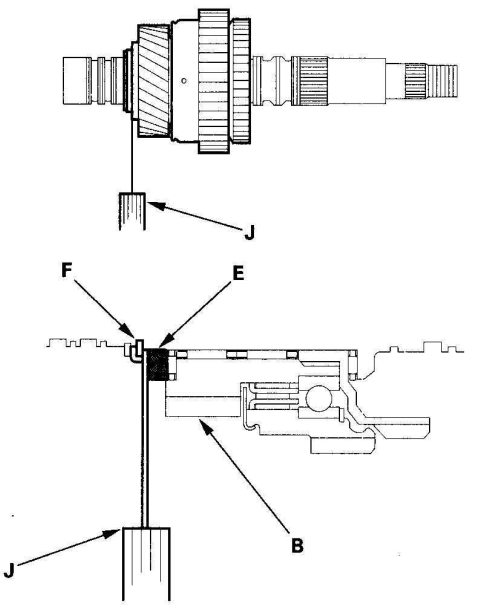
Secondary Shaft Clearance Inspection

1. Remove the O-rings from the secondary shaft.
2. Assemble the thrust needle bearing (A), 1st gear assembly (B), needle bearings (C), thrust needle bearing (D), 38 x 56.5 mm splined washer (E), 32 mm cotters (F), cotter retainer (G), and snap ring (H) on the secondary shaft (I).



3. Measure the clearance between the 38 x 56.5 mm splined washer (E) and cotters (F) with a feeler gauge (J) in at least three places. Use the average as the actual clearance.

STANDARD: 0.07 – 0.15 mm (0.003 – 0.006 in.)



4. If the measurement is out of standard, remove the splined washer, and measure its thickness.
5. Select and install a new splined washer, then recheck the clearance.

SPLINED WASHER, 38 x 56.5 mm

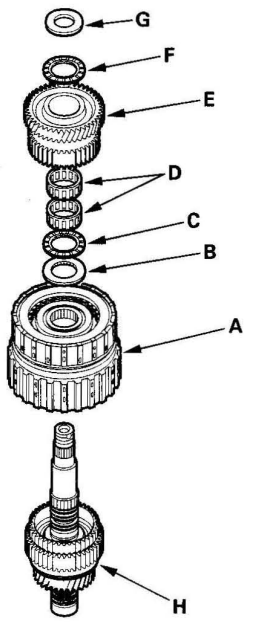
No.	Part Number	Thickness
1	90502-P0Z-000	6.85 mm (0.270 in.)
2	90503-P0Z-000	6.90 mm (0.272 in.)
3	90504-P0Z-000	6.95 mm (0.274 in.)
4	90505-P0Z-000	7.00 mm (0.276 in.)
5	90506-P0Z-000	7.05 mm (0.278 in.)
6	90507-P0Z-000	7.10 mm (0.280 in.)

BACK

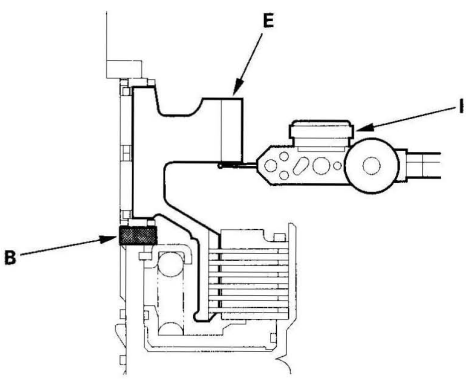
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6. Remove the 27 x 47 x 5 mm thrust washer from the mainshaft.

7. Assemble the 1st/1st-hold/2nd clutch assembly (A), 37 x 55 mm thrust washer (B), thrust needle bearing (C), needle bearings (D), 2nd gear (E), thrust needle bearing (F), and 27 x 47 x 5 mm thrust washer (removed from mainshaft) (G) on the secondary shaft sub-assembly (H).

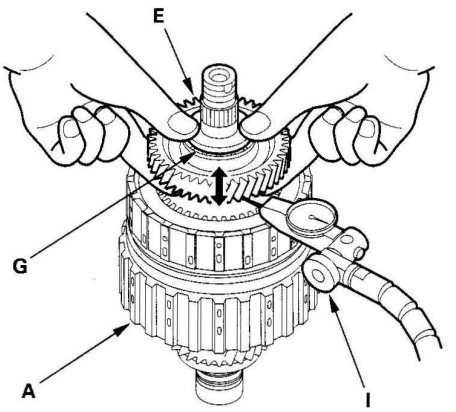


8. Set the dial indicator (I) on the 2nd gear (E).



9. Hold the 27 x 47 x 5 mm thrust washer (G) against the clutch assembly (A), and measure the 2nd gear axial clearance in at least three places while moving the 2nd gear (E). Use the average as the actual clearance.

STANDARD: 0.04 – 0.12 mm (0.002 – 0.005 in.)



10. If the measurement is out of standard, remove the 37 x 55 mm thrust washer and measure its thickness.

11. Select and install a new thrust washer, then recheck the clearance.

THRUST SHIM, 37 x 55 mm

No.	Part Number	Thickness
1	90406-P0Z-000	4.90 mm (0.193 in.)
2	90407-P0Z-000	4.95 mm (0.195 in.)
3	90408-P0Z-000	5.00 mm (0.197 in.)
4	90409-P0Z-000	5.05 mm (0.199 in.)
5	90410-P0Z-000	5.10 mm (0.201 in.)
6	90411-P0Z-000	5.15 mm (0.203 in.)
7	90412-P0Z-000	5.20 mm (0.205 in.)

12. Disassemble the shaft and gears.

13. Reinstall the 27 x 47 x 5 mm thrust washer on the mainshaft.

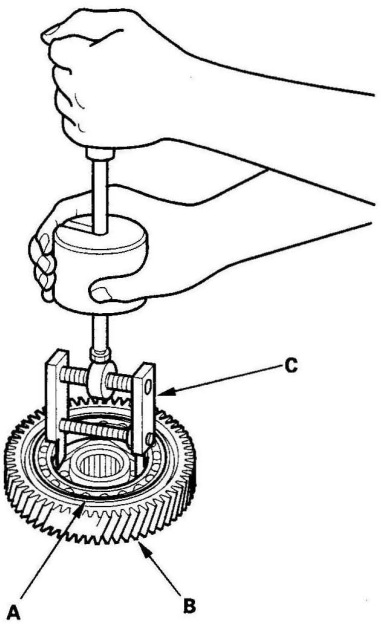
BACK

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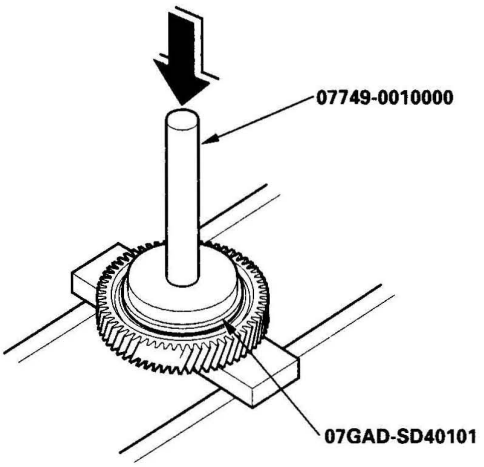
Secondary Shaft Idler Gear Bearing Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment 78 x 90 mm 07GAD-SD40101

1. Check the bearing for wear, damage, and rough movement. If the bearing is worn or damaged, go to step 2.
2. Place the secondary shaft idler gear in a vise with soft jaws.
3. Remove the bearing (A) from the secondary shaft idler gear (B) with a puller (C).



4. Install the bearing on the secondary shaft idler gear with the special tools and a press.

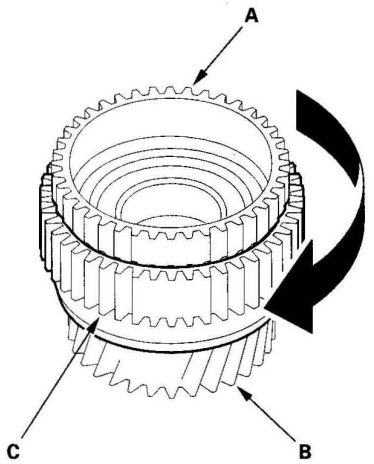


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1st Gear One-way Clutch Inspection

1. Hold the 1st-hold clutch hub (A), and turn the 1st gear (B) in the direction shown to be sure it turns freely. Also make sure the 1st gear does not turn in the opposite direction.

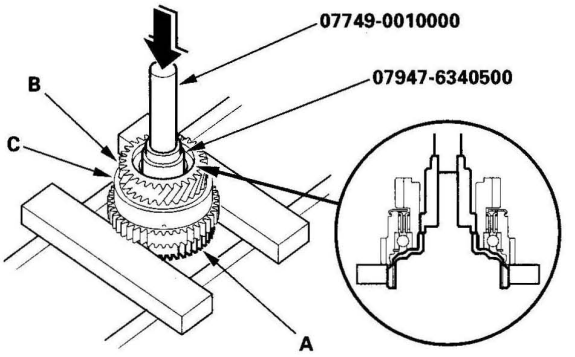


2. If any problem occurs on the 1st gear one-way clutch, replace the 1st clutch hub (C). The 1st gear one-way clutch is not available separately from the 1st clutch hub.

1st Clutch Hub Replacement

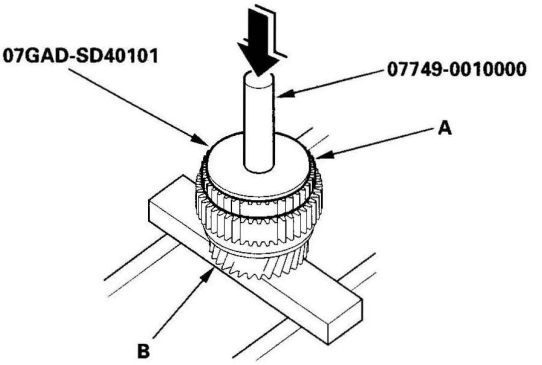
Special Tools Required
- Driver 07749-0010000
- Driver attachment 07947-6340500
- Attachment, 78 x 90 mm 07GAD-SD40101

1. Remove the 1st-hold clutch hub (A) from the 1st gear (B) with the special tools and a press.



2. Remove the 1st clutch hub (C) from the 1st gear, then install the new 1st clutch hub in the 1st gear.

3. Install the 1st-hold clutch hub (A) in the 1st gear (B) with the special tools and a press.

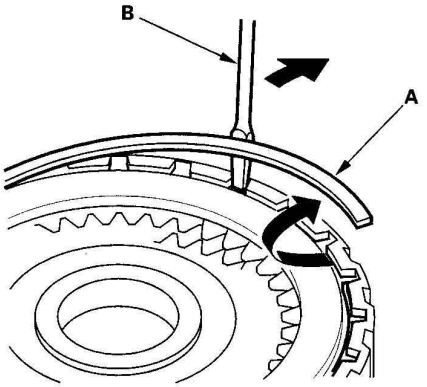


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Clutch Disassembly

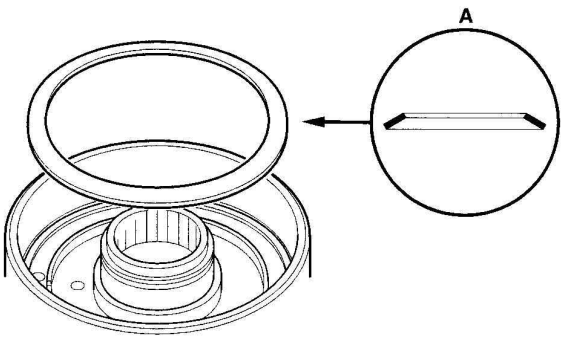
Special Tools Required
- Clutch spring compressor attachment 07LAE-PX40100
- Clutch spring compressor attachment 07HAE-PL50101
- Clutch spring compressor bolt assembly 07GAE-PG40200 or 07GAE-PG4020A

1. Remove the snap ring (A), then remove the clutch end plate, the clutch discs, and the plates with a screwdriver (B).

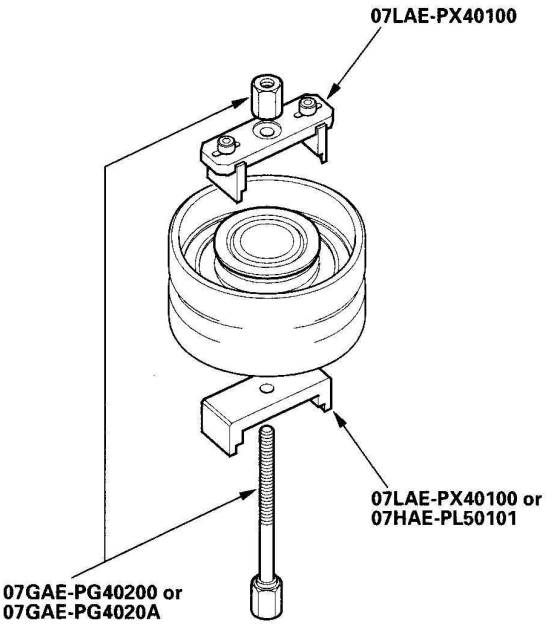


2. Remove the disc spring (A) from the 1st, 3rd, 4th, and 5th clutches.

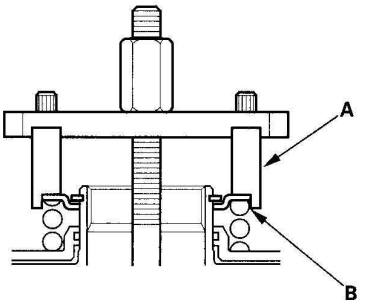
   NOTE: The 2nd clutch and 1st-hold clutch do not have a disc spring.



3. Install the special tools on the clutch assembly.



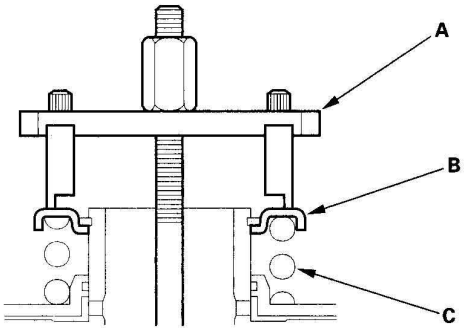
4. Be sure the special tool (A) is adjusted to have full contact with the spring retainer (B) on the 4th, 5th, and 1st clutches.



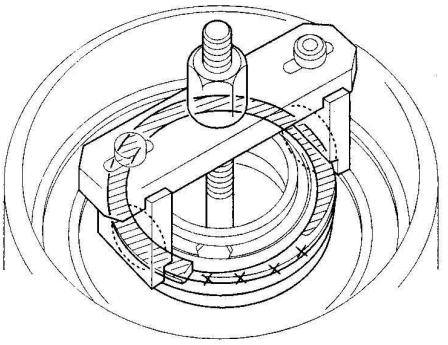
BACK

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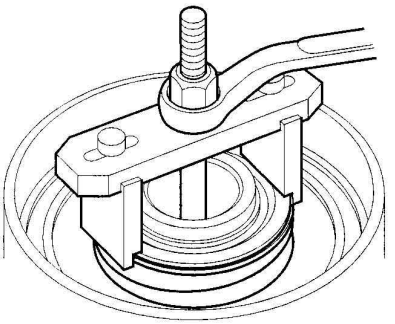
5. Set the special tool (A) on the spring retainer (B) of the 2nd and 3rd clutches so the tool works on the clutch return spring (C).



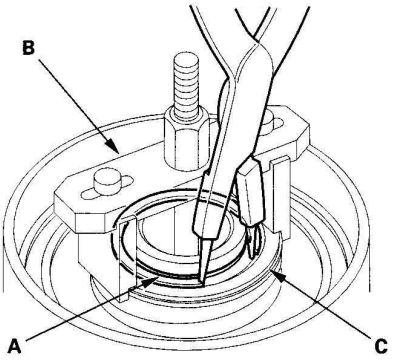
6. If either end of the special tool is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.



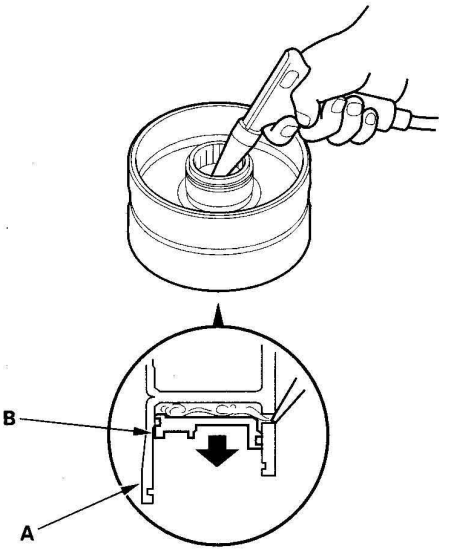
7. Compress the spring until the snap ring can be removed.



8. Remove the snap ring (A). Then remove the special tool (B), spring retainer (C), and the return spring.



9. Wrap a shop rag around the clutch drum (A), and apply air pressure to the fluid passage to remove the piston (B). Place a finger tip on the other end while applying air pressure.

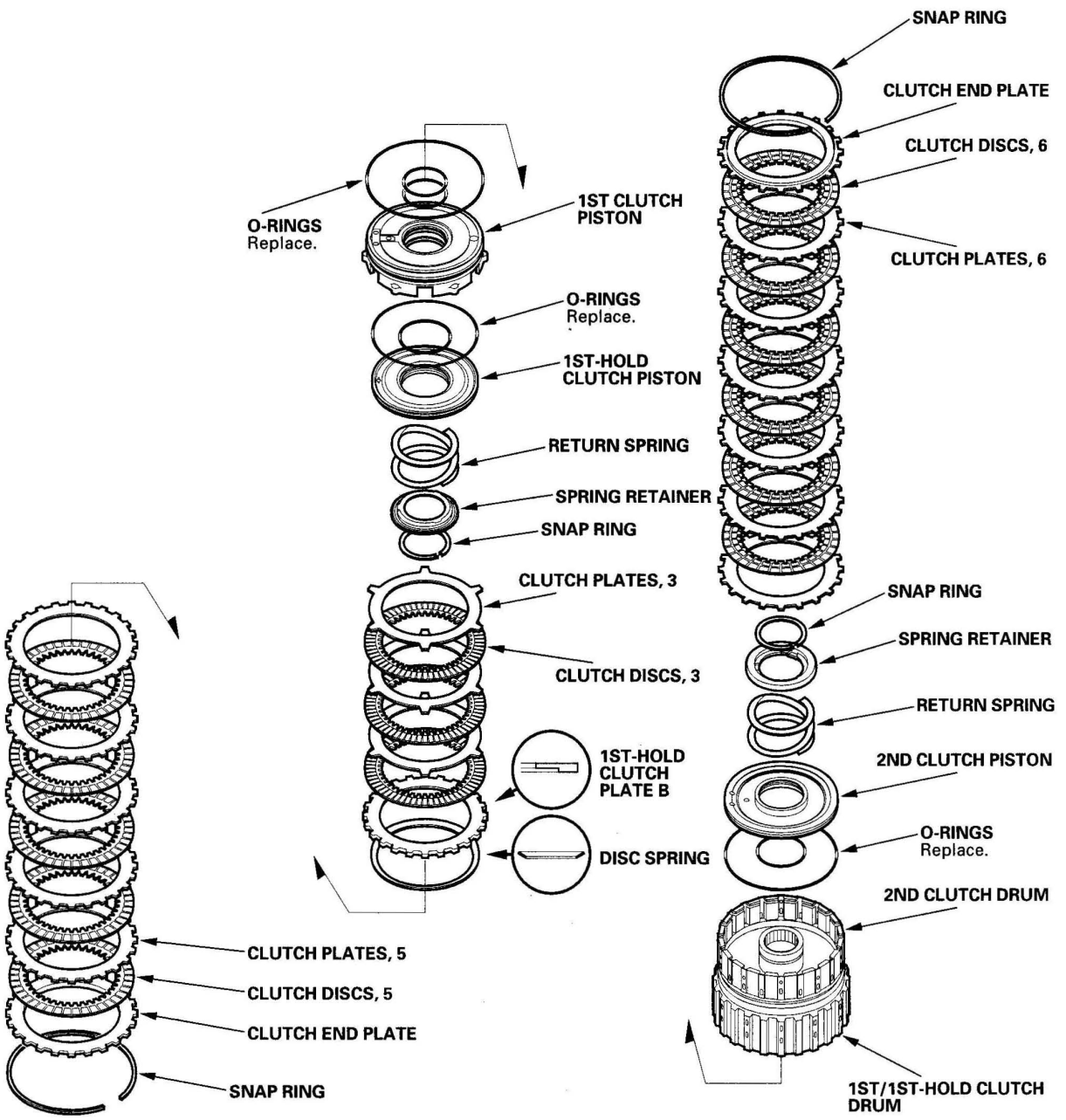


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Clutch Inspection

1st/1st-hold/2nd Clutch

- Clutch disc standard thickness: 1.94 mm (0.076 in.)
- Clutch plate standard thickness:
  - 1st clutch: 1.6 mm (0.063 in.)
  - 2nd clutch: 1.6 mm (0.063 in.)
  - 1st-hold clutch: 1.8 mm (0.071 in.)

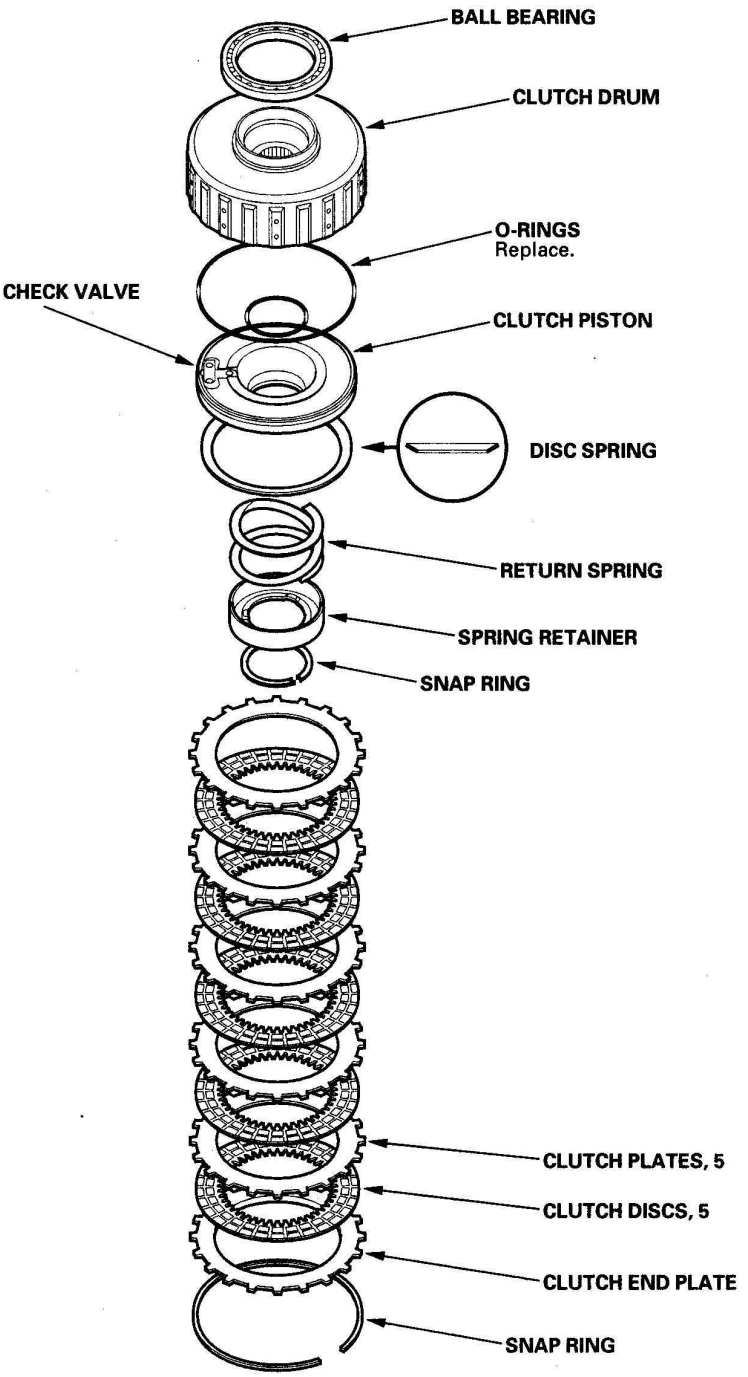


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3rd Clutch

- Clutch disc standard thickness: 1.94 mm (0.076 in.)
- Clutch plate standard thickness: 2.3 mm (0.091 in.)



(cont'd)

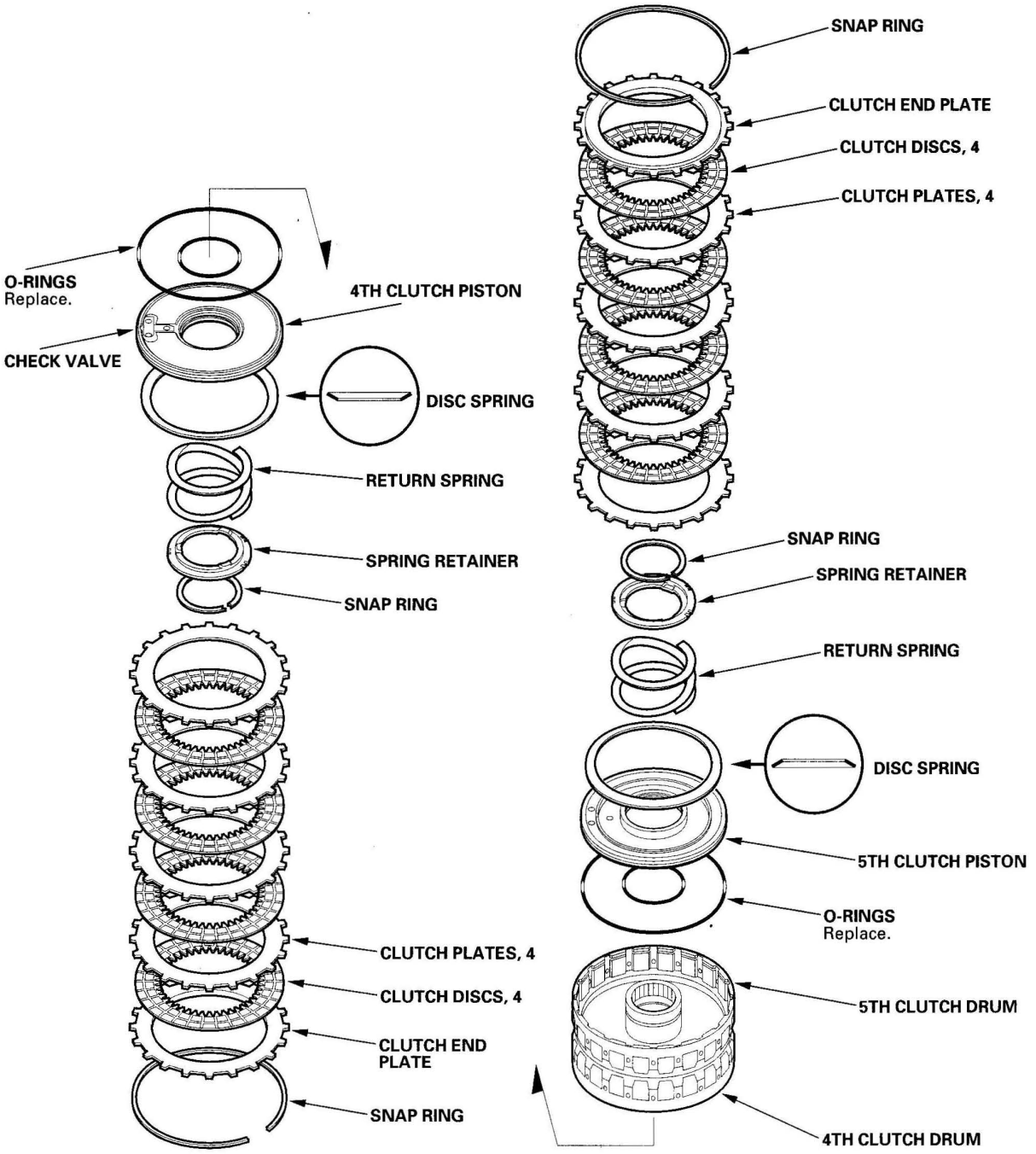
BACK

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Clutch Inspection (cont'd)

4th/5th Clutch

- Clutch disc standard thickness: 1.94 mm (0.076 in.)
- Clutch plate standard thickness:
  - 4th clutch: 2.3 mm (0.091 in.)
  - 5th clutch: 2.0 mm (0.079 in.)



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Clutch Reassembly

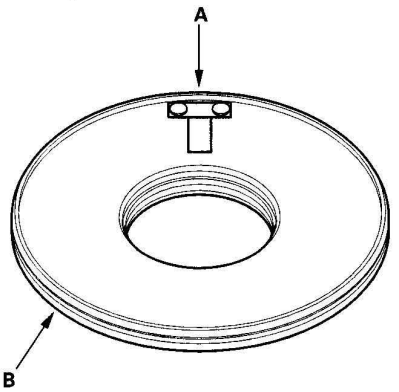
Special Tools Required
- Clutch spring compressor attachment 07LAE-PX40100
- Clutch spring compressor attachment 07HAE-PL50101
- Clutch spring compressor bolt assembly 07GAE-PG40200 or 07GAE-PG4020A
- Clutch compressor attachment 07ZAE-PRP0100

Note these items during reassembly:

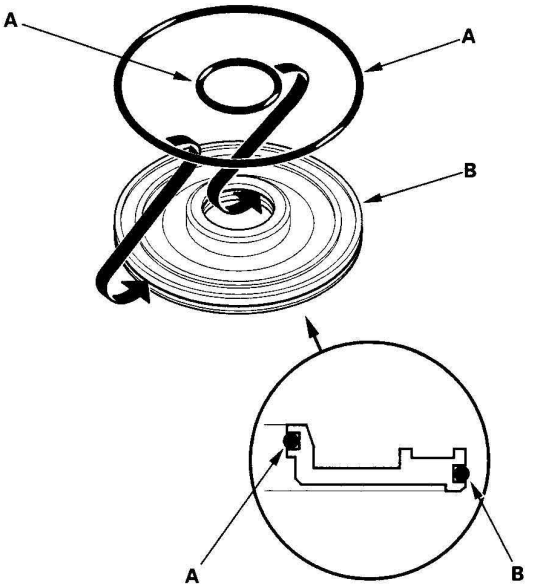
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air.
- Blow out all passages.
- Apply ATF to all parts before assembly.

1. Soak the clutch discs thoroughly in ATF for a minimum of 30 minutes.

2. Inspect the check valve (A) on the 3rd and 4th clutch pistons (B). If the check valve is loose, replace the piston.

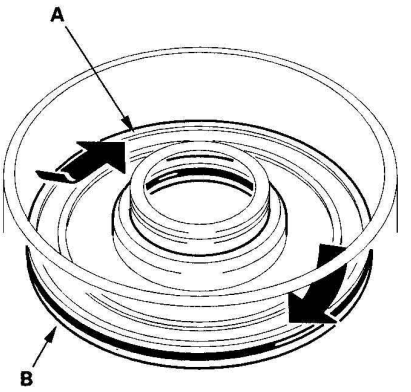


3. Install new O-rings (A) on the piston (B).



4. Install the piston (A) in the clutch drum (B). Apply pressure and rotate to ensure proper seating. Lubricate the piston O-ring with ATF before installing.

   NOTE: Do not pinch the O-ring by installing the piston with too much force.



(cont'd)

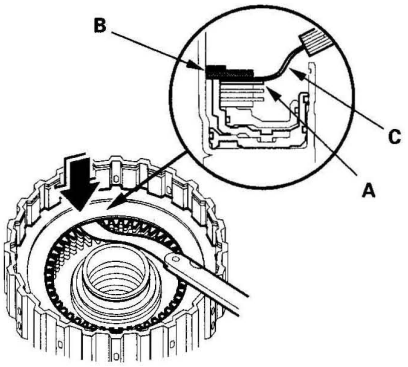
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Clutch Reassembly (cont'd)

5. Check the 1st-hold clutch plate-to-top-disc clearance; starting with a clutch plate, alternately install the clutch plate and discs in the 1st-hold clutch drum, then install the 1st-hold clutch plate.

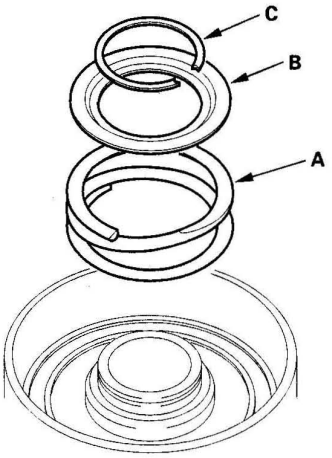
6. Measure the 1st-hold clutch clearance between the 1st-hold clutch plate B and the top disc (A) with a feeler gauge (C) while pressing the 1st-hold clutch plate B down. Take measurements in at least three places, and use the average as the actual clearance.

1st-hold Clutch Plate B-to-Top-disc Clearance
Service Limit: 0.5—0.9 mm (0.020—0.035 in.)

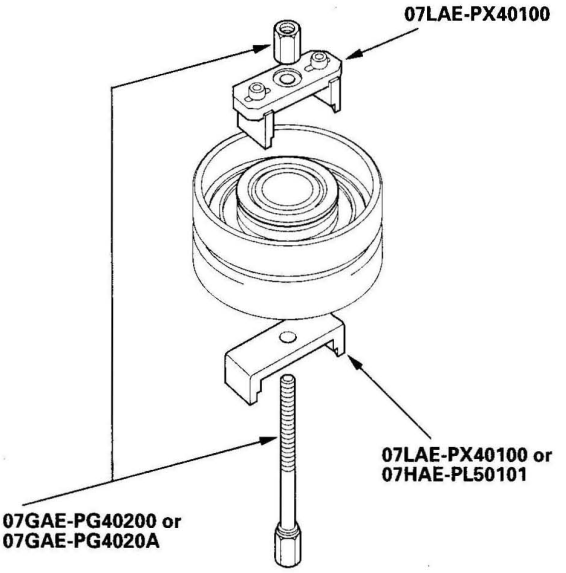


7. If the clearance is out of standard, replace the 1st-hold clutch plates and discs as a set, and recheck.

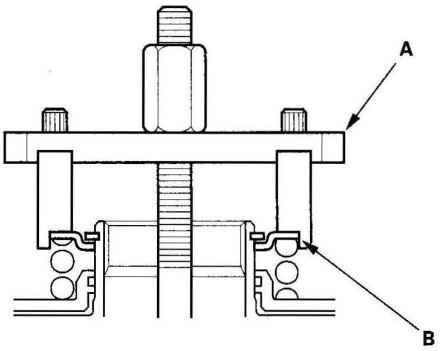
8. Install the return spring (A) and spring retainer (B), and position the snap ring (C) on the retainer.



9. Install the special tools on the clutch assembly.



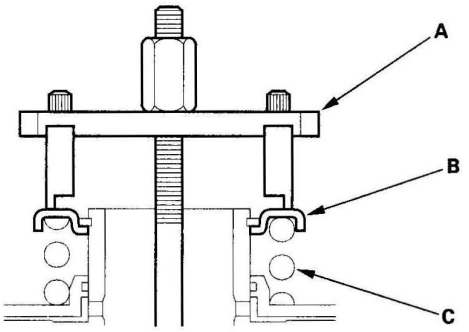
10. Be sure the special tool (A) is adjusted to have full contact with the spring retainer (B) on the 4th, 5th, and 1st clutches.



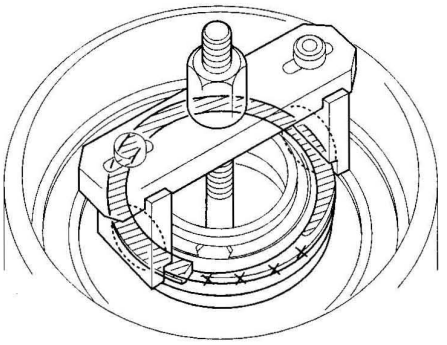
BACK

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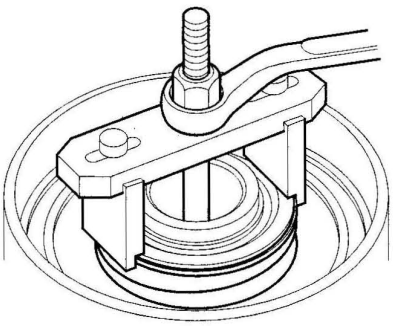
11. Set the special tool (A) on the spring retainer (B) of the 2nd and 3rd clutches so the tool works on the clutch return spring (C).



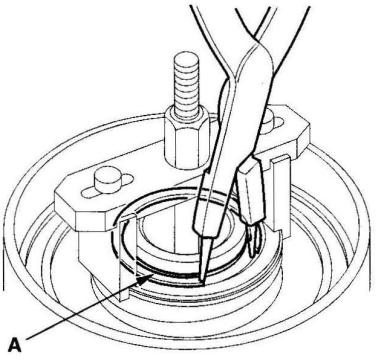
12. If either end of the special tool is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.



13. Compress the return spring.



14. Install the snap ring (A).



15. Remove the special tools.

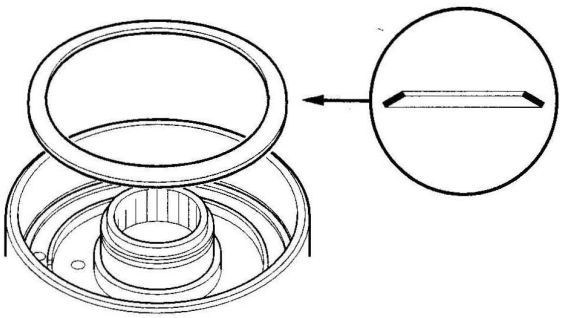
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Clutch Reassembly (cont'd)

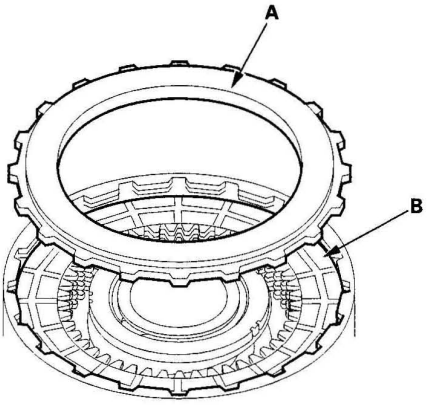
16. Install the disc spring in the 1st, 3rd, 4th, and 5th clutches in the direction shown.

    NOTE: The 2nd clutch and 1st-hold clutch do not have a disc spring.

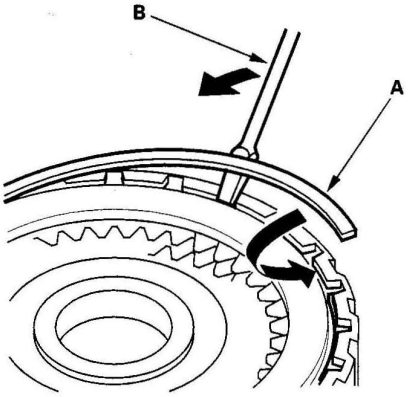


17. Make sure the inside of the clutch drum is free of dirt and other foreign particles.

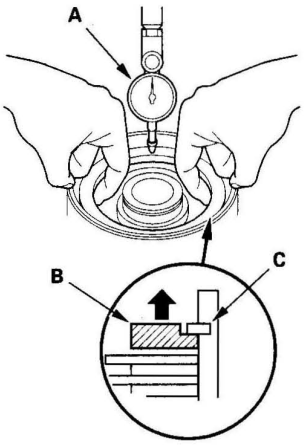
18. Starting with a clutch plate, alternately install the clutch plates and discs. Install the clutch end plate (A) with the flat side toward the disc (B).



19. Install the snap ring (A) with a screwdriver (B).



20. Set a dial indicator (A) on the clutch end plate (B).

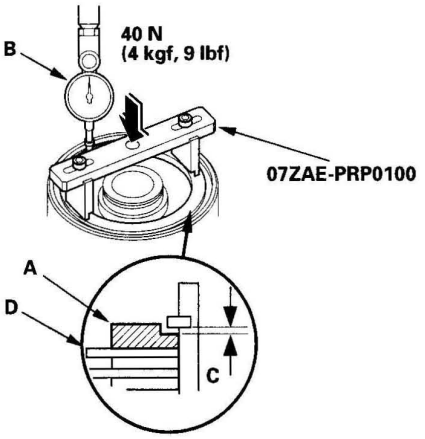


21. Zero the indicator with the clutch end plate lifted up to the snap ring (C).

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22. Releas the clutch end plate to lower it, then put the special tool on the end plate (A)



23. Press the special tool down with 40 N (4 kgf, 9 lbf) using a force gauge, and read the dial indicator reads the clearance (B) between the clutch end plate and top disc (C). Take measurements at least three places, and use the average as the actual clearance.

Clutch End-Plate-to-Top-Disc Clearance Service Limit:
- **1st Clutch: 1.1—1.3 mm (0.043—0.051 in.)**
- **2nd Clutch: 0.85—1.05 mm (0.033—0.041 in.)**
- **3rd Clutch: 0.7—0.9 mm (0.028—0.035 in.)**
- **4th Clutch: 0.55—0.75 mm (0.022—0.030 in.)**
- **5th Clutch: 0.55—0.75 mm (0.022—0.030 in.)**

24. If the clearance is out of service limit, select a new clutch end plate from the following table. Install the new clutch end plate, then recheck the clearance.

NOTE: If the thickest clutch end plate is installed, but the clearance is still over the service limit, replace the clutch discs and plates.



1ST CLUTCH END PLATES

Mark	Part Number	Thickness
1	22551-P7W-003	3.1 mm (0.122 in.)
2	22552-P7W-003	3.2 mm (0.126 in.)
3	22553-P7W-003	3.3 mm (0.130 in.)
4	22554-P7W-003	3.4 mm (0.134 in.)
5	22555-P7W-003	3.5 mm (0.138 in.)
6	22556-P7W-003	3.6 mm (0.142 in.)
7	22557-P7W-003	3.7 mm (0.146 in.)
8	22558-P7W-003	3.8 mm (0.150 in.)
9	22559-P7W-003	3.9 mm (0.154 in.)

2ND CLUTCH END PLATES

Mark	Part Number	Thickness
1	22551-PY4-003	2.1 mm (0.083 in.)
2	22552-PY4-003	2.2 mm (0.087 in.)
3	22553-PY4-003	2.3 mm (0.091 in.)
4	22554-PY4-003	2.4 mm (0.094 in.)
5	22555-PY4-003	2.5 mm (0.098 in.)
6	22556-PY4-003	2.6 mm (0.102 in.)
7	22557-PY4-003	2.7 mm (0.106 in.)
8	22558-PY4-003	2.8 mm (0.110 in.)
9	22559-PY4-003	2.9 mm (0.114 in.)

3RD CLUTCH END PLATES

Mark	Part Number	Thickness
1	22556-P7T-003	3.1 mm (0.122 in.)
2	22557-P7T-003	3.2 mm (0.126 in.)
3	22558-P7T-003	3.3 mm (0.130 in.)
4	22559-P7T-003	3.4 mm (0.134 in.)
6	22551-P7T-003	2.6 mm (0.102 in.)
7	22552-P7T-003	2.7 mm (0.106 in.)
8	22553-P7T-003	2.8 mm (0.110 in.)
9	22554-P7T-003	2.9 mm (0.114 in.)
0	22555-P7T-003	3.0 mm (0.118 in.)

4TH and 5TH CLUTCH END PLATES

Mark	Part Number	Thickness
1	22561-P7T-003	2.1 mm (0.083 in.)
2	22562-P7T-003	2.2 mm (0.087 in.)
3	22563-P7T-003	2.3 mm (0.091 in.)
4	22564-P7T-003	2.4 mm (0.094 in.)
5	22565-P7T-003	2.5 mm (0.098 in.)
6	22566-P7T-003	2.6 mm (0.102 in.)
7	22567-P7T-003	2.7 mm (0.106 in.)
8	22568-P7T-003	2.8 mm (0.110 in.)
9	22569-P7T-003	2.9 mm (0.114 in.)

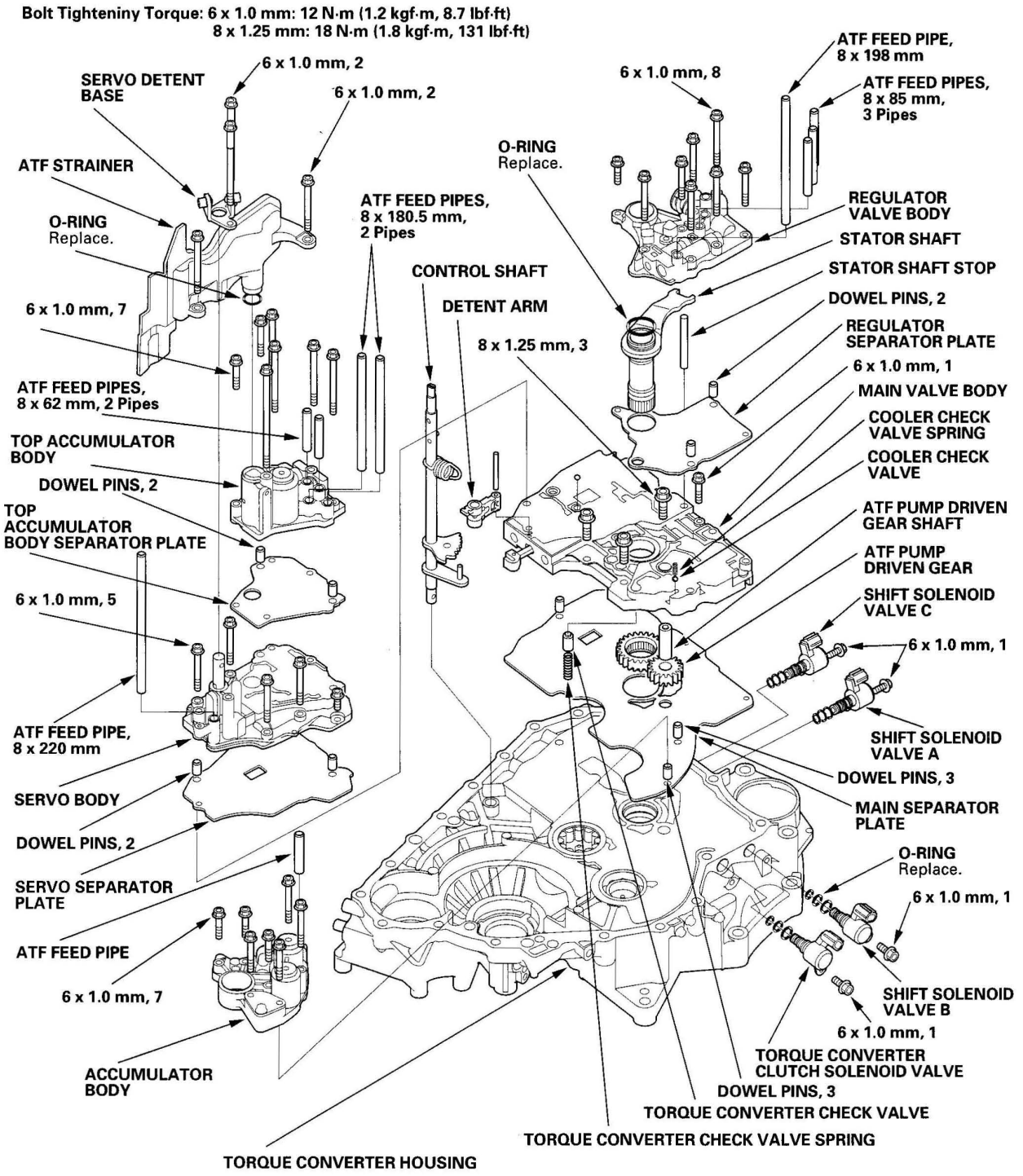
BACK

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Valve Body

Valve Bodies and ATF Strainer Installation

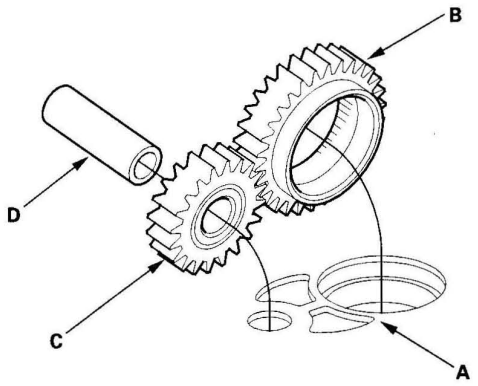
Exploded View



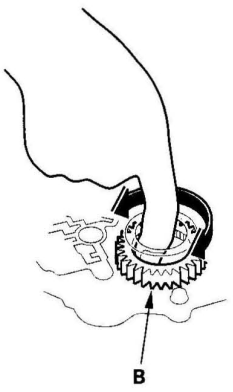
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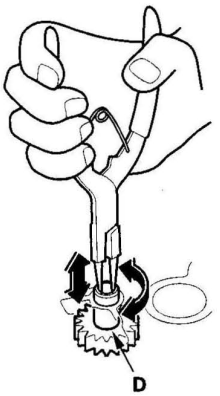
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1. Install the main separator plate (A) and three dowel pins on the torque converter housing. Then install the ATF pump drive gear (B), driven gear (C), and ATF pump driven gear shaft (D). Install the ATF pump driven gear with its grooved and chamfered side facing down.



2. Install the main valve body (one 6 mm bolt and three 8 mm bolts). Make sure the ATF pump drive gear (B) rotates smoothly in the normal operating direction, and the ATF pump driven gear shaft (D) moves smoothly in the axial and normal operating direction.





3. If the ATF pump drive gear and ATF pump driven gear shaft do not move smoothly, loosen the main valve body bolts. Realign the ATF pump driven gear shaft, and retighten the bolts to the specified torque, then recheck. Failure to align the ATF pump driven gear shaft correctly will result in a seized ATF pump drive gear or ATF pump driven gear shaft.

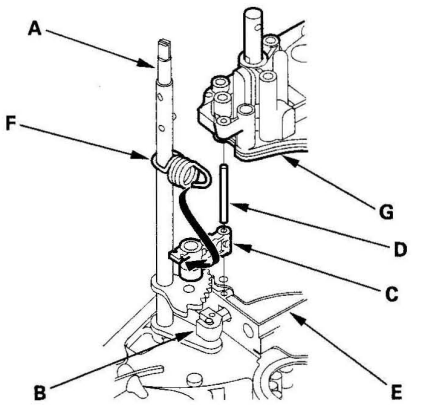
4. Install the torque converter check valve and spring, and the cooler check valve and spring on the main valve body, then install the two dowel pins and the regulator separator plate.

5. Install the stator shaft and stator shaft stop.

6. Install the regulator valve body (eight bolts).

7. Install the two dowel pins and the servo separator plate on the main valve body.

8. Install the control shaft (A) in the torque converter housing along with the manual valve (B).



9. Install the detent arm (C) and arm shaft (D) in the main valve body (E), then hook the detent arm spring (F) to the detent arm.

10. Install the servo body (G) (five bolts).

11. Install the top accumulator body separator plate with two dowel pins on the servo body, then install the top accumulator body (seven bolts).

12. Install the ATF strainer (two bolts).

13. Install the servo detent base (two bolts).

14. Install the accumulator body (seven bolts).

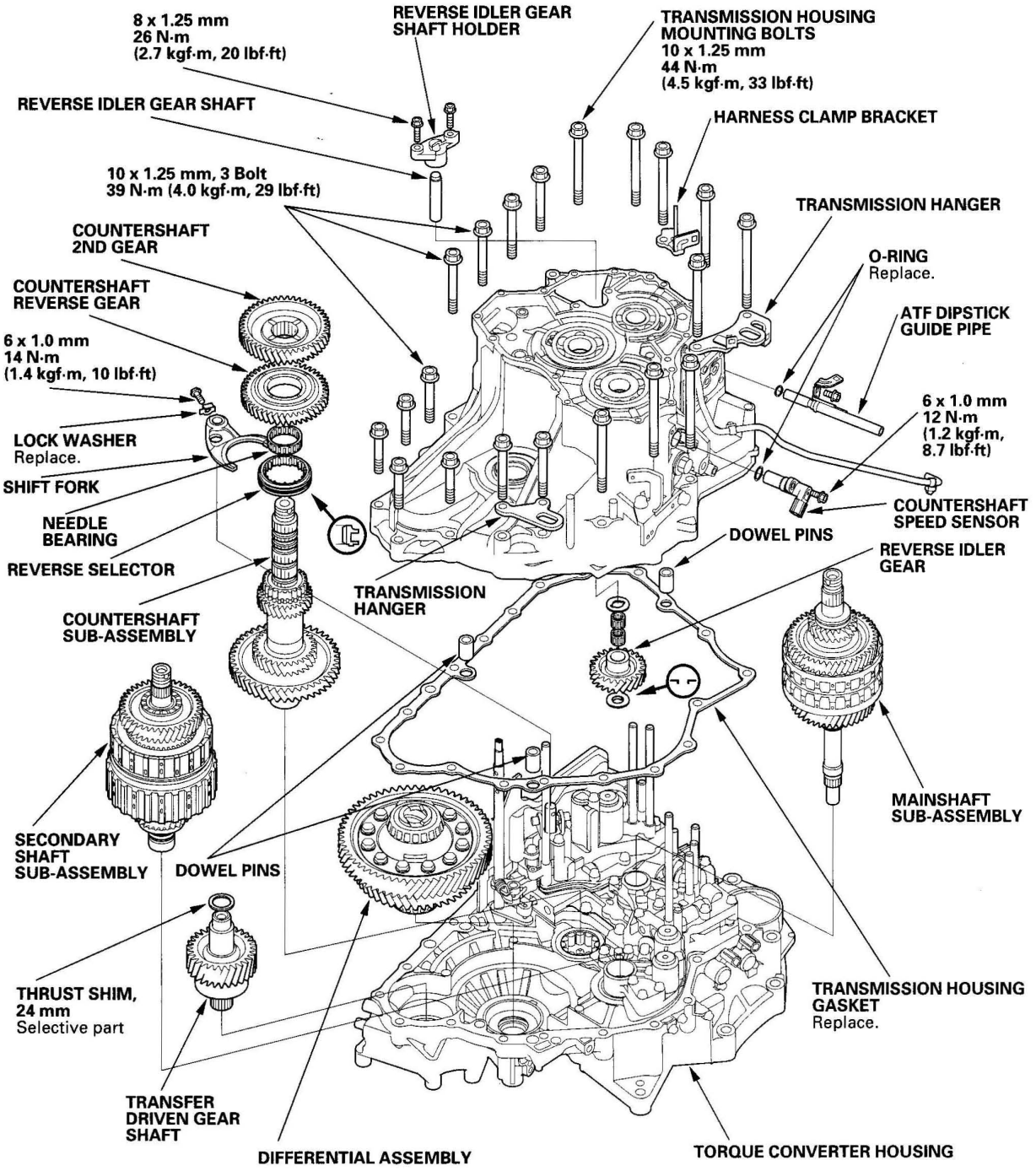
15. Install the one ATF feed pipe in the servo body, four pipes in the regulator valve body, four pipes in the top accumulator body, and one pipe in the accumulator body.

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Transmission Housing

Shaft Assemblies and Housing Installation

Exploded View



BACK

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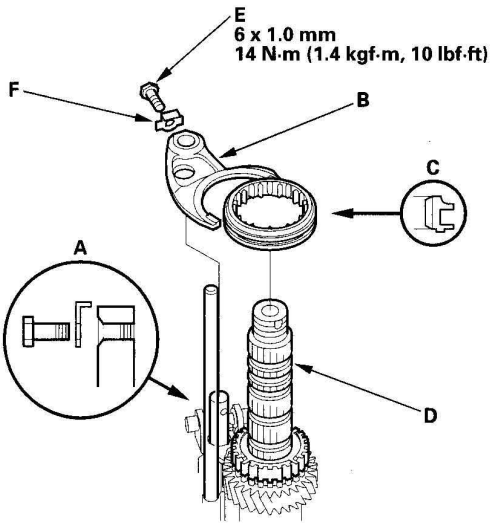
NOTE: Refer to the Exploded View as needed during the following procedure.

1. Install the 24 mm thrust shim on the transfer driven gear shaft, then install the shaft in the torque converter housing.

2. Install the differential assembly, countershaft sub-assembly, mainshaft sub-assembly, and secondary shaft sub-assembly in the torque converter housing.

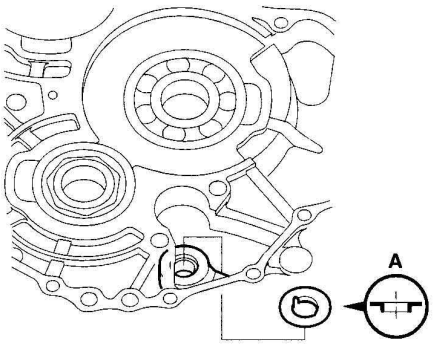
3. Install the countershaft 5th gear and reverse selector hub on the countershaft. If the reverse selector hub is a press-fitted type, refer to the installation (see page 14-219).

4. Turn the shift fork shaft (A) so the large chamfered hole is facing the fork bolt hole. Then install the shift fork (B) and reverse selector (C) together on the shift fork shaft and countershaft (D). Secure the shift fork to the shift fork shaft with the lock bolt (E) and a new lock washer (F), then bend the lock washer against the bolt head.

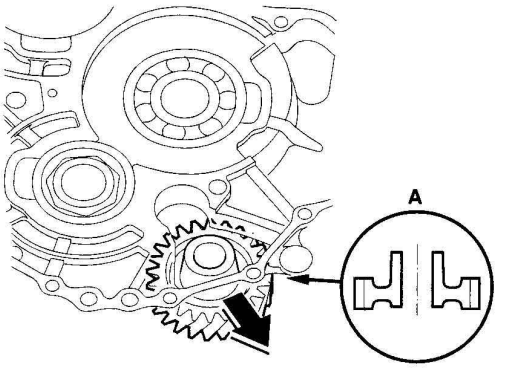


5. Install the needle bearing, countershaft reverse gear, and countershaft 2nd gear on the countershaft.

6. Place the thrust washer (A) in the transmission housing.



7. Place the reverse idler gear (A) in the transmission housing as shown, then slide it in the direction shown.

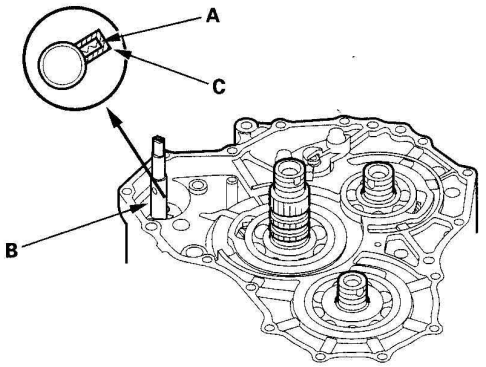


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Shaft Assemblies and Housing Installation (cont'd)

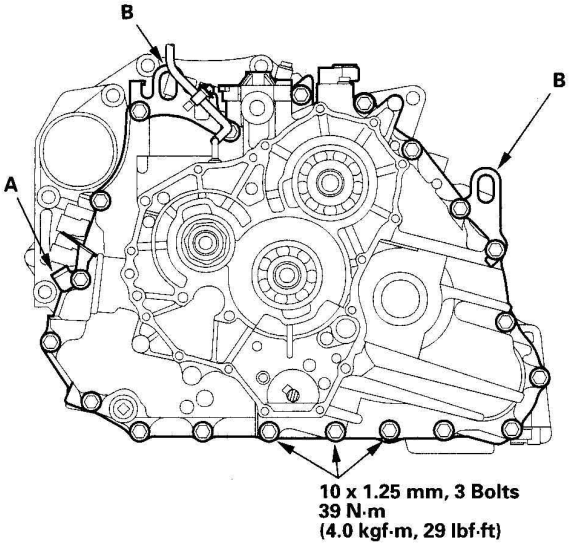
8. Align the spring pin (A) on the control shaft (B) with the transmission housing groove (C) by turning the control shaft.



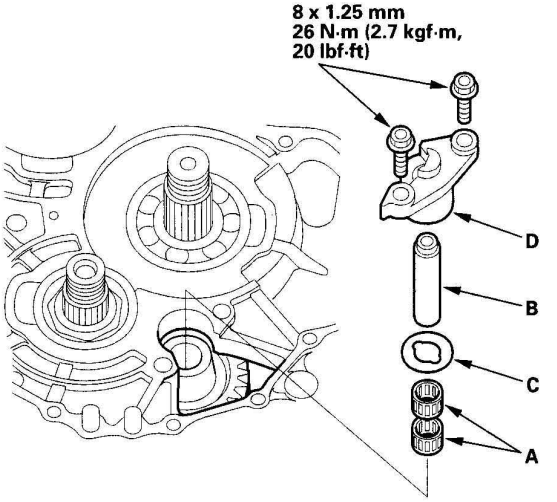
9. Install three dowel pins and a new gasket on the torque converter housing.

10. Place the transmission housing on the torque converter housing, then install the transmission housing mounting bolts along with the harness clamp bracket (A) and transmission hangers (B). Tighten the bolts in two or more steps.

TORQUE: 44N·m (4.5 kgf·m, 33 lbf·ft), 17 Bolts



11. Engage the reverse idler gear with the countershaft reverse gear and the mainshaft reverse gear. Then install the needle bearings (A), reverse idler gear shaft (B), and thrust washer (C) in the reverse idler gear, and install the reverse idler gear shaft holder (D) on the transmission housing.



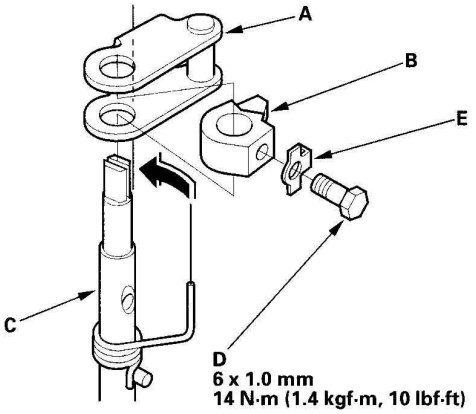
BACK

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End Cover, 3rd Gears, Idler Gear, and 3rd Clutch Installation

Special Tools Required
- Mainshaft holder
  07GAB-PF50101 or 07GAB-PF50100
- Adjustable bearing puller, 25 – 40 mm
  07736-A01000B or 07736-A01000A

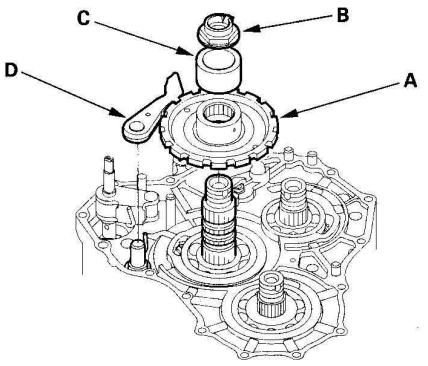
1. Install the park lever (A) and park stop (B) on the control shaft (C), then install the lock bolt (D) with a new lock washer (E). Do not bend the lock tab of the lock washer until step 28.



2. Lubricate the following parts with ATF:
   - Splines of the countershaft, the park gear, and the old locknut.
   - Threads of the countershaft and the old locknut.
   - Old conical spring washer.

3. Install the park gear (A) using the old locknut (B) and a collar (C). Hold the park pawl (D) against the park gear, then tighten the old locknut until the shaft splines come out over the park gear splines.

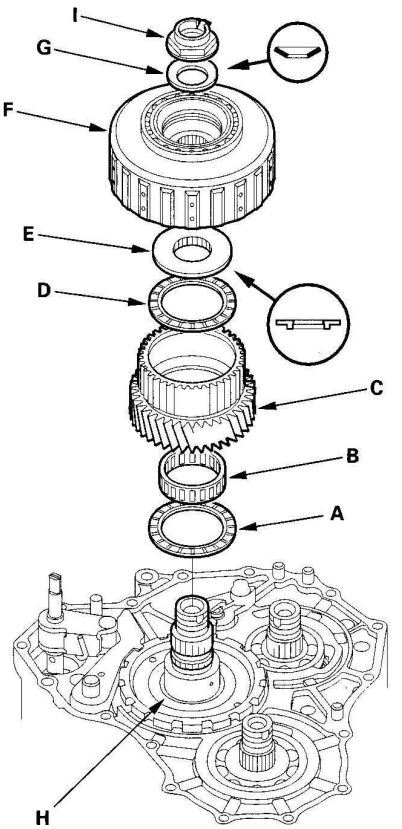
   NOTE:
   - Do not use an impact wrench.
   - Countershaft locknut has left-hand threads.



4. Remove the locknut and collar.

5. Install the thrust needle bearing (A), needle bearing (B), 3rd gear (C), thrust needle bearing (D), 31 x 63.5 mm splined washer (E), 3rd clutch assembly (F), and old conical spring washer (G) on the countershaft (H). Tighten the old locknut (I) to 226 N·m (23.0 kgf·m, 166 lbf·ft).

   NOTE: Use a torque wrench to tighten the locknut. Do not use an impact wrench.

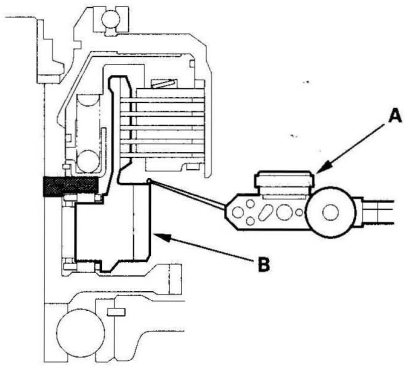


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Protected by AR

End Cover, 3rd Gears, Idler Gear, and 3rd Clutch Installation (cont'd)

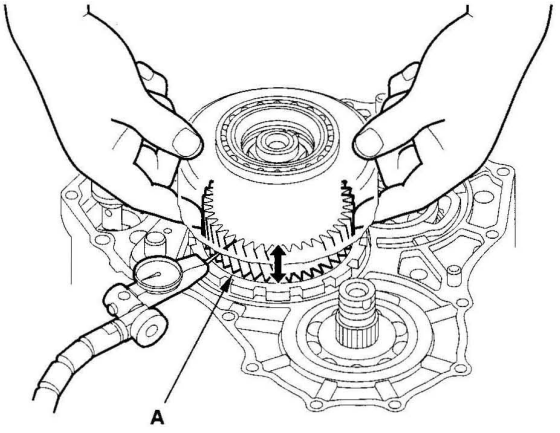
6. Set the dial indicator (A) to the countershaft 3rd gear (B).



7. Measure the countershaft 3rd gear axial clearance in at least three places, while moving the countershaft 3rd gear (A).
   Use the average as the actual clearance.

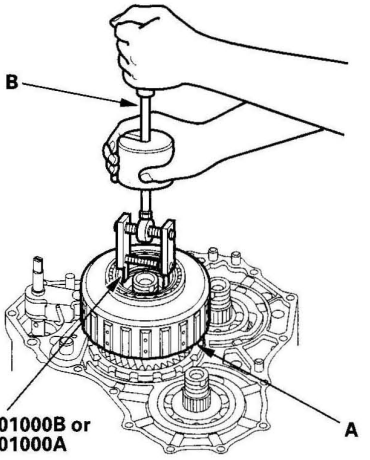
   If the clearance is out of standard, select the appropriate 31 x 63.5 mm splined washer in step 16.

   STANDARD: 0.015—0.045 mm (0.0006—0.0018 in.)



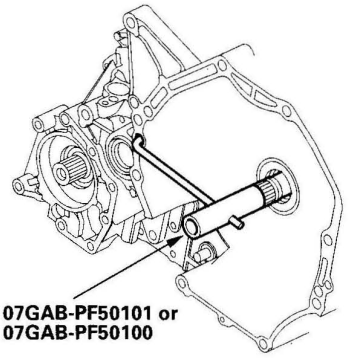
8. Remove the locknut and conical spring washer.

9. Remove the 3rd clutch assembly (A) with the special tool and a commercially available 3/8-16" slide hammer (B).



10. Remove the parts that were installed in step 5.

11. Install the special tool onto the mainshaft.



BACK

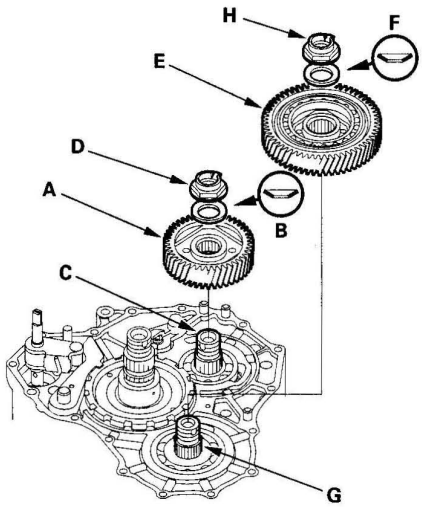
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12. Lubricate the following parts with ATF:

    - Splines of the mainshaft 3rd gear and secondary shaft idler gear.
    - Threads of the mainshaft and secondary shaft.
    - Threads of the old mainshaft and secondary shaft locknuts.
    - Old conical spring washer.

13. Install the mainshaft 3rd gear (A) and the old conical spring washer (B) on the mainshaft (C). Tighten the old locknut (D) to seat the 3rd gear to 226 N·m (23.0 kgf·m, 166 lbf·ft).

    NOTE: Use a torque wrench to tighten the locknut. Do not use an impact wrench.

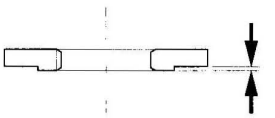


14. Install the secondary shaft idler gear (E) and the old conical spring washer (F) on the secondary shaft (G). Tighten the old locknut (H) to seat the secondary shaft idler gear to 226 N·m (23.0 kgf·m, 166 lbf·ft).

    NOTE:
    - Use a torque wrench to tighten the locknut. Do not use an impact wrench.
    - Secondary shaft locknut has left-hand threads.

15. Remove the old locknuts and old conical spring washers from the mainshaft and secondary shaft.

16. If the 3rd gear axial clearance is out of standard (measured in step 7), measure the difference of the 31 x 63.5 mm splined washer, and select the appropriate splined washer from the table below.



SPLINED WASHER, 31 x 63.5 mm

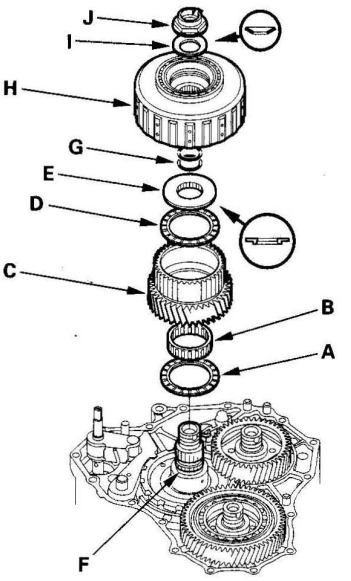
Mark	Part Number	Difference
A	90520-P7W-000	3.503 mm (0.1379 in.)
B	90521-P7W-000	3.490 mm (0.1374 in.)
C	90522-P7W-000	3.477 mm (0.1369 in.)
D	90523-P7W-000	3.464 mm (0.1364 in.)

17. Install the thrust needle bearing (A), needle bearing (B), 3rd gear (C), thrust needle bearing (D), and 31 x 63.5 mm splined washer (E) on the countershaft (F).

18. Wrap the shaft splines with tape to prevent O-ring damage, then install new O-rings (G).

19. Remove the tape, then install the 3rd clutch assembly (H), and old conical spring washer (I). Tighten the old locknut (J) to 226 N·m (23.0 kgf·m, 166 lbf·ft).

    NOTE: Use a torque wrench to tighten the locknut. Do not use an impact wrench.



(cont'd)

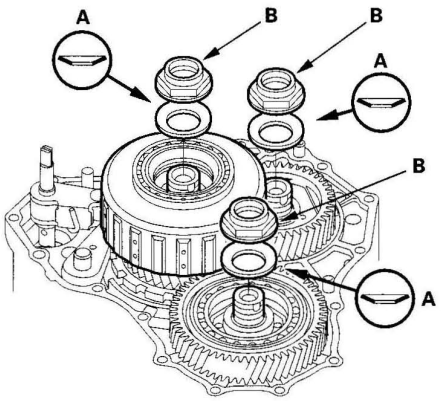
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End Cover, 3rd Gears, Idler Gear, and 3rd Clutch Installation (cont'd)

20. Remove the old locknut and old conical spring washer from the countershaft.

21. Lubricate the threads of each shaft, the new locknuts, and new conical spring washers with ATF.

22. Install the new conical spring washers (A) in the direction shown, and install the new locknuts (B).

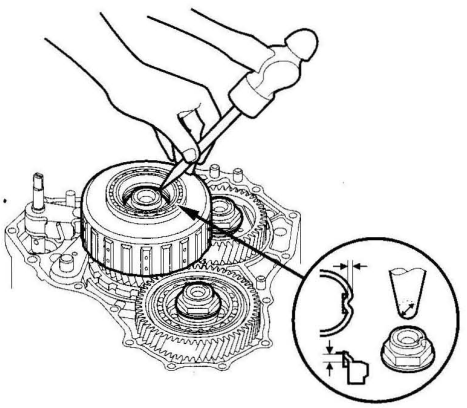


23. Tighten the locknuts to 167 N·m (17.0 kgf·m, 123 lbf·ft).

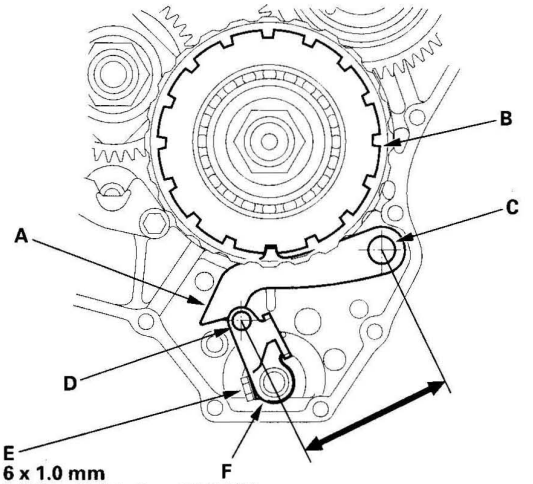
    NOTE:
    - Use a torque wrench to tighten the locknuts. Do not use an impact wrench.
    - Countershaft and secondary shaft locknuts have left-hand threads.

24. Remove the special tool from the mainshaft.

25. Stake each locknut into its shaft using a 3.5 mm punch.



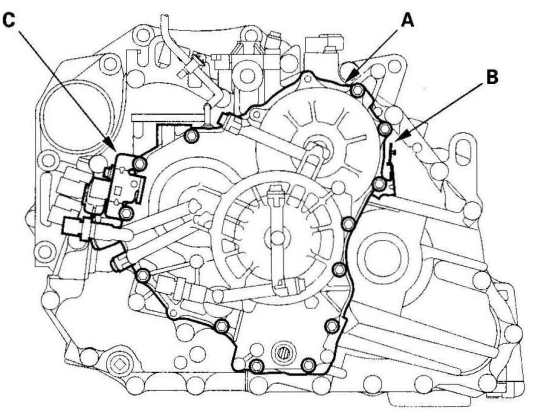
26. Set the park lever in the [P] position, then verify that the park pawl (A) engages the park gear (B).



27. If the park pawl does not engage fully, check the distance between the pawl shaft (C) and the park lever roller pin (D) (see page 14-193).

28. Tighten the lock bolt (E), and bend the lock tab of the lock washer (F) against the lock bolt head.

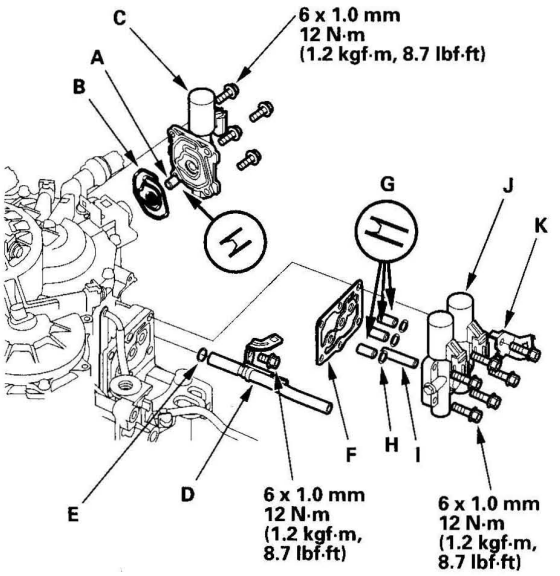
29. Install the end cover (A) with the two dowel pins, new O-rings, new gasket, harness clamp bracket (B), and connector bracket (C). Tighten the 13 bolts to 12 N·m (1.2 kgf·m, 8.7 lbf·ft).



BACK

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30. Install the 8 x 12 mm ATF feed pipe (A) with its filter side into the transmission housing.



31. Install the new gasket (B) in the mounting groove of the A/T clutch pressure control solenoid valve C body (C) properly, then install them on the transmission housing. Do not pinch the gasket.

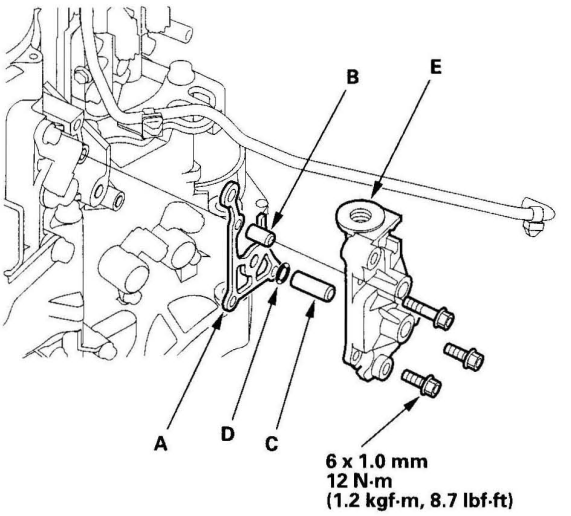
32. Install the ATF dipstick guide pipe (D) with the new O-ring (E).

33. Place the new gasket (F) on the transmission housing, then install the 8 x 18 mm ATF feed pipes (G) with their filter side into the transmission housing.

34. Install the new O-rings (H) over the feed pipes, and install the 8 x 40 mm ATF feed pipe (I).

35. Install the A/T clutch pressure control solenoid valves A and B (J) and the harness clamp bracket (K).

36. Place the new ATF passage body gasket (A) on the transmission housing, then install the 8 x 14 mm dowel pin (B) and the 10 x 25.5 mm ATF feed pipe (C) with the new O-ring (D). Install the ATF passage body (E) on the transmission housing, if it was removed.



(cont'd)

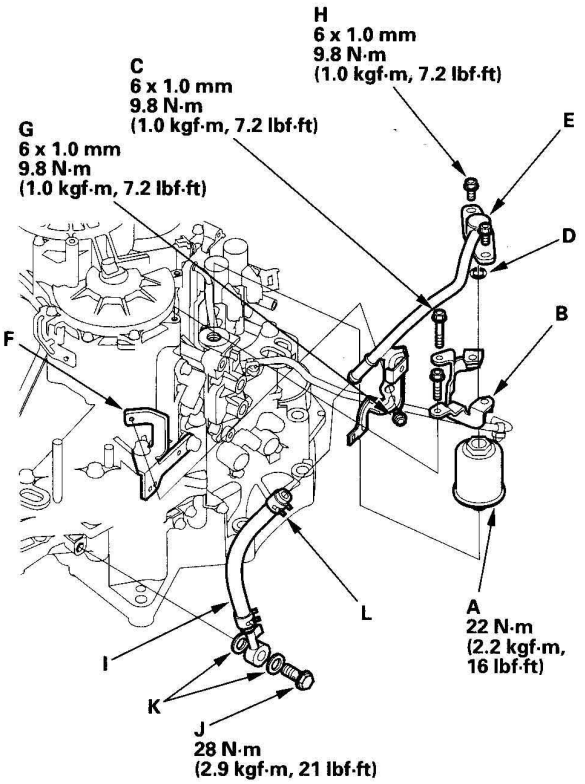
BACK

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Transmission End Cover

End Cover, 3rd Gears, Idler Gear, and 3rd Clutch Installation (cont'd)

37. Install the new ATF filter (A) on the transmission housing.



38. Install the filter line bracket (B) on the ATF filter, and loosely install the bolts (C).

39. Install the new O-ring (D) to the filter line (E), then install the filter line on the ATF filter.

40. Secure the end of the filter line on the bracket (F) with the bolt (G).

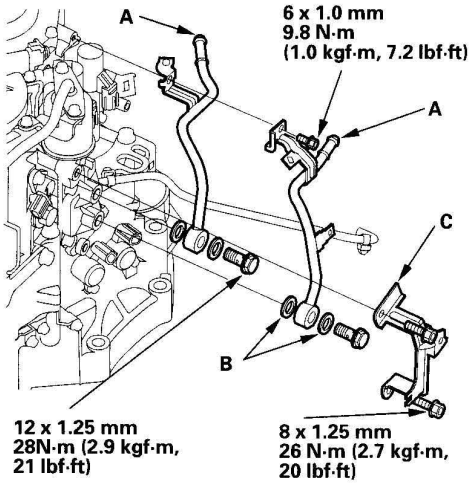
41. Secure the filter line on the filter line bracket with the bolts (H).

42. Tighten the bolts (C) on the filter line bracket to the specified torque.

43. Install the ATF hose (I) and line bolt (J) with the new sealing washers (K).

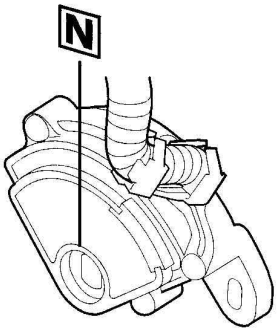
44. Connect the hose to the filter line, and secure it with the clip (L).

45. Install the ATF cooler lines (A) with the new sealing washers (B) and the line bolts, then install the harness clamp bracket (C).



46. Set the transmission range switch to the N position.

NOTE: The transmission range switch clicks in the N position.

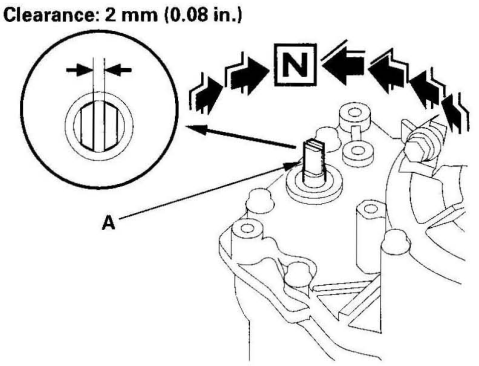


BACK

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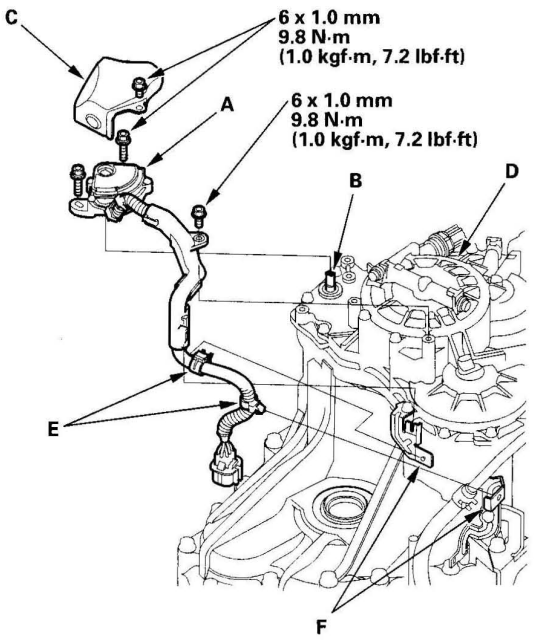
47. Turn the control shaft (A) to the N position by turning it.

    NOTE: Be careful not to squeeze the end of the control shaft tips together when turning into position. If the tips are squeezed together it will cause a faulty signal or position due to the play between the control shaft and the switch.

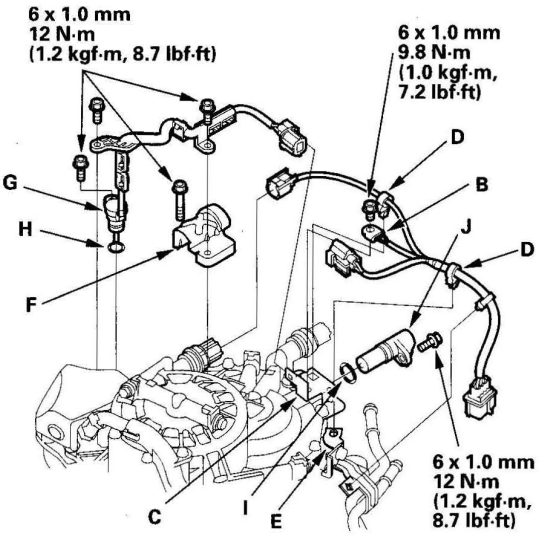


48. Install the transmission range switch (A) gently on the control shaft (B). Do not move the transmission range switch when tightening its bolts.

49. Install the transmission range switch cover (C); secure the harness with the bolt on the end cover (D); install the harness clips (E) on the brackets (F).



50. Connect the 3rd clutch pressure switch connector (A) and A/T wire harness ground terminal (B) on the connector bracket (C), then install the clips (D) on the bracket (E).



51. Install the switch cover (F).

52. Install the ATF temperature sensor (G) with the new O-ring (H), then secure the harness with the bolts. Connect the sensor connector to the A/T wire harness connector, then install it on the connector bracket (C).

53. Install the new O-ring (I) on the mainshaft speed sensor (J), then install the mainshaft speed sensor.

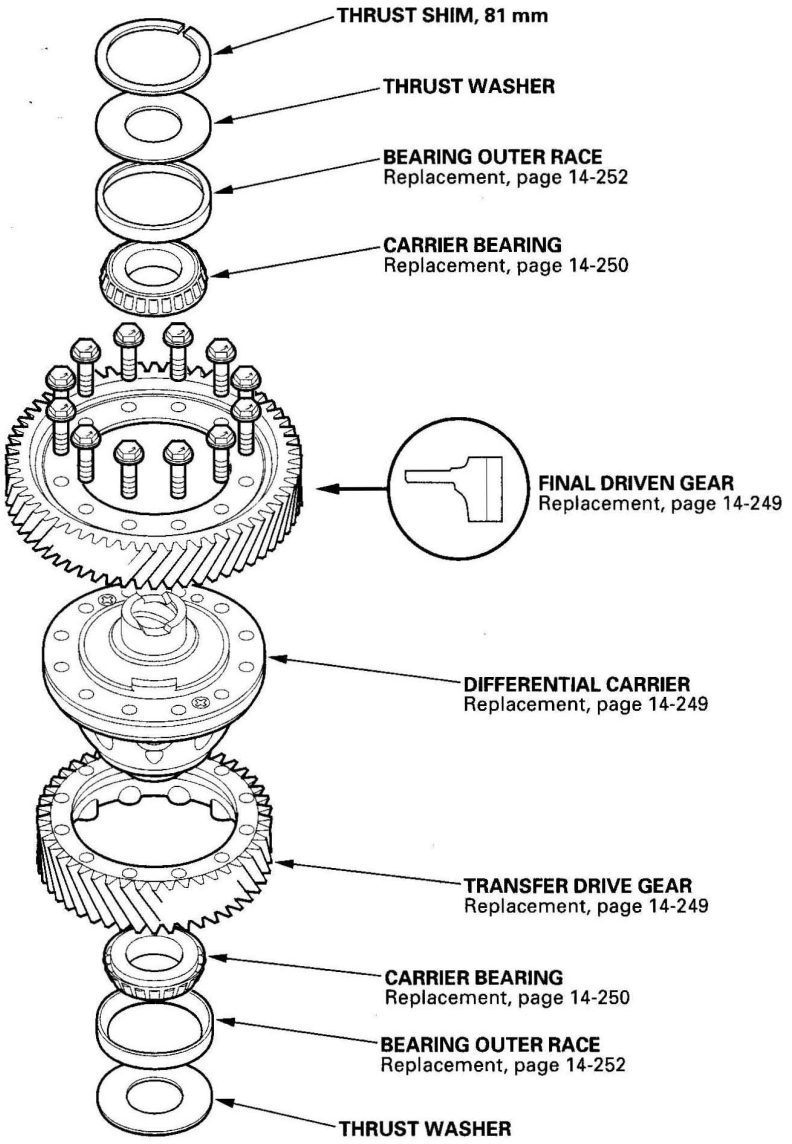
54. Install the dipstick.

BACK

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A/T Differential

Component Location Index

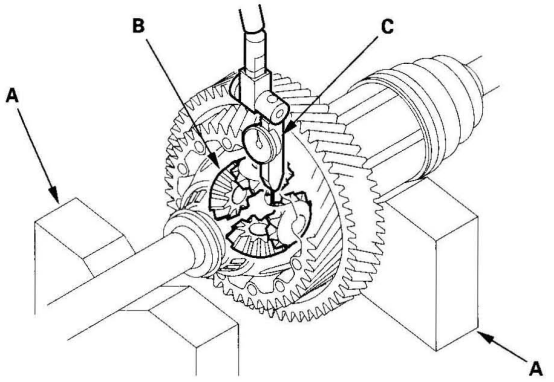


BACK

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Backlash Inspection

1. Install both axles, and place the differential assembly on V-blocks (A).



2. Check the backlash of the pinion gears (B) with a dial indicator (C).

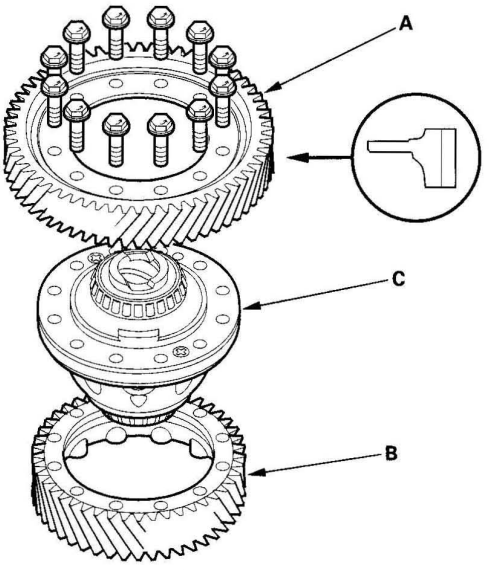
   STANDARD: 0.175 – 0.275 mm (0.007 – 0.011 in.)

3. If the backlash is out of standard, replace the differential carrier.

Final Driven Gear/Transfer Drive Gear/Carrier Replacement

1. Remove the final driven gear (A) and transfer drive gear (B) from the differential carrier (C).

   NOTE: The final driven gear bolts have left-hand threads.



2. Install the final driven gear with the chamfered side on the inner bore facing the differential carrier.

3. Tighten the bolts to the specified torque in a crisscross pattern.

   TORQUE: 101 N·m (10.3 kgf·m, 74.5 lbf·ft)

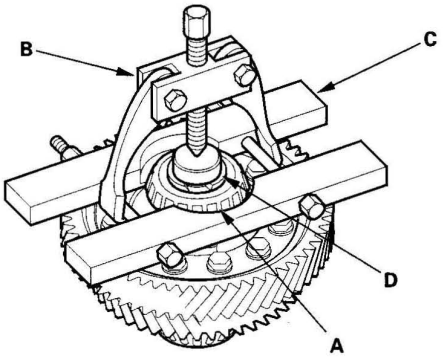
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Carrier Bearing Replacement

Special Tools Required
Attachment, 40 x 50 mm 07LAD-PW50601

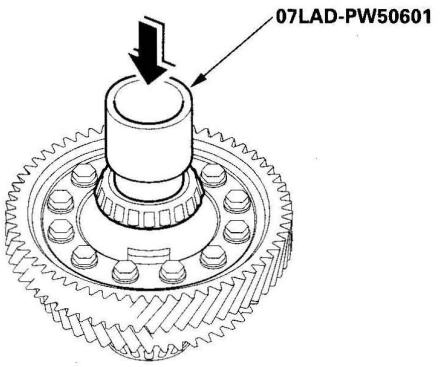
NOTE:
- The bearing and outer race should be replaced as a set.
- Inspect and adjust the bearing preload whenever the bearing is replaced.
- Check the bearing for wear and rough rotation. If the bearing is OK, removal is not necessary.

1. Remove the carrier bearing (A) with a commercially available bearing puller (B), bearing separator (C), and stepped adapter (D).



2. Install the new carrier bearings with the special tool and a press.

   NOTE:
   - Press the bearing on until it bottoms.
   - Use the small end of the special tool to install the bearing.
   - Press the bearing on securely so there is no clearance between the bearing and the differential carrier.



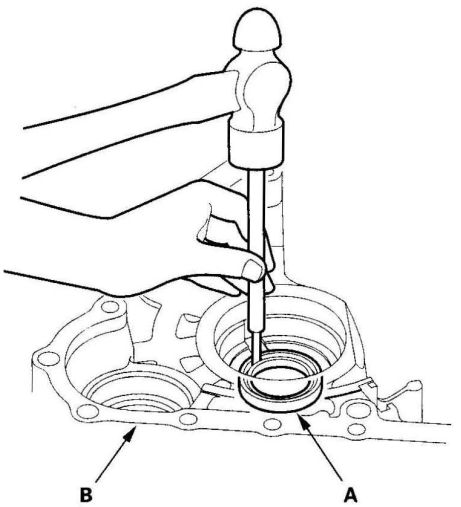
BACK

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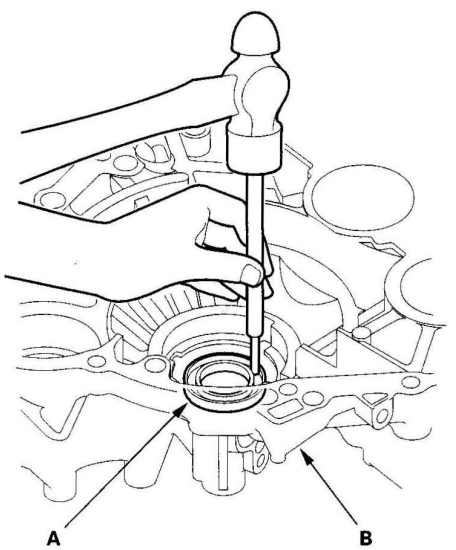
Oil Seal Replacement

Special Tools Required
- Driver 07749-0010000
- Seal driver attachment 07GAD-PG40100 or 07GAD-PG40101
- Oil seal driver attachment 07JAD-PH80101

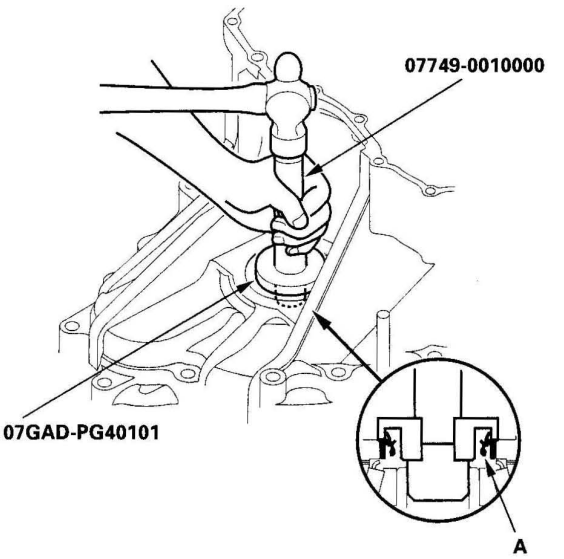
1. Remove the differential assembly.
2. Remove the oil seal (A) from the transmission housing (B).



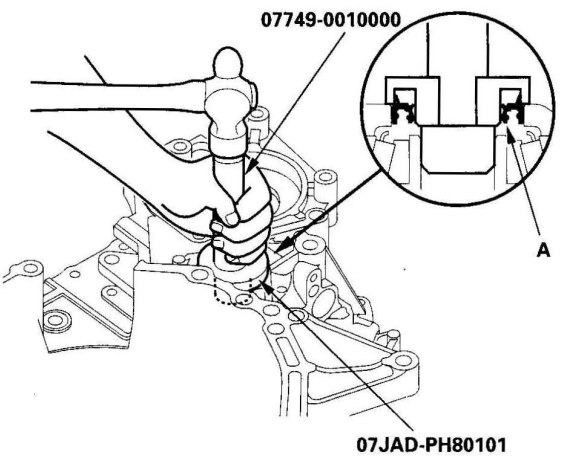
3. Remove the oil seal (A) from the torque converter housing (B).



4. Install the oil seal (A) in the transmission housing with the special tools.



5. Install the oil seal (A) in the torque converter housing with the special tools.



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Carrier Bearing Outer Race Replacement

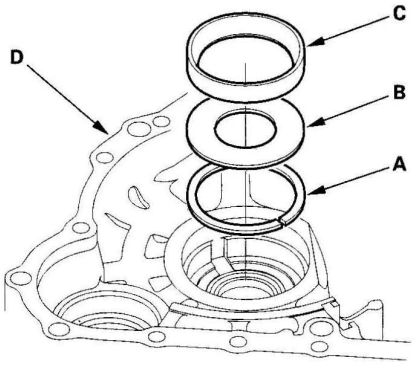
Special Tools Required
- Driver 07749-0010000
- Driver attachment, 78 x 90 mm 07GAD-SD40101

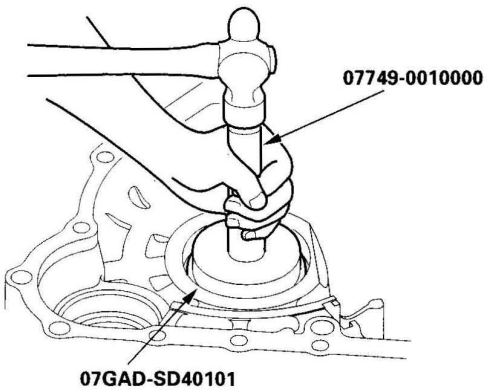
NOTE:
- Replace the bearing with a new one whenever the outer race is replaced.
- Do not use shim(s) on the torque converter housing side.
- Adjust preload after replacing the bearing and outer race.
- Coat all parts with ATF during installation.

1. Remove the bearing outer race from the transmission housing by heating the housing to about 212°F (100°C) with a heat gun. Do not heat the housing more than 212°F (100°C).

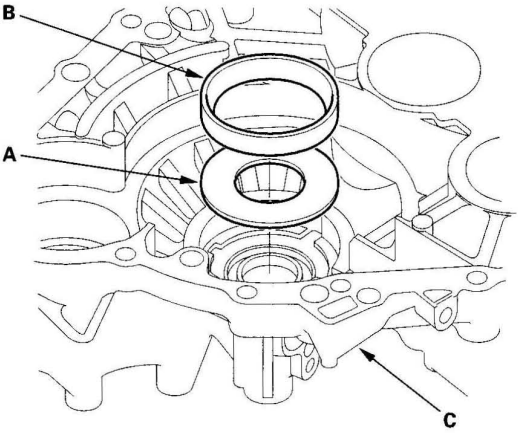
2. Remove the bearing outer race from the torque converter housing.

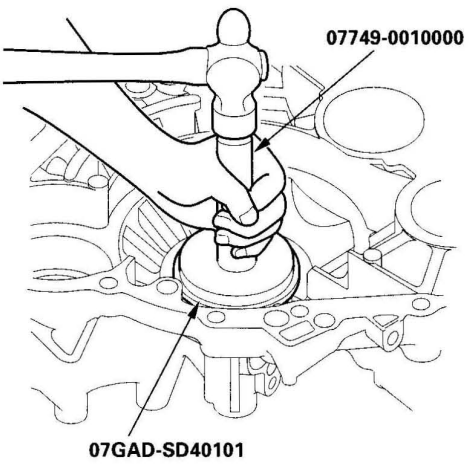
3. Install the thrust shim (A), thrust washer (B), and outer race (C) in the transmission housing (D) with the special tools.





4. Install the thrust washer (A) and outer race (B) in the torque converter housing (C), and use the special tools to make sure the outer race bottoms out in the housing.





BACK

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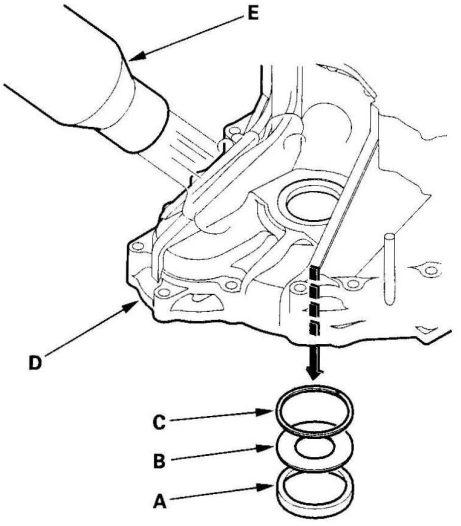
Carrier Bearing Preload Inspection

Special Tools Required
- Driver 07749-0010000
- Driver attachment, 78 x 90 mm 07GAD-SD40101
- Preload inspection tool 07YAJ-S3V0100

NOTE: If the transmission housing, torque converter housing, differential carrier, tapered roller bearing, outer race, or thrust shim were replaced, the bearing preload must be adjusted.

1. Remove the bearing outer race (A), thrust washer (B), and thrust shim (C) from the transmission housing (D) by heating the housing to about 212°F (100°C) with a heat gun (E). Do not heat the housing more than 212°F (100°C).

   NOTE: Let the transmission housing cool to room temperature before adjusting the bearing preload.



2. Replace the tapered roller bearing when the outer race is to be replaced.

3. Do not use a shim on the torque converter housing side.

4. Select the 2.60 mm (0.102 in.) thrust shim from the table below.

THRUST SHIM, 81 mm

No.	Part Number	Thickness
A	41438-P7T-700	2.05 mm (0.081 in.)
AA	41438-PGH-000	2.075 mm (0.082 in.)
B	41439-P7T-700	2.01 mm (0.083 in.)
BB	41439-PGH-000	2.125 mm (0.084 in.)
C	41440-P7T-700	2.15 mm (0.085 in.)
CC	41440-PGH-000	2.175 mm (0.086 in.)
D	41441-P7T-000	2.20 mm (0.087 in.)
DD	41441-PGH-000	2.225 mm (0.088 in.)
E	41442-P7T-000	2.25 mm (0.089 in.)
EE	41442-PGH-000	2.275 mm (0.090 in.)
F	41443-P7T-000	2.30 mm (0.091 in.)
FF	41443-PGH-000	2.325 mm (0.092 in.)
G	41444-P7T-000	2.375 mm (0.094 in.)
GG	41444-PGH-000	2.35 mm (0.093 in.)
H	41445-P7T-000	2.40 mm (0.094 in.)
HH	41445-PGH-000	2.425 mm (0.095 in.)
I	41446-P7T-000	2.45 mm (0.096 in.)
II	41446-PGH-000	2.475 mm (0.097 in.)
J	41447-P7T-000	2.50 mm (0.098 in.)
JJ	41447-PGH-000	2.525 mm (0.099 in.)
K	41448-P7T-000	2.55 mm (0.100 in.)
KK	41448-PGH-000	2.575 mm (0.101 in.)
L	41449-P7T-000	2.60 mm (0.102 in.)
LL	41449-PGH-000	2.625 mm (0.103 in.)
M	41450-P7T-000	2.65 mm (0.104 in.)
MM	41450-PGH-000	2.625 mm (0.105 in.)
N	41451-P7T-000	2.70 mm (0.106 in.)
NN	41451-PGH-000	2.725 mm (0.107 in.)
O	41452-P7T-000	2.75 mm (0.108 in.)
OO	41452-PGH-000	2.775 mm (0.109 in.)
P	41453-P7T-000	2.80 mm (0.110 in.)
PP	41453-PGH-000	2.825 mm (0.111 in.)
Q	41454-P7T-000	2.85 mm (0.112 in.)
QQ	41454-PGH-000	2.875 mm (0.113 in.)
R	41455-P7T-000	2.90 mm (0.114 in.)
RR	41455-PGH-000	2.925 mm (0.115in.)
S	41456-P7T-000	2.95 mm (0.116 in.)
SS	41456-PGH-000	2.975 mm (0.117 in.)
T	41457-P7T-000	3.00 mm (0.118 in.)
TT	41457-PGH-000	3.25 mm (0.119 in.)
U	41458-P7T-000	3.05 mm (0.120 in.)

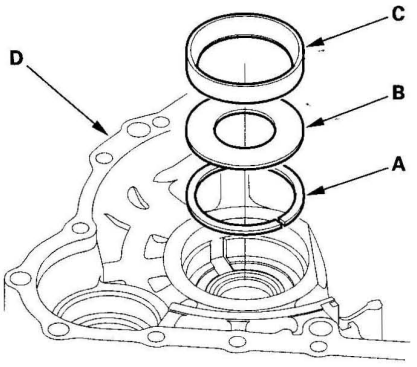
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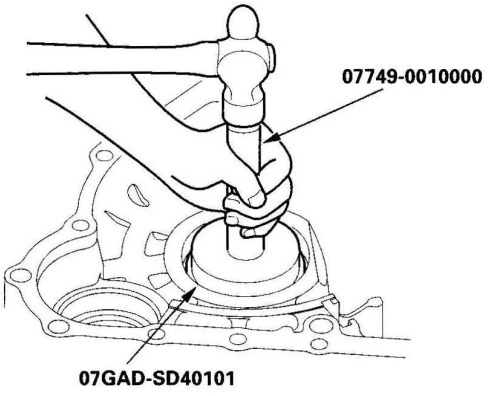
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Carrier Bearing Preload Inspection (cont'd)

5. Install the thrust shim (A), thrust washer (B), and bearing outer race (C) in the transmission housing (D).

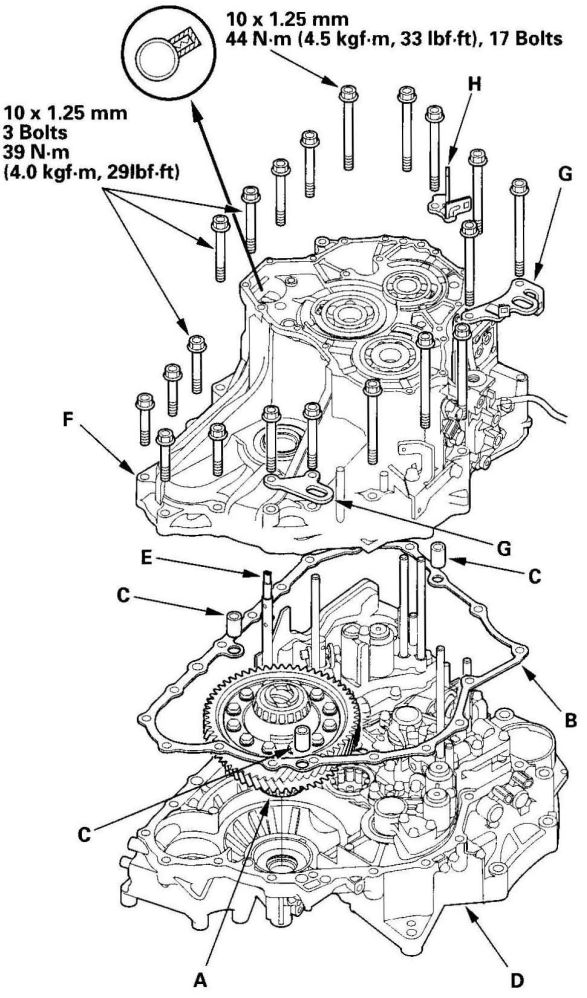


6. Drive the outer race with the special tools, and install it securely in the transmission housing.



7. Check that there is no clearance between the thrust washer, outer race, shim, and transmission housing.

8. Install the differential assembly (A), gasket (B), and dowel pins (C) on the torque converter housing (D). Align the spring pin on the control shaft (E) with the transmission housing groove.



9. Install the transmission housing (F) with the transmission hangers (G) and harness clamp bracket (H), then tighten the bolts.

BACK

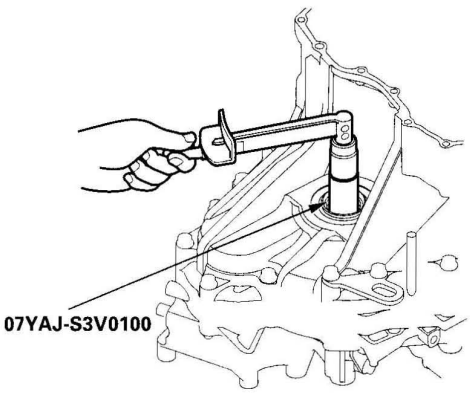
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10. Rotate the differential assembly in both directions to seat the bearings.

11. Measure the starting torque of the differential assembly with the special tools, a torque wrench and a socket. Measure the starting torque at normal room temperature in both directions.

STANDARD:

New bearing:	**3.8–5.3 N·m (39–54 kgf·cm, 34–47 lbf·in)**
Reused bearings:	**3.5–5.0 N·m (36–51 kgf·cm, 31–44 lbf·in)**



12. To increase the starting torque, increase the thickness of the shim. To decrease the starting torque, decrease the thickness of the shim. Changing the shim to the next size will increase or decrease starting torque about 0.3–0.4 N·m (3–4 kgf·cm, 3–3 lbf·in).

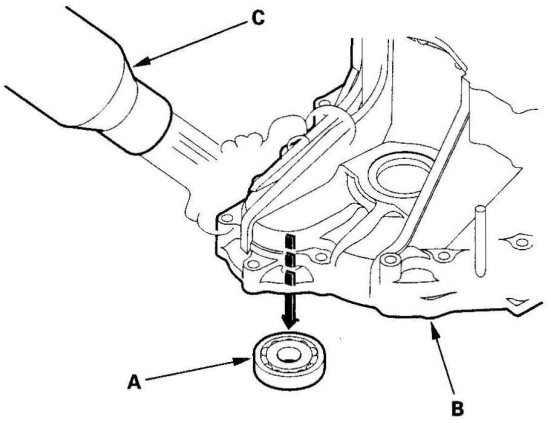
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Transfer Output Shaft

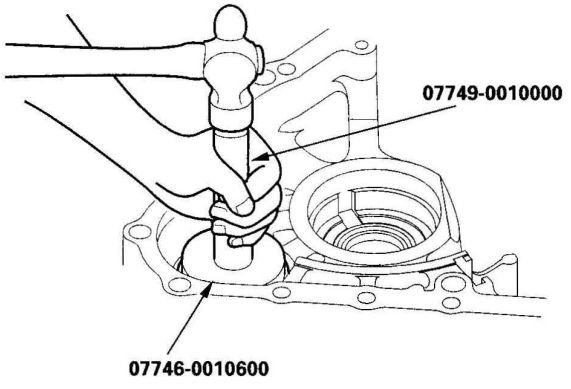
Transmission Housing Bearing Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 72 x 75 mm 07746-0010600

1. Remove the transfer output shaft bearing (A) from the transmission housing (B). If the bearing is press-fitted, remove the bearing by heating the housing to about 212°F (100°C) with a heat gun (C). Do not heat the housing more than 212°F (100°C).



2. Install the new bearing in the housing, use the special tools if the bearing is press-fitted.

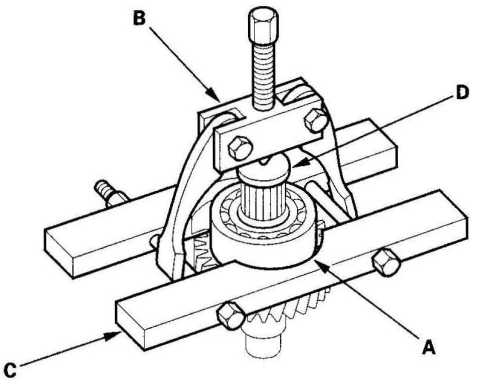


3. Select the 24 mm thrust shim (see page 14-257).

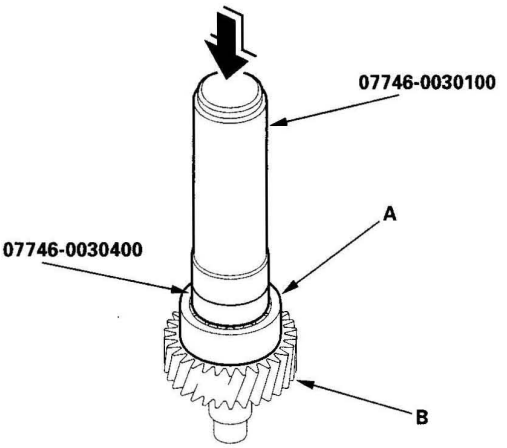
Transfer Output Shaft Bearing Replacement

Special Tools Required
- Driver 40 mm I.D. 07746-0030100
- Attachment, 35 mm I.D. 07746-0030400

1. Remove the transfer output shaft bearing (A) with a universal two-jaw puller (B) and a bearing separator (C). Place a shaft protector (D) between the transfer output shaft and a puller to prevent damaging the shaft.



2. Install the new bearing (A) on the transfer output shaft (B) with the special tools and a press.



3. Select the 24 mm thrust shim (see page 14-257).

BACK

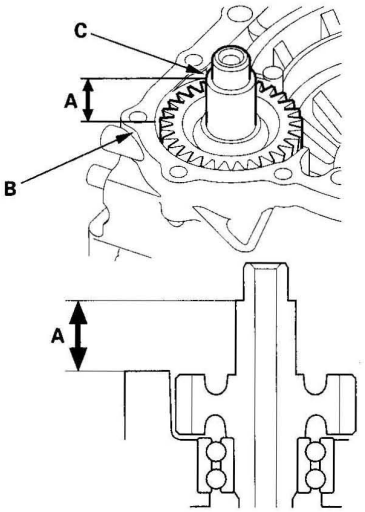
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24 mm Thrust Shim Selection

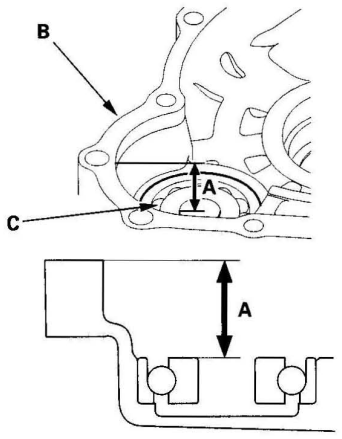
NOTE: If the transfer output shaft, transmission housing, or torque converter housing is replaced, select the 24 mm thrust shim.

1. Install the transfer output shaft in the torque converter housing.

2. Measure the distance (A) between the torque converter housing surface (B) and the 24 mm thrust shim mounting surface (C) of the transfer output shaft, then note the measurement (Measurement A).



3. Measure the distance (A) between the transmission housing surface (B) and the bearing inner race (C), then note the measurement (Measurement B). Do not push the bearing inner race while measuring the distance.



4. Calculate the thickness of the 24 mm thrust shim using the formula below.

FORMULA:
24 mm Thrust Shim Thickness
= (Measurement B + 0.6 mm) − Measurement A + Transmission Housing Gasket Thickness (0.5 mm)

Example:
Measurement A: 37.0 mm (1.475 in.)
Measurement B: 37.9 mm (1.492 in.)
24 mm Thrust Shim Thickness
= (37.9 + 0.6) − 37.0 + 0.5 = 2.0
- Select the No. E 24 mm thrust shim of 1.971 mm (0.078 in.).

5. Select the 24 mm thrust shim.

THRUST SHIM, 24 mm

Shim No.	Part Number	Thickness
A	29031-PGV-000	1.719 mm (0.068 in.)
B	29032-PGV-000	1.782 mm (0.070 in.)
C	29033-PGV-000	1.845 mm (0.073 in.)
D	29034-PGV-000	1.908 mm (0.075 in.)
E	29035-PGV-000	1.971 mm (0.078 in.)
F	29036-PGV-000	2.034 mm (0.080 in.)
G	29037-PGV-000	2.097 mm (0.083 in.)
H	29038-PGV-000	2.160 mm (0.085 in.)
J	29039-PGV-000	2.223 mm (0.088 in.)

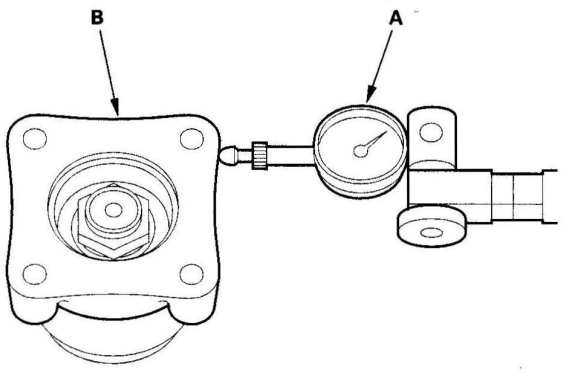
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Inspection

NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and a vise.

Transfer Gear Backlash Measurement

1. Set a dial indicator (A) on the companion flange (B).



2. Measure the transfer gear backlash.

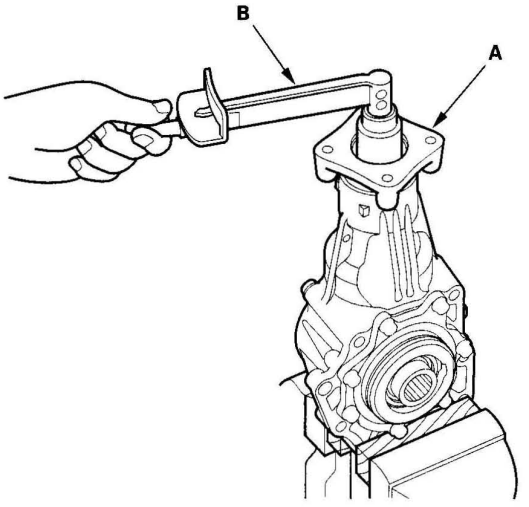
STANDARD: 0.06 – 0.16 mm (0.02 – 0.06 in.)

Total Starting Torque Measurement

3. Rotate the companion flange several time to seat the tapered roller bearings.

4. Measure the starting torque at the companion flange (A) using a torque wrench (B).

STANDARD:
3.89 – 7.26 N·m
(39.7 – 74.0 kgf·cm, 34.5 – 64.2 lbf·in)

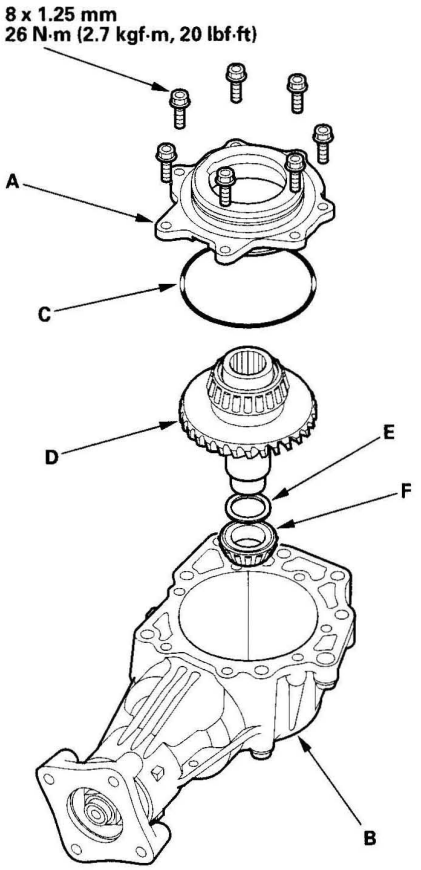


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Transfer Gear (Hypoid Gear) Tooth Contact Inspection

5. Remove the transfer cover (A) from the transfer housing (B), and remove the O-ring (C) from the transfer cover.



6. Remove the transfer drive gear/shaft assembly (D), 25 mm thrust shim (E), and tapered roller bearing (F).

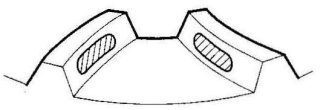
7. Apply Prussian Blue to both sides of the transfer drive gear teeth lightly and evenly.

8. Install the tapered roller bearing, 25 mm thrust shim, and transfer drive gear/shaft assembly in the transfer housing.

9. Install the transfer cover, and tighten the bolts. Do not install the O-ring on the transfer cover.

10. Rotate the companion flange in both directions until the transfer gear rotates one full turn in both directions.

11. Remove the transfer cover and transfer drive gear/shaft assembly, and check the transfer drive gear tooth contact pattern. The pattern should be centered on the gear teeth as shown.



12. If the measurements are out of standard or the tooth pattern are not correct, disassemble the transfer assembly and repair it.

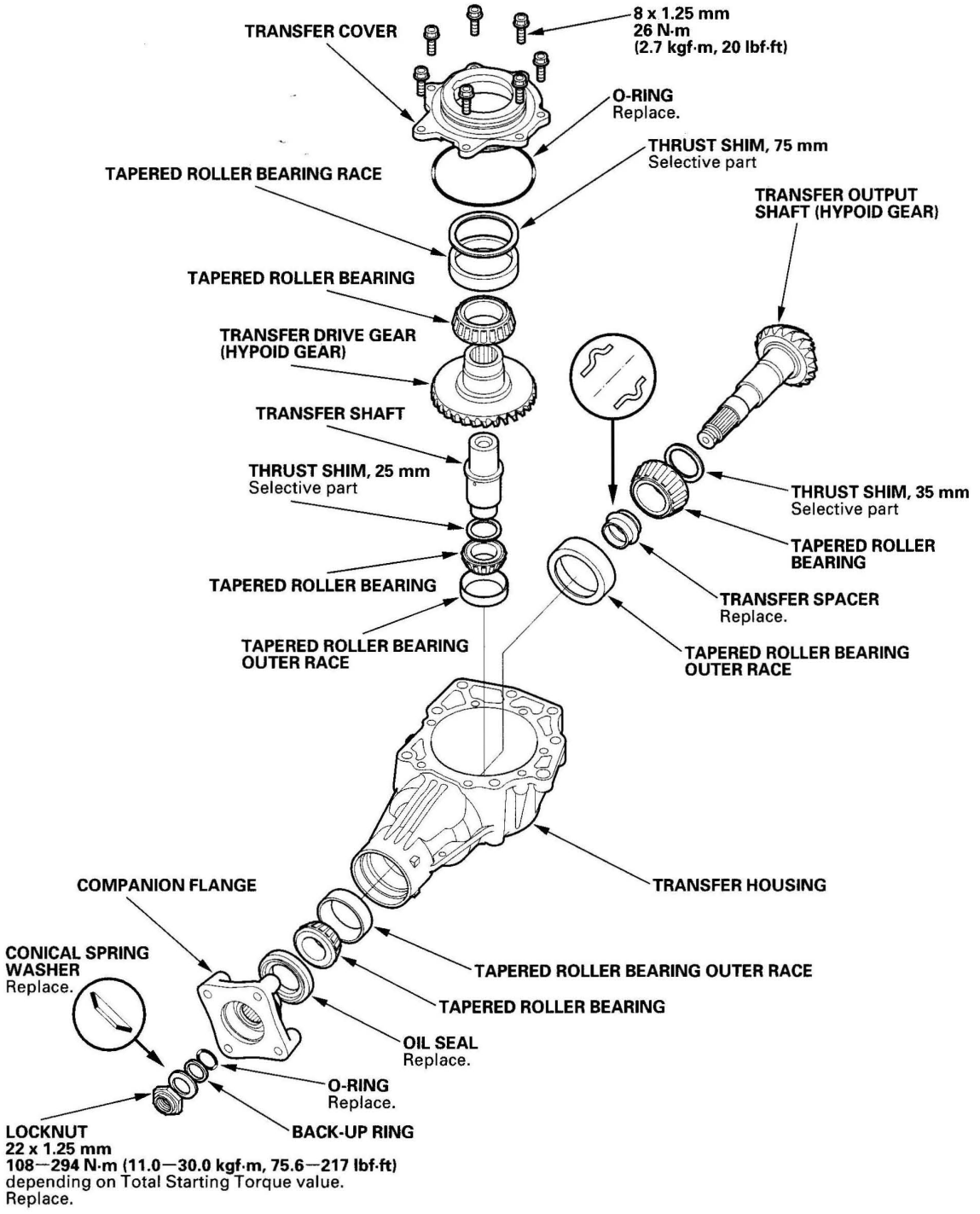
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Transfer Assembly

Disassembly

Exploded View

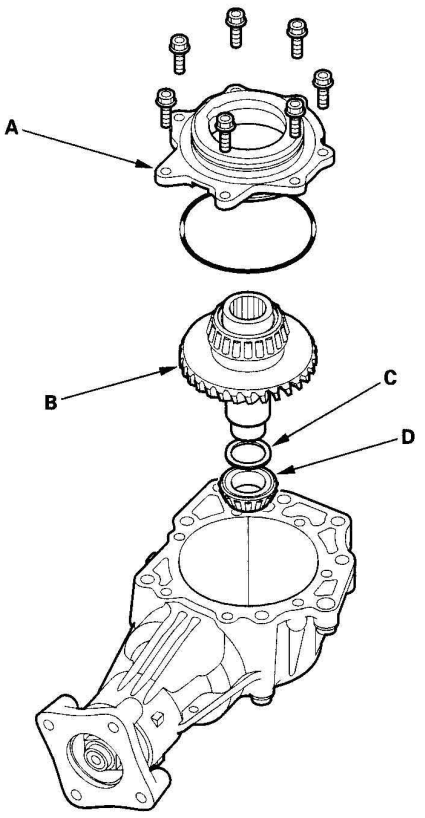


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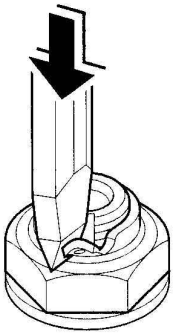
Special Tools Required
- Companion flange holder
  07XAB-0020100

1. Remove the transfer cover (A).



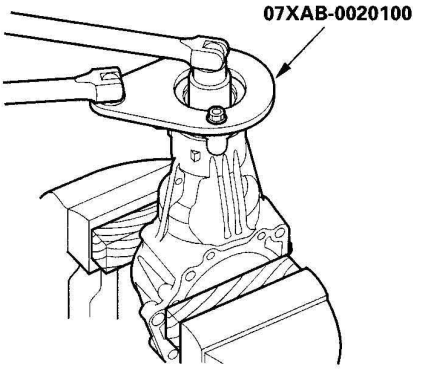
2. Remove the transfer drive gear/shaft assembly (B), 25 mm thrust shim (C), and tapered roller bearing (D).

3. Cut the lock tab on the locknut using a chisel.



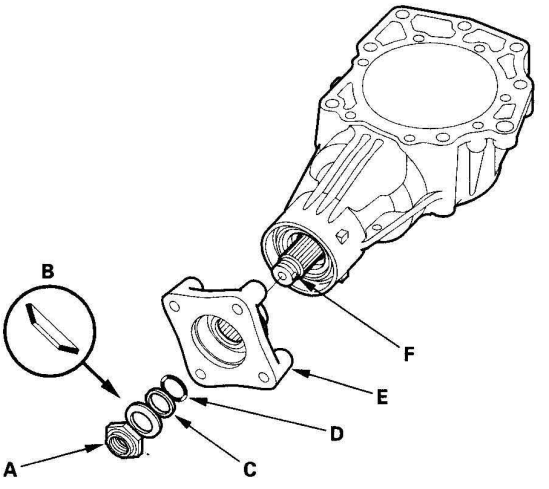
4. Secure the transfer housing in a bench vise with soft jaws. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

5. Install the special tool on the companion flange, then loosen the locknut.



6. Remove the special tool.

7. Remove the locknut (A), conical spring washer (B), back-up ring (C), O-ring (D), and companion flange (E) from the transfer driven gear shaft (F).



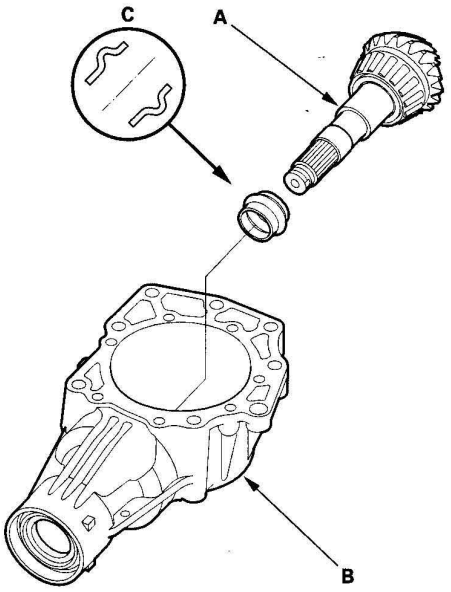
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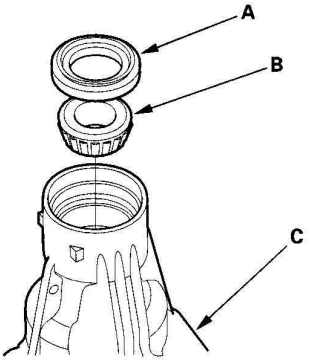
Transfer Assembly

Disassembly (cont'd)

8. Remove the transfer driven gear shaft (A) from the transfer housing (B), then remove the transfer spacer (C) from the transfer driven gear shaft.



9. Remove the oil seal (A) and tapered roller bearing (B) from the transfer housing (C).

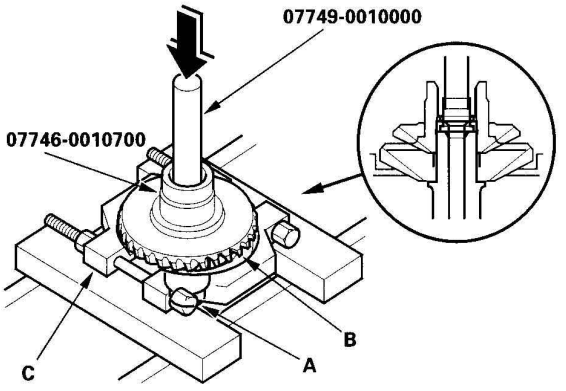


Transfer Drive Gear Replacement

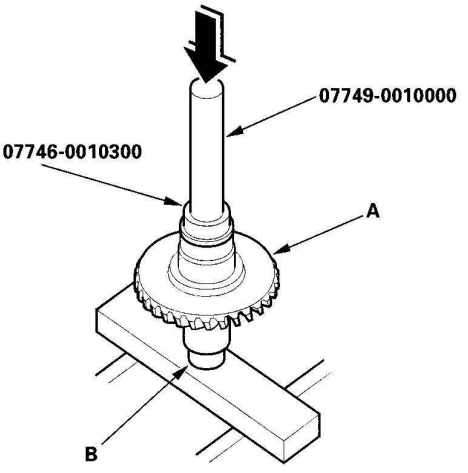
Special Tools Required
- Driver 07749-0010000
- Attachment, 24 x 26 mm 07746-0010700
- Attachment, 42 x 47 mm 07746-0010300

NOTE: Replace the transfer drive gear and transfer driven gear shaft as a set if either part is replaced.

1. Remove the transfer shaft (A) from the transfer drive gear (B) with the special tools, bearing separator (C) and a press.



2. Install the new transfer drive gear (A) on the transfer shaft (B) with the special tools and a press.



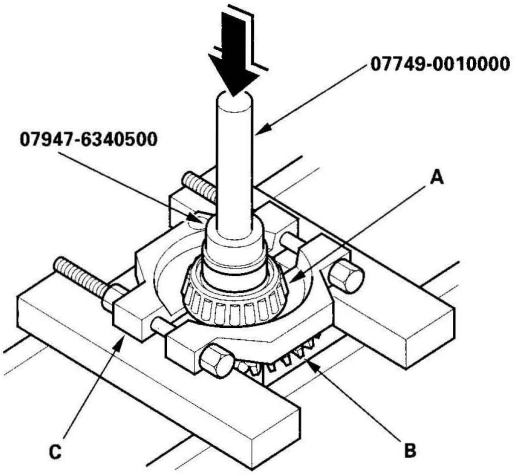
BACK

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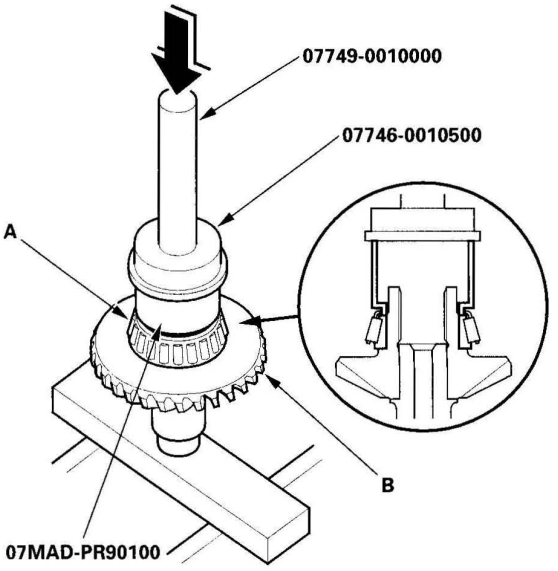
Transfer Drive Gear Bearing Replacement

Special Tools Required
- Driver 07749-0010000
- Driver attachment 07947-6340500
- Attachment, 62 x 68 mm 07746-0010500
- Attachment, 45 x 55 mm 07MAD-PR90100

1. Remove the tapered roller bearing (A) from the transfer drive gear (B) with the special tools, bearing separator (C) and a press.



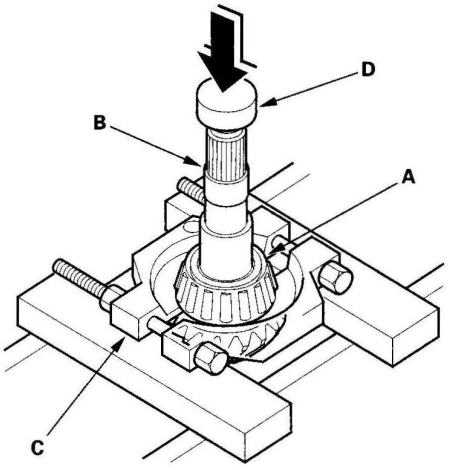
2. Install the new tapered roller bearing (A) on the transfer drive gear (B) with the special tools and a press.



Transfer Output Shaft Bearing Removal/Installation

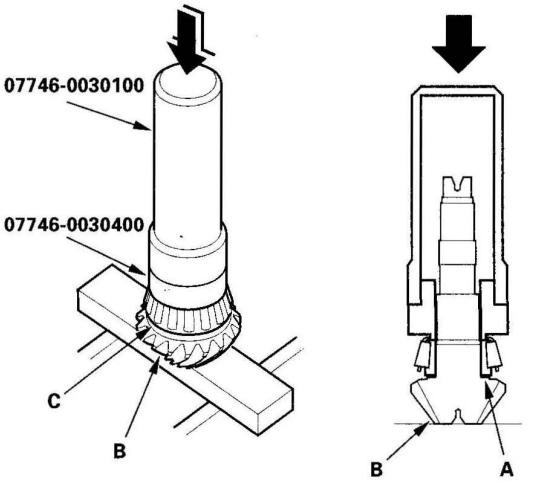
Special Tools Required
- Driver 40 mm I.D. 07746-0030100
- Attachment, 35 mm I.D. 07746-0030400

1. Remove the tapered roller bearing (A) from the transfer output shaft (B) with a bearing separator (C) and a press. Place a shaft protector (D) between the transfer output shaft and a press to prevent damaging the shaft.



2. Install the 35 mm thrust shim (A) on the transfer output shaft (B).

3. Install the tapered roller bearing (C) on the transfer output shaft (B) with the special tools and a press.



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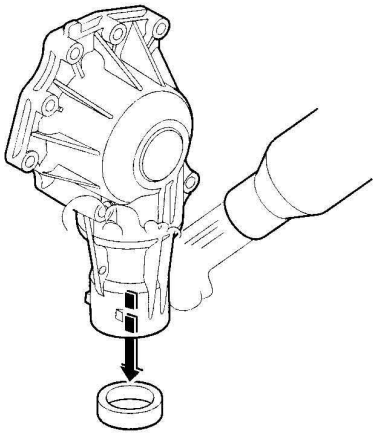
Transfer Housing Tapered Roller Bearing Outer Race Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 52 x 55 mm 07746-0010400
- Oil seal driver attachment 07JAD-PH80101
- Tapered bearing race installer A 07MAF-SP0011A
- Installer shaft 07MAF-SP0013A

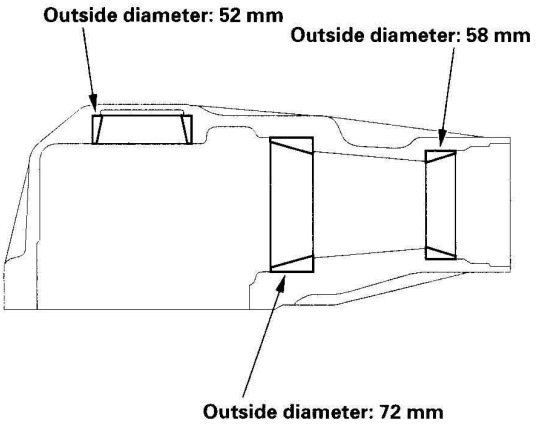
NOTE: Replace the bearing with a new one whenever the outer race is replaced.

1. Remove the bearing outer races from the transfer housing by heating the housing to about 212°F (100 °C) with a heat gun. Do not heat the housing more than 212°F (100°C).

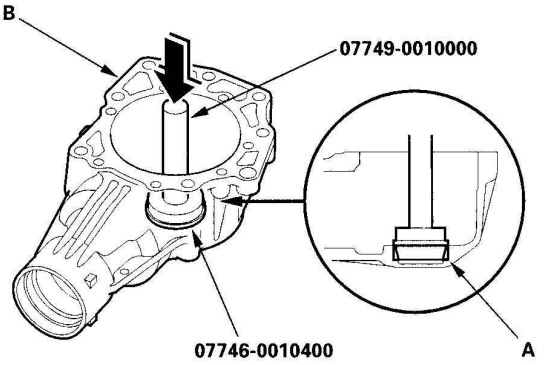
   NOTE: Some bearing outer races (52 mm and 72 mm) are not press-fitted, and can be removed without heating the housing.



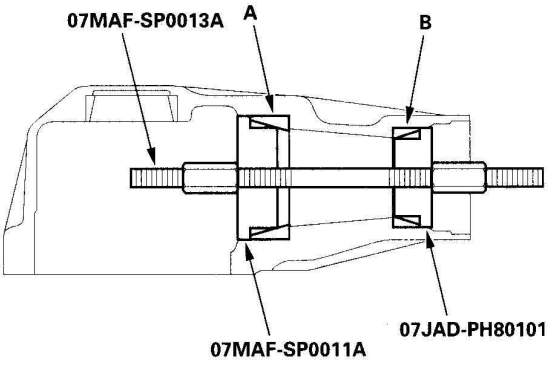
Bearing Outer Race Locations



2. Install the 52 mm bearing outer race (A) in the transfer housing (B) with the special tools.



3. Install the 72 mm (A) and 58 mm (B) bearing outer races in the transfer housing with the special tools.



BACK

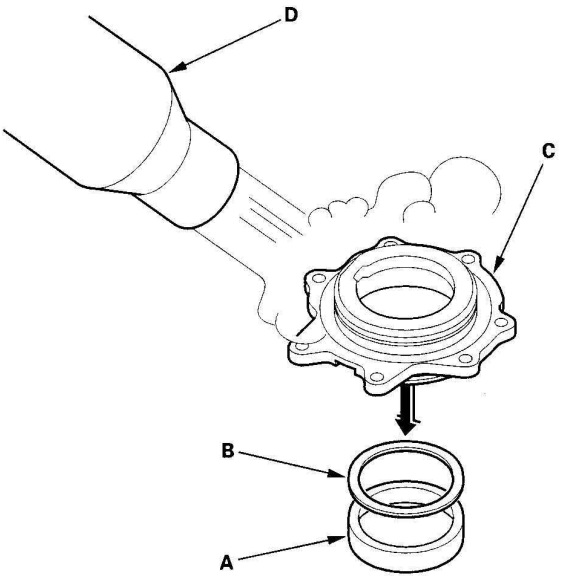
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Transfer Cover Tapered Roller Bearing Outer Race Removal/Installation

Special Tools Required
- Driver 07749-0010000
- Attachment, 72 x 75 mm 07746-0010600

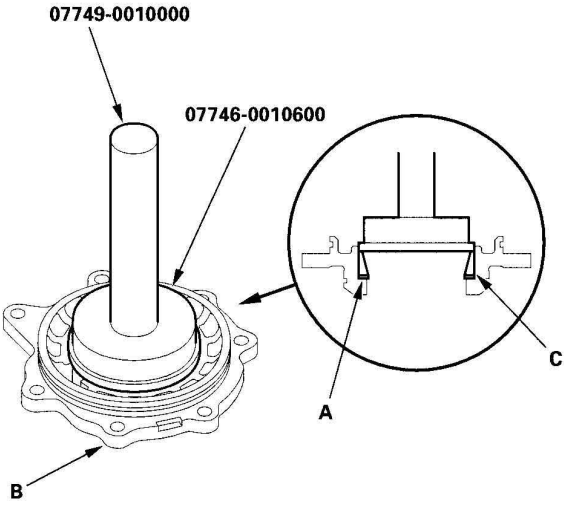
NOTE: Replace the bearing with a new one whenever the outer race is replaced.

1. Remove the bearing outer race (A) and 75 mm thrust shim (B) from the transfer cover (C). If the bearing outer race is press-fitted, remove the bearing outer race by heating the cover to about 212°F (100°C) with a heat gun (D). Do not heat the cover more than 212°F (100°C).



2. Install the 75 mm thrust shim (A) in the transfer cover (B).

3. Install the bearing outer race (C) in the cover. If the outer race is press-fitted, use the special tools.



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Reassembly

Special Tools Required
- Driver 40 mm I.D. 07746-0030100
- Attachment, 35 mm I.D. 07746-0030400
- Driver 07749-0010000
- Seal driver attachment 07GAD-PG40100 or 07GAD-PG40101
- Companion flange holder 07XAB-0020100
- Attachment, 72 x 75 mm 07746-0010600

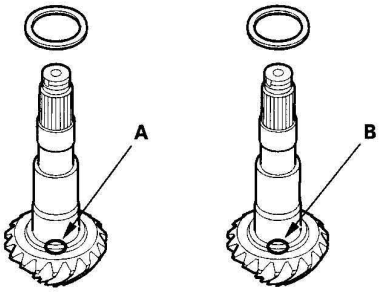
NOTE:
- While reassembling the transfer assembly:
  - Check and adjust the transfer gear tooth contact.
  - Measure and adjust the transfer gear backlash.
  - Check and adjust the tapered roller bearing starting torque.
- Coat all parts with ATF during reassembly.
- Replace the tapered roller bearing and the bearing outer race as a set if either part is replaced.
- Replace the transfer drive gear and the transfer driven gear shaft as a set if either part is replaced.

1. Select the 35 mm thrust shim if the transfer driven gear shaft is replaced. Calculate the thickness of the 35 mm thrust shim using the formula below, and select the shim from the table below.

FORMULA: $\frac{A}{100}-\frac{B}{100}+C=X$

A: Number on the existing transfer driven gear shaft
B: Number on the replacement transfer driven gear shaft
C: Thickness of the existing 35 mm thrust shim
X: Thickness needed for the replacement 35 mm thrust shim
NOTE: The number on the transfer driven gear shaft is shown in 1/100 mm.

EXAMPLE:
C: EXISTING 35 mm THRUST SHIM Thickness: C=1.05 mm
X: REPLACEMENT 35mm THRUST SHIM Thickness: X= ? ? mm



A: EXISTING TRANSFER DRIVEN GEAR SHAFT Number: A=+2
B: REPLACEMENT TRANSFER OUTPUT SHAFT Number: B=−1

$$X=\frac{A}{100}-\frac{B}{100}+C$$
$$=\frac{2}{100}-\frac{-1}{100}+1.05$$
$$=0.02+0.01+1.05=1.08\ (mm)$$

Select No. M 35 mm thrust shim of 1.08 mm (0.043 in.).

THRUST SHIM, 35 mm

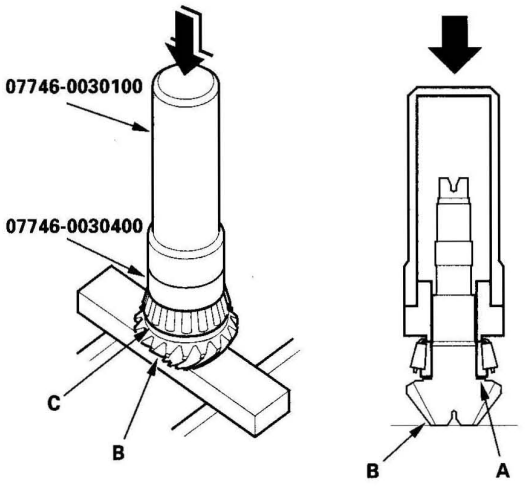
Shim No.	Part Number	Thickness
A	41361-PS3-000	0.72 mm (0.028 in.)
B	41362-PS3-000	0.75 mm (0.030 in.)
C	41363-PS3-000	0.78 mm (0.031 in.)
D	41364-PS3-000	0.81 mm (0.032 in.)
E	41365-PS3-000	0.84 mm (0.033 in.)
F	41366-PS3-000	0.87 mm (0.034 in.)
G	41367-PS3-000	0.90 mm (0.035 in.)
H	41368-PS3-000	0.93 mm (0.037 in.)
I	41369-PS3-000	0.96 mm (0.038 in.)
J	41370-PS3-000	0.99 mm (0.039 in.)
K	41371-PS3-000	1.02 mm (0.040 in.)
L	41372-PS3-000	1.05 mm (0.041 in.)
M	41373-PS3-000	1.08 mm (0.043 in.)
N	41374-PS3-000	1.11 mm (0.044 in.)

2. Select the 35 mm thrust shim if the tapered roller bearing on the transfer driven gear shaft is replaced. Measure the thickness of the replacement bearing and the existing bearing, and calculate the difference of the bearing thickness. Adjust the thickness of the existing 35 mm thrust shim by the amount of difference in bearing thickness, and select the replacement 35 mm thrust shim from the table on step 1.

BACK

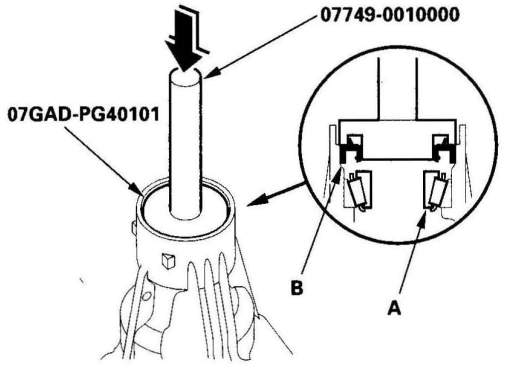
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3. Install the 35 mm thrust shim (A) on the transfer driven gear shaft (B), then install the tapered roller bearing (C) with the special tools and a press.

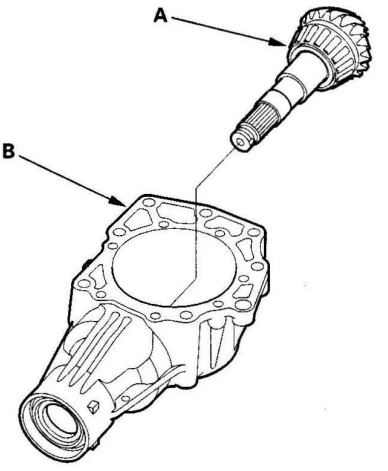


4. Place the tapered roller bearing (A) on the bearing outer race of the companion flange side of the transfer housing.

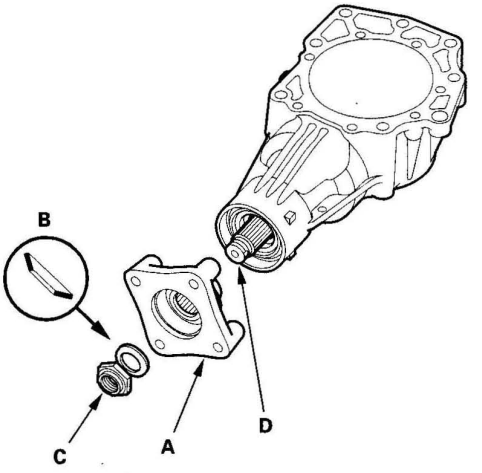
5. Install the new oil seal (B) on the transfer housing with the special tools and a press.



6. Install the transfer driven gear shaft (A) in the transfer housing (B). Do not install the transfer spacer on the transfer output shaft.



7. Install the companion flange (A), conical spring washer (B), and locknut (C) on the transfer output shaft (D). Do not install the O-ring and back-up ring on the transfer output shaft.



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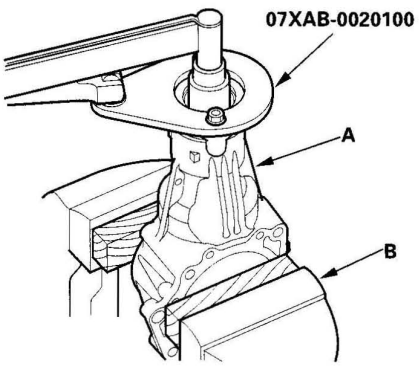
Reassembly (cont'd)

8. Secure the transfer housing (A) in a bench vise (B) with soft jaws, then install the special tool on the companion flange. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

9. Tighten the locknut while measuring the starting torque so the starting torque is within 1.15 – 1.71 N·m (11.7 – 17.4 kgf·cm, 10.2 – 15.1 lbf·in).

   NOTE: Do not stake the locknut in this step.

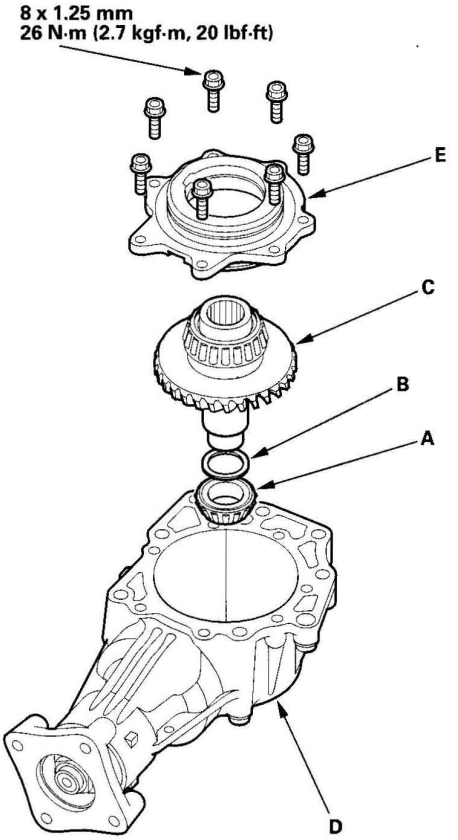
   TIGHTENING TORQUE:
   108 – 294 N·m
   (11.0 – 30.0 kgf·m, 79.6 – 217 lbf·ft)
   STARTING TORQUE:
   1.15 – 1.71 N·m
   (11.7 – 17.4 kgf·cm, 10.2 – 15.1 lbf·in)



10. Apply Prussian Blue to both sides of the transfer drive gear teeth lightly and evenly.

11. Install the tapered roller bearing (A), 25 mm thrust shim (B), and transfer drive gear/shaft assembly (C) in the transfer housing (D).

12. Install the transfer cover (E), and tighten the bolts. Do not install the O-ring on the transfer cover.



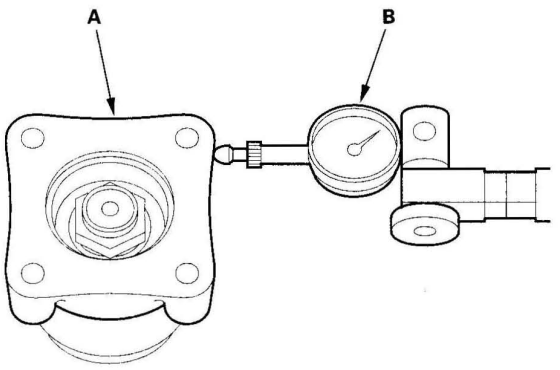
BACK

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13. Rotate the companion flange (A) several times to seat the tapered roller bearings.

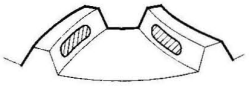
14. Set the dial indicator (B) on the companion flange, then measure the transfer gear backlash.

STANDARD: 0.06 – 0.16 mm (0.02 – 0.06 in.)

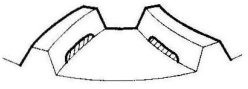


15. Remove the transfer cover, transfer drive gear/shaft assembly, and check the transfer drive gear tooth contact pattern.

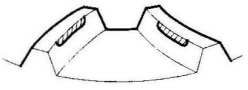
CORRECT TOOTH CONTACT PATTERN



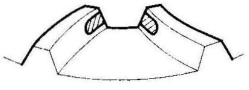
INCORRECT TOOTH CONTACT PATTERN



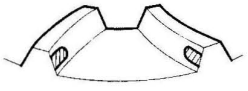
TOE CONTACT



HEEL CONTACT



FLANK CONTACT



FACE CONTACT

16. If the measurement of the backlash is out of the standard, adjust the transfer gear backlash with the 35 mm thrust shim and recheck. Do not use more than two 35 mm thrust shims to adjust the transfer gear backlash.

17. If the transfer gear tooth contact is incorrect, adjust the transfer gear tooth contact with the 25 mm or 35 mm thrust shim. Do not use more than two shims of each thrust shim to adjust the tooth contact.

- **Toe Contact**
  Use a thicker 35 mm thrust shim to move the transfer output shaft toward the transfer drive gear. Because this movement causes the transfer backlash to change, move the transfer drive gear away from the transfer output shaft to adjust the transfer gear backlash as follows:
  - Increase the thickness of the 25 mm thrust shim.
  - Reduce the thickness of the 75 mm thrust shim by the amount of increase thickness of the 25 mm thrust shim.

- **Heel Contact**
  Use a thinner 35 mm thrust shim to move the transfer driven gear shaft away from the transfer drive gear. Because this movement causes the transfer gear backlash to change, move the transfer drive gear toward the transfer output shaft to adjust the transfer gear backlash as follows:
  - Reduce the thickness of the 25 mm thrust shim.
  - Increase the thickness of the 75 mm thrust shim by amount of reduce thickness of the 25 mm thrust shim.

- **Flank Contact**
  Use a thinner thrust shim to move the transfer output toward the transfer output shaft.
  Flank contact must be adjusted within the limits of the transfer gear backlash. If the backlash exceeds the limits, adjust as described under Heel Contact.

- **Face Contact**
  Use a thicker thrust shim to move the transfer output away from the transfer output shaft.
  Face contact must be adjusted within the limits of the transfer gear backlash. If the backlash exceeds the limits, adjust as described under Toe Contact.

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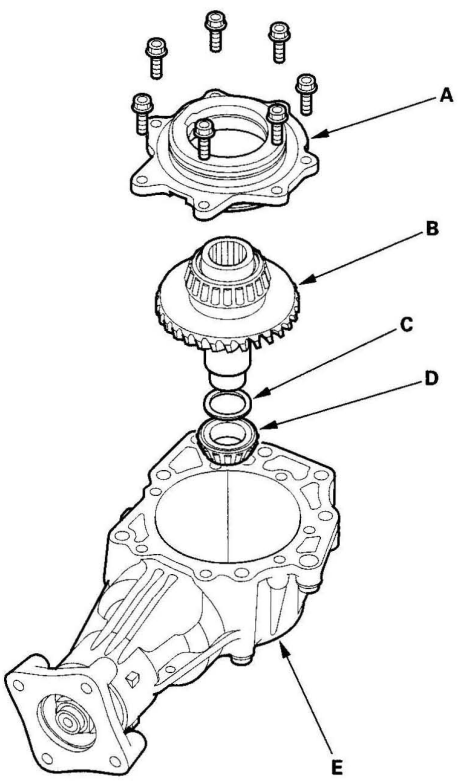
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Reassembly (cont'd)

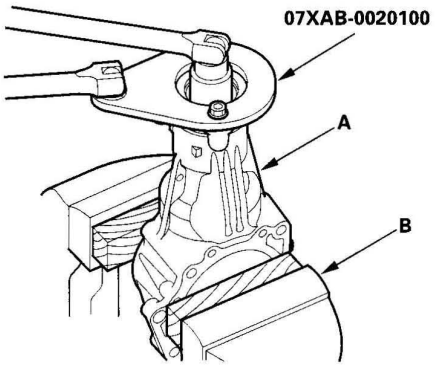
THRUST SHIM, 25 mm

Shim No.	Part Number	Thickness
1.70	29411-P1C-000	1.70 mm (0.067 in.)
1.73	29412-P1C-000	1.73 mm (0.068 in.)
1.76	29413-P1C-000	1.76 mm (0.069 in.)
1.79	29414-P1C-000	1.79 mm (0.070 in.)
1.82	29415-P1C-000	1.82 mm (0.072 in.)
1.85	29416-P1C-000	1.85 mm (0.073 in.)
1.88	29417-P1C-000	1.88 mm (0.074 in.)
1.91	29418-P1C-000	1.91 mm (0.075 in.)
1.94	29419-P1C-000	1.94 mm (0.076 in.)
1.97	29420-P1C-000	1.97 mm (0.078 in.)
2.00	29421-P1C-000	2.00 mm (0.079 in.)
2.03	29422-P1C-000	2.03 mm (0.080 in.)
2.06	29423-P1C-000	2.06 mm (0.081 in.)
2.09	29424-P1C-000	2.09 mm (0.082 in.)
2.12	29425-P1C-000	2.12 mm (0.083 in.)
2.15	29426-P1C-000	2.15 mm (0.085 in.)
2.18	29427-P1C-000	2.18 mm (0.086 in.)
2.21	29428-P1C-000	2.21 mm (0.087 in.)
2.24	29429-P1C-000	2.24 mm (0.088 in.)

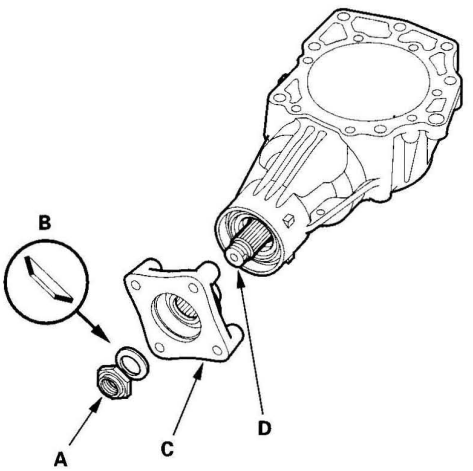
18. Remove the transfer cover (A), transfer drive gear/shaft assembly (B), 25 mm thrust shim (C), and tapered roller bearing (D) from the transfer housing (E) after adjusting the transfer gear backlash or transfer gear tooth contact.



19. Secure the transfer housing (A) in a bench vise (B) with soft jaws, then install the special tool on the companion flange. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.



20. Remove the locknut (A), conical spring washer (B), and companion flange (C) from the transfer output shaft (D).

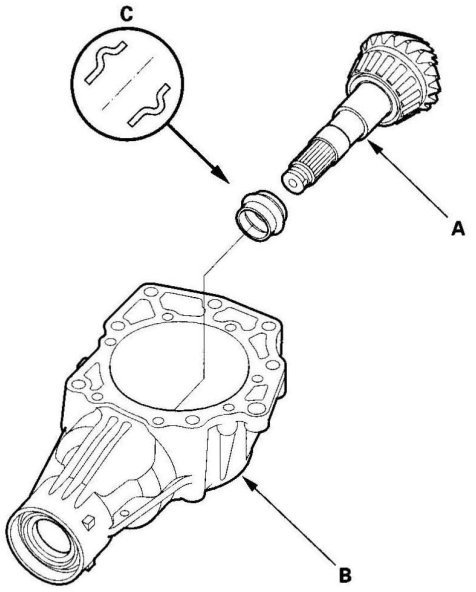


BACK

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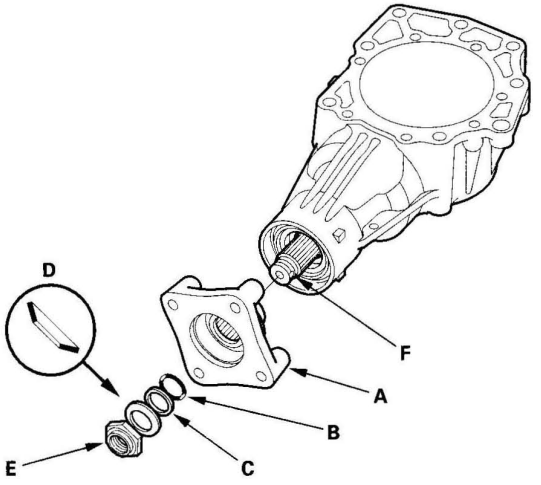
21. Remove the transfer output shaft (A) from the transfer housing (B).

22. Install the new transfer spacer (C) on the transfer output shaft in the direction shown, and install them in the transfer housing.

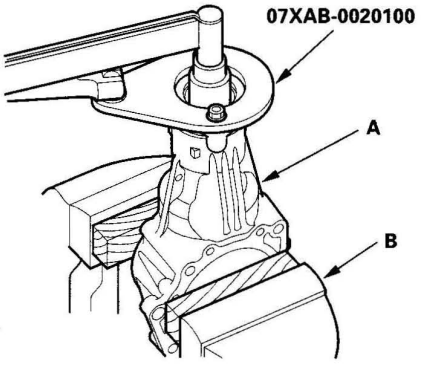


23. Coat the threads of the locknut and transfer output shaft with ATF.

24. Install the companion flange (A), new O-ring (B), back-up ring (C), new conical spring washer (D), and new locknut (E) on the transfer output shaft (F). Install the conical spring washer in the direction shown.



25. Secure the transfer housing (A) in a bench vise (B) with soft jaws, then install the special tool on the companion flange. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.



26. Tighten the locknut while measuring the starting torque of the transfer driven gear.

TIGHTENING TORQUE:
108 – 294 N·m
(11.0 – 30.0 kgf·m, 79.6 – 217 lbf·ft)
STARTING TORQUE:
1.15 – 1.71 N·m
(11.7 – 17.4 kgf·cm, 10.2 – 15.1 lbf·in)

NOTE:
- Rotate the companion flange several times to seat the tapered roller bearings, then measure the starting torque.
- If the starting torque exceeds 1.71 N·m (17.4 kgf·cm, 15.1 lbf·in), replace the transfer spacer and reassemble the parts. Do not adjust the torque with the locknut loose.
- If the tightening torque exceeds 294 N·m (30.0 kgf·m, 217 lbf·ft), replace the transfer spacer and reassemble the parts.
- Write down the measurement of the starting torque: it is used to measure the total starting torque.

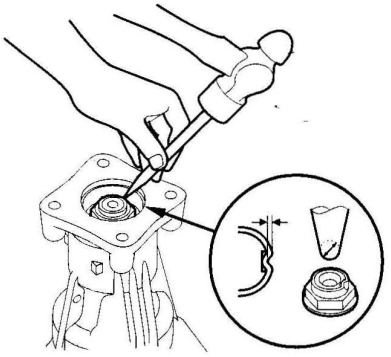
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Reassembly (cont'd)

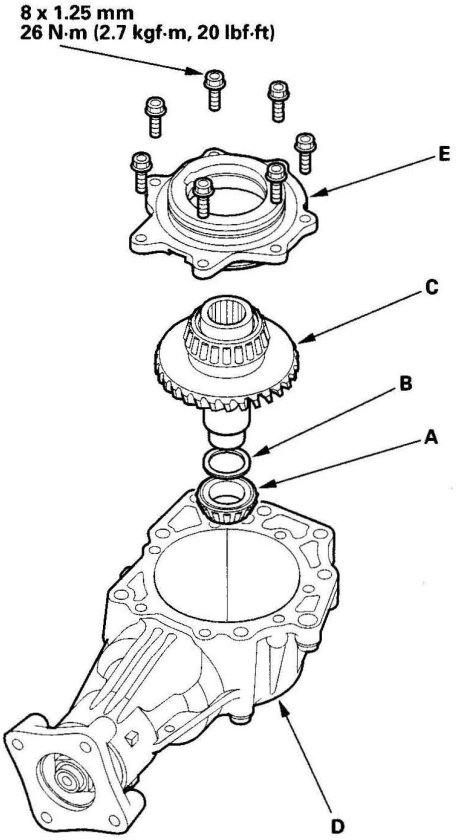
27. Remove the special tools.

28. Stake the locknut using a 3.5 mm punch.



29. Install the tapered roller bearing (A), 25 mm thrust shim (B), and transfer drive gear/shaft assembly (C) in the transfer housing (D).

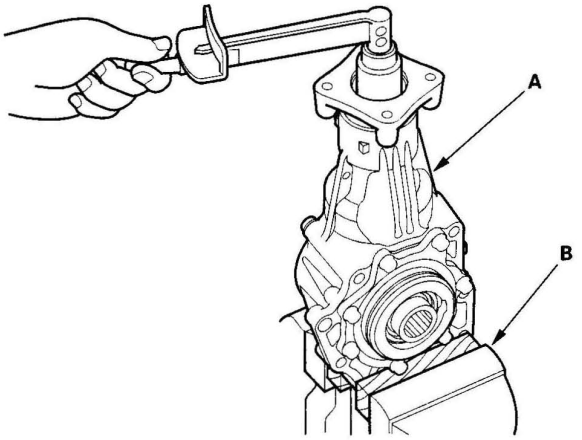
30. Temporarily install the transfer cover (E) without the O-ring, and tighten the bolts.



31. Secure the transfer housing (A) in a bench vise (B) with soft jaws, then rotate the companion flange several times to seat the tapered roller bearings. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

32. Measure the total starting torque. Total starting torque is the figure below + the transfer driven gear starting torque measured in step 26.

TOTAL STARTING TORQUE = 1.51 – 1.78 N·m (15.4 – 18.1 kgf·cm, 13.4 – 15.7 lbf·in) + Transfer Output Starting Torque Value (measured and written down in step 26)



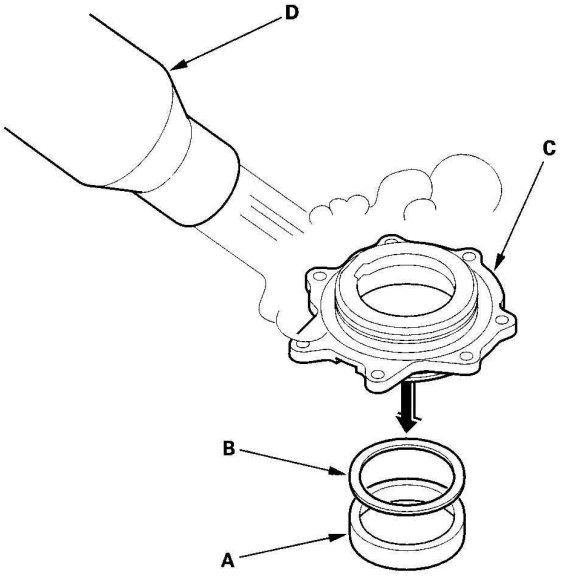
BACK

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33. Remove the transfer cover.

34. If the measurement is out of standard, remove the bearing outer race (A) and 75 mm thrust shim (B) from the transfer cover (C). If the bearing outer race is press-fitted, remove the bearing outer race by heating the cover to about 212°F (100°C) with a heat gun (D). Do not heat the cover more than 212°F (100 °C).

    If the measurement is within the standard, go to step 36.



35. Measure the thickness of removed 75 mm thrust shim, and select the new 75 mm shim.

THRUST SHIM, 75 mm

Shim No.	Part Number	Thickness
AA	41401-PGV-000	1.52 mm (0.060 in.)
AB	41402-PGV-000	1.55 mm (0.061 in.)
AC	41403-PGV-000	1.58 mm (0.062 in.)
AD	41404-PGV-000	1.61 mm (0.063 in.)
AE	41405-PGV-000	1.64 mm (0.065 in.)
B	41402-PW8-010	1.67 mm (0.066 in.)
C	41403-PW8-010	1.70 mm (0.067 in.)
D	41404-PW8-010	1.73 mm (0.068 in.)
E	41405-PW8-010	1.76 mm (0.069 in.)
F	41406-PW8-010	1.79 mm (0.070 in.)
G	41407-PW8-010	1.82 mm (0.072 in.)
H	41408-PW8-010	1.85 mm (0.073 in.)
I	41409-PW8-010	1.88 mm (0.074 in.)
J	41410-PW8-010	1.91 mm (0.075 in.)
K	41411-PW8-010	1.94 mm (0.076 in.)
L	41412-PW8-010	1.97 mm (0.078 in.)
M	41413-PW8-010	2.00 mm (0.079 in.)
N	41414-PW8-010	2.03 mm (0.080 in.)
O	41415-PW8-010	2.06 mm (0.081 in.)
P	41416-PW8-010	2.09 mm (0.082 in.)
Q	41417-PW8-010	2.12 mm (0.083 in.)
R	41418-PW8-010	2.15 mm (0.085 in.)
S	41419-PW8-010	2.18 mm (0.086 in.)
T	41420-PW8-010	2.21 mm (0.087 in.)
U	41421-PW8-010	2.24 mm (0.088 in.)
V	41422-PW8-010	2.27 mm (0.089 in.)
W	41423-PW8-010	2.30 mm (0.091 in.)
X	41424-PW8-010	2.33 mm (0.092 in.)
Y	41425-PW8-010	2.36 mm (0.093 in.)
Z	41426-PW8-010	2.39 mm (0.094 in.)
ZA	41406-PGV-000	2.42 mm (0.095 in.)
ZB	41407-PGV-000	2.45 mm (0.096 in.)
ZC	41408-PGV-000	2.48 mm (0.098 in.)
ZD	41409-PGV-000	2.51 mm (0.099 in.)
ZE	41410-PGV-000	2.54 mm (0.100 in.)
ZF	41411-PGV-000	2.57 mm (0.101 in.)
ZG	41412-PGV-000	2.60 mm (0.102 in.)
ZH	41413-PGV-000	2.63 mm (0.104 in.)
ZI	41414-PGV-000	2.66 mm (0.105 in.)

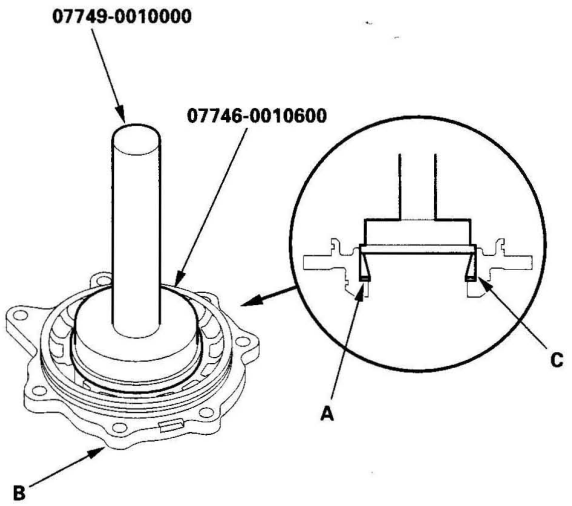
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Reassembly (cont'd)

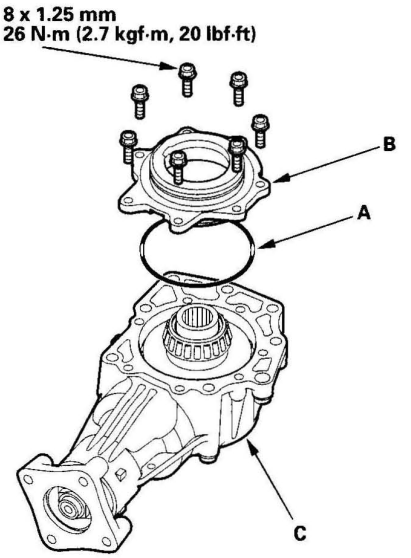
36. Install the 75 mm thrust shim (A) in the transfer cover (B). If you heated the cover, let it cool to room temperature before installing the thrust shim.

37. Install the bearing outer race (C) in the cover. Use the special tools if the outer race is press-fitted.



38. After replacing the 75 mm thrust shim, recheck and make sure the total starting torque is within the specification.

39. Install the new O-ring (A) on the transfer cover (B), then install the cover on the transfer housing (C).



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Rear Differential

Rear Differential

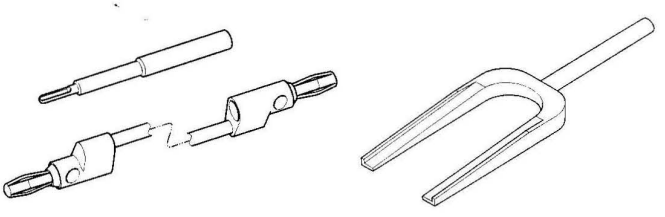
Special Tools 15-2
Component Location Index 15-3
General Troubleshooting Information 15-4
DTC Troubleshooting Index 15-10
Symptom Troubleshooting Index 15-11
System Description 15-12
Circuit Diagram 15-18
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VTM-4 Indicator Light Circuit Troubleshooting 15-34
VTM-4 LOCK Indicator Light Circuit Troubleshooting 15-36
Differential Fluid Inspection and Replacement 15-39
Differential Function Test 15-40
Differential Oil Temperature Sensor Replacement 15-42
VTM-4 Lock Switch Test/Replacement 15-42
VTM-4 Control Unit Replacement 15-43
VTM-4 Relay Replacement 15-43
Differential Mount Replacement 15-44
Differential Removal 15-45
Backlash Inspection 15-47
Differential Installation 15-48

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Rear Differential

Special Tools

Ref. No.	Tool Number	Description	Qty
①	07SAZ-001000A	Backprobe Set	2
②	07AAD-S3VA000	Driveshaft Remover	1

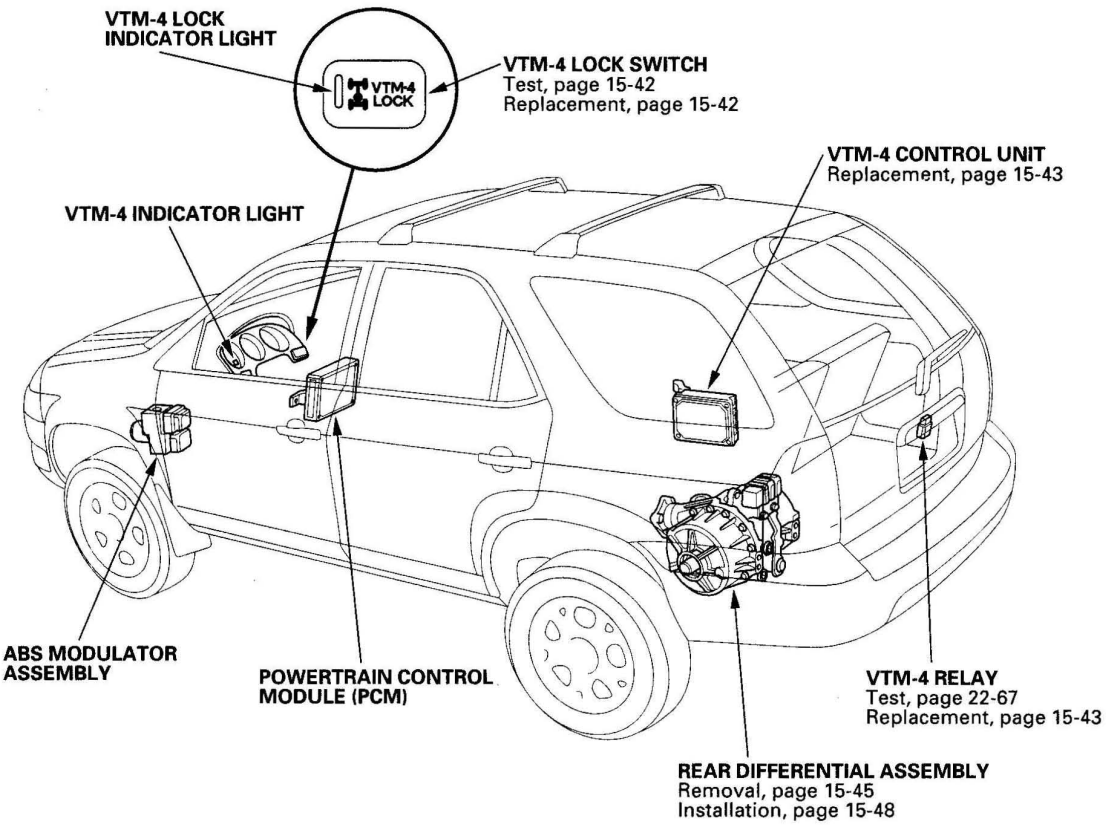


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Component Location Index



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General Troubleshooting Information

VTM-4 Indicator Light

The VTM-4 indicator light comes on under certain conditions even if the 4WD system working normally. Here are some examples:

- When you use high-powered wireless equipment such as a CB or Ham radio in the vehicle.
- When you keep spinning the rear wheels while the vehicle is stuck in sand, mud, snow, etc.
- When the battery voltage suddenly drops below 8 volts or rises above 16 volts.

After the VTM-4 indicator light comes on, it stays on until you turn the ignition switch off.

Diagnostic Trouble Code (DTC)

- The VTM-4 control unit can memorize up to seven different DTCs. The system displays the DTCs by blinking the VTM-4 indicator light. Multiple DTCs are displayed in the order they occured, beginning with the most recent.
- If the same DTC is detected more than once, the most recent DTC is written over the earlier one. Therefore, when the same problem is detected more than once, it is memorized as a single DTC.
- The DTCs are memorized in the EEPROM (non-volatile memory). Therefore, the memorized DTCs are not cleared when the battery is disconnected or the VTM-4 control unit is disconnected.
- If there is a problem in the central processing unit (CPU) of the VTM-4 control unit, the VTM-4 indicator light comes on, but no DTC is memorized.

Self-diagnosis

When a problem is detected by self-diagnosis, the system does the following:

- Turns the VTM-4 indicator light on.
- Memorizes the DTC.
- Stops 4WD control and puts the vehicle back in 2WD (FWD).
- Reduces engine torque to suit the driving conditions when the abnormally was detected.

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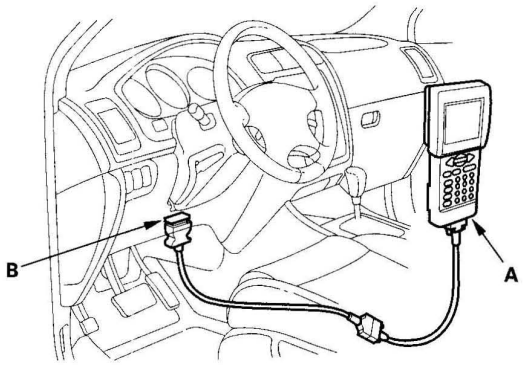
Initialization of the VTM-4 Control Unit

Whenever the VTM-4 control unit is replaced, it must be initialized to make the 4WD system function.
There are two methods used to initialize the VTM-4 control unit. One method is to use the Honda PGM Tester with the appropriate software plugged into the 16P Data Link Connector (DLC).

The other method is to initialize the VTM-4 control unit manually.

Initialization with Honda PGM Tester:

1. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P DLC (B) located behind the driver's dashboard lower cover.



2. Turn the ignition switch ON (II), and follow the prompts on the Honda PGM Tester screen.

   NOTE: See the Honda PGM Tester user's manual for specific instruction.

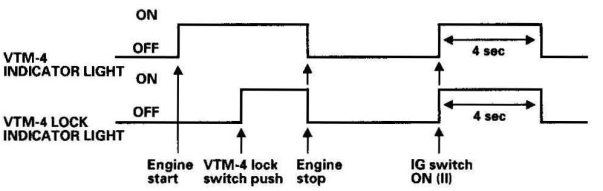
Manual Initialization:

1. Start the engine (the VTM-4 indicator light comes on, and the VTM-4 lock switch indicator is off).

2. Apply the brakes, and move the shift lever to either the R, 1, or 2 position, then push the VTM-4 lock switch (the VTM-4 indicator light stays on, and the VTM-4 lock switch indicator is on). The 4WD system is now in lock mode.

3. Turn the ignition switch off.

4. Turn the ignition switch ON (II) (the VTM-4 indicator light and the VTM-4 lock indicator light both come on for 4 seconds, then go off). The VTM-4 control unit is initialized.



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General Troubleshooting Information (cont'd)

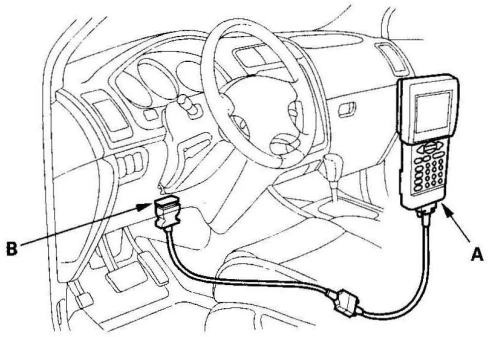
How to Check for DTCs

When the VTM-4 control unit senses an abnormality in the input or output systems, the VTM-4 indicator light in the gauge assembly will usually come on, and the Malfunction Indicator Lamp (MIL), the D5 indicator light and/or the ABS indicator light may also come on. There are two methods used to check for DTCs. One method is to use the Honda PGM Tester with the appropriate software plugged into the 16P Data Link Connector (DLC).

The other method is to connect the Service Check Signal (SCS) circuit with the Honda PGM Tester. When the 16P DLC is connected to the Honda PGM Tester, the VTM-4 indicator light will indicate the Diagnostic Trouble Code (DTC) when the ignition switch is turned ON (II) and the SCS circuit is connected to body ground.

Honda PGM Tester method:

1. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P DLC (B) located behind the driver's dashboard lower cover.



2. Turn the ignition switch ON (II), and follow the prompts on the Honda PGM Tester to display the DTC(s) on the screen. After determining the DTC(s), refer to the DTC Troubleshooting Index.

   NOTE: See the Honda PGM Tester user's manual for specific instruction.

3. If there are fuel and emissions DTCs, A/T DTCs, and ABS DTC's at the same time, troubleshoot the fuel and emission DTC's first.

4. After recording the DTCs, clear all DTCs.

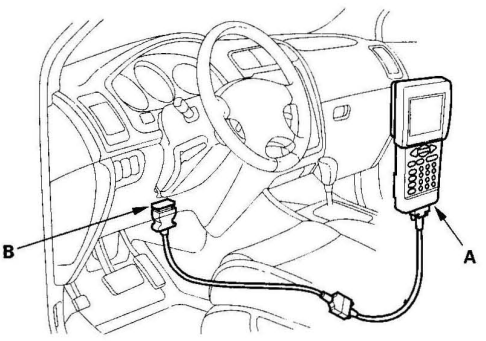
5. Test-drive the vehicle for several minutes in 4WD mode, and check for DTCs. If the DTC returns, refer to the DTC Troubleshooting Index. If the DTC does not return, there was an intermittent problem within the circuit. Make sure all connectors and terminals in the circuit are tight.

Service Check Signal Circuit (SCS) Method:

1. Park the vehicle on level ground. Shift to the P position, then turn off the engine.

2. Release the parking brake pedal.

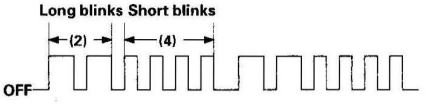
3. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P DLC (B) located behind the driver's dashboard lower cover.



4. Connect the SCS circuit to body ground using the Honda PGM Tester.

5. Turn the ignition switch ON (II), and observe the VTM-4 indicator light.

   NOTE: Codes above 10 are indicated by a series of long and short blinks. One long blink equals 10 short blinks. Add the long and short blinks together to determine the code. After determining the code, refer to the DTC Troubleshooting Index.



See DTC 24

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6. Record the all DTC(s), then refer to the DTC Troubleshooting Index to determine the meaning of the DTC.

7. Clear the DTCs from the VTM-4 control unit memory (refer to page 15-8).

8. If the MIL, D5 indicator light, and the ABS indicator light all come on at the same time, troubleshooting the cause for the MIL first.

9. Test-drive the vehicle for several minutes in 4WD mode, and check for DTCs. If the DTC returns, refer to the DTC Troubleshooting Index. If the DTC does not return, there was an intermittent problem within the circuit. Make sure all connectors and terminals in the circuit are tight.

How to Troubleshoot Circuits at the VTM-4 Control Unit

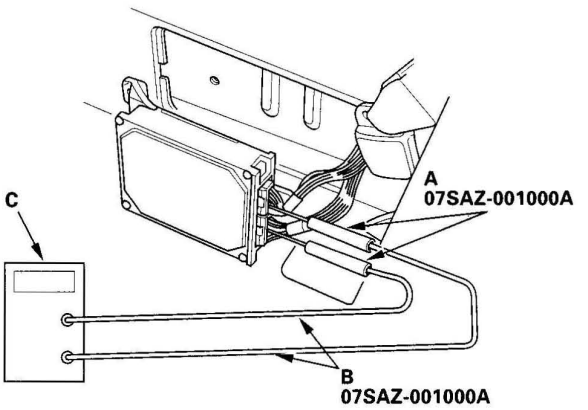
Special Tools Required
Backprobe set 07SAZ-001000A (two required)

1. Remove the front mounting bolts from the right third row seat, and fold the seat cushion back.

2. Remove the cover from the right rear side trim panel to gain access to the VTM-4 control unit (see page 15-43).

3. Inspect the circuit on the VTM-4 control unit, according to the DTC troubleshooting using the special tools and a digital multimeter or an analog circuit tester.

4. Connect the backprobes adapters (A) to the stacking patch codes (B), and connect the cords to the multimeter or and analog circuit tester (C). Using the wire insulator as a guide for the contoured-tip of the backprobe adapter, gently slide the tip into the connector from the wire side until it comes in contact with the terminal end of the wires.



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General Troubleshooting Information (cont'd)

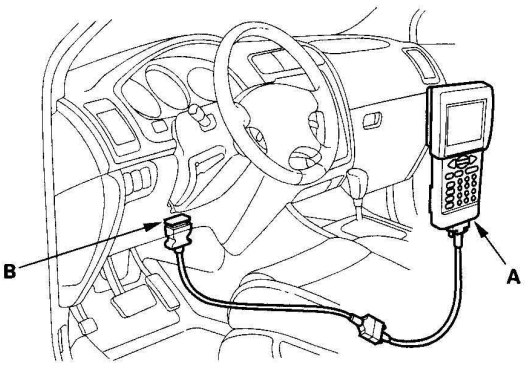
How to Clear the VTM-4 Control Unit Memory

There are two methods used to clear DTCs from the VTM-4 control unit memory. One method is to use the Honda PGM Tester with the appropriate software plugged into the 16P Data Link Connector (DLC).

The other method is to connect the Service Check Signal (SCS) connector with the Honda PGM Tester, and manually clear the memory.

Honda PGM Tester method:

1. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P DLC (B) located behind the driver's dashboard lower cover.

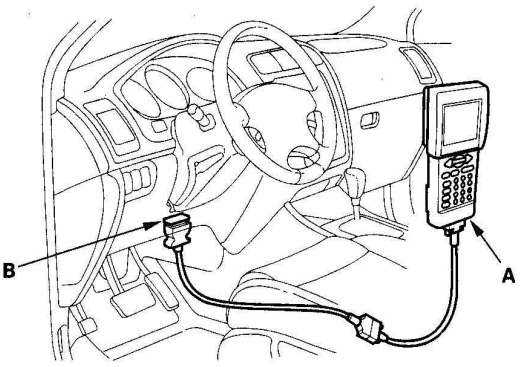


2. Turn the ignition switch ON (II), and follow the prompts on the Honda PGM Tester screen to clear the DTC(s).

   NOTE: See the Honda PGM Tester user's manual for specific instruction.

Service Check Signal Circuit (SCS) Method:

1. Park the vehicle on level ground. Shift to the P position, then turn off the engine.
2. Release the parking brake pedal.
3. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P DLC (B) located behind the driver's dashboard lower cover.



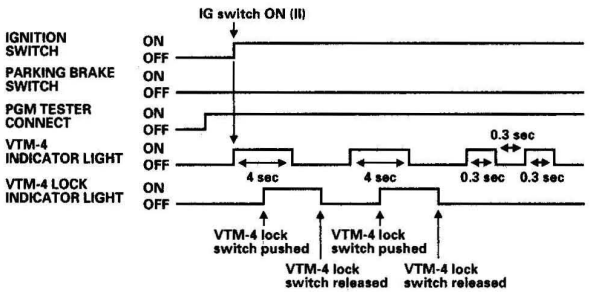
4. Connect the SCS circuit to body ground using the Honda PGM Tester.
5. Turn the ignition switch ON (II).
6. The VTM-4 indicator light comes on and stays on for 4 seconds. Press and hold the VTM-4 lock switch in while the VTM-4 indicator light is on.
7. When the VTM-4 indicator light goes off, release the VTM-4 lock switch.
8. The VTM-4 indicator light comes on and stays on for 4 seconds. Press and hold the VTM-4 lock switch in while the VTM-4 indicator light is on.

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9. When the VTM-4 indicator light goes off, release the VTM-4 lock switch. The VTM-4 indicator light will blink twice quickly to confirm that the DTCs have been cleared from the VTM-4 control unit memory.

   NOTE: If the VTM-4 indicator light does not blink twice quickly, the memory has not been cleared. Turn the ignition switch off, then repeat step 5 through 9 again.



10. Turn the ignition switch OFF, then disconnect the Honda PGM Tester from the 16P DLC.

How to End a Troubleshooting Session (required after any troubleshooting)

1. Turn the ignition switch OFF.
2. Clear the DTCs from the VTM-4 control unit memory (refer to page 15-8).
3. Disconnect the Honda PGM Tester from the 16P DLC.
4. Verify that the problem has been repaired; test-driving the vehicle for several minutes in 4WD mode.

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DTC Troubleshooting Index

DTC*	DTM-4 Indicator Light	Detection Item		Page
21	ON	Left-front wheel sensor	• Sensor is defective • Open or short in the wire harness • VTM-4 control unit is defective • ABS modulator is defective	(see page 15-20)
22	ON	Right-front wheel sensor		
23	ON	Left-rear wheel sensor		
24	ON	Right-rear wheel sensor		
26	ON	ABS modulator control unit or wire harness	• Open or short in the wire harness from the VTM-4 control unit to ABS modulator • ABS modulator is defective	(see page 15-21)
37	ON	Engine RPM signal circuit	• Open or short in the wire harness • VTM-4 control unit or PCM is defective	(see page 15-22)
38	ON			
41	ON	PCM communication	• Open or short in the wire harness of VTM-4 control unit to PCM • VTM-4 control unit or PCM is defective	(see page 15-23)
42	ON	Differential oil temperature sensor	• Sensor is defective • Open or short in the wire harness • VTM-4 control unit is defective	(see page 15-25)
43	ON			
44	ON	VTM-4 relay	• Relay is defective • Open or short in the wire harness • VTM-4 control unit is defective	(see page 15-26)
45	ON	ABS modulator unit power supply	• Open or short in the wire harness • VTM-4 control unit is defective	(see page 15-28)
51	ON	Left clutch electromagnetic coil	• Electromagnetic coil is defective • Open or short in the wire harness • VTM-4 control unit is defective	(see page 15-28)
52	ON	Left clutch electromagnetic coil		
53	ON	Left clutch electromagnetic coil		
54	ON	Left clutch electromagnetic coil		
55	ON	Right clutch electromagnetic coil	• Electromagnetic coil is defective • Open or short in the wire harness • VTM-4 control unit is defective	(see page 15-30)
56	ON	Right clutch electromagnetic coil		
57	ON	Right clutch electromagnetic coil		
58	ON	Right clutch electromagnetic coil		
59	ON	Right/left clutch electromagnetic coil power supply	• Battery is out of specification • Abnormality in the charging system • VTM-4 control unit is defective	(see page 15-31)
73	ON	MAP (Manifold absolute pressure) sensor, Throttle position sensor, or PCM	• Abnormality in the PCM system	(see page 15-32)
77	ON	PCM	• PCM is defective	(see page 15-32)
78	ON	VTM-4 control unit	• VTM-4 control unit is defective	(see page 15-33)

*: DTCs are indicated by the DTM-4 indicator light when the 16P Data Link Connector (DLC) is connected to the Honda PGM Tester.

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Symptom Troubleshooting Index

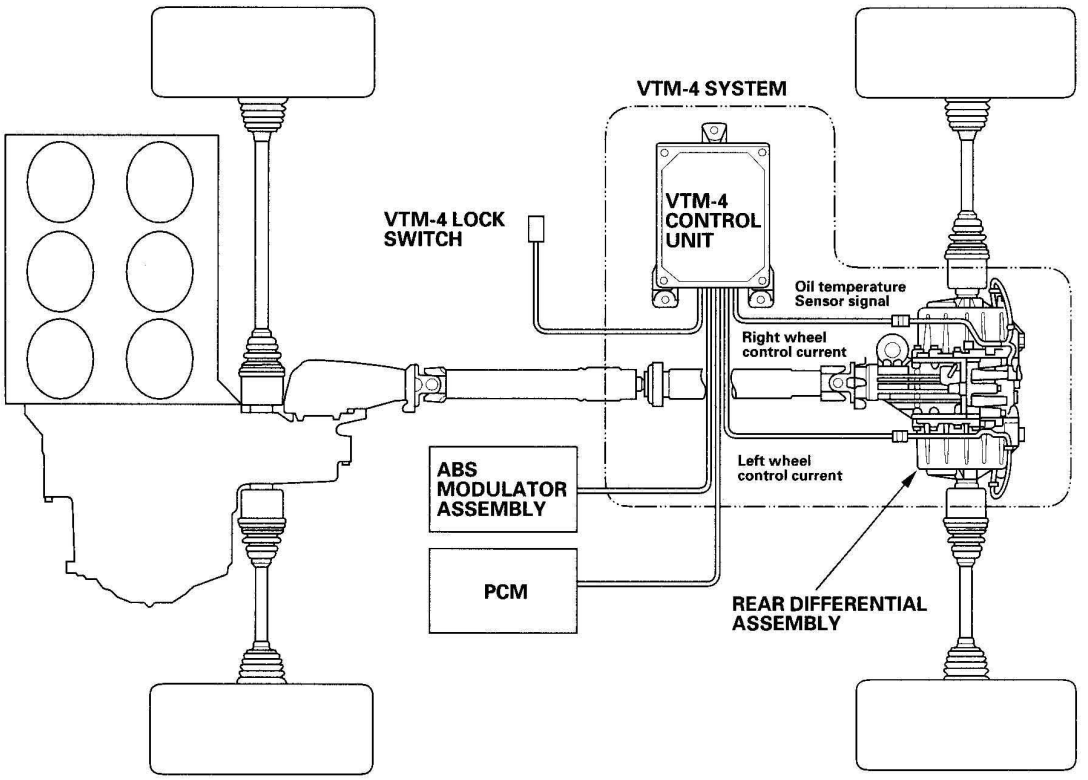
Symptom	Diagnostic Procedure	Also check for
The VTM-4 indicator light comes on, but no DTC is stored	VTM-4 Indicator Light Circuit Troubleshooting (see page 15-34).	
The VTM-4 indicator light does not comes on	VTM-4 Indicator Light Circuit Troubleshooting (see step 1 on page 15-35).	
The VTM-4 LOCK indicator light does not come on, when the VTM-4 lock switch is pushed	VTM-4 Lock Indicator Light Circuit Troubleshooting (see page 15-34).	
The VTM-4 LOCK indicator light comes on with ignition switch ON (II), and does not turn off	VTM-4 Lock Indicator Light Circuit Troubleshooting (see step 1 on page 15-37).	
The VTM-4 LOCK indicator light does not come on, for about 4 seconds when ignition switch ON (II)	VTM-4 Lock Indicator Light Circuit Troubleshooting (see step 1 on page 15-38).	

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Rear Differential

System Description

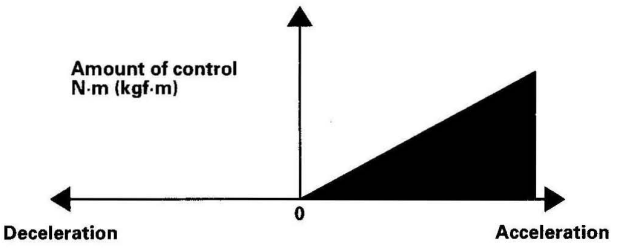
This vehicle is equipped with a rear differential system called the Variable Torque Management 4WD (VTM-4) system. The VTM-4 control unit controls the currents flowing through electromagnetic coils to engage and disengage the right and left clutches in the rear differential assembly.
The operation of the VTM-4 system consists of the following functions; Vehicle Accerelation Torque Control (VATC), Limited Slip Differential (LSD), and Lock Control.
They combine to distribute driving torque between the front and rear wheels when the vehicle is being accelerated or when wheels are slipping. The system locks up the rear differential clutches when the transmission is in R, 1 and 2 positions. By design, the torque is reduced gradually at speeds above 6 mph (10 km/h) to minimize the load on the 4 WD system.
The VTM-4 control unit has fail-safe function, a self-diagnosis function, and a provision to communicate with the Honda PGM tester.



BACK

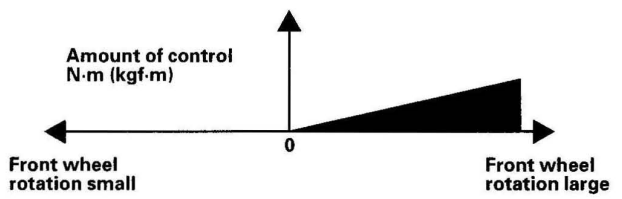
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- VATC Control
  The torque to be delivered to the rear wheels is calculated based on the acceleration of the vehicle obtained from PCM.



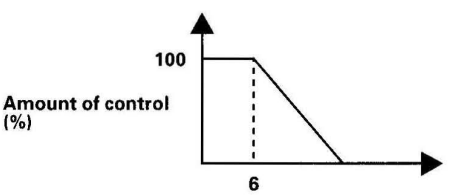
Acceleration of vehicle
(calculation from driving torque)

- LSD Control
  The torque to be delivered to the rear wheels is calculated based on the differences in speed and acceleration between the front and rear wheels.



Rotation difference between
front wheel and rear wheel

- LOCK Control
  Rear differential clutch lock control is done by pushing the VTM-4 lock switch manually when the shift lever is in R, 1 or 2 position.



Velocity of vehicle
(mph)

(cont'd)

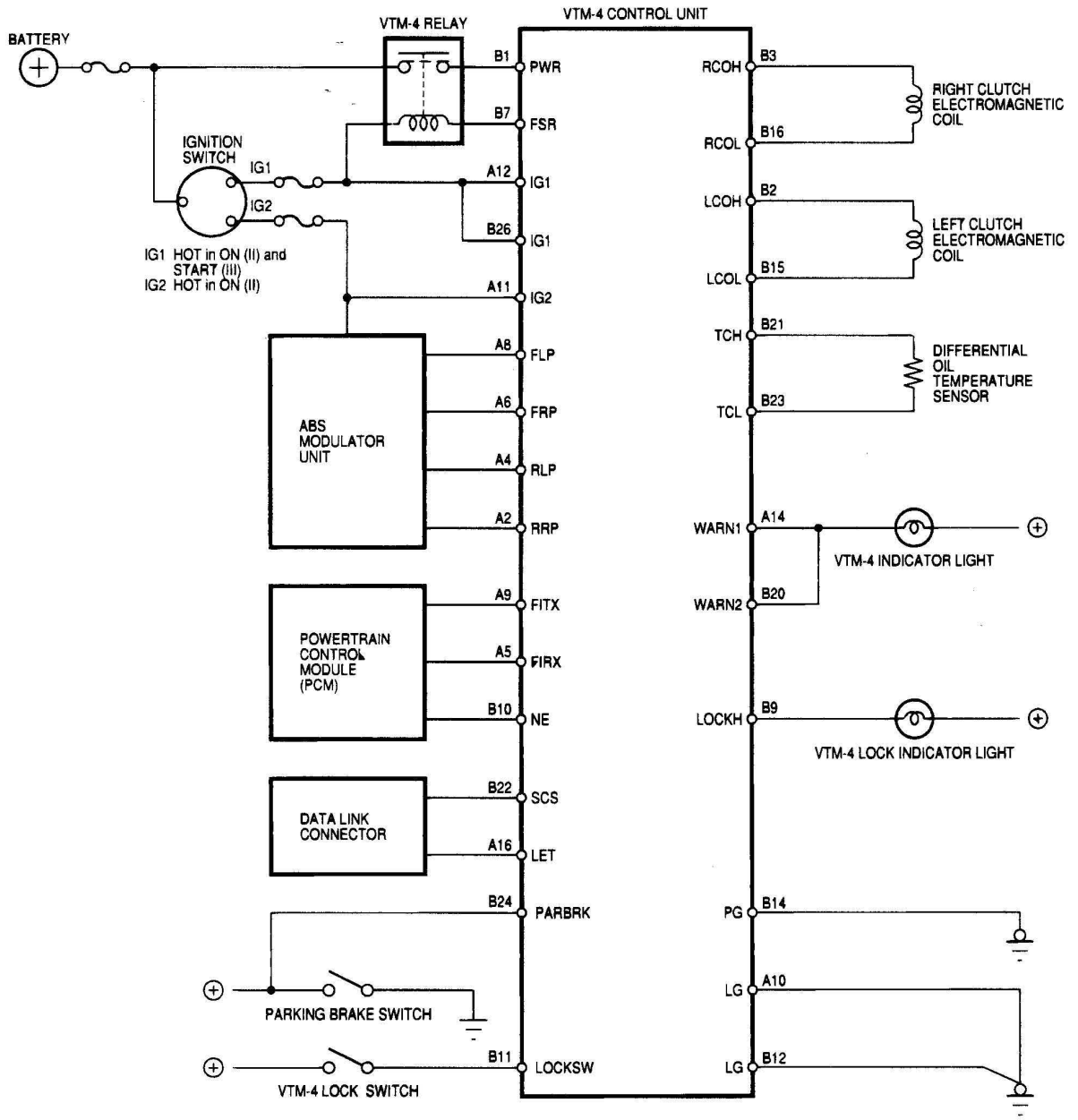
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System Description (cont'd)

Electric Control System

VTM-4 Control Unit Electrical Connections



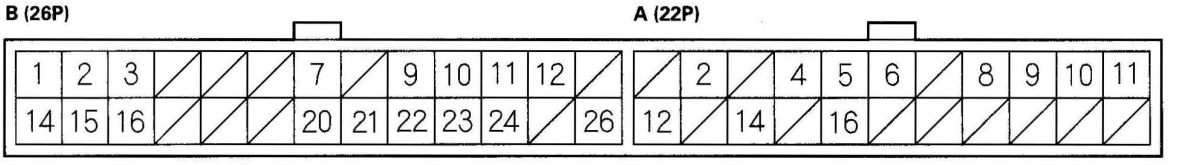
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VTM-4 Control Unit Inputs and Outputs

The VTM-4 control unit terminal voltage and measuring conditions for the 4WD control system are shown.

VTM-4 Control Unit Connector Terminal Locations



Terminal number	Wire color	Terminal sign (Terminal name)	Description	Measurement	
				Conditions	Voltage
A2	GRY/RED	RRP (Rear right pulse)	Detects right-rear wheel sensor signal	Turn wheel at 1 turn/ second	2 V—3 V
A4	GRY/YEL	RLP (Rear left pulse)	Detects left-rear wheel sensor signal		
A5	BLK	FIRX (Fuel injection receiver)	Reception signal from PCM	Ignition switch ON (II)	Above 5 V
A6	LT GRN	FRP (Front right pulse)	Detects right-front wheel sensor signal	Turn wheel at 1 turn/ second	2 V—3 V
A8	WHT/RED	FLP (Front left pulse)	Detects left-front wheel sensor signal		
A9	WHT	FITX (Fuel injection transmitter)	Sending signal to PCM	Ignition switch ON (II)	Above 5 V
A10	BRN/BLK	LG (Logic ground)	Ground		Below 1 V
A11	ORN	IG 2 (Ignition 2)	Power supply for activating the system	Ignition switch ON (II)	Battery Voltage
A12	BLK/YEL	IG 1 (Ignition 1)	Power supply for activating the system	Ignition switch ON (II)	Battery Voltage
A14	RED/WHT	WARN 1 (Warning 1)	Drives VTM-4 indicator light	VTM-4 indicator light on	Below 4 V
				VTM-4 indicator light off	Battery Voltage
A16	LT BLU	LET (Line end tester)	Communication signal to Honda PGM Tester	Ignition switch ON (II) (Not connected to PGM Tester)	About 5 V

(cont'd)

BACK

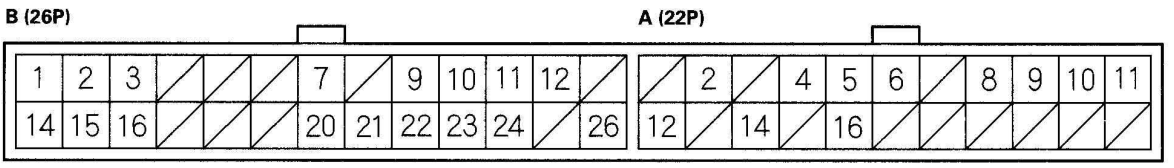
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System Description (cont'd)

VTM-4 Control Unit Input and Outputs

The VTM-4 control unit terminal voltage and measuring conditions for the 4WD control system are shown.

VTM-4 Control Unit Connector Terminal Locations



Terminal number	Wire color	Terminal sign (Terminal name)	Description	Measurement	
				Conditions	Voltage
B1	RED/BLU	PWR (Power)	Power supply for VTM-4 control unit	10 seconds after Ignition switch ON (II)	Below 3 V
				Engine running	Battery Voltage
				VTM-4 lock mode	Above 8 V
B2	BLK/RED	LCOH (Left coil high)	Drives left clutch electromagnetic coil (Positive)	Ignition switch ON (II)	Below 1 V
				Engine running	Below 1 V
				VTM-4 lock mode	Above 3 V
B3	BRN	RCOH (Right coil high)	Drives right clutch electromagnetic coil (Positive)	Ignition switch ON (II)	Below 1 V
				Engine running	Below 1 V
				VTM-4 lock mode	Above 3 V
B7	ORN/GRN	FSR (Fail-safe relay)	Drives VTM-4 relay	Ignition switch ON (II)	Battery Voltage
				Engine running	Below 1 V
B9	YEL/BLK	LCOKH (Lock lamp)	Drives VTM-4 LOCK indicator light	VTM-4 LOCK indicator light on	Below 4 V
				VTM-4 LOCK indicator light off	Battery Voltage
B10	GRN/BLU	NE (Engine revolution)	Detects engine revolution signal	Ignition switch ON (II)	Above 8 V
				Engine running at 1,000 rpm	5 V—8 V
B11	BRN/WHT	LOCKSW (Lock switch)	Detects VTM-4 lock switch signal	Ignition switch ON (II)	Below 1 V
				VTM-4 lock mode	Battery Voltage
B12	BRN/BLK	LG (Logic ground)	Ground		Below 1 V
B14	BLK	PG (Power ground)	Ground		Below 0.5 V
B15	BLK/WHT	LCOL (Left coil low)	Drives left clutch electromagnetic coil (Negative)	Ignition switch ON (II)	Below 1 V
				Engine running	Below 1 V
				VTM-4 lock mode	Below 1 V

BACK

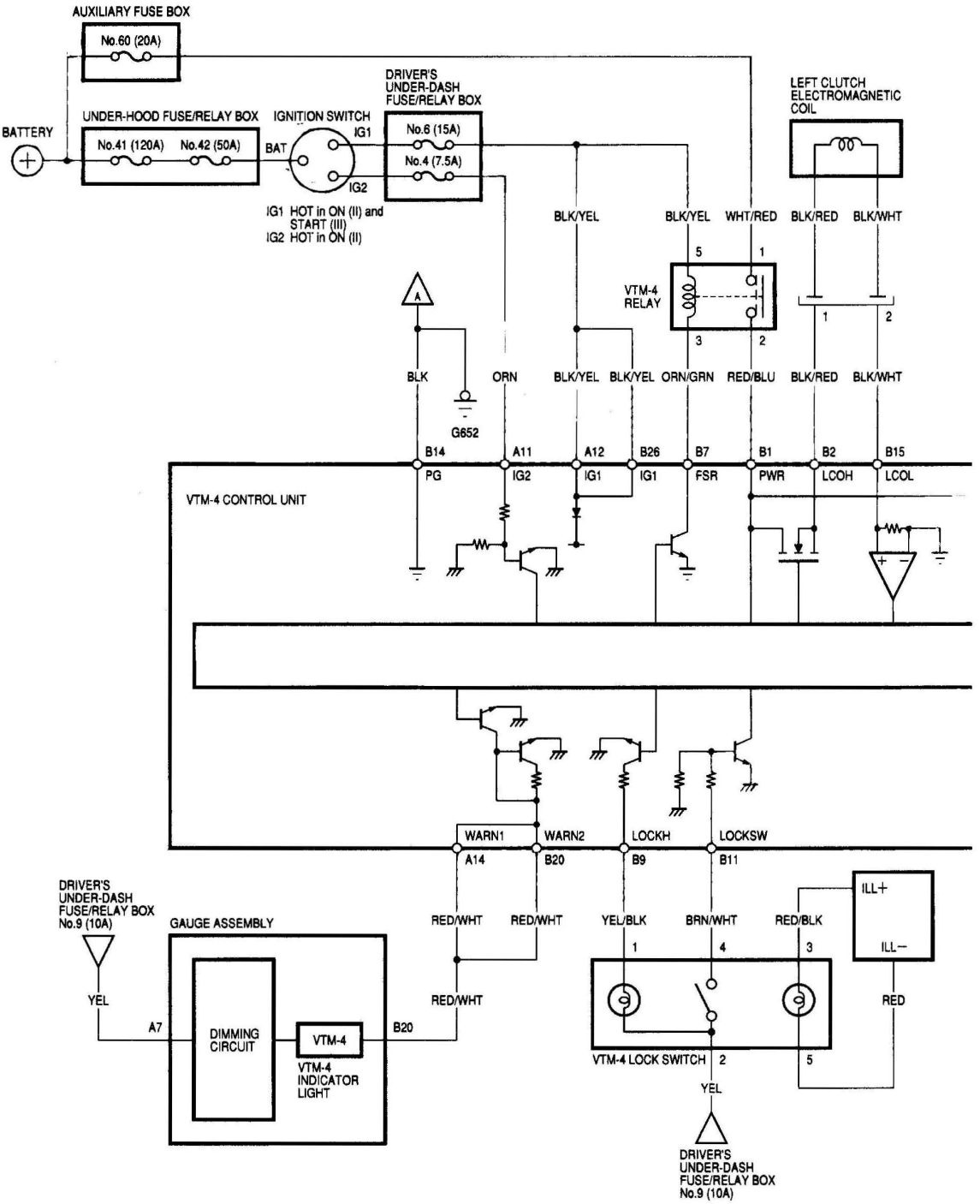
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B16	GRN	RCOL (Right coil low)	Drives right clutch electromagnetic coil (Negative)	Ignition switch ON (II)	Below 1 V
				Engine running	Below 1 V
				VTM-4 lock mode	Below 1 V
B20	RED/WHT	WARN 2 (Warning 2)	Drives VTM-4 indicator light	VTM-4 indicator light on	Below 4 V
				VTM-4 indicator light off	Battery Voltage
B21	WHT	TCH (Temperature coil high)	Power supply for differential oil temperature sensor	Check at normal temperature with the ignition switch ON (II)	4 V – 5 V
B22	BRN	SCS (Service check signal)	Detects service check connector signal	SCS circuit shorted	Below 2 V
				SCS circuit opened	About 5 V
B23	BLK	TCL (Temperature coil low)	Detects differential oil temperature sensor signal	Check at normal temperature with the ignition switch ON (II)	3 V – 4.2 V
B24	GRN/RED	PARBRK (Parking brake)	Detects parking brake signal	Parking brake on	Below 2 V
				Parking brake off	Battery Voltage
B26	BLK/YEL	IG 1 (Ignition 1)	Power supply for activating the system	Ignition switch ON (II)	Battery Voltage

BACK

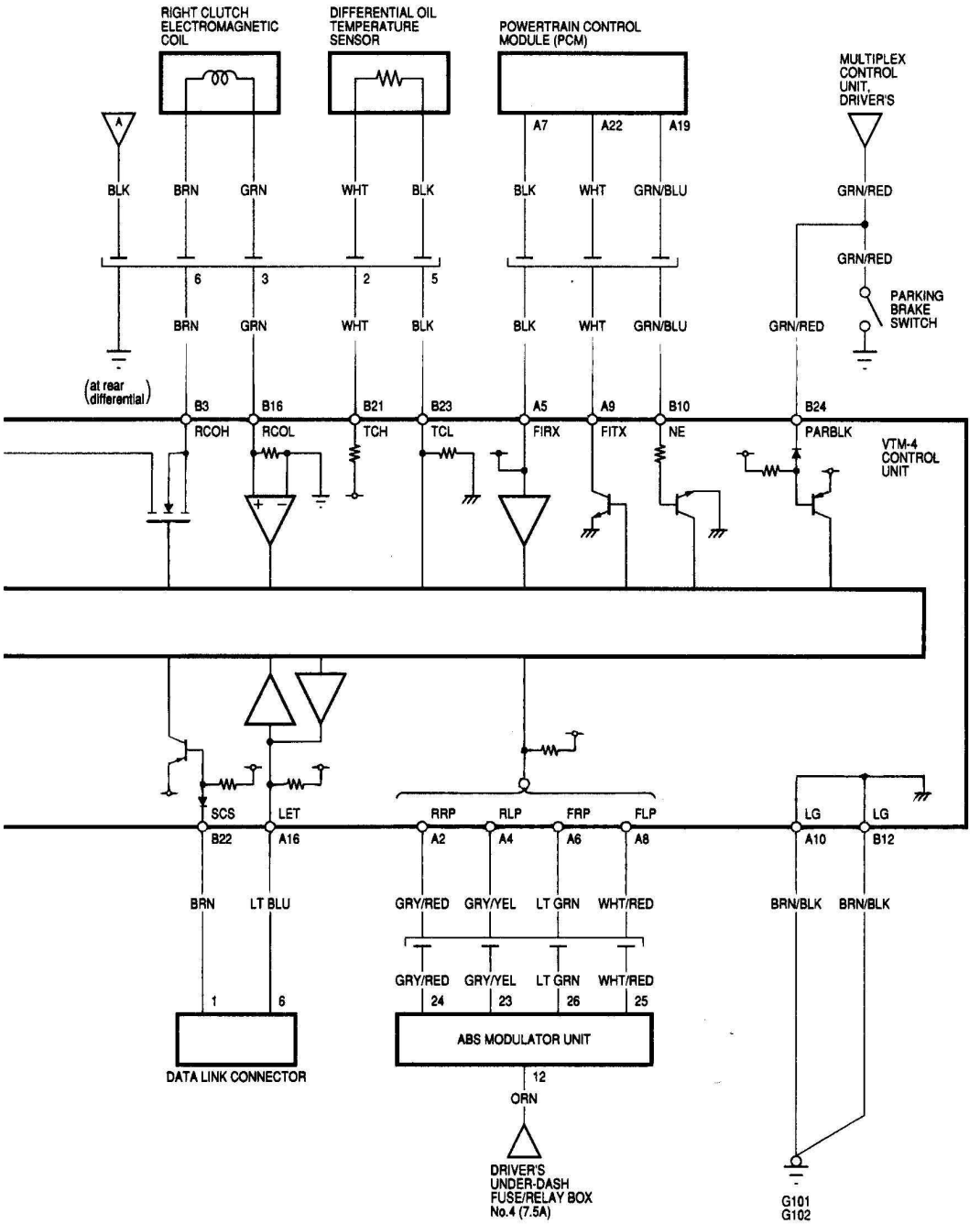
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Circuit Diagram



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BACK

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DTC Troubleshooting

DTC 21, 22, 23, 24: Wheel Sensor

1. Clear the DTC (see page 15-8).
2. Test-drive the vehicle, and watch for the VTM-4 indicator light.

   Does the VTM-4 indicator light come on?

   YES – Go to step 3.

   NO – The system is OK at this time. ■
3. Watch the ABS indicator light.

   Does the ABS indicator light come on?

   YES – Inspect the ABS system (see page 19-33).

   NO – Go to step 4.
4. Raise the vehicle, and make sure it is securely supported.
5. Spin the rear wheels by hand, and check for rear brake drag.

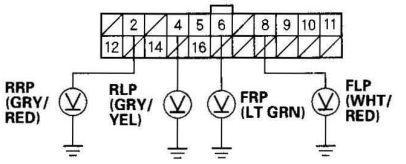
   Are the rear brakes dragging?

   YES – Repair cause of rear brake drag and retest. ■

   NO – Go to step 6.
6. Turn the ignition switch ON (II).
7. Measure the voltage between the A2, A4, A6, and/or A8 terminal of the VTM-4 control unit and body ground while rotating the appropriate wheel one rotation a second.

DTC	Appropriate Terminal
21 (Left-front)	A8
22 (Right-front)	A6
23 (Left-rear)	A4
24 (Right-rear)	A2

VTM-4 CONTROL UNIT CONNECTOR A (22P)



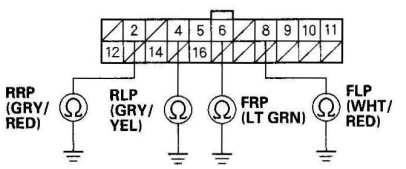
Wire side of female terminals

Is there 2V – 3V?

YES – Go to step 13.

NO – Go to step 8.
8. Turn the ignition switch OFF.
9. Disconnect the VTM-4 control unit and the ABS control unit connectors.
10. Check the same terminal of the VTM-4 control unit A (22P) connector for continuity to body ground.

VTM-4 CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Is there continuity?

YES – Repair short to ground in the wire between the A2, A4, A6, or A8 terminals of the VTM-4 control unit and the ABS control unit. ■

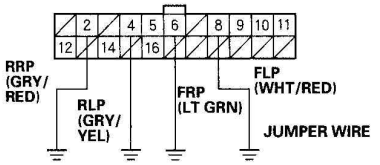
NO – Go to step 11.

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11. Connect the same terminals of the VTM-4 control unit A (22P) connector to body ground with the jumper wires.

VTM-4 CONTROL UNIT CONNECTOR A (22P)

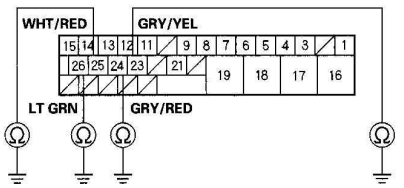


Wire side of female terminals

12. Check for continuity between the ABS control unit connector terminals and body ground.

Appropriate wheel	Appropriate Terminal	
	VTM-4 Control Unit	ABS modulator
Right-front	A6	26
Left-front	A8	25
Right-rear	A2	24
Left-rear	A4	23

ABS CONTROL UNIT CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 13.

NO—Repair open in the wire between the A2, A4, A6, or A8 terminals of the VTM-4 control unit and the ABS control unit. ■

13. Check for loose terminal fit in the VTM-4 control unit and the ABS control unit connectors. If it is normal, replace the VTM-4 control unit and test-drive and the vehicle, and watch for the VTM-4 indicator light.

Does the VTM-4 indicator light on?

YES—Replace the ABS modulator assembly. ■

NO—The system is OK at this time. ■

DTC 26: ABS Modulator Control Unit or Wire Harness

1. Clear the DTC (see page 15-8).
2. Test-drive the vehicle, and watch for the VTM-4 indicator light.

Does the VTM-4 indicator light come on?

YES—Go to step 3.

NO—The system is OK at this time. ■

3. Watch the ABS indicator light.

Does the ABS indicator light come on?

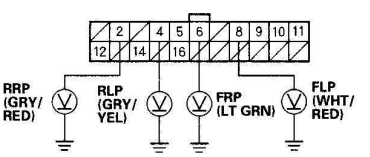
YES—Inspect the ABS system (see page 19-33).

NO—Go to step 4.

4. Raise the vehicle, and make sure it is securely supported.
5. Turn the ignition switch ON (II).
6. Measure the voltage between the A2, A4, A6, and A8 terminals of the VTM-4 control unit and body ground while rotating the appropriate wheel one rotation a second.

Appropriate wheel	Appropriate Terminal
Left-front	A8
Right-front	A6
Left-rear	A4
Right-rear	A2

VTM-4 CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Are all four readings 2 V—3 V?

YES—Check for loose terminal fit in the VTM-4 control unit. If it is normal, replace the VTM-4 control unit. ■

NO—Check for loose wires or poor connections between the VTM-4 control unit and the ABS control unit. If it is normal, replace the ABS modulator assembly. ■

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DTC Troubleshooting (cont'd)

DTC 37, 38: Engine RPM Signal Circuit

1. Clear the DTC (see page 15-8).
2. Test-drive the vehicle, and watch for the VTM-4 indicator light.

   Does the VTM-4 indicator light come on?

   YES – Go to step 3.

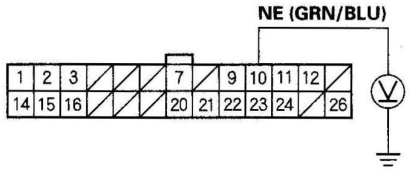
   NO – The sytem is OK at this time. ■
3. Watch the MIL.

   Does the MIL come on?

   YES – Inspect the Fuel and Emission system (see page 11-3). ■

   NO – Go to step 4.
4. Disconnect the B (26P) connector from the VTM-4 control unit.
5. Measure the voltage between the B10 terminal and body ground with the engine running.

VTM-4 CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Condition	Voltage
Ignition switch ON (II)	Above 10 V
Engine running	5 V – 8 V

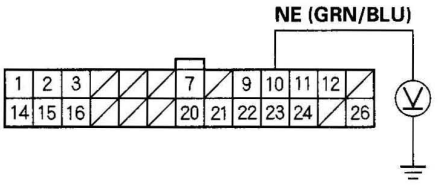
Is the voltage correct?

YES – Go to step 13.

NO – Go to step 6.

6. Turn the ignition switch OFF.
7. Disconnect PCM connector A (32P).
8. Turn the ignition switch ON (II).
9. Measure the voltage between the B10 terminal of the VTM-4 control unit and body ground.

VTM-4 CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

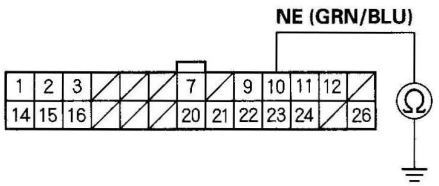
Is there voltage?

YES – Repair short to power in the wire between the B10 terminal of the VTM-4 control unit and the A19 terminal of the PCM. ■

NO – Go to step 10.

10. Turn the ignition switch OFF.
11. Check for continuity between the B10 terminal of the VTM-4 control unit and body ground.

VTM-4 CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there continuity?

YES – Repair short to ground in the wire between the B10 terminal of the VTM-4 contorl unit and the A19 terminal of the PCM. ■

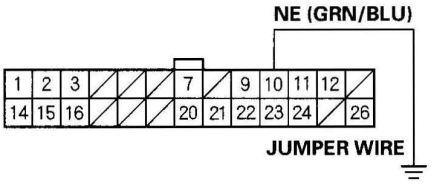
NO – Go to step 12.

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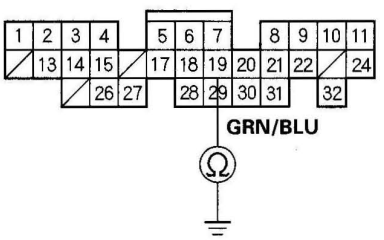
12. Connect the B10 terminal of the VTM-4 control unit connector B (26P) to body ground with the jumper wire, then check for continuity between the A19 terminal of the PCM and body ground.

VTM-4 CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

PCM CONNECTOR A (32P)



Wire side of female terminals

Is there continuity?

YES — Go to step 13.

NO — Repair open in the wire between the B10 terminal of the VTM-4 control unit and the A19 terminal of the PCM. ■

13. Check for loose terminal fit in the VTM-4 control unit and the PCM connectors. If it is normal, replace the VTM-4 control unit and test-drive the vehicle, and watch for the VTM-4 indicator light.

Does the VTM-4 indicator light come on?

YES — Replace the PCM. ■

NO — The system is OK at this time. ■

DTC 41: PCM Communication (A/T Control System)

1. Clear the DTC (see page 15-8).

2. Test-drive the vehicle, and watch for the VTM-4 indicator light.

Does the VTM-4 indicator light come on?

YES — Go to step 3.

NO — The system is OK at this time. ■

3. Connect the Honda PGM Tester to the 16P Data Link Connector (DLC), and check for an A/T system DTC.

Is there a DTC?

YES — Troubleshoot the A/T system for the cause of the DTC (refer to page 14-7). ■

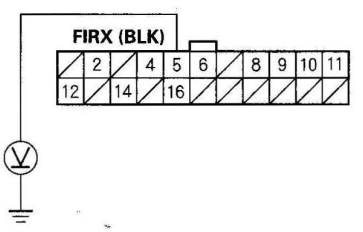
NO — Go to step 4.

4. Disconnect the A (22P) connector from the VTM-4 control unit, and the A (32P) connector from the PCM.

5. Turn the ignition switch ON (II).

6. Measure the voltage between the A5 terminal of the VTM-4 control unit and body ground.

VTM-4 CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Is there more than 1 volt?

YES — Repair short to power in the wire between the A5 terminal of the VTM-4 control unit and the A7 terminal of the PCM. ■

NO — Go to step 7.

(cont'd)

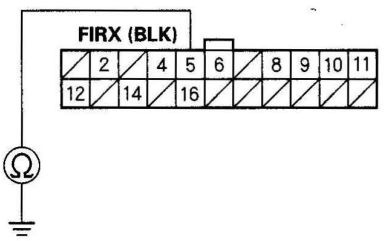
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DTC Troubleshooting (cont'd)

7. Turn the ignition switch OFF.

8. Check for continuity between the A5 terminal of the VTM-4 control unit and body ground.

VTM-4 CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

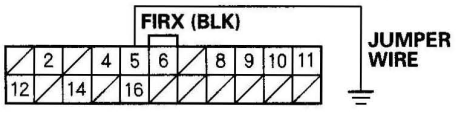
Is there continuity?

YES—Repair short to ground in the wire between the A5 terminal of the VTM-4 control unit and the A7 terminal of the PCM.■

NO—Go to step 9.

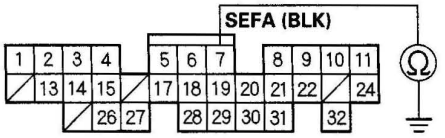
9. Connect the A5 terminal of the VTM-4 control unit connector A (22P) to body ground with a jumper wire, then check for continuity between the A7 terminal of the PCM and body ground.

VTM-4 CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

PCM CONNECTOR A (32P)



Wire side of female terminals

Is there continuity?

YES—Go to step 10.

NO—Repair open in the wire between the A5 terminal of the VTM-4 control unit and A7 terminal of the PCM.■

10. Check for loose terminal fit in the VTM-4 control unit and the PCM connectors. If it is normal, replace the VTM-4 control unit and test-drive the vehicle, and watch for the VTM-4 indicator light.

Does the VTM-4 indicator light come on?

YES—Replace the PCM.■

NO—The system is OK at this time.■

BACK

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DTC 42, 43: Differential Oil Temperature Sensor

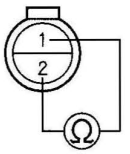
1. Clear the DTC (see page 15-8).
2. Test-drive the vehicle, and watch for the VTM-4 indicator light.

   Does the VTM-4 indicator light come on?

   YES – Go to step 3.

   NO – The system is OK at this time. ■
3. Turn the ignition switch OFF.
4. Remove the wire harness cover from the rear differential.
5. Disconnect the 2P connector from the differential oil temperature sensor, then measure the resistance of the differential oil temperature sensor.

DIFFERENTIAL OIL TEMPERATURE SENSOR CONNECTOR



Terminal side of male terminals

Oil temperature	Resistance
32°F (0°C)	5.82 kΩ – 7.26 kΩ
86°F (30°C)	1.53 kΩ – 1.83 kΩ
212°F (100°C)	148 Ω – 162 Ω
284°F (140°C)	52 Ω – 61 Ω

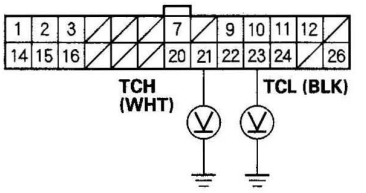
Is the resistance correct?

YES – Go to step 6.

NO – Replace the differential oil temperature sensor. ■

6. Disconnect the B (26P) connector from the VTM-4 control unit.
7. Turn the ignition switch ON (II).
8. Measure the voltage between the B21 and B23 terminals of the VTM-4 control unit and body ground.

VTM-4 CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

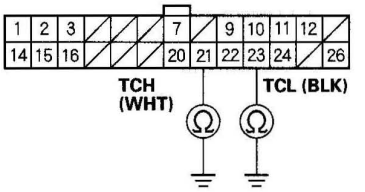
Is there voltage?

YES – Repair short to power in the wire between the B21 or B23 terminal of the VTM-4 control unit and the differential oil temperature sensor. ■

NO – Go to step 9.

9. Turn the ignition switch OFF.
10. Check for continuity between the B21 and B23 terminals of the VTM-4 control unit and body ground.

VTM-4 CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there continuity?

YES – Repair short to ground in the wire between the B21 or B23 terminals of the VTM-4 control unit and the differential oil temperature sensor. ■

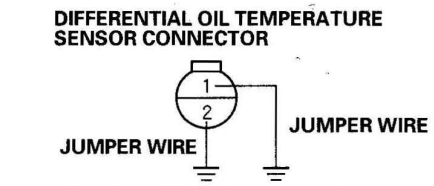
NO – Go to step 11.

(cont'd)

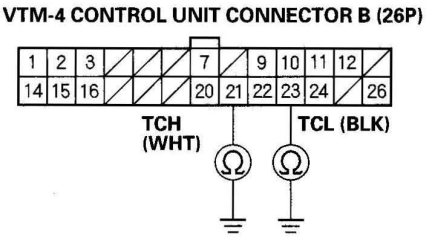
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DTC Troubleshooting (cont'd)

11. Connect the differential oil temperature sensor connector terminals to body ground with jumper wires, then check for continuity between the B21 and B23 terminals of the VTM-4 control unit connector B (26P) and body ground.



Terminal side of female terminals



Wire side of female terminals

Is there continuity?

YES—Check for loose terminal fit in the VTM-4 control unit and the differential oil temperature sensor connectors. If it is normal, replace the VTM-4 control unit.■

NO—Repair open in the wire between the B21 or B23 terminals of the VTM-4 control unit and the differential oil temperature sensor.■

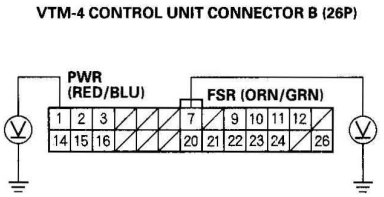
DTC 44: VTM-4 Relay

1. Clear the DTC (see page 15-8).
2. Test-drive the vehicle, and watch for the VTM-4 indicator light.

   Does the VTM-4 indicator light come on?

   YES—Go to step 3.

   NO—The system is OK at this time.■
3. Turn the engine OFF, then with the VTM-4 control unit still connected, measure the voltage between the B1 and B7 terminals of the VTM-4 control unit and body ground with the ignition switch ON (II), and again after the engine starts.



Wire side of female terminals

Condition	B1 (PWR)	B7 (FSR)
Ignition switch ON (II)	Below 3 V	Battery voltage
Engine start	Battery voltage	Below 3 V

Is the voltage correct?

YES—Go to step 15.

NO—Go to step 4.

4. Turn the ignition switch OFF.
5. Remove the VTM-4 relay, and test it (see page 22-67).

   Is the VTM-4 relay OK?

   YES—Go to step 6.

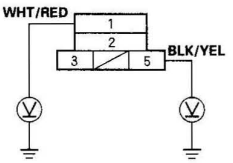
   NO—Replace the VTM-4 relay.■
6. Turn the ignition switch ON (II) with VTM-4 relay removed.

BACK

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7. Measure the voltage between the No. 1 and No. 5 terminals of the VTM-4 relay 5P connector and body ground.

VTM-4 RELAY CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 8.

NO – Check for blown No. 60 (20A) fuse in the auxilary fuse box or No. 6 (15A) fuse in the driver's under-dash fuse/relay box.
If the fuses are OK, repair open in the wire between the auxiliary fuse box or the driver's under-dash fuse/relay box and the VTM-4 relay. ■

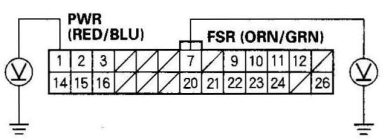
8. Turn the ignition switch OFF.

9. Disconnect the B (26P) connector from the VTM-4 control unit.

10. Turn the ignition switch ON (II).

11. Measure the voltage between the B1 and B7 terminals of the VTM-4 control unit and body ground.

VTM-4 CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there voltage?

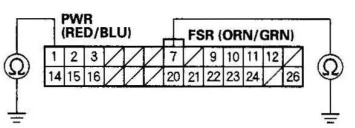
YES – Repair short to power in the wire between the B1 or B7 terminals of the VTM-4 control unit and the VTM-4 relay. ■

NO – Go to step 12.

12. Turn the ignition switch OFF.

13. Check for continuity between the B1 and B7 terminals of the VTM-4 control unit and body ground.

VTM-4 CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

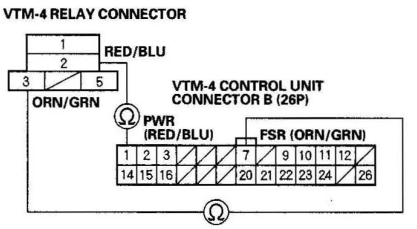
Is there continuity?

YES – Repair short to ground in the wire between the B1 or B7 terminals of the VTM-4 control unit and the VTM-4 relay. ■

NO – Go to step 14.

14. Check for continuity between the B1 terminal of the VTM-4 control unit and the No. 2 terminal of the VTM-4 relay, and between the B7 terminal of the VTM-4 control unit and the No. 3 terminal of the VTM-4 relay.

VTM-4 RELAY CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Go to step 15.

NO – Repair open in the wire between B1 or B7 terminals of the VTM-4 control unit and the VTM-4 relay. ■

15. Check for loose terminal fit in the VTM-4 control unit and the VTM-4 relay connectors. If it is normal, test-drive the vehicle, and watch for the VTM-4 indicator light.

Does the VTM-4 indicator light come on?

YES – Replace the VTM-4 control unit. ■

NO – The system is OK at this time. ■

BACK

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DTC Troubleshooting (cont'd)

DTC 45: ABS Modulator Unit Power Supply

1. Clear the DTC (see page 15-8).
2. Test-drive the vehicle, and watch for the VTM-4 indicator light.

   Does the VTM-4 indicator light come on?

   YES – Go to step 3.

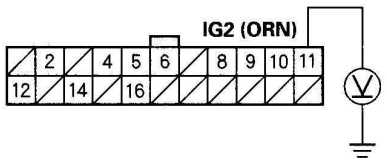
   NO – The system is OK at this time. ■
3. Watch the ABS indicator light.

   Does the ABS indicator light come on?

   YES – Inspect the ABS system (see page 19-33).

   NO – Go to step 4.
4. Measure the voltage between the A11 terminal of the VTM-4 control unit and body ground with the ignition switch ON (II), and when the engine is cranking.

VTM-4 CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Condition	A11 (IG2) terminal
Ignition switch ON (II)	Battery voltage
Starter is driven	0 V

Is the voltage correct?

YES – Check for loose terminal fit in the VTM-4 control unit connectors. If it is normal, replace the VTM-4 control unit. ■

NO – Repair open in the wire between the No. 11 terminal of the VTM-4 control unit and the driver's under-dash fuse/relay box. ■

DTC 51, 52, 53, 54: Left Clutch Electromagnetic Coil

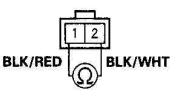
1. Clear the DTC (see page 15-8).
2. Test-drive the vehicle, and watch for the VTM-4 indicator light.

   Does the VTM-4 indicator light come on?

   YES – Go to step 3.

   NO – The system is OK at this time. ■
3. Turn the ignition switch OFF.
4. Disconnect the left clutch electromagnetic coil 2P connector on the differential. Then measure the resistance between the No. 1 terminal and No. 2 terminal of the left clutch electromagnetic coil connector.

LEFT CLUTCH ELECTROMAGNETIC COIL CONNECTOR



Terminal side of male terminals

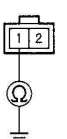
Is there 1 Ω to 3 Ω ?

YES – Go to step 5.

NO – Replace the rear differential assembly. ■

5. Measure the resistance between the No. 1 terminal and differential carrier assembly.

LEFT CLUTCH ELECTROMAGNETIC COIL CONNECTOR



Terminal side of male terminals

Is there 50 MΩ or more?

YES – Go to step 6.

NO – Replace the rear differential assembly. ■

BACK

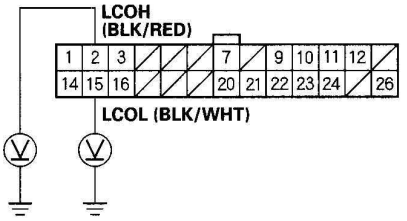
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6. Disconnect the B (26P) connector from the VTM-4 control unit.

7. Turn the ignition switch ON (II).

8. Measure the voltage between the B2 and B15 terminals of the VTM-4 control unit and body ground.

VTM-4 CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there voltage?

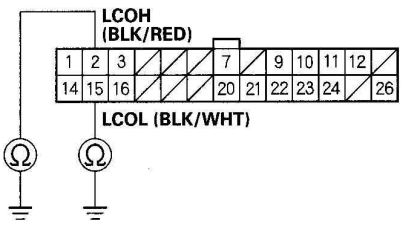
YES – Repair short to power in the wire between the B2 or B15 terminals of the VTM-4 control unit and the left clutch electromagnetic coil. ■

NO – Go to step 9.

9. Turn the ignition switch OFF.

10. Check for continuity between the B2 and B15 terminals of the VTM-4 control unit and body ground.

VTM-4 CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

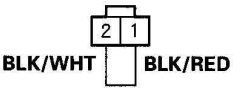
Is there continuity?

YES – Repair short to ground in the wire between the B2 or B15 terminals of the VTM-4 control unit and the left clutch electromagnetic coil. ■

NO – Go to step 11.

11. Connect a jumper wire between No. 1 terminal and No. 2 terminal of the 2P connector of the left clutch electromagnetic coil. Then check for continuity between the B2 terminal and B15 terminal of the VTM-4 control unit.

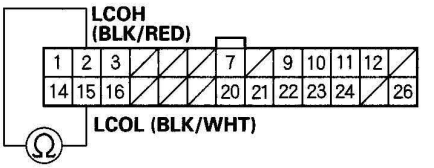
LEFT CLUTCH ELECTROMAGNETIC COIL CONNECTOR



JUMPER WIRE

Terminal side of female terminals

VTM-4 CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there continuity?

YES – Do the troubleshooting for the right clutch electromagnetic coil (see page 15-30). If it is normal, replace the VTM-4 control unit. ■

NO – Repair open in the wire between the B2 or B15 terminals of the VTM-4 control unit and the left clutch electromagnetic coil. ■

BACK

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DTC Troubleshooting (cont'd)

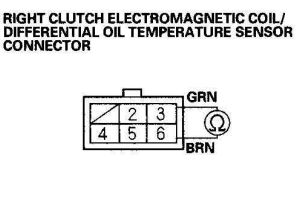
DTC 55, 56, 57, 58: Right Clutch Electromagnetic Coil

1. Clear the DTC (see page 15-8).
2. Test-drive the vehicle, and watch for the VTM-4 indicator light.

   Does the VTM-4 indicator light come on?

   YES – Go to step 3.

   NO – The system is OK at this time. ■
3. Turn the ignition switch OFF.
4. Disconnect the left clutch electromagnetic coil 6P connector on the differential. Then measure the resistance between the No. 3 terminal and No. 6 terminal of the right clutch electromagnetic coil 6P connector.

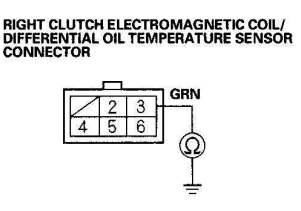


Terminal side of male terminals

   Is there 1 Ω to 3 Ω ?

   YES – Go to step 5.

   NO – Replace the rear differential assembly.
5. Measure the resistance between the No. 3 terminal and differential carrier assembly.

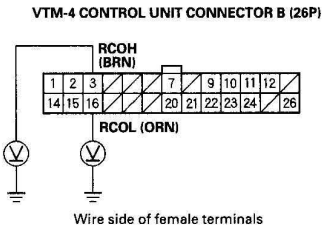


Terminal side of male terminals

   Is there 50 MΩ or more?

   YES – Go to step 6.

   NO – Replace the rear differential assembly. ■
6. Disconnect the B (26P) connector from the VTM-4 control unit.
7. Turn the ignition switch ON (II).
8. Measure the voltage between the B3 and B16 terminals of the VTM-4 control unit and body ground.

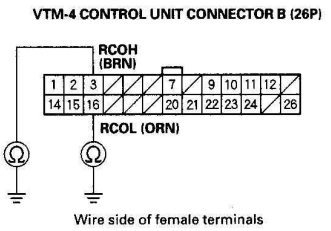


Wire side of female terminals

   Is there voltage?

   YES – Repair short to power in the wire between the B3 or B16 terminals of the VTM-4 control unit and the right clutch electromagnetic coil.

   NO – Go to step 9.
9. Turn the ignition switch OFF.
10. Check for continuity between the B3 and B16 terminals of the VTM-4 control unit and body ground.



Wire side of female terminals

   Is there continuity?

   YES – Repair short to ground in the wire between the B3 or B16 terminal of the VTM-4 control unit and the right clutch electromagnetic coil.

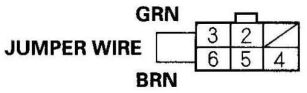
   NO – Go to step 11.

BACK

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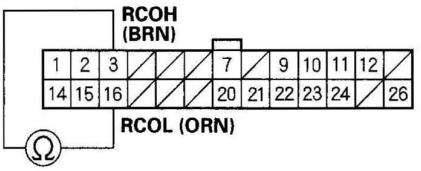
11. Connect a jumper between the No. 3 terminals and No. 6 terminal of the right clutch electromagnetic coil 6P connector. Then check the for continuity between the B3 terminal and B16 terminal of the VTM-4 control unit.

RIGHT CLUTCH ELECTROMAGNETIC COIL/ DIFFERENTIAL OIL TEMPERATURE SENSOR CONNECTOR



Terminal side of female terminals

VTM-4 CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there continuity?

YES — Do the troubleshooting for the left clutch electromagnetic coil (see page 15-28). If it is normal, replace the VTM-4 control unit.

NO — Repair open in the wire between the B3 or B16 terminals of the VTM-4 control unit and the right clutch electromagnetic coil. ■

DTC 59: Right/Left Clutch Electromagnetic Coil Power Supply

1. Clear the DTC (see page 15-8).
2. Test-drive the vehicle, and watch for the VTM-4 indicator light.

   Does the VTM-4 indicator light come on?

   YES — Go to step 3.

   NO — The system is OK at this time. ■
3. Check the battery.

   Is the specified battery installed, and is it fully charged?

   YES — Go to step 4.

   NO — Replace the battery. ■
4. Watch the charging system indicator.

   Does the charging system indicator come on with ignition switch ON (II), and after the engine starts, does the indicator go off?

   YES — Check for loose terminal fit in the VTM-4 control unit connectors. If it is normal, replace the VTM-4 control unit. ■

   NO — Check the charging system. ■

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DTC Troubleshooting (cont'd)

DTC 73: MAP (Manifold Absolute Pressure) Sensor, Throttle Position Sensor, or PCM

1. Clear the DTC (see page 15-8).
2. Test-drive the vehicle, and watch for the VTM-4 indicator light.

   Does the VTM-4 indicator light come on?

   YES – Go to step 3.

   NO – The system is OK at this time. ■
3. Watch the MIL.

   Does the MIL come on?

   YES – Inspect the Fuel and Emissions system (see page 11-3).

   NO – Check for loose terminal fit in the VTM-4 control unit and the PCM connectors. If it is normal, replace the VTM-4 control unit. ■

DTC 77: PCM

1. Clear the DTC (see page 15-8).
2. Test-drive the vehicle, and watch for the VTM-4 indicator light.

   Does the VTM-4 indicator light come on?

   YES – Go to step 3.

   NO – The system is OK at this time. ■
3. Replace the PCM, and test-drive the vehicle again, and watch for the VTM-4 indicator light.

   Does the VTM-4 indicator light come on?

   YES – Check for loose terminal fit in the VTM-4 control unit. If it is normal, replace the VTM-4 control unit. ■

   NO – The system is OK at this time. ■

BACK

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DTC 78: VTM-4 Control Unit

1. Clear the DTC (see page 15-8).
2. Test-drive the vehicle, and watch for the VTM-4 indicator light.

   Does the VTM-4 indicator light come on?

   YES – Go to step 3.

   NO – The system is OK at this time. ■
3. Check the battery.

   Is the specified battery installed, and is it fully charged?

   YES – Go to step 4.

   NO – Replace the battery. ■
4. Watch the charging system indicator.

   Does the charging system indicator come on with ignition switch ON (II), and after the engine starts, does the indicator go off?

   YES – Go to step 5.

   NO – Check the charging system. ■
5. Check for installation of any aftermarket CB or Ham radios which may cause a RF signal interference.

   Is there an aftermarket radio installed?

   YES – Disconnect the aftermarket radio and retest. ■

   NO – Check for loose terminal fit in the VTM-4 control unit connectors. If it is normal, replace the VTM-4 control unit. ■

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VTM-4 Indicator Light Circuit Troubleshooting

The VTM-4 indicator light comes on, but no DTC is stored.

1. Check the No. 6 (15A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES — Go to step 2.

   NO — Replace the fuse and recheck. ■

2. Reinitialize the VTM-4 control unit, and watch the VTM-4 indicator (see page 15-5).

   Does the VTM-4 indicator light come on and stay on?

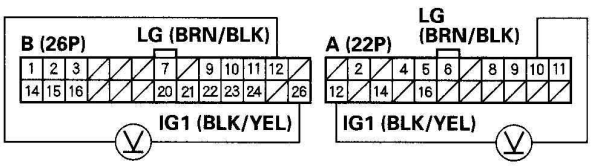
   YES — Go to step 3.

   NO — The system is OK at this time. ■

3. Turn the ignition switch OFF.

4. Measure the voltage between the A12 and A10 terminals of the VTM-4 control unit, and between the B26 and B12 terminal of the VTM-4 control unit.

VTM-4 CONTROL UNIT CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES — Go to step 5.

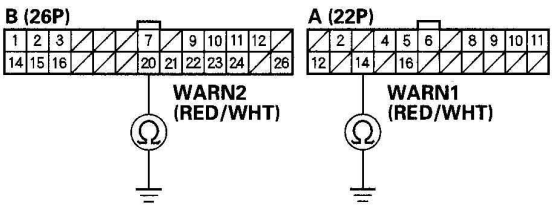
NO — Repair open in the wire between A12 or B26 terminals of the VTM-4 control unit and the driver's under-dash fuse/relay box, or repair open in the wire between A10 or B12 terminals of the VTM-4 control unit and body ground. ■

5. Turn the ignition switch OFF.

6. Disconnect the VTM-4 control unit and the gauge assembly connectors.

7. Check for continuity between the A14 and B20 terminals of the VTM-4 control unit and body ground.

VTM-4 CONTROL UNIT CONNECTORS



Wire side of female terminals

Is there continuity?

YES — Repair short to ground in the wire between the A14 or B20 terminals of the VTM-4 control unit and the gauge assembly. ■

NO — Go to step 8.

8. Reconnect the gauge assembly connectors only, then turn the ignition switch ON (II).

   Does the VTM-4 indicator light come on?

   YES — Replace the gauge assembly. ■

   NO — Check for loose terminal fit in VTM-4 connectors. If it is normal, replace the VTM-4 control unit. ■

BACK

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The VTM-4 indicator light does not come on.

1. Turn the ignition switch ON (II), and check for operation all gauge assembly indicator lights.

   Do the indicator lights come on?

   YES – Go to step 2.

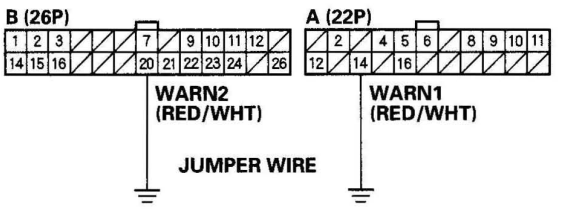
   NO – Check for open or short in the power and ground circuits in the gauge assembly (see page 22-73).

2. Disconnect the A (22P) and B (26P) connectors from the VTM-4 control unit.

3. Turn the ignition switch ON (II).

4. Connect the A14 or B20 terminals of the VTM-4 control unit to body ground with a jumper wire, and watch the VTM-4 indicator light.

VTM-4 CONTROL UNIT CONNECTORS



Wire side of female terminals

Does the VTM-4 indicator light come on?

YES – Check for loose terminal fit in the VTM-4 control unit connectors. If it is normal, replace the VTM-4 control unit. ■

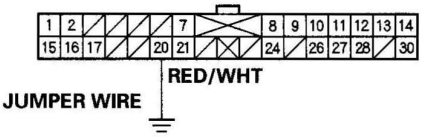
NO – Go to step 5.

5. Turn the ignition switch OFF.

6. Disconnect the A (22P) and B (30P) connectors from the gauge assembly.

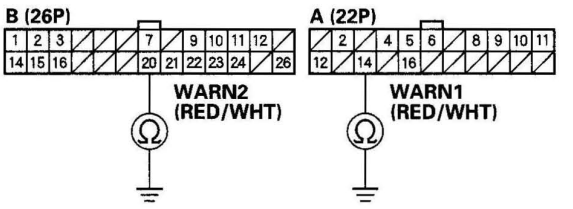
7. Connect the B20 terminal of the gauge assembly to body ground with a jumper wire, then check for continuity between the A14 and B20 terminals of the VTM-4 control unit and body ground.

GAUGE ASSEMBLY CONNECTOR B (30P)



Wire side of female terminals

VTM-4 CONTROL UNIT CONNECTORS



Wire side of female terminals

Is there continuity?

YES – Check for a blown bulb in the VTM-4 indicator light or a problem in gauge assembly. ■

NO – Repair open in the wire between the A7 terminal of the gauge assembly and driver's under-dash fuse/relay box. ■

BACK

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VTM-4 LOCK Indicator Light Circuit Troubleshooting

The VTM-4 LOCK indicator light does not come on when the VTM-4 lock switch is pushed.

NOTE: The VTM-4 LOCK indicator will only come on when the engine is running and the transmission is in R, 1, or 2 before the switch is pressed.

1. Check the No. 9 (10A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES – Go to step 2.

   NO – Replace the fuse and recheck. ■

2. Turn the ignition switch ON (II), and watch the VTM-4 LOCK indicator light.

   Does the VTM-4 LOCK indicator light come on with the ignition switch ON (II), and does the light go off 4 seconds later?

   YES – Go to step 3.

   NO – Go to step 10.

3. Start the engine, and move the shift lever to the R, 1, and 2 positions, then watch the VTM-4 LOCK indicator light.

   Does the VTM-4 LOCK indicator light come on when the VTM-4 lock switch is pushed?

   YES – The system is OK at this time. ■

   NO – Go to step 4.

4. Check for A/T system DTC.

   Is there DTC?

   YES – Troubleshoot the A/T system for the cause of the DTC (refer to page 14-7). ■

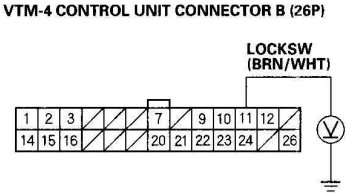
   NO – Go to step 5.

5. Turn the ignition switch OFF.

6. Disconnect the A (22P) and B (26P) connectors from the VTM-4 control unit.

7. Turn the ignition switch ON (II).

8. Connect a voltmeter between the B11 terminal of the VTM-4 control unit and body ground.



Wire side of female terminals

   Is there battery voltage when the VTM-4 lock switch is pushed?

   YES – Check for loose terminal fit in the VTM-4 control unit connectors. If it is normal, replace the VTM-4 control unit. ■

   NO – Go to step 9.

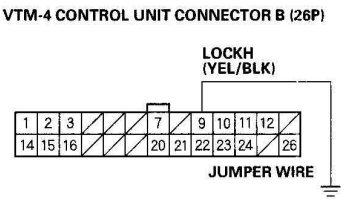
9. Test the VTM-4 lock switch (see page 15-42).

   Is the VTM-4 lock switch OK?

   YES – Repair open in the wire between the VTM-4 lock switch and the VTM-4 control unit. ■

   NO – Replace the VTM-4 lock switch. ■

10. Connect the B9 terminal of the VTM-4 control unit to body ground with a jumper wire, and watch the VTM-4 LOCK indicator light.



Wire side of female terminals

   Does the VTM-4 LOCK indicator light come on?

   YES – Check for loose terminal fit in the VTM-4 control unit connectors. If it is normal, replace the VTM-4 control unit. ■

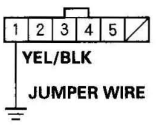
   NO – Go to step 11.

BACK

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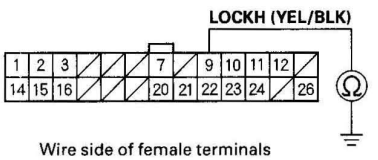
11. Turn the ignition switch OFF.
12. Remove the VTM-4 lock switch.
13. Connect the No. 1 terminal of the VTM-4 lock switch 6P connector to body ground with a jumper wire. Check the continuity between the B9 terminal and body ground.

VTM-4 LOCK SWITCH CONNECTOR



Wire side of female terminals

VTM-4 CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

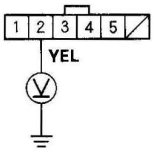
Is there continuity?

YES – Go to step 14.

NO – Repair open in the wire between the B9 terminal and the VTM-4 lock switch. ■

14. Turn the ignition switch ON (II).
15. Measure the voltage between the No. 2 terminal of the VTM-4 lock switch 6P connector and body ground.

VTM-4 LOCK SWITCH CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Replace the VTM-4 LOCK indicator light bulb. ■

NO – Repair open in the wire between the No. 2 terminal of the VTM-4 lock switch 6P connector and the driver's under-dash fuse/relay box. ■

The VTM-4 LOCK indicator light comes on with ignition switch ON (II), and does not go off.

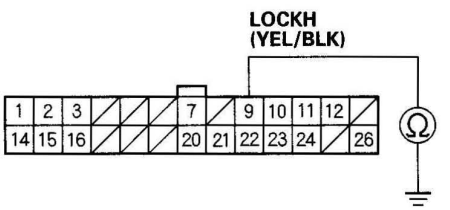
1. Disconnect the B (26P) connector from the VTM-4 control unit.
2. Turn the ignition switch ON (II), and watch the VTM-4 LOCK indicator light.

   Does the VTM-4 LOCK indicator light come on with ignition switch ON (II)?

   YES – Go to step 3.

   NO – Check for loose terminal fit in the VTM-4 control unit connectors. If it is normal, replace the VTM-4 control unit. ■
3. Turn the ignition switch OFF.
4. Disconnect the VTM-4 lock switch connector.
5. Check for continuity between the B9 terminal of the VTM-4 control unit and body ground.

VTM-4 CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there continuity?

YES – Repair short to ground in the wire between the B9 terminal of the VTM-4 control unit and the VTM-4 lock switch. ■

NO – Replace the VTM-4 lock switch. ■

(cont'd)

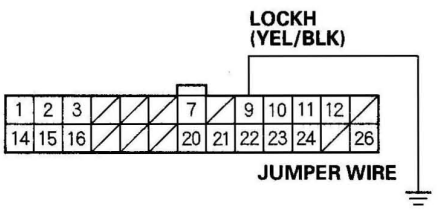
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VTM-4 LOCK Indicator Light Circuit Troubleshooting (cont'd)

The VTM-4 LOCK indicator light does not come on for about 4 seconds when ignition switch ON (II).

1. Disconnect the B (26P) connector from the VTM-4 control unit.
2. Turn the ignition switch ON (II).
3. Connect the B9 terminal of the VTM-4 control unit to body ground with a jumper wire, and watch the VTM-4 LOCK indicator light.

VTM-4 CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

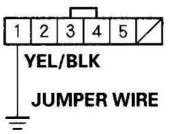
Does the VTM-4 LOCK indicator light come on?

YES – Check for loose terminal fit in the VTM-4 control unit connectors. If it is normal, replace the VTM-4 control unit. ■

NO – Go to step 4.

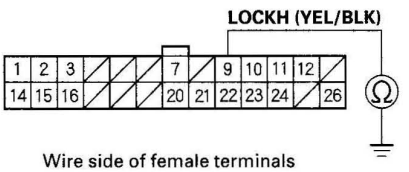
4. Turn the ignition switch OFF.
5. Remove the VTM-4 lock switch.
6. Connect the No. 1 terminal of the VTM-4 lock switch 6P connector to the body ground with a jumper wire. Check for continuity between the B9 terminal and body ground.

VTM-4 LOCK SWITCH CONNECTOR



Wire side of female terminals

VTM-4 CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

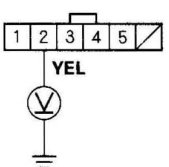
Is there continuity?

YES – Go to step 7.

NO – Repair open in the wire between the B9 terminal of the VTM-4 control unit and VTM-4 lock switch. ■

7. Turn the ignition switch ON (II).
8. Measure the voltage between the No. 2 terminal of the VTM-4 lock switch 6P connector and body ground.

VTM-4 LOCK SWITCH CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Replace VTM-4 LOCK indicator light bulb. ■

NO – Repair open in the wire between the No. 2 terminal of the VTM-4 lock switch 6P connector and the driver's under-dash fuse/relay box. ■

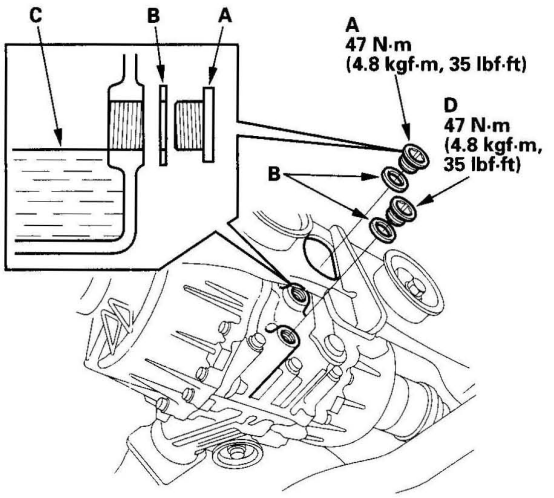
BACK

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Differential Fluid Inspection and Replacement

1. With the vehicle on level ground, inspect the differential fluid with engine OFF.

2. Remove the oil filler plug (A) and sealing washer (B), then check the condition of the fluid, and make sure the fluid is at the proper level (C).



3. The fluid level must be up to the fill hole. If it is below the hole, add the recommended fluid until it runs out, then reinstall the oil filler plug with a new sealing washer.

4. If the differential fluid is dirty, remove the drain plug (D) and sealing washer (B), then drain the fluid.

5. Clean the drain plug, then reinstall with a new washer, and refill the differential with the recommended fluid to the proper level.

   Fluid capacity
   '01 model:
   2.80 ℓ (2.95 US.qt, 2.46 Imp.qt) at oil change
   '02 model:
   2.64 ℓ (2.79 US.qt, 2.32 Imp.qt) at oil change

   Recommended fluid
   VTM-4 Differential Fluid

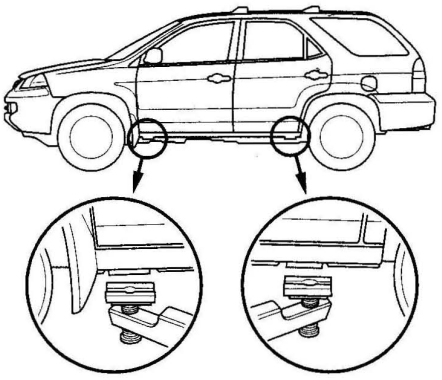
6. Reinstall the oil filler plug with a new washer.

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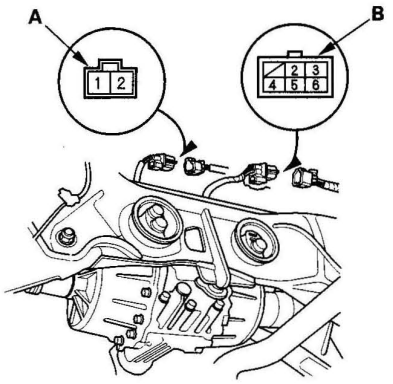
Differential Function Test

2WD mode

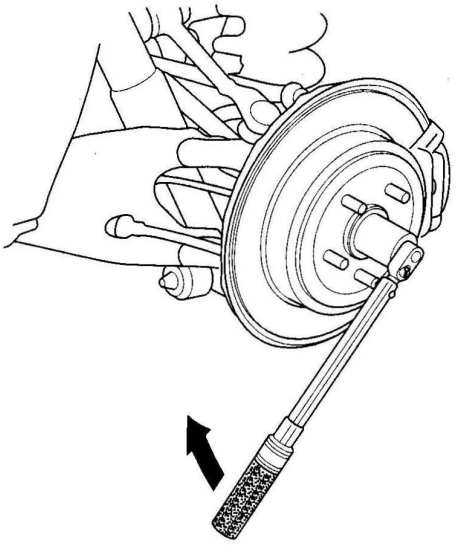
1. Lift up the vehicle so all four wheels are off the ground (see page 1-8).



2. Remove the rear wheels.
3. Turn the ignition switch OFF with the shift lever in the [P] position.
4. Release the parking brake.
5. Disconnect the left clutch electromagnetic coil 2P connector (A) and the right clutch electromagnetic coil 6P connector (B).



6. Using a click-type torque wrench set at 20 N·m (2.0 kgf·m, 15 lbf·ft), turn each rear hub clockwise.
   - If either hub turns without the torque wrench clicking, the differential is OK.
   - If the torque wrench clicks while turning either hub, the rear differential is faulty, replace it.

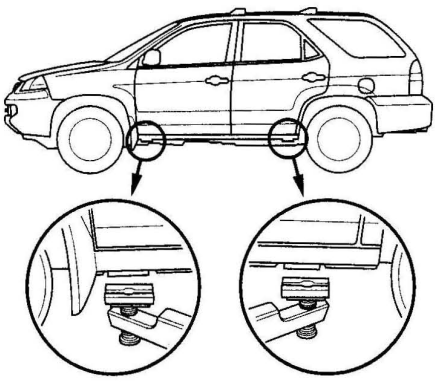


BACK

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4WD mode

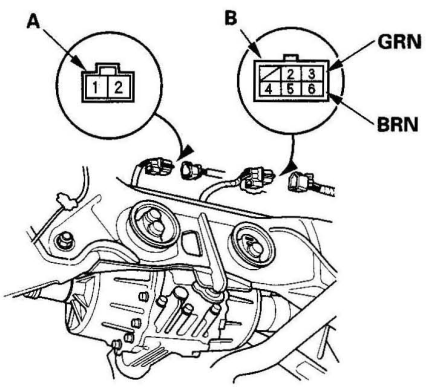
1. Lift up the vehicle so all four wheels are off the ground (see page 1-8).



2. Remove the rear wheels.
3. Turn the ignition switch OFF with the shift lever in the [P] position.
4. Release the parking brake.
5. Disconnect the left clutch electromagnetic coil 2P connector (A) and the right clutch electromagnetic coil 6P connector (B).

NOTICE

Connecting battery voltage to the left or right clutch electromagnetic coils for more than 3 minutes will damage the rear differential.

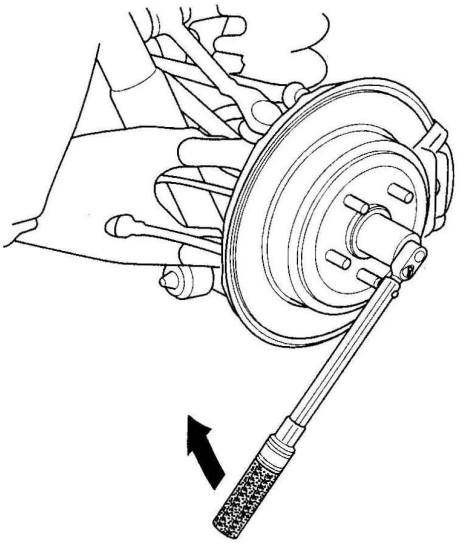


Left Clutch Electromagnetic Coil Test

6. Connect the battery power to the No. 1 terminal of the left clutch electromagnetic coil 2P connector (A) and ground to the No. 2 terminal.

Right Clutch Electromagnetic Coil Test

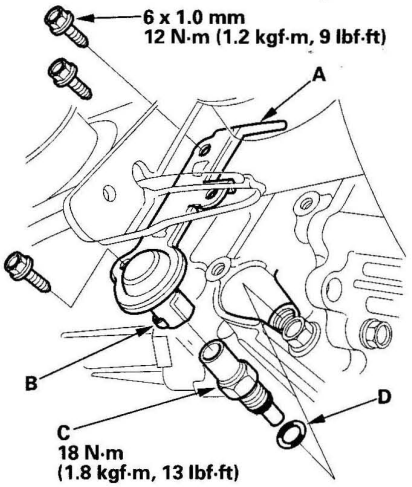
7. Connect the battery power to the No. 6 (BRN) terminal of the right clutch electromagnetic coil 6P connector (B) and ground to the No. 3 (GRN) terminal.
8. Using a click-type torque wrench set at 200 N·m (20.4 kgf·m, 148 lbf·ft), turn each rear hub clockwise.
   - If the torque wrench clicks on both hubs, the differential is OK.
   - If either hub turns, replace the rear differential.



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Differential Oil Temperature Sensor Replacement

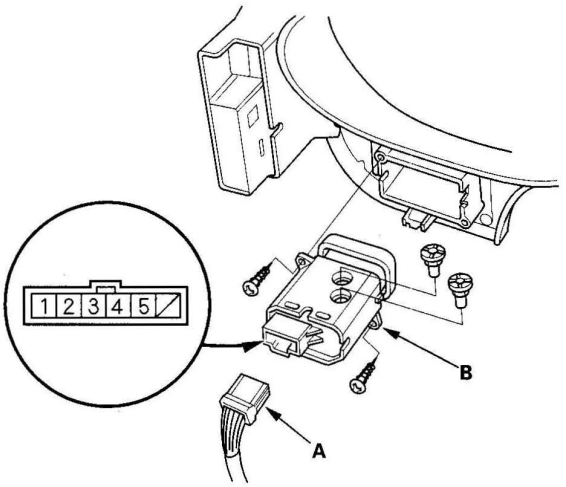
1. Remove the wire harness cover (A), then disconnect the differential oil temperature sensor 2P connector (B).



2. Remove the differential oil temperature sensor (C).
3. Install the differential oil temperature sensor (C) in the reverse order of removal, with a new O-ring (D).

VTM-4 Lock Switch Test/ Replacement

1. Remove the instrument panel (see page 20-67).
2. Disconnect the 6P connector (A) from the VTM-4 lock switch (B), then remove the two screws and the switch.



3. Check for continuity between the terminals in each switch position according to the table. If the switch fails any continuity check, replace the switch.

Terminal / Position	1		2	3	4		5
Release the switch	○	⌀	○	○		⌀	○
Push the switch	○	⌀	○	○		⌀	○
			○		○		

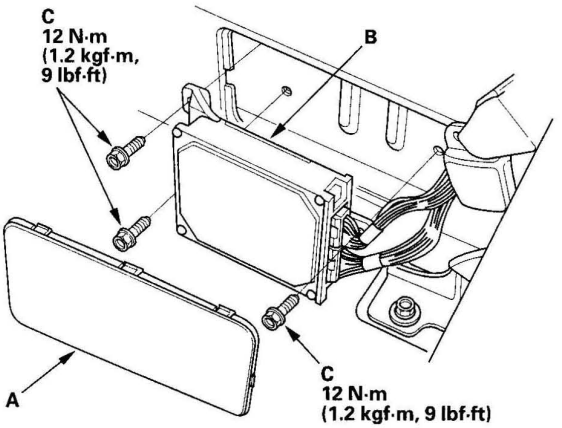
BACK

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VTM-4 Control Unit Replacement

NOTE: The VTM-4 control unit must be initialized (see page 15-5) after replacement, otherwise the 4WD system will not function.

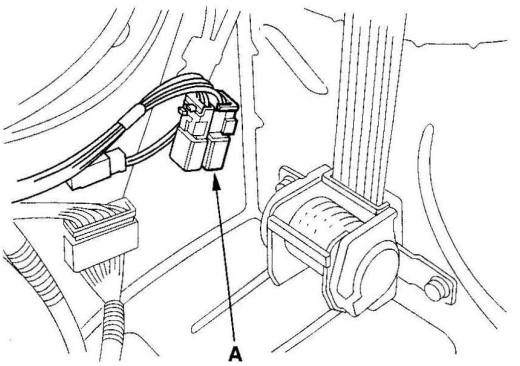
1. Remove the front mounting bolts from the right third row seat, and fold the seat cushion back (see page 20-101).
2. Remove the cover (A) from the right rear side trim panel to gain access to the VTM-4 control unit (B).



3. Remove the three bolts (C) from the VTM-4 control unit.
4. Disconnect the VTM-4 control unit connectors.
5. Install the VTM-4 control unit in the reverse order of removal.

VTM-4 Relay Replacement

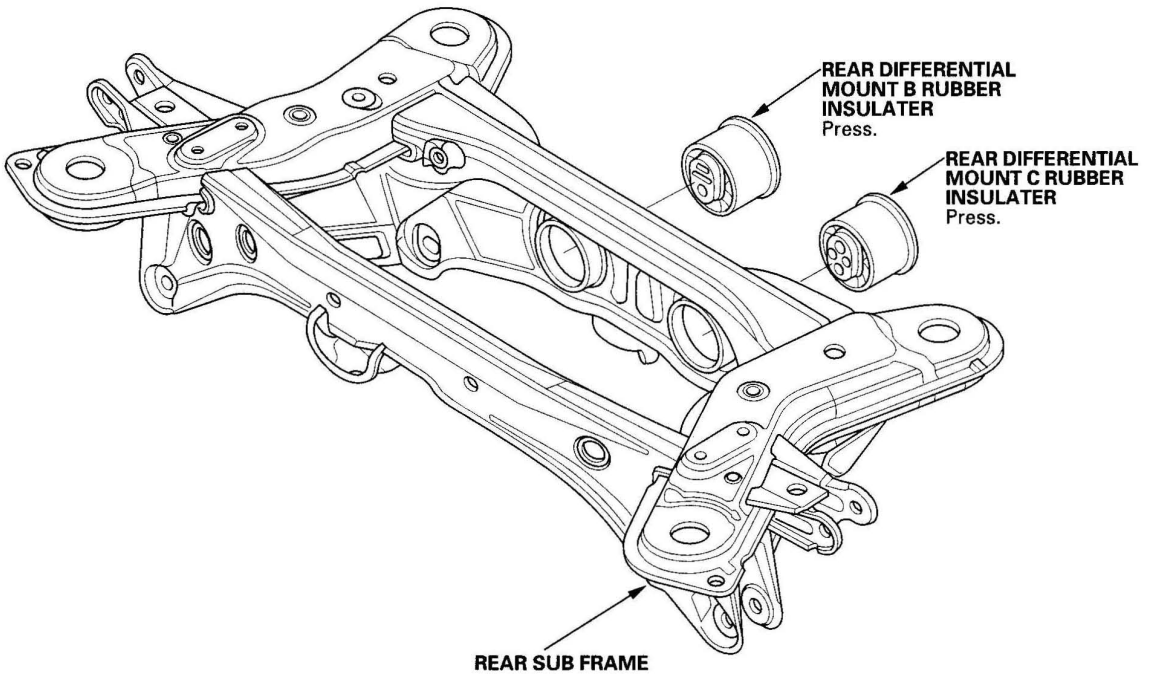
1. Remove the right rear side trim panel (see page 20-57).
2. Remove the VTM-4 relay (A).



3. Install the VTM-4 relay in the reverse order of removal.

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Differential Mount Replacement

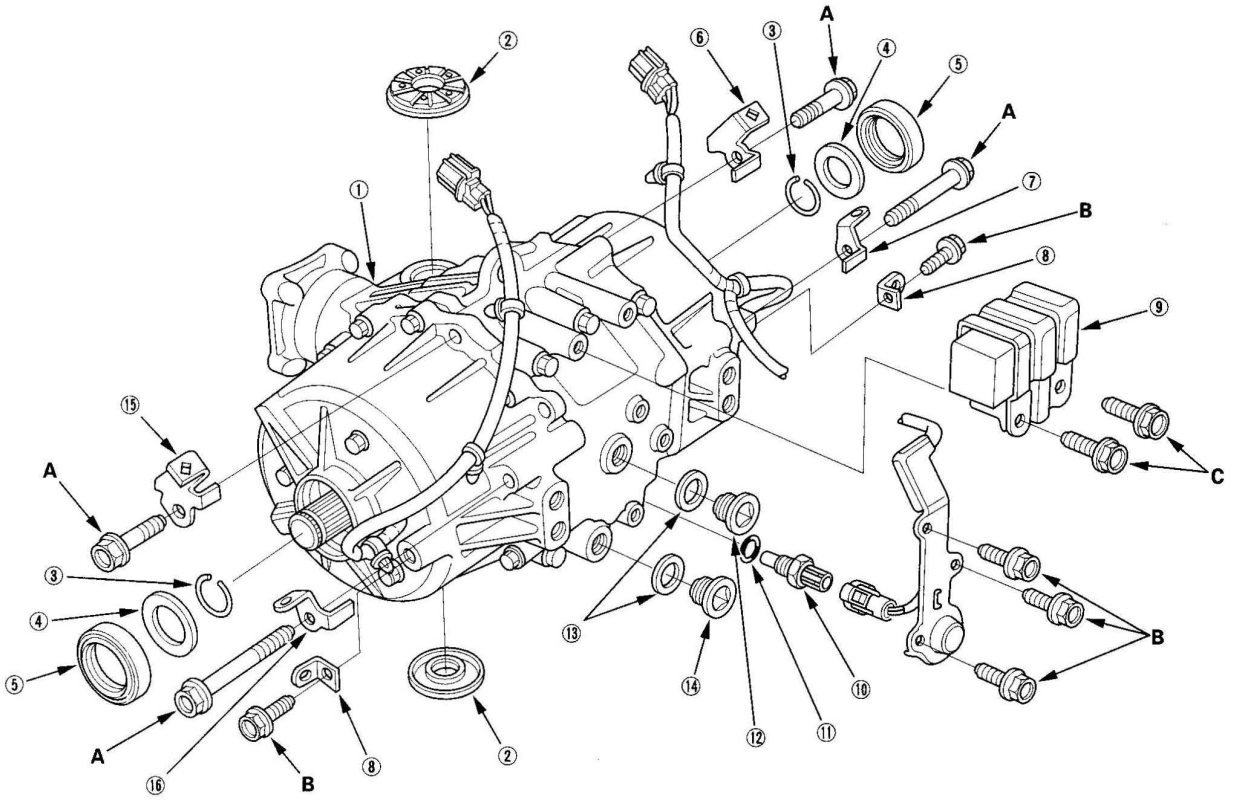


BACK

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Differential Removal

Exploded View



A: 27 N·m (2.8 kgf·m, 20 lbf·ft)
B: 12 N·m (1.2 kgf·m, 9 lbf·ft)
C: 22 N·m (2.2 kgf·m, 16 lbf·ft)

① REAR DIFFERENTIAL CARRIER ASSEMBLY
② REAR DIFFERENTIAL MOUNT A RUBBER INSULATER
③ SET RING
Replace.
④ THRUST WASHER
Replace.
⑤ HALF SHAFT OUTER SEAL
Replace.
⑥ REAR DIFFERENTIAL CABLE BRACKET A
⑦ REAR DIFFERENTIAL CABLE BRACKET C
⑧ REAR DIFFERENTIAL CABLE BRACKET F
⑨ REAR DIFFERENTIAL DYNAMIC DAMPER
⑩ DIFFERENTIAL OIL TEMPERATURE SENSOR
⑪ O-RING
Replace.
⑫ FILLER PLUG
47 N·m (4.8 kgf·m, 35 lbf·ft)
⑬ SEALING WASHER
Replace.
⑭ DRAIN PLUG
47 N·m (4.8 kgf·m, 35 lbf·ft)
⑮ REAR DIFFERENTIAL CABLE BRACKET B
⑯ REAR DIFFERENTIAL CABLE BRACKET D

(cont'd)

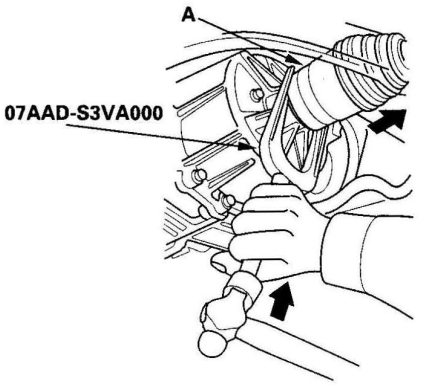
BACK

Protected by AR

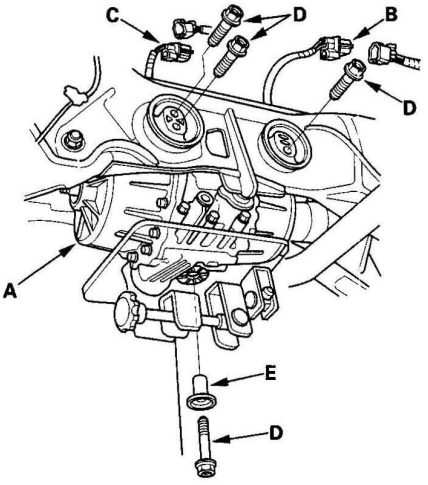
Differential Removal (cont'd)

Special Tool Required
Driveshaft remover 07AAD-S3VA000

1. Drain the differential fluid (see page 15-39).
2. Make a reference mark across the propeller shaft, the transmission, and the rear differential, then remove the propeller shaft (see page 16-36).
3. Remove the left upper arm bolt, then remove the upper arm from the vehicle (see page 18-28).
4. Remove the left rear damper (see page 18-32).
5. Remove the both inboard joints (A) using the special tool as shown.



6. Place a transmission jack under the rear differential (A).

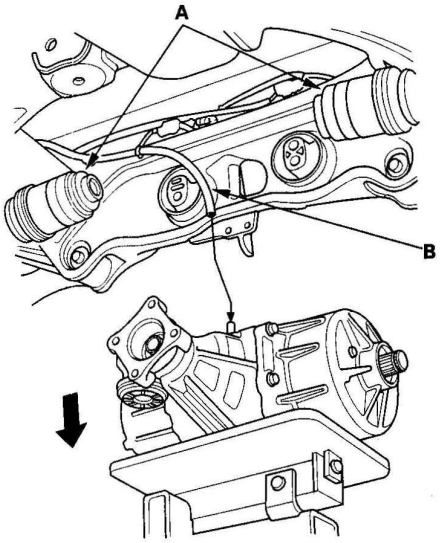


7. Disconnect the 6P (B) and 2P (C) connectors, then remove the mounting bolts (D) and washer (E).

BACK

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8. Lower the rear differential a little on the transmission jack, then remove the rear driveshaft (A) from the rear differential.

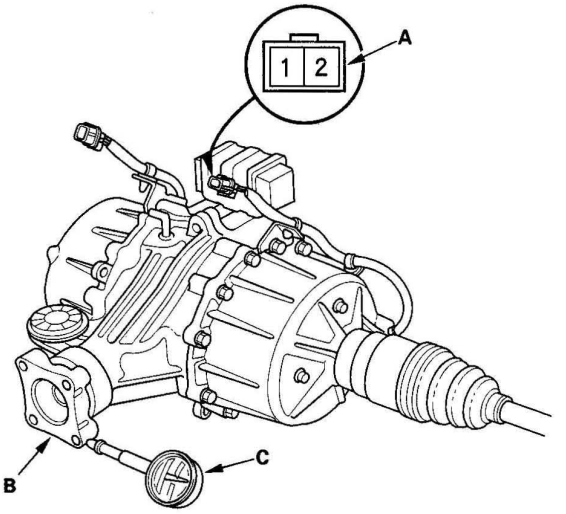


9. Disconnect the breather tube (B) from the rear differential.

10. Lower the rear differential the transmission jack.

Backlash Inspection

1. Install the left rear driveshaft, then connect the battery power to the No. 1 terminal of the left clutch electromagnetic coil 2P connector (A) and ground to the No. 2 terminal.



2. Check the backlash of the companion flange (B) with a dial indicator (C).

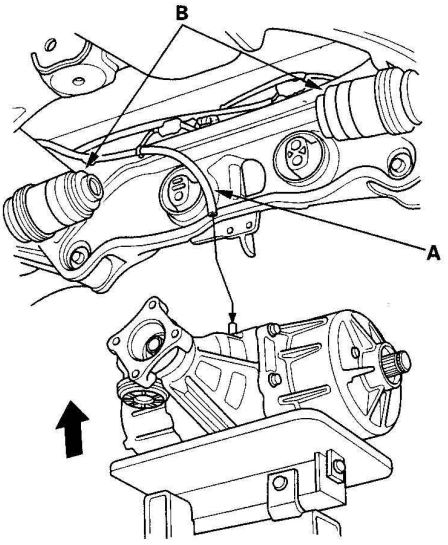
   STANDARD: 1.23—2.38 mm (0.048—0.094 in.)

3. If the backlash is out of standard, replace the rear differential.

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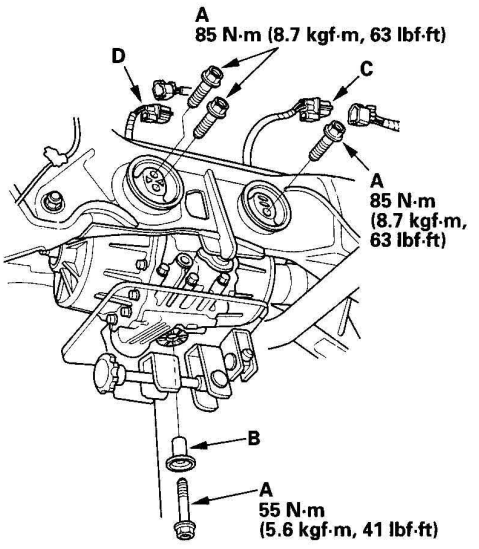
Differential Installation

1. Raise the rear differential a little on the transmission jack, then connect the breather tube (A) to the rear differential.



2. Apply multipurpose grease to the splines of the rear driveshafts (B) (see step 1 on page 16-32), then install the rear driveshafts to the rear differential.

3. Raise the rear differential to the mounting level, then install the mounting bolts (A) and washer (B).

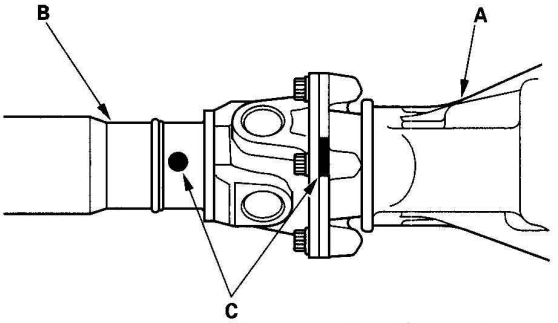


4. Connect the 6P (C) and 2P (D) connectors.

5. Install the rear damper (see page 18-32).

6. Install the upper arm and the upper arm bolt to the vehicle (see page 18-28).

7. When install the new rear differential (A) onto the propeller shaft (B), aligning the reference mark (C).



'01 model: white reference mark
'02 model: yellow reference mark

8. Install the propeller shaft to the transmission and the rear differential by aligning the reference marks (see page 16-36).

9. Refill the differential with recommended fluid (see page 15-39).

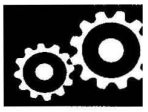
BACK

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Transaxle

Driveline/Axle

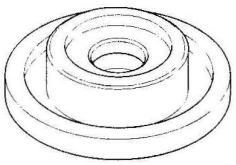
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Rear Driveshafts Reassembly 16-26
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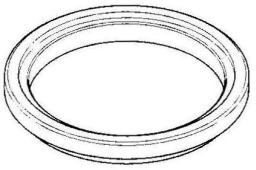
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Special Tools

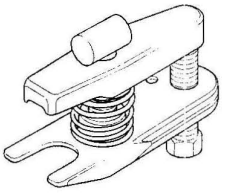
Ref.No.	Tool Number	Description	Qty
①	07JAD-PH80101	Oil Seal Driver Attachment	1
②	07LAF-SM40300	Support Base Attachment	1
③	07MAC-SL00100	Ball Joint Remover, 32 mm	1
④	07XAC-001020A	Threaded Adapter, 24 x 1.5 mm	1
⑤	07746-0010300	Attachment, 42 x 47 mm	1
⑥	07749-0010000	Driver	1
⑦	07947-4630100	Fork Seal Driver, 39.2 x 49.5 x 15 mm	1
⑧	07965-SD90100	Support Base	1
⑨	07AAD-S3VA000	Driveshaft Remover	1



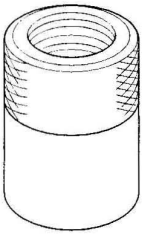
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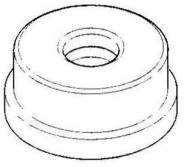
②



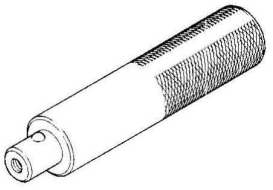
③



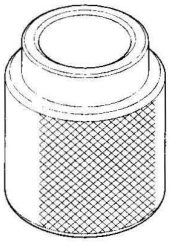
④



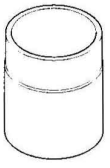
⑤



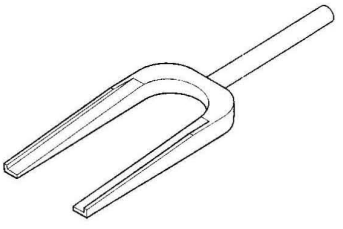
⑥



⑦



⑧



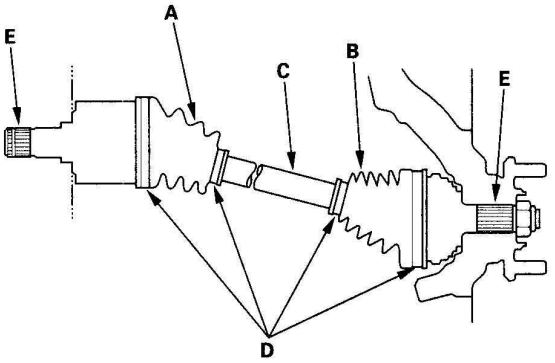
⑨

BACK

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Driveshaft Inspection

1. Check the inboard boot (A) and the outboard boot (B) on the driveshaft (C) for cracks, damage, leaking grease, and loose boot bands (D). If any damage is found, replace the boot and boot bands.



2. Turn the driveshaft by hand, and make sure the splines (E) and joint are not excessively loose.

3. Make sure the driveshaft is not twisted or cracked; if it is, replace it.

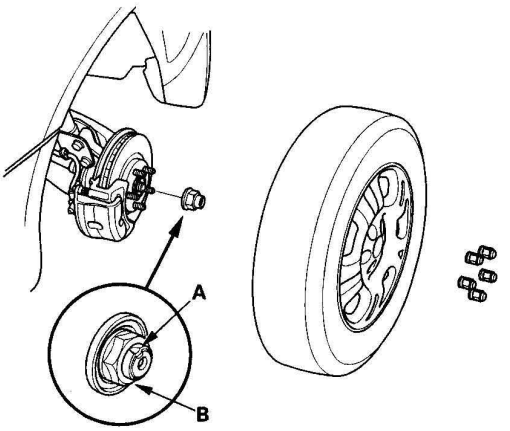
Front Driveshafts Removal

Special Tools Required
Ball joint remover, 32 mm 07MAC-SL00100

1. Loosen the wheel nuts slightly.

2. Raise the front of the vehicle, and make sure it is securely supported.

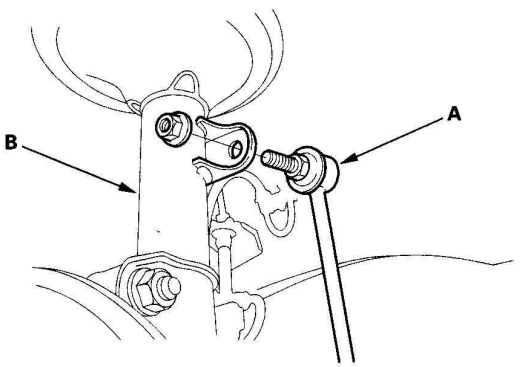
3. Remove the wheel nuts and front wheels.



4. Lift up the locking tab (A) on the spindle nut (B), then remove the nut.

5. If the left driveshaft is removed, drain the transmission fluid (see page 14-132). It is not necessary to drain the transmission fluid when the right driveshaft is removed.

6. Remove the stabilizer link (A) from the damper (B).

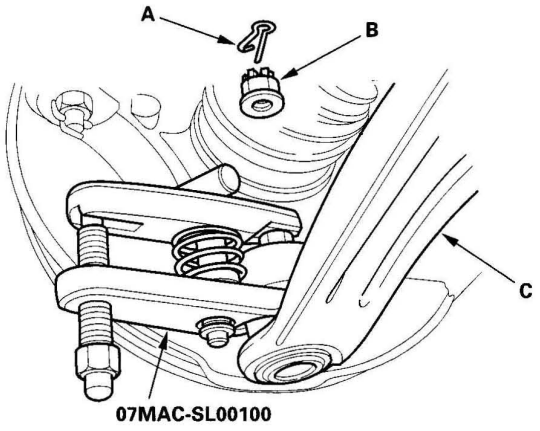


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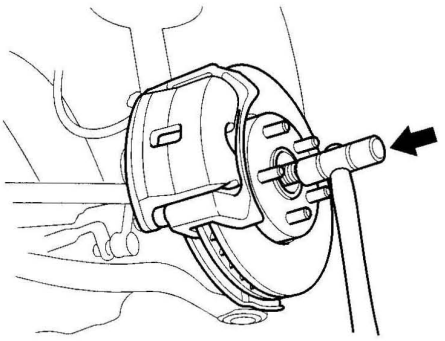
Front Driveshafts Removal (cont'd)

7. Remove the lock pin (A) from the lower arm ball joint castle nut (B), and remove the nut.



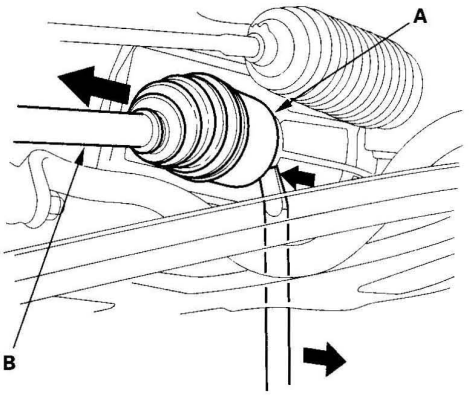
8. Separate the ball joint from the lower arm (C) with the special tool (see page 18-16).

9. Pull the knuckle outward, and remove the driveshaft outboard joint from the front wheel hub using a plastic hammer.

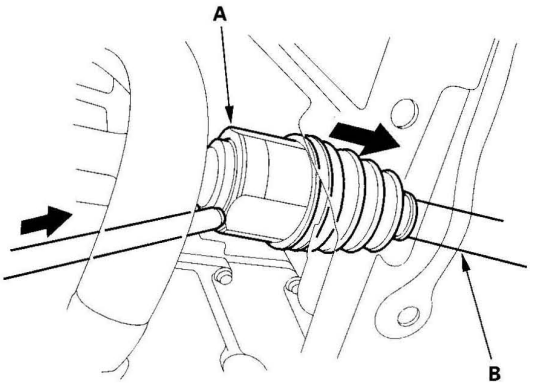


10. Pry (left driveshaft)/tap (right driveshaft) the inboard joint (A), and remove the driveshaft from the differential case or bearing support as an assembly. Do not pull on the driveshaft (B); the inboard joint may come apart. Pull the driveshaft straight out to avoid damaging the differential oil seal or the intermediate shaft outer seal.

Left driveshaft:



Right driveshaft:



BACK

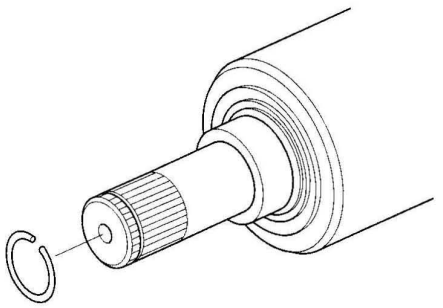
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Front Driveshafts Disassembly

Special Tools Required
- Threaded adapter, 24 x 1.5 mm 07XAC-001020A
- Slide hammer, commercially available

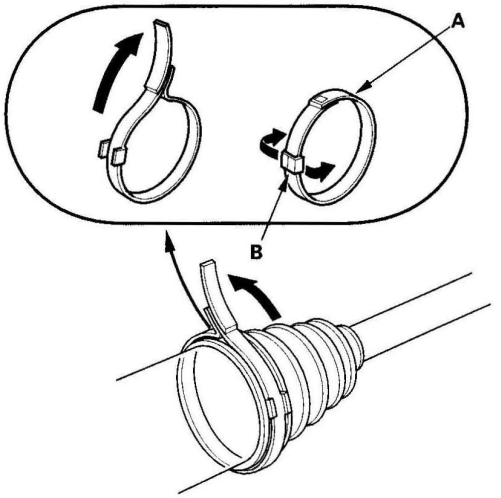
Inboard Joint Side:

1. Remove the set ring from the inboard joint.

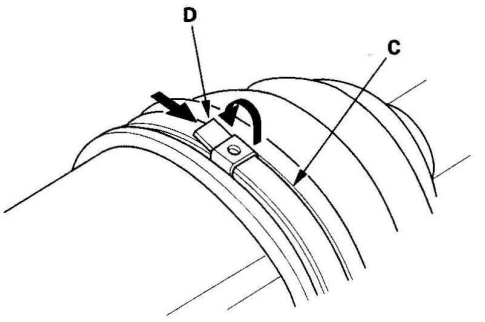


2. Remove the boot bands. Be careful not to damage the boot.
   - If the boot band is a locking tab type (A), pry up the locking tab (B) with a screwdriver, and lift up the end of the band.
   - If the boot band is a double loop type (C), lift up the band bend (D).

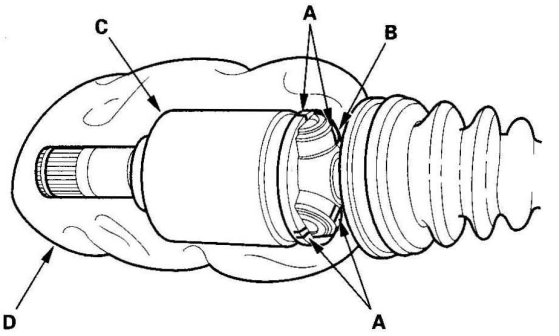
Locking tab type



Double loop type



3. Make a mark (A) on each roller (B) and inboard joint (C) to identify the locations of rollers and grooves in the inboard joint. Then remove the inboard joint on the shop towel (D). Be careful not to drop the rollers when separating them from the inboard joint.

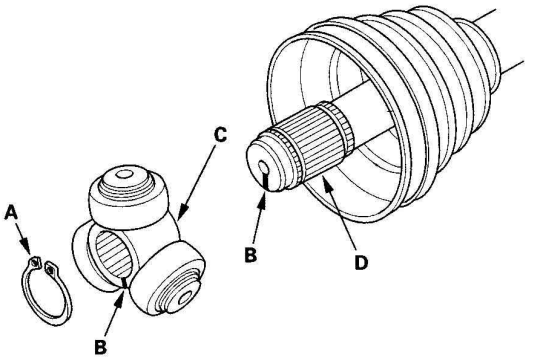


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Front Driveshafts Disassembly (cont'd)

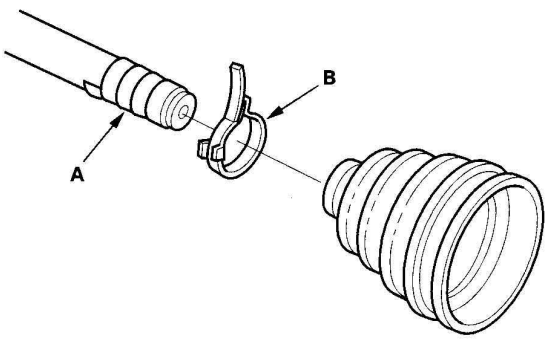
4. Remove the snap ring (A).



5. Make a mark (B) on the spider (C) and driveshaft (D) to identify the position of the spider on the shaft.

6. Remove the spider.

7. Wrap the splines on the driveshaft with vinyl tape (A) to prevent damage to the boot.

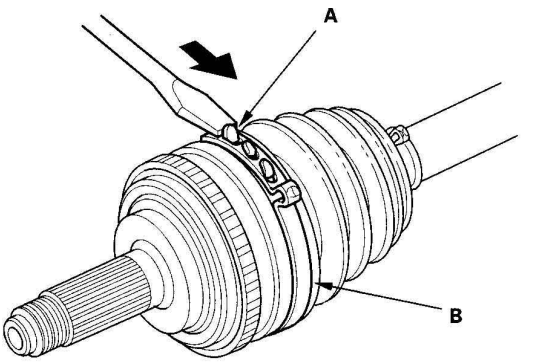


8. Remove the inboard boot and locking tab type boot band (B). Be careful not to damage the boot.

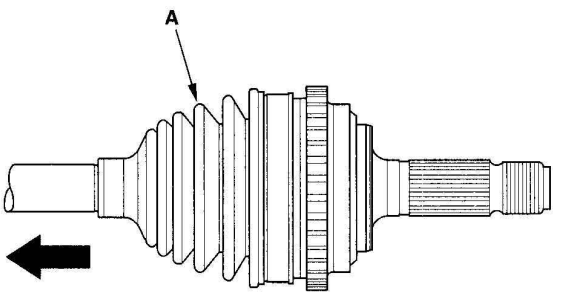
9. Remove the vinyl tape.

Outboard Joint Side:

1. Lift up the three tabs (A) with a screwdriver, then remove the boot bands (B). Be careful not to damage the boot.



2. Slide the outboard boot (A) to the inboard joint side. Be careful not to damage the boot.

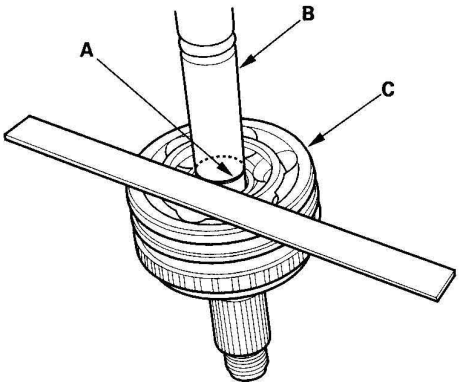


BACK

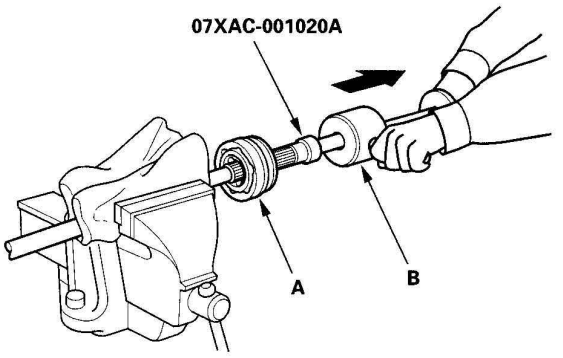
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3. Wipe off the grease to expose the driveshaft and the outboard joint inner race.

4. Make a mark (A) on the driveshaft (B) at the same position of the outboard joint end (C).



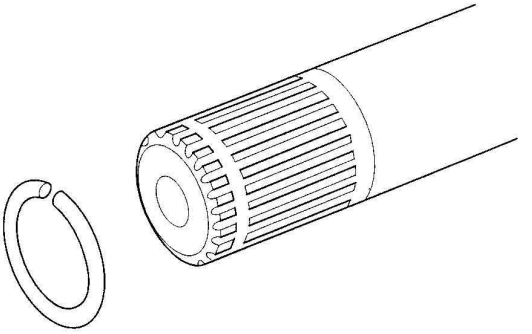
5. Carefully clamp the driveshaft in a vise.



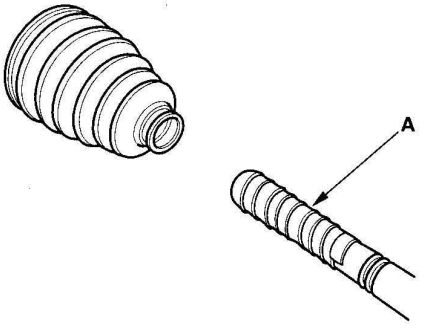
6. Remove the outboard joint (A) using the special tool and a commercially available 5/8" x 18 slide hammer (B).

7. Remove the driveshaft from the vise.

8. Remove the circlip from the driveshaft.



9. Wrap the splines on the driveshaft with vinyl tape (A) to prevent damage to the boot.



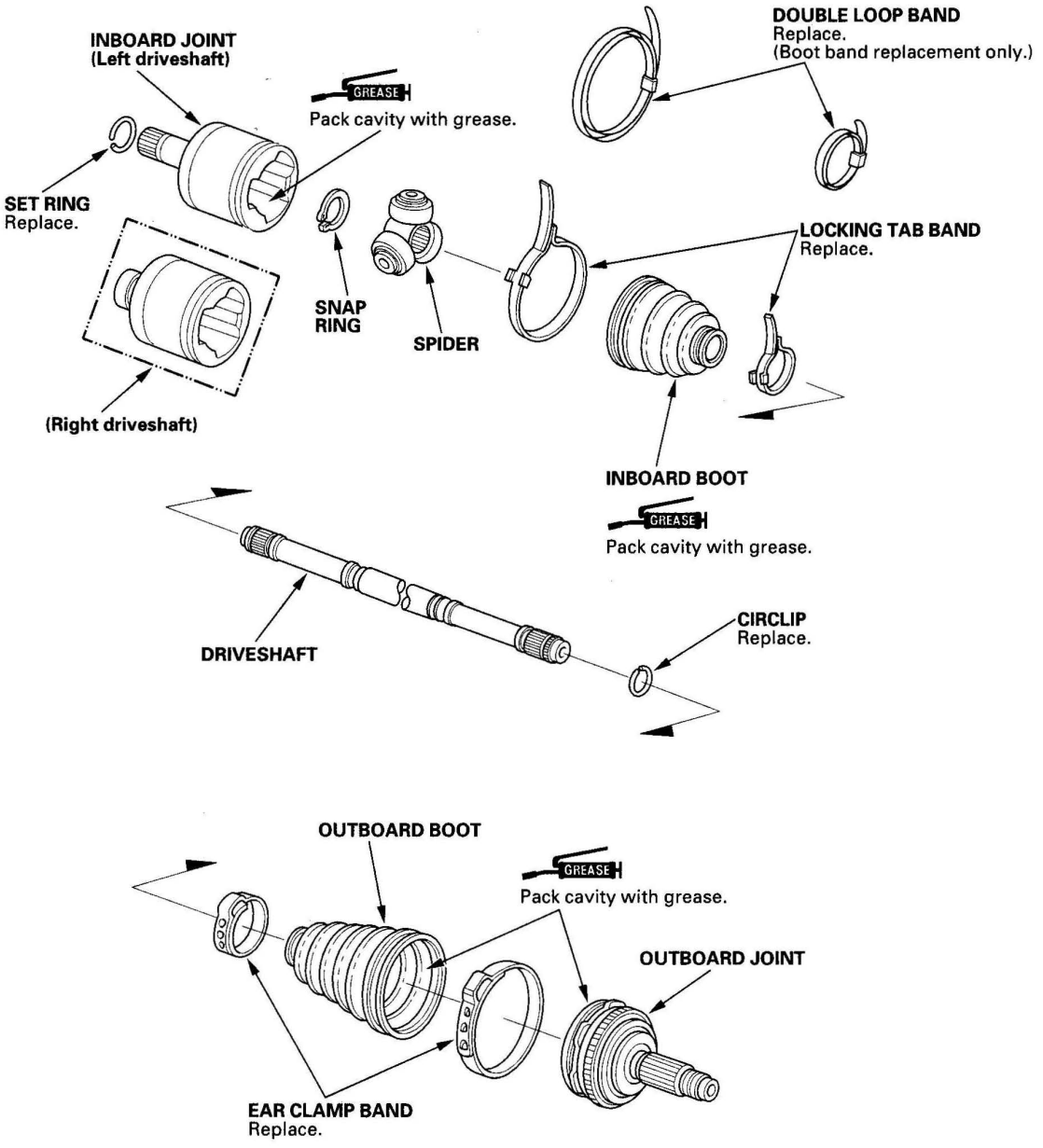
10. Remove the outboard boot. Be careful not to damage the boot.

11. Remove the vinyl tape.

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Front Driveshafts Reassembly

Exploded View



BACK

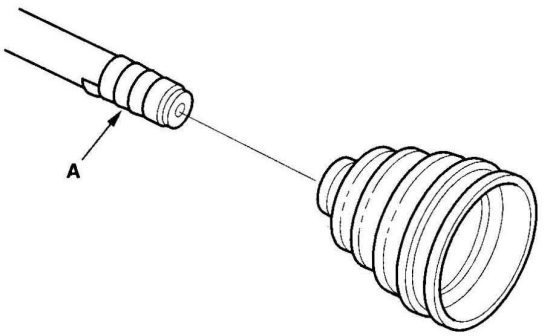
Protected by AR

Special Tools Required
- Boot band tool, KD-3191 or equivalent, commercially available
- Boot band pincers, Kent-Moore J-35910 or equivalent, commercially available

NOTE: Refer to the Exploded View as needed during this procedure.

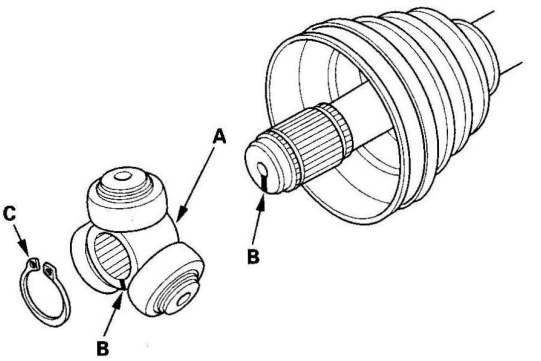
Inboard Joint Side:

1. Wrap the splines with vinyl tape (A) to prevent damage to the inboard boot.



2. Install the inboard boot on the driveshaft, then remove the vinyl tape. Be careful not to damage the inboard boot.

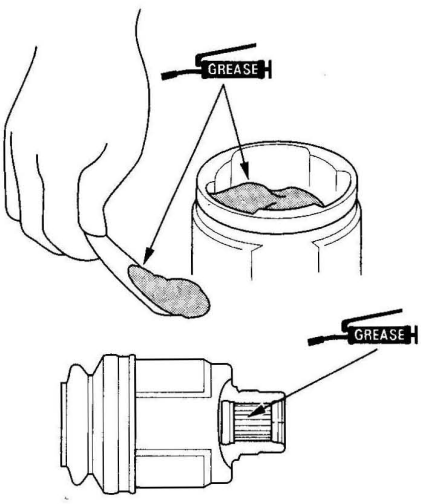
3. *Install the spider (A) onto the driveshaft by aligning* the marks (B) on the spider and the end of the driveshaft.



4. Install the snap ring (C).

5. Pack the inboard joint with the joint grease included in the new driveshaft set.

Grease quantity
Inboard joint: 175—195 g (6.2—6.9 oz)

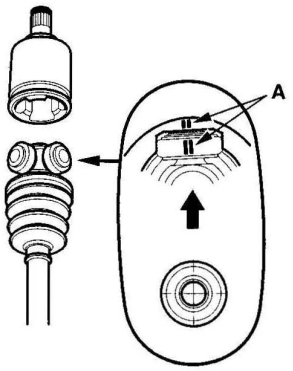


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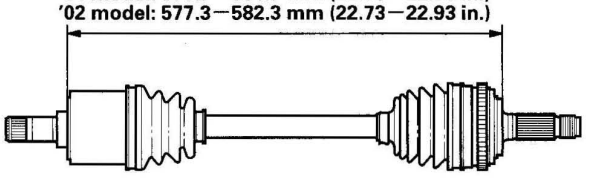
Front Driveshafts Reassembly (cont'd)

6. Fit the inboard joint onto the driveshaft, and note these items:
   - Reinstall the inboard joint onto the driveshaft by aligning the marks (A) on the inboard joint and the rollers.
   - Hold the driveshaft so the inboard joint points up to prevent it from falling off.

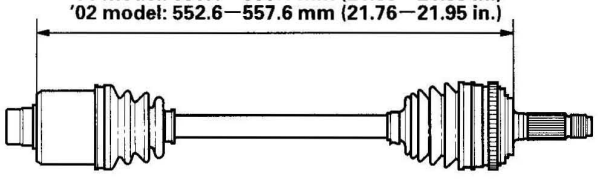


7. Adjust the length of the driveshafts to the figure below, then adjust the boots to halfway between full compression and full extension. Make sure the ends of the boots seat in the grooves of the driveshaft and joint.

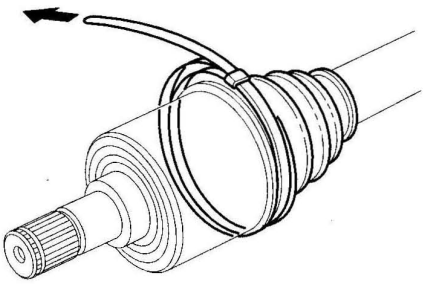
Left Driveshaft:
'01 model: 576.7—581.7 mm (22.70—22.90 in.)
'02 model: 577.3—582.3 mm (22.73—22.93 in.)



Right Driveshaft:
'01 model: 550.1—555.1 mm (21.66—21.85 in.)
'02 model: 552.6—557.6 mm (21.76—21.95 in.)

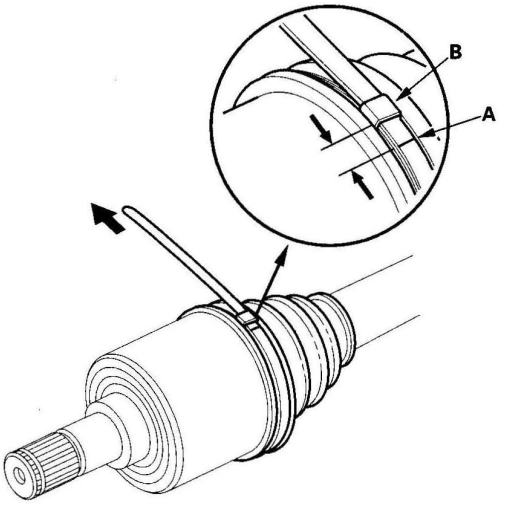


8. Fit the boot ends onto the driveshaft and the inboard joint, then install the boot band.



9. Pull up the slack in the band by hand.

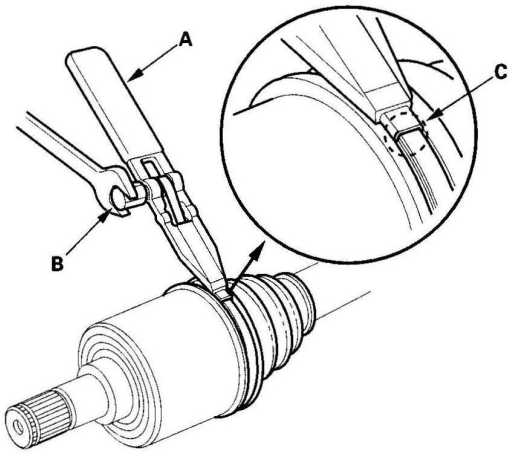
10. Mark a position (A) on the band 10—14 mm (0.4—0.6 in.) from the clip (B).



BACK

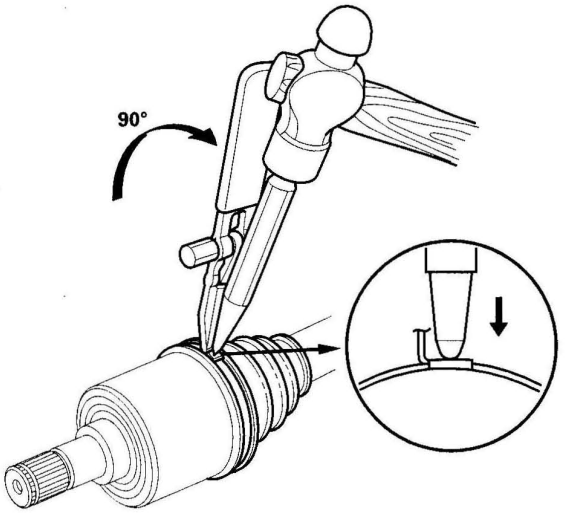
Protected by AR

11. Thread the free end of the band through the nose section of a commercially available boot band tool KD-3191 or equivalent (A), and into the slot on the winding mandrel (B).

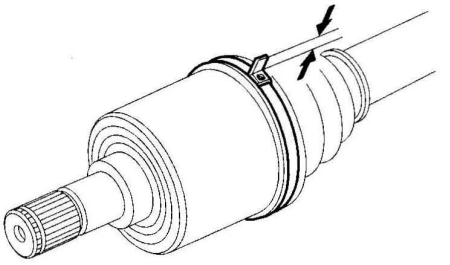


12. Place a wrench on the winding mandrel of the boot band tool, and tighten the band until the marked spot (C) on the band meets the edge of the clip.

13. Lift up the boot band tool to bend the free end of the band 90° to the clip. Center-punch the clip, then fold over the remaining tail onto the clip.

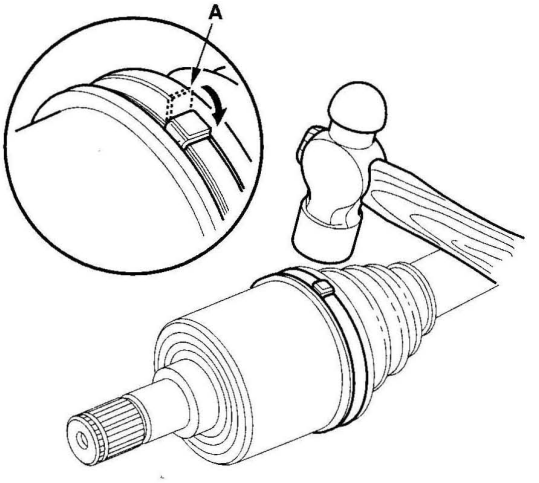


14. Unwind the boot band tool, and cut off the excess free end of the band to leave a 5—10 mm (0.2—0.4 in.) tail protruding from the clip.



15. Bend the band end (A) by tapping it down with a hammer.

NOTE:
- Make sure the band and clip do not interfere with anything, and the band does not move.
- Remove any grease remaining on the surrounding surfaces.



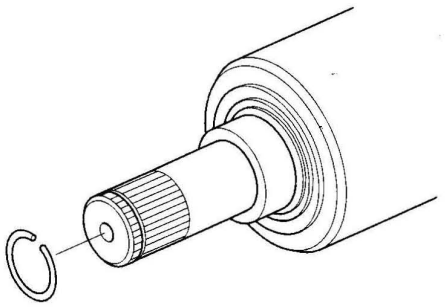
16. Install the boot band on the other end of the boot, and repeat step 9 through 15.

(cont'd)

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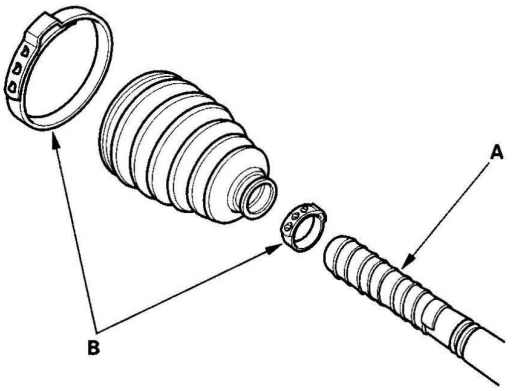
Front Driveshafts Reassembly (cont'd)

17. Install the new set ring.

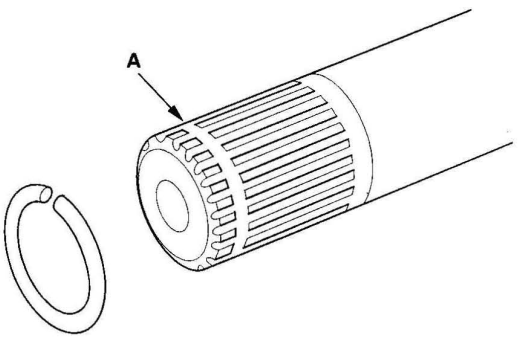


Outboard Joint Side:

1. Wrap the splines with vinyl tape (A) to prevent damage to the outboard boot.



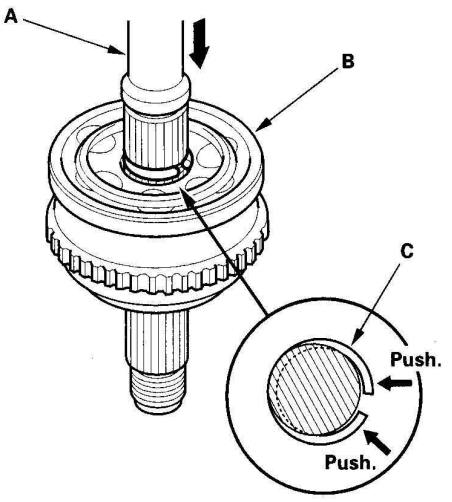
2. Install the new ear clamp bands (B) and outboard boot, then remove the vinyl tape. Be careful not to damage the boot.
3. Install the new circlip into the driveshaft groove (A).



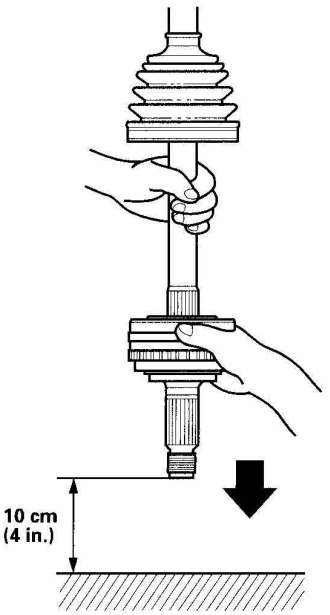
BACK

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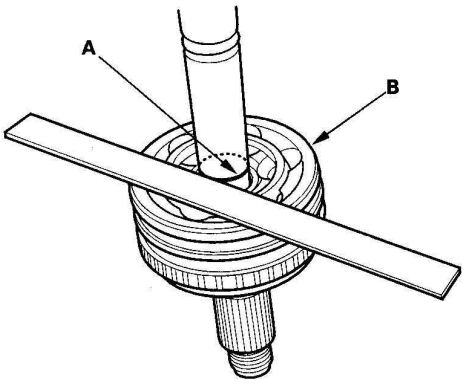
4. Insert the driveshaft (A) into the outboard joint (B) until the circlip (C) is close on the joint.



5. To completely seat the outboard joint, pick up the driveshaft and joint, and drop them from about 10 cm (4 in.) onto a hard surface. Do not use a hammer as excessive force may damage the driveshaft.

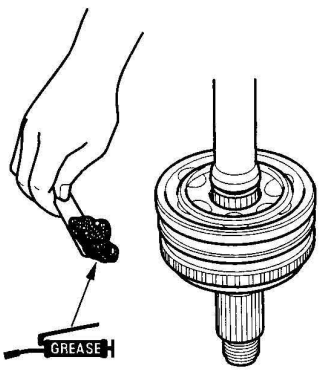


6. Check the alignment of the paint mark (A) with the outboard joint end (B).



7. Pack the outboard joint with the joint grease included in the new joint boot set.

Grease quantity
Outboard Joint: 110—130 g (3.9—4.6 oz)

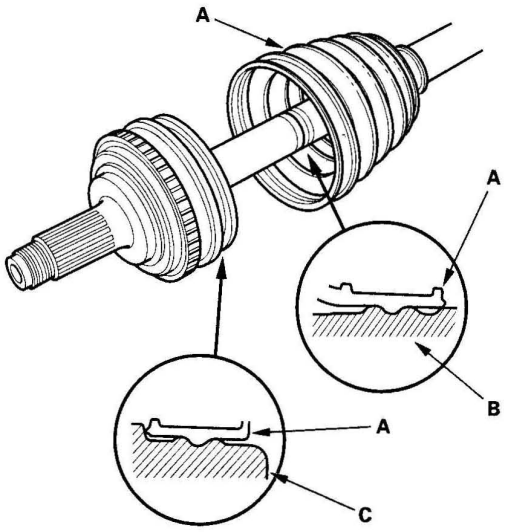


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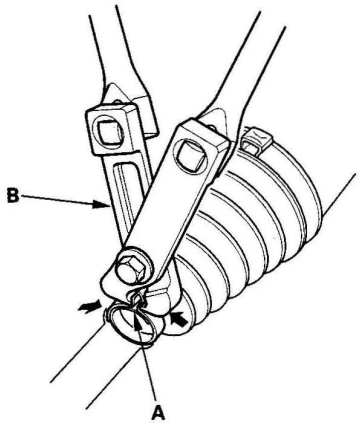
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Front Driveshafts Reassembly (cont'd)

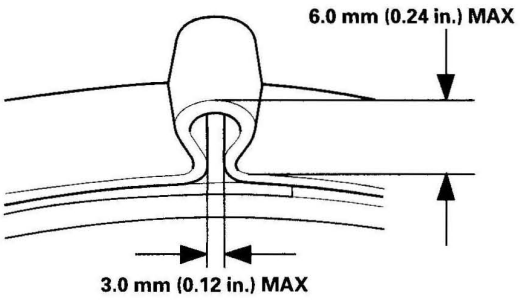
8. Fit the boot (A) ends onto the driveshaft (B) and outboard joint (C).



9. Close the ear portion (A) of the band with a commercially available boot band pincers Kent-Moore J35910 or equivalent (B).



10. Check the clearance between the closed ear portion of the band. If the clearance is not within the standard, close the ear portion of the band further.



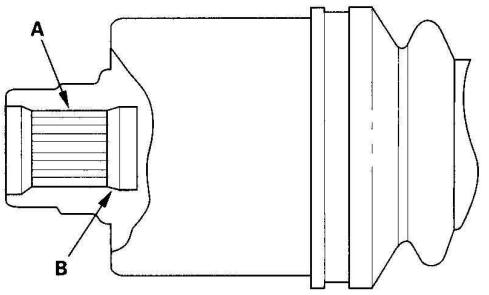
11. Repeat steps 9 and 10 for the band on the other end of the boot.

BACK

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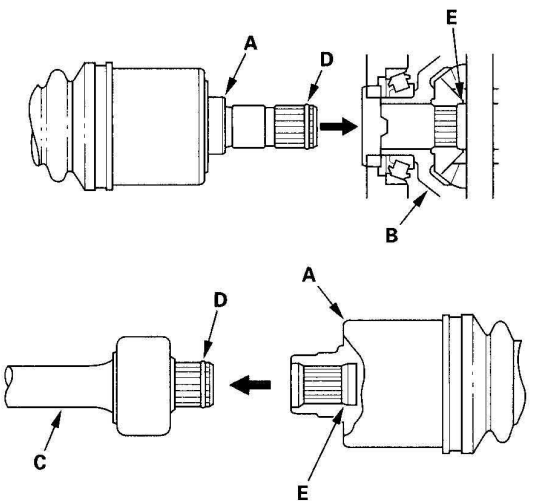
Front Driveshafts Installation

1. Apply 2.0—3.0 g (0.07—0.10 oz) of multipurpose grease to the whole splined surface (A) of the right driveshaft. After applying grease, remove the grease from the splined grooves at intervals of 2—3 splines and from the set ring groove (B) so that air can bleed from the intermediate shaft.

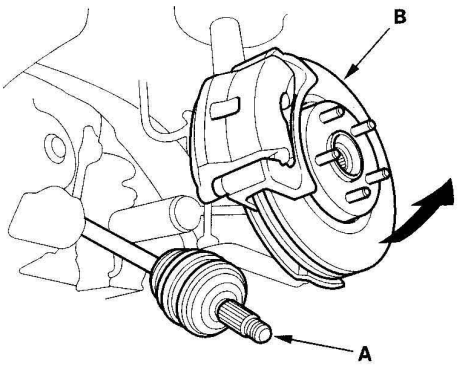


2. Install a new set ring onto the set ring groove of the driveshaft.

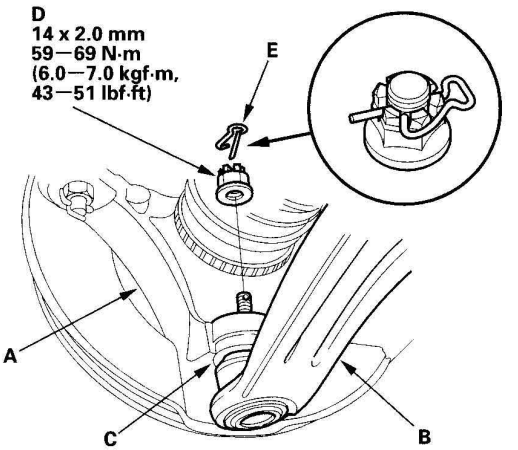
3. Clean the areas where the driveshaft contacts the differential thoroughly with solvent or carburetor cleaner, and dry with compressed air. Insert the inboard end (A) of the driveshaft into the differential (B) or intermediate shaft (C) until the set ring (D) locks in the groove (E).



4. Install the outboard joint (A) into the front hub (B).



5. Install the knuckle (A) onto the lower arm (B). Be careful not to damage the ball joint boot (C). Wipe off the grease before tightening the nut at the ball joint. Torque the castle nut (D) to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.



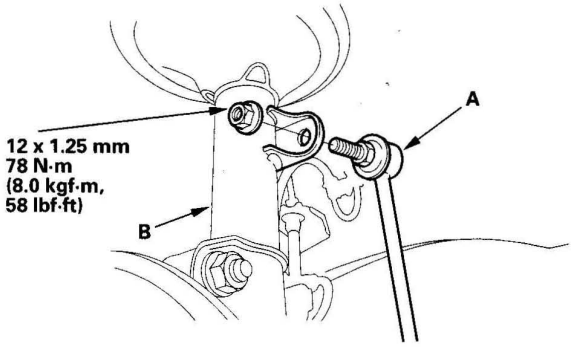
6. Install the new lock pin (E) into the pin hole as shown.

(cont'd)

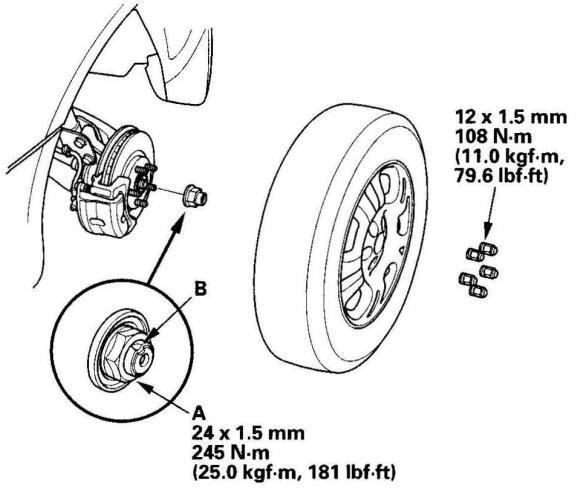
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Front Driveshafts Installation (cont'd)

7. Install the stabilizer link (A) to the damper (B).



8. Install a new spindle nut (A), then tighten the nut. After tightening, use a drift to stake the spindle nut shoulder (B) against the driveshaft.



9. Clean the mating surfaces of the brake disc and the front wheel, then install the front wheel with the wheel nuts.

10. Tighten the flange bolts and the self-locking nut with the vehicle's weight on the damper.

11. Refill the transmission with recommended fluid (see page 14-132).

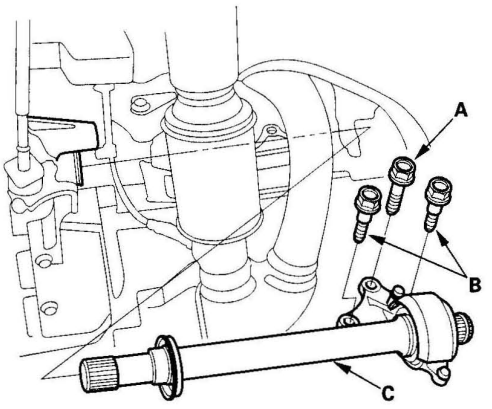
12. Check the front wheel alignment, and adjust it if necessary (see page 18-5).

Intermediate Shaft Removal

1. Drain the transmission fluid (see page 14-132).

2. Remove the right driveshaft (see page 16-3).

3. Remove the flange bolt (A) and the two dowel bolts (B).



4. Remove the intermediate shaft (C) from the differential. Hold the intermediate shaft horizontal until it is clear of the differential to prevent damage to the differential oil seal.

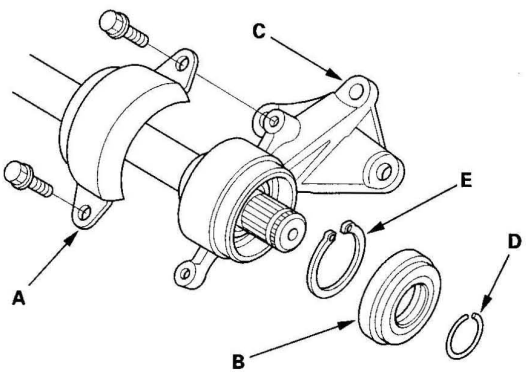
BACK

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Intermediate Shaft Disassembly

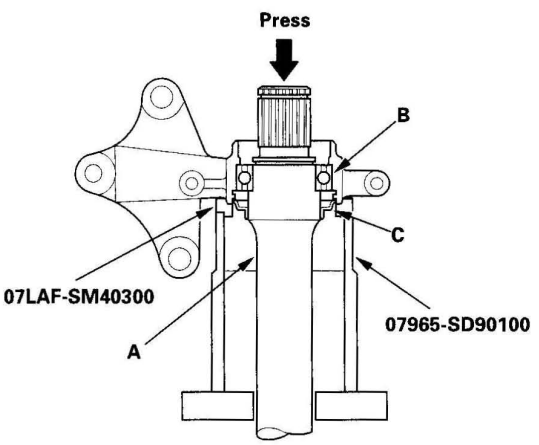
Special Tools Required
- Driver 07749-0010000
- Support base attachment 07LAF-SM40300
- Support base 07965-SD90100
- Attachment, 42 x 47 mm 07746-0010300

1. Remove the heat shield (A) and intermediate shaft outer seal (B) from the bearing support (C).

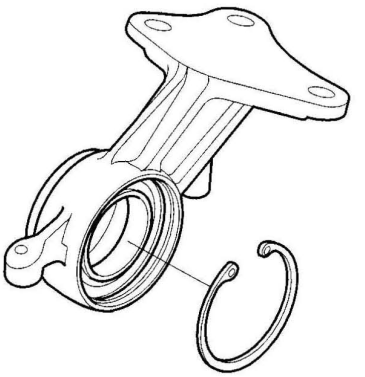


2. Remove the set ring (D) and the external snap ring (E).

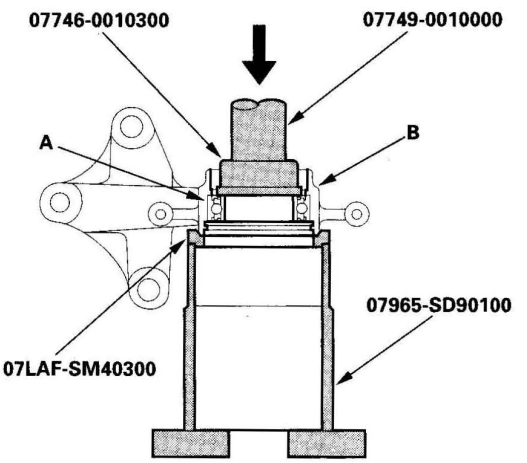
3. Press the intermediate shaft (A) out of the intermediate shaft bearing (B) using the special tools and a press. Be careful not to damage the metal rings (C) on the intermediate shaft during disassembly.



4. Remove the internal snap ring.



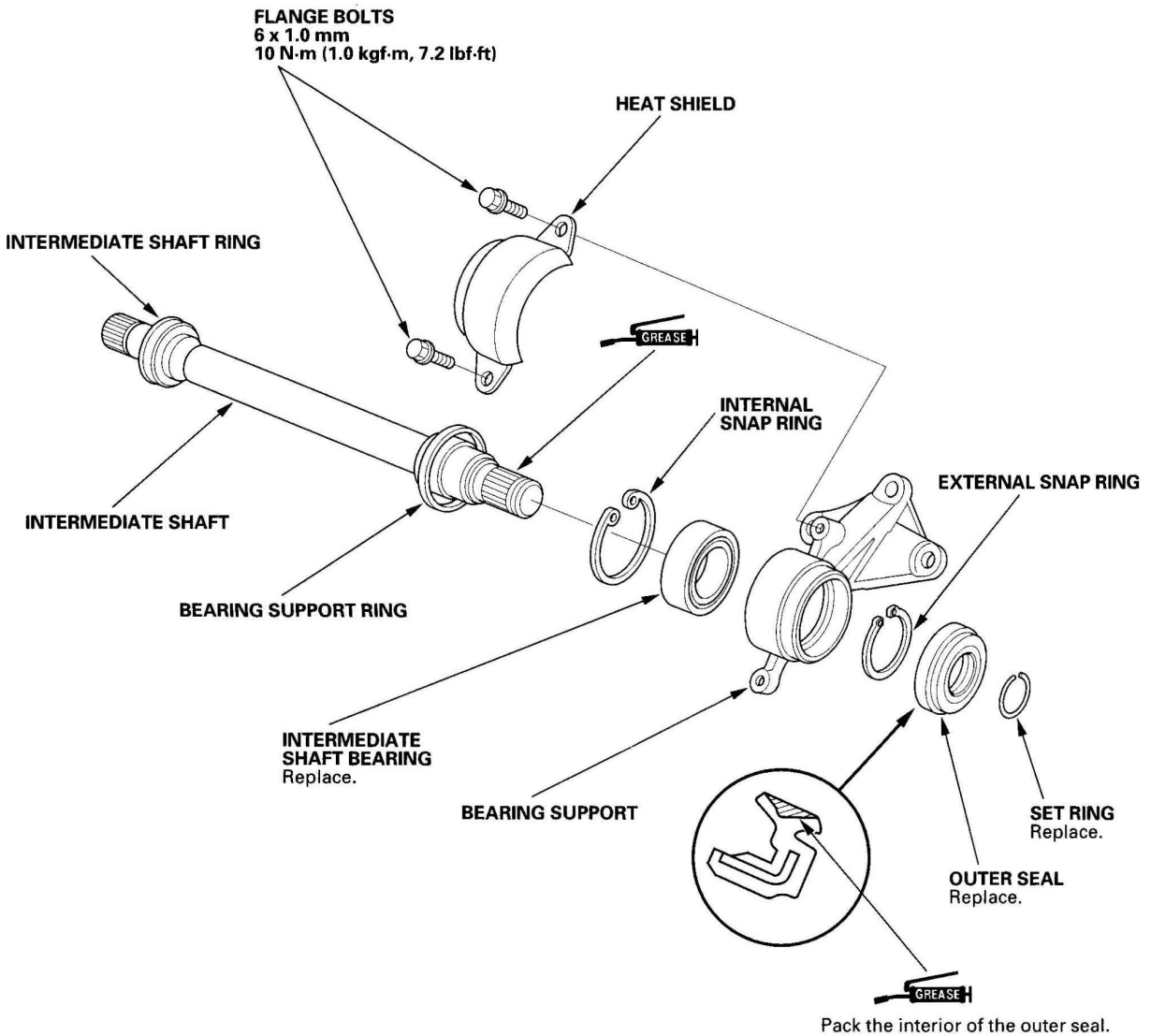
5. Press the intermediate shaft bearing (A) out of the bearing support (B) using the special tools and a press.



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Intermediate Shaft Reassembly

Exploded View



BACK

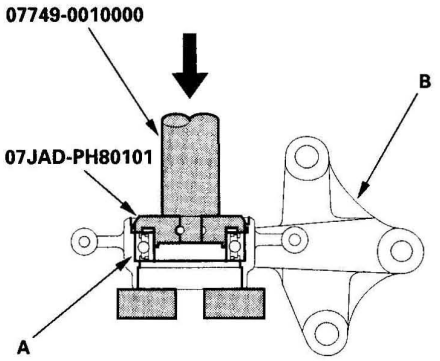
Protected by AR

Special Tools Required
- Driver 07749-0010000
- Support base attachment 07LAF-SM40300
- Support base 07965-SD90100
- Oil seal driver attachment 07JAD-PH80101
- Fork seal driver, 39.2 x 49.5 x 15 mm 07947-4630100

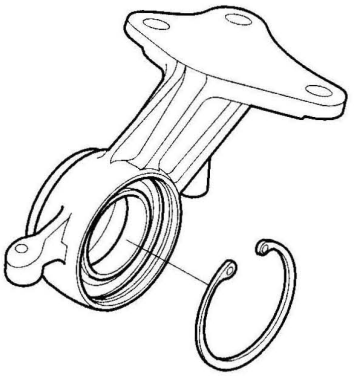
NOTE: Refer to the Exploded View as needed during this procedure.

1. Clean the disassembled parts with solvent, and dry them with compressed air. Do not wash the rubber parts with solvent.

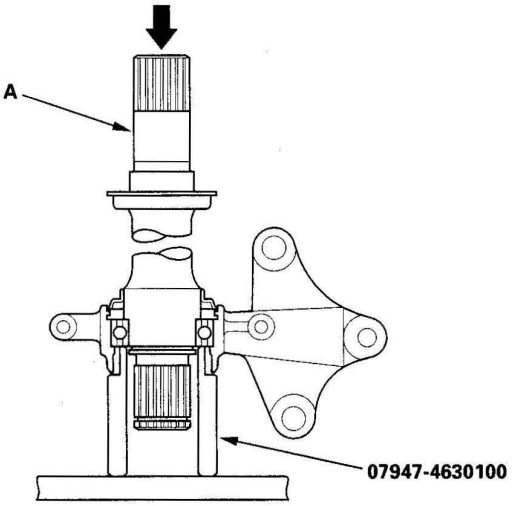
2. Press the intermediate shaft bearing (A) into the bearing support (B) using the special tools and a press.



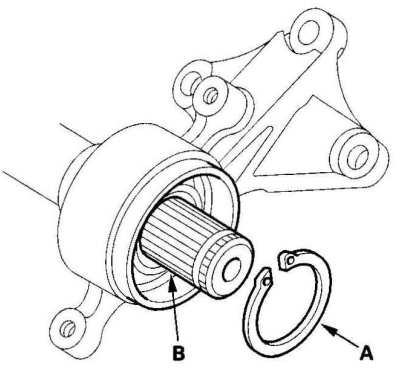
3. Seat the internal snap ring into the groove of the bearing support.



4. Press the intermediate shaft (A) into the shaft bearing using the special tool and a press.



5. Seat the external snap ring (A) into the groove of the intermediate shaft (B).

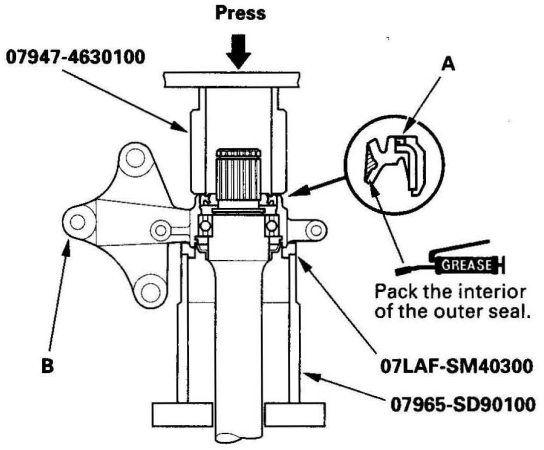


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Intermediate Shaft Reassembly (cont'd)

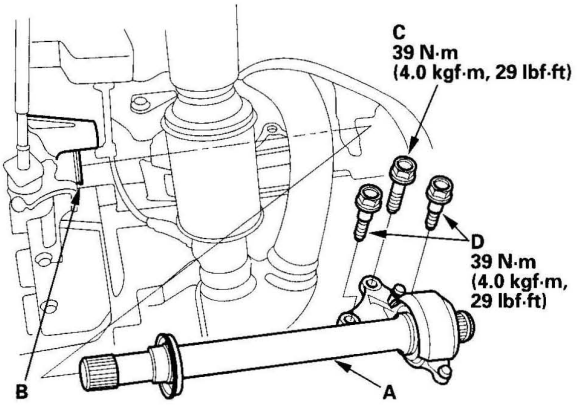
6. Pack the interior of the outer seal (A). Install the outer seal into the bearing support (B) using the special tools and a press.



7. Install the heat shield onto the bearing support.

Intermediate Shaft Installation

1. Clean the areas where the intermediate shaft (A) contacts the transmission (differential) thoroughly with solvent or carburetor cleaner, and dry with compressed air. Insert the intermediate shaft assembly into the differential. Hold the intermediate shaft horizontal to prevent damage to the differential oil seal (B).



2. Install the flange bolt (C) and the two dowel bolts (D).

3. Install the right driveshaft (see page 16-15).

4. Refill the transmission with recommended fluid (see page 14-132).

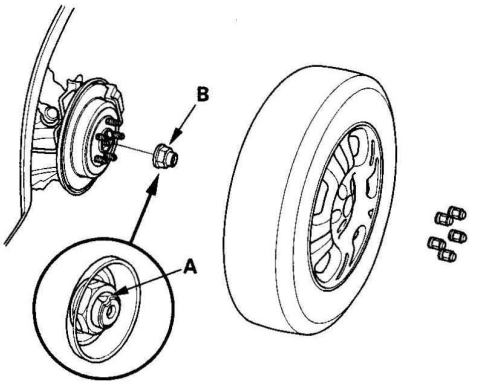
BACK

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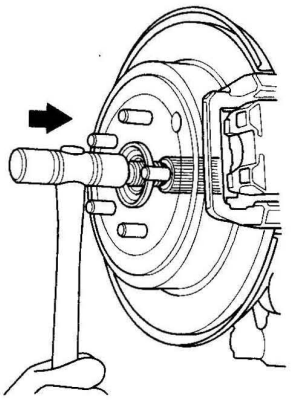
Rear Driveshafts Removal

Special Tools Required
Driveshaft remover 07AAD-S3VA000

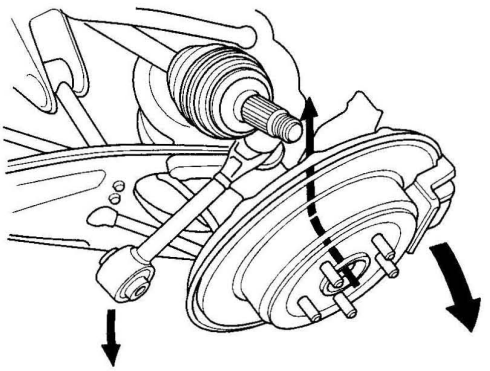
1. Loosen the wheel nuts slightly.
2. Raise the rear of the vehicle, and make sure it is securely supported.
3. Drain the differential fluid (see page 15-39).
4. Remove the wheel nuts and rear wheels.



5. Lift up the locking tab (A) on the spindle nut (B), then remove the nut.
6. Remove the upper arm bolt (see page 18-28).
7. Remove the rear damper (see page 18-32).
8. Remove the lower arm B flange bolt (see page 18-29).
9. Remove the ABS rear wheel sensor bracket (see page 19-59).
10. Pull the knuckle outward, and disconnect the rear driveshaft outboard joint from the rear wheel hub using a plastic hammer.



11. Remove the rear driveshaft outboard joint.

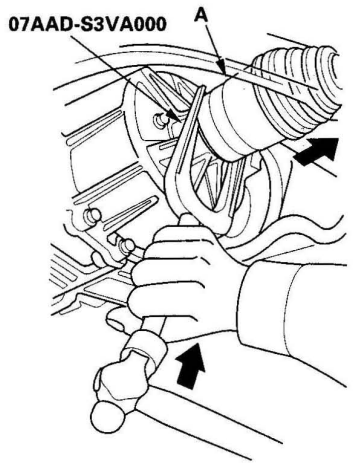


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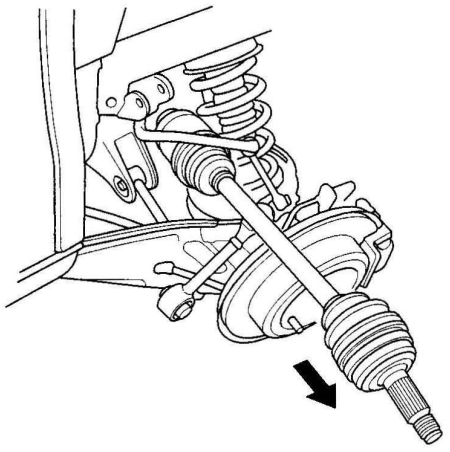
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Rear Driveshafts Removal (cont'd)

12. Remove the rear driveshaft inboard joint (A) using the special tool as shown.



13. Remove the rear driveshaft.



Rear Driveshafts Disassembly

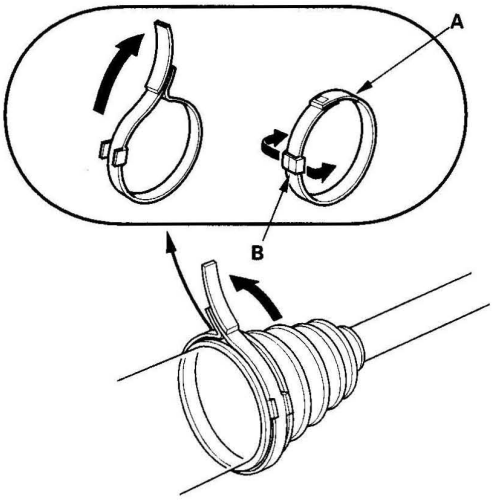
Special Tools Required
- Threaded adapter, 24 x 1.5 mm 07XAC-001020A
- Slide hammer, commercially available

Inboard Joint Side:

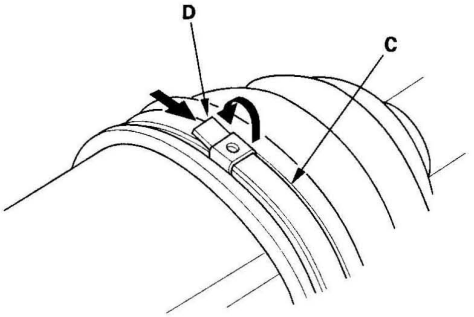
1. Remove the boot bands. Be careful not to damage the boot.

   - If the boot band is a locking tab type (A), pry up the locking tab (B) with a screwdriver, and lift up the end of the band.
   - If the boot band is a double loop type (C), lift up the band bend (D).

Locking tab type



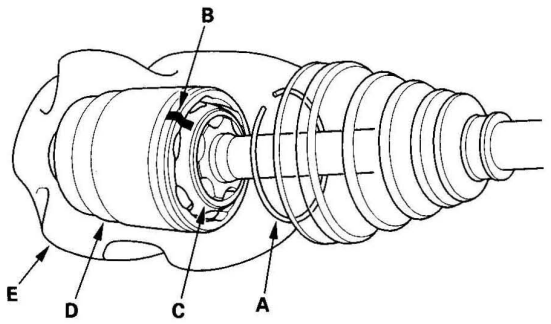
Double loop type



BACK

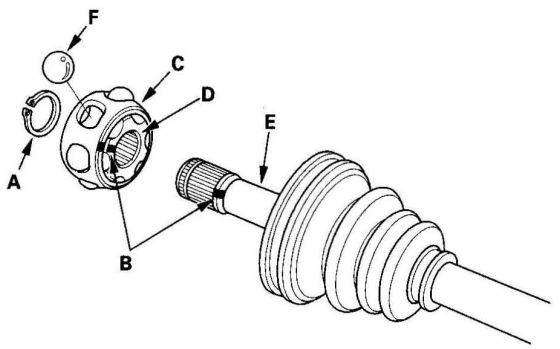
Protected by AR

2. Remove the circlip (A).



3. Make a mark (B) on the bearing retainer (C) and inboard joint (D) to identify the locations of ball bearings and grooves in the inboard joint. Then remove the inboard joint on the shop towel (E). Be careful not to drop the ball bearings when separating them from the inboard joint.

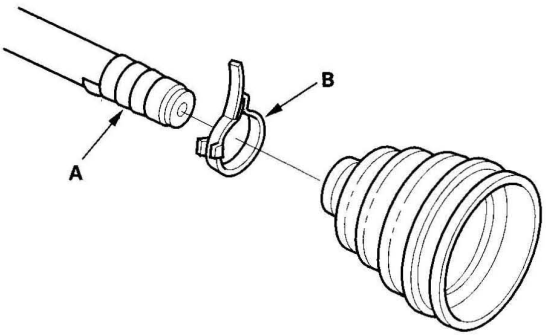
4. Remove the snap ring (A).



5. Make a mark (B) on the bearing retainer (C), the bearing race (D) and driveshaft (E) to identify the position of the bearing retainer and the bearing race on the shaft.

6. Remove the bearing race and the steel ball bearing (F).

7. Wrap the splines on the driveshaft with vinyl tape (A) to prevent damage to the boot.



8. Remove the inboard boot and locking tab type boot band (B). Be careful not to damage the boot.

9. Remove the vinyl tape.

(cont'd)

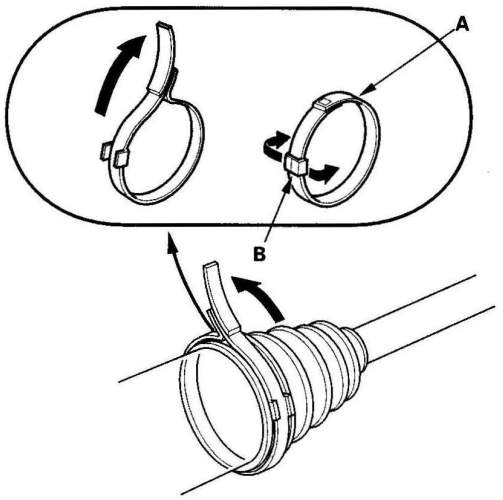
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Rear Driveshafts Disassembly (cont'd)

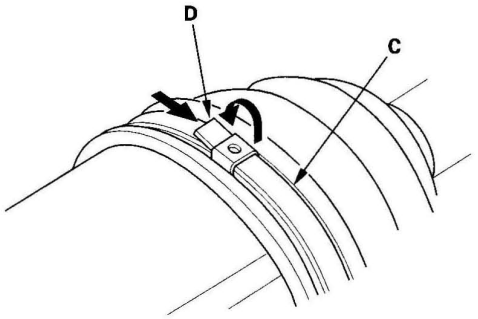
Outboard Joint Side:

1. Remove the boot bands. Be careful not to damage the boot.
   - If the boot band is a locking tab type (A), pry up the locking tab (B) with a screwdriver, and lift up the end of the band.
   - If the boot band is a double loop type (C), lift up the band bend (D).

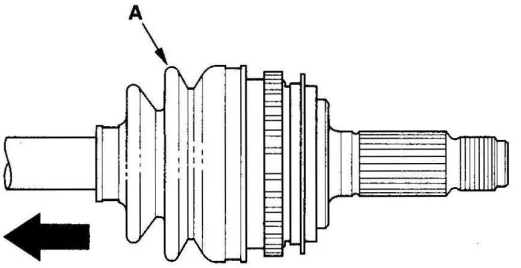
Locking tab type



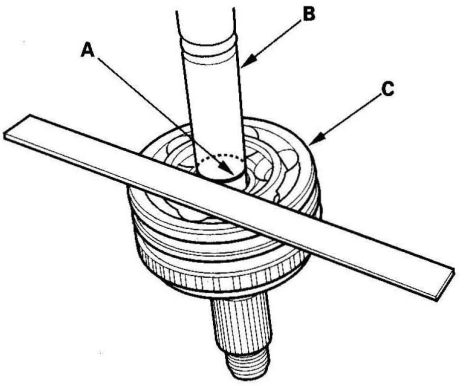
Double loop type



2. Slide the outboard boot (A) to the inboard joint side. Be careful not to damage the boot.



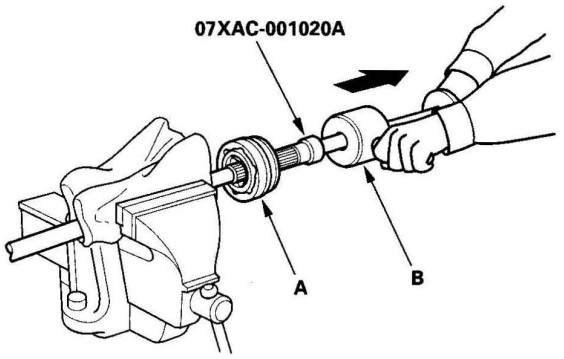
3. Wipe off the grease to expose the driveshaft and the outboard joint end.
4. Make a mark (A) on the driveshaft (B) at the same position of the outboard joint end (C).



BACK

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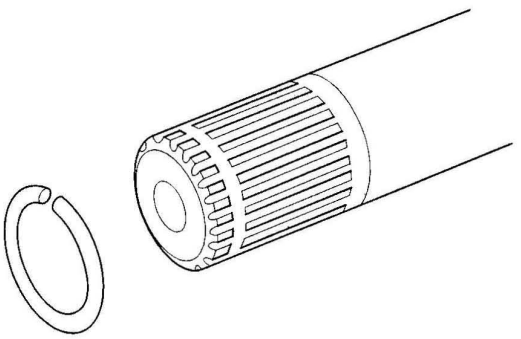
5. Carefully clamp the driveshaft in a vise.



6. Remove the outboard joint (A) using the special tool and a commercially available 5/8" x 18 slide hammer (B).

7. Remove the driveshaft from the vise.

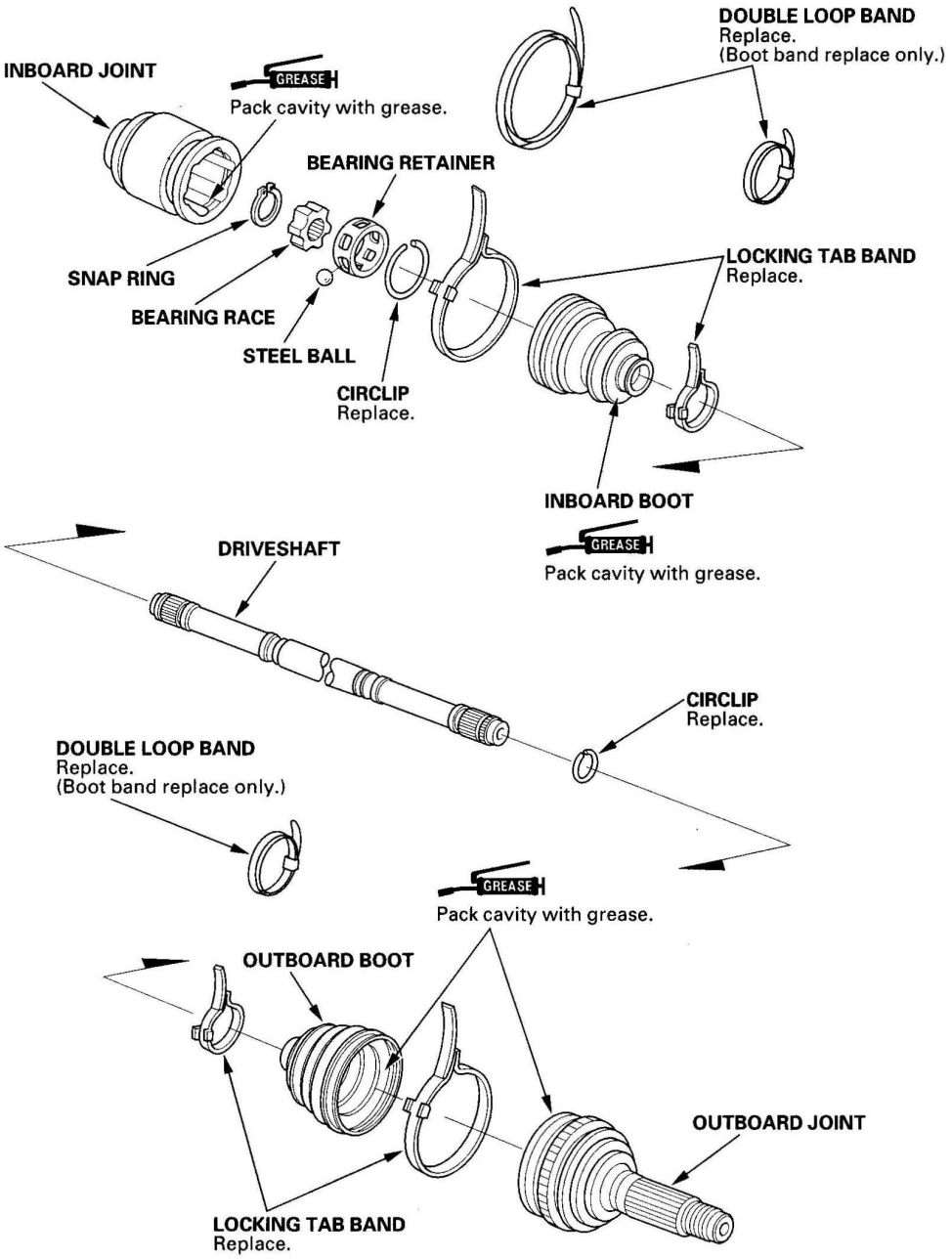
8. Remove the circlip from the driveshaft.



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Rear Driveshafts Reassembly

Exploded View



BACK

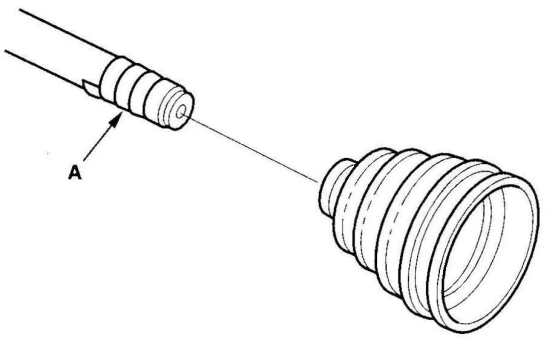
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Special Tools Required
- Boot band tool, KD-3191 or equivalent, commercially available
- Boot band pincers, Kent-Moore J-35910 or equivalent, commercially available

NOTE: Refer to the Exploded View as needed during this procedure.

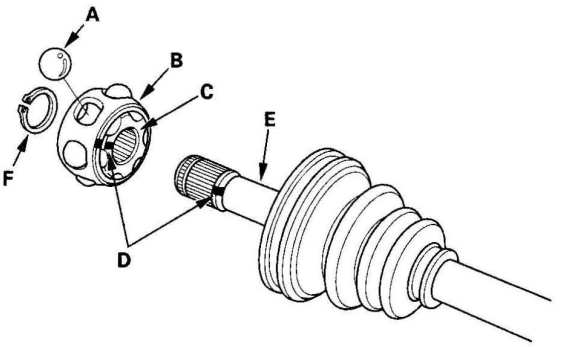
Inboard Joint Side:

1. Wrap the splines with vinyl tape (A) to prevent damage to the inboard boot.



2. Install the inboard boot to the driveshaft, then remove the vinyl tape.

3. Install the steel ball (A) and the bearing retainer (B) onto the bearing race (C) by aligning the marks (D) on the bearing retainer and the bearing race.

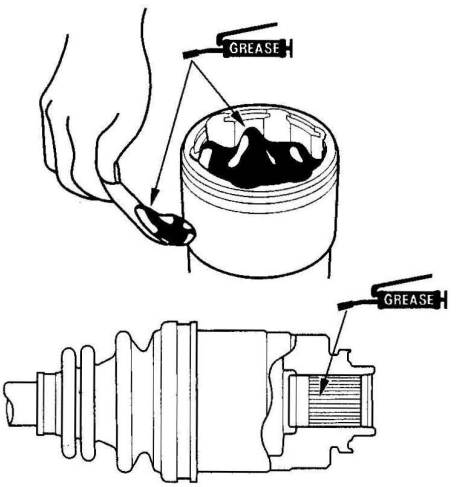


4. Install the bearing onto the driveshaft (E) by aligning the marks (D) on the bearing and the driveshaft.

5. Install the snap ring (F).

6. Pack the inboard joint with the joint grease included in the new driveshaft set.

Grease quantity
Inboard joint: 100—120 g (3.5—4.2 oz)

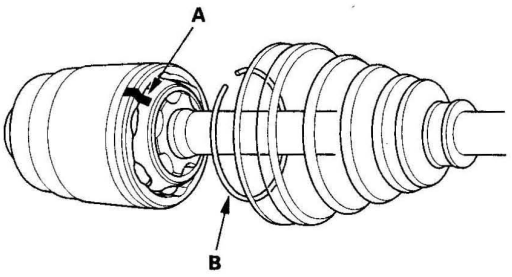


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Rear Driveshafts Reassembly (cont'd)

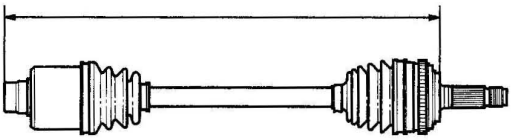
7. Install the inboard joint onto the driveshaft by aligning the marks (A) on the inboard joint and driveshaft.



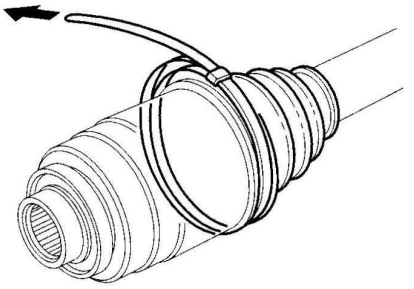
8. Install the circlip (B).

9. Adjust the length of the driveshafts to the figure below, then adjust the boots to halfway between full compression and full extension. Make sure the ends of the boots seat in the grooves of the driveshaft and joint.

Left Driveshaft: 621.6–626.6 (24.5–24.7 in.)
Right Driveshaft: 650.6–655.6 (25.6–25.8 in.)

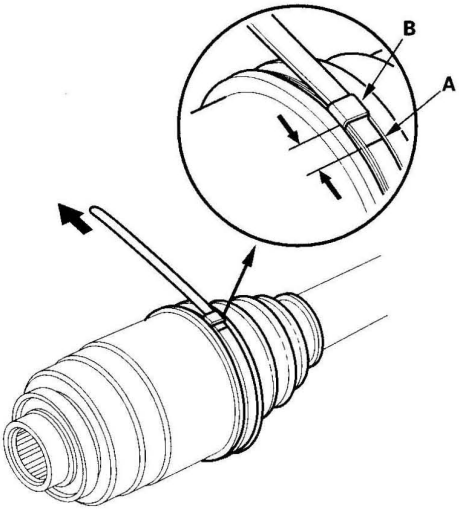


10. Fit the boot ends onto the driveshaft and the inboard joint, then install the boot band.



11. Pull up the slack in the band by hand.

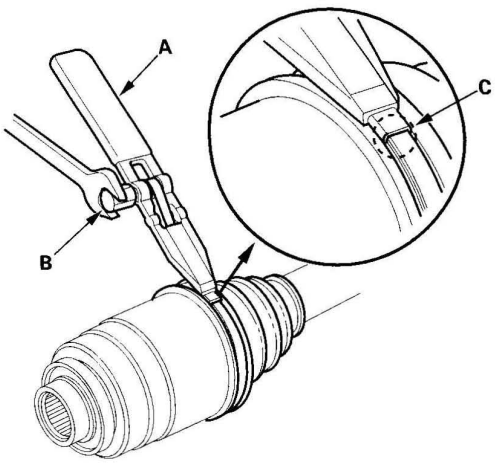
12. Mark a position (A) on the band 10–14 mm (0.4–0.6 in.) from the clip (B).



BACK

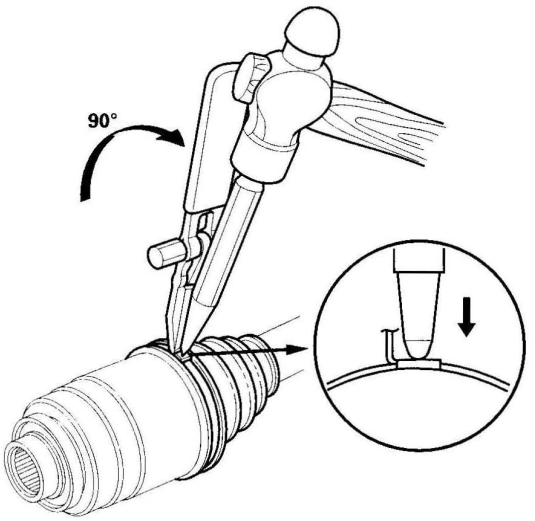
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13. Thread the free end of the band through the nose section of a commercially available boot band tool KD-3191 or equivalent (A), and into the slot on the winding mandrel (B).

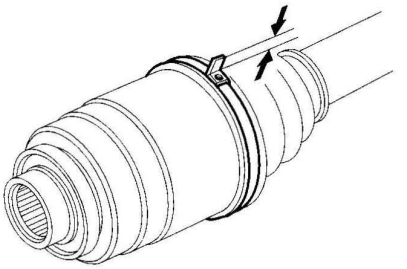


14. Place a wrench on the winding mandrel of the boot band tool, and tighten the band until the marked spot (C) on the band meets the edge of the clip.

15. Lift up the boot band tool to bend the free end of the band 90° to the clip. Center-punch the clip, then fold over the remaining tail onto the clip.

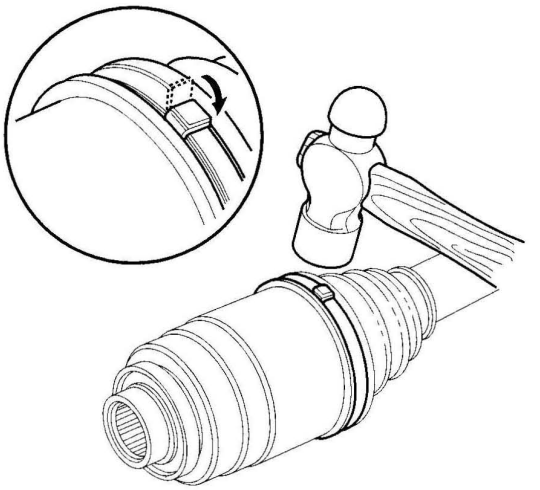


16. Unwind the boot band tool, and cut off the excess free end of the band to leave a 5—10 mm (0.2—0.4 in.) tail protruding from the clip.



17. Bend the band end (A) by tapping it down with a hammer.

NOTE:
- Make sure the band and clip do not interfere with anything, and the band does not move.
- Remove any grease remaining on the surrounding surfaces.



18. Install the boot band on the other end of the boot, and repeat steps 11 through 17.

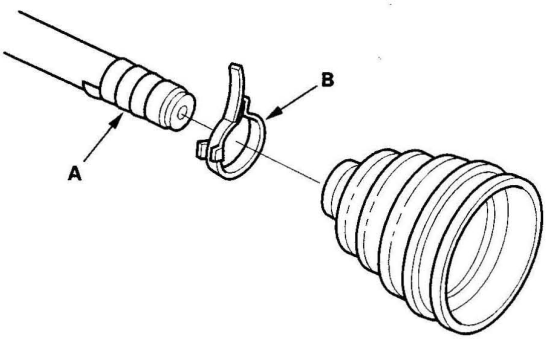
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Rear Driveshafts Reassembly (cont'd)

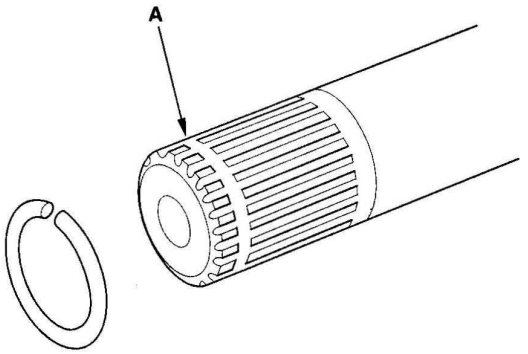
Outboard Joint Side:

1. Wrap the splines with vinyl tape (A) to prevent damage to the inboard boot.

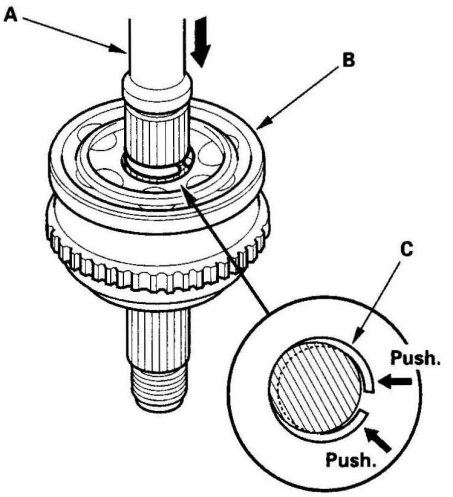


2. Install the new locking tab type boot band (B) and the outboard boot on the driveshaft, then remove the vinyl tape.

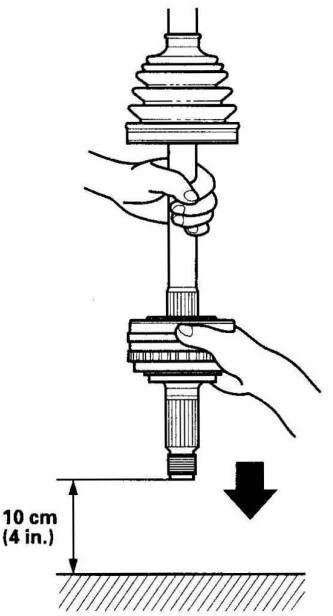
3. Install the new circlip into the driveshaft groove (A).



4. Insert the driveshaft (A) into the outboard joint (B) until the circlip (C) is close on the joint.



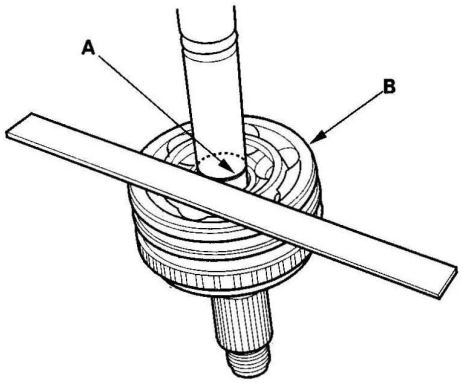
5. To completely seat the outboard joint, pick up the driveshaft and joint, and drop them from about 10 cm (4 in.) onto a hard surface. Do not use a hammer as excessive force may damage the driveshaft.



BACK

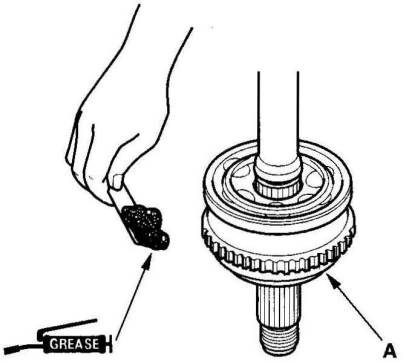
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6. Check the alignment of the paint mark (A) with the outboard joint end (B).

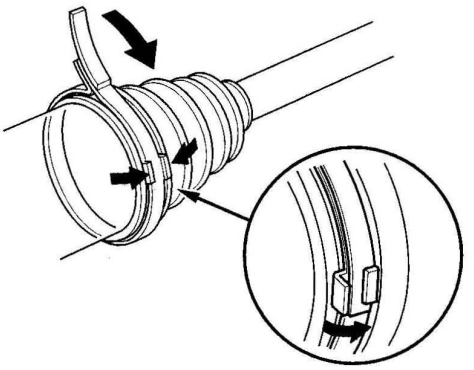


7. Pack the outboard joint (A) with the joint grease included in the new joint boot set.

Grease quantity
Outboard Joint: 65—85 g (2.3—3.0 oz)



8. Install a new locking tab type boot band on the outboard joint side of the outboard boot. Fold down the locking tabs.



9. Lightly tap on the double-over portions to reduce their height.

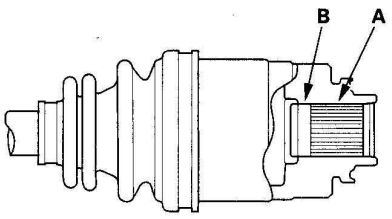
10. Install a double loop type boot band on the front driveshaft side of inboard boot (see step 8 on page 16-10).

BACK

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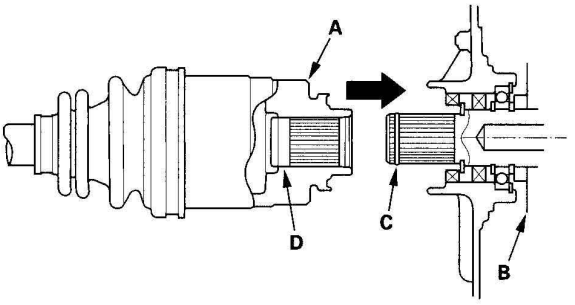
Rear Driveshafts Installation

1. Apply 1.5—2.0 g (0.05—0.07 oz) of multipurpose grease to the whole splined surface (A). After applying grease, remove the grease from the splined grooves at intervals of 2—3 splines and from the set ring groove (B) so that air can bleed from the differential.

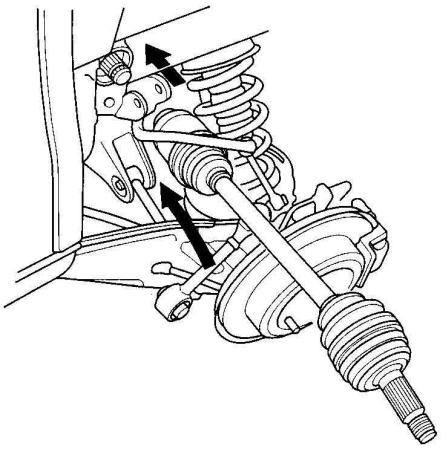


2. Install a new set ring onto the set ring groove of the differential.

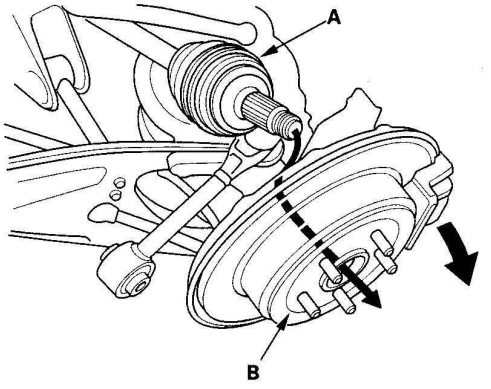
3. Clean the areas where the driveshaft contacts the differential thoroughly with solvent or carburetor cleaner, and dry with compressed air. Insert the inboard end (A) of the driveshaft into the differential (B) until the set ring (C) locks in the groove (D).



4. Install the driveshaft.



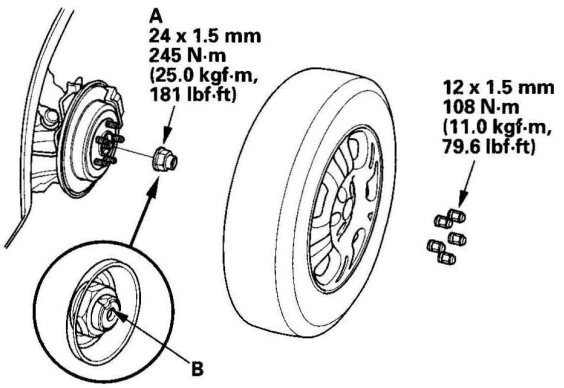
5. Install the outboard joint (A) into the rear hub (B).



BACK

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6. Install the ABS rear wheel sensor bracket (see page 19-59).
7. Install the lower arm B flange bolt (see page 18-29).
8. Install the rear damper (see page 18-32).
9. Install the upper arm bolt (see page 18-28).
10. Install a new spindle nut (A), then tighten the nut. After tightening, use a drift to stake the spindle nut shoulder (B) against the driveshaft.

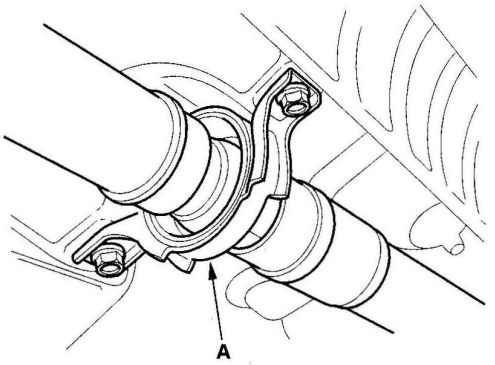


11. Clean the mating surfaces of the brake disc and the rear wheel, then install the rear wheel with the wheel nuts.
12. Refill the differential with recommended fluid (see page 15-39).
13. Check the rear wheel alignment, and adjust it if necessary (see page 18-5).

Propeller Shaft Inspection

Universal Joint and Boots

1. Shift into [N] position.
2. Raise the vehicle off the ground, and support it with safety stands in the proper location (see page 1-8).
3. Check the center support bearing (A) for excessive play or rattle. If the center support has excessive play or rattle, replace the propeller shaft assembly.



4. Check the universal joint boots for damage and deterioration. If the boots are damaged or deteriorated, replace the propeller shaft assembly.
5. Check the universal joints for excessive play or rattle. If the universal joints have excessive play or rattle, replace the propeller shaft assembly.

(cont'd)

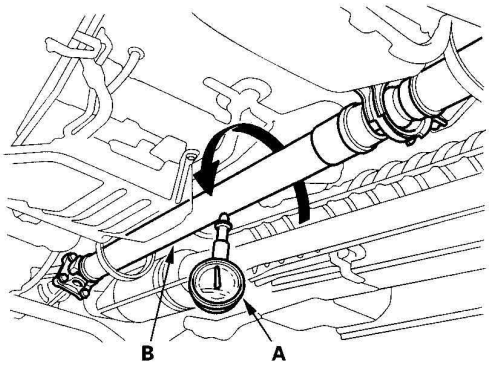
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Propeller Shaft Inspection (cont'd)

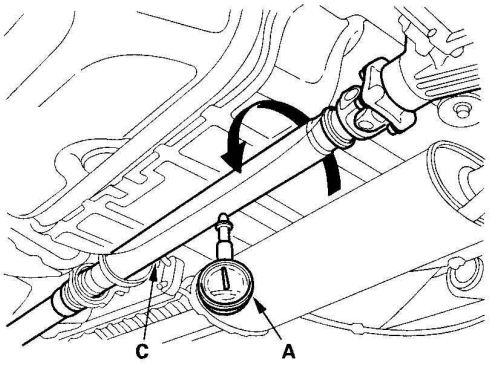
Propeller Shaft Runout

6. Install a dial indicator (A) with its needle on the center of No. 1 propeller shaft (B) or No. 2 propeller shaft (C).

No. 1 Propeller Shaft Runout:
Service Limit: 1.5 mm (0.06 in.)



No. 2 Propeller Shaft Runout:
Service Limit: 1.5 mm (0.06 in.)



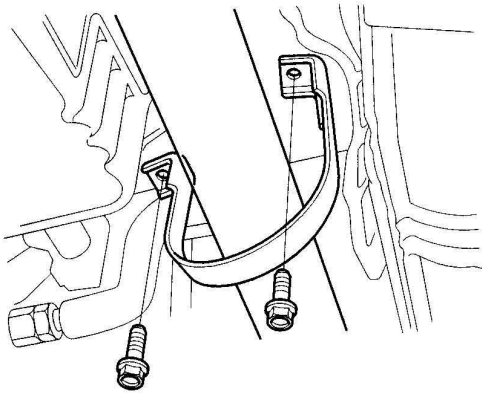
7. Turn the other propeller shaft slowly and check the runout. Repeat this procedure for the other propeller shaft.

8. If the runout on either propeller shaft exceeds the service limit, replace the propeller shaft assembly.

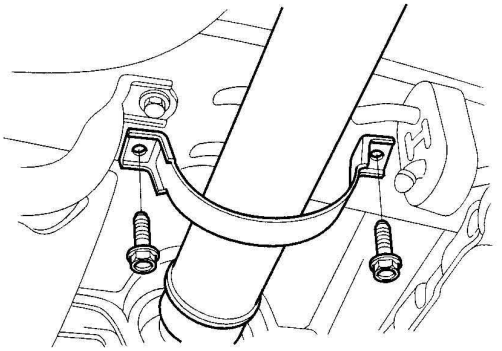
Propeller Shaft Removal

1. Raise the vehicle off the ground, and support it with safety stands in the proper location (see page 1-8).

2. Remove the No. 1 propeller shaft protector.



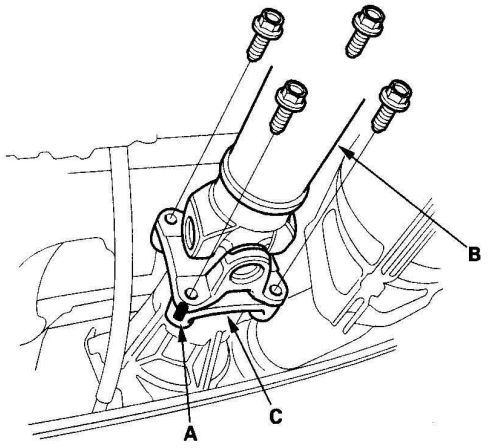
3. Remove the No. 2 propeller shaft protector.



BACK

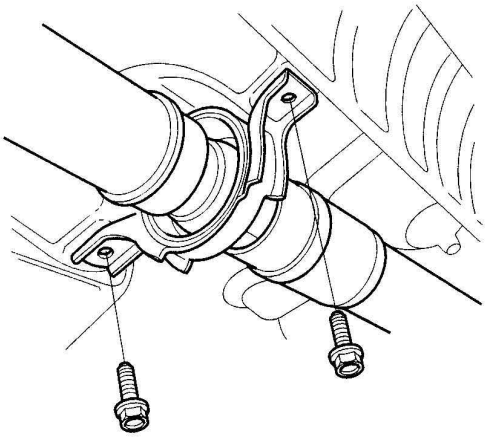
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4. Make a reference mark (A) across the propeller shaft (B) and transfer companion flange (C).

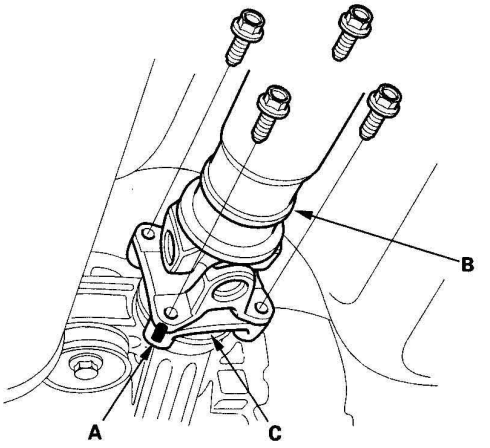


5. Separate the propeller shaft from the transfer assembly.

6. Remove the center support bearing mounting bolts.



7. Make a reference mark (A) across the propeller shaft (B) and rear differential companion flange (C).

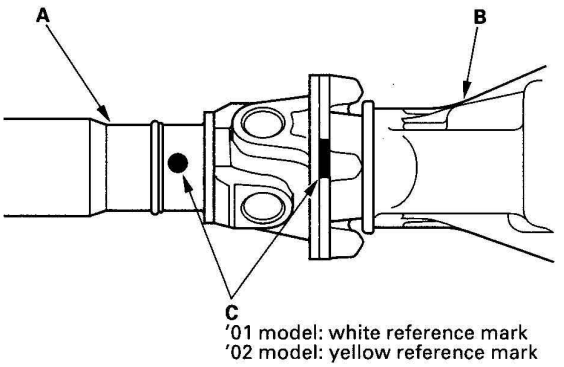


8. Separate the propeller shaft from the rear differential, then remove the propeller shaft.

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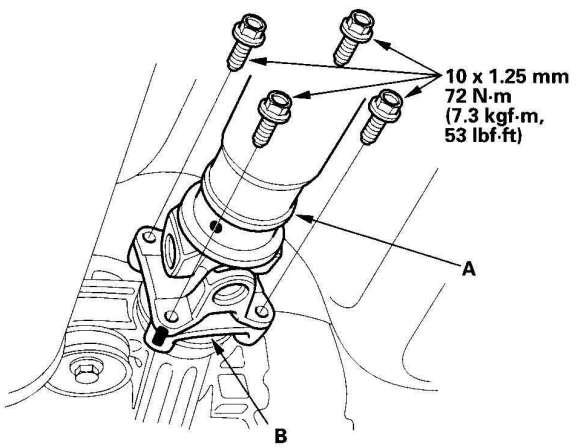
Propeller Shaft Installation

1. Install the new propeller shaft (A) onto the rear differential (B), by aligning the reference mark (C).

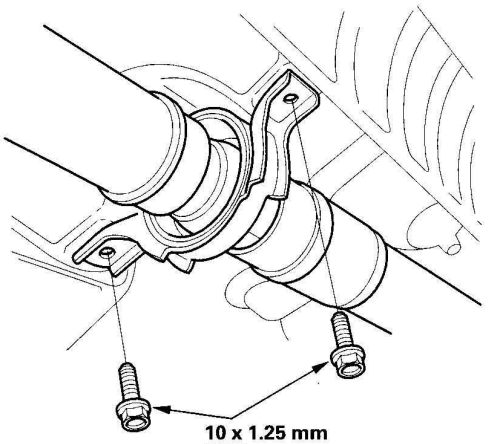


'01 model: white reference mark
'02 model: yellow reference mark

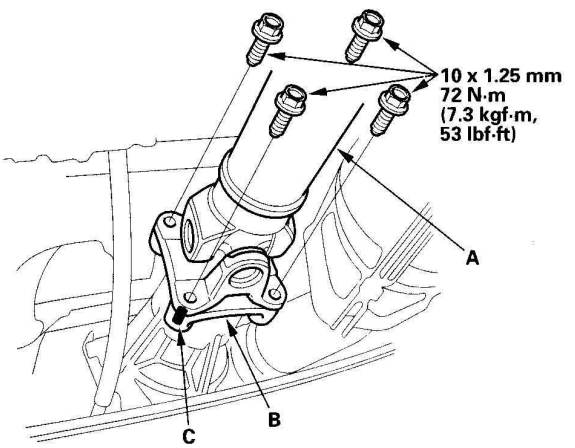
2. Attach the propeller shaft (A) to the rear differential (B) with new mounting bolts.



3. Install the center support bearing mounting bolts. Make sure you use new mounting bolts.



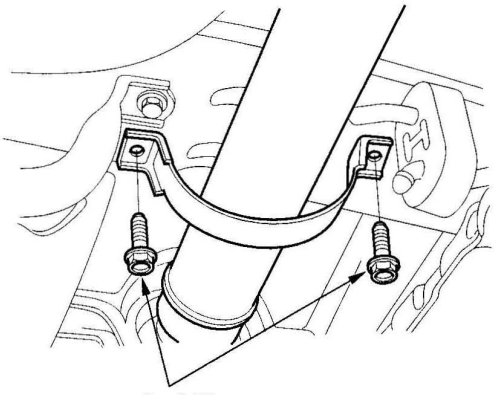
4. Install the propeller shaft (A) onto the transfer (B) by aligning the reference mark (C). Make sure you use new mounting bolts.



BACK

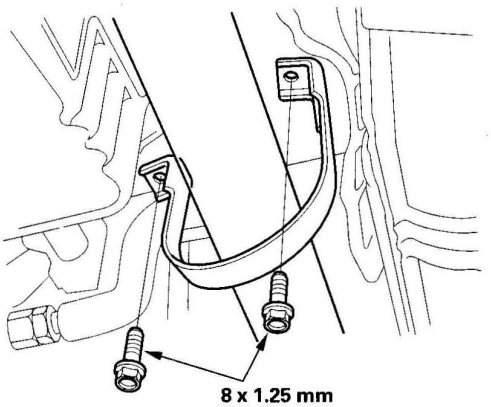
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5. Install the No. 2 propeller shaft protector.



8 x 1.25 mm
22 N·m
(2.2 kgf·m, 17 lbf·ft)

6. Install the No. 1 propeller shaft protector.



8 x 1.25 mm
22 N·m
(2.2 kgf·m, 17 lbf·ft)

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Steering

Power Steering

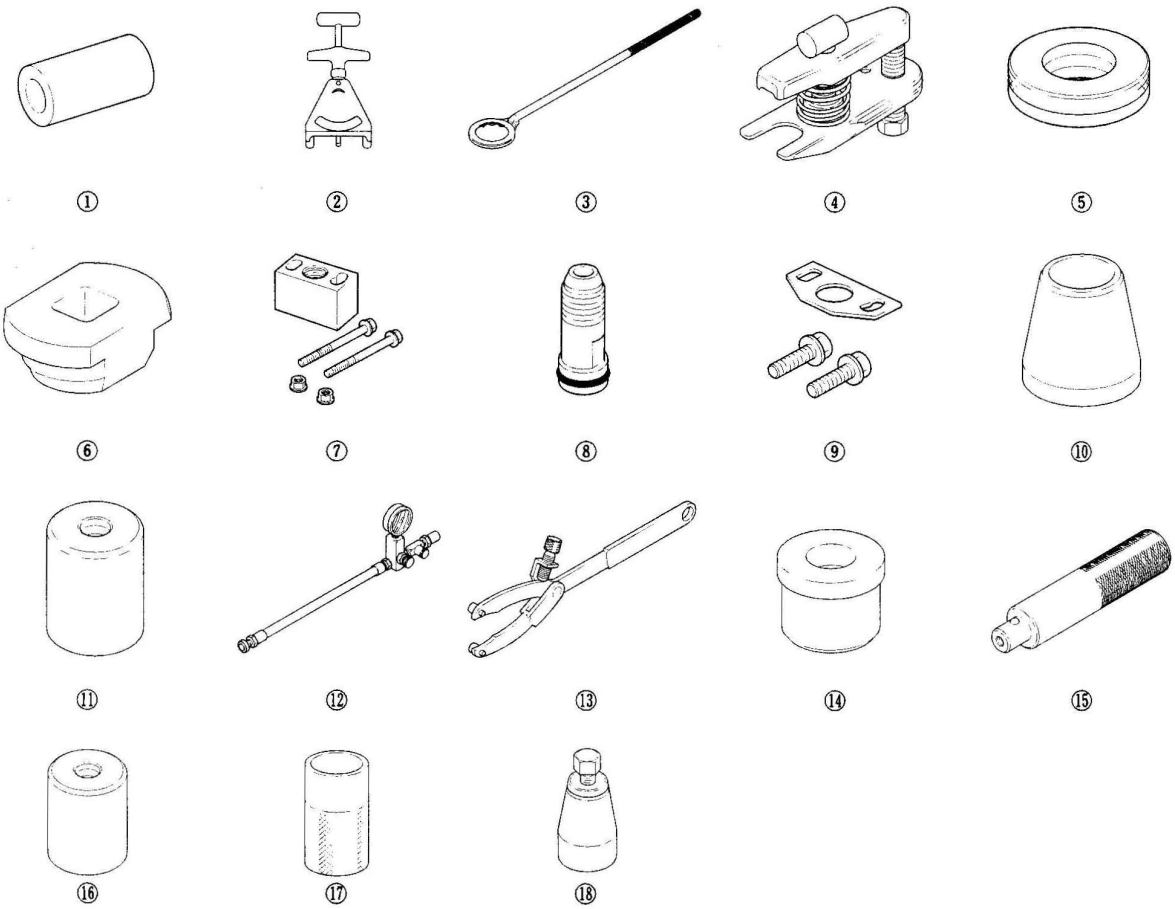
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Special Tools

Ref.No.	Tool Number	Description	Qty
①	07GAF-PH70100	Pilot Collar	1
*②	07JGG-001010A, 07JGG-0010100, or 07TGG-001000A	Belt Tension Gauge	1
③	07916-SA50001	Locknut Wrench, 40 mm	1
④	07MAC-SL00200	Ball Joint Remover, 28 mm	1
⑤	07NAG-SR3090A	Valve Seal Ring Sizing Tool	1
⑥	07TAF-SZ50100	Cylinder End Seal Remover Attachment	1
⑦	07RAK-S040122	P/S Joint Adaptor (Hose)	1
⑧	07VAK-P8A011A	P/S Joint Adaptor (Pump)	1
⑨	07VAK-P8A012A	P/S Joint Adaptor Plate (Pump)	1
⑩	07ZAG-S3VA100	Piston Seal Ring Guide	1
⑪	07ZAG-S3VA200	Valve Seal Ring Sizing Tool	1
⑫	07406-0010001 or 07406-001000A	P/S Pressure Gauge	1
⑬	07725-0030000	Universal Holder	1
⑭	07746-0010100	Attachment, 32 x 35 mm	1
⑮	07749-0010000	Driver	1
⑯	07965-SA50500	Front Hub Dis/Assembly Tool	1
⑰	07974-SA5020A or 07974-SA50200	Sleeve Seal Ring Sizing Tool	1
⑱	07974-SA50800	Ball Joint Boot Clip Guide	1

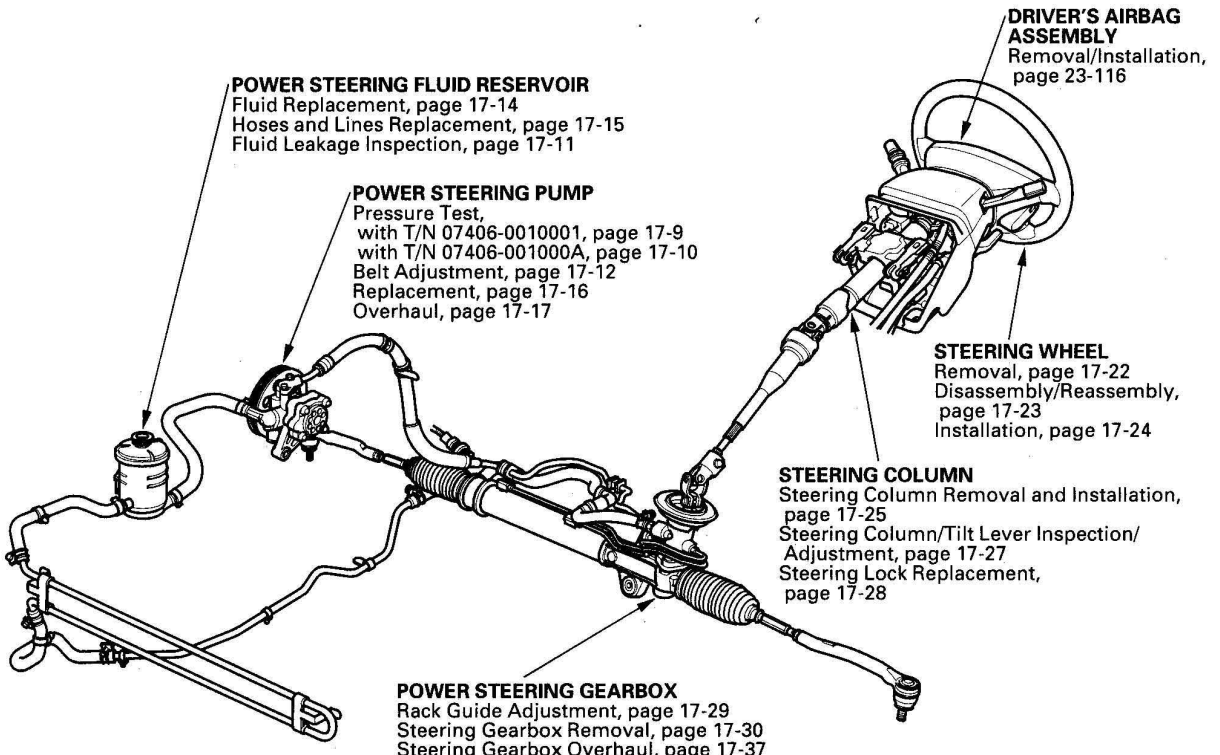
* Included in the Belt Tension Gauge Set, 07TGG-001000A.



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Component Location Index



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Symptom Troubleshooting Index

Find the symptom in the chart below, and do the related procedures in the order listed until you find the cause.

Symptom	Procedure(s)	Also check for:
Hard Steering	Troubleshoot the system (see page 17-6).	• Modified suspension • Tire sizes, tire varieties, and air pressure
Assist (excessively light steering at high speed)	Check the rack guide adjustment (see page 17-29).	Front wheel alignment (see page 18-5).
Shock or vibration when the wheel is turned to full lock	1. Check the rack guide adjustment (see page 17-29). 2. Check the power steering pump belt for slippage and adjust as necessary (see page 17-12). 3. Replace the steering gearbox (see page 17-30).	
Steering wheel will not return smoothly	1. Check cylinder lines A and B for deformation. 2. Check wheel alignment (see page 18-5). 3. Replace the steering gearbox (see page 17-30).	
Uneven or rough steering	1. Check the rack guide adjustment (see page 17-29). 2. Check power steering pump belt adjustment (see page 17-12). 3. Check for low or erratic engine idle speed (see page 11-112). 4. Check for air in the power steering system due to low fluid level. 5. Check for low fluid level in the power steering reservoir due to possible leaks in system. 6. Replace the steering gearbox (see page 17-30).	
Steering wheel kicks back during wide turns	1. Check power steering pump belt adjustment (see page 17-12). 2. Check the power steering pump fluid pressure with T/N 07406-0010001 (see page 17-9) or with T/N 07406-001000A (see page 17-10).	
Humming	1. Check when the noise occurs • If the noise is heard 2—3 minutes after starting the engine in cold weather, this is normal. • If the noise is heard when the wheel is turned with the vehicle stopped, this is normal due to the fluid pulsation. 2. Check for the high-pressure hose touching the sub-frame or body. 3. Check for automatic transmission converter noise. Remove the power steering belt, and recheck.	Pump pressure

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Rattle or chattering (Rack rattle)	1. Check for loose steering components (tie-rod and ball joints). Tighten or replace as necessary. 2. Check the steering column shaft for wobbling. If the steering column wobbles, replace the steering column assembly (see page 17-25). 3. Check the rack guide adjustment (see page 17-29). 4. Check the power steering pump pulley. • If the pulley is loose, tighten it (see step 33 on page 17-21). • If the pump shaft is loose, replace the pump (see page 17-16).	
Hissing noise/foaming fluid in reservoir	• Check the fluid level. If low, fill the reservoir to the proper level and check for leaks. • Check the reservoir for leaks. • Check for crushed inlet hose or loose hose clamp allowing air into the suction side of the system. • Check the power steering pump shaft oil seal for leaks.	
Pump noise	• Compare the pump noise at normal operating temperature to another alike vehicle, (pump noise up to 2−3 minutes after starting the engine in cold weather is normal). • Remove and inspect the pump for wear and damage (see page 17-17).	
Squeaking	Check the power steering belt tension and adjust as necessary (see page 17-12).	
Fluid leaks from the steering gearbox	• Fluid leaks from the top of the valve body unit: Replace the valve body unit. • Fluid leaks from the left tie-rod boot: Replace the valve oil seal on the pinion shaft. Replace the cylinder end seal on the gearbox side. • Fluid leaks from the right tie-rod boot: Replace the cylinder end seal. • Fluid leaks from pinion shaft near the lower steering joint bolt: Replace the valve body unit.	
Fluid leaks from line	• Fluid leaks from the cylinder line A or B connections (flare nuts): Tighten the connection and retest. If it still leaks, replace the fitting O-rings. • Fluid leaks from a damaged cylinder line A or B: Replace the cylinder line. • Fluid leaks from the pump outlet hose or return line fitting on the valve body unit (flair nuts): Tighten the fitting and retest. If it still leaks, replace the hose, the line, or valve body unit as necessary.	
Fluid leaks from pump	• Fluid leaks from the front oil seal: Replace the front oil seal. • Fluid leaks from the power steering pump housing: Replace the leaking O-rings or seals (see page 17-17), and if necessary replace the power steering pump (see page 17-16).	
Fluid leaks from reservoir	• Fluid leaks from around the reservoir cap: Fluid level is too high: drain the reservoir to the proper level. Aerated fluid: Check for on air leak on the inlet side of pump. • Fluid leaks from reservoir: Check the reservoir for cracks and replace as necessary.	
Fluid leaks from pump outlet hose (high-pressure)	• Check the fitting for loose bolts. If the bolts are tight, replace the fitting O-ring. • Fluid leaks at the swagged joint: Replace the outlet hose.	
Fluid leaks from pump inlet hose (low-pressure)	Check the hose for damage, deterioration, or improper assembly. Replace or repair as necessary.	

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Hard Steering Troubleshooting

1. Check the power assist (see page 17-7).

   Is the power assist more than 29 N (3.0 kgf, 6.5 lbf)?

   YES – Go to step 2.

   NO – Power assist is OK. ■

2. Measure steady-state fluid pressure from the pump at idle with T/N 07406-0010001 (see page 17-9) or with T/N 07406-001000A (see page 17-10).

   Is the pressure 1,500 kPa (15 kgf/cm², 213 psi) or less?

   YES – Go to step 3.

   NO – Go to step 7.

3. Measure the pump relief pressure at idle with T/N 07406-0010001 (see page 17-9) or with T/N 07406-001000A (see page 17-10).

   Is the pressure 8,300 – 8,800 kPa (85 – 90 kgf/cm², 1,210 – 1,280 psi) or less?

   YES – Go to step 4.

   NO – Go to step 8.

4. With a spring scale, measure the power assist in both directions, to the left and to the right.

   Are the two measurements within 5.0 N (0.51 kgf, 1.12 lbf) of each other?

   YES – Go to step 5.

   NO – Go to step 9.

5. Measure the fluid pressure with T/N 07406-0010001 (see page 17-9) or with T/N 07406-001000A (see page 17-10) with both pressure gauge valves open (if so equipped), while turning the steering wheel fully to the left and fully to the right.

   Is the pressure 8,300 – 8,800 kPa (85 – 90 kgf/cm², 1,210 – 1,280 psi) or less?

   YES – Go to step 6.

   NO – Faulty gearbox. ■

6. Adjust the rack guide (see page 17-29), and retest.

   Is the steering OK?

   YES – Repair is completed. ■

   NO – Faulty gearbox. ■

7. Check for feed and return lines between the pump and the gearbox for clogging and deformation.

   Are the lines clogged or deformed?

   YES – Repair or replace the lines. ■

   NO – Faulty valve body unit. ■

8. Check the flow control valve (see step 9 on page 17-18) for smooth movement and leaks.

   Is the flow control valve OK?

   YES – Faulty pump assembly. ■

   NO – Faulty flow control valve. ■

9. Check the cylinder lines A and B for deformation (see page 17-37).

   Are the A or B lines deformed?

   YES – Replace the lines. ■

   NO – Go to step 10.

10. Check for a bent rack shaft or misadjusted rack guide (too tight).

    Is the rack shaft bent or the rack guide adjusted too tight?

    YES – Replace the rack shaft or readjust the rack guide. ■

    NO – Faulty valve body unit. ■

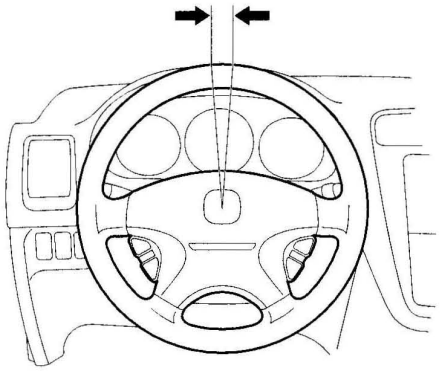
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Steering Wheel Rotational Play Check

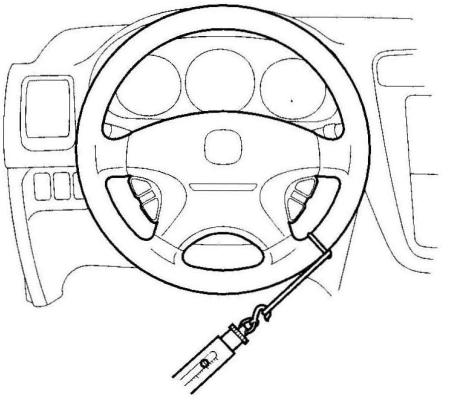
1. Turn the front wheels to the straight ahead position.
2. Measure how far you can turn the steering wheel left and right without moving the front wheels.
   - If the play is within the limit, the gearbox and steering linkages are OK.
   - If the play exceeds the limit, adjust the rack guide (see page 17-29). If the play is still excessive after rack guide adjustment, inspect the steering linkage and gearbox (see page 17-8).

ROTATIONAL PLAY: 0—10 mm (0—0.39 in.)



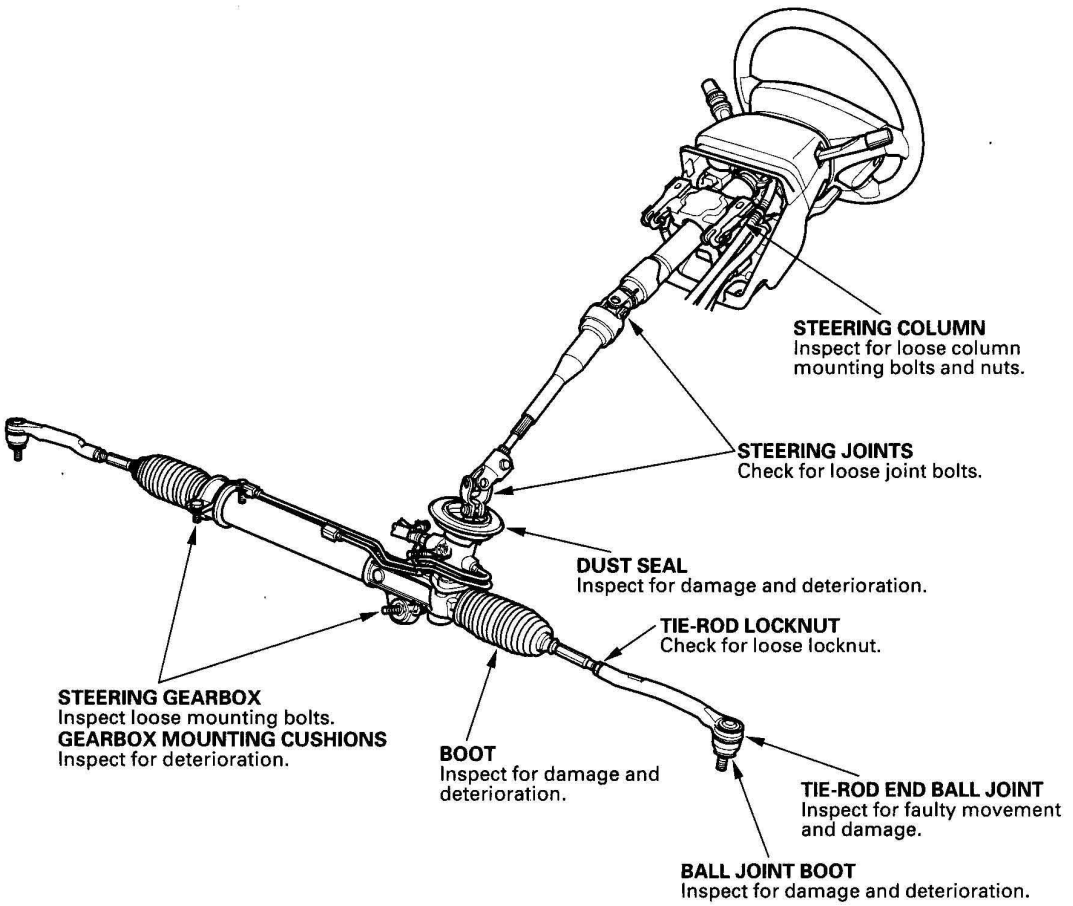
Power Assist Check

1. Check the power steering fluid level (see page 17-14), pump belt tension (see page 17-12), and set the tire pressures to the cold specification (see page 18-5).
2. Start the engine, let it idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid.
3. Attach a commercially available spring scale to the steering wheel. With the engine idling and the vehicle on a clean, dry floor, pull the scale as shown and read it as soon as the tires begin to turn.
   - If the scale reads no more than 29 N (3.0 kgf, 6.5 lbf) the gearbox and pump are OK.
   - If the scale reads more than 29 N (3.0 kgf, 6.5 lbf) check the gearbox and pump.



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Steering Linkage and Gearbox Inspection



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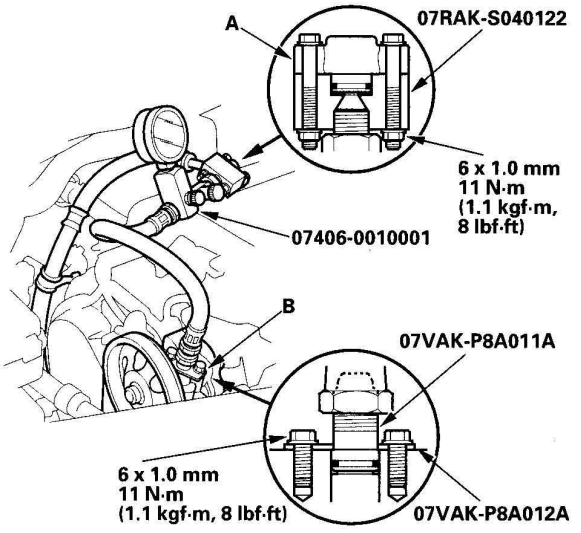
Pump Pressure Test with T/N 07406-0010001

Special Tools Required
- P/S joint adapter (pump) 07VAK-P8A011A
- P/S joint adapter plate (pump) 07VAK-P8A012A
- P/S joint adapter (hose) 07RAK-S040122
- P/S pressure gauge 07406-0010001

Check the fluid pressure as follows to determine whether the trouble is in the pump or gearbox.

1. Check the power steering fluid level (see page 17-14) and pump belt tension (see page 17-12).

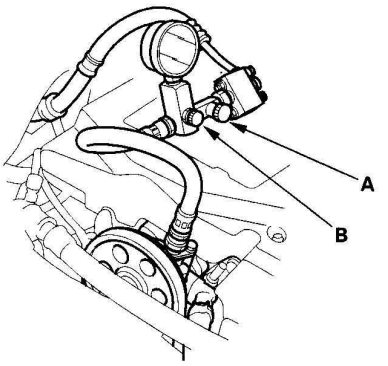
2. Disconnect the pump outlet hose (A) from the pump outlet with care so as not to spill the power steering fluid on the frame and other parts, then install the P/S joint adapter (pump) on the pump outlet (B) with the P/S joint outlet plate.



3. Connect the P/S joint adapter (hose) to the P/S pressure gauge, then connect the pump outlet hose (A) to the P/S joint adapter (hose).

4. Install the P/S pressure gauge to the P/S joint adapter (pump).

5. Fully open the shut-off valve (A).



6. Fully open the pressure control valve (B).

7. Start the engine and let it idle.

8. Turn the steering wheel from lock-to-lock several times to warm the fluid to operating temperature.

9. Measure steady-state fluid pressure while the engine is idling. If the pump is in good condition, the gauge should read no more than 1,500 kPa (15 kgf/cm², 213 psi).
   If it reads high, check for:
   - Clogged or deformed feed or return line between the pump and gearbox.
   - Clogged valve body unit.

10. Close the pressure control valve, then close the shut-off valve gradually until the pressure gauge needle is stable. Read the pressure.

    NOTICE
    Do not keep the pressure control valve closed more than 5 seconds or the pump could be damaged by over-heating.

11. Immediately open the pressure control valve fully. If the pump is in good condition, the gauge should read at least 8,300—8,800 kPa (85—90 kgf/cm², 1,210—1,280 psi). A low reading means pump output is too low for full assist. Repair or replace the pump.

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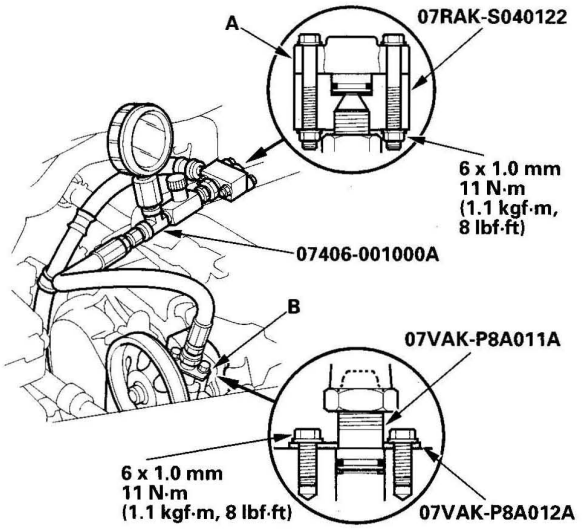
Pump Pressure Test with T/N 07406-001000A

Special Tools Required
- P/S joint adapter (pump) 07VAK-P8A011A
- P/S joint adapter plate (pump) 07VAK-P8A012A
- P/S joint adapter (hose) 07RAK-S040122
- P/S pressure gauge 07406-001000A

Check the fluid pressure as follows to determine whether the trouble is in the pump or gearbox.

1. Check the power steering fluid level (see page 17-14) and pump belt tension (see page 17-12).

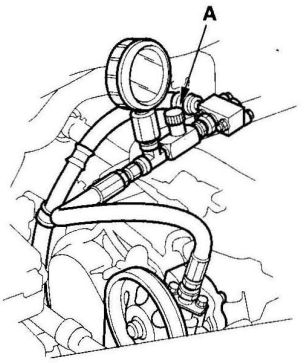
2. Disconnect the pump outlet hose (A) from the pump outlet with care so as not to spill the power steering fluid on the frame and other parts, then install the P/S joint adapter (pump) on the pump outlet (B) with the P/S joint outlet plate.



3. Connect the P/S joint adapter (hose) to the P/S pressure gauge, then connect the pump outlet hose (A) to the P/S joint adapter (hose).

4. Install the P/S pressure gauge to the P/S joint adapter (pump).

5. Open the pressure control valve (A) fully.



6. Start the engine and let it idle.

7. Turn the steering wheel from lock-to-lock several times to warm the fluid to operating temperature.

8. Measure steady-state fluid pressure while the engine is idling. If the pump is in good condition, the gauge should read no more than 1,500 kPa (15 kgf/cm², 213 psi).
   If it reads high, check for:
   - Clogged or deformed feed or return line between the pump and gearbox.
   - Clogged valve body unit.

9. Close the pressure control valve gradually and read the pressure.

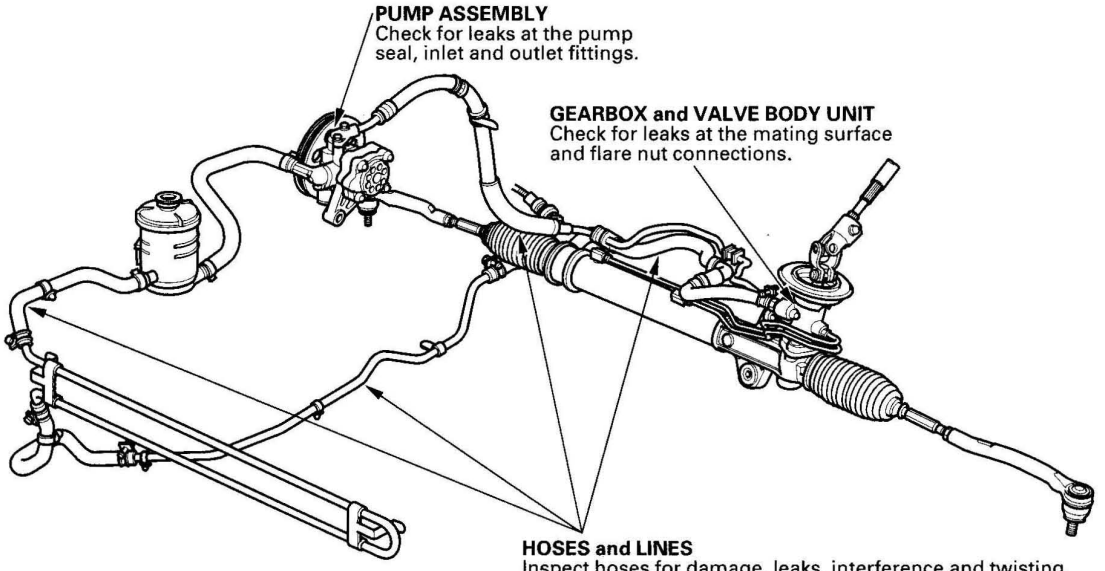
   NOTICE
   Do not keep the pressure control valve closed more than 5 seconds or the pump could be damaged by over-heating.

10. Immediately open the pressure control valve fully. If the pump is in good condition, the gauge should read at least 8,300 – 8,800 kPa (85 – 90 kgf/cm², 1,210 – 1,280 psi). A low reading means pump output is too low for full assist. Repair or replace the pump.

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Fluid Leakage Inspection



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Pump Belt Inspection and Adjustment

Special Tools Required
Belt tension gauge 07JGG-001010A, 07JGG-0010100, or 07TGG-001000A

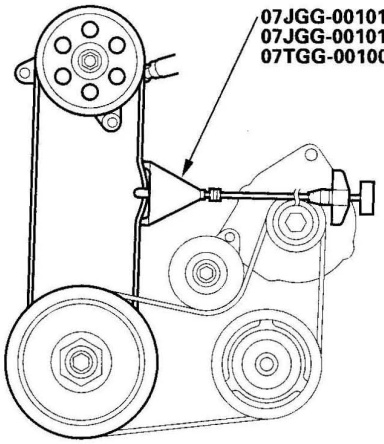
Belt Tension Gauge Method

Inspection

1. Attach the belt tension gauge to the belt with the gauge face toward the engine, and measure the tension of the belt. Follow the manufacturer's instructions. If the belt is worn or damaged, replace it.

   NOTE: Remove the belt tension gauge carefully to avoid hitting the gauge reset lever.

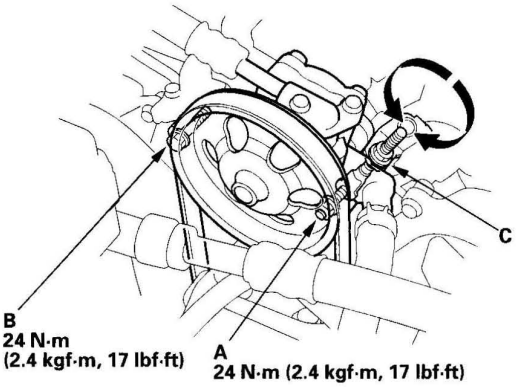
   Tension:
   Used Belt: 390 – 540 N (40 – 55 kgf, 88 – 121 lbf)
   New Belt: 740 – 880 N (75 – 90 kgf, 165 – 198 lbf)



2. If you installed a new belt, run the engine for 5 minutes, then readjust the belt to the used belt specifications.

Adjustment

3. Loosen the power steering pump mounting nut (A) and bolt (B).



4. Turn the adjusting nut (C) to get the proper belt tension, then retighten the mounting nut and bolt.

5. Start the engine and turn the steering wheel from lock-to-lock several times, then stop the engine and recheck the tension of the belt.

BACK

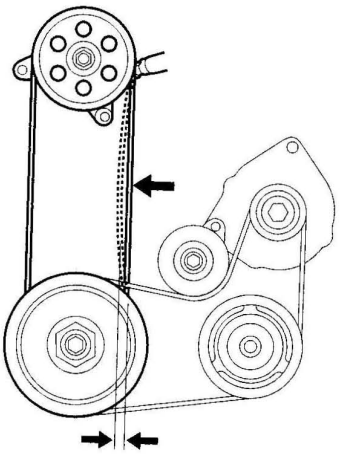
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Deflection Method

Inspection

1. Apply a force of 98 N (10 kgf, 22 lbf) and measure the deflection between the power steering pump pulley (A) and the crankshaft pulley (B).

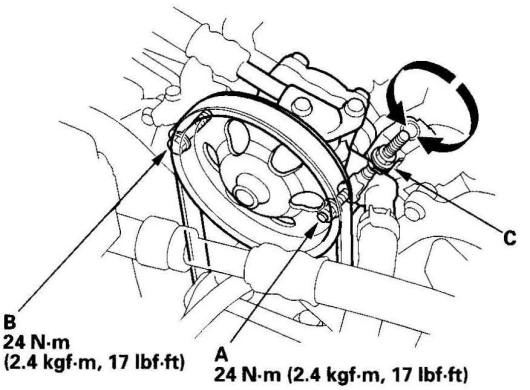
Deflection:
Used Belt: 13.0—16.5 mm (0.51—0.65 in.)
New Belt: 8.5—11.0 mm (0.33—0.43 in.)



2. If you installed a new belt, run the engine for 5 minutes, then readjust the belt to the used belt specifications.

Adjustment

3. Loosen the power steering pump mounting nut (A) and bolt (B).



4. Turn the adjusting nut (C) to get the proper belt tension, then retighten the mounting nut and bolt.

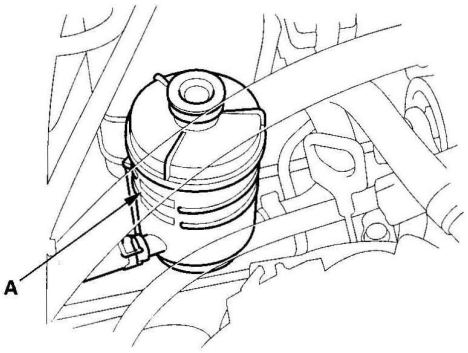
5. Start the engine and turn the steering wheel from lock-to-lock several times, then stop the engine and recheck the tension of the belt.

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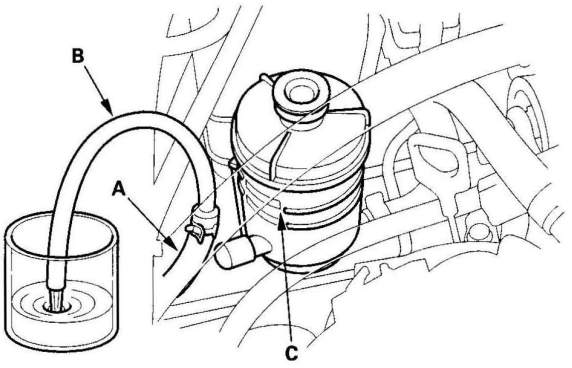
Fluid Replacement

Check the reservoir (A) at regular intervals, and add the recommended fluid as necessary. Always use Honda Power Steering Fluid. Using any other type of power steering fluid or automatic transmission fluid can cause increased wear and poor steering in cold weather.

SYSTEM CAPACITY:
1.22 ℓ (1.29 US.qt, 1.07 Imp.qt)
SYSTEM CAPACITY with accessory power steering cooler:
1.26 ℓ (1.33 US.qt, 1.11 Imp.qt)
RESERVOIR CAPACITY:
0.4 ℓ (0.42 US.qt, 0.35 Imp.qt)



1. Remove the power steering reservoir from its holder. Raise the reservoir, then disconnect the return hose (A) to drain the reservoir. Take care not to spill the fluid on the body and parts. Wipe off any spilled fluid at once.



2. Connect a hose (B) of suitable diameter to the disconnected return hose, and put the hose end in a suitable container.
3. Start the engine, let it run at idle, and turn the steering wheel from lock-to-lock several times. When fluid stops running out of the hose, shut off the engine. Discard the fluid.
4. Reinstall the return hose on the reservoir.
5. Fill the reservoir to the upper level line (C).
6. Start the engine and run it at fast idle, then turn the steering from lock-to-lock several times to bleed air from the system.
7. Recheck the fluid level and add more if necessary. Do not fill the reservoir beyond the upper level line.

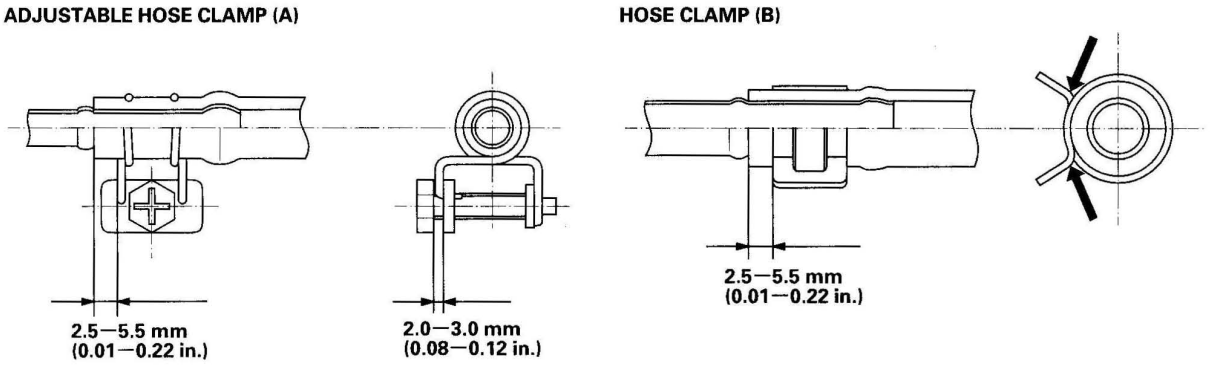
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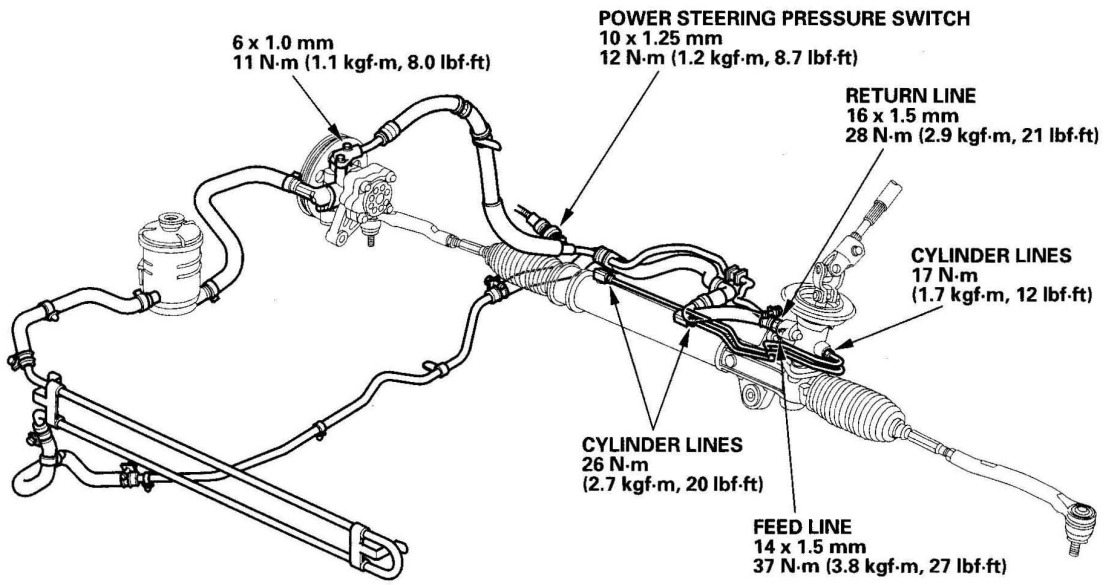
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Hoses and Lines Replacement

Note these items during installation:

- Connect each hose to the corresponding line securely until it contacts the stop on the line. Install the clamp or adjustable clamp at the specified distance from the hose end as shown.
- Check all clamps for deterioration or deformation; replace the clamps with new ones if necessary.
- Add the recommended power steering fluid to the specified level on the reservoir and check for leaks.

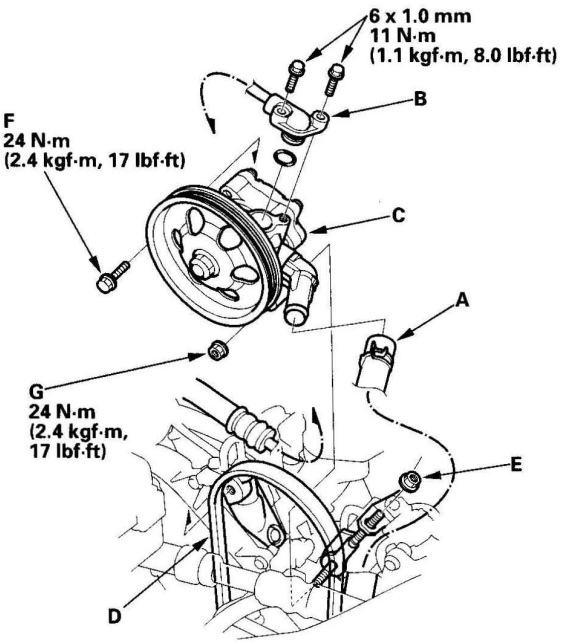




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Pump Replacement

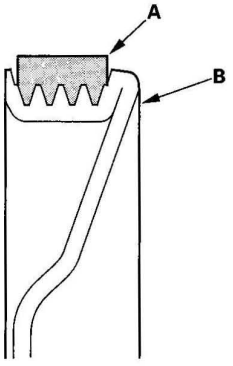
1. Place a suitable container under the vehicle.
2. Drain the power steering fluid from the reservoir.
3. Cover the crankshaft pulley with several shop towels to protect if from spilled power steering fluid. Disconnect the pump inlet hose (A) and pump outlet hose (B) from the pump (C), and plug them. Take care not to spill the fluid on the body or parts. Wipe off any spilled fluid at once.



4. Remove the belt (D) by loosening the pump adjusting nut (E), then remove pump mounting bolt (F), nut (G) and pump. Do not turn the steering wheel with pump removed.
5. Connect the pump outlet hose and inlet hose to the pump. Tighten the pump fittings securely.
6. Loosely install the pump in the pump bracket with the mounting bolt and nut.
7. Install the pump belt (A) on the pulley (B).

   Note these items during belt installation:

   - Make sure that the power steering belt is properly positioned on the pulleys.
   - Do not get the power steering fluid or grease on the belt or pulley faces. Clean off any fluid or grease before installation.



8. Adjust the pump belt adjustment (see page 17-12).
9. Fill the reservoir to the upper level line (see page 17-14).

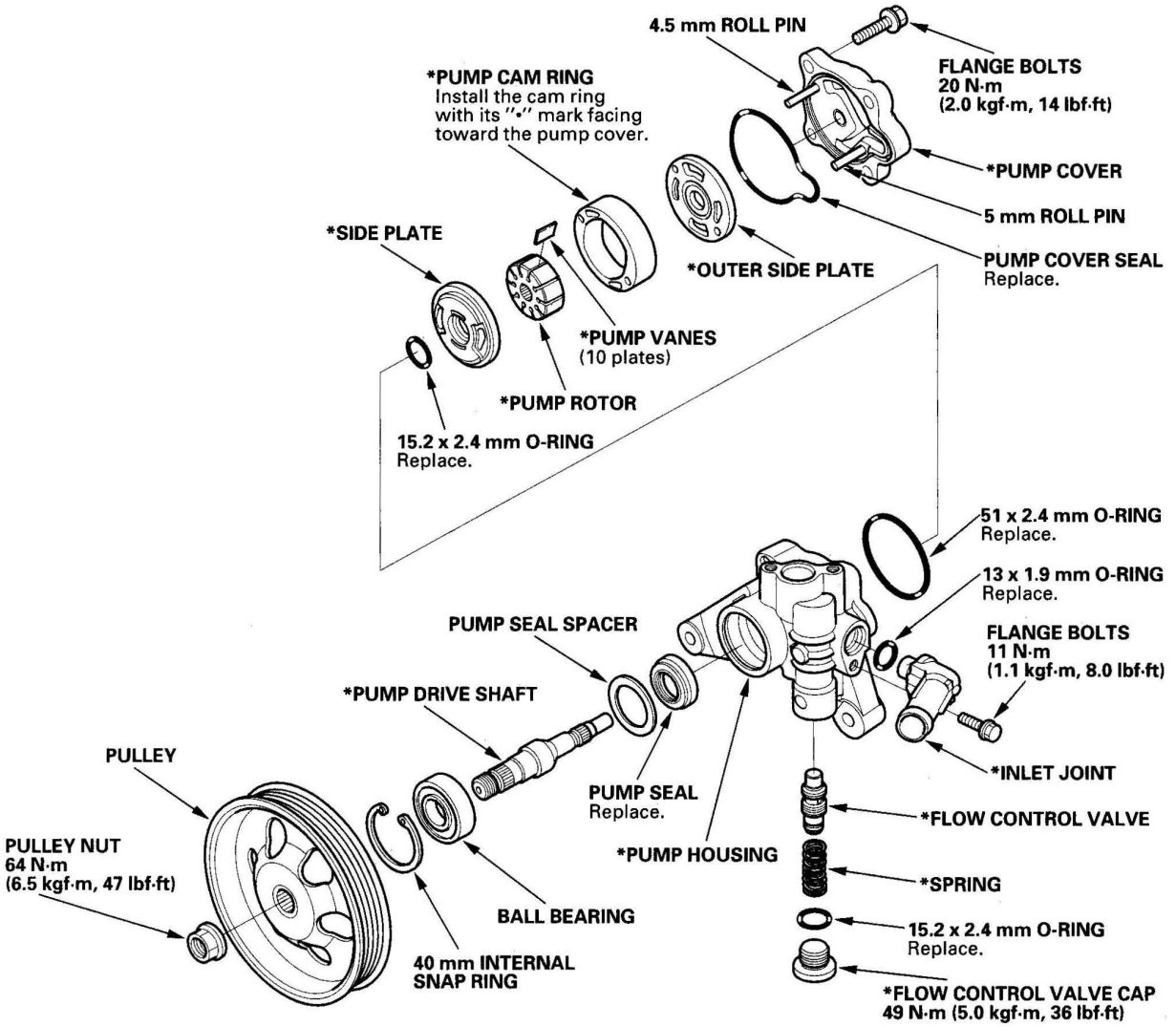
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Pump Overhaul

Exploded View

Replace the pump as an assembly if the parts indicated with asterisk (*) are worn or damaged.



(cont'd)

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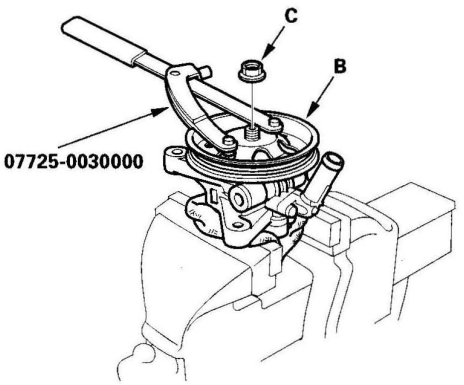
Pump Overhaul (cont'd)

Special Tools Required
Universal holder 07725-0030000

Disassembly

NOTE: Refer to the Exploded View as needed during the following procedure.

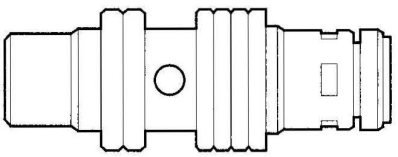
1. Remove the power steering pump (see page 17-16).
2. Drain the fluid from the pump.
3. Hold the steering pump (A) in a vise with soft jaws, hold the pulley (B) with the special tool, and remove the pulley nut (C) and pulley. Be careful not to damage the pump housing with the jaws of the vise.



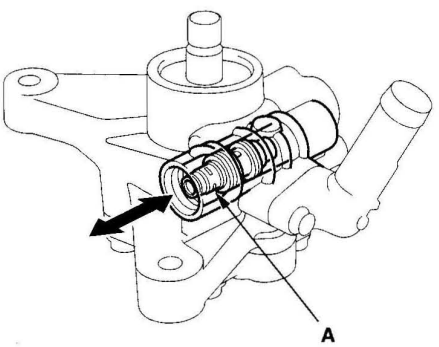
4. Loosen the flow control valve cap with a hex wrench, and remove it and the O-ring, flow control valve and spring.
5. Remove the pump cover and pump cover seal.
6. Remove the outer side plate, pump cam ring, pump rotor, pump vanes, side plate and O-rings.
7. Remove the circlip, then remove the pump drive shaft by tapping on the shaft end with the plastic hammer.
8. Remove the pump seal spacer and pump seal.

Inspection

9. Check the flow control valve for wear, burrs, and other damage to the edges of the grooves in the valve.



10. Inspect the bore of the flow control valve on the pump housing for scratches and wear.
11. Slip the flow control valve into the pump housing, and check that it moves in and out smoothly. If OK, go to step 12; if not, replace the pump as an assembly. The flow control valve (A) is not available separately.

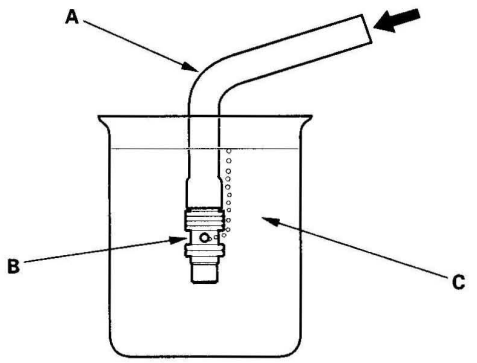


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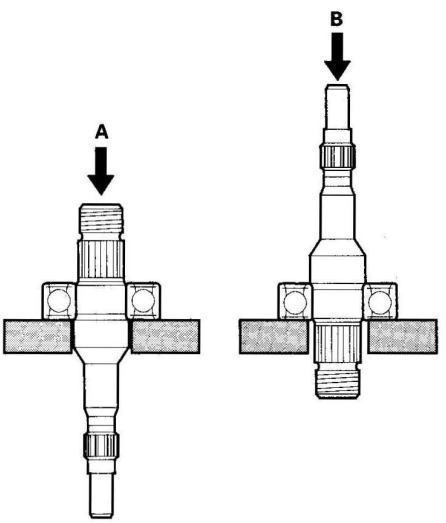
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12. Attach a hose (A) to the end of the flow control valve (B) as shown. Then submerge the flow control valve (B) in a container of power steering fluid or solvent (C), and blow in the hose.

    - If air bubbles leak through the valve at less than 98 kPa (1.0 kgf/cm^2, 14.2 psi), replace the pump as an assembly. The flow control valve is not available separately.
    - If the flow control valve tests OK, set it aside for reassembly later.



13. Inspect the ball bearing by rotating the outer race slowly. If you feel any play (axial or radial) or roughness, remove the faulty ball bearing (A), and install a new one (B).

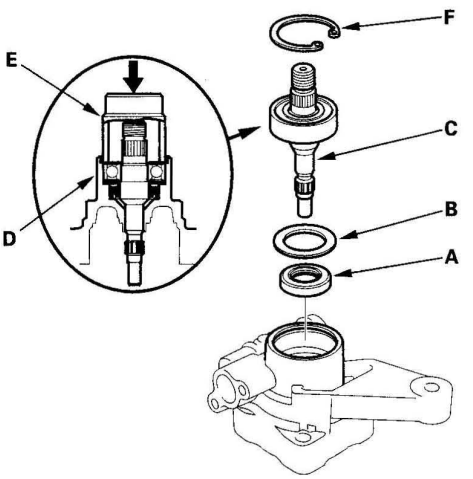


14. Inspect each part shown with an asterisk in the Exploded View; if any of them are worn or damaged, replace the pump as an assembly.

Reassembly

15. Clean the disassembled parts with solvent, and dry them with compressed air. Do not dip rubber parts in solvent.

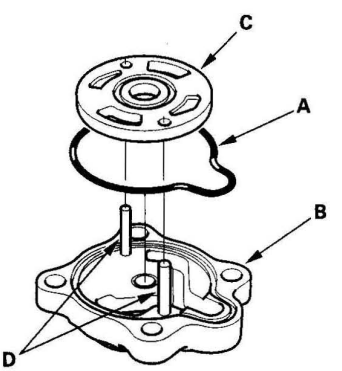
16. Install the new pump seal (A)(with its grooved side facing in) into the pump housing by hand, then install the pump seal spacer (B).



17. Position the pump drive shaft (C) in the pump housing (D), then drive it in using an appropriately sized socket wrench (E) (ball bearing O.D. 40 mm).

18. Install the 40 mm internal snap ring (F) with its radiused side facing out.

19. Coat the new pump cover seal (A) with power steering fluid, and install it into the groove in the pump cover (B).



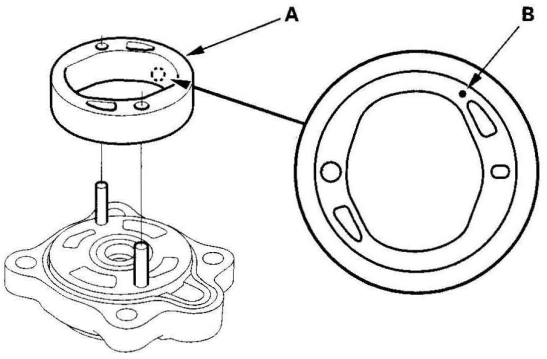
20. Install the outer side plate (C) over the two roll pins (D).

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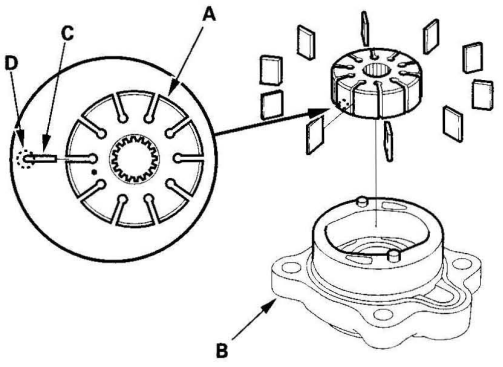
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Pump Overhaul (cont'd)

21. Set the pump cam ring (A) over the two roll pins with its "•" mark (B) facing down.

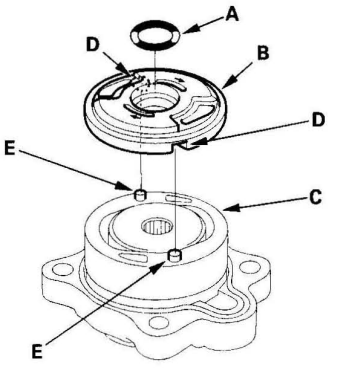


22. Assemble pump rotor (A) to the pump cover (B).



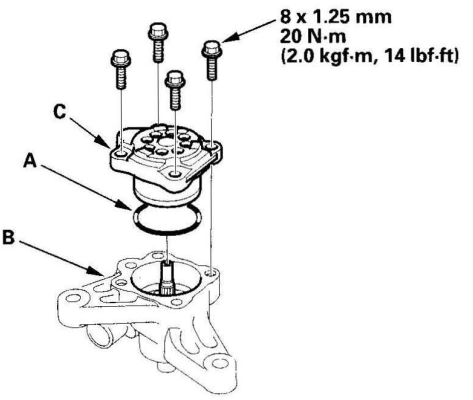
23. Set the 10 vanes (C) in the grooves in the rotor. Make sure that the round ends (D) of the vanes are in contact with the sliding surface of the cam ring.

24. Coat the new O-ring (A) with power steering fluid, and install it into the groove in the side plate (B).



25. Install the side plate on the cam ring (C) by aligning the roll pins set holes (D) in the side plate with the roll pins (E).

26. Coat the new O-ring (A) with power steering fluid, and position it in the bottom of the pump housing (B).

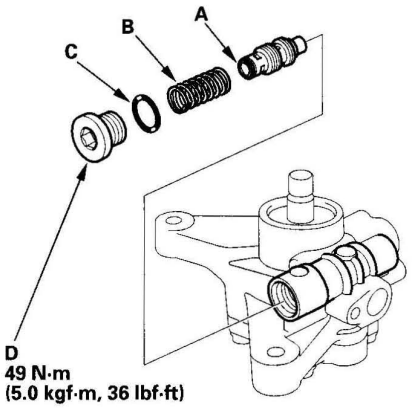


27. Install the pump cover assembly (C) in the pump housing.

BACK

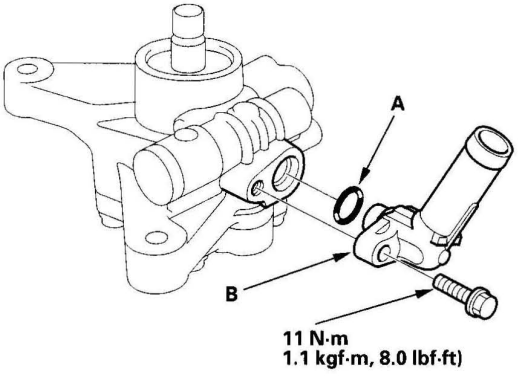
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28. Coat the flow control valve (A) with power steering fluid, then install it and the spring (B) in the pump housing.

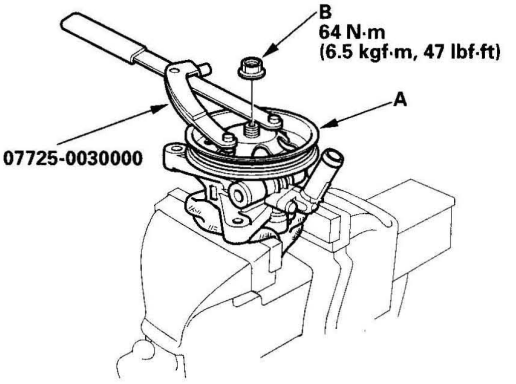


29. Coat the new O-ring (C) with power steering fluid, and install it on the flow control valve cap (D), then install the cap on the pump housing, and tighten it.

30. Coat the new O-ring (A) with power steering fluid, and install it on the inlet joint (B). Install the inlet joint on the pump housing, and tighten the flange bolt.



31. Install the pulley (A), then loosely install the pulley nut (B). Hold the steering pump in a vise with soft jaws. Be careful not to damage the pump housing with the jaws of the vise.



32. Hold the pulley with the special tool, and tighten the pulley nut.

33. Check that the pump turns smoothly by turning the pulley by hand.

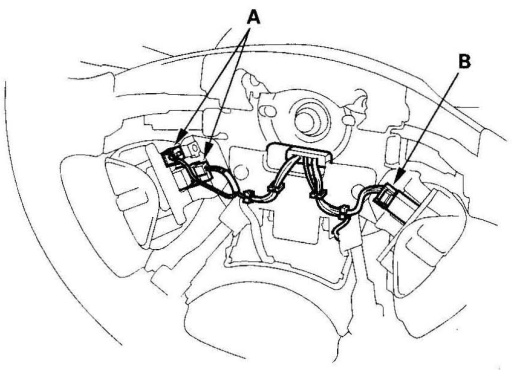
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Steering Wheel Removal

SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions, and procedures in the SRS section (see page 23-16),before performing repairs or service.

1. Align the front wheels straight ahead, then remove the driver's airbag from the steering wheel (see page 23-116).

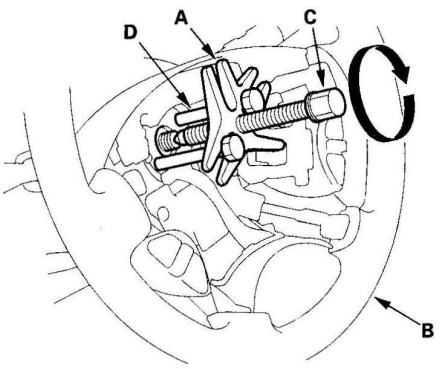
2. Disconnect the radio remote switch connectors (A) and cruise control switch connector (B).



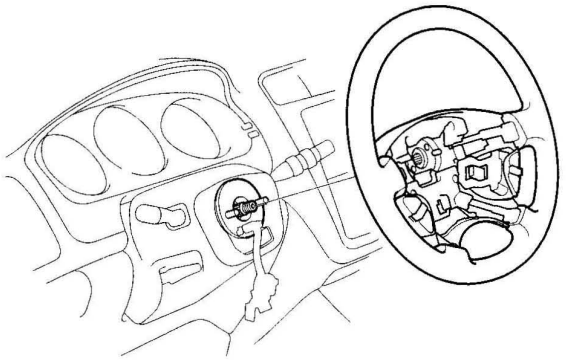
3. Remove the steering wheel nut. Set a steering wheel puller (A) on the steering wheel (B). Free the steering wheel from the steering column by turning the pressure bolt (C) of the puller.

   Note these items when removing the steering wheel:

   - Do not tap on the steering wheel or the steering column shaft when removing the steering wheel.
   - If you thread the puller bolts (D) into the wheel hub more than five threads, the bolts will hit the cable reel and damage it. To prevent this, install a pair of jam nuts five threads up on each puller bolt.



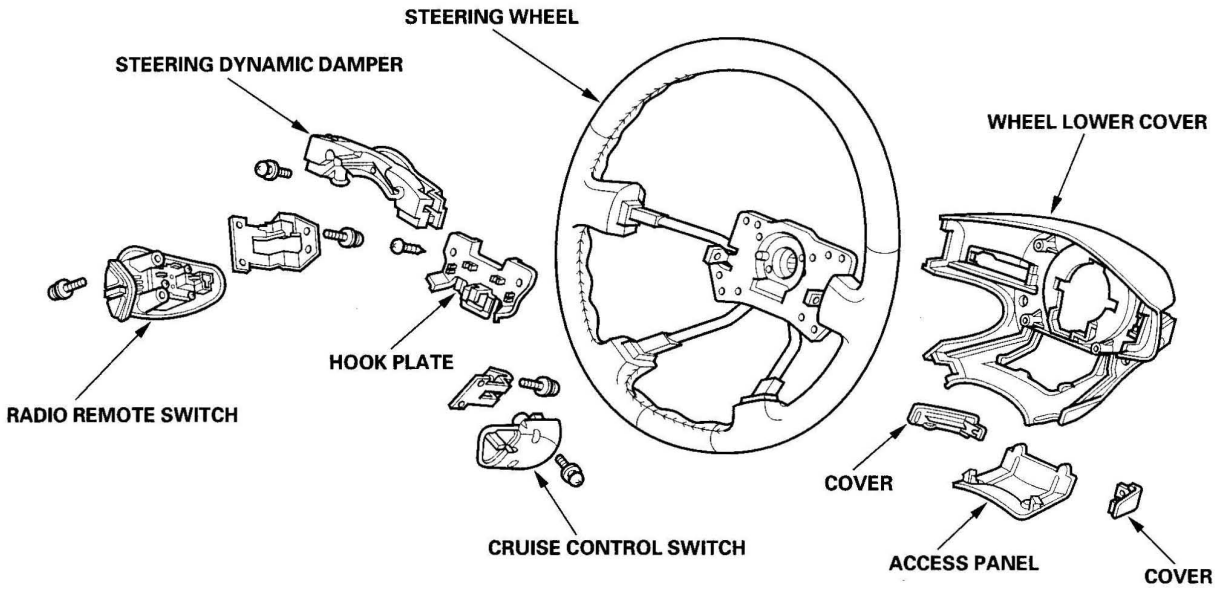
4. Remove the steering wheel puller, then remove the steering wheel from the steering column.



BACK

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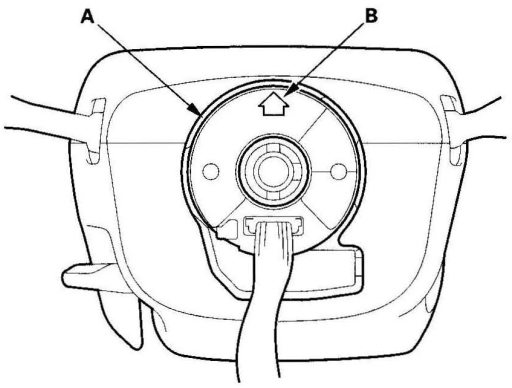
Steering Wheel Disassembly/Reassembly



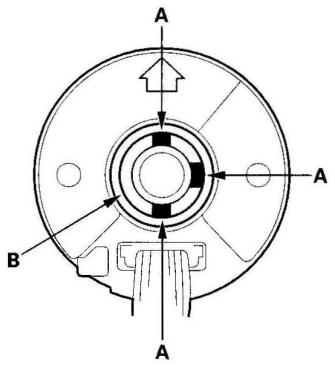
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Steering Wheel Installation

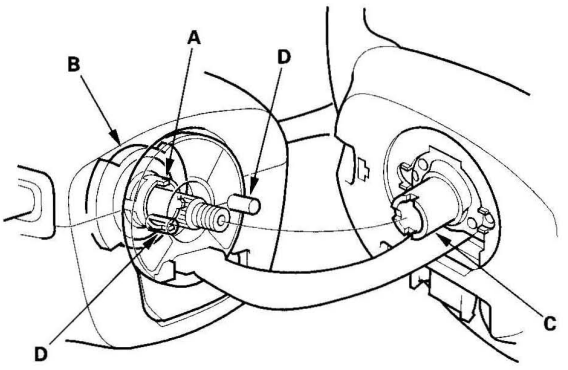
1. Before installing the steering wheel, make sure the front wheels are aligned straight ahead, then center the cable reel (A). Do this by first rotating the cable reel clockwise until it stops. Then rotate it counterclockwise about two and a half turns. The arrow mark (B) on the cable reel label point should point straight up.



2. Position the tabs (A) of the turn signal canceling sleeve (B) as shown.



3. Install the steering wheel on to the steering column shaft, making sure the steering wheel hub (C) engages the pins (D) of the cable reel and tabs (A) of the canceling sleeve (B). Do not tap on the steering wheel or steering column shaft when installing the steering wheel.



4. Install the steering wheel nut and tighten it to 49 N·m (5.0 kgf·m, 36 lbf·ft).

5. Connect the radio remote switches connector and cruise control switch connector.

6. Install the driver's airbag, and confirm that the system is operating properly (see step 1 on page 23-116).

7. Check the horn, radio remote switch, cruise control set/resume switch and turn signal canceling for proper operation.

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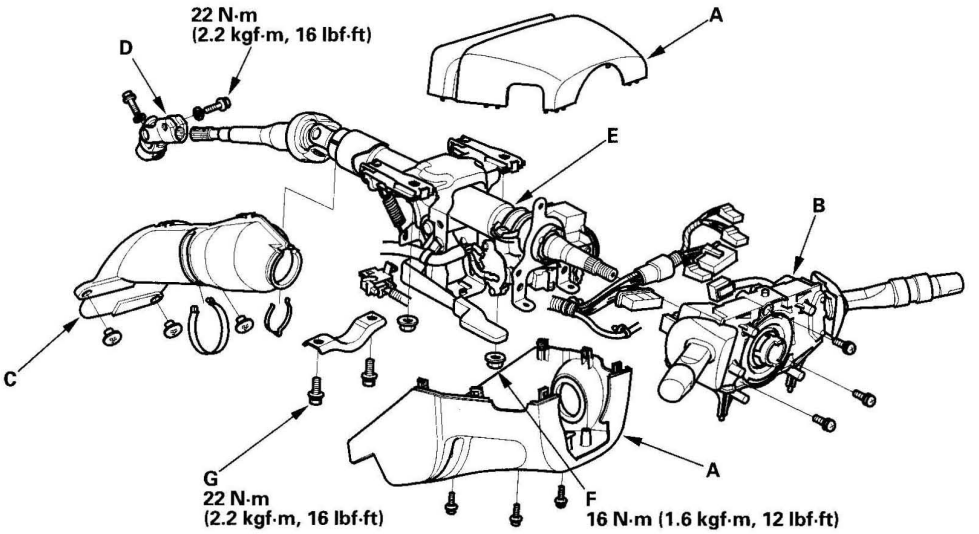
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Steering Column Removal and Installation

SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions, and procedures in the SRS section (see page 23-16) before performing repairs or service.

Removal

1. Record the radio station presets, and disconnect the battery negative cable.
2. Remove the driver's airbag assembly (see page 23-116).
3. Remove the steering wheel (see page 17-22).
4. Remove the column covers (A).



5. Remove the cable reel (see page 23-124).
6. Remove the combination switch assembly (B) from the steering column shaft by removing the three mounting screws, and disconnecting the connectors.
7. Remove the driver's kick panel, and disconnect the ignition switch connectors from the driver's under-dash fuse/relay box.
8. Remove the steering joint cover (C).
9. Disconnect the steering joint (D), and remove it from the column shaft.
10. Remove the steering column (E) by removing the attaching nuts (F) and bolts (G).

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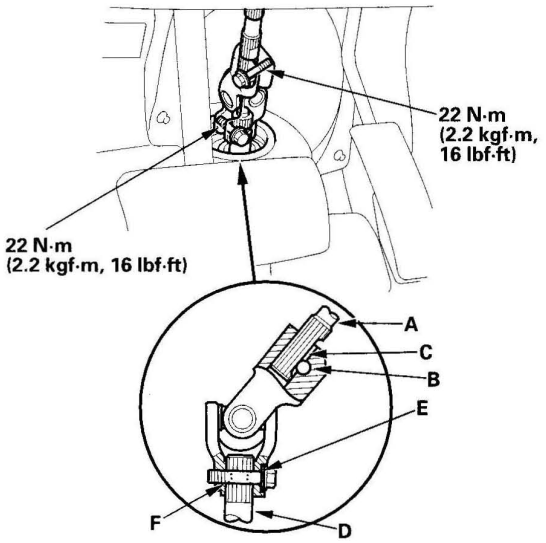
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Steering Column Removal and Installation (cont'd)

Installation

1. Install the steering column and make sure the wires are not caught or pinched by any parts.

2. Insert the upper end of the steering joint onto the steering shaft (A) (line up the bolt hole (B) with the flat portion (C) on the shaft).



3. Slip the lower end of the steering joint onto the pinion shaft (D) (line up the bolt hole (E) with the groove (F) around the shaft), and loosely install the lower joint bolt. Be sure that the lower joint bolt is securely in the groove in the pinion shaft.

4. Pull on the steering joint to make sure that the steering joint is fully seated. Then install the upper joint bolt and tighten it.

5. Finish the installation in the reverse order of disassembly, and note these items:

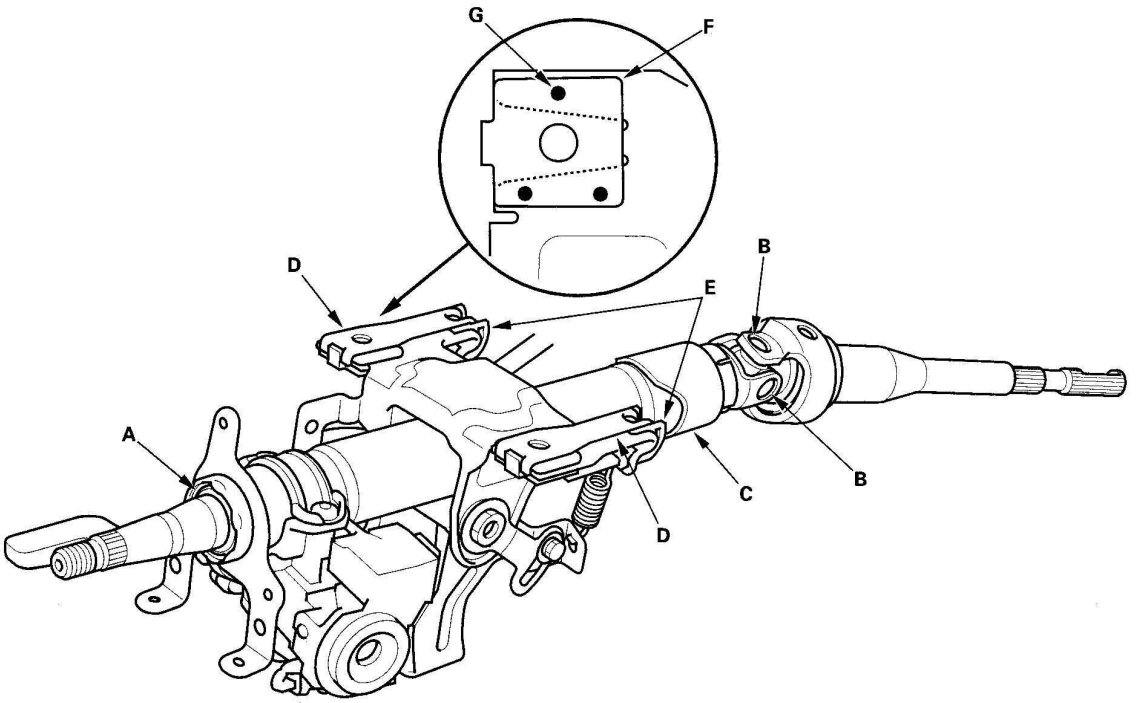
   - Make sure the wire harness is routed and fastened properly.
   - Make sure the connectors are properly connected.
   - Reinstall the steering wheel (see page 17-24).
   - Reconnect the battery and reset the radio presets.
   - Verify cruise control, horn, radio remote, and turn signal switch operation.
   - Make sure the steering wheel is centered.

BACK

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Steering Column/Tilt Lever Inspection/Adjustment

- Check the steering column ball bearing (A) and the steering joint bearings (B) for play and proper movement. If any bearing is noisy or has excessive play, replace the steering column as an assembly.
- Check the retaining collar (C) for damage. If it is damaged, replace the steering column as an assembly.
- Check the absorbing plates (D), absorbing plate guides (E) and sliding capsules (F) for distortion or breakage. If there is distortion or breakage, replace the steering column as an assembly. The sliding capsule is attached to the column bracket with the plastic injections (G).



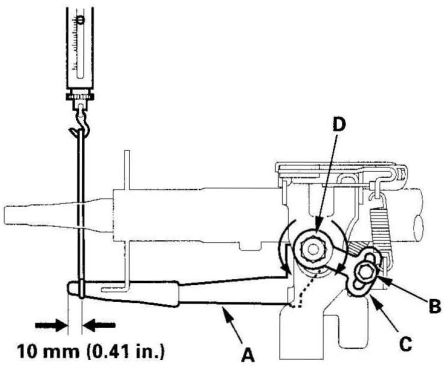
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Steering Column/Tilt Lever Inspection/Adjustment (cont'd)

1. Move the tilt lever (A) from the loose position to the lock position three to five times. With the tilt lever in the loose position measure the tilt lever preload 10 mm (0.4 in.) from the end of the tilt lever.

Preload: 70—90 N (7—9 kgf, 15—20 lbf)



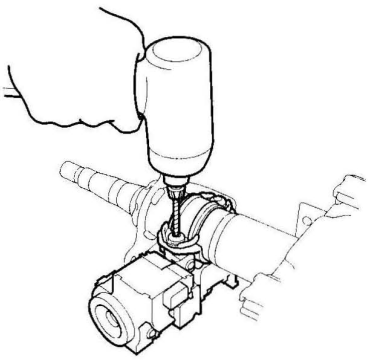
2. If the measurement is out of the specification, adjust the preload using the following procedures.

- Loosen the tilt lever, and set the steering column in the neutral position.
- Remove the 6 mm lock bolt (B), and remove the stop (C). Be careful not to loosen the tilt lever when installing the stop or tightening the 6 mm lock bolt.
- Adjust the preload by turning the tilt lock bolt (D) left or right.
- Pull up the tilt lever to the uppermost position, and install the stop. Check the preload again. If the measurement is still out of specification, repeat the above procedures to adjust.

Steering Lock Replacement

1. Remove the steering column (see page 17-25).

2. Center punch each of the two shear bolts, and drill their heads off with a 5 mm (0.20 in.) drill bit. Be careful not to damage the switch body when removing the shear bolts.



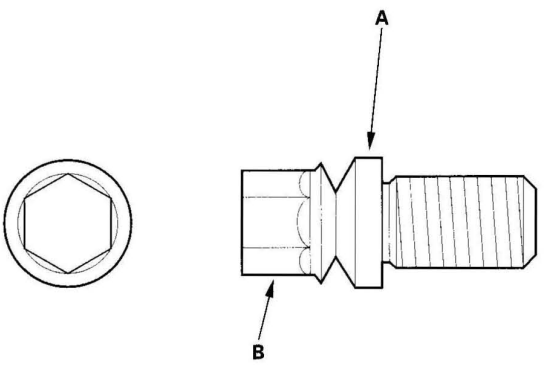
3. Remove the shear bolts from the switch body.

4. Install the switch body without the key inserted.

5. Loosely tighten the new shear bolts.

6. Insert the ignition key, and check for proper operation of the steering wheel lock. Make sure that the ignition key turns freely.

7. Tighten the shear bolts (A) until the hex heads (B) twist off.



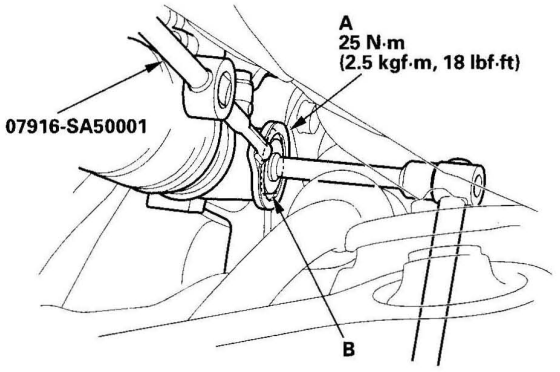
BACK

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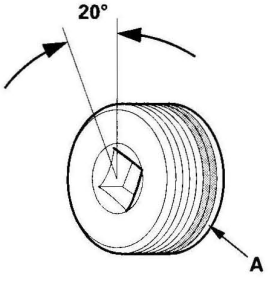
Rack Guide Adjustment

Special Tools Required
Locknut wrench, 40 mm 07916-SA50001

1. Set the wheels in the straight ahead position.
2. Loosen the rack guide screw locknut (A) with a special tool, then remove the rack guide screw (B).



3. Remove the old sealant from rack guide screw threaded section, and apply new sealant around the threads (A). Loosely install the rack guide screw on the steering gearbox.



4. Tighten the rack guide screw to 25 N·m (2.5 kgf·m, 18 lbf·ft), then loosen it.
5. Retighten the rack guide screw to 3.9 N·m (0.4 kgf·m, 2.9 lbf·ft), then back it off to specified angle.

   Specified Return Angle: 20°

6. Tighten the locknut while holding the rack guide screw.
7. Check for unusual steering effort through the complete turning travel.
8. Check the steering wheel rotational play and power assist (see page 17-7).

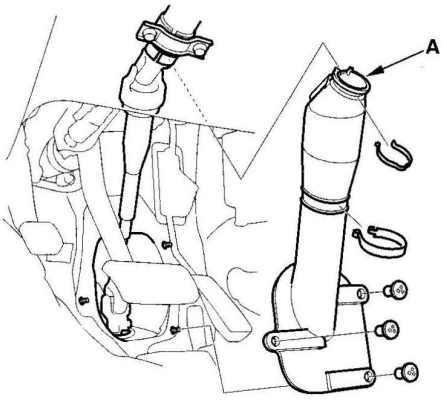
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Steering Gearbox Removal

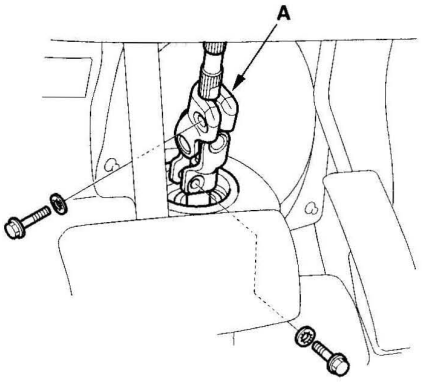
Special Tools Required
Ball joint remover, 28 mm 07MAC-SL00200

Note these items during removal:
- Using solvent and a brush, wash any oil and dirt off the valve body unit, its lines, and the end of the gearbox. Blow dry with compressed air.
- Be sure to remove the steering wheel before disconnecting the steering joint. Damage to the cable reel can occur.
- Lower the front subframe from the body and remove/install the steering gearbox through the gap produced by lowering the front subframe.

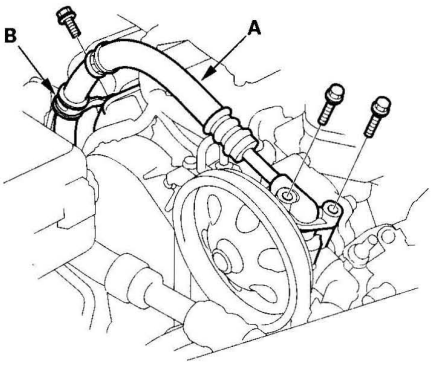
1. Drain the power steering fluid (see page 17-14).
2. Disconnect the battery cable.
3. Remove the driver's airbag assembly (see page 23-116).
4. Remove the steering wheel (see page 17-22).
5. Remove the steering joint cover (A).



6. Remove the steering joint bolts, disconnect the steering joint by moving the steering joint (A) toward the column.



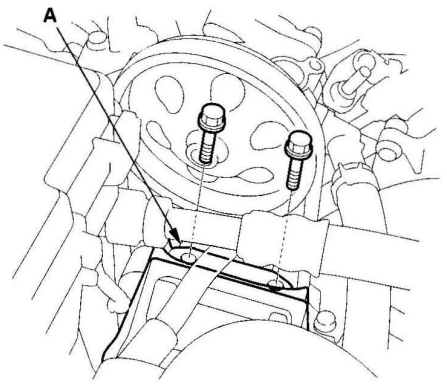
7. Disconnect the pump outlet hose (A) from the power steering pump, and remove the feed hose clamp (B).



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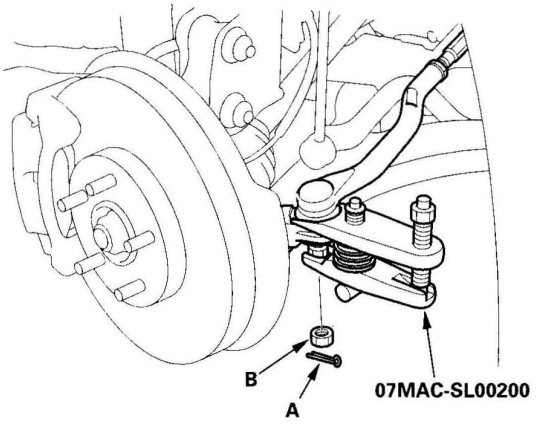
8. Remove the 10 mm flange bolts on the engine side mount bracket (A).



9. Raise the vehicle, and make sure it is securely supported.

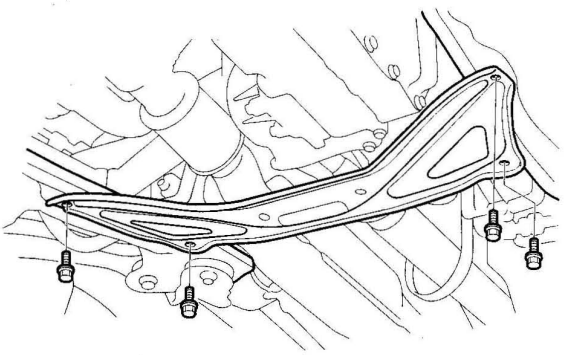
10. Remove the front wheels.

11. Remove the cotter pin (A) from the 12 mm nut (B), and loosen the nut.

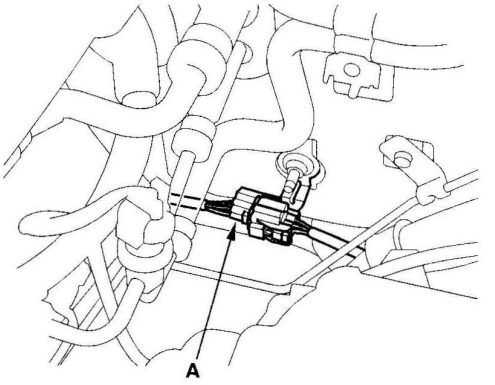


12. Separate the tie-rod ball joint and knuckle using the special tool (see page 18-9).

13. Remove the subframe stiffener plate.



14. Disconnect the secondary heated oxygen sensor (secondary HO2S) connector (A) from the engine compartment.

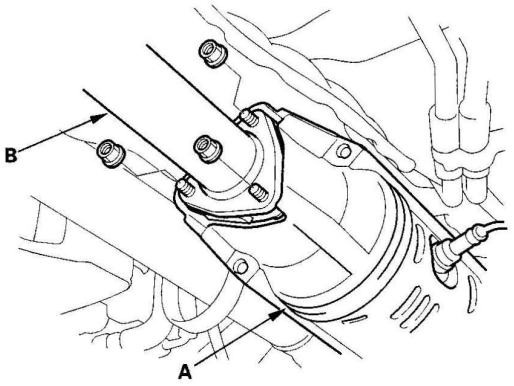


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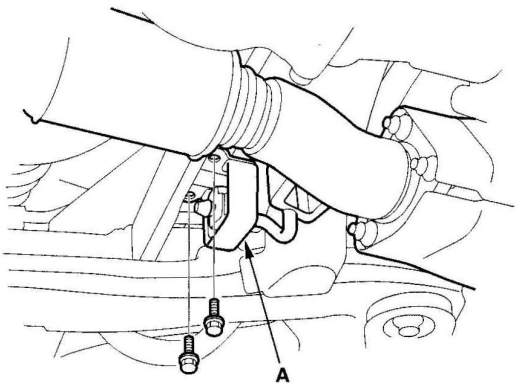
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Steering Gearbox Removal (cont'd)

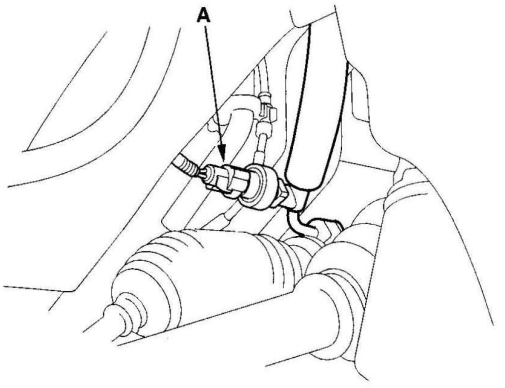
15. Remove the three self-locking nuts, and disconnect the three way catalytic converter (TWC) (A) and mufflers (B) (see page 9-4).



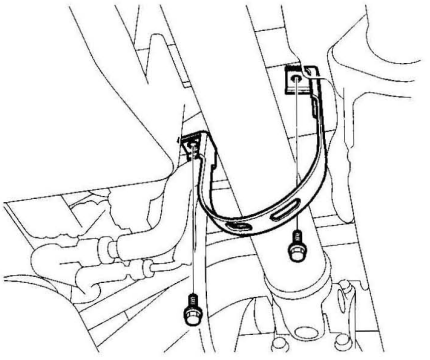
16. Remove the 10 mm flange bolts of the exhaust rubber mount (A).



17. Disconnect the power steering pressure (PSP) switch connector (A).



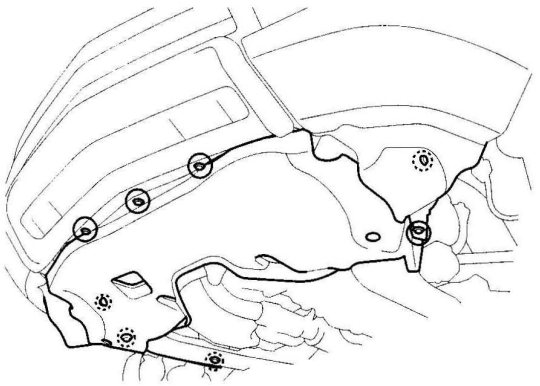
18. Remove the propeller shaft protector.



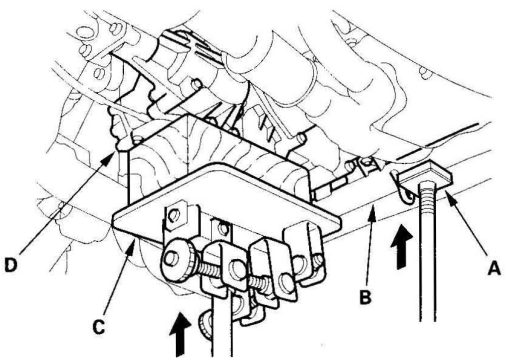
BACK

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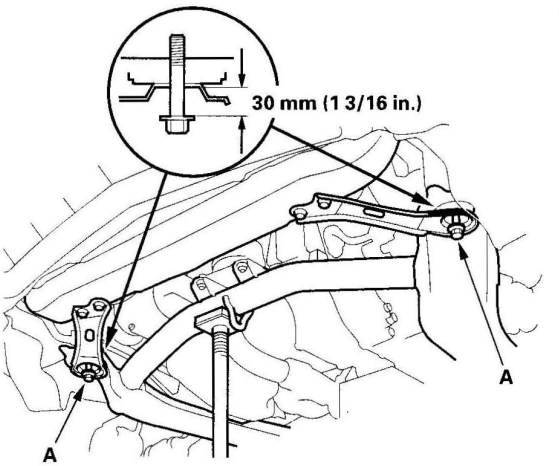
19. Remove the splash shield.



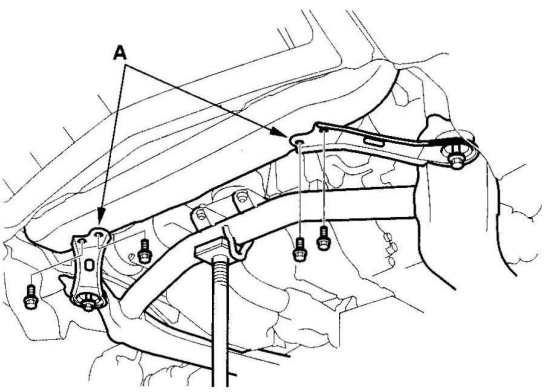
20. Place a jack (A) under the front tube of the front subframe (B), and support it by raising the jack. Place a transmission jack (C) under the center of the transfer case (D).



21. Loosen the two 14 mm flange bolts (A) on the front subframe so they are about 30 mm (1 3/16 in.) from the mounting surface. Do not loosen the 14 mm flange bolts more than necessary.



22. Remove the four 12 mm flange bolts from the front stiffener plates (A).

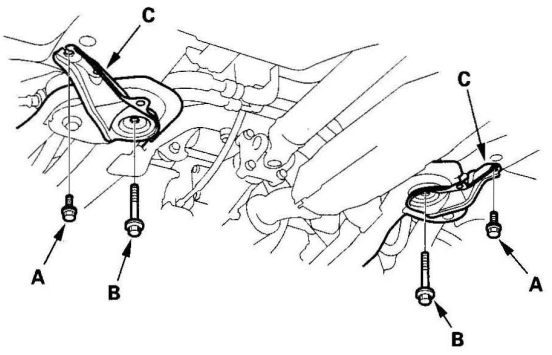


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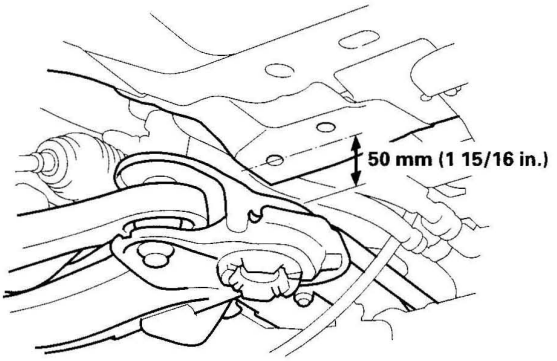
Steering Gearbox Removal (cont'd)

23. Support the transfer case securely by raising the transmission jack, then remove the two 12 mm flange bolts (A).

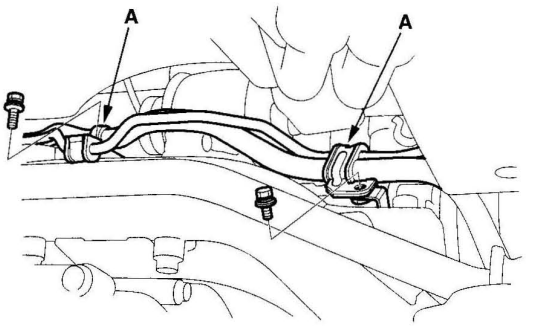


24. Remove the two 14 mm special bolts (B) and rear stiffener plates (C) from the front subflame.

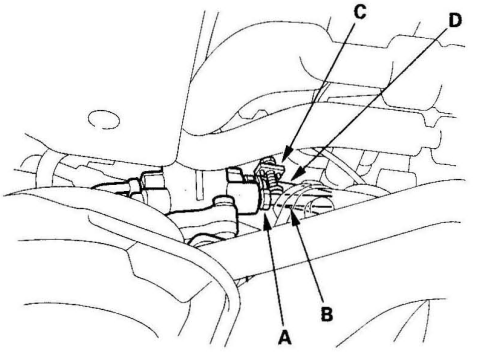
25. Lower the transmission jack slowly until the front subframe has dropped about 50 mm (1 15/16 in.)



26. Remove the P/S line mounting brackets (A) from the front subframe and gearbox mounting bracket.



27. Loosen the 14 mm flare nut (A), and disconnect the feed line (B).

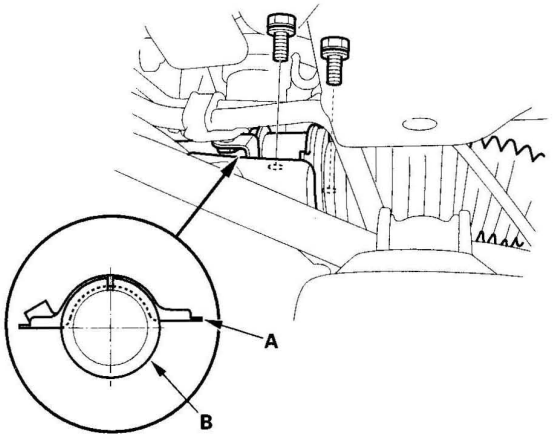


28. Loosen the adjustable hose clamp (C) and disconnect the return hose (D).

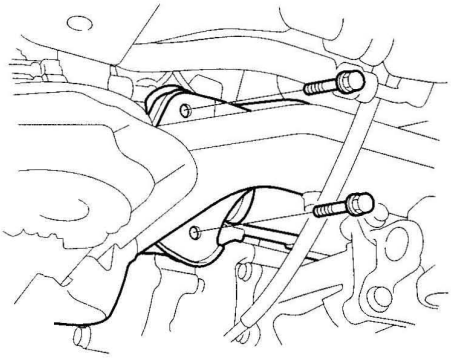
BACK

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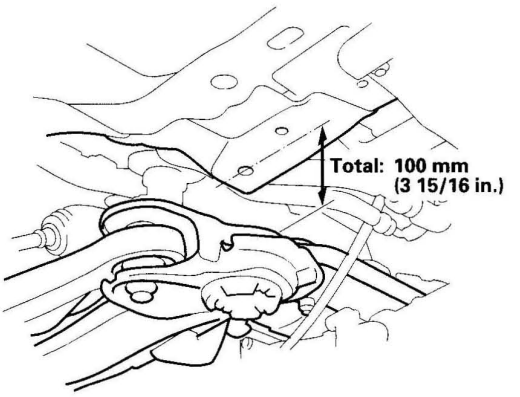
29. Remove the two 10 mm flange bolts from the right side of the gearbox, then remove the mounting bracket (A) and cushion (B).



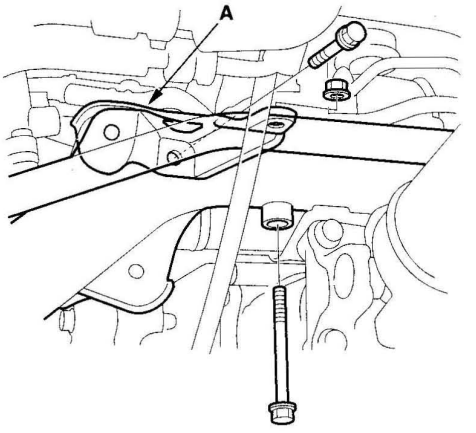
30. Remove the two 10 mm flange bolts from the left side of the gearbox.



31. Lower the transmission jack slowly until the front subframe has dropped 100 mm (3 15/16 in.) total.



32. Remove the gearbox stiffener bracket (A) from the left side of the front subframe.

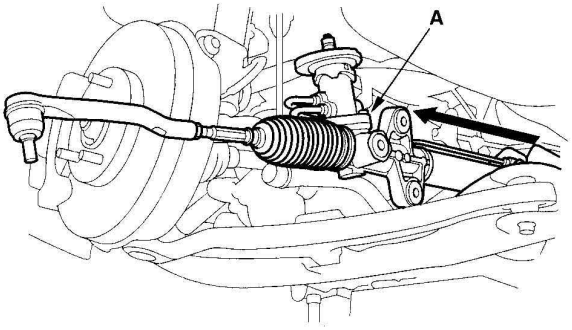


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Steering Gearbox Removal (cont'd)

33. Slide the steering gearbox (A) between the body and front subframe toward the left, and remove the steering gearbox.

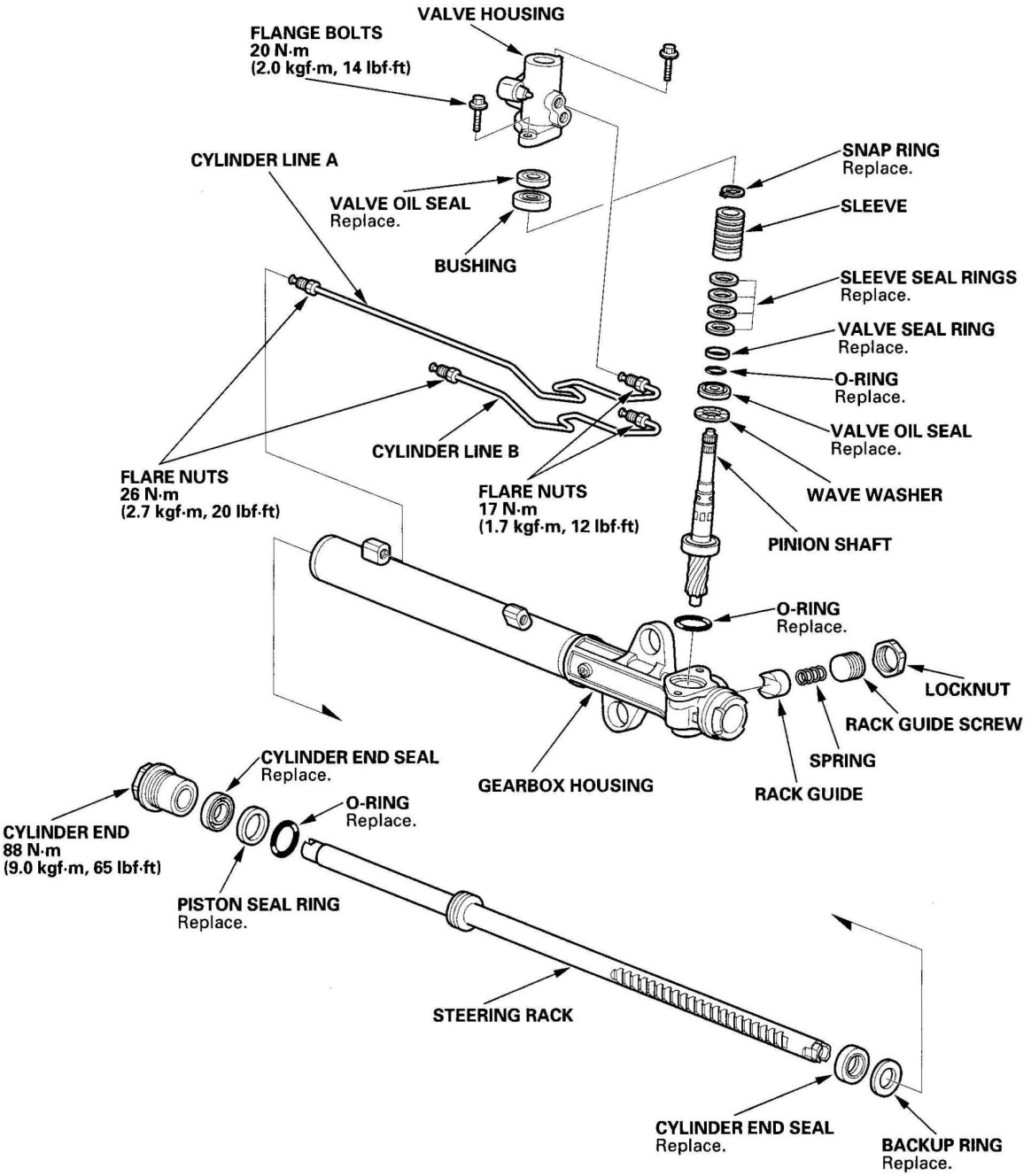


BACK

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Steering Gearbox Overhaul

Exploded View



(cont'd)

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Steering Gearbox Overhaul (cont'd)

Special Tools Required
- Cylinder end seal remover attachment 07TAF-SZ50100
- Pilot collar 07GAF-PH70100
- Valve seal ring sizing tool 07NAG-SR3090A
- Ball joint boot clip guide 07974-SA50800
- Sleeve seal ring sizing tool 07974-SA5020A or 07974-SA50200
- Attachment, 32 x 35 mm 07746-0010100
- Driver 07749-0010000
- Piston seal ring guide 07ZAG-S3VA100
- Piston seal ring sizing tool 07ZAG-S3VA200
- Pincers, Oetiker 1098 or equivalent, commercially available.

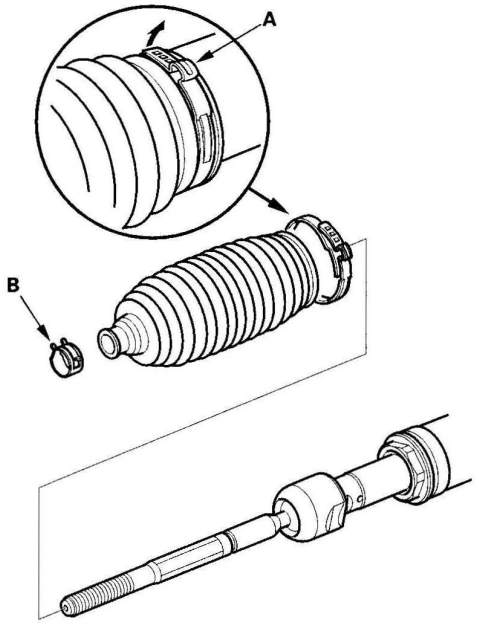
NOTE: Refer to the Exploded View as needed during this procedure.

Removal

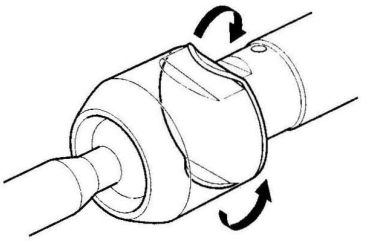
1. Remove the steering gearbox (see page 17-30).

Disassembly

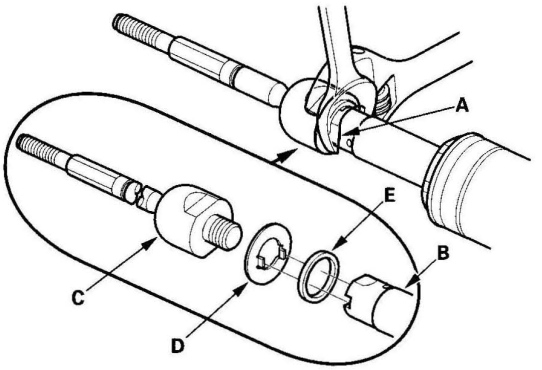
2. Remove the boot bands (A) and tie-rod clips (B). Pull the boots away from the ends of the gearbox.



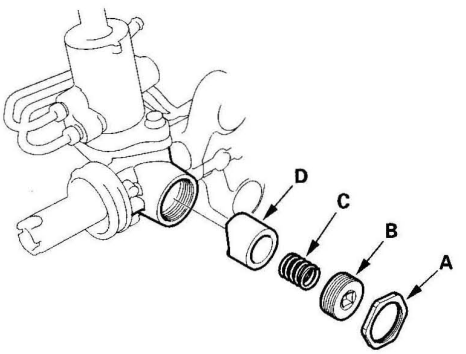
3. Unbend the lock washer.



4. Hold the flat surface sections (A) of the steering rack (B) with a wrench, and unscrew both rack ends (C) with a wrench. Be careful not to damage the rack surface with the wrench. Remove the lock washer (D) and stop washer (E).



5. Loosen the locknut (A), then remove the rack guide screw (B).

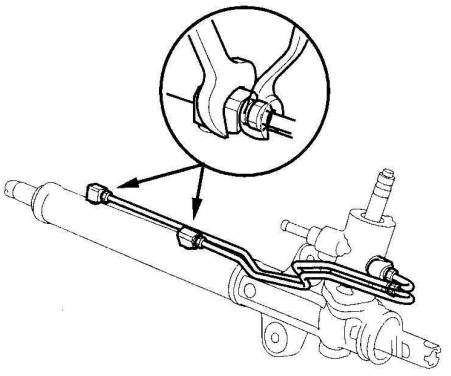


6. Remove the spring (C) and the rack guide (D) from the gearbox.

BACK

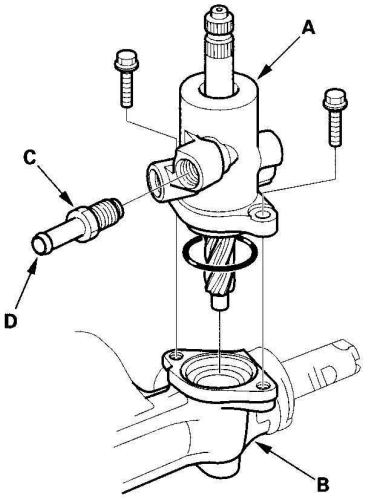
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7. Remove the cylinder lines from the gearbox.



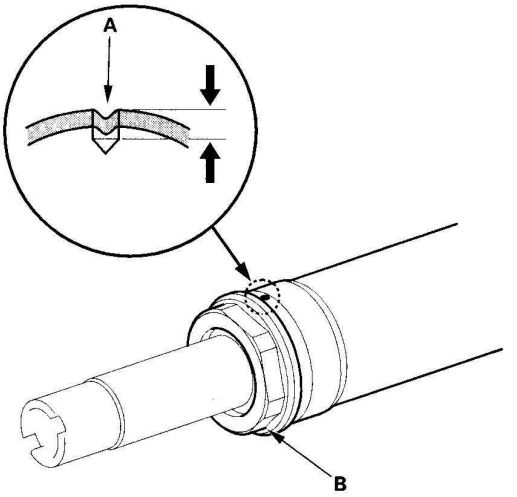
8. Drain the fluid from the cylinder fittings by slowly moving the steering rack back and forth.

9. Remove the two flange bolts, then remove the valve body unit (A) from the gearbox (B).

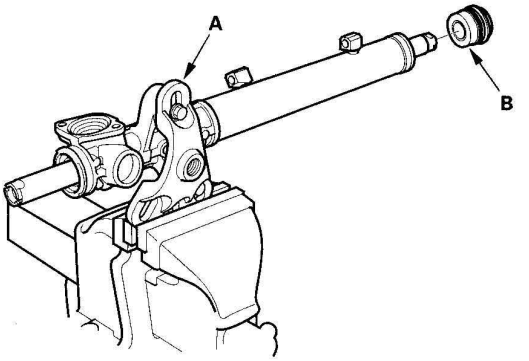


10. Loosen the 16 mm flare nut (C), and remove the return line joint (D).

11. Drill a 3 mm (0.12 in.) diameter hole about 2.5–3.0 mm (0.10–0.12 in.) in depth in the staked point (A) on the cylinder. Do not allow metal shavings to enter the cylinder housing. After removing the cylinder end (B), remove any burrs at the staked point.



12. Attach the yoke of a universal puller (A) to the steering gearbox mounts with bolts. Clamp the yoke in a vise with soft jaws as shown, then loosen and remove the cylinder end (B). Do not clamp the cylinder housing or gearbox housing in the vise.

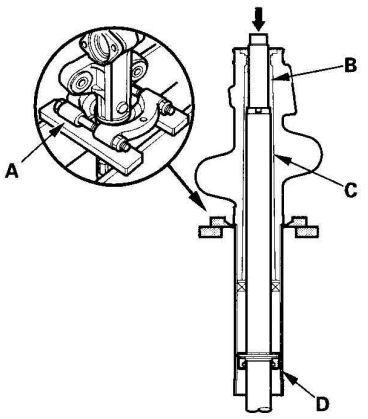


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Steering Gearbox Overhaul (cont'd)

13. Install a commercially available bearing separator (A) on the gearbox housing as shown.

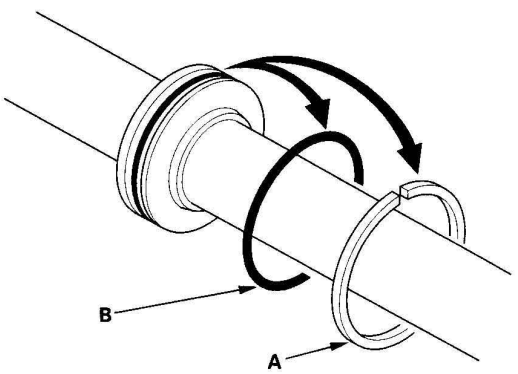


14. Place an appropriately sized deep socket wrench (B) on the steering rack (C).

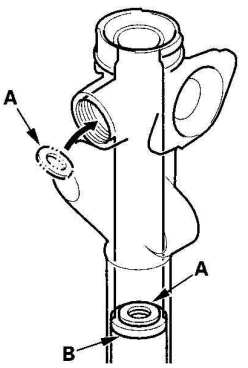
15. Set the steering gearbox in a press so the gearbox housing points upward, then press the cylinder end seal (D) and steering rack out of the gearbox. Hold the steering rack to keep it from falling when pressed clear. Be careful not to damage the inner surface of the cylinder housing with the tool.

16. Remove the cylinder end seal from the steering rack.

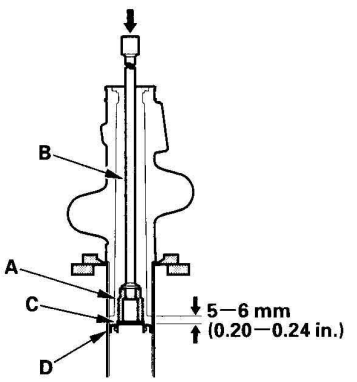
17. Carefully pry the piston seal ring (A) and O-ring (B) off the rack piston. Be careful not to damage the inside of the seal ring groove and piston edges when removing the seal ring.



18. Install a washer (O.D. 27.5 mm, HES P/N 94103-10400)(A) so it will fit through the rack guide hole of the gearbox housing, then position the washer on the cylinder end seal (B). Make sure that the washer is securely positioned on the cylinder end seal edges.



19. Install the socket wrench with a 27.5 mm O.D. (A) onto the 24" long 3/8" drive extension (B), and carefully place it on the washer (C).



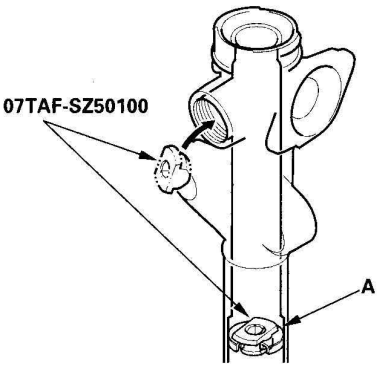
20. Set the steering gearbox in a press so the gearbox housing points upward, then push out the cylinder end seal (D) 5—6 mm (0.20—0.24 in.) by pressing the 24" long 3/8" drive extension end.

21. Remove the steering gearbox from the press, and remove the washer from the gearbox inside.

BACK

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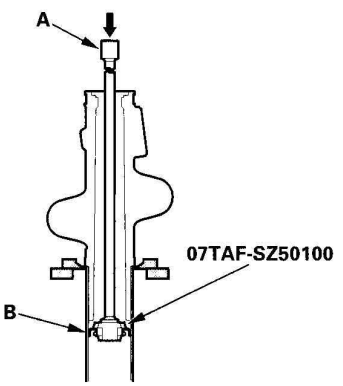
22. Turn the special tool so it will fit through the rack guide hole of the steering gearbox, then position the special tool on the cylinder end seal (A). Make sure that the special tool is securely positioned on the seal edges.



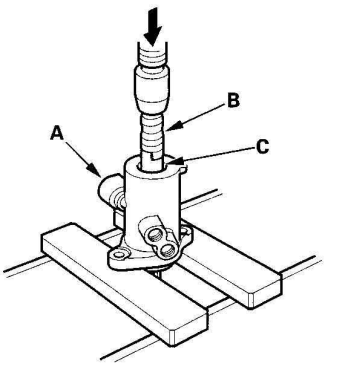
23. Insert a 24" long 3/8" drive extension (A), on the special tool. Place the steering gearbox in a press, then remove the cylinder end seal (B) from the gearbox by pressing on the 24" long 3/8" drive extension.

    Note these items when pressing the cylinder end seal:

    - Keep the tool straight to avoid damaging the cylinder wall. Check the tool angle, and correct it if necessary, when removing the cylinder end seal.
    - Use a press to remove the cylinder end seal. Do not try to remove the seal by striking the tool; striking the tool would break the cylinder end seal, and the seal would remain in the gearbox.



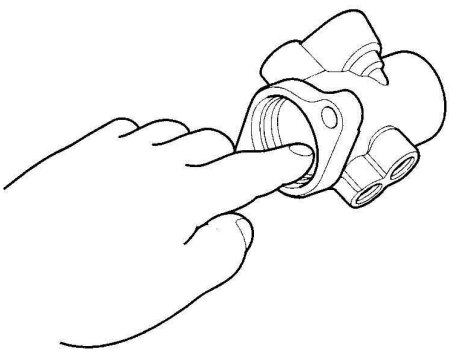
24. Before removing the valve housing (A), apply vinyl tape (B) to the splines on the pinion shaft (C).



25. Separate the valve housing from the pinion shaft/ valve using a press.

26. With your finger, check the inner wall of the valve housing where the seal ring slides. If there is a step in the wall, the housing is worn. Replace it.

    NOTE: There may be sliding marks from the seal ring on the wall of the valve housing. Replace the valve housing only if the wall is stepped.



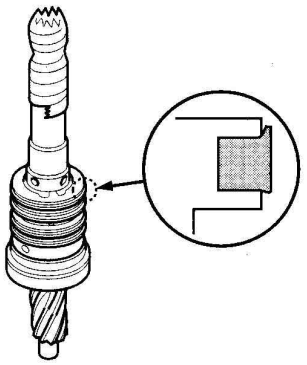
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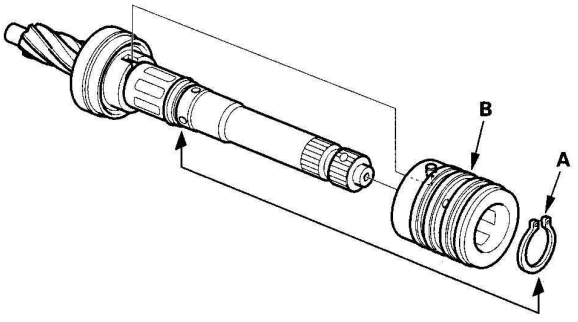
Steering Gearbox Overhaul (cont'd)

27. Check for wear, burrs and other damage to the edges of the grooves in the sleeve.

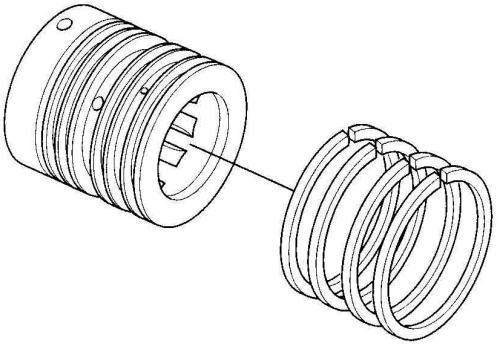
    NOTE: The pinion shaft and sleeve are a precision matched set. If either the pinion shaft or sleeve must be replaced, replace both parts as a set.



28. Remove the snap ring (A) and sleeve (B) from the pinion shaft.



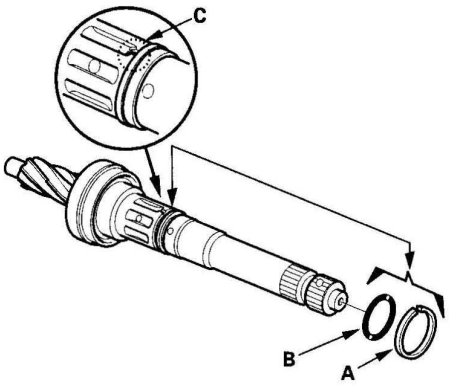
29. Using a cutter or an equivalent tool, cut and remove the four seal rings from the sleeve. Be careful not to damage the edges of the sleeve grooves and outer surface when removing the seal rings.



BACK

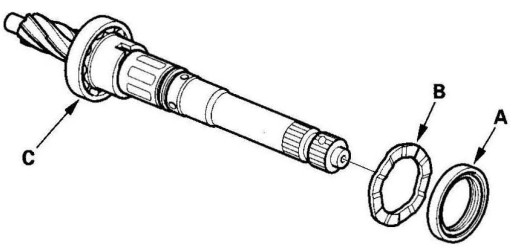
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30. Using a cutter or an equivalent tool, cut the valve seal ring (A) and O-ring (B) at the cutting groove position (C) in the pinion shaft. Remove the valve seal ring and O-ring. Be careful not to damage the edges of the pinion shaft groove and outer surface when removing the valve seal ring and O-ring.

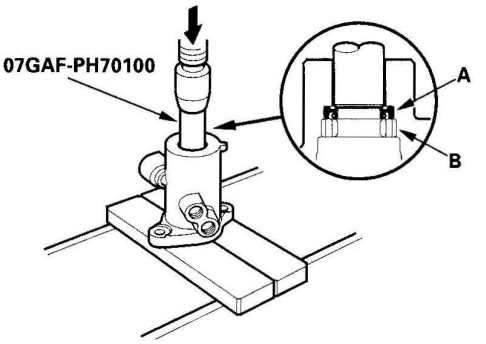


31. Remove the valve oil seal (A) and wave washer (B) from the pinion shaft.

    Note these items during disassembly:
    - Inspect the ball bearing (C) by rotating the outer race slowly. If there is any excessive play or wear, replace the pinion shaft and sleeve as an assembly.
    - The pinion shaft and sleeve are a precise fit; do not intermix old and new pinion shafts and sleeves.



32. Press the valve oil seal (A) and bushing (B) out of the valve housing using a hydraulic press and special tool.



33. Clean the disassembled parts with solvent, and dry them with compressed air. Do not dip rubber parts in the solvent.

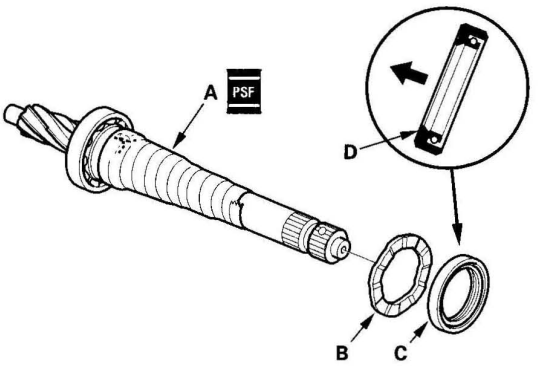
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Steering Gearbox Overhaul (cont'd)

Reassembly

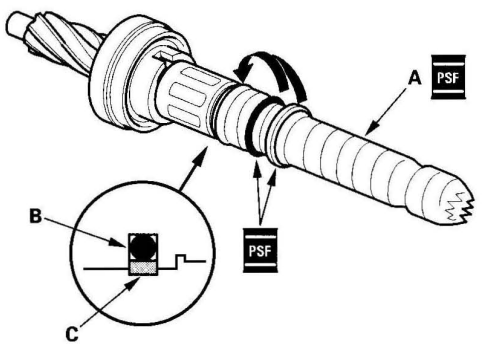
34. Apply vinyl tape (A) to the stepped portion of the pinion shaft, and coat the surface of the vinyl tape with the power steering fluid.



35. Install the wave washer (B).

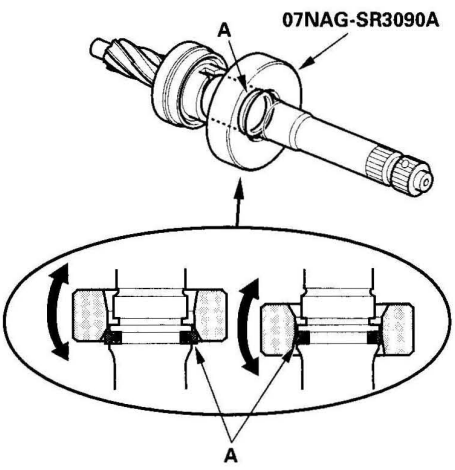
36. Coat the inside surface of the new valve oil seal (C) with power steering fluid, and install the seal with its grooved side facing opposite the bearing, then slide it over the pinion shaft, being careful not to damage its sealing lip (D).

37. Apply vinyl tape (A) to the splines and stepped portion of the shaft, and coat the surface of the vinyl tape with the power steering fluid.



38. Fit the new O-ring (B) in the groove of the pinion shaft. Then slide the new valve seal ring (C) over the shaft and in the groove on the pinion shaft.

39. Remove the tape, and apply power steering fluid to the surface of the valve seal ring (A).



40. Apply power steering fluid to the inside of the special tool. Set the larger diameter end of the special tool over the valve seal ring, and move the special tool up and down several times to make the valve seal ring fit in the pinion shaft groove.

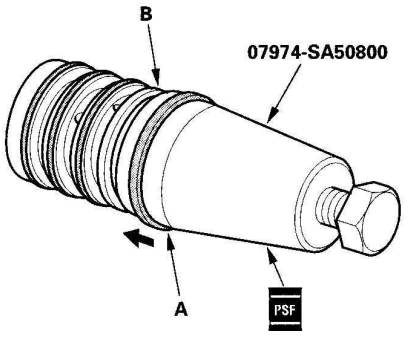
41. Remove the special tool, turn it over, slide the smaller diameter end over the valve seal ring. Move it up and down several times to make the valve seal ring fit snugly in the pinion shaft groove.

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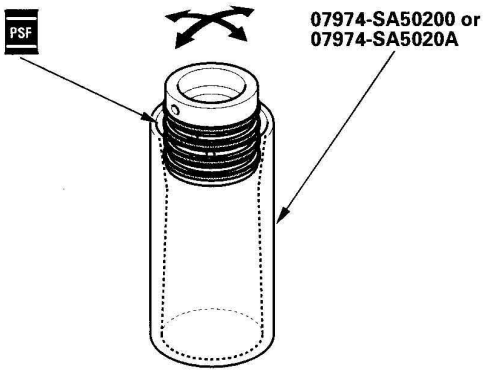
42. Apply power steering fluid to the surface of the special tool. Slip two new seal rings (A) over the special tool from the smaller diameter end, and expand them. Install only two rings at a time from each end of the pinion shaft sleeve (B).

    Note these items when installing the seal ring:
    - Do not over-expand the seal ring. Install the resin seal rings with care so as not to damage them. After installation, be sure to contract the seal rings using the special tool (sizing tool).
    - There are two types of sleeve seal rings: black and brown. Do not mix the different types of rings as they are not compatible.



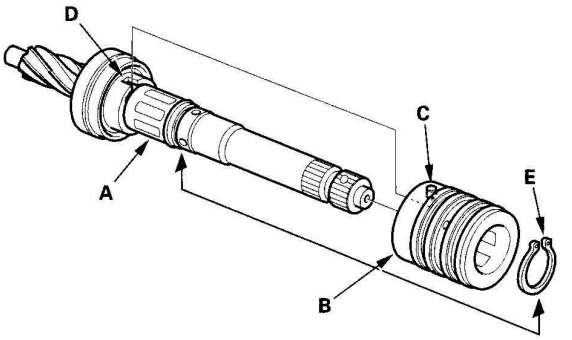
43. Align the special tool with each groove in the sleeve, and slide a sleeve seal ring into each groove. After installation, compress the seal rings with your fingers temporarily.

44. Apply power steering fluid to the seal rings on the sleeve, and to the entire inside surface of the special tool, then slowly insert the sleeve into the special tool.

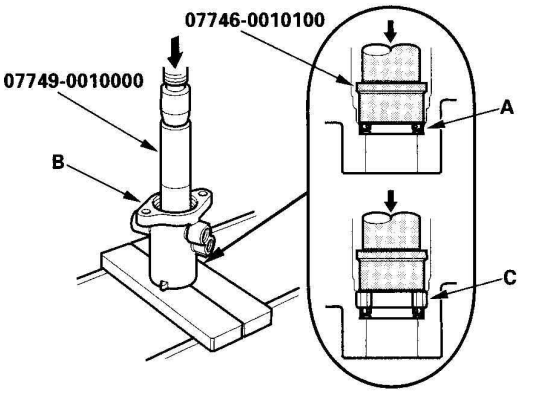


45. Move the sleeve back and forth several times to make the seal rings snugly fit in the sleeve. Be sure that the seal rings are not twisted.

46. Apply power steering fluid to the surface of the pinion shaft (A). Slide the sleeve (B) onto the pinion shaft by aligning the locating pin (C) on the inside of the sleeve with the cutout (D) in the shaft. Then install the new snap ring (E) securely in the pinion shaft groove. Be careful not to damage the valve seal ring when inserting the sleeve.



47. Apply power steering fluid to the seal ring lip of the new valve oil seal (A), then install the seal in the valve housing (B) using a hydraulic press and special tools. Install the seal with its grooved side facing the tool.



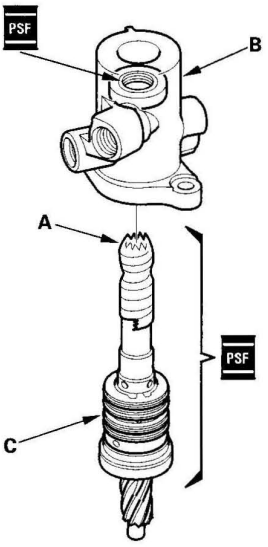
48. Press the bushing (C) into the valve housing with a hydraulic press and special tool.

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Steering Gearbox Overhaul (cont'd)

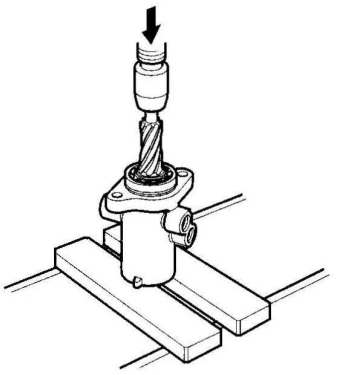
49. Apply vinyl tape (A) to the pinion shaft, then coat the vinyl tape with power steering fluid.



50. Insert the pinion shaft into the valve housing (B). Be careful not to damage the valve seal rings (C).

51. Remove the vinyl tape from the pinion shaft, then remove any residue from the tape adhesive.

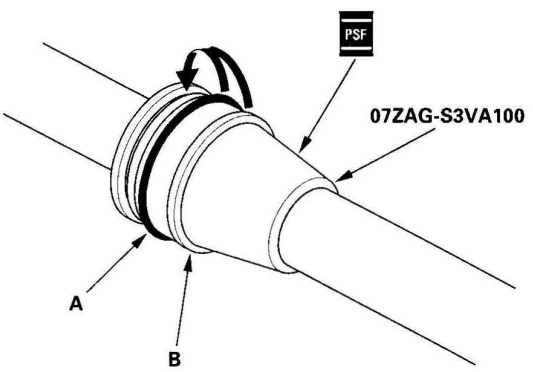
52. Press the pinion shaft/sleeve into the valve housing with a hydraulic press. Check that the pinion shaft/sleeve turns smoothly by hand after installing it.



53. Coat the special tool with power steering fluid, then slide it onto the rack, big end first.

54. Position the new O-ring (A) and new piston seal ring (B) on the special tool, then slide them down toward the big end of the tool.

    Note these items during reassembly:
    - Do not over expand the resin seal rings. Install the resin seal rings with care so as not to damage them. After installation, be sure to contract the seal ring using the special tool (sizing tool).
    - Replace piston's O-ring and seal ring as a set.



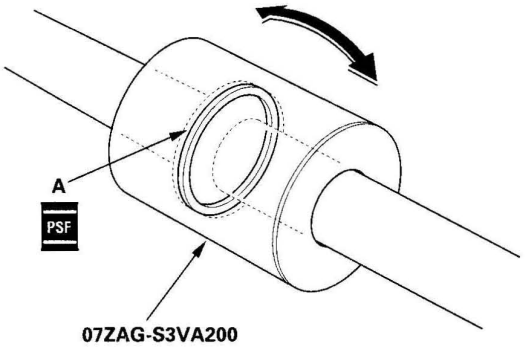
55. Pull the O-ring off into the piston groove, then pull the piston seal ring off into the piston groove on top of the O-ring.

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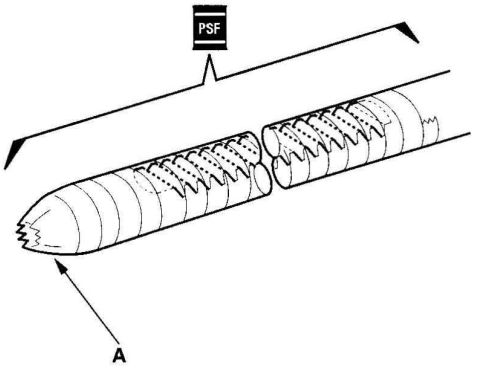
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56. Coat the piston seal ring (A) and the inside of the special tool with power steering fluid, then carefully slide the tool onto the rack and over the piston seal ring.

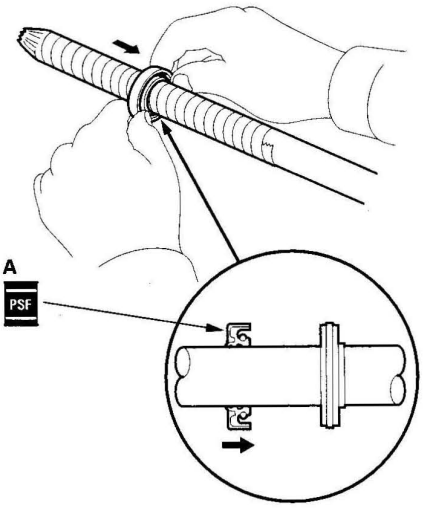
57. Move the special tool back and forth several times to make the piston seal ring fit snugly in the piston.



58. Wrap vinyl tape (A) around the rack teeth and rack end edges, then coat the surface of the tape with power steering fluid. Make sure that the vinyl tape is wrapped carefully so there is no stepped portion.

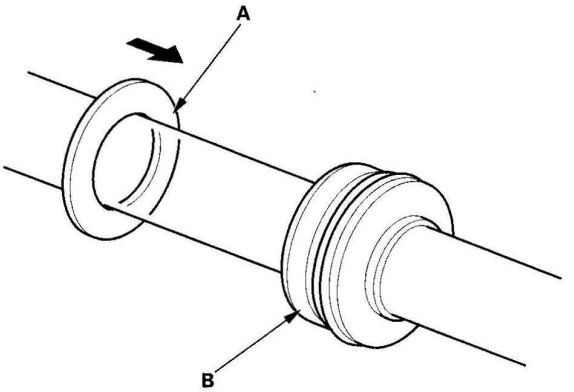


59. Coat the inside surface of the new cylinder end seal (A) with power steering fluid, then install it onto the steering rack with its grooved side toward the piston. When installing the cylinder end seal, be careful not to damage the lip of the seal with the edges or teeth of the steering rack.



60. Remove the vinyl tape from the steering rack, then remove any adhesive residue.

61. Install the new backup ring (A) on the steering rack, then place the cylinder end seal (B) against the piston.

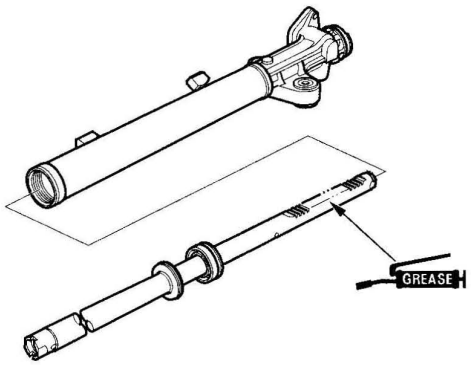


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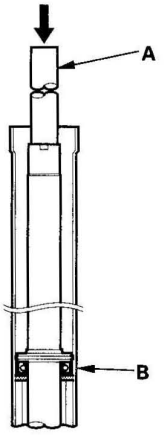
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Steering Gearbox Overhaul (cont'd)

62. Grease the steering rack teeth, then insert the steering rack into the gearbox housing. Be careful not to damage to inner surface of the cylinder wall with the rack edges.



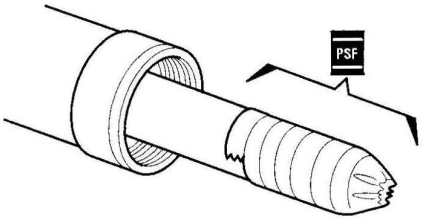
63. Insert an appropriate size deep socket wrench (A) onto the steering rack as shown.



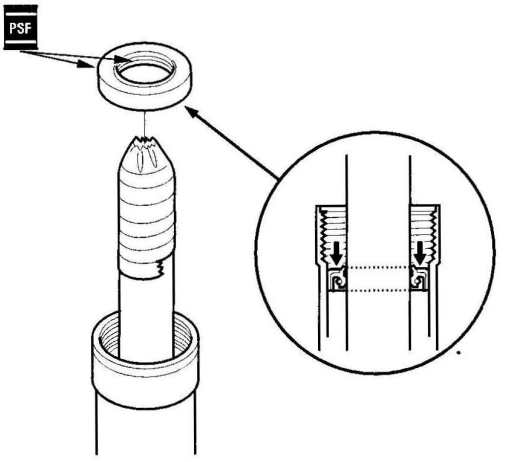
64. Install the cylinder end seal (B) into the bottom of the cylinder by pressing on the tool with a press. Do not push on the tool with excessive force as it may damage the cylinder end seal.

65. Remove the tool, and center the steering rack.

66. Wrap vinyl tape around the rack end edges, and coat the surface of the tape with the power steering fluid. Make sure that the vinyl tape is wrapped carefully so there is no stepped portion.



67. Coat the inside surface of the new cylinder end seal with power steering fluid, then install the seal onto the steering rack with its grooved side toward the piston.



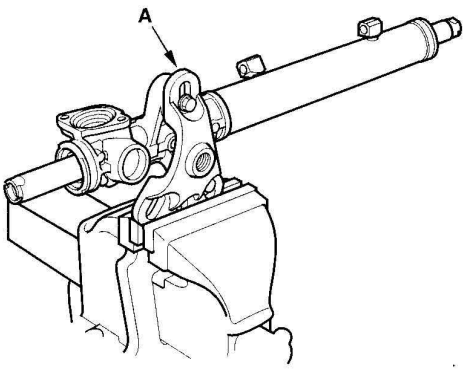
68. Push in the cylinder end seal with your finger. Be careful not to damage the face of the seal with the threads and burrs at the staked position of the cylinder housing.

69. Remove the vinyl tape from the steering rack, then remove any adhesive residue.

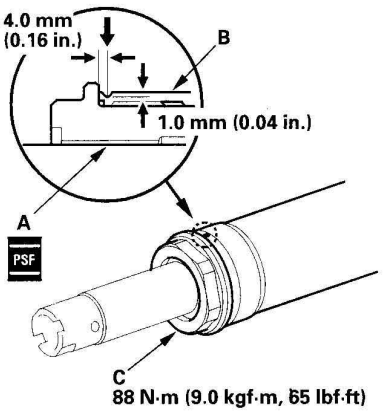
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70. Attach the yoke of a universal puller (A) to the steering gearbox mounts with bolts, then clamp the yoke in a vise with soft jaws. Do not clamp the cylinder housing or gearbox housing in the vise.

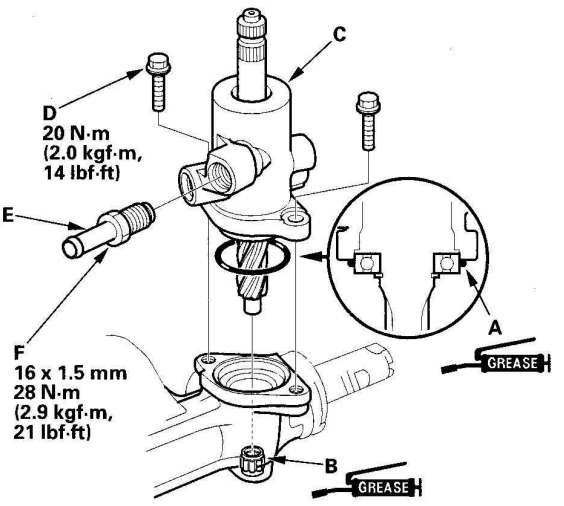


71. Coat the inside surface of the cylinder end (A) with power steering fluid, then install the cylinder end by screwing it into the cylinder (B).



72. Remove the yoke from the gearbox, then, after tightening the cylinder end (C), stake the point of the cylinder shown (opposite from where the stake was removed during disassembly).

73. Coat the new O-ring (A) with grease, and carefully fit it on the valve housing.



74. Apply grease to the needle bearing (B) in the gearbox housing, then install the valve body unit (C) by engaging the gears. Note the valve body unit installation position (direction of the line connections).

75. Tighten the flange bolts (D) to the specified torque.

76. Install the return line joint (E), and tighten the 16 mm flare nut (F).

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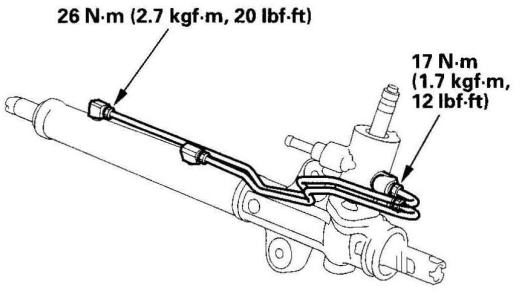
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Steering Gearbox Overhaul (cont'd)

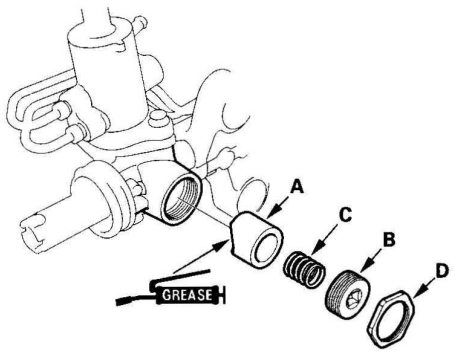
77. Install the cylinder lines.

    Note these items during reassembly:

    - Thoroughly clean the joints of the cylinder lines. The joints must be free of foreign material.
    - Install the cylinder lines by tightening the flare nuts by hand first, then tighten the flare nuts to the specified torque.



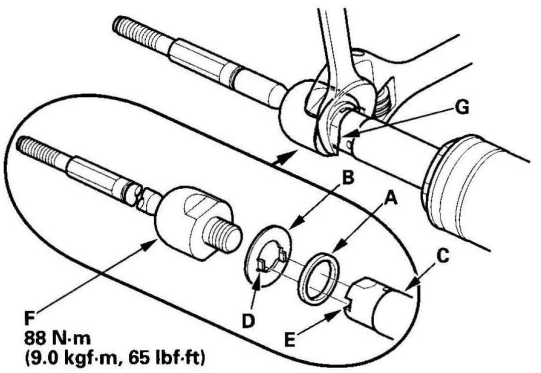
78. Grease the sliding surface of the rack guide (A), and install it onto the gearbox housing.



79. Remove the old sealant from the rack guide screw (B), then apply new sealant all around the threads. Install the spring (C), rack guide screw and locknut (D).

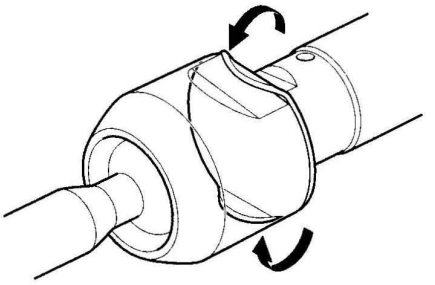
80. Adjust the rack guide screw (see page 17-29). After adjusting, check that the rack moves smoothly by sliding it right and left.

81. Install the new stop washer (A) and lock washer (B) on the rack end (C) in the rack. Align the lock washer tabs (D) with the slots (E). Install the rack end (F) while holding the lock washer in place. Repeat this step for the other side of the rack.



82. Hold the flat surface sections (G) of the steering rack with a wrench, and tighten both rack ends. Be careful not to damage the rack surface with the wrench.

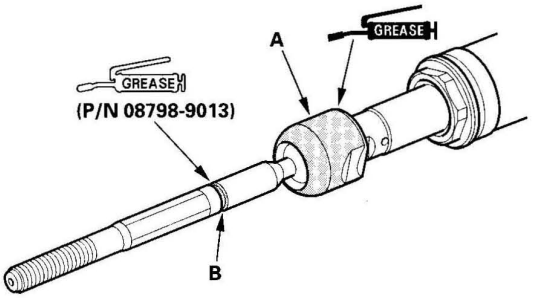
83. Bend the lock washer back against the flat spots on the rack end joint housing.



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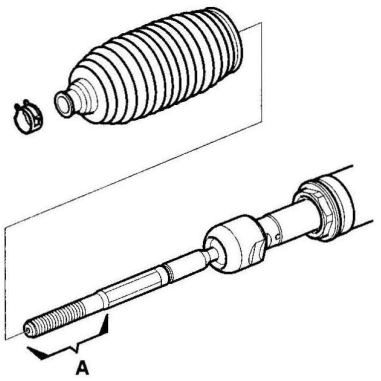
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84. Apply multipurpose grease to the circumference of the rack end joint housing (A).

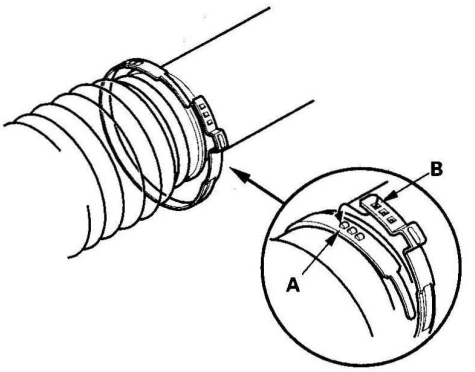


85. Apply a light coat of silicone grease to the boot grooves (B) on the rack end.

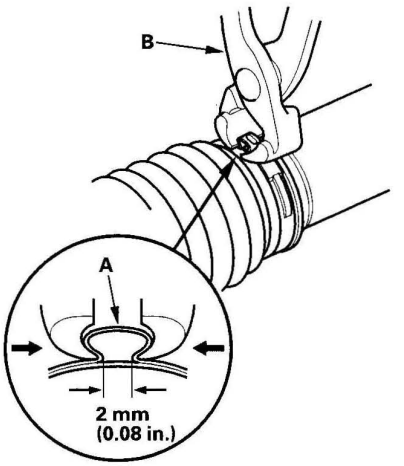
86. Center the steering rack within its stroke. Install the boots on the rack ends with the tie-rod clips. After installing the boots, wipe the grease off the threaded section (A) of the rack end.



87. Install the new boot bands by aligning the tabs (A) with the holes (B) on the band.



88. Close the ear portion (A) of the band with commercially available pincers Oetiker 1098 or equivalent (B).

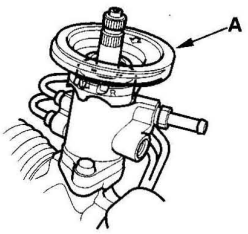


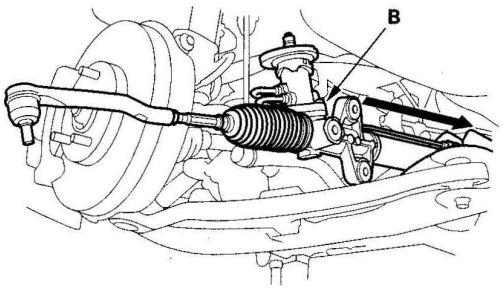
89. Slide the rack right and left to be certain that the boots are not deformed or twisted.

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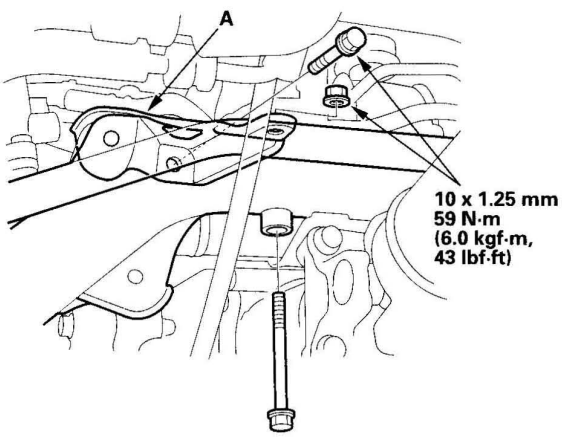
Steering Gearbox Installation

1. Install the pinion shaft grommet (A) on the valve housing.
2. Slide the steering gearbox (B) between the front subframe and body from the driver's side. Place the gearbox in position on the front subframe.

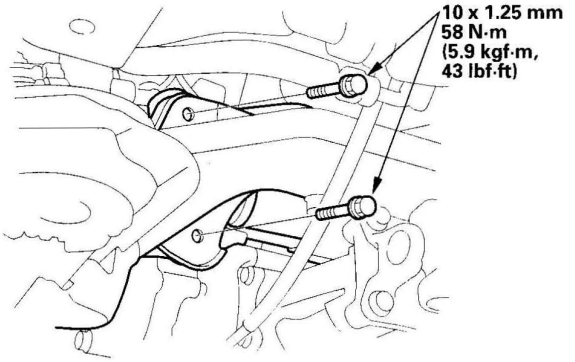




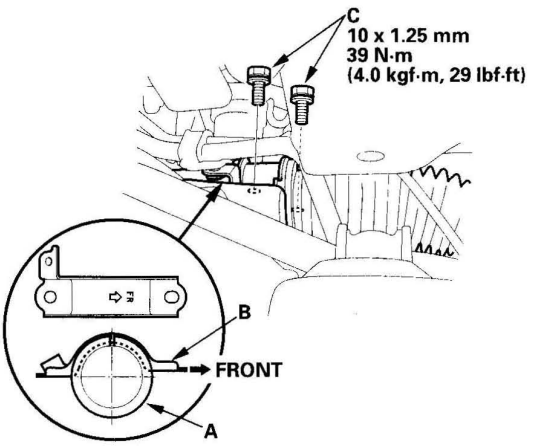
3. Install the gearbox stiffener bracket (A) on the front subframe, and tighten the bolt and nut to the specified torque.



4. Loosely install the two 10 mm flange bolts on the left side of the gearbox.



5. Install the mounting cushion (A) on the right side of the gearbox.

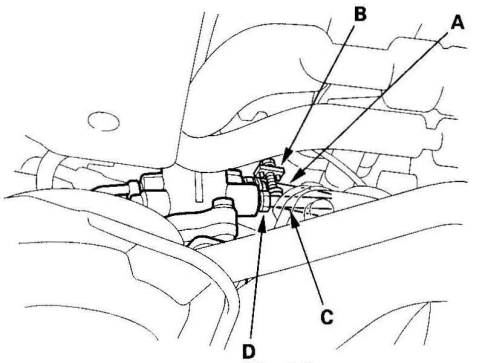


6. Install the mounting bracket (B) over the mounting cushion, then install the two 10 mm flange bolts (C). Tighten the four 10 mm flange bolts for the gearbox to the specified torque.

BACK

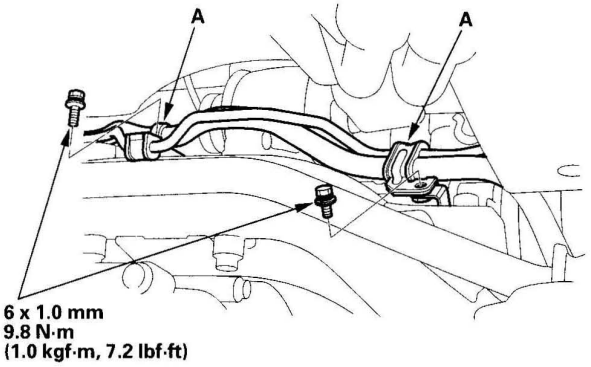
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7. Connect the return hose (A) securely, and tighten the adjustable hose clamp (B) (see page 17-15).



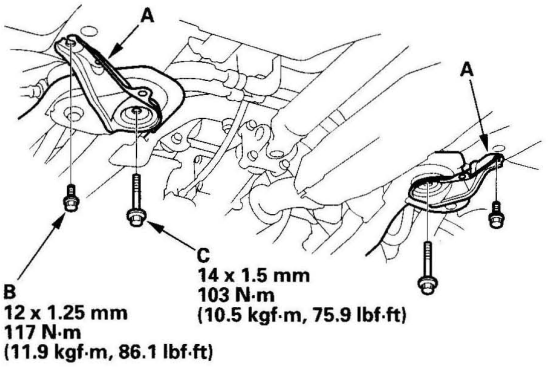
8. Connect the feed line (C), and tighten the 14 mm flare nut (D) to the specified torque.

9. Install the P/S line mounting brackets (A) on the front subframe and gearbox mounting bracket.

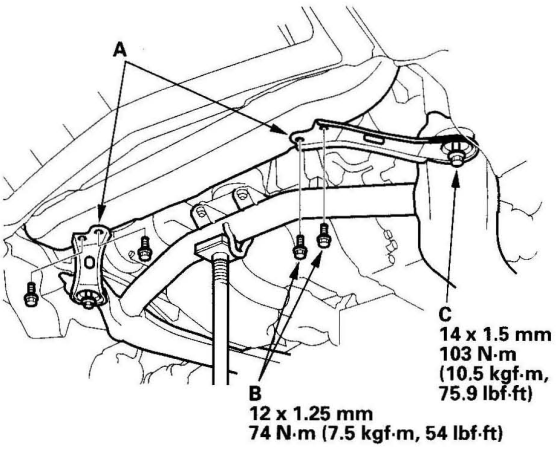


10. Carefully raise the front subframe with the transmission jack (transfer case supporting jack).

11. Install the rear stiffener plates (A). Tighten the 12 mm flange bolts (B) and 14 mm special bolts (C) to specified torque.



12. Install the front stiffener plates (A) with 12 mm flange bolts (B) and 14 mm special bolts (C), and tighten to specified torque.



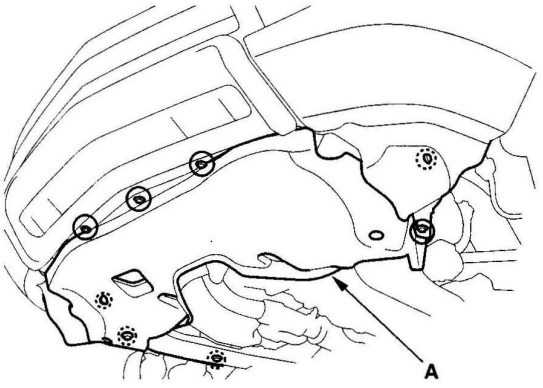
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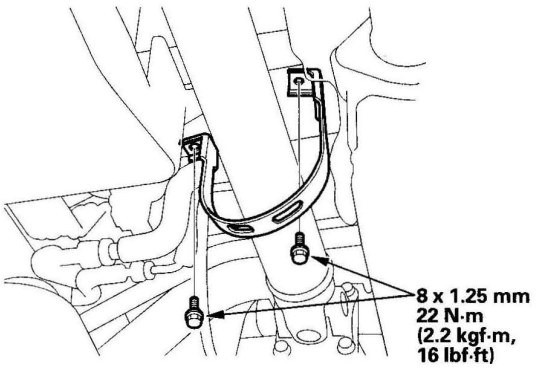
Steering Gearbox Installation (cont'd)

13. Lower the front subframe supporting jack and the transmission jack.

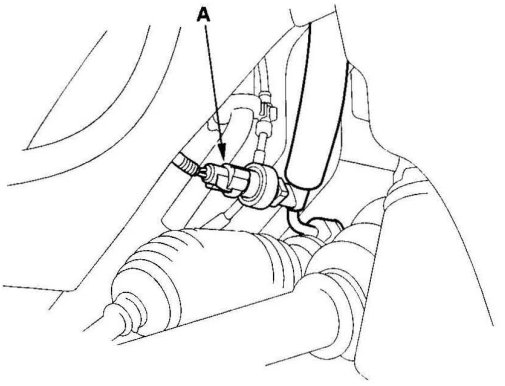
14. Install the splash shield (A).



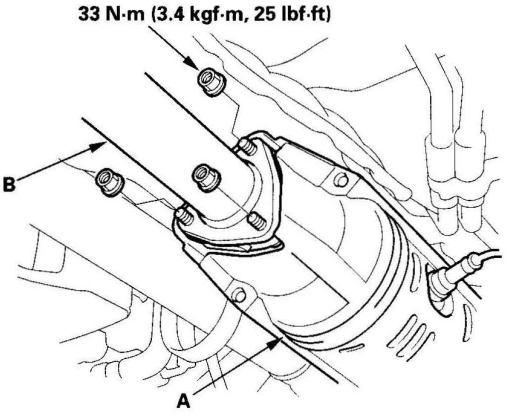
15. Install the propeller shaft protector.



16. Connect the power steering pressure (PSP) switch connector (A).



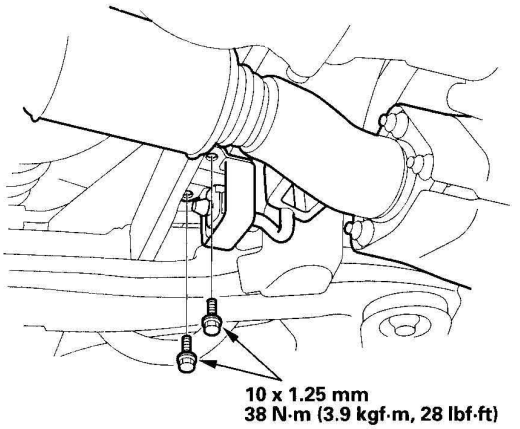
17. Connect the three way catalytic converter (TWC) (A) and mufflers (B). Install the new 10 mm self-locking nuts and tighten them to specified torque.



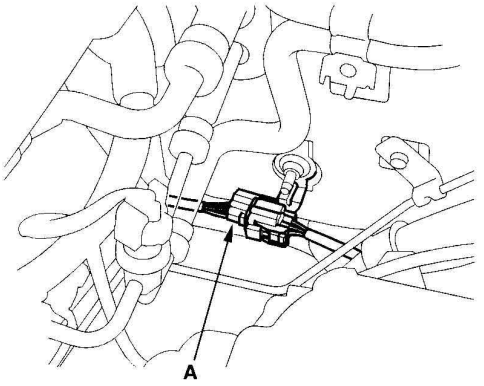
BACK

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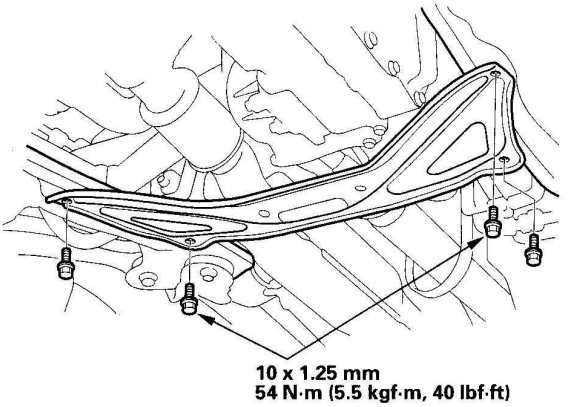
18. Install the exhaust rubber mount on the frame.



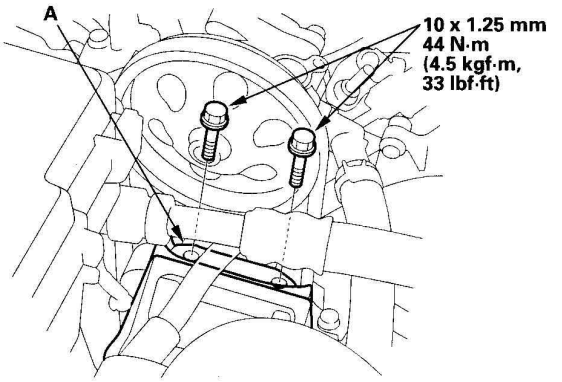
19. Connect the secondary heated oxygen sensor (secondary HO2S) connector (A), and install the wire harness on the clamp and clip. Make sure the wire harness is routed and fastened properly.



20. Install the subframe stiffener plate.



21. Install the 10 mm flange bolts on the engine side mount bracket (A).

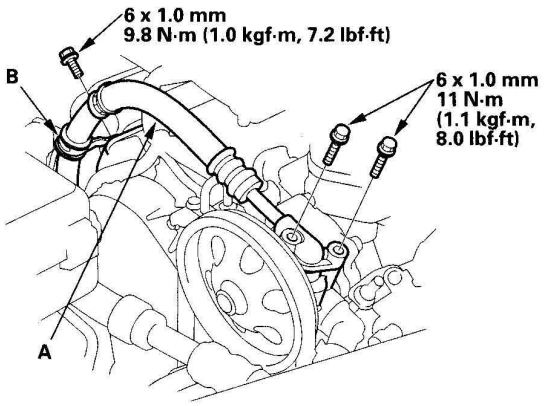


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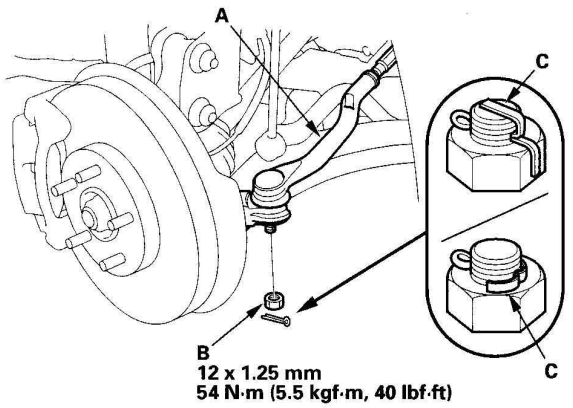
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Steering Gearbox Installation (cont'd)

22. Connect the pump outlet hose (A) from the power steering pump, and install the feed hose clamp (B).



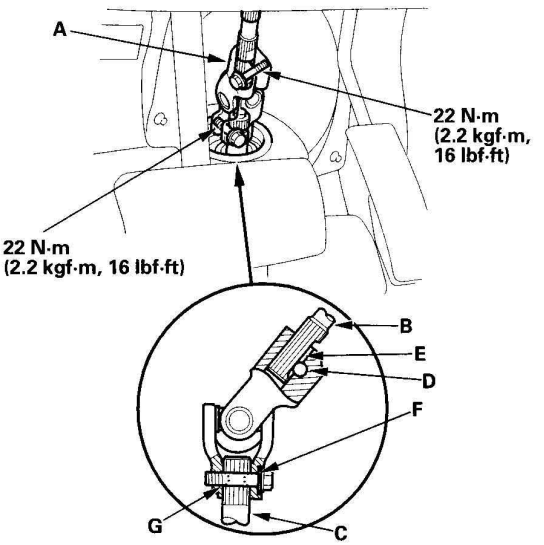
23. Wipe off any grease contamination from the ball joint tapered section and threads. Reconnect the tie rod ends (A) to the steering knuckles. Install the 12 mm nut (B) and tighten it.



24. Install the new cotter pin (C) and bend it as shown.

25. Center the steering rack within its stroke, then install the steering joint (A), and reconnect the steering shaft (B) and pinion shaft (C). Make sure the steering joint is connected as follows:

- Insert the upper end of the steering joint onto the steering shaft (line up the bolt hole (D) with the flat portion (E) on the shaft).
- Slip the lower end of the steering joint onto the pinion shaft (line up the bolt hole (F) with the groove (G) around the shaft), and loosely install the lower joint bolt. Be sure that the lower joint bolt is securely in the groove in the pinion shaft.
- Pull on the steering joint to make sure that the steering joint is fully seated. Then install the upper joint bolt and tighten it.

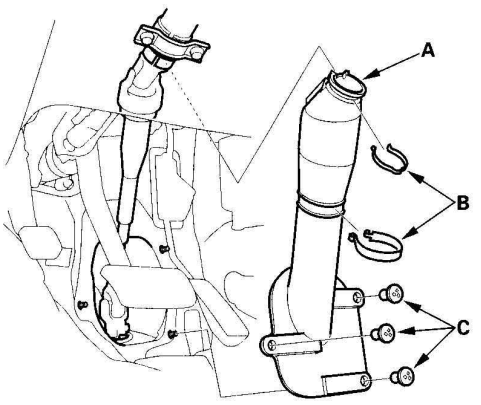


26. Center the cable reel first by rotating it clockwise until it stops. Then rotate it counterclockwise (about two and half turns) until the arrow mark on the label points straight up.
Reinstall the steering wheel (see page 17-24).

BACK

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27. Install the steering joint cover (A) with the clamps (B) and clips (C).



28. Install the front wheels.

29. Connect the battery cable.

30. Fill the system with power steering fluid, and bleed air from the system (see page 17-14).

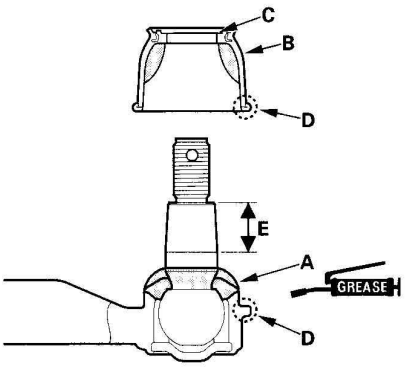
31. After installation, perform the following checks.

- Start the engine, allow it to idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid. Check the gearbox for leaks (see page 17-11).
- Adjust the front toe (see page 18-6).
- Check the steering wheel spoke angle. Adjust by turning the right and left tie-rods equally, if necessary.

Special Tools Required
Front hub dis/assembly tool 07965-SA50500

1. Remove the boot from the tie-rod end, and wipe the old grease off the ball pin.

2. Pack the lower area of the ball pin (A) with fresh multipurpose grease.

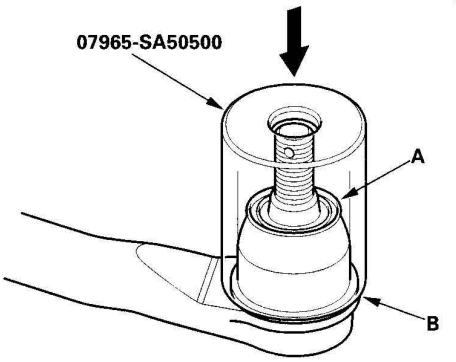


3. Pack the interior of the new boot (B) and lip (C) with fresh multipurpose grease.

   Note these items when installing new grease:

   - Keep grease off the boot installation section (D) and the tapered section (E) of the ball pin.
   - Do not allow dust, dirt, or other foreign materials to enter the boot.

4. Install the new boot (A) using the special tool. The boot must not have a gap at the boot installation sections (B). After installing the boot, check the ball pin tapered section for grease contamination, and wipe it if necessary.



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Suspension

Front and Rear Suspension

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Wheel Runout Inspection 18-8
Ball Joint Removal 18-9

Front Suspension

Knuckle/Hub Replacement 18-10
Ball Joint Boot Replacement 18-14
Stabilizer Link Replacement 18-15
Lower Arm Replacement 18-16
Damper/Spring Replacement 18-17

Rear Suspension

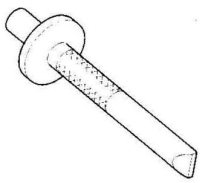
Knuckle/Hub/Wheel Bearing Replacement 18-21
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Upper Arm Replacement 18-28
Lower Arm A Replacement 18-29
Lower Arm B Replacement 18-29
Trailing Arm Replacement 18-31
Damper Replacement 18-32
Spring/Bump Stop Replacement 18-34



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Special Tools

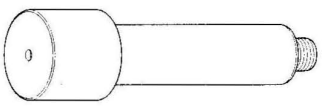
Ref.No.	Tool Number	Description	Qty
①	07AAD-S3VA100	Ball Joint Striker Tool	1
②	07AAF-S3VA100	Ball Joint Thread Protector	1
③	07GAF-SD40100	Hub Dis/Assembly Tool	1
④	07GAF-SE00100	Hub Dis/Assembly Tool	1
⑤	07MAC-SL00200	Ball Joint Remover, 28 mm	1
⑥	07VAD-P8A010A	Attachment, 80 mm	1
⑦	07746-0010500	Attachment, 62 x 68 mm	1
⑧	07749-0010000	Driver	1
⑨	07948-SB00101	Attachment, 96 mm	1
⑩	07965-SD90100	Support Base	1
⑪	07974-SA50700	Ball Joint Boot Clip Guide	1



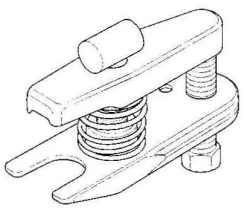
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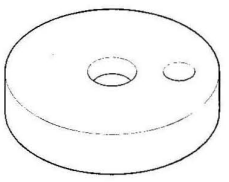
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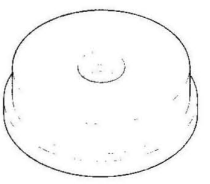
③, ④



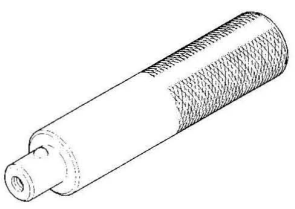
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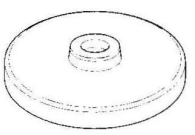
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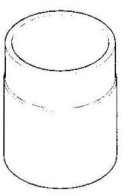
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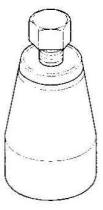
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⑩



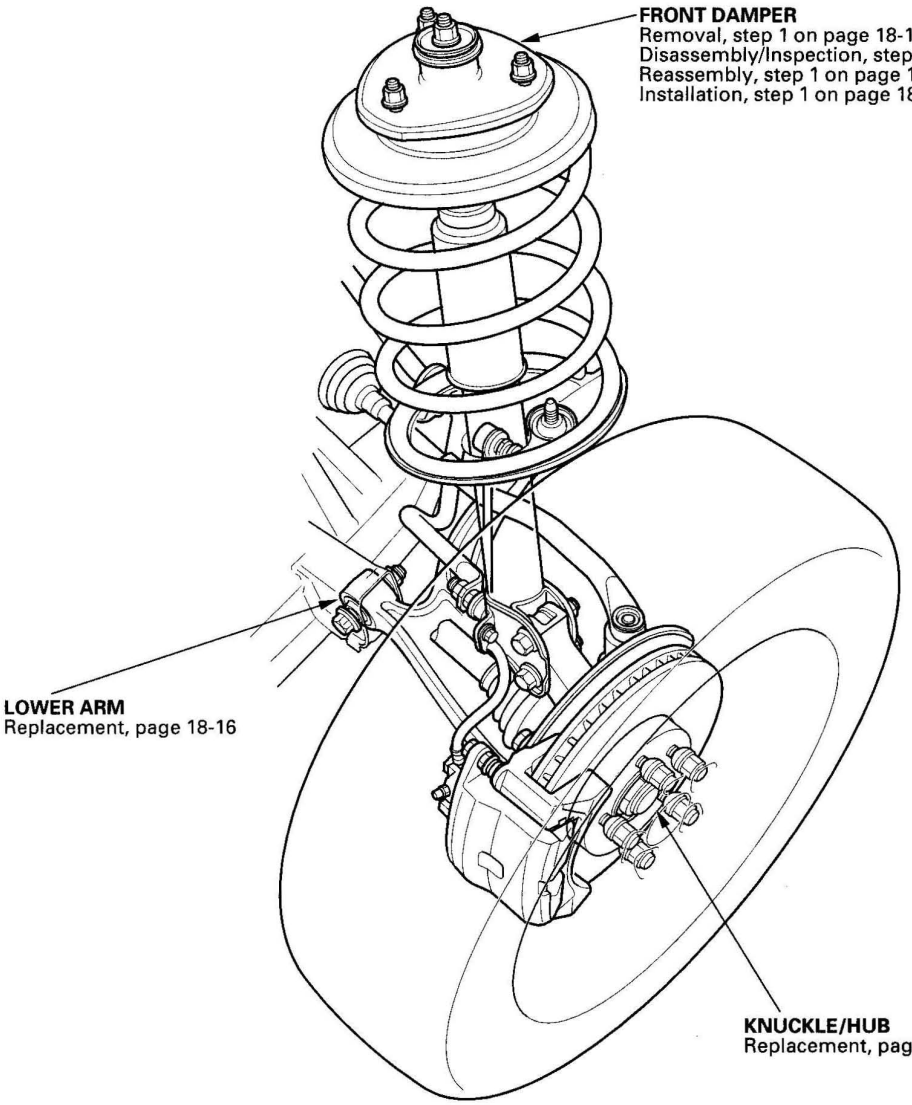
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BACK

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Component Location Index

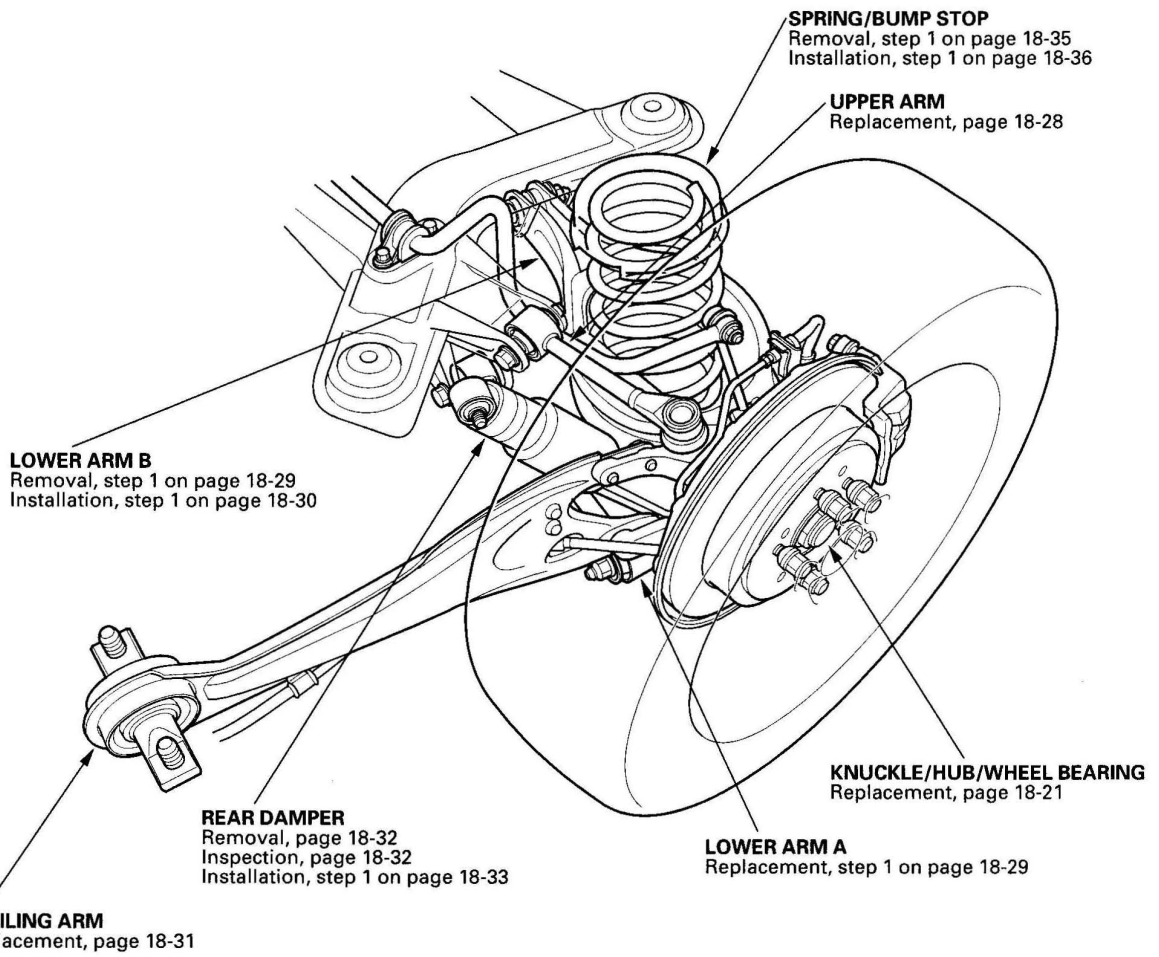
Front Suspension:



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Component Location Index (cont'd)

Rear Suspension:



BACK

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Wheel Alignment

The suspension can be adjusted for front and rear toe.

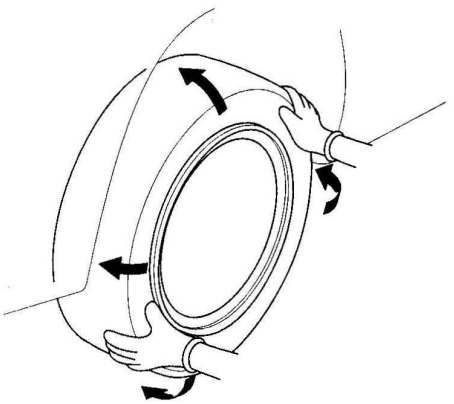
Pre-Alignment Checks

For proper inspection and adjustment of the wheel alignment, do these checks:

1. Release the parking brake to avoid an incorrect measurement.
2. Make sure the suspension is not modified.
3. Check the tire size and tire pressure.

   Tire size: 235/65 R17 103T
   Tire pressure: 220 kPa (2.2 kgf/cm², 32 psi)

4. Check the runout of the wheels and tires.
5. Check the suspension ball joints. (Hold a wheel with your hands, and move it up and down and right and left to check for wobbling.)



6. Bounce the suspension up and down several times to stabilize the suspension.

Caster Inspection

Use commercially available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and/or turning angle). Follow the equipment manufacturer's instructions.

1. Check the caster angle.

   Caster angle: 1°53′ ± 1°

2. If out of specification, check for bent or damaged suspension components.

(cont'd)

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Wheel Alignment (cont'd)

Camber Inspection

Use commercially-available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and/or turning angle). Follow the equipment manufacturer's instructions.

1. Check the camber angle.

   Camber angle:
   Front: −0°30′ ± 1°
   Rear: −0°30′ ± 45′

2. If out of specification, check for bent or damaged suspension components.

Front Toe Inspection/Adjustment

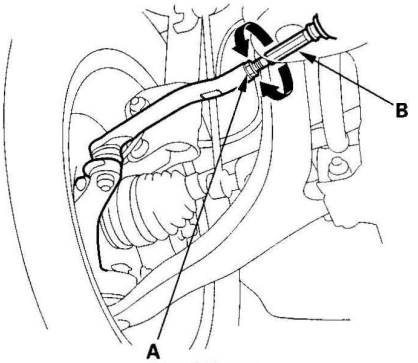
Use commercially-available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and/or turning angle). Follow the equipment manufacturer's instructions.

1. Center the steering wheel spokes.
2. Check the toe with the wheels pointed straight ahead.

   Front toe: 0±2 mm (0±1/16 in.)

   - If no adjustment is required, remove the alignment equipment.
   - If adjustment is required, go to step 3.

3. Loosen the tie-rod locknuts (A), and turn both tie-rods (B) until the front toe is within specifications.



4. After adjusting, tighten the tie-rod locknuts. Reposition the rack-rod boot if it is twisted or displaced.

BACK

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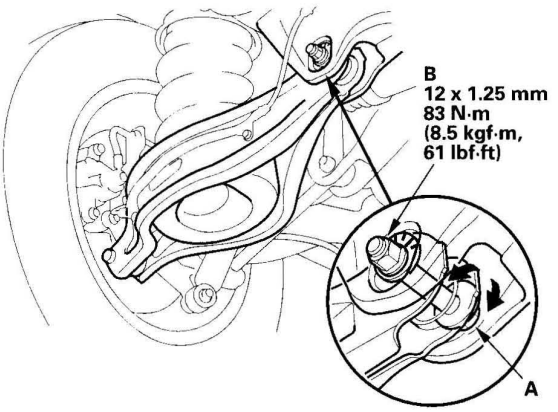
Rear Toe Inspection/Adjustment

Use commercially-available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and/or turning angle). Follow the equipment manufacturer's instructions.

1. Release the parking brake to avoid an incorrect measurement.
2. Check the toe.

   Rear toe: 0±2 mm (0±1/16 in.)

   - If no adjustment is required, remove the alignment equipment.
   - If adjustment is required, go to step 3.
3. Hold the adjusting bolt (A) on the rear lower arm B, and loosen the self-locking nut (B).



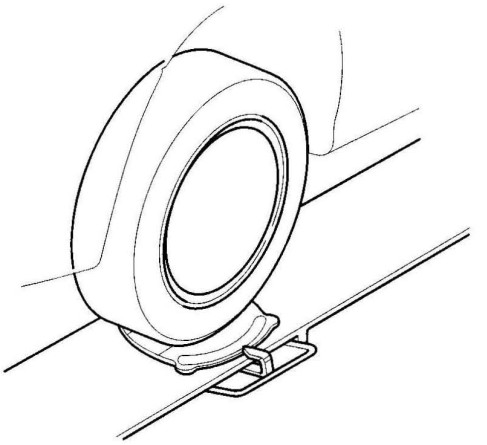
4. Adjust the rear toe by turning the adjusting bolt until the toe is correct.
5. Tighten the self-locking nut while holding the adjusting bolt.

Turning Angle Inspection

Use commercially-available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and/or turning angle). Follow the equipment manufacturer's instructions.

1. Turn the wheel right and left while applying the brake, and measure the turning angle of both wheels.

   Turning angle:
   Inward wheel: 38°08'
   Outward wheel: 30°19'



2. If the turning angle is not within the specifications, check for bent or damaged suspension components.

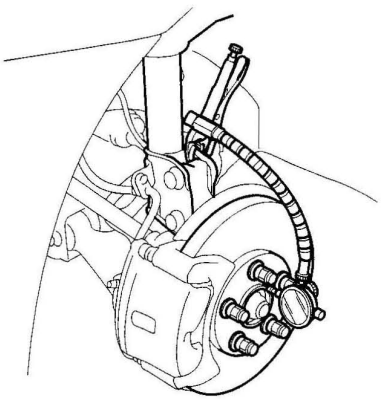
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Wheel Bearing End Play Inspection

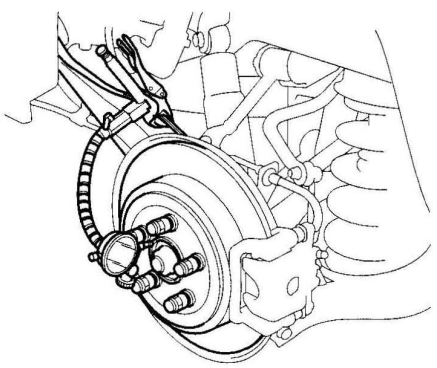
1. Raise the vehicle, and make sure it is securely supported.
2. Remove the wheels, then reinstall the wheel nuts.
3. Attach the dial gauge. Place the dial gauge against the hub flange.

Front/Rear:
Standard: 0−0.05 mm (0−0.002 in.)

Front:



Rear:

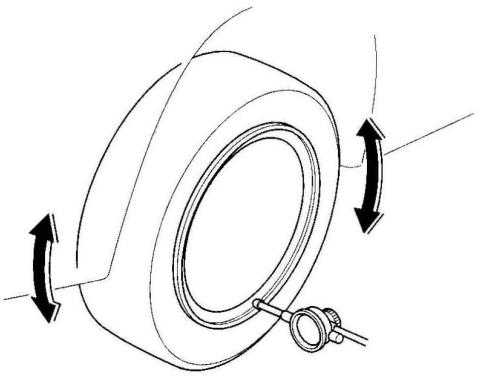


4. Measure the bearing end play moving the brake disc inward or outward.
5. If the bearing end play measurement is more than the standard, replace the wheel bearing.

Wheel Runout Inspection

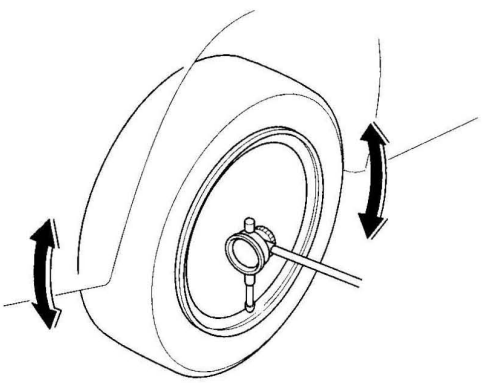
1. Raise the vehicle, and make sure it is securely supported.
2. Check for bent or deformed wheels.
3. Set up the dial gauge as shown, and measure axial runout by turning the wheel.

Front and Rear Wheel Axial Runout:
Standard: 0−0.7 mm (0−0.03 in.)
Service Limit: 2.0 mm (0.08 in.)



4. Readjust the dial gauge to the position shown, and measure radial runout.

Front and Rear Wheel Radial Runout:
Standard: 0−0.7 mm (0−0.03 in.)
Service Limit: 1.5 mm (0.06 in.)



5. If the wheel runout is more than the service limit, replace the wheel.

BACK

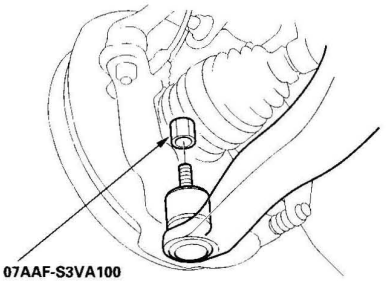
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Ball Joint Removal

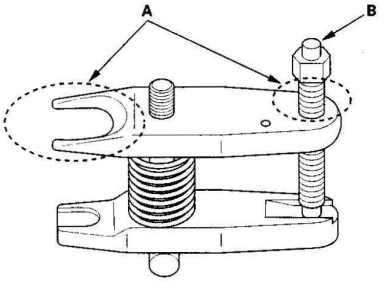
Special Tools Required
Ball joint striker tool 07AAD-S3VA100
Ball joint thread protector 07AAF-S3VA100
Ball joint remover, 28 mm 07MAC-SL00200

NOTE: The front lower arm ball joint is not replaceable separately. If the ball joint is worn or damaged, replace the lower arm and ball joint as an assembly.

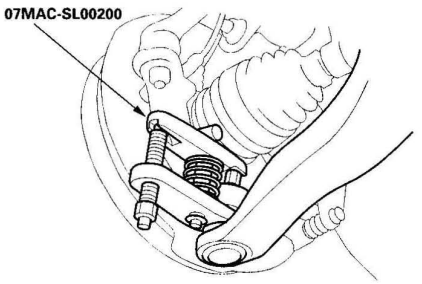
1. Screw the ball joint thread protector all the way onto the ball joint stud.



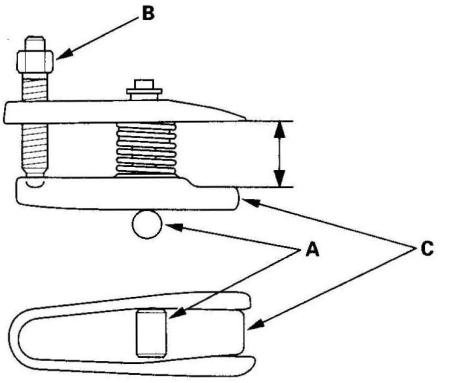
2. Apply molybdenum grease (A) to the special tool at the areas shown. This makes installing the tool easier and prevents damage to the pressure bolt (B) threads.



3. Install the special tool as shown. Insert the jaws carefully, making sure you do not damage the ball joint boot. Adjust the jaw spacing by turning the pressure bolt.

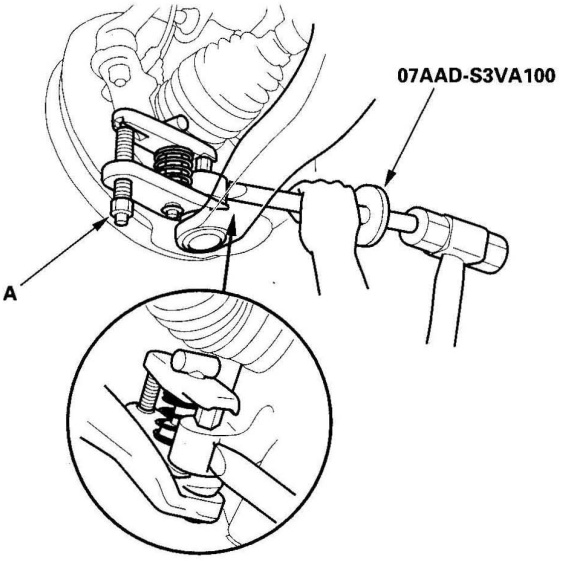


4. Once the special tool is in place, turn the adjusting bolt (A) as necessary to make the jaws parallel. Then hand-tighten the pressure bolt (B), and recheck the jaws to make sure they are still parallel.



5. After making the adjustment to the adjusting bolt, make sure the head of the adjusting bolt (A) is in this position to the allow the jaw (C) to pivot.

6. Tighten the pressure bolt (A). If the ball joint does not pop loose, strike the side of the knuckle with a hammer and the special tool to dislodge the ball joint.

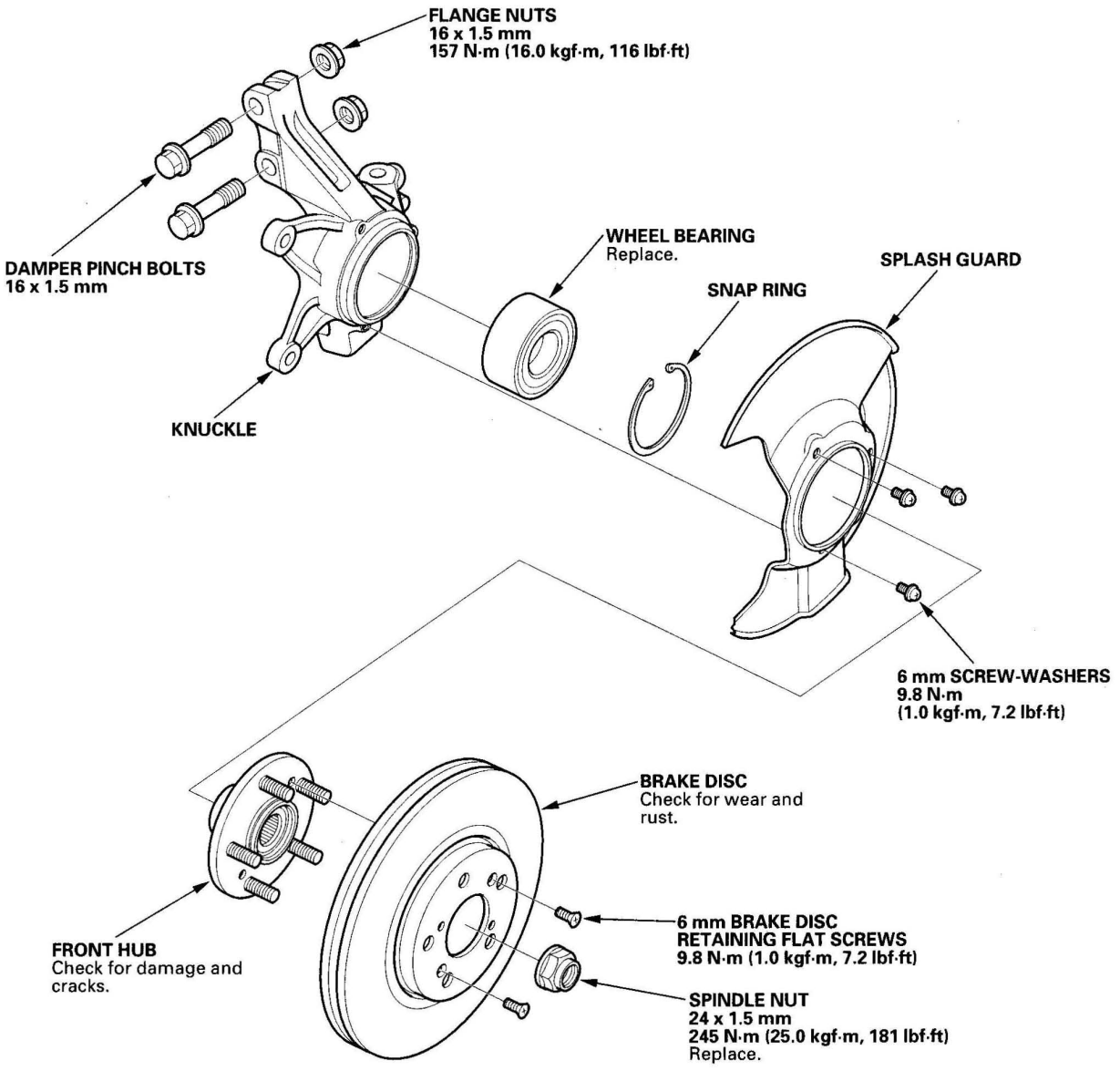


7. Remove the tool. Then remove the thread protector from the end of the ball joint, and pull the ball joint out of the steering/suspension arm. Inspect the ball joint boot, and replace it if damaged.

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Knuckle/Hub Replacement

Exploded View



BACK

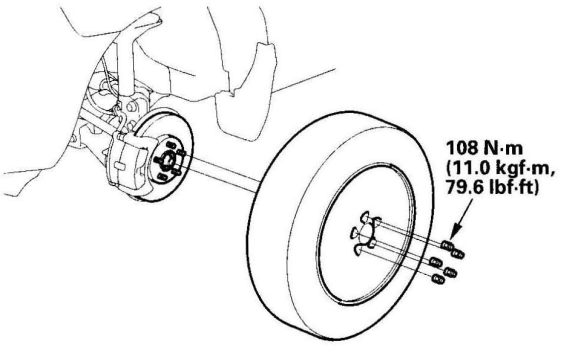
Protected by AR

Special Tools Required
- Ball joint remover, 28 mm 07MAC-SL00200
- Hub dis/assembly tool 07GAF-SE00100
- Attachment, 62 x 68 mm 07746-0010500
- Driver 07749-0010000
- Support base 07965-SD90100
- Attachment, 96 mm 07948-SB00101
- Attachment, 86 mm 07VAD-P8A010A

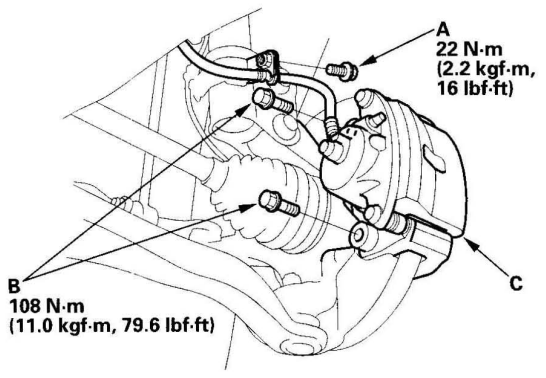
1. Loosen the wheel nuts slightly.

2. Raise the front of the vehicle, and make sure it is securely supported.

3. Remove the wheel nuts and front wheels.

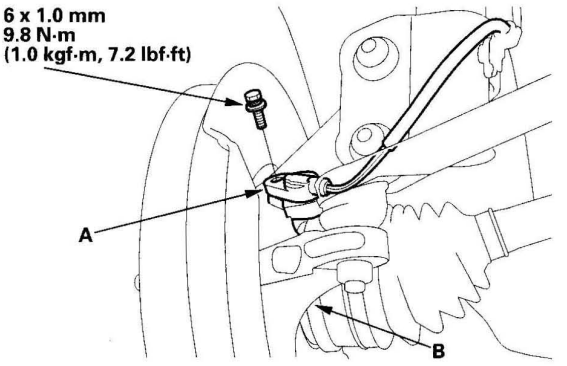


4. Remove the brake hose mounting bolt (A).

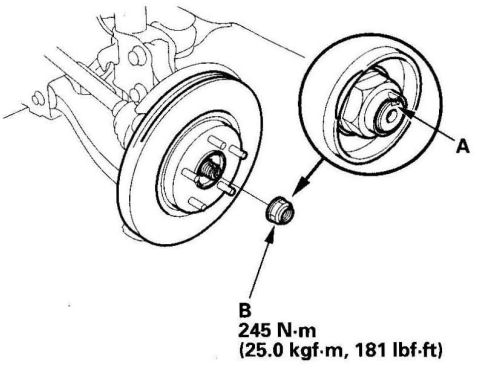


5. Remove the caliper mounting bolts (B), and hang the caliper assembly (C) to one side. To prevent damage to the caliper assembly or brake hose, use a short piece of wire to hang the caliper from the undercarriage.

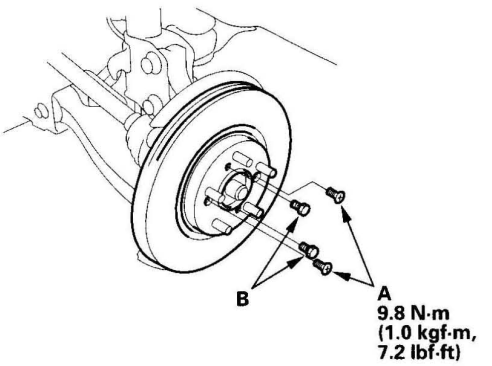
6. Remove the wheel sensor (A) from the knuckle (B). Do not disconnect the wheel sensor connector.



7. Raise the stake (A) of the spindle nut (B), then remove the nut.



8. Remove the brake disc retaining screws (A).



9. Screw two 8 x 1.25 mm bolts (B) into the brake disc to push it away from the hub. Turn each bolt two turns at a time to prevent cocking the disc excessively.

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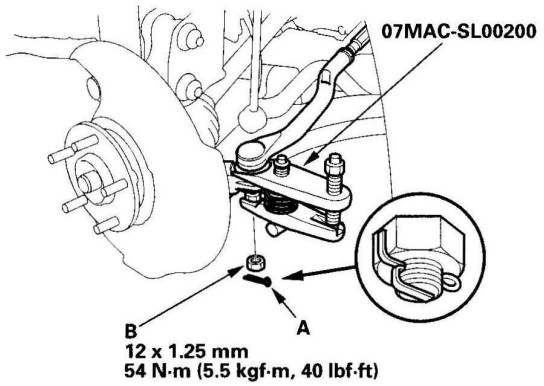
Protected by AR

Knuckle/Hub Replacement (cont'd)

10. Remove the brake disc from the hub.

11. Check the front hub for damage and cracks.

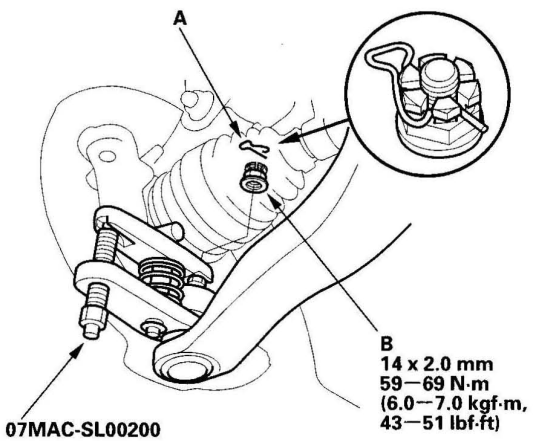
12. Remove the cotter pin (A) from the tie-rod end ball joint, then loosen the nut (B).



13. Remove the tie-rod ball joint from the knuckle using the special tool (see page 18-9).

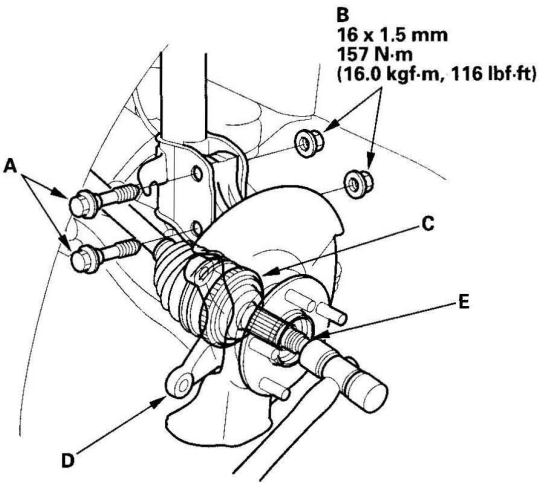
14. Remove the lock pin (A) from the lower arm ball joint castle nut (B), and remove the nut.

    NOTE: Do not force or hammer on the lower arm, or pry between the lower arm and the knuckle. You could damage the ball joint.



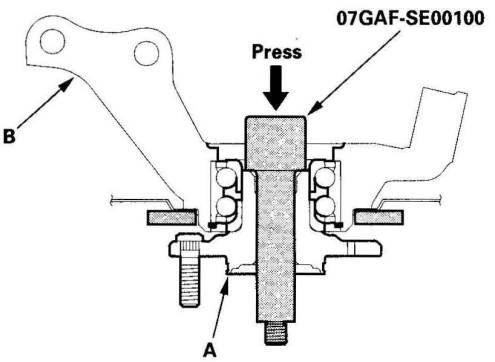
15. Remove the lower arm ball joint from the knuckle using the special tool (see page 18-9).

16. Remove the damper pinch bolts (A) and flange nuts (B) from the damper.



17. Pull the knuckle outward, and remove the driveshaft outboard joint (C) from the knuckle (D) by tapping the driveshaft end (E) with a plastic hammer, then remove the knuckle.

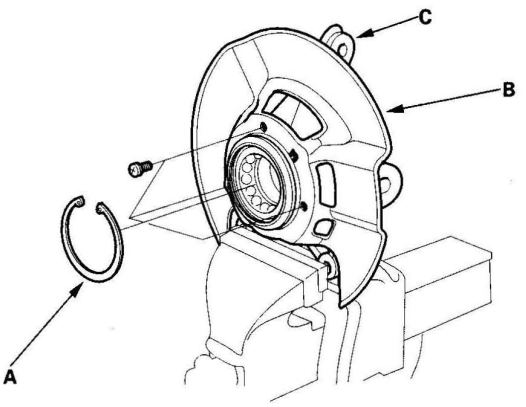
18. Separate the hub (A) from the knuckle (B) using the special tool and a hydraulic press. Take care not to deform the splash guard. Hold onto the hub to keep it from falling when pressed clear.



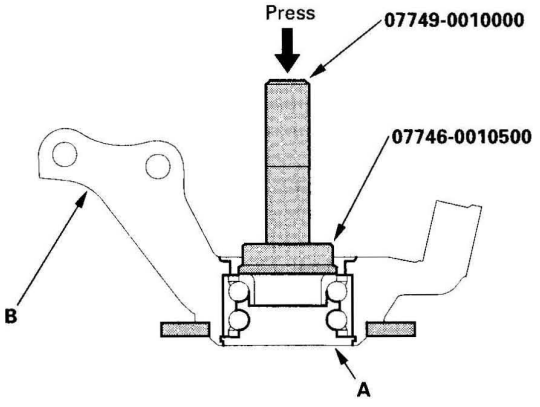
BACK

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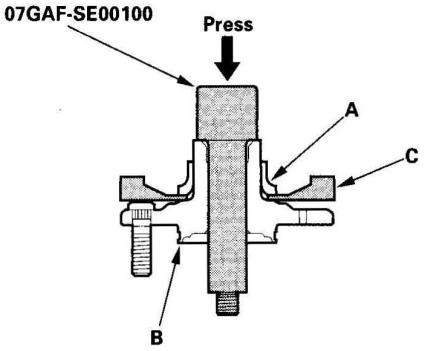
19. Remove the snap ring (A) and the splash guard (B) from the knuckle (C).



20. Press the wheel bearing (A) out of the knuckle (B) using the special tools and a press.

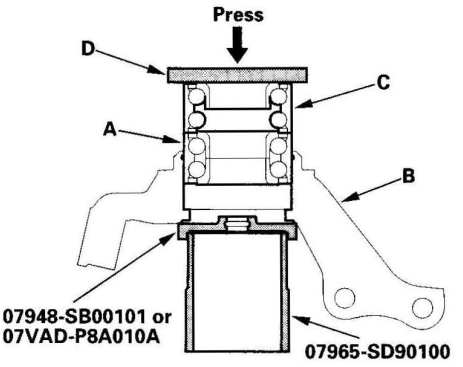


21. Press the wheel bearing inner race (A) from the hub (B) using the special tool, a commercially available bearing separator (C), and a press.

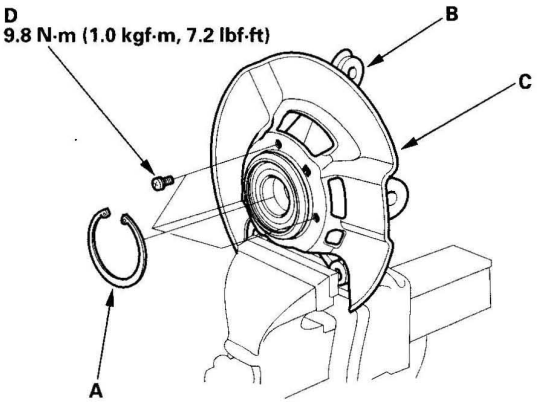


22. Wash the knuckle and hub thoroughly in high flash point solvent before reassembly.

23. Press a new wheel bearing (A) into the knuckle (B) using the old bearing (C), a steel plate (D), the special tool, and a press. Be careful not to damage the sleeve of the pack seal.



24. Install the snap ring (A) securely in the knuckle (B).



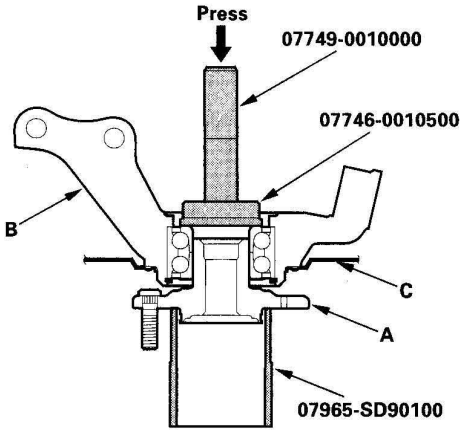
25. Install the splash guard (C), and tighten the screws (D).

(cont'd)

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Knuckle/Hub Replacement (cont'd)

26. Install the hub (A) onto the knuckle (B) using the special tools and a press. Be careful not to deform the splash guard (C).



27. Install the knuckle in the reverse order of removal, and note these items:

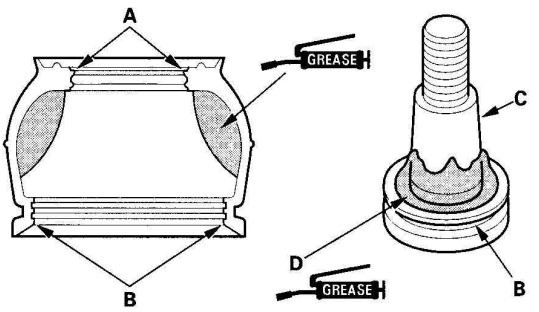
- Be careful not to damage the ball joint boots when installing the knuckle.
- Tighten all mounting hardware to the specified torque values.
- Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the castle nut by loosening it.
- Install a new lock pin on the castle nut after torquing.
- Use a new spindle nut on reassembly.
- Before installing the spindle nut, apply a small amount of engine oil to the seating surface of the nut. After tightening, use a drift to stake the spindle nut shoulder against the driveshaft.
- Before installing the brake disc, clean the mating surfaces of the front hub and the inside of the brake disc.
- Before installing the wheel, clean the mating surfaces of the brake disc and the inside of the wheel.
- Check the front wheel alignment, and adjust it if necessary (see page 18-5).

Ball Joint Boot Replacement

Special Tools Required
Ball joint boot clip guide 07974-SA50700

1. Remove the boot clip and the boot.

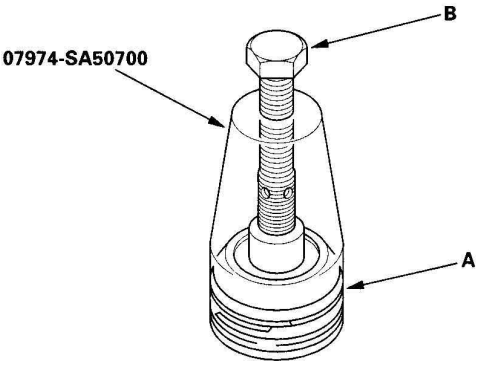
2. Pack the interior and lip (A) of a new boot with grease. Do not contaminate the lower collar of the boot (B) with grease.



3. Wipe the grease off the tapered section (C) of the pin, and pack fresh grease into the base (D). Do not let dirt or other foreign materials get into the boot.

4. Install the boot onto the ball joint, then squeeze it gently to force out any air.

5. Adjust the special tool with the adjusting bolt (B) until its base is just above the groove around the bottom of the boot. Then slide the clip over the tool and into position on the boot.



6. After installing a boot, wipe any grease off the exposed portion of the ball joint pin.

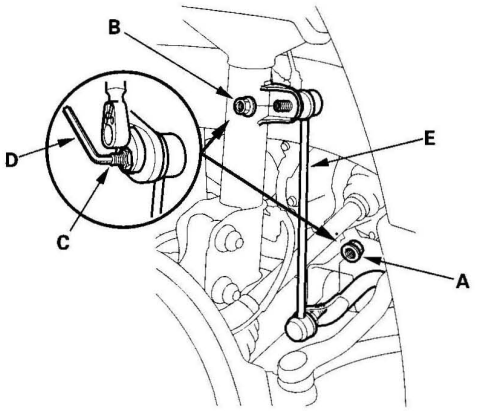
BACK

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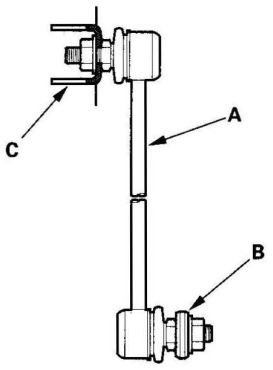
Stabilizer Link Replacement

1. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheels.

2. Remove the self-locking nut (A) and flange nut (B) while holding the respective joint pins (C) with a hex wrench (D), and remove the stabilizer link (E).



3. Install the stabilizer link (A) on the stabilizer bar (B) and damper (C) with the joint pins set at the center of each moving range.

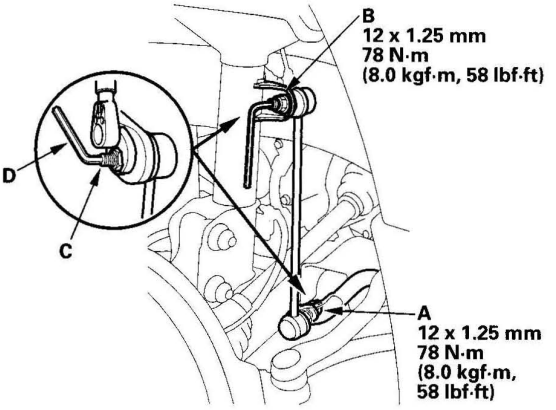


4. Install the self-locking nut and flange nut, and lightly tighten them.

   NOTE: Use a new self-locking nut on reassembly.

5. Place a jack under the lower arm, and raise the suspension to load the vehicle weight.

6. Tighten the self-locking nut (A) and flange nut (B) to the specified torque values while holding the respective joint pins (C) with a hex wrench (D).



7. After 5 minutes of driving, re-tighten the self-locking nut to the specified torque.

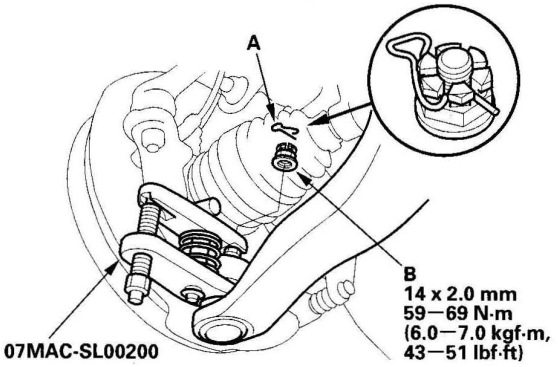
Protected by AR

Lower Arm Replacement

Special Tools Required
Ball joint remover, 28 mm 07MAC-SL00200

1. Raise the front of vehicle, and make sure it is securely supported. Remove the front wheels.

2. Remove the lock pin (A) from the lower arm ball joint castle nut (B), and remove the nut.

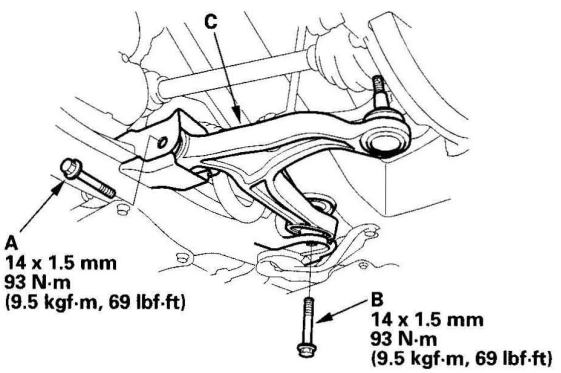


3. Remove the lower arm ball joint from the knuckle using the special tool (see page 18-9).

   NOTE: Do not force or hammer on the lower arm, or pry between the lower arm and the knuckle. You could damage the ball joint.

4. Remove the lower arm.

   -1 Remove the forward lower arm mounting bolt (A).
   -2 Remove the rearward lower arm mounting bolt (B).
   -3 Remove the lower arm (C) from the sub frame.



5. Install the lower arm in the reverse order of removal, and note these items:

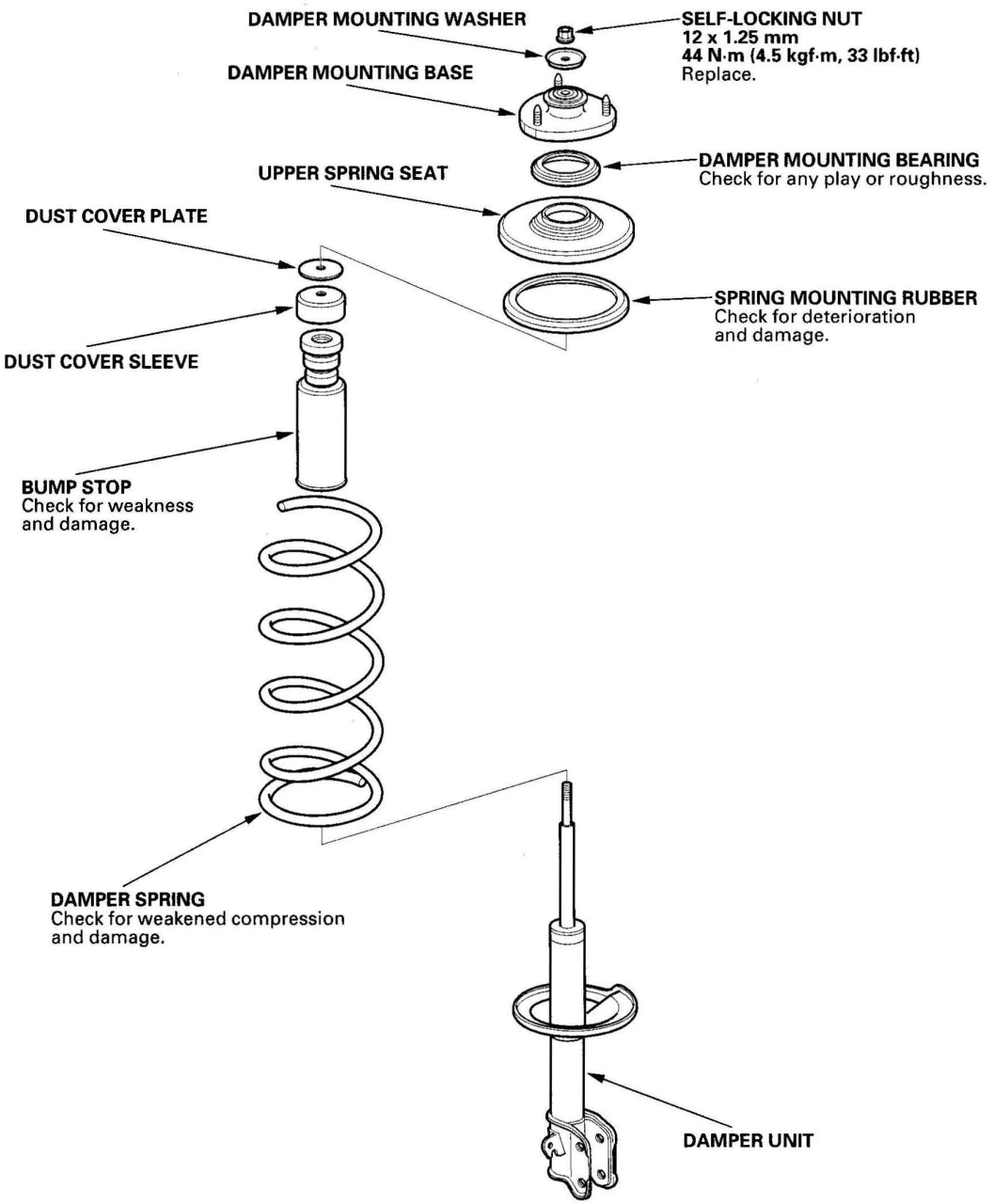
   - Be careful not to damage the ball joint boot when connecting the lower arm to the knuckle.
   - Tighten all mounting hardware to the specified torque values.
   - Tighten the castle nut to the lower torque value, then tighten it only far enough to align the slot with the pin hole. Do not align the castle nut by loosening it.
   - Install a new lock pin on the castle nut after torquing.
   - Before installing the wheel, clean the mating surfaces of the brake disc and the inside of the wheel.
   - Check the front wheel alignment, and adjust it if necessary (see page 18-5).

BACK

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Damper/Spring Replacement

Exploded View



(cont'd)

BACK

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Damper/Spring Replacement (cont'd)

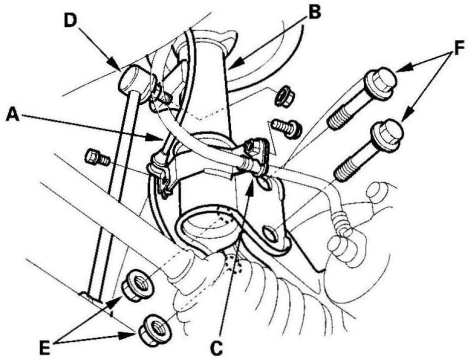
Special Tools Required
Strut spring compressor, Branick MST-580A or Model 7200, or equivalent, commercially available

Removal

1. Remove the front wheels.

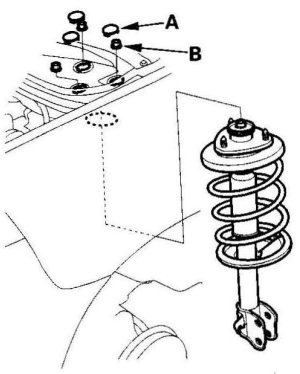
2. Remove the damper.

   -1 Remove the wheel sensor harness (A) from the damper (B). Do not disconnect the wheel sensor connector.
   -2 Remove the brake hose bracket (C) from the damper.
   -3 Disconnect the stabilizer link (D) from the damper.
   -4 Remove the flange nuts (E) and damper pinch bolts (F) from the damper.



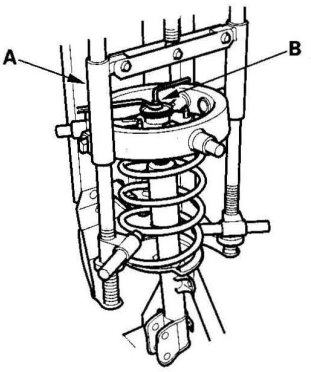
3. Remove the service caps (A), and remove the damper by removing the three flange nuts (B).

   NOTE: Damper springs are different, left and right. Mark the springs L and R before you continue.



Disassembly/Inspection

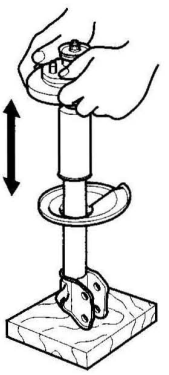
1. Compress the damper spring with a commercially available strut spring compressor (A) according to the manufacturer's instructions, then remove the self-locking nut (B). Do not compress the spring more than necessary to remove the nut.



2. Release the pressure from the strut spring compressor, then disassemble the damper as shown in the Exploded View.

3. Reassemble all parts, except for the spring.

4. Compress the damper assembly by hand, and check for smooth operation through a full stroke, both compression and extension. The damper should extend in a smooth, continuous motion when the compression is released. If it does not (no compression or no extension), the gas is leaking, and the damper should be replaced.



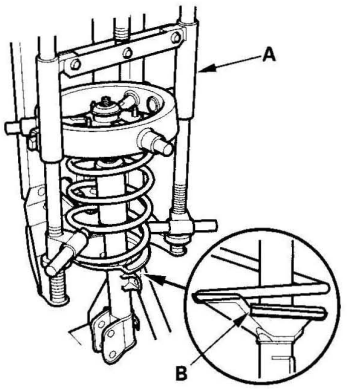
5. Check for oil leaks, abnormal noises, or binding during these tests.

BACK

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Reassembly

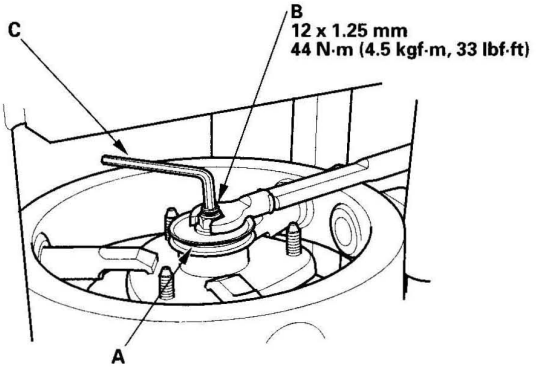
1. Install the damper unit on a commercially available strut spring compressor (A).



2. Assemble the damper in the reverse order of removal except for the washer and self-locking nut. Align the bottom of the damper spring and the spring lower seat (B).

3. Compress the damper spring.

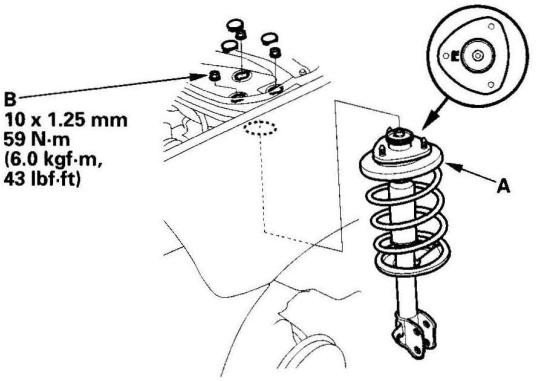
4. Install the damper mounting washer (A) and a new self-locking nut (B).



5. Hold the damper rod using a hex wrench (C), and tighten the self-locking nut.

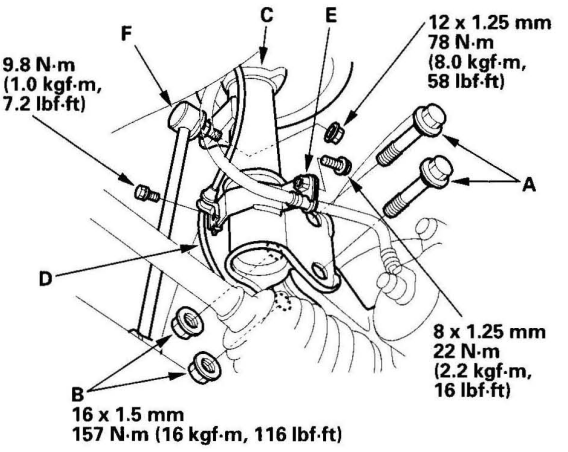
Installation

1. Loosely install the damper (A) onto the frame, then loosely install the three flange nuts (B).



2. Install the damper onto the knuckle.

   –1 Loosely install the damper pinch bolts (A) and flange nuts (B) to the damper (C).
   –2 Install the wheel sensor harness (D) to the damper.
   –3 Install the brake hose bracket (E) to the damper.
   –4 Loosely install the stabilizer link (F) to the damper.



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Damper/Spring Replacement (cont'd)

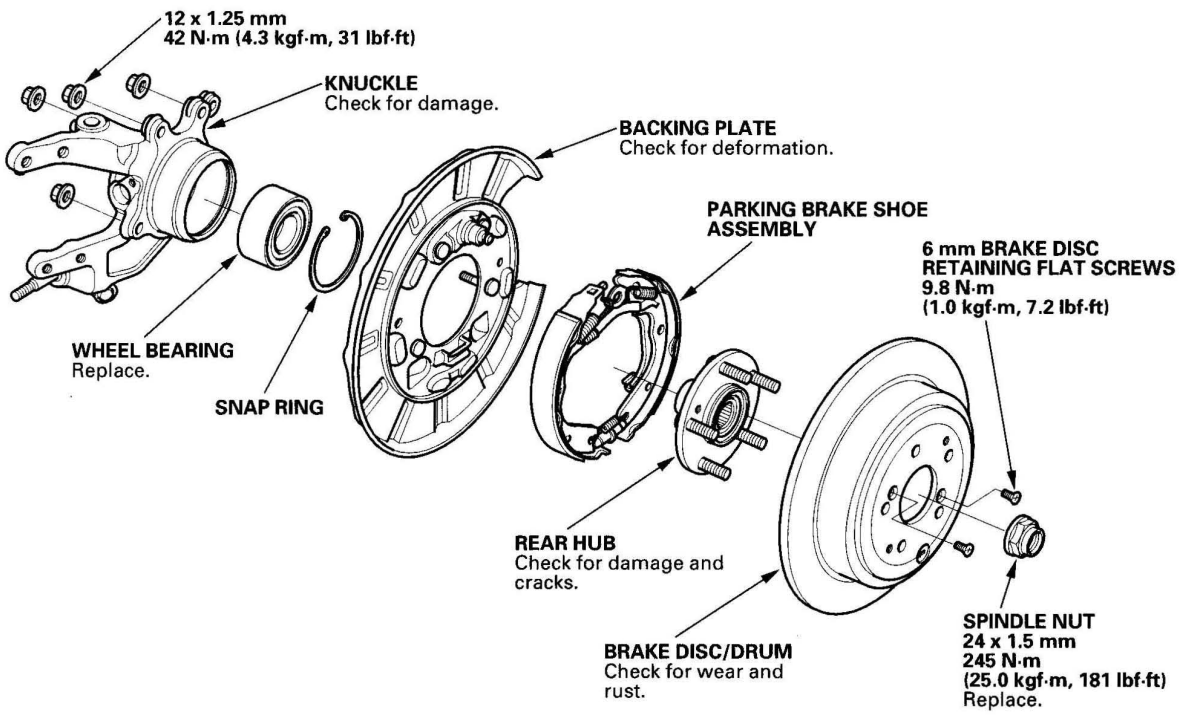
3. Raise the front suspension with a floor jack to load the vehicle weight.
4. Tighten the damper pinch bolts and flange nuts to the specified torque.
5. Tighten the flange nuts on top of the damper to the specified torque.
6. Install the service caps.
7. Install the front wheels.
8. Check the front wheel alignment, and adjust it if necessary (see page 18-5).

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Knuckle/Hub/Wheel Bearing Replacement

Exploded View



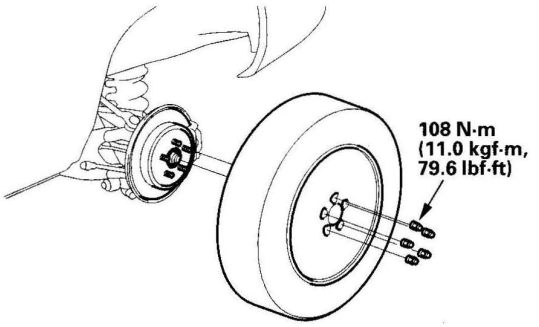
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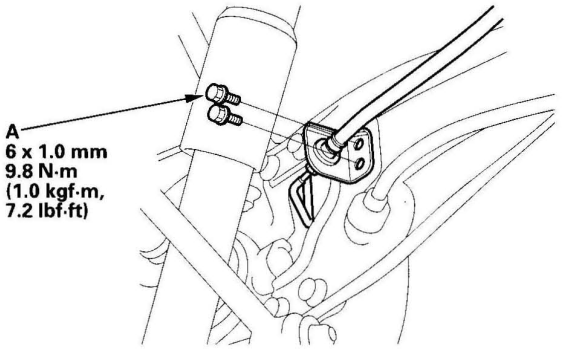
Knuckle/Hub/Wheel Bearing Replacement (cont'd)

Special Tools Required
- Ball joint remover, 28 mm 07MAC-SL00200
- Hub dis/assembly tool 07GAF-SD40100
- Attachment, 62 x 68 mm 07746-0010500
- Driver 07749-0010000
- Support base 07965-SD90100

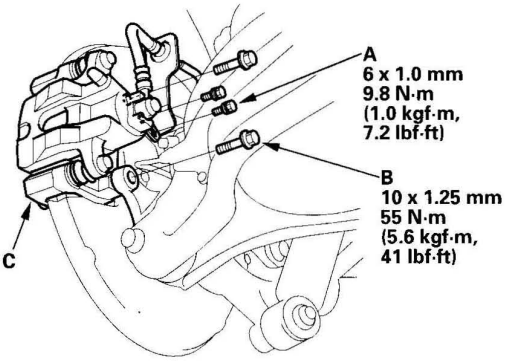
1. Loosen the wheel nuts slightly.
2. Raise the rear of the vehicle, and make sure it is securely supported.
3. Remove the wheel nuts and rear wheels.



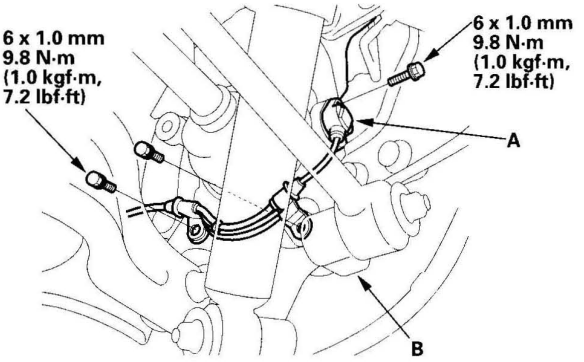
4. Remove the brake hose bracket mounting bolts (A) from the trailing arm.



5. Remove the brake hose bracket mounting bolts (A) from the knuckle.



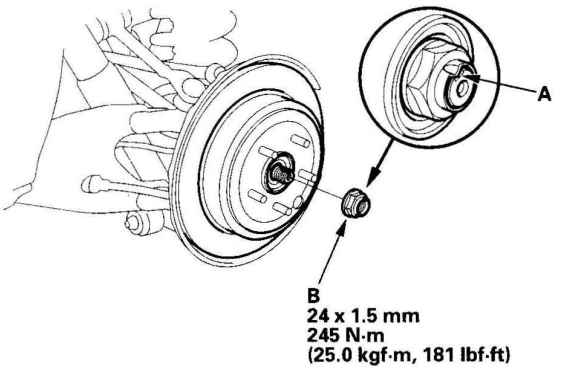
6. Remove the caliper mounting bolts (B), and hang the caliper assembly (C) to one side. To prevent damage to the caliper assembly or brake hose, use a short piece of wire to hang the caliper from the undercarriage.
7. Remove the wheel sensor (A) and sensor harness from the knuckle (B). Do not disconnect the wheel sensor connector.



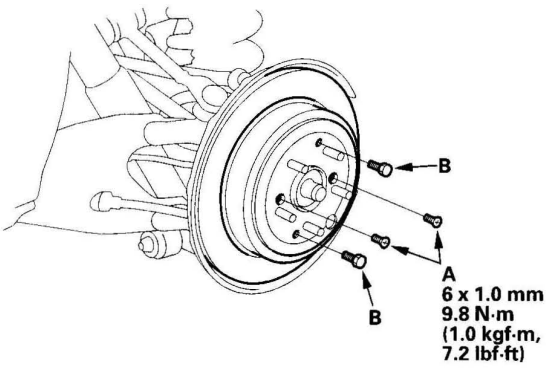
BACK

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8. Raise the stake (A) of the spindle nut (B), then remove the nut.



9. Remove the brake disc retaining screws (A).

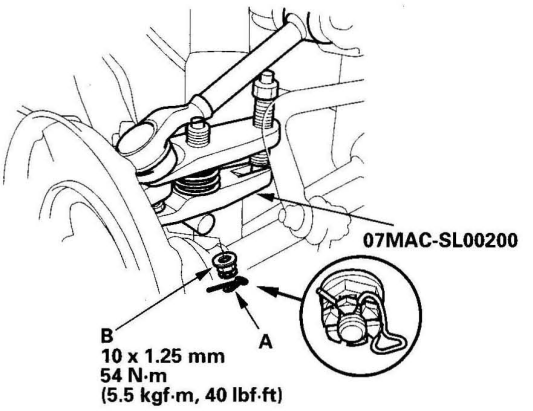


10. Screw two 8 x 1.25 mm bolts (B) into the brake disc to push it away from the hub. Turn each bolt two turns at a time to prevent cocking the disc excessively.

11. Remove the brake disc from the hub.

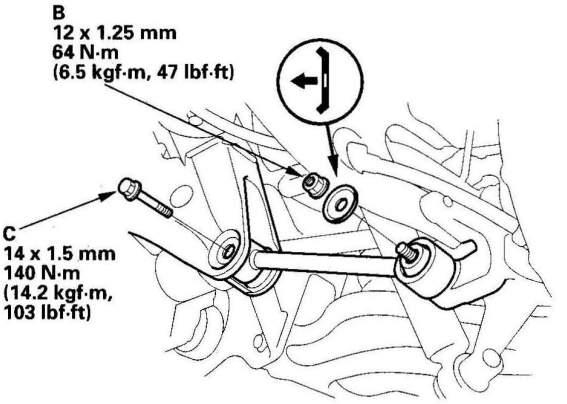
12. Check the rear hub for damage and cracks.

13. Remove the lock pin (A) from the upper arm ball joint, then loosen the nut (B).



14. Remove the upper arm ball joint from the knuckle using the special tool (see page 18-9).

15. Remove the flange nut (B), washer, and flange bolt (C), then remove the lower arm A.

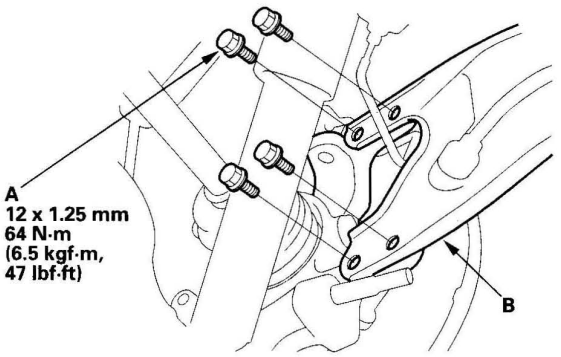


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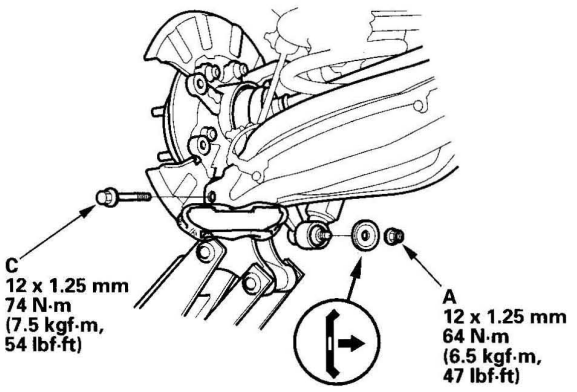
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Knuckle/Hub/Wheel Bearing Replacement (cont'd)

16. Remove the flange bolts (A), and separate the knuckle from the trailing arm (B).

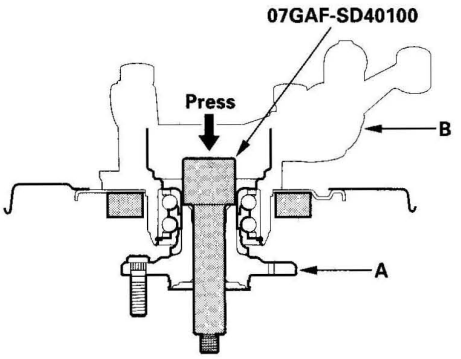


17. Place a floor jack under lower arm B. Remove the self-locking nut (A), washer, and flange bolt (C).

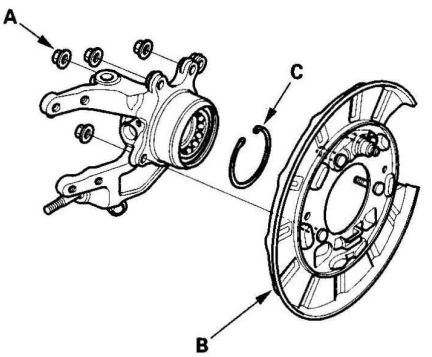


18. Remove the knuckle while pushing in the driveshaft and holding the driveshaft outboard joint.

19. Separate the hub (A) from the knuckle (B) using the special tool and a hydraulic press. Take care not to deform the splash guard. Hold onto the hub to keep it from falling when pressed clear.



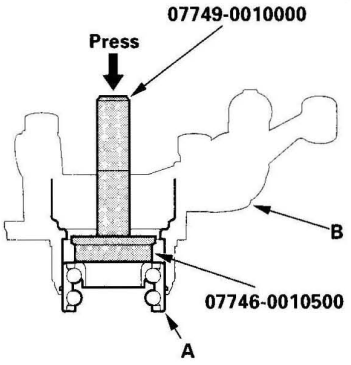
20. Remove the flange nuts (A), backing plate (B), and snap ring (C).



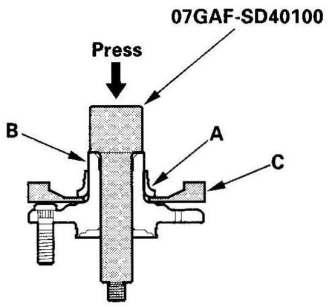
BACK

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21. Press the wheel bearing (A) out of the knuckle (B) using the special tools and a press.

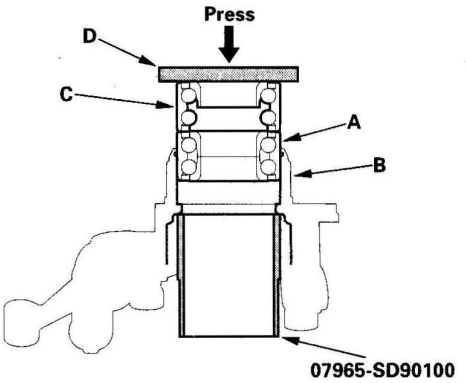


22. Press the wheel bearing inner race (A) from the hub (B) using the special tool, a commercially available bearing separator (C), and a press.

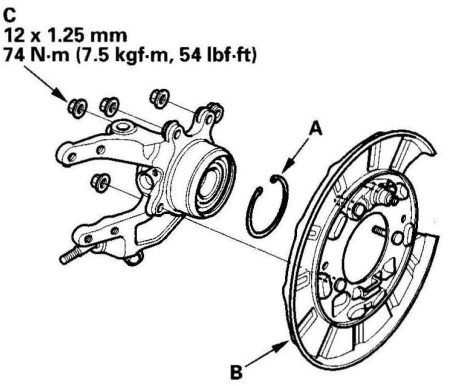


23. Wash the knuckle and hub thoroughly in high flash point solvent before reassembly.

24. Press a new wheel bearing (A) into the knuckle (B) using the old bearing (C), a steel plate (D), the special tool, and a press. Be careful not to damage the sleeve of the pack seal.



25. Install the snap ring (A), backing plate (B), and flange nuts (C). Tighten the flange nuts to the specified torque.

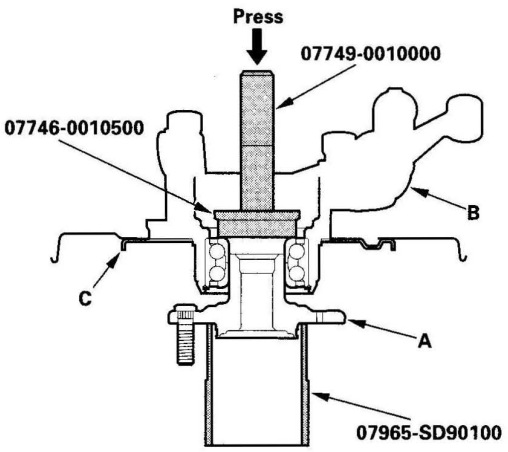


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Knuckle/Hub/Wheel Bearing Replacement (cont'd)

26. Install the hub (A) on the the knuckle (B) using the special tools and a hydraulic press. Be careful not to deform the splash guard (C).



27. Install the knuckle in the reverse order of removal, and note these items:

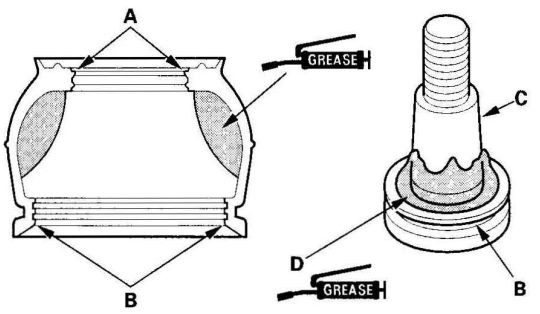
- Be careful not to damage the ball joint boot when installing the knuckle.
- Tighten all mounting hardware to the specified torque values.
- Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the castle nut by loosening it.
- Install a new lock pin on the castle nut after torquing.
- Use a new spindle nut on reassembly.
- Before installing the spindle nut, apply a small amount of engine oil to the seating surface of the nut. After tightening, use a drift to stake the spindle nut shoulder against the driveshaft.
- Before installing the brake disc/drum, clean the mating surfaces of the rear hub and the inside of the brake disc/drum.
- Before installing the wheel, clean the mating surfaces of the brake disc/drum and the inside of the wheel.
- Check the rear wheel alignment, and adjust it if necessary (see page 18-5).

Ball Joint Boot Replacement

Special Tools Required
Ball joint boot clip guide 07974-SA50700

1. Remove the boot clip and the boot.

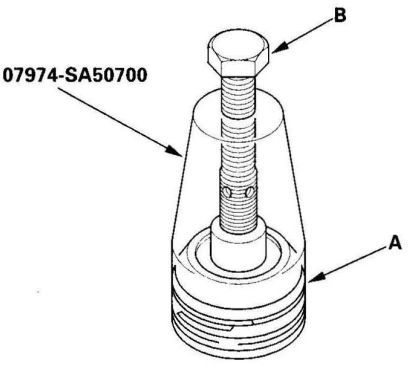
2. Pack the interior and lip (A) of a new boot with grease. Do not contaminate the lower collar of the boot (B) with grease.



3. Wipe the grease off the tapered section (C) of the pin, and pack fresh grease into the base (D). Do not let dirt or other foreign materials get into the boot.

4. Install the boot onto the ball joint, then squeeze it gently to force out any air.

5. Adjust the special tool with the adjusting bolt (B) until its base is just above the groove around the bottom of the boot. Then slide the clip over the tool and into position on the boot.



6. After installing a boot, wipe any grease off the exposed portion of the ball joint pin.

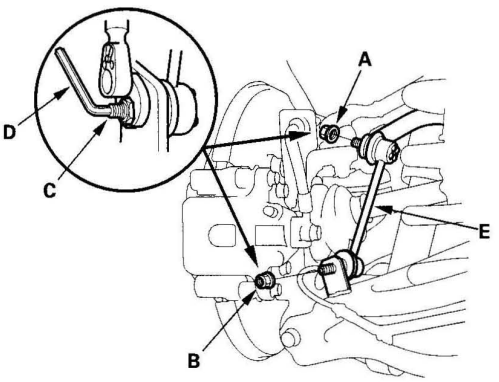
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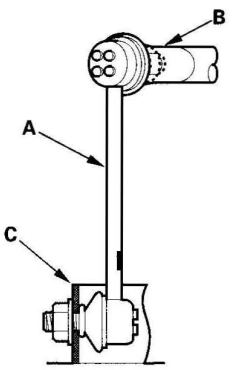
Stabilizer Link Replacement

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.

2. Remove the self-locking nut (A) and flange nut (B) while holding the respective joint pins (C) with a hex wrench (D), and remove the stabilizer link (E).



3. Install the stabilizer link (A) on the stabilizer bar (B) and stabilizer link bracket (C) with the joint pins set at the center of each moving range.

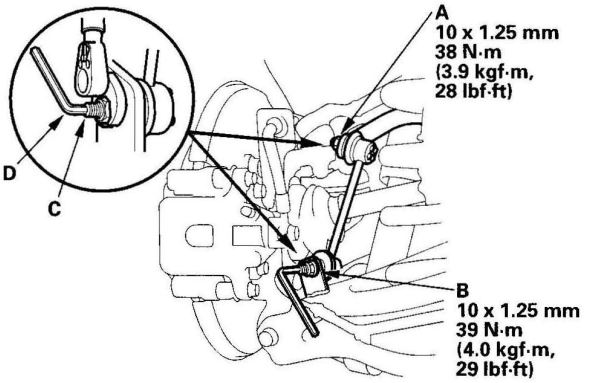


4. Install the self-locking nut and flange nut, and lightly tighten them.

   NOTE: Use a new self-locking nut on reassembly.

5. Place a floor jack at the connecting point of lower arm B and the knuckle, and raise the suspension to load the vehicle weight.

6. Tighten the self-locking nut (A) and flange nut (B) to the specified torque values while holding the respective joint pins (C) with a hex wrench (D).



7. After 5 minutes of driving, re-tighten the flange nuts to the specified torque.

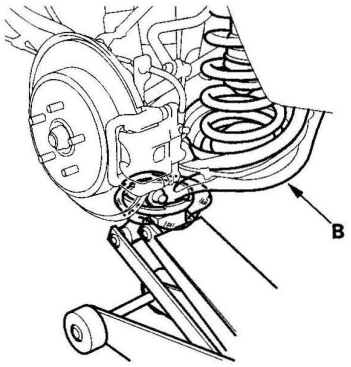
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Upper Arm Replacement

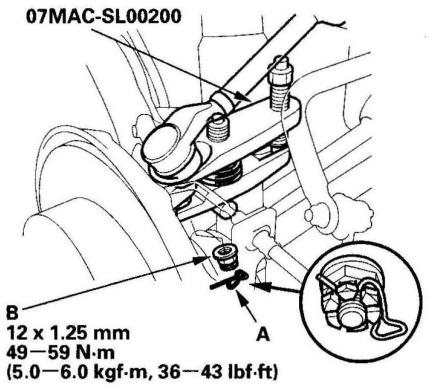
Special Tools Required
Ball joint remover, 28 mm 07MAC-SL00200

1. Raise the rear of the vehicle, and make sure it is securely supported, then remove the rear wheels.

2. Place a floor jack at the connecting point of lower arm B and the knuckle.

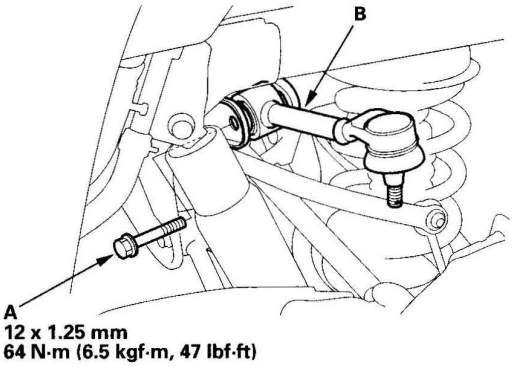


3. Remove the lock pin (A) from the upper arm ball joint castle nut (B), and remove the nut.



4. Remove the upper arm ball joint from the knuckle using the special tool (see page 18-9).

5. Remove the upper arm bolt (A). Remove the upper arm (B) from the vehicle.



6. Install the upper arm in the reverse order of removal, and note these items:

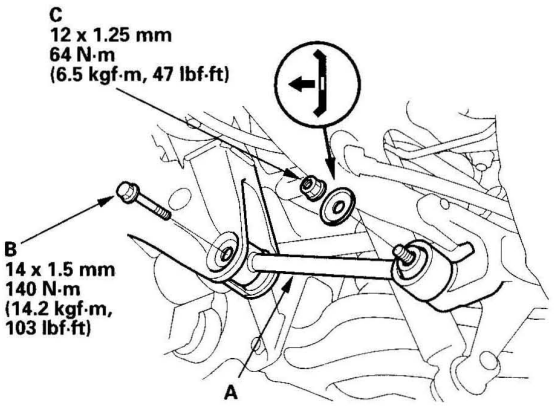
- Be careful not to damage the ball joint boot when connecting the upper arm to the knuckle.
- Tighten all mounting hardware to the specified torque values.
- Tighten the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the castle nut by loosening it.
- Install a new lock pin on the castle nut after torquing.
- Before installing the wheel, clean the mating surfaces of the brake disc/drum and the inside of the wheel.
- Check the rear wheel alignment, and adjust it if necessary (see page 18-5).

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Lower Arm A Replacement

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Remove lower arm A mounting bolt (B).

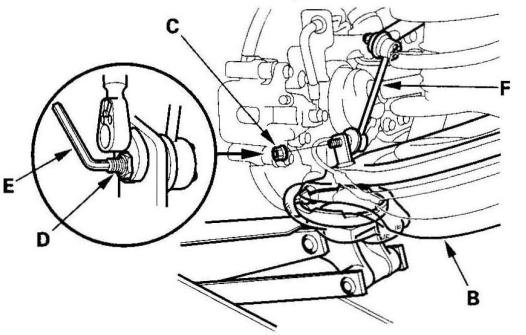


3. Remove lower arm A mounting nut (C).
4. Remove lower arm A from the vehicle.
5. Install lower arm A in the reverse order of removal, and note these items:
   - Tighten all mounting hardware to the specified torque values.
   - Before installing the wheel, clean the mating surfaces of the brake disc/drum and the inside of the wheel.
   - Check the rear wheel alignment, and adjust it if necessary (see page 18-5).

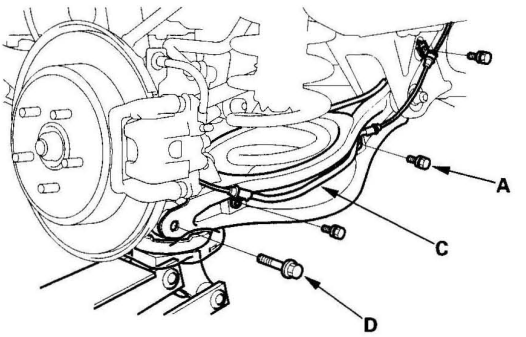
Lower Arm B Replacement

Removal

1. Raise the rear of the vehicle, make sure it is securely supported. Remove the rear wheels.
2. Place a floor jack at the connecting point of lower arm B and the knuckle.



3. Remove the flange nut (C) while holding the joint pin (D) with a hex wrench (E), and disconnect the stabilizer link (F) from lower arm B.
4. Remove the three flange bolts (A) and the wheel sensor harness (C) from lower arm B. Do not disconnect the wheel sensor connector.



5. Remove the flange bolt (D) that connects lower arm B and the knuckle.

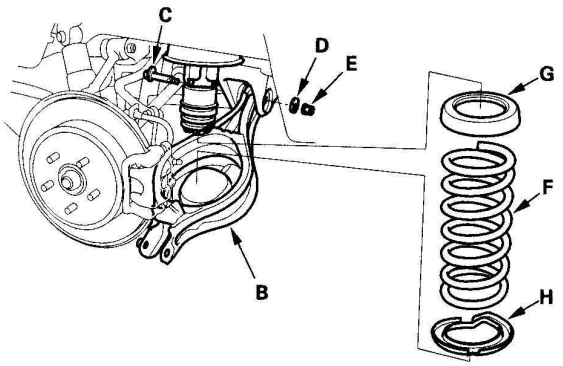
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Lower Arm B Replacement (cont'd)

6. Lower the floor jack gradually.

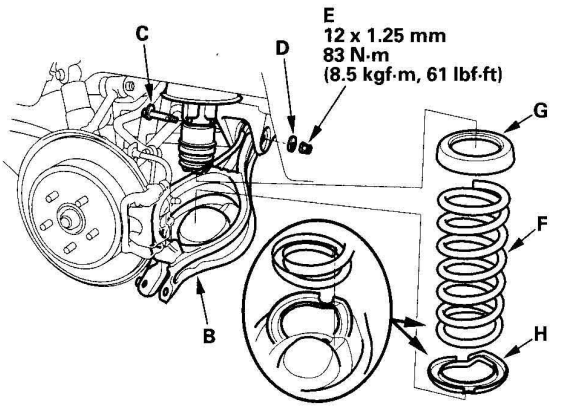
7. Remove the spring (F), upper spring seat (G), and lower spring seat (H).



8. Remove the self-locking nut (E), adjusting collar (D), and adjusting bolt (C), then remove lower arm B.

Installation

1. Position lower arm B, install the adjusting bolt (C), adjusting collar (D), and loosely install the self-locking nut (E).



2. Install the spring (F), and upper spring seat (G). Align the bottom of the spring and the lower spring seat (H) with lower arm B as shown.

3. Place a floor jack at the connecting point of lower arm B and the knuckle.

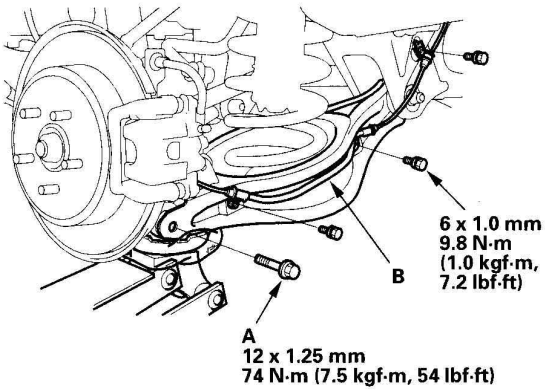
4. Align the bolt holes of lower arm B and the knuckle, and install the flange bolt.

BACK

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5. Raise the rear suspension with a floor jack to load the vehicle weight.

6. Tighten the flange bolt (A) and self-locking nut on the adjusting bolt to the specified torque values.



7. Install the wheel sensor harness (B).

8. Install the rear wheels.

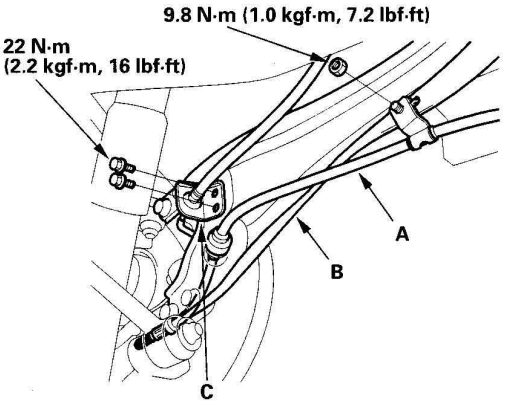
9. Check the rear wheel alignment, and adjust it if necessary (see page 18-5).

Trailing Arm Replacement

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.

2. Remove the brake disc/drum (see step 4 on page 18-22).

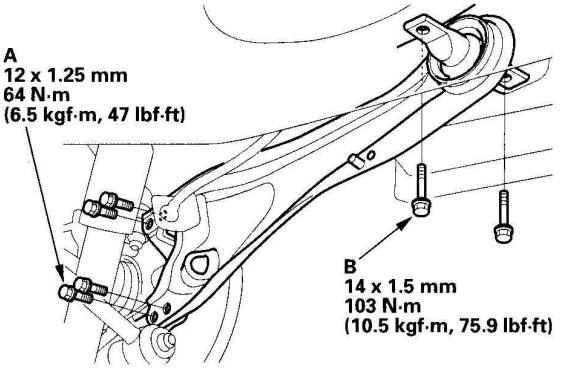
3. Remove the parking brake cable (A) from the trailing arm (B).



4. Remove the brake hose bracket (C) from the trailing arm.

5. Place a floor jack at the connecting point of lower arm B and the knuckle.

6. Remove the flange bolts (A) and trailing arm mounting bolts (B) from the trailing arm, then remove the trailing arm.



(cont'd)

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Trailing Arm Replacement (cont'd)

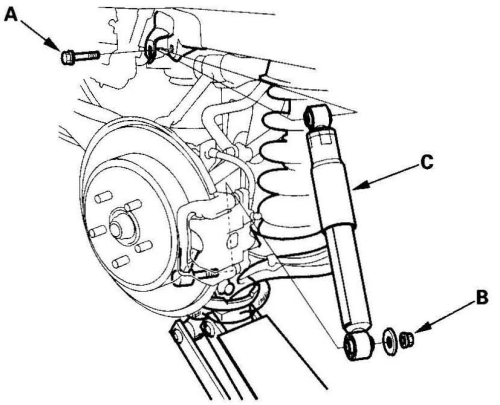
7. Install the trailing arm in the reverse order of removal, and note these items:

   - Tighten all mounting hardware to the specified torque values.
   - Check the brake hose and line joint for leaks, and tighten if necessary.
   - Check the brake hose for interference and twisting.
   - Before installing the wheel, clean the mating surfaces of the brake disc/drum and the inside of the wheel.
   - Check the rear wheel alignment, and adjust it if necessary (see page 18-5).

Damper Replacement

Removal

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Place a floor jack at the connecting point of lower arm B and the knuckle.
3. Remove the flange bolt (A) from the body.



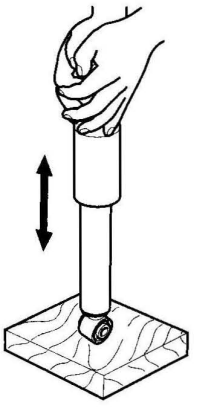
4. Remove the self-locking nut (B) and washer from the knuckle.
5. Compress the damper (C) by hand, and remove it from the vehicle.

BACK

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Inspection

1. Push on the damper by hand as shown.



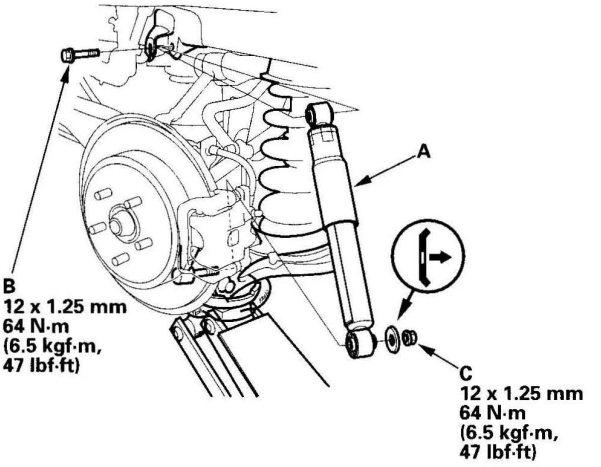
2. Check for smooth operation through a full stroke, both compression and extension. The damper should extend in a smooth, continuous motion when the compression is released. If it does not (no compression or no extension), the gas is leaking, and the damper should be replaced.

3. Check for oil leaks, abnormal noises, or binding during these tests.

Installation

1. Place a floor jack at the connecting point of lower arm B and the knuckle.

2. Compress the damper (A) by hand, and move it into position. Loosely install the flange bolt (B), washer, and self-locking nut (C).



3. Raise the rear suspension with a floor jack to load the vehicle weight.

4. Tighten the flange bolt and self-locking nut to the specified torque values.

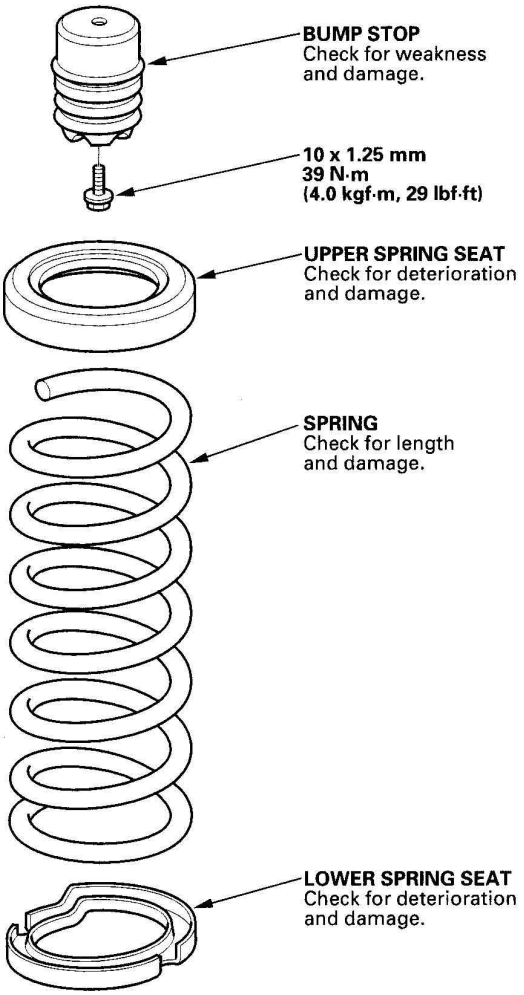
5. Install the rear wheels.

6. Check the rear wheel alignment, and adjust it if necessary (see page 18-5).

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Spring/Bump Stop Replacement

Exploded View

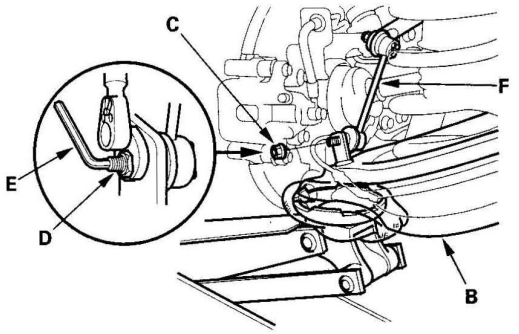


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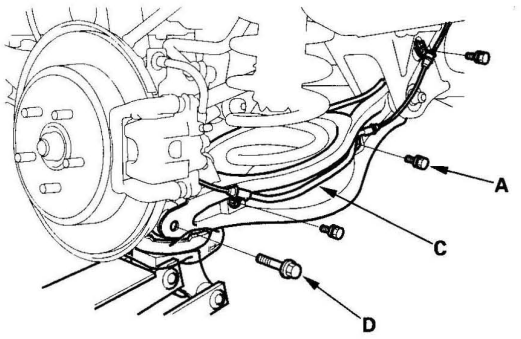
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Removal

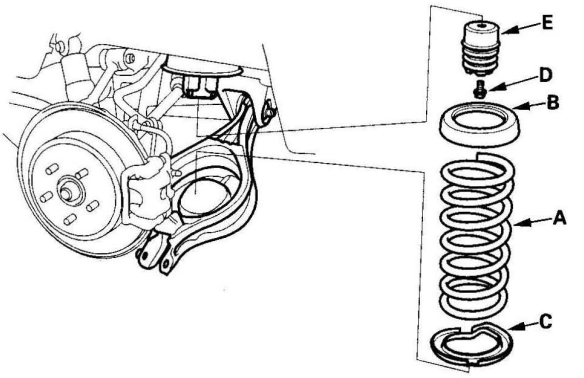
1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Place a floor jack at the connecting point of lower arm B and the knuckle.



3. Remove the flange nut (C) while holding the joint pin (D) with a hex wrench (E), and disconnect the stabilizer link (F) from lower arm B.
4. Remove the three flange bolts (A) and the wheel sensor harness (C) from lower arm B. Do not disconnect the wheel sensor connector.



5. Remove the flange bolt (D) that connects lower arm B and the knuckle.
6. Lower the floor jack gradually.
7. Remove the spring (A), upper spring seat (B), and lower spring seat (C).



8. Remove the flange bolt (D) and bump stop (E).

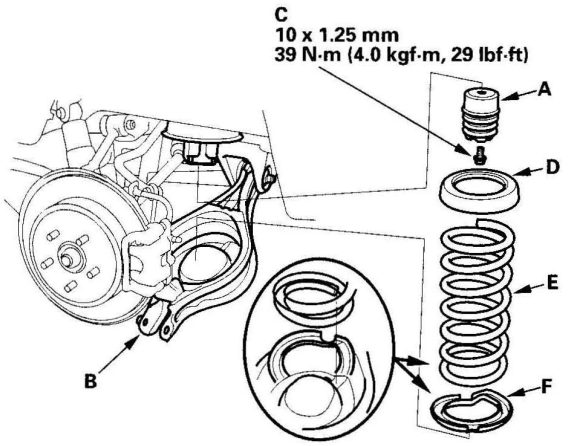
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Spring/Bump Stop Replacement (cont'd)

Installation

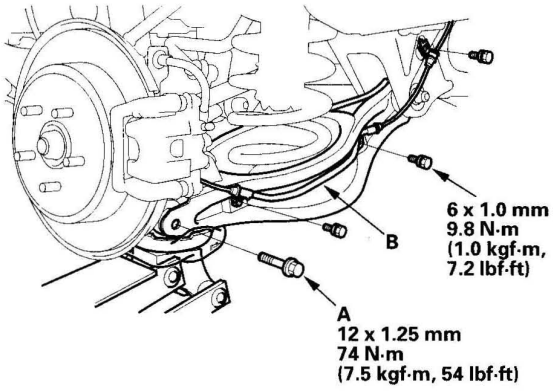
1. Install the bump stop (A), and tighten the flange bolt (C) to the specified torque.



2. Install the upper spring seat (D) and spring (E). Align the bottom of the spring and the lower spring seat (F) with lower arm B as shown.

3. Place a floor jack at the connecting point of lower arm B and the knuckle.

4. Align the bolt holes of lower arm B and the knuckle, and install the flange bolt (A).



5. Raise the rear suspension with a floor jack to load the vehicle weight.

6. Tighten the flange bolt (A) to the specified torque.

7. Install the wheel sensor harness (B).

8. Install the rear wheels.

9. Check the rear wheel alignment, and adjust it if necessary (see page 18-5).

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Brakes

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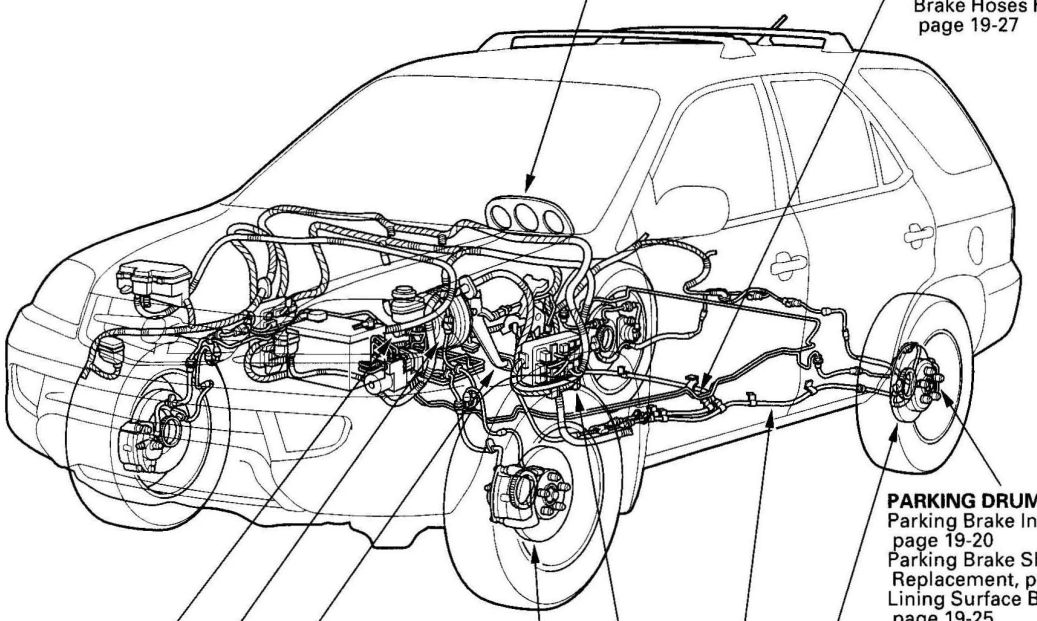
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Conventional Brake Components

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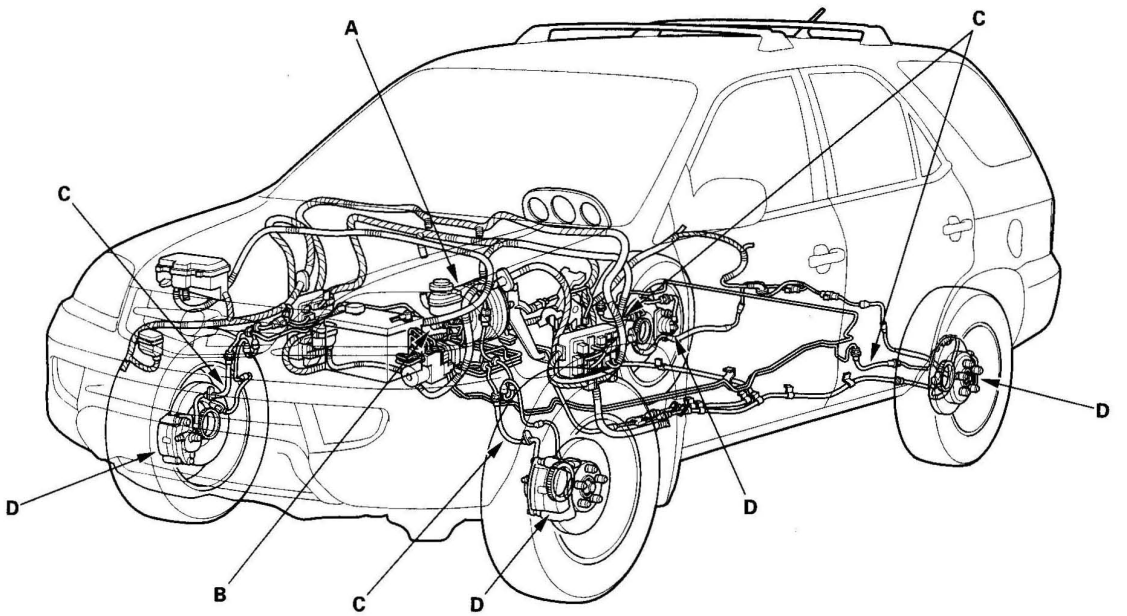
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Brake System Operation and Leakage Check

Check all of the following items:

Component	Procedure
Brake Booster (A)	Check brake operation by applying the brakes during a test drive. If the brakes do not work properly, check the brake booster. Replace the brake booster as an assembly if it does not work properly or if there are signs of leakage.
Piston Cup and Pressure Cup Inspection (B)	• Check brake operation by applying the brakes. Look for damage or signs of fluid leakage. Replace the master cylinder as an assembly if the pedal does not work properly or if there is damage or signs of fluid leakage. • Check for a difference in brake pedal stroke between quick and slow brake applications. Replace the master cylinder as an assembly if there is a difference in pedal stroke.
Brake Hoses (C)	Look for damage or signs of fluid leakage. Replace the brake hose with a new one if it is damaged or leaking.
Caliper Piston Seal and Piston Boots (D)	Check brake operation by applying the brakes. Look for damage or signs of fluid leakage. If the pedal does not work properly, the brakes drag, or there is damage or signs of fluid leakage, disassemble and inspect the brake caliper. Replace the boots and seals with new ones whenever the brake caliper is disassembled.



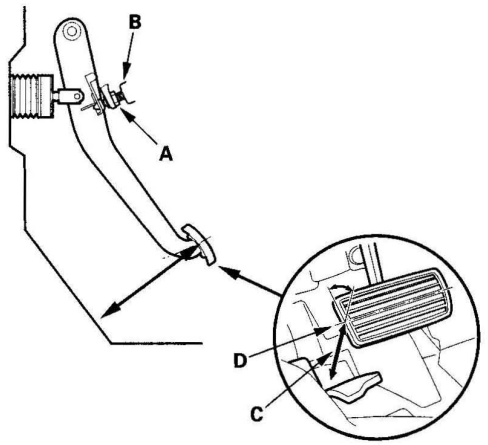
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Brake Pedal and Brake Pedal Position Switch Adjustment

Pedal Height

1. Disconnect the brake pedal position switch connector, loosen the brake pedal position switch locknut (A), and back off the brake pedal position switch (B) until it is no longer touching the brake pedal.

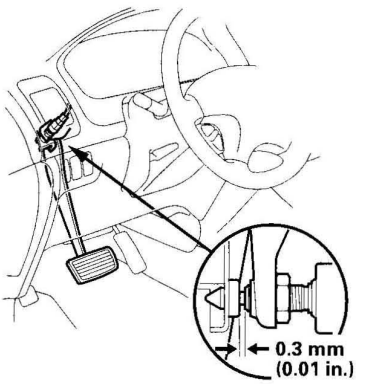


2. Pull back the carpet at the insulator cutout, and measure the pedal height (C) from the middle of the left side center of the pedal pad (D).

   Standard Pedal Height (with carpet removed): 164 mm (6 7/16 in.)

Brake Switch Clearance

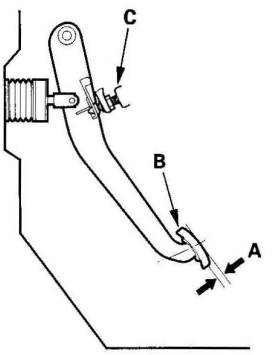
3. Screw in the brake pedal position switch until its plunger is fully pressed (the threaded end touches the pad on the pedal arm). Then back off the switch 3/4 turn to make 0.3 mm (0.01 in.) of clearance between the threaded end and the pad. Tighten the locknut securely. Connect the brake pedal position switch connector. Make sure the brake lights go off when the pedal is released.



Pedal Free Play

4. With the engine stopped, inspect the pedal free play (A) on the pedal pad (B) by pushing the pedal by hand.

   Free Play: 1–5 mm (1/16–3/16 in.)



5. If the pedal free play is out of specification, adjust the brake pedal position switch (C). If the pedal free play is insufficient, it may result in excessive brake drag.

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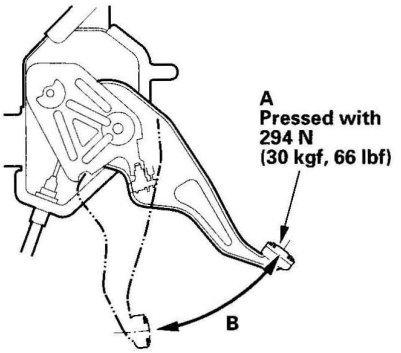
Parking Brake Check and Adjustment

Inspection

1. Press the parking brake pedal (A) with 294 N (30 kgf, 66 lbf) of force. The parking brake pedal should travel within the specified number of clicks (B).

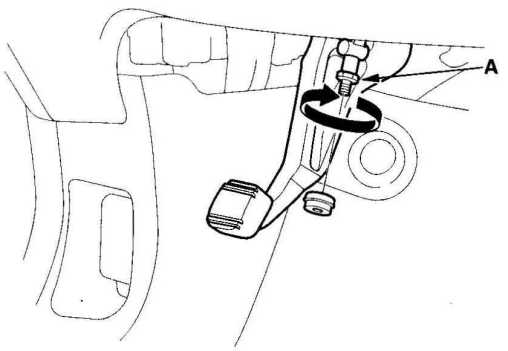
   Pedal clicks: 4 to 6

   If the number of pedal clicks is excessive, adjust the parking brake.



Minor Adjustment

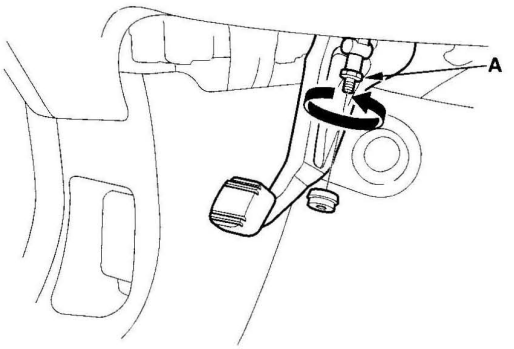
1. Raise the rear of the vehicle, and make sure it is securely supported.
2. Tighten the adjusting nut (A) until the parking brakes drag slightly when the rear wheels are turned.



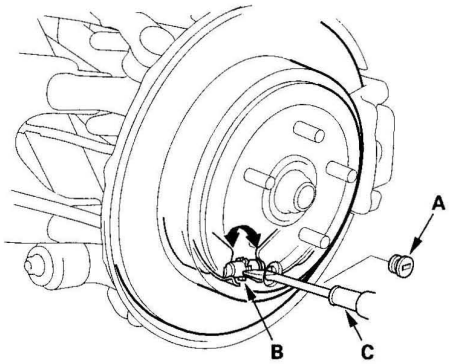
3. Back off the adjusting nut in half-turn increments, and check for proper adjustment (4 to 6 clicks) at a pedal force of 294 N (30 kgf, 66 lbf).

Major Adjustment (to be done when replacing brake shoes)

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Release the parking brake, and back off the adjusting nut (A).



3. Remove the access plug (A).



4. Turn up the ratchet teeth (B) or the adjuster assembly with a flat-tip screwdriver (C) until the shoes lock against the drum. Then back off ten clicks, and install the access plug.
5. Do the minor adjustment procedure.
6. Install the rear wheels.

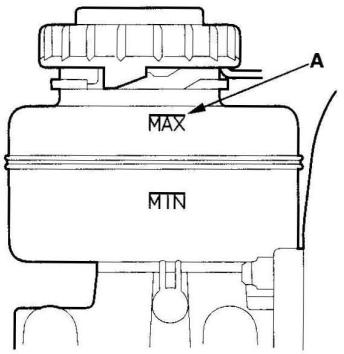
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Brake System Bleeding

NOTE:
- Do not reuse the drained fluid.
- Always use Genuine Honda DOT 3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and shorten the life of the system.
- Do not allow dirt or other foreign matter to contaminate the brake fluid.
- Do not spill brake fluid on the vehicle, it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- The reservoir on the master cylinder must be at the MAX (upper) level mark at the start of the bleeding procedure and checked after bleeding each brake caliper. Add fluid as required.

1. Make sure the brake fluid level in the reservoir is at the MAX (upper) level line (A).



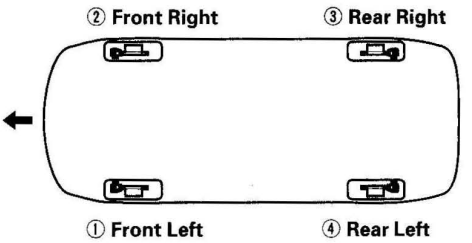
2. Attach a length of clear drain tube to the bleed screw.

3. Have someone slowly pump the brake pedal several times, then apply steady pressure.

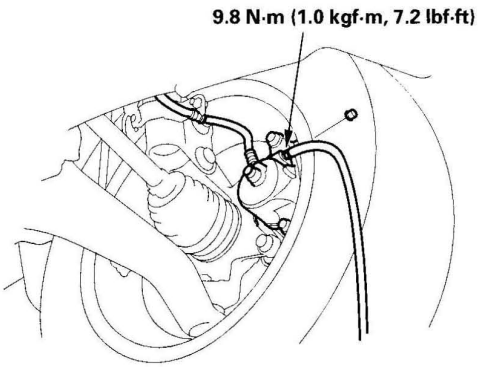
4. Loosen the left-front brake bleed screw to allow air to escape from the system. Then tighten the bleed screw securely.

5. Repeat the procedure for each wheel in the sequence shown below until air bubbles no longer appear in the fluid.

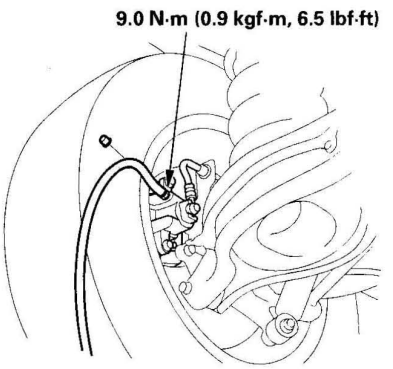
BLEEDING SEQUENCE:



FRONT:



REAR:

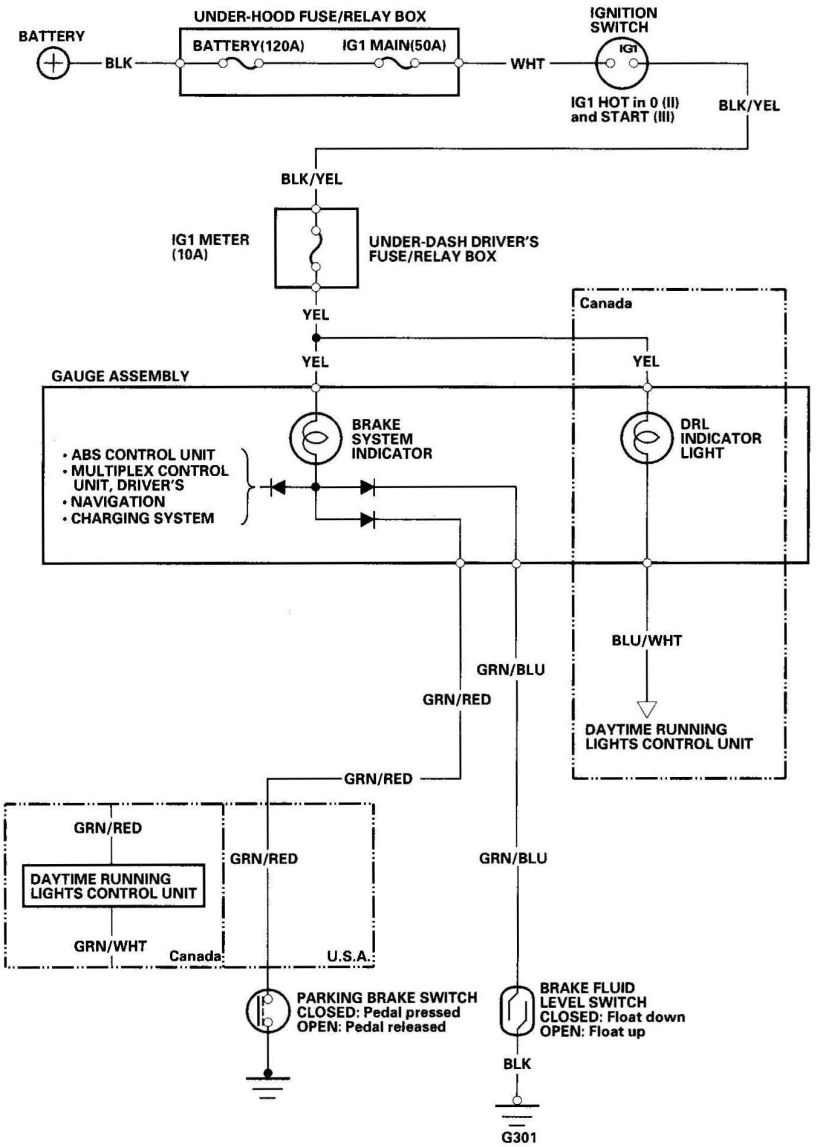


6. Refill the master cylinder reservoir to the MAX (upper) level line.

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Brake System Indicator Circuit Diagram

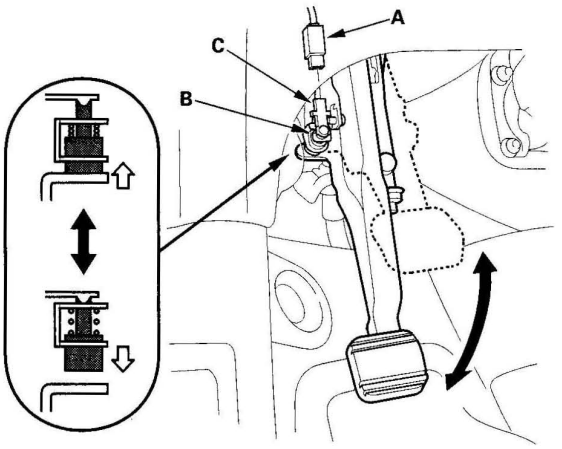


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Parking Brake Switch Test

1. Disconnect the parking brake switch connector (A) from the switch (B).



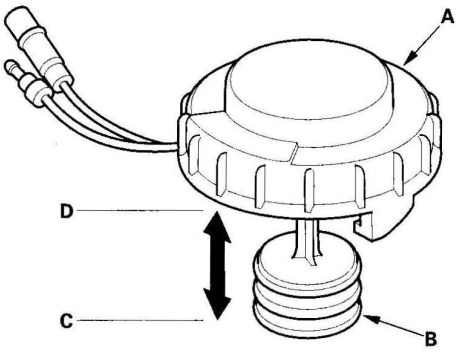
2. Check for continuity between the positive terminal (C) and body ground.

   - With the parking brake pedal pressed, there should be continuity.
   - With the parking brake pedal released, there should be no continuity.

   NOTE:
   - If both the ABS indicator and the brake system indicator come on at the same time, check the ABS first.
   - If the parking brake switch/fluid level switch is OK, but the brake system indicator does not function, check the ABS (For Canada model: do the input test for the daytime running lights control unit first).

Brake Fluid Level Switch Test

1. Remove the reservoir cap (A). Check that the float (B) moves up and down freely; if it doesn't, replace the reservoir cap assembly.



2. Check for continuity between the terminals with the float in the down position (C) and the up position (D):

   - With the float up, there should be no continuity.
   - With the float down, there should be continuity.

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Front Brake Pads Inspection and Replacement

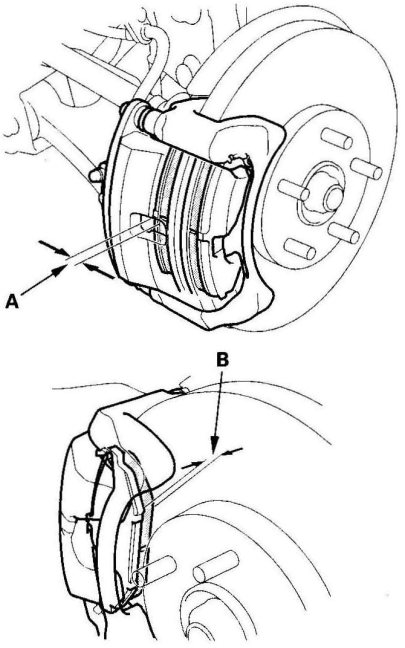
⚠CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OHSA-approved vacuum cleaner.

Inspection

1. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheels.
2. Check the thickness of the inner pad (A) and outer pad (B). Do not include the thickness of the backing plate.

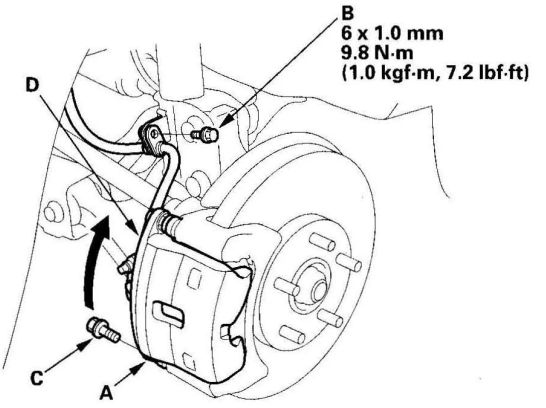
Brake pad thickness:
Standard: 10.5 – 11.5 mm (0.41 – 0.45 in.)
Service Limit: 1.6 mm (0.06 in.)



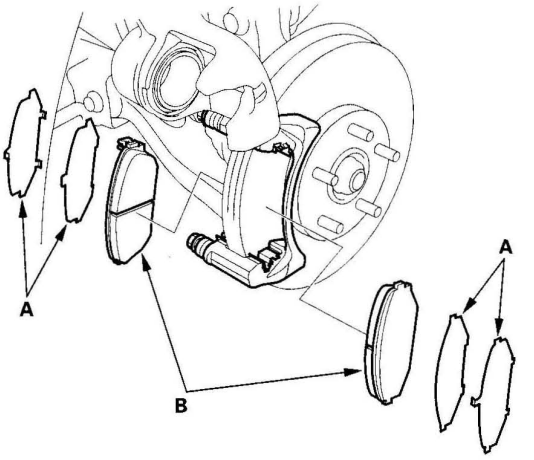
3. If the brake pad thickness is less than the service limit, replace all the pads as a set.

Replacement

1. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheels.
2. Remove the brake hose mounting bolt (B) from the knuckle.



3. Remove the flange bolt (C) while holding pin A with a wrench being careful not to damage the pin boot, and pivot the caliper (D) up out of the way. Check the hose and pin boots for damage and deterioration.
4. Remove the pad shims (A) and pads (B).

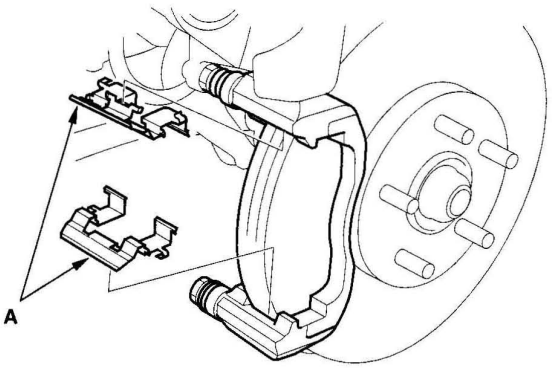


(cont'd)

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Front Brake Pads Inspection and Replacement (cont'd)

5. Remove the pad retainers (A).

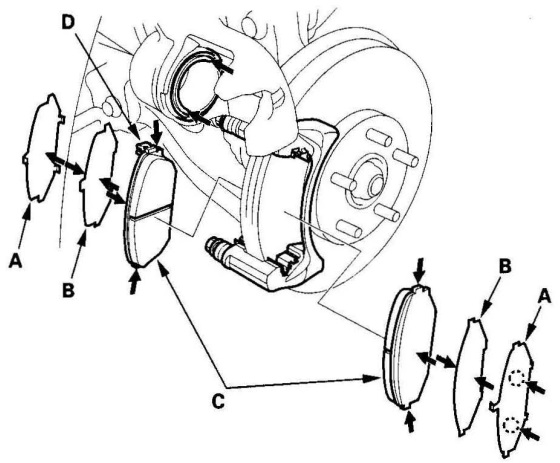


6. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.

7. Check the brake disc for damage and cracks.

8. Clean and install the pad retainers.

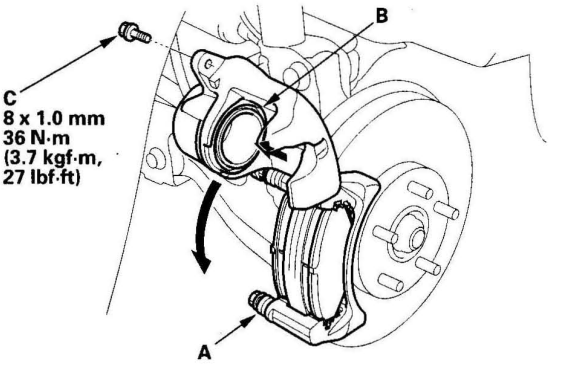
9. Apply Molykote M77 grease or Daikalub 528D grease to the pad side of shims A, both sides of shims B, the back of pads (C), and the other areas indicated by the arrows. Wipe excess grease off the shims and pads. Contaminated brake discs or pads reduce stopping ability. Keep grease off the brake discs and pads.



10. Install the brake pads and pad shims correctly. Install the pad with the wear indicator (D) on the inside.

    If you are reusing the pads, always reinstall the brake pads in their original positions to prevent a momentary loss of braking efficiency.

11. Push in the piston (B) so that the caliper will fit over the pads. Make sure that the piston boot is in position to prevent damaging it when pivoting the caliper down.



12. Pivot the caliper down into position. Install the flange bolt (C), and torque it to the specified torque while holding pin A with a wrench being careful not to damage the pin boot.

13. Install the brake hose mounting bolt, and tighten it to the specified torgue.

14. Press the brake pedal several times to make sure the brakes work, then test-drive.

    NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.

15. After installation, check for leaks at hose and line joints or connections, and retighten if necessary.

BACK

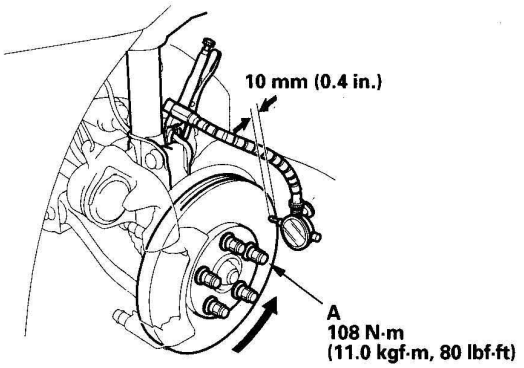
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Front Brake Disc Inspection

Runout

1. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheels.
2. Remove the brake pads (see page 19-9).
3. Inspect the brake disc surface for damage and cracks. Clean the disc thoroughly, and remove all rust.
4. Install suitable flat washers (A) and wheel nuts, and tighten the nuts to the specified torque to hold the brake disc securely against the hub.

   Brake Disc Runout:
   Service Limit: 0.10 mm (0.004 in.)



5. Set up the dial gauge against the brake disc as shown, and measure the runout at 10 mm (0.4 in.) from the outer edge of the disc.
6. If the brake disc is beyond the service limit, refinish the disc with an on-car brake lathe. The Kwik-Lathe produced by Kwik-way Manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation.

   Max. Refinish Limit: 26.0 mm (1.02 in.)

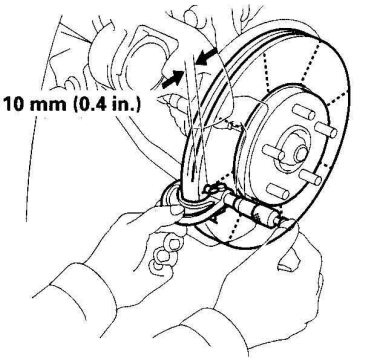
   NOTE:
   - If the brake disc is beyond the service limit for refinishing, replace it (see step 3 on page 18-11).
   - A new disc should be refinished if its runout is greater than 0.10 mm (0.004 in.).

Thickness and Parallelism

1. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheels.
2. Remove the brake pads (see page 19-9).
3. Using a micrometer, measure brake disc thickness at eight points, approximately 45° apart and 10 mm (0.4 in.) in from the outer edge of the disc. Replace the brake disc if the smallest measurement is less than the max. refinishing limit.

   Brake Disc Thickness:
   Standard: 27.9—28.1 mm (1.10—1.11 in.)
   Max. Refinishing Limit: 26.0 mm (1.02 in.)
   Brake Disc Parallelism: 0.015 mm (0.0006 in.) max.

   NOTE: This is the maximum allowable difference between the thickness measurements.



4. If the brake disc is beyond the service limit for parallelism, refinish the disc with an on-car brake lathe. The Kwik-Lathe produced by Kwik-way Manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation.

   NOTE: If the brake disc is beyond the service limit for refinishing, replace it (see step 3 on page 18-11).

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Conventional Brake Components

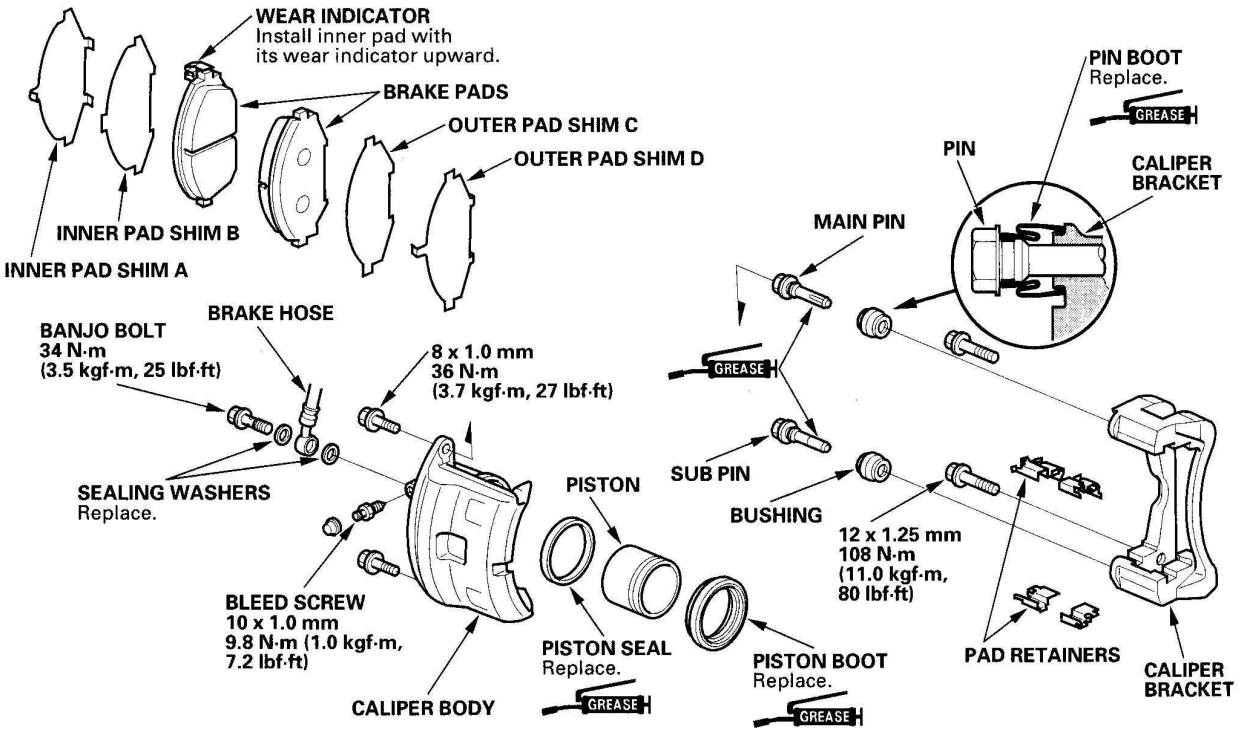
Front Brake Caliper Overhaul

⚠CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

Remove, disassemble, inspect, reassemble, and install the caliper, and note these items:

- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.
- To prevent dripping brake fluid, cover disconnected hose joints with rags or shop towels.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dirt and other foreign particles.
- Replace parts with new ones as specified in the illustration.
- Make sure no dirt or other foreign matter gets in the brake fluid.
- Make sure no grease or oil gets on the brake discs or pads.
- When reusing pads, always reinstall them in their original positions to prevent loss of braking efficiency.
- Do not reuse drained brake fluid. Use only clean Genuine Honda DOT 3 Brake Fluid. Non-Honda brake fluid can cause corrosion and shorten the life of the system.
- Coat the piston, piston seal groove, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones.
- After installing the caliper, check the brake hose and line for leaks, interference, and twisting.



BACK

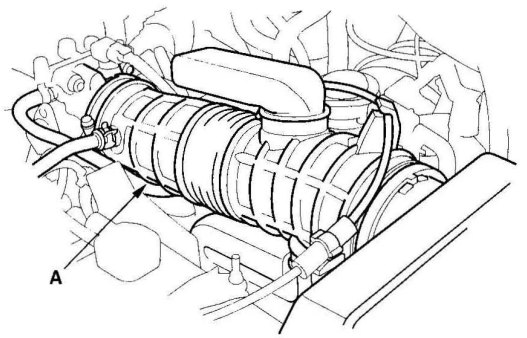
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Master Cylinder Replacement

NOTICE

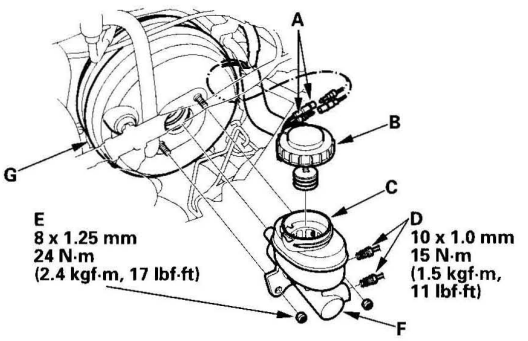
Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.

1. Remove the intake air duct (A) (see step 7 on page 5-2).



2. Remove the throttle cable holder.

3. Disconnect the brake fluid level switch connectors (A), and remove the reservoir cap (B).



4. Remove the brake fluid from the master cylinder reservoir (C) with a syringe.

5. Disconnect the brake lines (D) from the master cylinder. To prevent spills, cover the hose joints with rags or shop towels.

6. Remove the master cylinder mounting nuts (E).

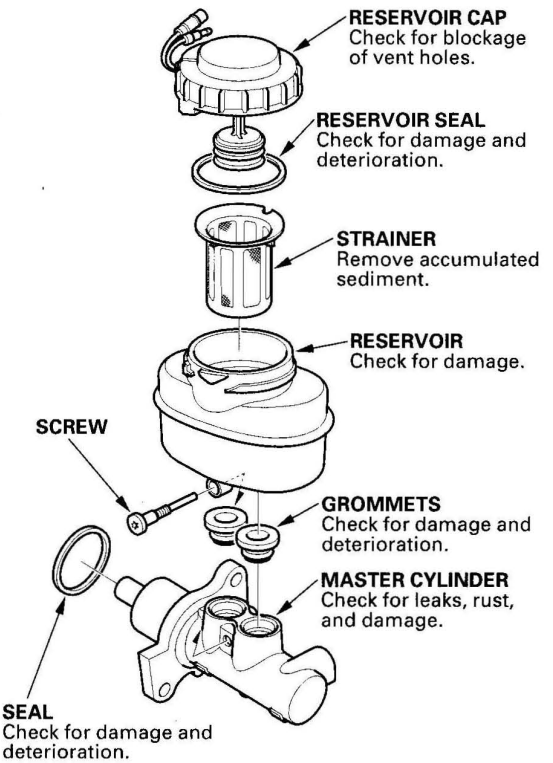
7. Remove the master cylinder (F) from the brake booster (G). Be careful not to bend or damage the brake lines when removing the master cylinder.

8. Install the master cylinder in the reverse order of removal.

Master Cylinder Inspection

NOTE:

- Before reassembling, check that all parts are free of dirt and other foreign particles.
- Do not try to disassemble the master cylinder assembly. Replace the master cylinder assembly with a new part if necessary.
- Do not allow dirt or foreign matter to contaminate the brake fluid.



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Brake Booster Test

Functional Test

1. With the engine stopped, press the brake pedal several times to deplete the vacuum reservoir, then press the pedal hard, and hold it for 15 seconds. If the pedal sinks, either the master cylinder is bypassing internally, or the brake system (master cylinder, lines, modulator, or caliper) is leaking.

2. Start the engine with the pedal pressed. If the pedal sinks slightly, the vacuum booster is operating normally. If the pedal height does not vary, the booster or check valve is faulty.

3. With the engine running, press the brake pedal lightly. Apply just enough pressure to hold back automatic transmission creep. If the brake pedal sinks more than 10 mm (3/8 in.) in 3 minutes, the master cylinder is faulty. A slight change in pedal height when the A/C compressor cycles on and off is normal. (The A/C compressor load changes the vacuum available to the booster.)

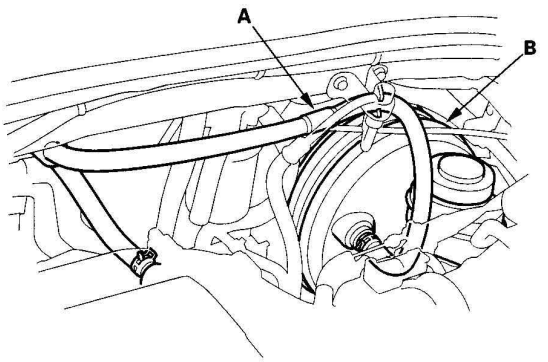
Leak Test

1. Press the brake pedal with the engine running, then stop the engine. If the pedal height does not vary while pressed for 30 seconds, the vacuum booster is OK. If the pedal rises, the booster is faulty.

2. With the engine stopped, press the brake pedal several times using normal pressure. When the pedal is first pressed, it should be low. On consecutive applications, the pedal height should gradually rise. If the pedal position does not vary, check the booster check valve.

Booster Check Valve Test

1. Disconnect the brake booster vacuum hose at the booster (B). The check valve (A) is built into the hose.



2. Start the engine, and let it idle. There should be vacuum available. If no vacuum is available, the check valve is not working properly. Replace the brake booster vacuum hose and check valve, and retest.

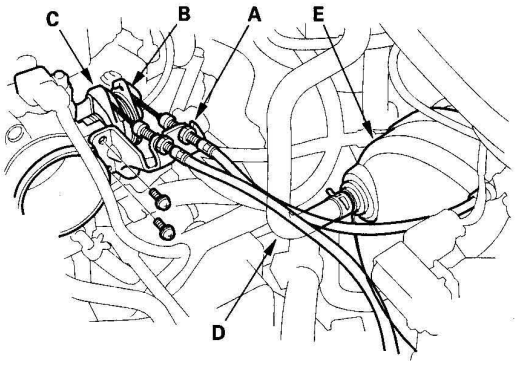
BACK

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Brake Booster Replacement

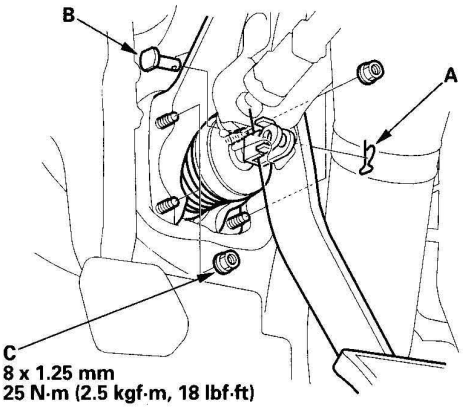
1. Remove the master cylinder (see page 19-13).

2. Remove the cable bracket (A) from the throttle body, then disconnect the throttle cable end (B) and actuator cable end (C) from the throttle linkage.



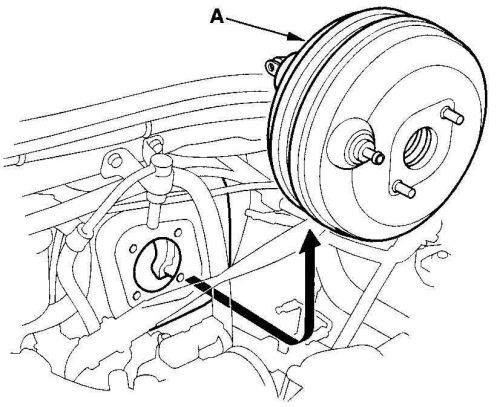
3. Disconnect the vacuum hose (D) from the brake booster (E).

4. Remove the lock pin (A) and joint pin (B).



5. Remove the brake booster mounting nuts (C).

6. Pull the brake booster (A) forward, and remove it from the engine compartment.



7. Install the brake booster in the reverse order of removal, and note these items:

   - Adjust the pushrod length before installing the brake booster.
   - After installation, adjust brake pedal height and brake pedal free play (see page 19-4).
   - After installation, check for cable free play, and adjust the actuator cable (see page 4-42) or the throttle cable (see page 11-139) if necessary.

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Rear Brake Pads Inspection and Replacement

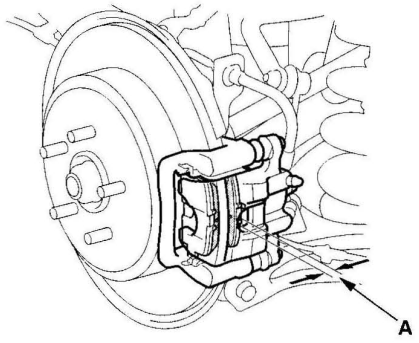
⚠CAUTION

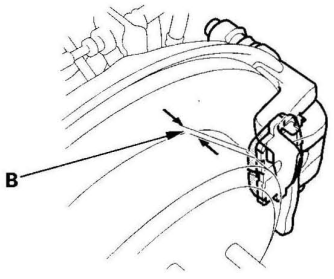
Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OHSA-approved vacuum cleaner.

Inspection

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Check the thickness of the inner pad (A) and outer pad (B). Do not include the thickness of the backing plate.

Brake pad thickness:
Standard: 9.5—10.5 mm (0.37—0.41 in.)
Service Limit: 1.6 mm (0.06 in.)

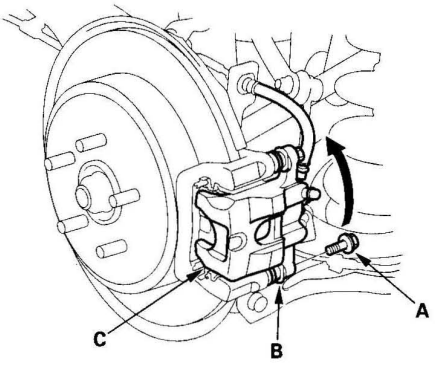




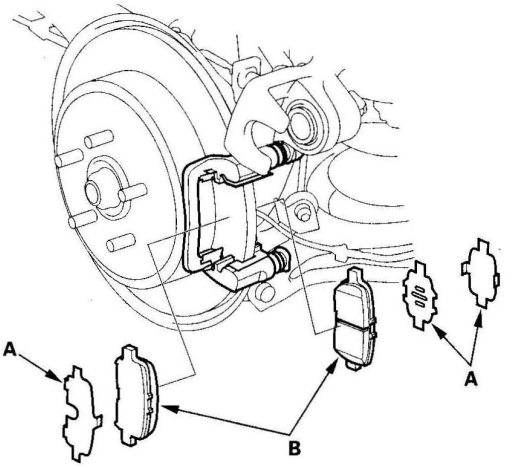
3. If the brake pad thickness is less than the service limit, replace all the pads as a set.

Replacement

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Remove the flange bolt (A) while holding the pin (B) with a wrench being careful not to damage the pin boot, and pivot the caliper (C) up out of the way. Check the hose and pin boots for damage and deterioration



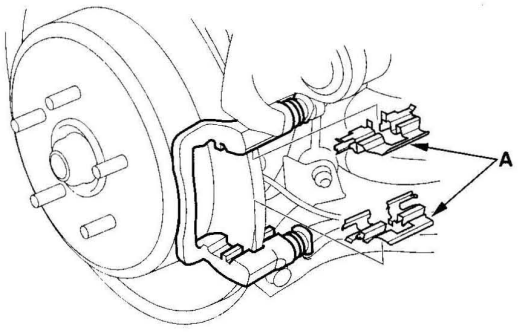
3. Remove the pad shims (A) and pads (B).



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4. Remove the pad retainers (A).

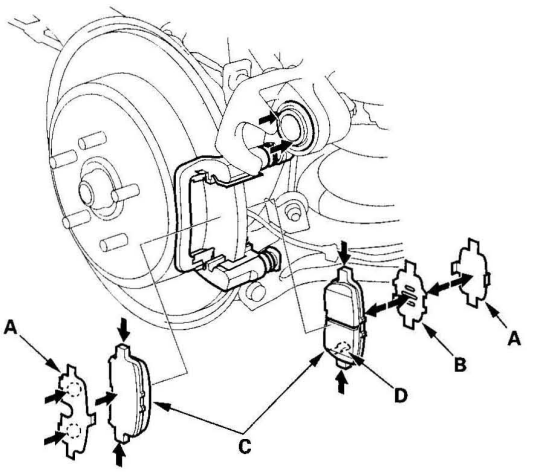


5. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.

6. Check the brake disc for damage and cracks.

7. Clean and install the pad retainers.

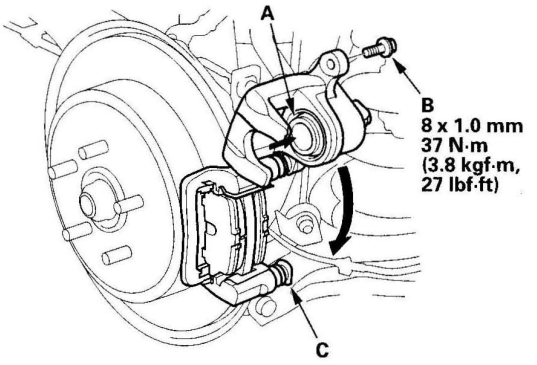
8. Apply Molykote M77 grease or Daikalub 528D grease to the pad side of the outer shims (A), both sides of the inner shim (B), the back of pads (C), and the other areas indicated by the arrows. Wipe excess grease off the shims and pads. Contaminated brake discs or pads reduce stopping ability. Keep grease off the brake discs and pads.



9. Install the brake pads and pad shims correctly. Install the pad with the wear indicator (D) on the inside.

   If you are reusing the pads, always reinstall the brake pads in their original positions to prevent a momentary loss of braking efficiency.

10. Push in the piston (A) so the caliper will fit over the pads. Make sure the piston boot is in position to prevent damaging it when pivoting the caliper down.



11. Pivot the caliper down into position. Install the flange bolt (B), and torque it to the specified torque while holding the pin (C) with a wrench being careful not to damage the pin boot.

12. Press the brake pedal several times to make sure the brakes work, then test-drive.

    NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.

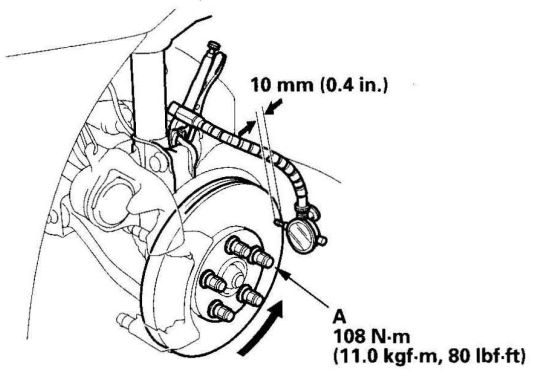
13. After installation, check for leaks at hose and line joints or connections, and retighten if necessary.

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Rear Brake Disc Inspection

Runout

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Remove the brake pads (see page 19-16).
3. Inspect the brake disc surface for damage and cracks. Clean the disc thoroughly, and remove all rust.
4. Install suitable flat washers (A) and wheel nuts, and tighten the nuts to the specified torque to hold the brake disc securely against the hub.



5. Set up the dial gauge against the brake disc as shown, and measure the runout at 10 mm (0.4 in.) from the outer edge of the disc.

   Brake Disc Runout:
   Service Limit: 0.10 mm (0.004 in.)

6. If the brake disc is beyond the service limit, refinish the disc.

   Max. Refinish Limit: 9.0 mm (0.35 in.)

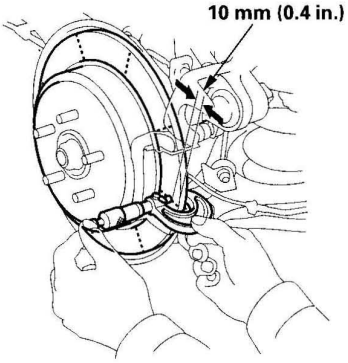
   NOTE:
   - If the brake disc is beyond the service limit for refinishing, replace it (see step 3 on page 18-22).
   - A new disc should be refinished if its runout is greater than 0.10 mm (0.004 in.).

Thickness and Parallelism

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Remove the brake pads (see page 19-16).
3. Using a micrometer, measure disc thickness at eight points, about 45° apart and 10 mm (0.4 in.) in from the outer edge of the disc. Replace the brake disc if the smallest measurement is less than the max. refinishing limit.

   Brake Disc Thickness:
   Standard: 10.9—11.1 mm (0.43—0.44 in.)
   Max. Refinishing Limit: 9.0 mm (0.35 in.)
   Brake Disc Parallelism: 0.015 mm (0.0006 in.) max.

   NOTE: This is the maximum allowable difference between the thickness measurements.



4. If the brake disc is beyond the service limit for parallelism, refinish the brake disc.

   NOTE: If the brake disc is beyond the service limit for refinishing, replace it (see step 3 on page 18-22).

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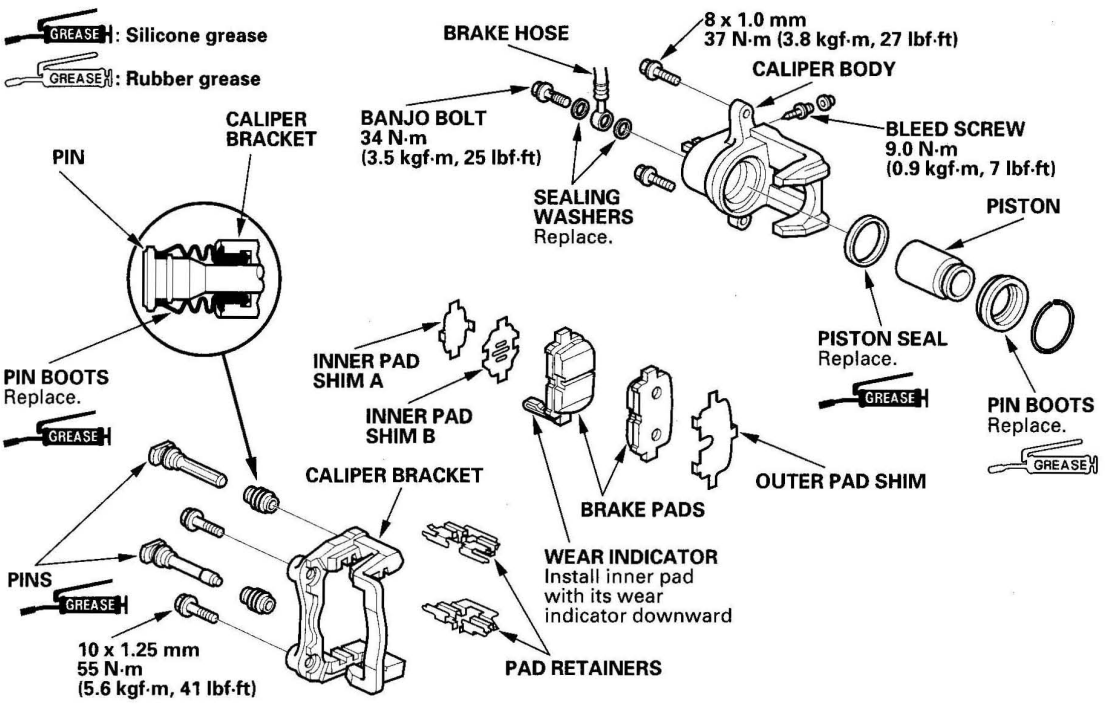
Rear Brake Caliper Overhaul

⚠CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

Remove, disassemble, inspect, reassemble, and install the caliper, and note these items:

- Do not spill brake fluid on the vehicle; It may damage the paint; If brake fluid gets on the paint, wash it off immediately with water.
- To prevent dripping brake fluid, cover disconnected hose joints with rags or shop towels.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dirt and other foreign particles.
- Replace parts with new ones as specified in the illustration.
- Make sure no dirt or other foreign matter gets into the brake fluid.
- Make sure no grease or oil gets on the brake discs or pads.
- When reusing pads, always reinstall them in their original positions to prevent loss of braking efficiency.
- Do not reuse drained brake fluid. Use only clean Genuine Honda DOT 3 Brake Fluid. Non-Honda brake fluid can cause corrosion and shorten the life of the system.
- Coat the piston, piston seal groove, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones.
- After installing the caliper, check the brake hose and line for leaks, interference, and twisting.



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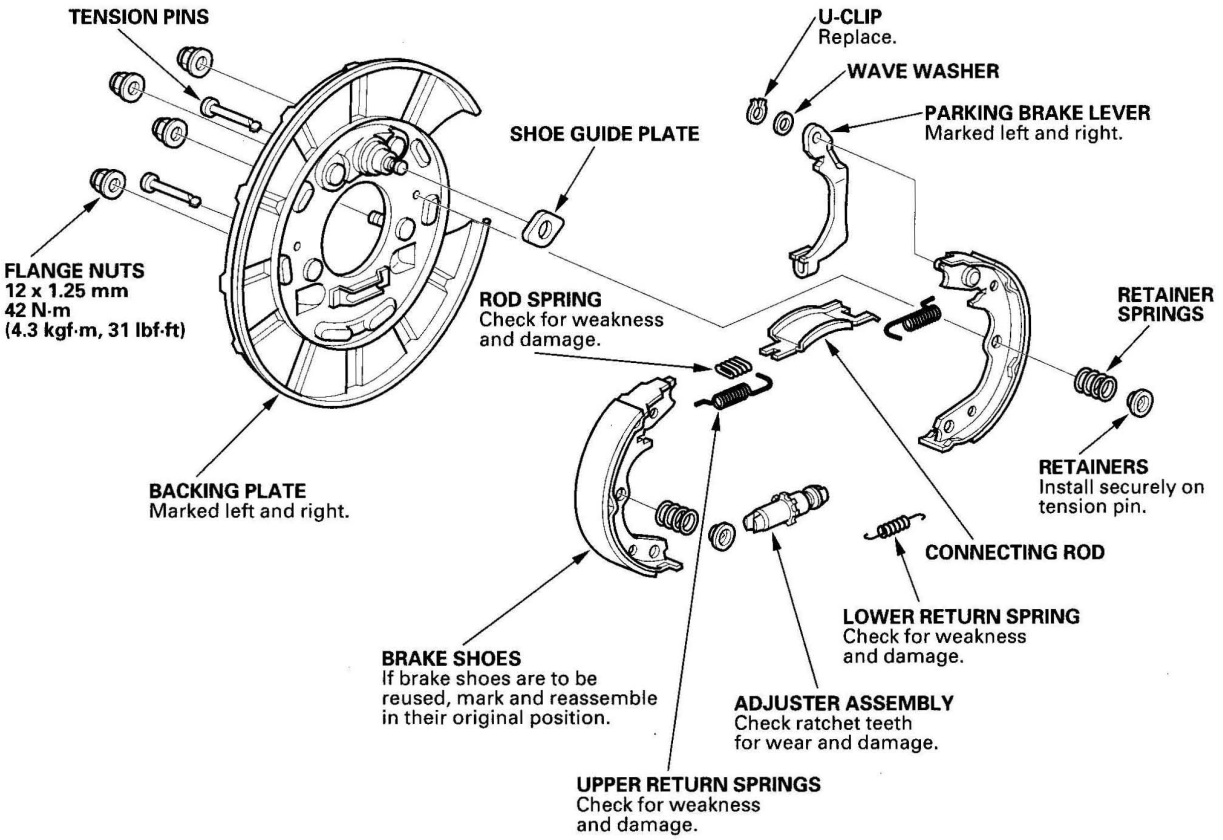
Conventional Brake Components

Parking Brake Inspection

⚠CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

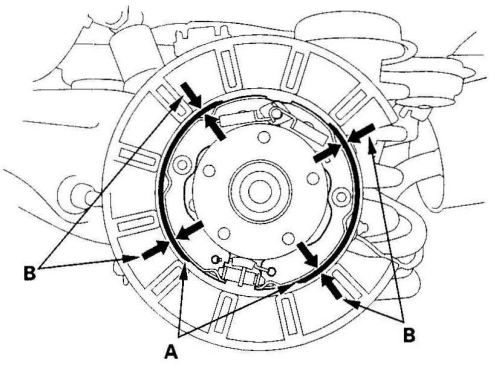
1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Release the parking brake, and remove the rear caliper and brake disc/drum (see step 3 on page 18-22).



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3. Check the parking brake linings (A) for cracking, glazing, wear, and contamination.



4. Measure the parking brake lining thickness (B). Measurement does not include brake shoe thickness.

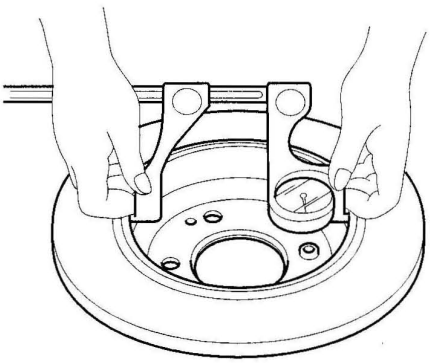
Parking brake lining thickness:
Standard: 4.0 mm (0.16 in.)
Service limit: 1.0 mm (0.04 in.)

5. If the brake lining thickness is less than the service limit, replace all the parking brake shoes as a set.

6. Check the bearings in the hub unit for smooth operation.

7. Measure the inside diameter of the parking brake drum with inside vernier calipers.

Parking brake drum inside diameter:
Standard: 209.9–210.0 mm (8.264–8.267 in.)
Service limit: 211.0 mm (8.307 in.)



8. If the inside diameter of the parking brake drum is more than service limit, replace the rear brake disc/drum.

9. Check the parking brake drum for scoring, grooves, and cracks.

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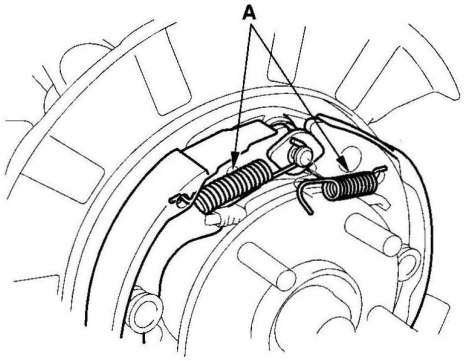
Parking Brake Shoes Replacement

⚠CAUTION

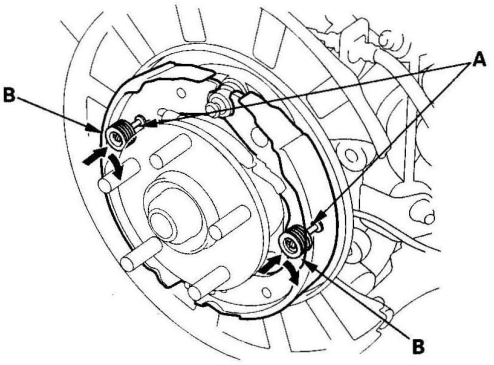
Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OHSA-approved vacuum cleaner.

Disassembly

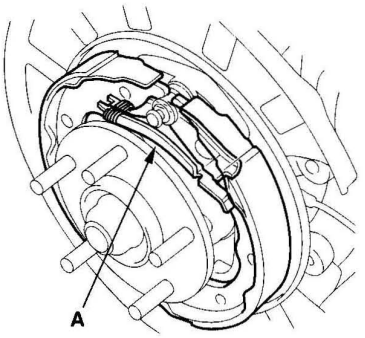
1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Release the parking brake, and remove the rear brake caliper and brake disc/drum (see step 3 on page 18-22).
3. Disconnect and remove the upper return springs (A).



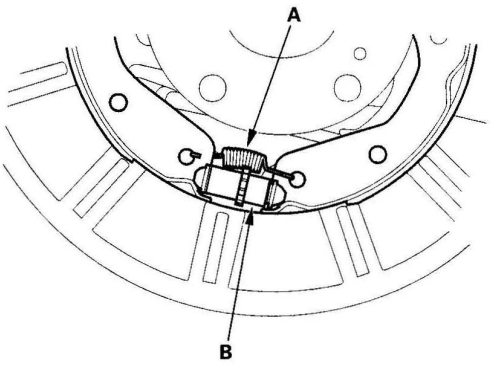
4. Remove the tension pins (A) by pushing and turning the retainers (B).



5. Remove the connecting rod (A).



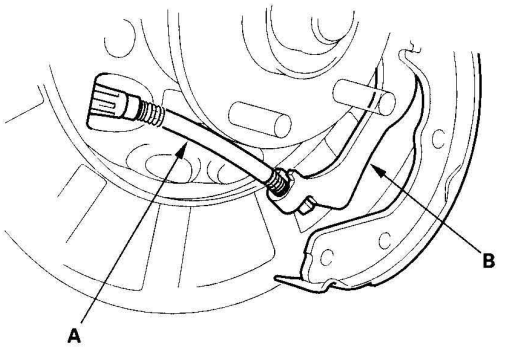
6. Lower the parking brake shoe assembly.
7. Remove the forward brake shoe by removing the lower return spring (A) and adjuster assembly (B).



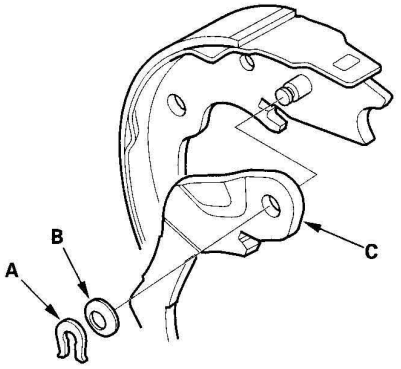
BACK

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8. Remove the rearward brake shoe by disconnecting the parking brake cable (A) from the parking brake lever (B).

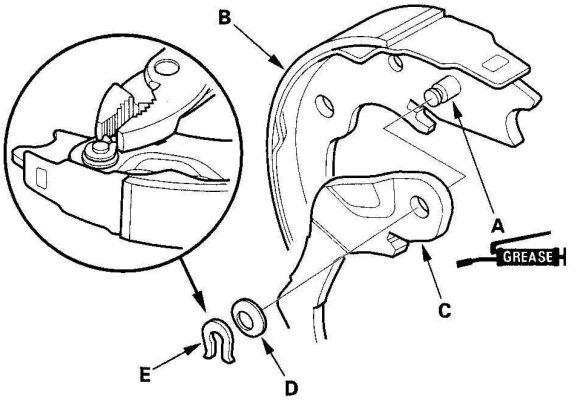


9. Remove the U-clip (A), wave washer (B), and parking brake lever (C) from the brake shoe.



Reassembly

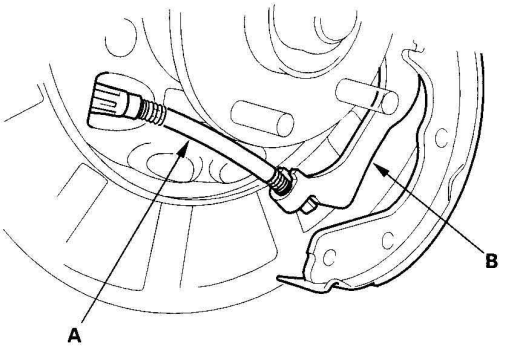
1. Apply Molykote 44 MA grease to the sliding surface of the pivot pin (A) of the rearward brake shoe (B).



2. Install the parking brake lever (C) and wave washer (D) on the pivot pin, and secure with a new U-clip (E).

   - Install the wave washer with its convex side facing out.
   - Pinch the U-clip securely to prevent the parking brake lever from coming out from the brake shoe.

3. Connect the parking brake cable (A) to the parking brake lever (B).

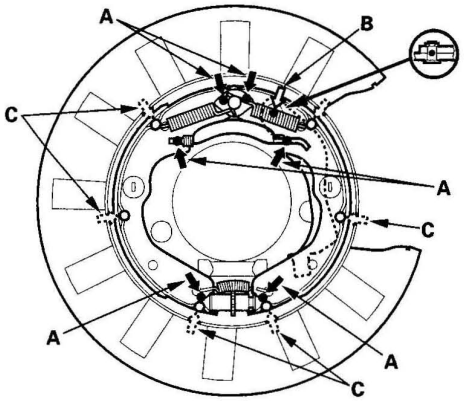


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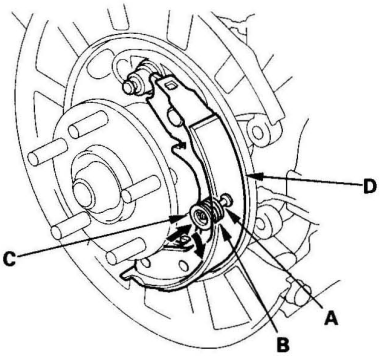
Parking Brake Shoes Replacement (cont'd)

4. Apply Molykote 44 MA grease to the shoe ends and connecting rod ends (A), sliding surfaces (B), and opposite edges of the parking brake shoe (C) as shown. Wipe off any excess. Keep grease off the brake linings.

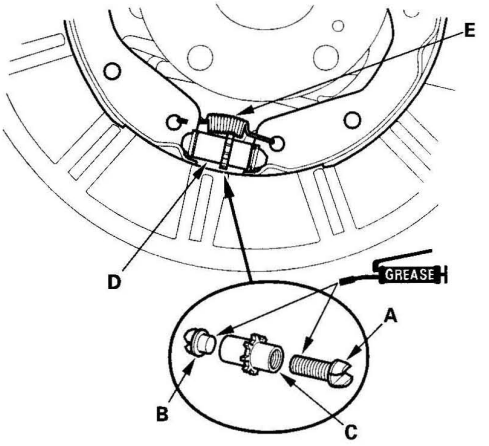


Greasing symbols:
- **Brake shoe ends and connecting rod ends**
- **Opposite edge of the shoe**
- **Sliding surface**

5. Install the tension pin (A), retainer spring (B), and retainer (C) of the rearward brake shoe (D). Make sure the tension pin does not contact the parking brake lever.

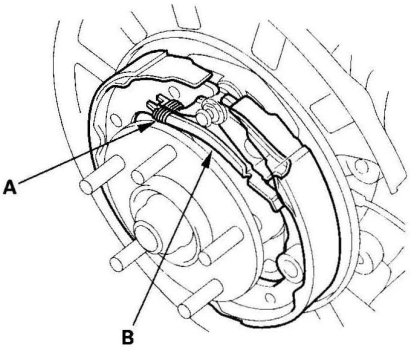


6. Clean the threaded portions of clevis A, and coat the threads of clevis A with grease. Clean the sliding surface of clevis B, and coat the sliding surface of clevis B with grease. Install clevis A and B on the adjuster (C), and shorten clevis A by turning the adjuster.



7. Reinstall the brake shoe adjuster assembly (D), and hook the lower return spring (E) on the parking brake shoes.

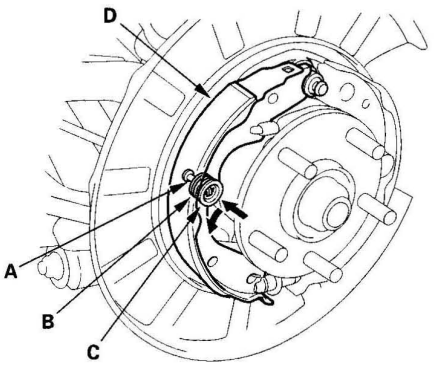
8. Install the rod spring (A) to the connecting rod (B) first. Then install the connecting rod on the parking brake shoes.



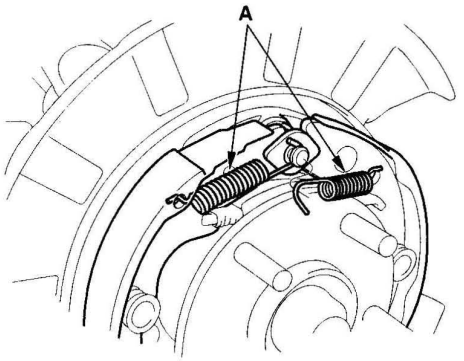
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9. Install the tension pin (A), retainer spring (B), and retainer (C) of the forward brake shoe (D).



10. Install the upper return springs (A).



11. Install the rear brake disc/drum and rear brake caliper.

12. Adjust the parking brake (see page 19-5).

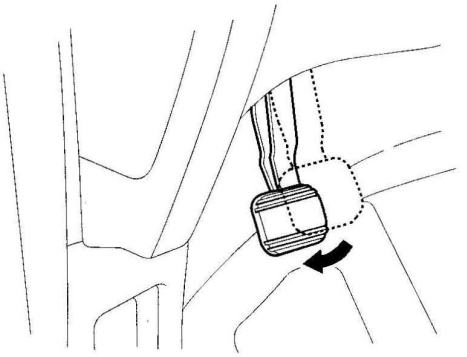
Parking Brake Shoe Lining Break-in

NOTE: Do brake linings surface break-in when replacing shoes with new linings and/or new rear brake disc/drum.

⚠ WARNING

Do this operation in a safe area.

1. Park the vehicle on a firm, level surface.
2. Do the major parking brake adjustment (see page 19-5).
3. Do the minor parking brake adjustment (see page 19-5).
4. Press the parking brake pedal two to four clicks.



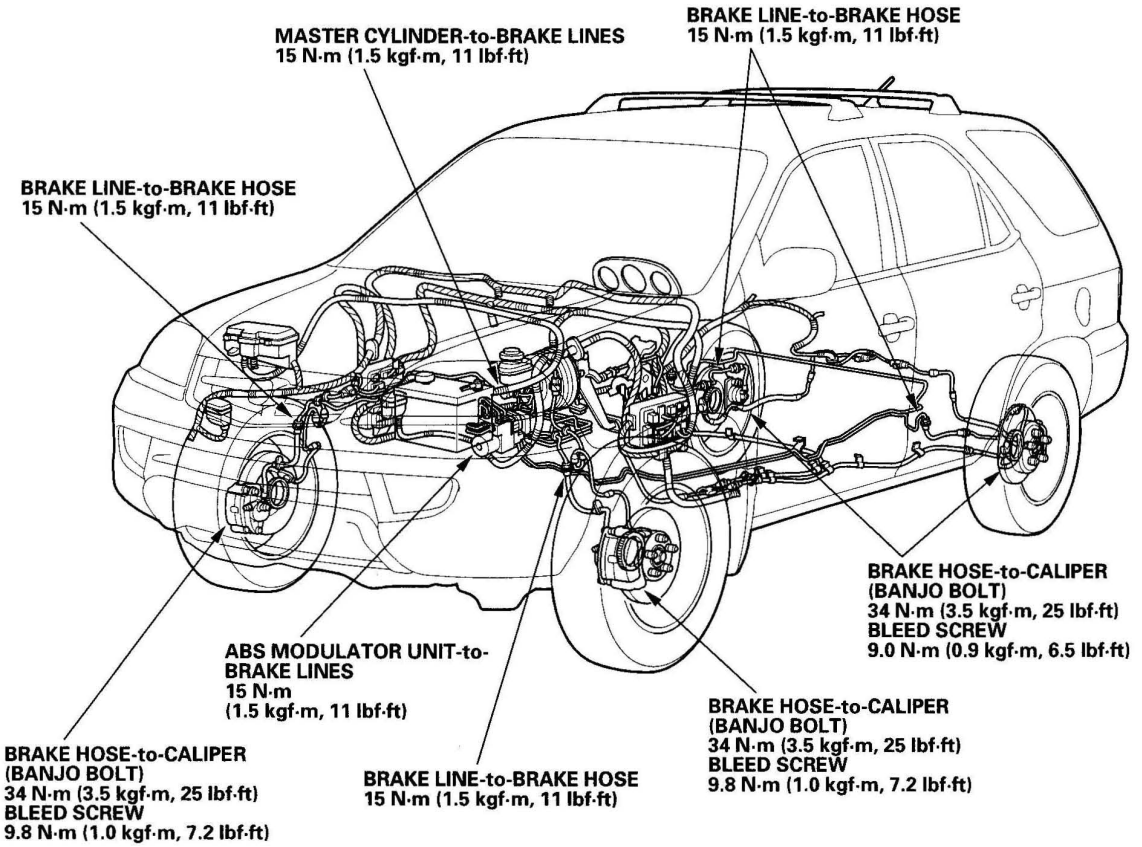
5. Drive the vehicle for 400 m (1/4 mile) at no more than 31 mph (50 km/h).
6. Stop the vehicle, and release the parking brake for 5-10 minutes to allow the drums to cool.
7. Repeat steps 4 through 6 three more times.
8. Check the parking brake pedal adjustment (see page 19-5).

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Brake Hoses and Lines Inspection

1. Inspect the brake hoses for damage, deterioration, leaks, interference, and twisting.
2. Check the brake lines for damage, rusting, and leaks. Also check for bent brake lines.
3. Check for leaks at hose and line joints and connections, and retighten if necessary.
4. Check the master cylinder and ABS modulator unit for damage and leaks.

   NOTE: Replace the brake hose clip whenever the brake hose is serviced.



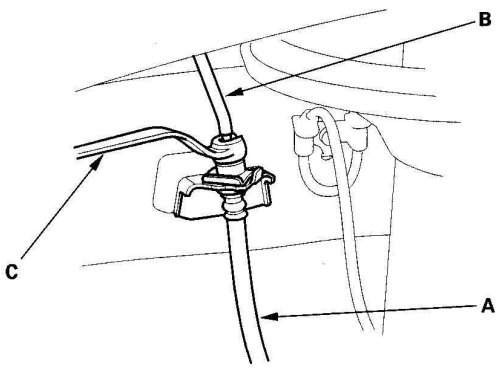
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Brake Hose Replacement

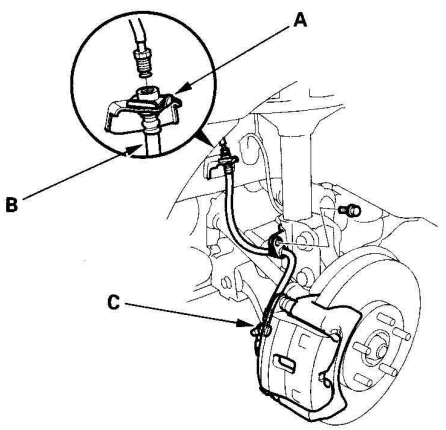
NOTE:
- Before reassembling, check that all parts are free of dirt and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.

1. Replace the brake hose (A) if the hose is twisted, cracked, or if it leaks.



2. Disconnect the brake hose from the brake line (B) using a 10 mm flare-nut wrench (C).

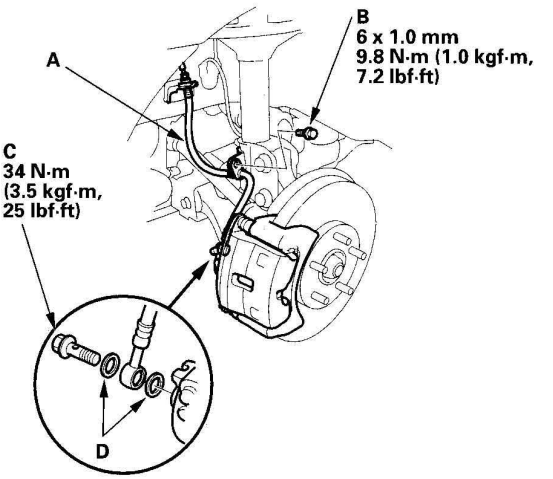
3. Remove and discard the brake hose clip (A) from the brake hose (B).



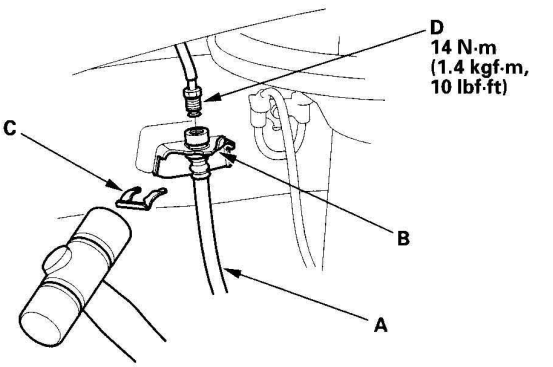
4. Remove the banjo bolt (C), and disconnect the brake hose from the caliper.

5. Remove the brake hose from the damper.

6. Install the brake hose (A) on the damper with flange bolt (B) first, then connect the brake hose to the caliper with the banjo bolt (C) and new sealing washers (D).



7. Install the brake hose (A) on the upper brake hose bracket (B) with a new brake hose clip (C).



8. Connect the brake line (D) to the brake hose.

9. After installing the brake hose, bleed the brake system (see page 19-6).

10. Do the following checks:

    - Check the brake hose and line joint for leaks, and tighten if necessary.
    - Check the brake hoses for interference and twisting.

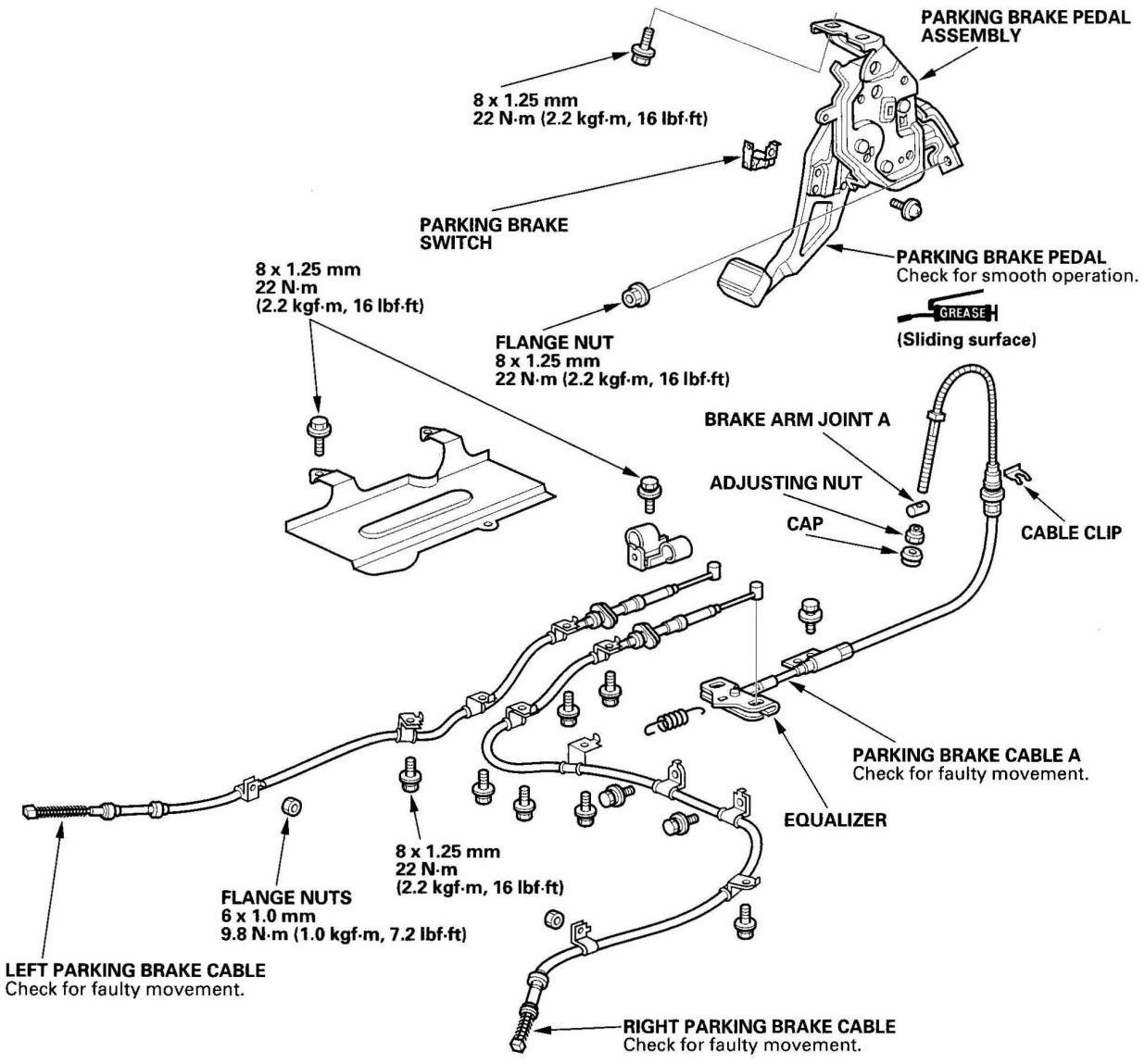
BACK

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Conventional Brake Components

Parking Brake Cable Replacement

Exploded View



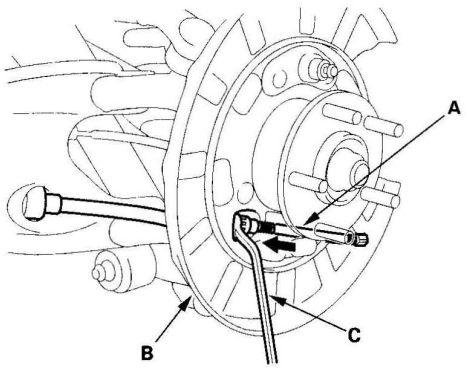
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NOTE: The parking brake cable must not be bent or distorted. This will lead to stiff operation and premature cable failure. Refer to the Exploded View as needed during this procedure.

1. Remove the parking brake shoes, and disconnect the parking brake cable from the brake shoe (see page 19-22).

2. Remove the parking brake cable (A) from the backing plate (B) using a 12 mm offset wrench (C).



3. Install the parking brake cable in the reverse order of removal, and adjust the parking brake (see page 19-5). Apply the parking brake firmly 10 times, then adjust it again.

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Brakes

Conventional Brake Components 19-1

ABS (Anti-lock Brake System) Components

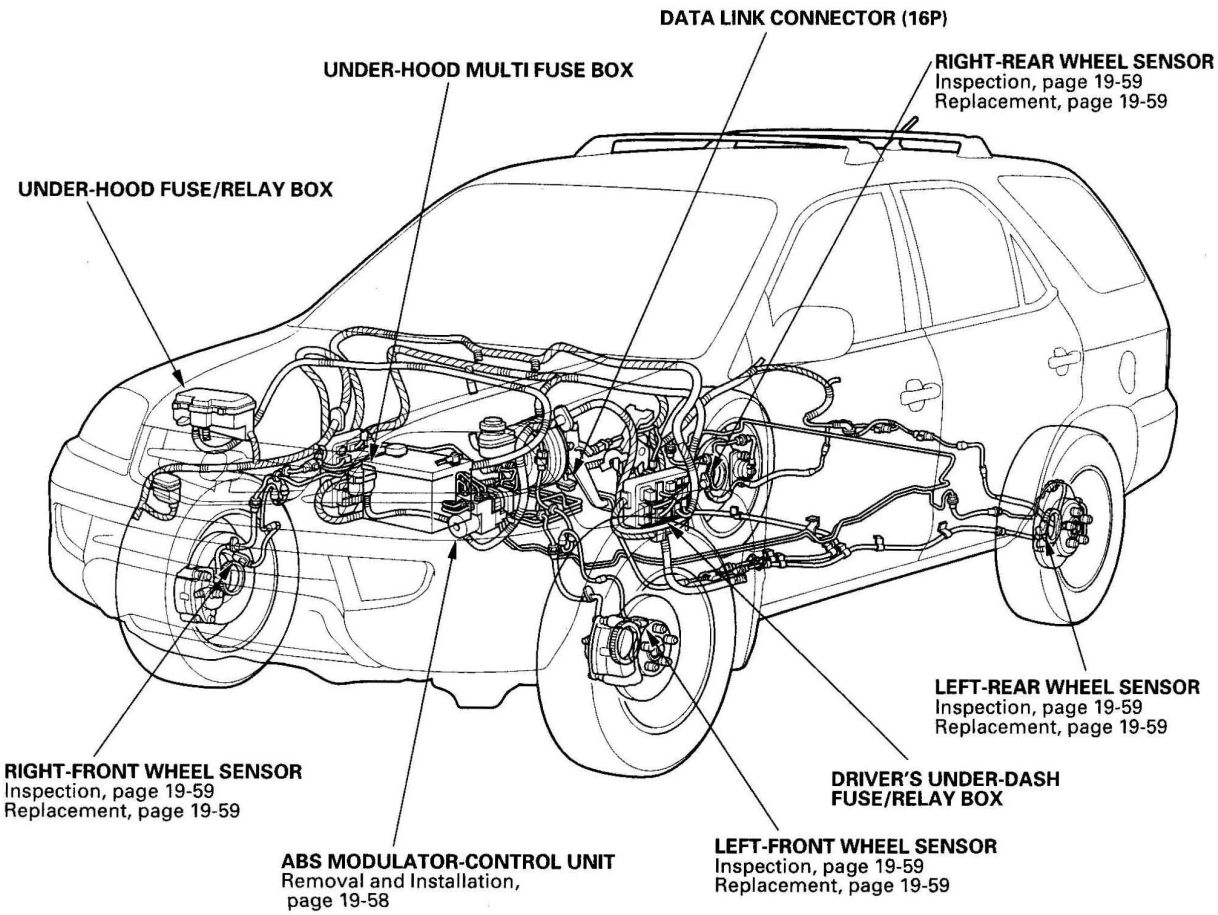
Component Location Index 19-32
General Troubleshooting Information 19-33
DTC Troubleshooting Index 19-37
Symptom Troubleshooting Index 19-38
System Description 19-39
Circuit Diagram 19-45
DTC Troubleshooting 19-47
ABS Indicator Circuit Troubleshooting 19-53
Brake System Indicator Circuit Troubleshooting 19-56
ABS Modulator-Control Unit Removal and Installation 19-58
Wheel Sensor Inspection 19-59
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ABS Components

Component Location Index



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General Troubleshooting Information

ABS Indicator

- If the system is OK, the ABS indicator goes off 2 seconds after turning the ignition switch ON (II) without starting the engine, and then comes on again and goes off 2 seconds later after starting the engine. This occurs because the ABS control unit is turned on by the IG2 power source.
- The ABS indicator comes on when the ABS control unit detects a problem in the system. However, even though the system is operating properly, the indicator will come on under these conditions:
  - Only the drive wheels rotate
  - One drive wheel is stuck
  - The vehicle goes into a spin
  - The ABS continues to operate for a long time.
  - The vehicle is subjected to an electrical signal disturbance.

To determine the actual cause of the problem, question the customer about the problem, taking the above-listed conditions into consideration.

- When a problem is detected and the ABS indicator comes on, there are cases when the indicator stays on until the ignition switch is turned OFF, and cases when the indicator goes off automatically when the system returns to normal.
  - DTC 61: The ABS indicator goes off automatically when the system returns to normal.
  - DTC 11, 13, 15, 17, 31, 32, 33, 34, 35, 36, 37, 38, 54, or 81: The ABS indicator stays on until the ignition switch is turned OFF whether or not the system returns to normal.
  - DTC 12, 14, 16, 18, 21, 51, 52, or 53: The ABS indicator goes off when the vehicle is driven again and the system is OK after the ignition switch is turned from OFF to ON (II).

Diagnostic Trouble Code (DTC)

- The memory can hold three DTCs. However, when the same DTC is detected more than once, the more recent DTC is written over the earlier one. Therefore, when the same problem is detected repeatedly, it is memorized as a single DTC.
- The DTCs are indicated in the order they occurred, beginning with the most recent.
- The DTCs are memorized in the EEPROM (non-volatile memory). Therefore, the memorized DTCs are not cleared when the battery is disconnected, the ignition switch is turned off, or the system returns to normal. Do the specified procedures to clear the DTCs.

Self-diagnosis

- Self-diagnosis can be classified into two categories:
  - Initial diagnosis:
    Done right after the engine starts and until the ABS indicator goes off.
  - Regular diagnosis:
    Done right after the initial diagnosis until the ignition switch is turned OFF.
- When a problem is detected by self-diagnosis, the system does the following:
  - Turns the ABS indicator on.
  - Memorizes the DTC
  - Stops ABS control

Kickback

The pump motor operates when the ABS is functioning, and the fluid in the reservoir is forced out to the master cylinder, causing kickback at the brake pedal.

Pump Motor

- The pump motor operates when the ABS is functioning.
- The ABS control unit checks the pump motor operation when the vehicle is started the first time after the ignition switch is turned ON (II). You may hear the motor operate at this time, but it is normal.

How to Troubleshoot ABS DTCs

The troubleshooting flowchart procedures assume that the cause of the problem is still present and the ABS indicator is still on. Following the flowchart when the ABS indicator does not come on can result in incorrect diagnosis. The connector illustrations show the female terminal connectors with a single outline and the male terminal connectors with a double outline.

1. Question the customer about the conditions when the problem occured, and try to reproduce the same conditions for troubleshooting. Find out when the ABS indicator came on, such as during ABS control, after ABS control, when the vehicle was at a certain speed, etc.

2. When the ABS indicator does not come on during the test-drive, but troubleshooting is done based on the DTC, check for loose connectors, poor terminal contact, etc., before you start troubleshooting.

3. After troubleshooting, clear the DTC, and test-drive the vehicle. Make sure the ABS indicator does not come on.

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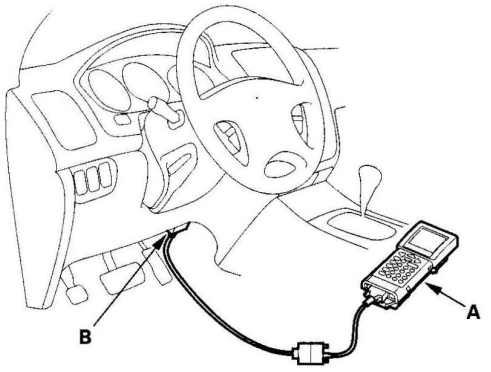
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General Troubleshooting Information (cont'd)

How to Retrieve ABS DTCs

Honda PGM Tester Method:

1. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P Data Link Connector (DLC) (B) under the driver's side of the dashboard.

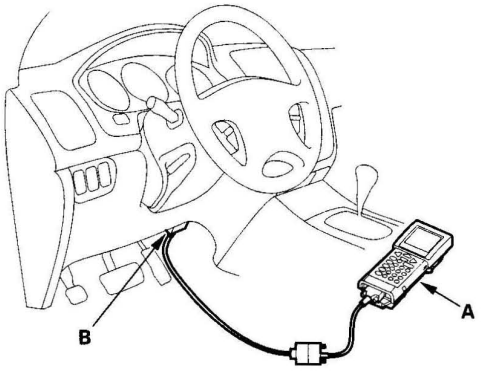


2. Turn the ignition switch ON (II), and follow the prompts on the Honda PGM Tester to display the DTC(s) on the screen. After determining the DTC, refer to the DTC Troubleshooting Index.

   NOTE: See the Honda PGM Tester user's manual for specific instructions.

Service Check Signal (SCS) Circuit Method:

1. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P Data Link Connector (DLC) (B) under the driver's side of the dashboard.



2. Short the SCS circuit to body ground using the Honda PGM Tester.

3. Turn the ignition switch ON (II) without pressing the brake pedal.

   NOTE: If you press the brake pedal when turning the ignition switch ON (II), the system shifts to the DTC clearing mode.

BACK

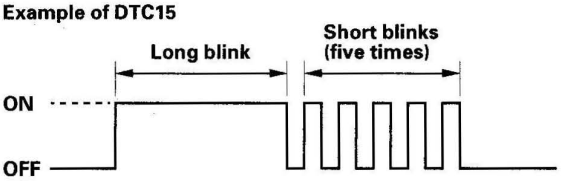
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4. The blinking frequency indicates the DTC. DTCs are indicated by a series of long and short blinks. One long blink equals 10 short blinks. Add the long and short blinks together to determine the DTC. After determining the DTC, refer to the DTC Troubleshooting Index.

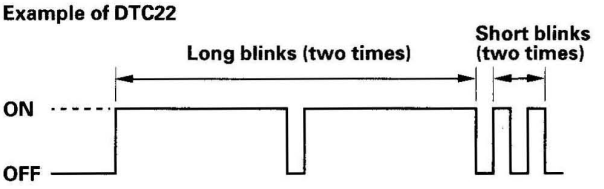
   NOTE:
   - If the DTC is not memorized, the ABS indicator will go off for 3.6 seconds, and then come back on.
   - If the ABS indicator stays on, troubleshoot for "ABS indicator does not go off" (see step 1 on page 19-54).

   The system will not indicate the DTC unless these conditions are met:
   - The brake pedal is not pressed.
   - The ignition switch is turned ON (II).
   - The SCS circuit is shorted to body ground before the ignition switch is turned ON (II).

Example of DTC15



Example of DTC22



5. Turn the ignition switch OFF.

6. Disconnect the Honda PGM Tester from the DLC.

(cont'd)

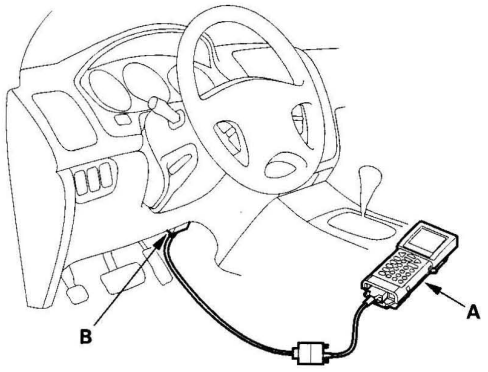
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General Troubleshooting Information (cont'd)

How to Clear ABS DTCs

Honda PGM Tester Method:

1. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P Data Link Connector (DLC) (B) under the driver's side of the dashboard.



2. Turn the ignition switch ON (II), and clear the DTC (s) by following the screen prompts on the Honda PGM Tester.

   NOTE: See the Honda PGM Tester user's manual for specific instructions.

Cycling the Ignition Switch Method:

Clear the DTC by turning the ignition switch ON (II) then OFF at least 20 times.

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DTC Troubleshooting Index

DTC	Detection Item	Note
DTC:11	Right-front wheel sensor (open/short to body ground/short to power)	(see page 19-47)
DTC:12	Faulty right-front wheel sensor pulse signal	(see page 19-48)
DTC:13	Left-front wheel sensor (open/short to body ground/short to power)	(see page 19-47)
DTC:14	Faulty left-front wheel sensor pulse signal	(see page 19-48)
DTC:15	Right-rear wheel sensor (open/short to body ground/short to power)	(see page 19-47)
DTC:16	Faulty right-rear wheel sensor pulse signal	(see page 19-48)
DTC:17	Left-rear wheel sensor (open/short to body ground/short to power)	(see page 19-47)
DTC:18	Faulty left-rear wheel sensor pulse signal	(see page 19-48)
DTC:21	Continuous operation (chipped pulser)	(see page 19-49)
DTC:31	Solenoid	(see page 19-50)
DTC:32	Solenoid	(see page 19-50)
DTC:33	Solenoid	(see page 19-50)
DTC:34	Solenoid	(see page 19-50)
DTC:35	Solenoid	(see page 19-50)
DTC:36	Solenoid	(see page 19-50)
DTC:37	Solenoid	(see page 19-50)
DTC:38	Solenoid	(see page 19-50)
DTC:51	Motor lock	(see page 19-50)
DTC:52	Motor stuck off	(see page 19-51)
DTC:53	Motor stuck on	(see page 19-51)
DTC:54	Main relay stuck off	(see page 19-52)
DTC:61	Ignition voltage	(see page 19-52)
DTC:81	CPU (Central Processing Unit)	(see page 19-53)

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Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
ABS indicator does not come on	ABS indicator circuit troubleshooting (see page 19-53)	
ABS indicator does not go off and no DTC is stored	ABS indicator circuit troubleshooting (see step 1 on page 19-54)	
Brake system indicator does not come on	Brake system indicator circuit troubleshooting (see page 19-56)	
Brake system indicator does not go off and no DTC is stored	Brake system indicator circuit troubleshooting (see step 1 on page 19-54)	

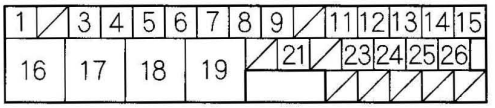
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System Description

ABS Control Unit Inputs and Outputs for 31P Connector

ABS CONTROL UNIT 31P CONNECTOR



Wire side of female terminals

Terminal number	Wire color	Terminal sign (Terminal name)	Description	Measurement			
				Terminals	Conditions (Ignition switch ON (II))		Voltage
1	BLU/YEL	RRS (−) (Rear-right signal negative)	Detects right-rear wheel sensor signal	1−3	Wheel	Spin wheel at 1 turn/second	AC: 0.053 V or above Oscilloscope 0.15 Vp-p or above
3	GRN/YEL	RRS (+) (Rear-right signal positive)					
4	GRN	FRS (−) (Front-right signal negative)	Detects right-front wheel sensor signal	4−5			
5	GRN/BLK	FRS (+) (Front-right signal positive)					
6	BRN/BLK	FLS (−) (Front-left signal negative)	Detects left-front wheel sensor signal	6−7			
7	GRN/BLU	FLS (+) (Front-left signal positive)					
8	PNK	RLS (−) (Rear-left signal negative)	Detects left-rear wheel sensor signal	8−9		Stops	About 2.5 V
9	PNK/BLK	RLS (+) (Rear-left signal positive)					
11	GRY	DIAG-K (Diagnosis K)	Communicates with the Honda PGM Tester	———	———		———
12	BRN	DIAG-L (Diagnosis L)	DTC indication	———	———		———

(cont'd)

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System Description (cont'd)

Terminal number	Wire color	Terminal sign (Terminal name)	Description	Measurement			
				Terminals	Conditions (Ignition switch ON (II))		Voltage
13	BLU/WHT	ABS	Drives ABS indicator	13—GND	ABS indicator	ON	About 5 V
						OFF	Below 1 V
14	WHT/BLK	STOP	Detects brake pedal position switch signal	14—GND	Brake pedal	Pressed	Battery voltage
						Released	0 V
15	ORN	IG2	Power source for activating the system	15—GND	——		Battery voltage
16	BLK	M-GND (Motor ground)	Ground for the pump motor	16—GND	——		Below 0.3 V
17	WHT	+B-MR (+B motor relay)	Power source for the pump motor	17—GND	At all times		Battery voltage
18	WHT/GRN	+B-FSR (+B fail-safe relay)	Power source for the valve relay	18—GND	At all times		Battery voltage
19	BLK	GND	Ground for the modulator assembly	19—GND	——		Below 0.3 V
21	YEL/WHT	EBD (Electronic brake distribution)	Drives brake system indicator	21—GND	Engine running, parking brake	Pressed	Below 0.3 V
						Released	Battery voltage
23	GRY/YEL	RLP (Rear-left pulse)	Outputs left-rear wheel sensor signal	——	——		——
24	GRY/RED	RRP (Rear-right pulse)	Outputs right-rear wheel sensor signal				
25	WHT/RED	FLP (Front-left pulse)	Outputs left-front wheel sensor signal				
26	LT GRN	FRP (Front-right pulse)	Outputs right-front wheel sensor signal				

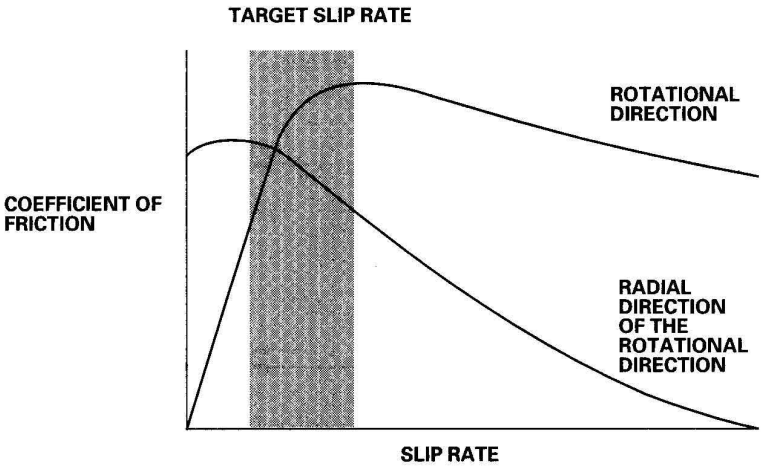
BACK

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Features

When the brake pedal is pressed during driving, the wheels can lock before the vehicle comes to a stop. In such an event, the maneuverability of the vehicle is reduced if the front wheels are locked, and the stability of the vehicle is reduced if the rear wheels are locked, creating an extremely unstable condition. The ABS precisely controls the slip rate of the wheels to ensure maximum grip force from the tires, thereby ensures maneuverability and stability of the vehicle.
The ABS calculates the slip rate of the wheels based on the vehicle speed and the wheel speed, then it controls the brake fluid pressure to reach the target slip rate.

Grip Force of Tire and Road Surface



(cont'd)

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ABS Components

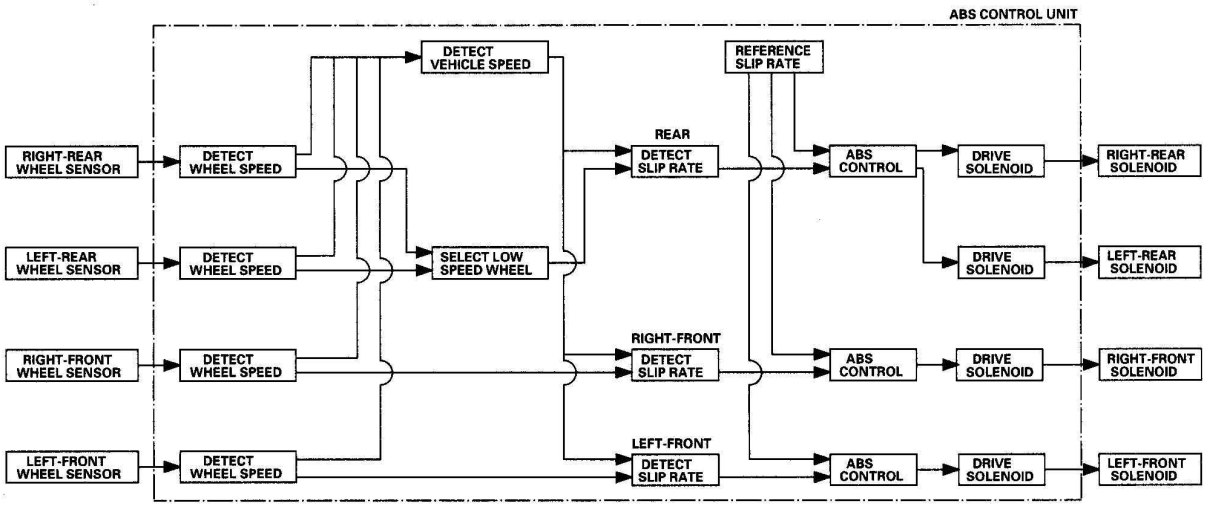
System Description (cont'd)

ABS Control Unit

Main Control
The ABS control unit detects the wheel speed based on the wheel sensor signal it received, then it calculates the vehicle speed based on the detected wheel speed. The control unit detects the vehicle speed during deceleration based on the rate of deceleration.

The ABS control unit calculates the slip rate of each wheel and transmits the control signal to the modulator unit solenoid valve when the slip rate is high.

The pressure reduction control has three modes: pressure reducing, pressure retaining, and pressure intensifying.



Electronic Brake Distribution (EBD) Control
The electronic brake distribution (EBD) function helps control vehicle braking by adjusting the rear brake force before the ABS operates. Based on wheel sensor signals, the ABS control unit uses the modulator to control the rear brakes individually. When the rear wheel speed is less than the front wheel speed, the ABS control unit retains the current rear brake fluid pressure by closing the inlet valve in the modulator. As the rear wheel speed increases and approaches the front wheel speed, the control unit increases the rear brake fluid pressure by momentarily opening the inlet valve. This whole process is repeated very rapidly. While this is happening, there is kickback at the brake pedal.

During self-diagnosis, if the ABS control unit detects a problem that affects the EBD, it turns on the brake system indicator and the ABS indicator.

Self-diagnosis Function
1. The ABS control unit is equipped with a main CPU and a sub-CPU. Each CPU checks the other for problems.
2. The CPUs check the circuit of the system.
3. The ABS control unit turns on the ABS indicator when the unit detects a problem and the unit stops the system.
4. The self-diagnosis can be classified into these two categories:
   - Initial diagnosis
   - Regular diagnosis

On-board Diagnosis Function
The ABS can be diagnosed with the Honda PGM Tester.
The ALB Checker cannot be used with this system. For air bleeding and checking wheel sensor signals, use the Honda PGM Tester. See the Honda PGM Tester user's manual for specific operating instructions.

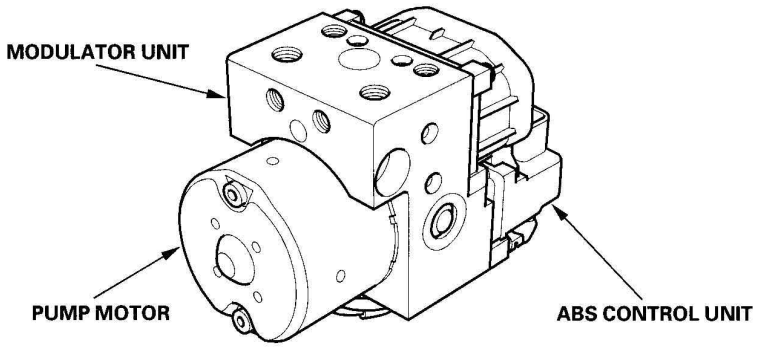
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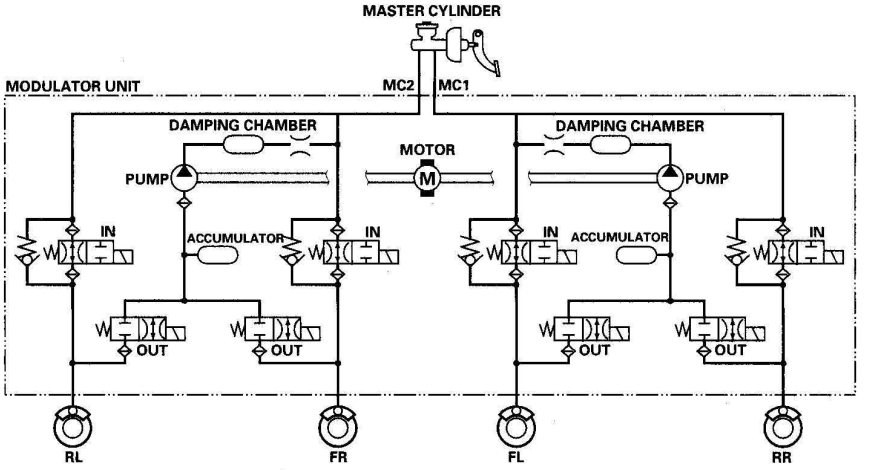
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ABS Modulator

The ABS modulator consists of the inlet solenoid valve, outlet solenoid valve, reservoir, pump, pump motor, and the damping chamber. The modulator reduces the caliper fluid pressure directly. It is a circulating-type modulator because the brake fluid circulates through the caliper, reservoir, and the master cylinder. The hydraulic control has three modes: pressure intensifying, pressure retaining, and pressure reducing. The hydraulic circuit is an independent four-channel type, one channel for each wheel.

ABS MODULATOR-CONTROL UNIT





IN: INLET VALVE (NORMALLY OPEN)
OUT: OUTLET VALVE (NORMALLY CLOSED)

Pressure intensifying mode: Inlet valve open, outlet valve closed
Master cylinder fluid is pumped out to the caliper.

Pressure retaining mode: Inlet valve closed, outlet valve closed
Caliper fluid is retained by the inlet valve and outlet valve.

Pressure reducing mode: Inlet valve closed, outlet valve open
Caliper fluid flows through the outlet valve to the reservoir.

Motor operation mode: When starting the pressure reducing mode, the pump motor is ON.
When stopping ABS operation, the pump motor is OFF.
The reservoir fluid is pumped out by the pump, through the damping chamber, to the master cylinder.

(cont'd)

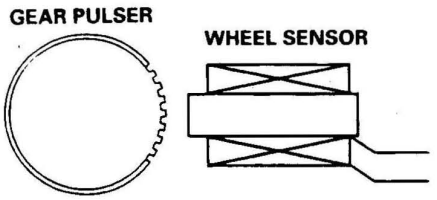
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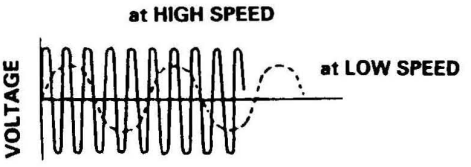
ABS Components

System Description (cont'd)

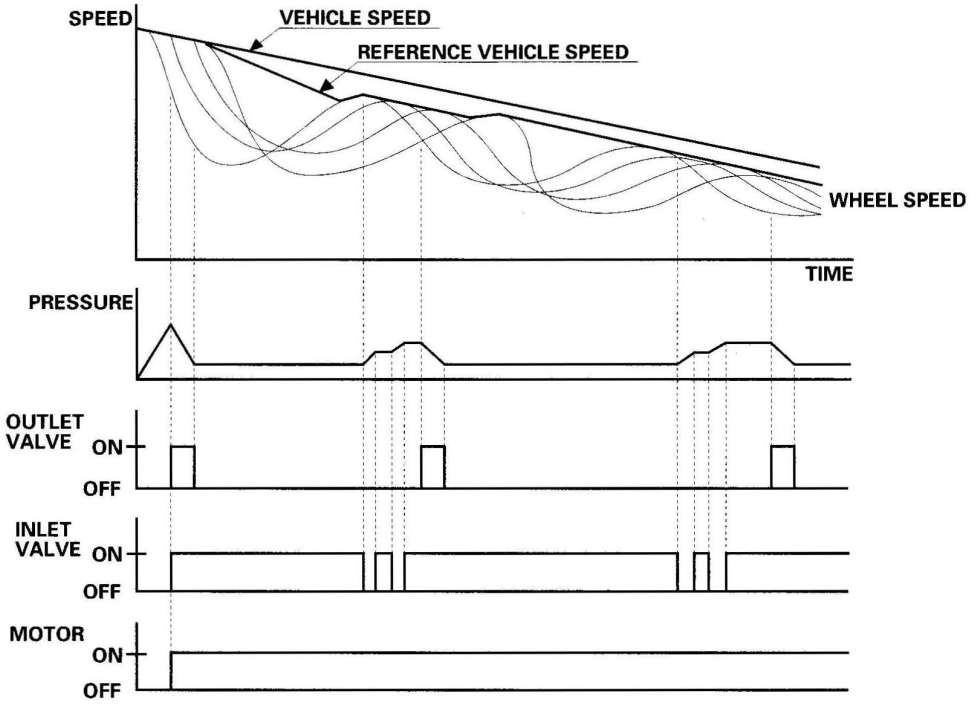
Wheel Sensors

The wheel sensors are the magnetic contactless type. As the gear pulser teeth rotate past the wheel sensor's magnetic coil, AC current is generated. The AC frequency changes in accordance with the wheel speed. The ABS control unit detects the wheel sensor signal frequency and thereby detects the wheel speed.





Wheel Speed and Modulator Control

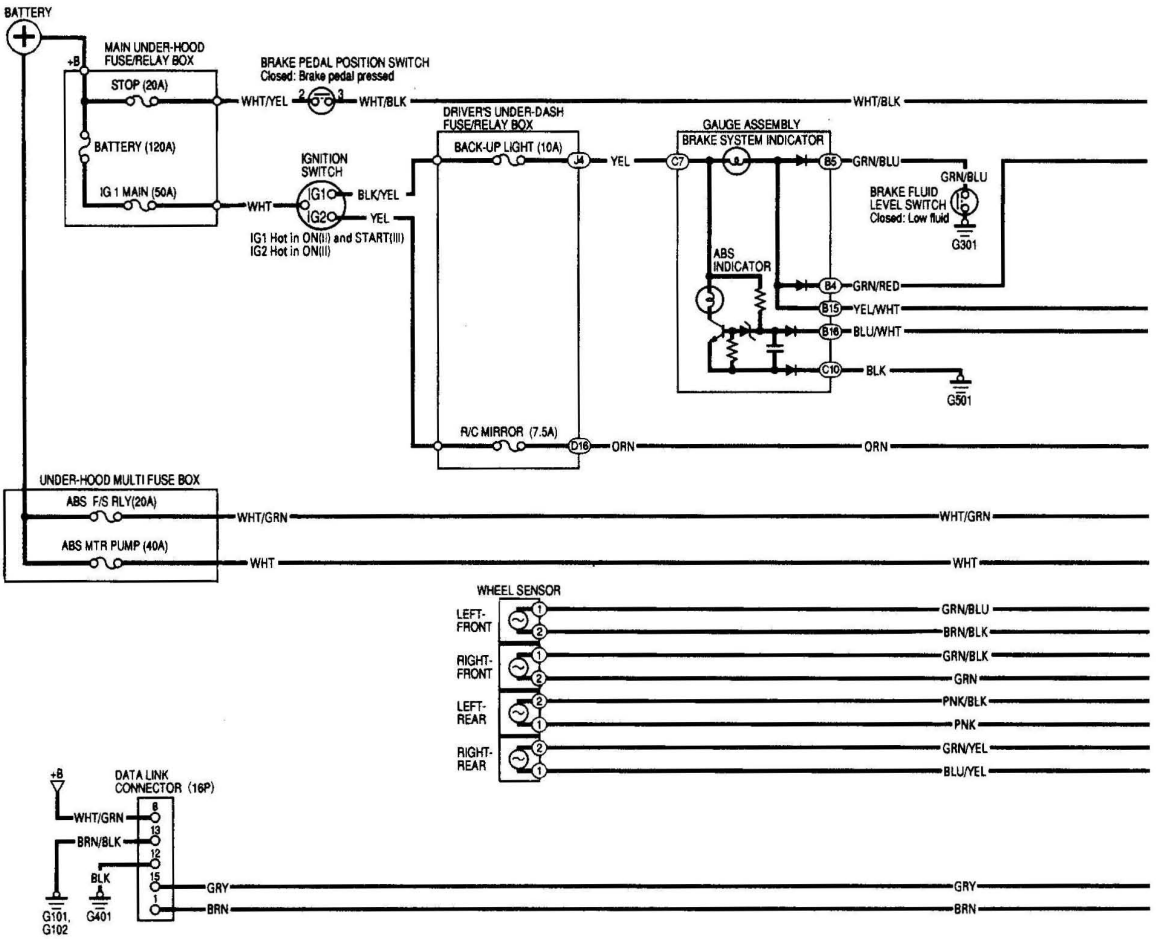


When the wheel speed drops sharply below the vehicle speed, the outlet valve opens momentarily to reduce the caliper fluid pressure. The pump motor starts at this time. As the wheel speed is restored, the inlet valve opens momentarily to increase the caliper fluid pressure.

BACK

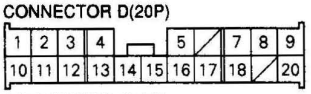
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Circuit Diagram

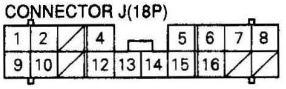


DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTORS

CONNECTOR D(20P)



CONNECTOR J(18P)

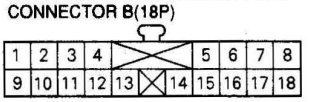


BRAKE SWITCH 4P CONNECTOR

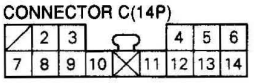


GAUGE ASSEMBLY CONNECTORS

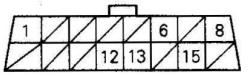
CONNECTOR B(18P)



CONNECTOR C(14P)



DATA LINK CONNECTOR (16P)



Wire side of female terminals

WHEEL SENSOR CONNECTORS

FRONT



Terminal side of male terminals

REAR



Wire side of female terminals

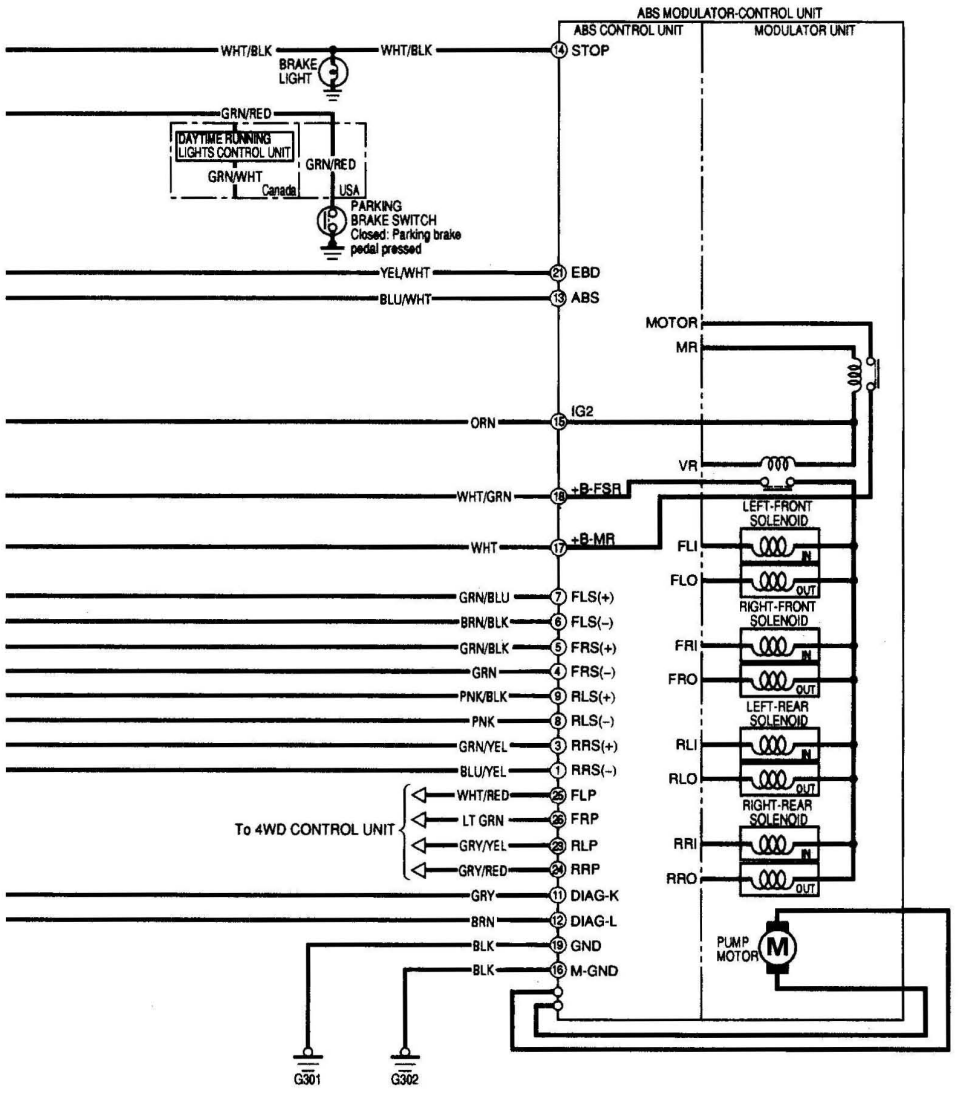
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BACK

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ABS Components

Circuit Diagram (cont'd)



BACK

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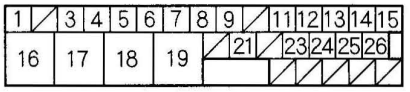
DTC Troubleshooting

DTC 11, 13, 15, 17: Wheel Sensor (Open/Short to Body Ground/Short to Power)

1. Disconnect the ABS control unit 31P connector.
2. Start the engine.
3. Measure the voltage between the appropriate wheel sensor (+) circuit terminal of the ABS control unit 31P connector and body ground (see table).

DTC	Appropriate Terminal
11 (Right-front)	No. 5: FRS (+)
13 (Left-front)	No. 7: FLS (+)
15 (Right-rear)	No. 3: RRS (+)
17 (Left-rear)	No. 9: RLS (+)

ABS CONTROL UNIT 31P CONNECTOR



Wire side of female terminals

Is there battery voltage?

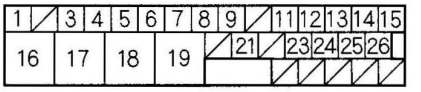
YES—Repair short to power in the (+) circuit wire between the ABS modulator-control unit and the appropriate wheel sensor. ■

NO—Go to step 4.

4. Turn the ignition switch OFF.
5. Check for continuity between the appropriate wheel sensor (+) circuit terminal and body ground (see table).

DTC	Appropriate Terminal
11 (Right-front)	No. 5: FRS (+)
13 (Left-front)	No. 7: FLS (+)
15 (Right-rear)	No. 3: RRS (+)
17 (Left-rear)	No. 9: RLS (+)

ABS CONTROL UNIT 31P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 6.

NO—Go to step 7.

6. Disconnect the harness 2P connector from the appropriate wheel sensor, then check for continuity between the (+) and (−) terminals of the harness and body ground.

Is there continuity?

YES—Repair short to body ground in the (+) or (−) circuit wire between the ABS modulator-control unit and the wheel sensor. ■

NO—Replace the wheel sensor (see page 19-59). ■

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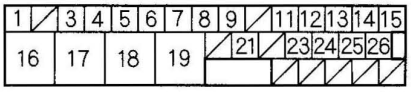
Protected by AR

DTC Troubleshooting (cont'd)

7. Check the resistance between the appropriate wheel sensor (+) and (−) circuit terminals (see table).

DTC	Appropriate Terminal	
	(+) Side	(−) Side
11 (Right-front)	No. 5: FRS (+)	No. 4: FRW (−)
13 (Left-front)	No. 7: FLS (+)	No. 6: FLW (−)
15 (Right-rear)	No. 3: RRS (+)	No. 1: RRW (−)
17 (Left-rear)	No. 9: RLS (+)	No. 8: RLW (−)

ABS CONTROL UNIT 31P CONNECTOR



Wire side of female terminals

Is there 450−2,000 Ω ?

YES−Check for loose ABS control unit 31P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck. ■

NO−Go to step 8.

8. Disconnect the harness 2P connector from the appropriate wheel sensor, and check the resistance between the (+) and (−) terminals of the wheel sensor.

Is there 450−2,000 Ω ?

YES−Repair open in the (+) or (−) circuit wire, or short between the (+) circuit wire and the (−) circuit wire between the ABS modulator-control unit and the wheel sensor. ■

NO−Replace the wheel sensor (see page 19-59). ■

DTC 12, 14, 16, 18: Wheel Sensor Pulse Signal

NOTE: If the ABS indicator comes on for the reasons described below, the indicator goes off when you test-drive the vehicle at 31 mph (50 km/h).

- Only the drive wheel rotated
- The vehicle spun
- Electrical noise

1. Visually check for appropriate wheel sensor and pulser installation (see table).

DTC	Appropriate Wheel Sensor
12	Right-front
14	Left-front
16	Right-rear
18	Left-rear

Are they installed correctly?

YES−Go to step 2.

NO−Reinstall or replace the appropriate wheel sensor or pulser. ■

2. Disconnect the ABS control unit 31P connector.

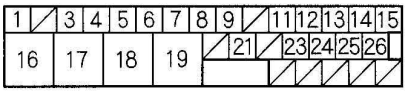
BACK

Protected by AR

3. Measure the resistance between the appropriate wheel sensor (+) and (−) circuit terminals (see table).

DTC	Appropriate Terminal	
	(+) Side	(−) Side
12 (Right-front)	No. 5: FRS (+)	No. 4: FRS (−)
14 (Left-front)	No. 7: FLS (+)	No. 6: FLS (−)
16 (Right-rear)	No. 3: RRS (+)	No. 1: RRS (−)
18 (Left-rear)	No. 9: RLS (+)	No. 8: RLS (−)

ABS CONTROL UNIT 31P CONNECTOR



Wire side of female terminals

Is there less than 450 Ω ?

YES—Repair short to wire between the appropriate wheel sensor (+) and (−) circuits. ■

NO—Go to step 4.

4. Check for continuity between the appropriate wheel sensor (+) circuit terminal and other wheel sensor (+) circuit terminals (see table).

DTC	Appropriate Terminal	Other Terminal		
12	No. 5: FRW (+)	No. 7	No. 3	No. 9
14	No. 7: FLW (+)	No. 5	No. 3	No. 9
16	No. 3: RRW (+)	No. 5	No. 7	No. 9
18	No. 9: RLW (+)	No. 5	No. 7	No. 3

Is there continuity?

YES—Repair short to wire between the appropriate wheel sensor and the other wheel sensor. ■

NO—Clear the DTC (see page 19-36), and test-drive the vehicle. If the ABS indicator comes on and the same DTC is indicated, replace the ABS modulator-control unit (see page 19-58). ■

DTC 21: Continuous Operation (Chipped Pulser)

1. Clear the DTC (see page 19-36).
2. Test-drive the vehicle at 19 mph (30 km/h) or more.

   Does the ABS indicator come on and is DTC 21 indicated?

   YES—Go to step 3.

   NO—The system is OK at this time. ■
3. Check the pulser gear for a chipped tooth.

   Is the pulser OK?

   YES—Check for a loose ABS control unit 31P connector. If necessary, substitute a known-good ABS modulator control unit, and recheck. ■

   NO—Replace the driveshaft. (Chipped pulser gear) ■

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DTC Troubleshooting (cont'd)

DTC 31, 32, 33, 34, 35, 36, 37, 38: Solenoid

1. Clear the DTC (see page 19-36).
2. Test-drive the vehicle.

Does the ABS indicator come on and are DTCs 31, 32, 33, 34, 35, 36, 37 or 38 indicated?

YES – Replace the ABS modulator-control unit (see page 19-58). ■

NO – The system is OK at this time. ■

DTC 51: Motor Lock

1. Clear the DTC (see page 19-36).
2. Test-drive the vehicle.

Does the ABS indicator come on and is DTC 51 indicated?

YES – Replace the ABS modulator-control unit (see page 19-58). ■

NO – The system is OK at this time. ■

BACK

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DTC 52: Motor Stuck Off

1. Check the ABS PUMP (40 A) fuse in the under-hood multi fuse box, and reinstall the fuse if it is OK.

   Is the fuse OK?

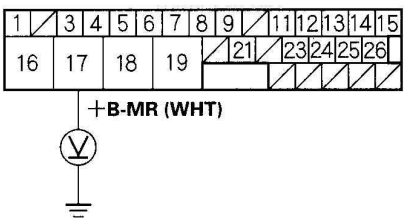
   YES – Go to step 2.

   NO – Replace the fuse, and recheck. ■

2. Disconnect the ABS control unit 31P connector.

3. Measure the voltage between the ABS control unit 31P connector terminal No. 17 and body ground.

ABS CONTROL UNIT 31P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Replace the ABS modulator-control unit. ■

NO – Repair open in the wire between the ABS control unit and the under-hood multi fuse box. ■

DTC 53: Motor Stuck On

1. Clear the DTC (see page 19-36).

2. Test-drive the vehicle.

   Does the ABS indicator come on and is DTC 53 indicated?

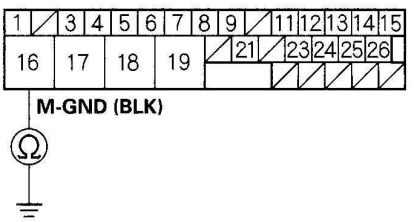
   YES – Go to step 3.

   NO – Intermittent failure, the system is OK at this time. ■

3. Disconnect the ABS control unit 31P connector.

4. Check for continuity between the ABS control unit 31P connector terminal No. 16 and body ground.

ABS CONTROL UNIT 31P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Replace the ABS modulator-control unit. ■

NO – Repair open in the wire between the ABS control unit and body ground. ■

BACK

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DTC Troubleshooting (cont'd)

DTC 54: Main Relay Stuck Off

1. Check the ABS F/S RLY (20A) fuse in the under-hood multi fuse box, and reinstall the fuse if it is OK.

   Is the fuse OK?

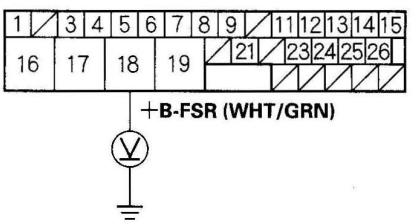
   YES – Go to step 2.

   NO – Replace the fuse, and recheck. ■

2. Disconnect the ABS control unit 31P connector.

3. Measure the voltage between the ABS control unit connector terminal No. 18 and body ground.

ABS CONTROL UNIT 31P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Replace the ABS modulator-control unit. ■

NO – Repair open in the wire between the ABS control unit and the under-hood multi fuse box. ■

DTC 61: Ignition Voltage

1. Check the R/C MIRROR (7.5A) fuse in the driver's under-dash fuse/relay box, and reinstall the fuse if it is OK.

   Is the fuse OK?

   YES – Go to step 2.

   NO – Replace the fuse and recheck. ■

2. Clear the DTC (see page 19-36).

3. Test-drive the vehicle.

   Does the ABS indicator come on and is DTC 61 indicated?

   YES – Go to step 4.

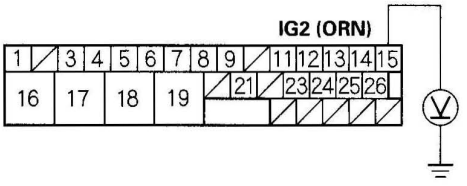
   NO – The system is OK at this time. ■

4. Disconnect the ABS control unit 31P connector.

5. Turn the ignition switch ON (II).

6. Measure the voltage between the ABS control unit 31P connector terminal No. 15 and body ground.

ABS CONTROL UNIT 31P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Replace the ABS modulator-control unit. ■

NO – Repair open in the wire between the ABS control unit and the under-hood multi fuse box. ■

BACK

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DTC 81: CPU (Central Processing Unit)

1. Clear the DTC (see page 19-36).
2. Test-drive the vehicle.

   Does the ABS indicator come on and is DTC 81 indicated?

   YES – Replace the ABS modulator-control unit (see page 19-58). ■

   NO – The system is OK at this time. ■

ABS Indicator Circuit Troubleshooting

ABS indicator does not come on

1. Turn the ignition switch ON (II), and watch the ABS indicator.

   Does the ABS indicator come on?

   YES – The system is OK at this time. ■

   NO – Go to step 2.

2. Turn the ignition switch OFF then ON (II) again.

   Does the brake system indicator come on?

   YES – Go to step 3.

   NO – Repair open in the indicator power source circuit. ■

   - Blown BACK UP LIGHT (10A) fuse.
   - Open in the wire between the BACK UP LIGHT (10A) fuse and gauge assembly.
   - Open circuit inside the fuse box.

3. Turn the ignition switch OFF.
4. Disconnect the ABS control unit 31P connector.
5. Turn the ignition switch ON (II).

   Does the ABS indicator come on?

   YES – Check for loose terminals in the ABS control unit 31P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck. ■

   NO – Go to step 6.

6. Check the ABS indicator bulb in the gauge assembly.

   Is the bulb OK?

   YES – Go to step 7.

   NO – Replace the ABS indicator bulb. ■

7. Turn the ignition switch OFF.
8. Remove the gauge assembly (see page 22-80).

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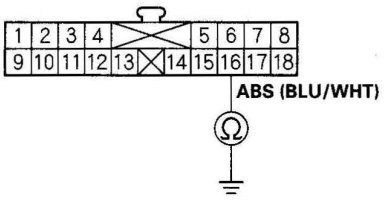
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ABS Indicator Circuit Troubleshooting (cont'd)

9. Disconnect gauge assembly connector B (18P).

10. Check for continuity between gauge assembly connector B (18P) terminal No. 16 body ground.

GAUGE ASSEMBLY CONNECTOR B (18P)



Wire side of female terminals

Is there continuity?

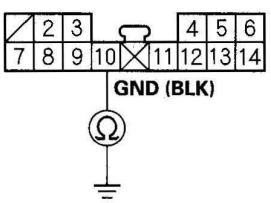
YES – Repair short to body ground in the wire between the gauge assembly and the ABS control unit. ■

NO – Go to step 11.

11. Connect gauge assembly connector B (18P), and disconnect gauge assembly connector C (14P).

12. Check for continuity between gauge assembly connector C (14P) terminal No. 10 and body ground.

GAUGE ASSEMBLY CONNECTOR C (14P)



Wire side of female terminals

Is there continuity?

YES – Check for loose terminals in the gauge assembly connectors. If the connectors are OK, replace the printed circuit board in the gauge assembly. ■

NO – Repair open in the wire between the gauge assembly and body ground (G501). ■

ABS indicator does not go off.

1. Check the ABS F/S RLY (20A) fuse in the under-hood multi fuse box, and reinstall the fuse if it is OK.

Is the fuse OK?

YES – Go to step 2.

NO – Replace the fuse, and recheck. If the fuse is blown, check for a short to body ground in this fuse circuit. If the circuit is OK, replace the ABS modulator-control unit. ■

2. Check the R/C MIRROR (7.5A) fuse in the under-dash fuse/relay box, and reinstall the fuse if it is OK.

Is the fuse OK?

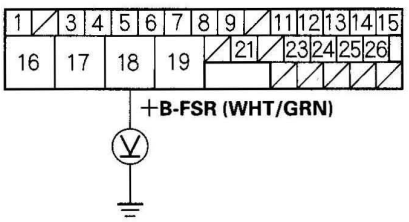
YES – Go to step 3.

NO – Replace the fuse, and recheck. If the fuse is blown, check for a short to body ground in this fuse circuit. ■

3. Disconnect the ABS control unit 31P connector.

4. Measure the voltage between terminal No. 18 and body ground.

ABS CONTROL UNIT 31P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 5.

NO – Repair open in the wire between the ABS F/S RLY (20A) fuse and the ABS control unit. ■

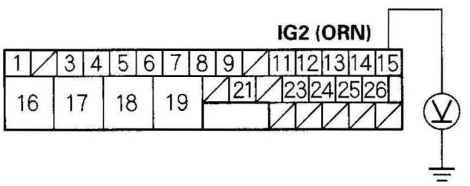
5. Turn the ignition switch ON (II).

BACK

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6. Measure the voltage between the ABS control unit 31P connector terminal No. 15 and body ground.

ABS CONTROL UNIT 31P CONNECTOR



Wire side of female terminals

Is there battery voltage?

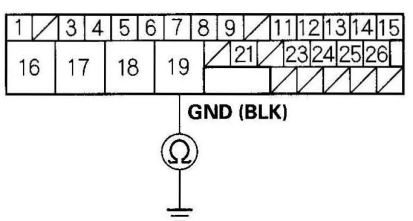
YES – Go to step 7.

NO – Repair open in the wire between the No. 16 (7.5A) fuse and the ABS control unit. ■

7. Turn the ignition switch OFF.

8. Check for continuity between the ABS control unit 31P connector terminal No. 19 and body ground.

ABS CONTROL UNIT 31P CONNECTOR



Wire side of female terminals

Is there continuity?

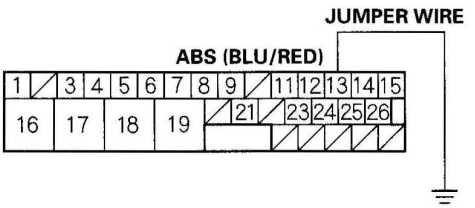
YES – Go to step 9.

NO – Repair open in the wire between the ABS control unit and body ground (G301). ■

9. Turn the ignition switch ON (II).

10. Connect the ABS control unit 31P connector terminal No. 13 and body ground with a jumper wire.

ABS CONTROL UNIT 31P CONNECTOR



Wire side of female terminals

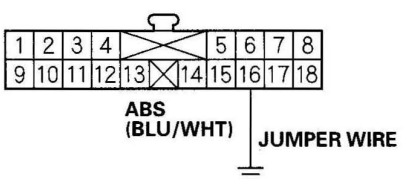
Does the ABS indicator go off?

YES – Check for loose terminals in the ABS control unit 31P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck. ■

NO – Go to step 11.

11. Connect gauge assembly connector B (18P) terminal No. 16 and body ground with a jumper wire.

GAUGE ASSEMBLY CONNECTOR B (18P)



Wire side of female terminals

Does the ABS indicator go off?

YES – Repair open in the wire between the gauge assembly and the ABS control unit. ■

NO – Check for loose gauge assembly connector B (18P). If the connector is OK, replace the printed circuit board in the gauge assembly. ■

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Brake System Indicator Circuit Troubleshooting

Brake system indicator does not come on

1. With the parking brake released, turn the ignition switch ON (II), and watch the brake system indicator.

   Does the brake system indicator come on?

   YES – Go to step 3.

   NO – Go to step 2.

2. Turn the ignition switch OFF then ON (II) again.

   Does the ABS indicator come on?

   YES – Go to step 12.

   NO – Repair open in the indicator power source circuit. ■

   - Blown BACK UP LIGHT (10A) fuse.
   - Open in the wire betwcen the BACK UP LIGHT (10A) fuse and the gauge assembly.
   - Open circuit inside the fuse box.

3. Start the engine, and apply the parking brake.

   Does the brake system indicator come on?

   YES – The system is OK at this time. ■

   NO – Go to step 4.

4. Turn the ignition switch OFF.

5. Disconnect the parking brake switch connector from the switch (see step 1 on page 19-8).

6. Turn the ignition switch ON (II).

7. Measure voltage between the parking brake switch connector terminal and body ground.

   Is there battery voltage?

   YES – Replace the parking brake switch. ■

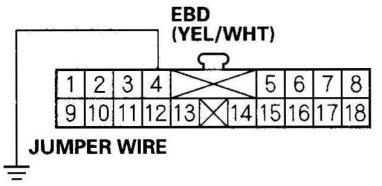
   NO – Go to step 8.

8. Turn the ignition switch OFF.

9. Remove the gauge assembly (see page 22-80).

10. Connect the gauge assembly connector B (18P) terminal No. 4 and body ground with a jumper wire.

GAUGE ASSEMBLY CONNECTOR B (18P)



Wire side of female terminals

11. Turn the ignition switch ON (II).

    Does the parking brake indicator come on?

    YES – Repair open in the GRN/RED wire between the gauge assembly and the parking brake switch. ■

    NO – Replace the printed circuit board in the gauge assembly. ■

12. Start the engine, and apply the parking brake.

    Does the brake system indicator come on?

    YES – Go to step 16.

    NO – Go to step 13.

13. Turn the ignition switch OFF.

14. Remove the gauge assembly (see page 22-80).

15. Check the brake system indicator bulb.

    Is the bulb OK?

    YES – Replace the printed circuit board in the gauge assembly. ■

    NO – Replace the brake system indicator bulb. ■

16. Turn the ignition switch OFF.

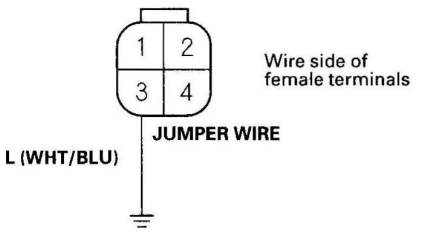
17. Disconnect the alternator connector (4P).

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18. Connect the alternator connector (4P) WHT/BLU terminal and body ground with a jumper wire.

ALTERNATOR 4P CONNECTOR



19. Turn the ignition swich ON (II).

Does the brake system indicator come on?

YES – Replace the alternator or repair the charging system circuit. ■

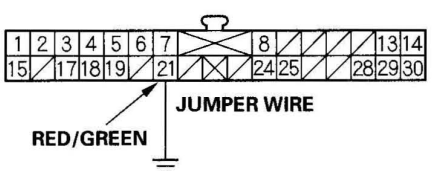
NO – Go to step 20.

20. Turn the ignition switch OFF.

21. Remove the gauge assembly (see page 22-80).

22. Connect the gauge assembly connector A (30P) terminal No. 21 and body ground with a jumper wire.

GAUGE ASSEMBLY CONNECTOR A (30P)



23. Turn the ignition switch ON (II).

Does the brake system indicator come on?

YES – Repair open in the WHT/BLU wire between the alternator and the gauge assembly. ■

NO – Replace the printed circuit board in the gauge assembly. ■

Brake system indicator does not go off

1. Release the parking brake.
2. Start the engine.

   Does the brake system indicator go off?

   YES – The system is OK at this time. ■

   NO – Go to step 3.
3. Check the ABS indicator.

   Does the ABS indicator stay on?

   YES – Read the ABS DTCs (see page 19-33), and do the applicable troubleshooting. ■

   NO – Go to step 4.
4. Turn the ignition switch OFF.
5. Disconnect the ABS control unit 31P connector.
6. Start the engine, and check the brake system indicator.

   Does the brake system indicator go off?

   YES – Replace the ABS modulator-control unit. ■

   NO – Check the brake system indicator circuit. ■

   - Short to body ground between the gauge assembly, the parking brake switch and the ABS control unit, or short to body ground between the gauge assembly and the brake fluid level switch.
   - Parking brake switch stuck ON.
   - Brake fluid level switch stuck ON.
   - Short to body ground in the WHT/BLU wire between the gauge assembly and the alternator.
   - Faulty alternator.

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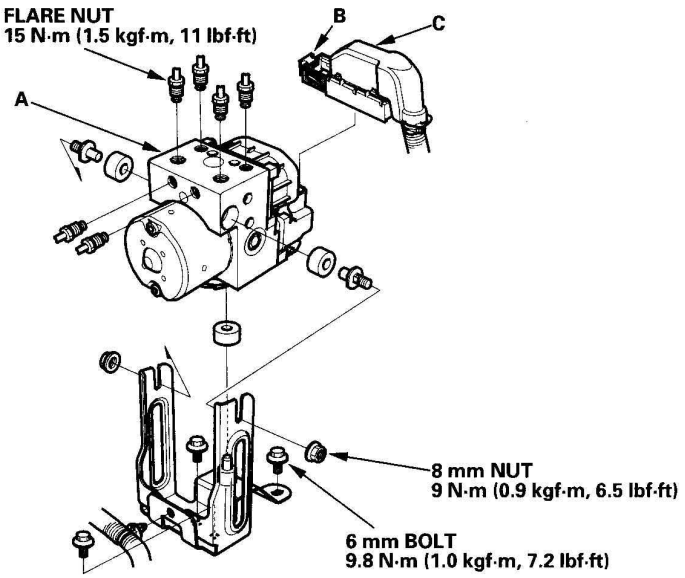
ABS Components

ABS Modulator-Control Unit Removal and Installation

NOTE:
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.
- Take care not to damage or deform the brake lines during removal and installation.
- To prevent the brake fluid from flowing, plug and cover the hose ends and joints with a shop towel or equivalent material.

Removal

1. Pull up the lock (B) of the ABS control unit 31P connector (C), then disconnect the connector.



2. Disconnect the six brake lines.
3. Remove the two 8 mm nuts.
4. Remove the ABS modulator-control unit (A).

Installation

1. Install the ABS modulator-control unit, then tighten the two 8 mm nuts.
2. Align the connecting surface of the ABS control unit 31P connector.
3. Push in the lock of the ABS control unit 31P connector until you hear it click into place, then connect the connector.
4. Bleed the brake system, starting with the front wheels.
5. Start the engine, and check that the ABS indicator goes off.
6. Test-drive the vehicle, and check that the ABS indicator does not come on.

BACK

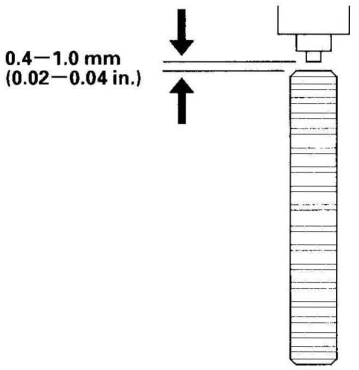
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Wheel Sensor Inspection

1. Inspect the front and rear pulsers for chipped or damaged teeth.
2. Measure the air gap between the wheel sensor and pulser all the way around while rotating the pulser. If the gap exceeds 1.0 mm (0.04 in.), repair as needed.

Standard:
Front/Rear: 0.4—1.0 mm (0.02—0.04 in.)

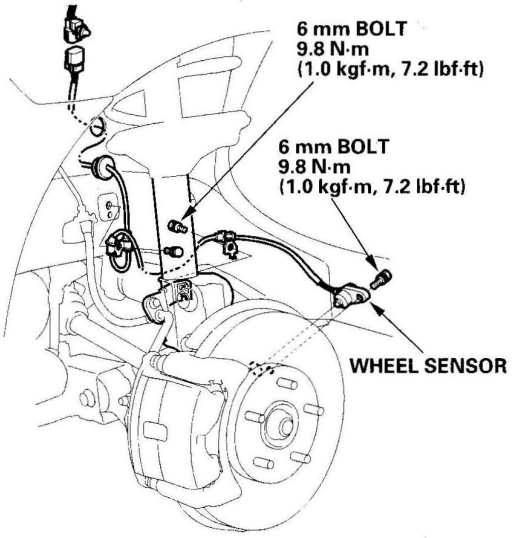
Front/Rear



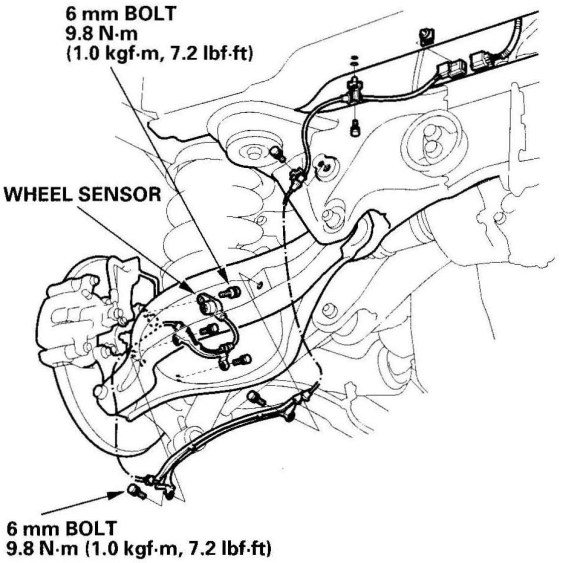
Wheel Sensor Replacement

NOTE: Install the sensors carefully to avoid twisting the wires.

Front:



Rear:



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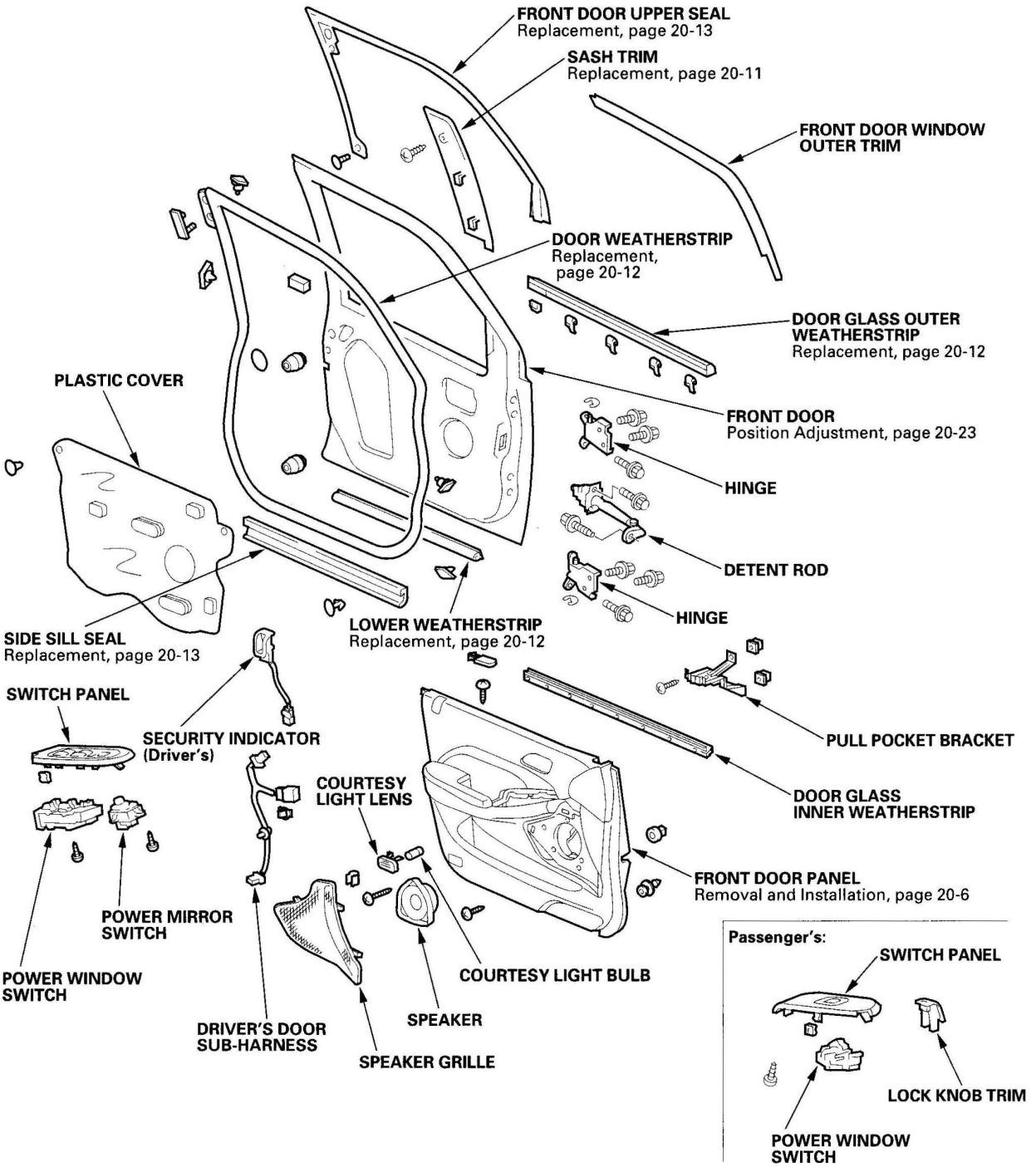
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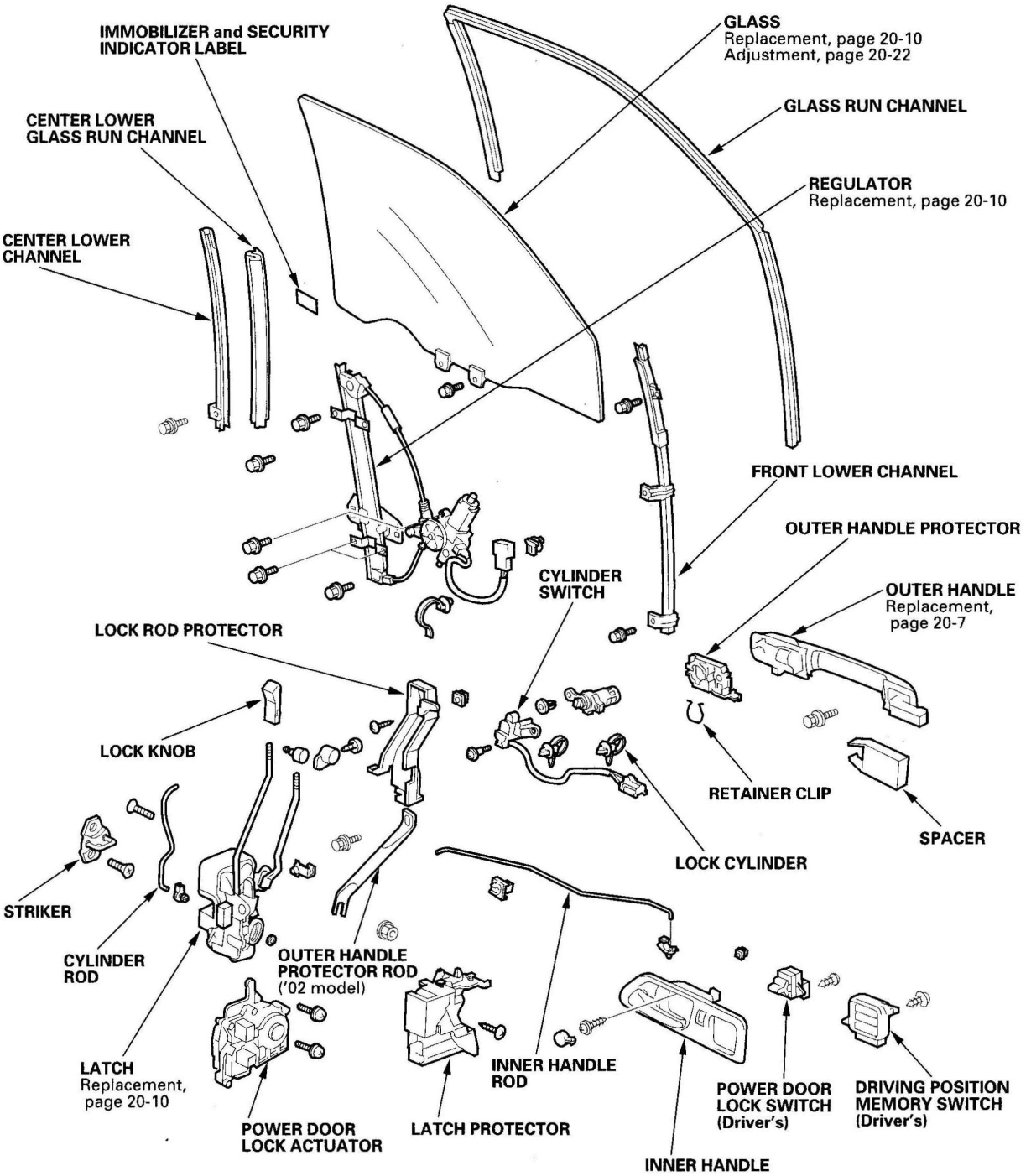
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Component Location Index - Front Door



BACK

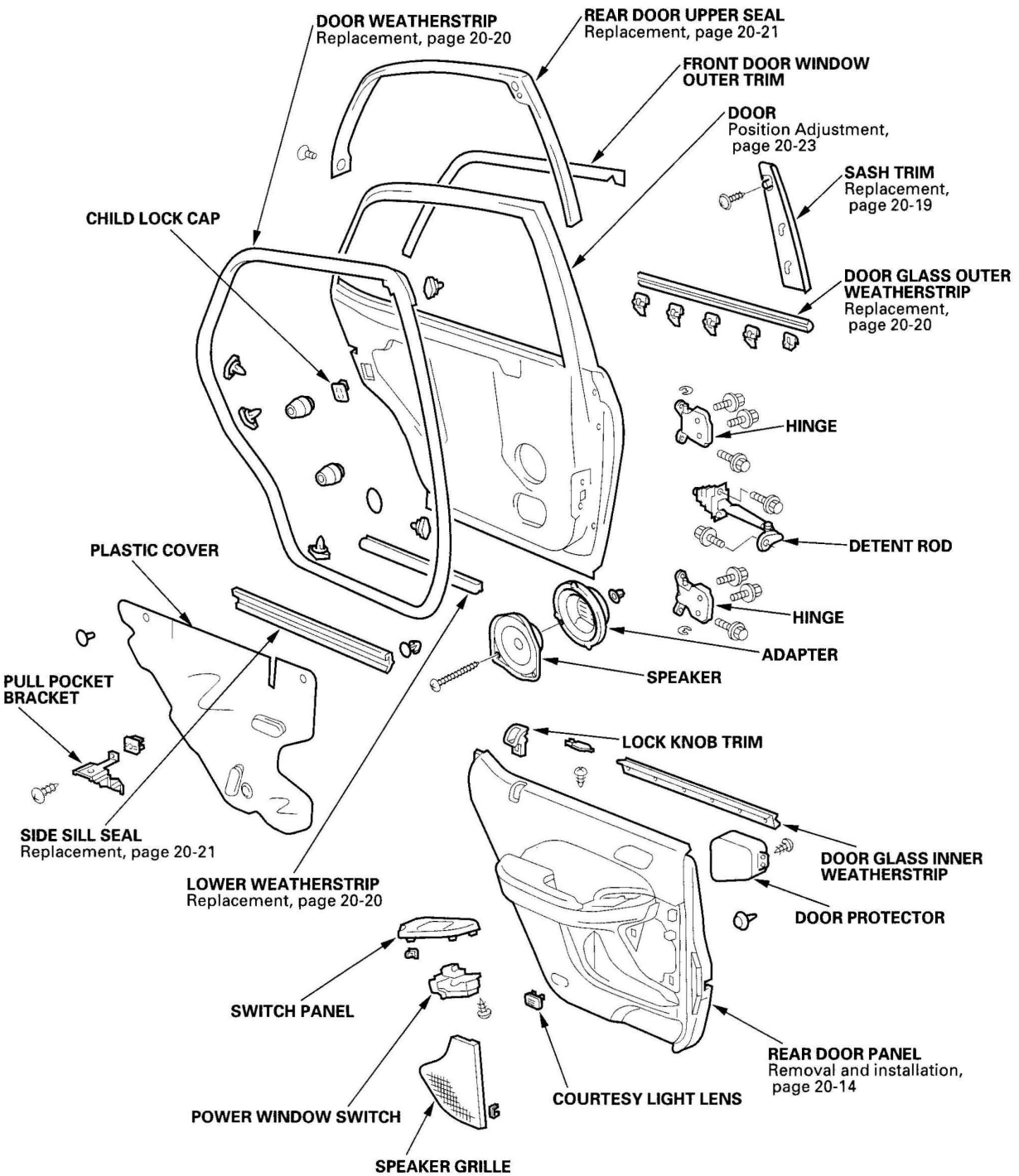
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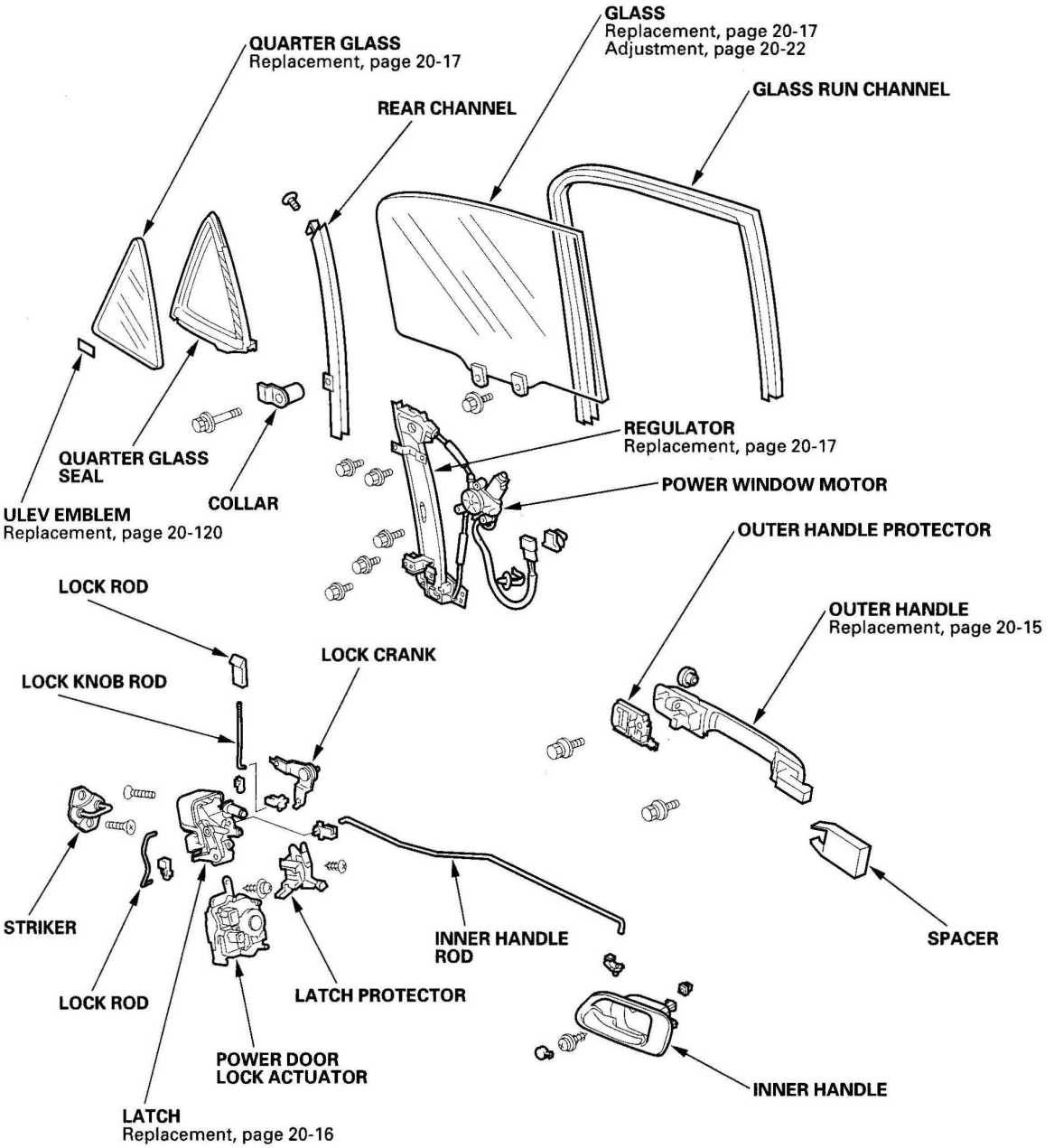
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Component Location Index - Rear Door



BACK

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BACK

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Front Door Panel Removal/Installation

Special Tools Required
Trim pad remover, Snap-on A177A or equivalent, commercially available.

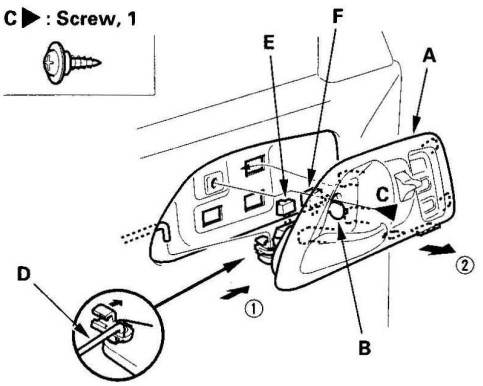
1. Remove the mirror mount cover (see step 2 on page 20-25). Take care not to scratch the door panel.

2. Remove the inner handle (A). Take care not to scratch the door panel.

   – 1 Pry out the cap (B), and remove the screw (C).
   – 2 Pull the inner handle forward and out half-way.
   – 3 Disconnect the inner handle rod (D) and power door lock switch connector (E). For some models on driver's side, disconnect the driving position memory switch connector (F).

Fastener Location

C ▶ : Screw, 1

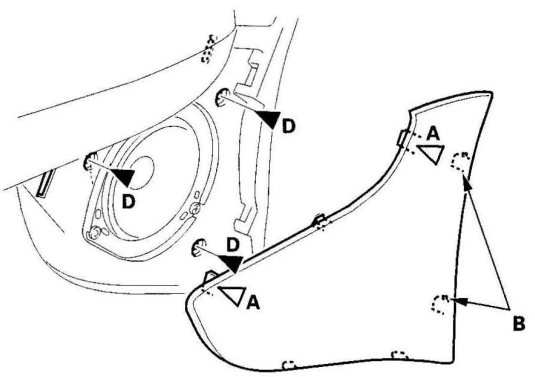


3. Detach the clips (A) and hooks (B), then remove the speaker grille (C). Remove the screws (D).

Fastener Locations

A ▷ : Clip, 2 D ▶ : Screw, 3



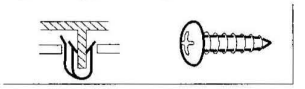


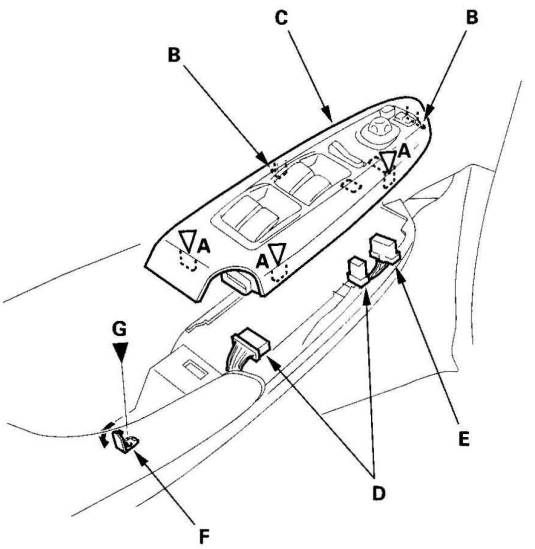
4. Detach the clips (A) and release the hooks (B), then remove the switch panel (C). Take care not to scratch the door panel. Disconnect the power window switch (door multi-plex control unit) connectors (D). On driver's side, disconnect the power mirror switch connector (E).

Driver's

Fastener Locations

A ▷ : Clip, 3 G ▶ : Screw, 1



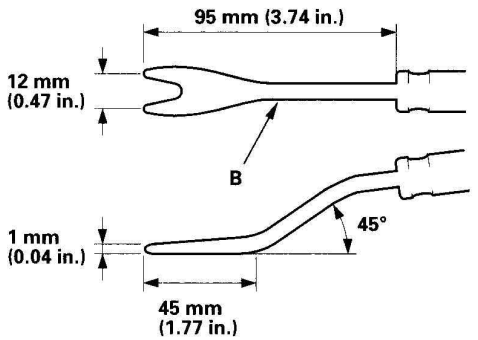


5. Pry out the cap (F), and remove the screw (G).

BACK

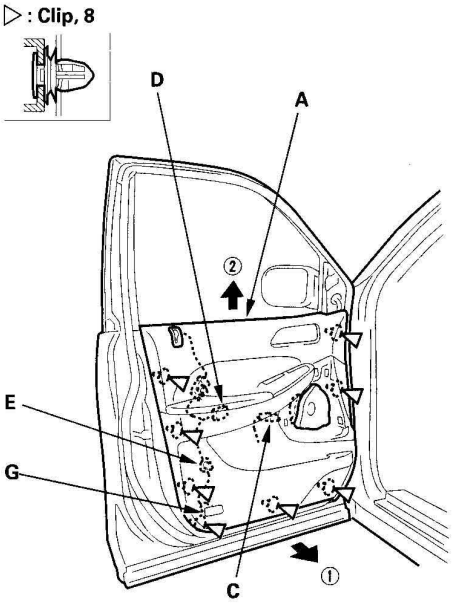
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6. Release the clips that hold the door panel (A) with a commercially available trim pad remover (B), then remove the door panel by pulling it upward. Disconnect the speaker connector (C).
On driver's side, disconnect the front door sub-harness connector (D). On passenger's side, disconnect the courtesy light bulb socket (E), and detach the harness clip (F) from the panel.
Remove the door panel with as little bending as possible to avoid creasing or breaking it.



Fastener Locations

▷ : Clip, 8



7. Install the door panel in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Make sure the connectors are plugged in properly, and the inner handle rod and courtesy light bulb socket are connected properly.

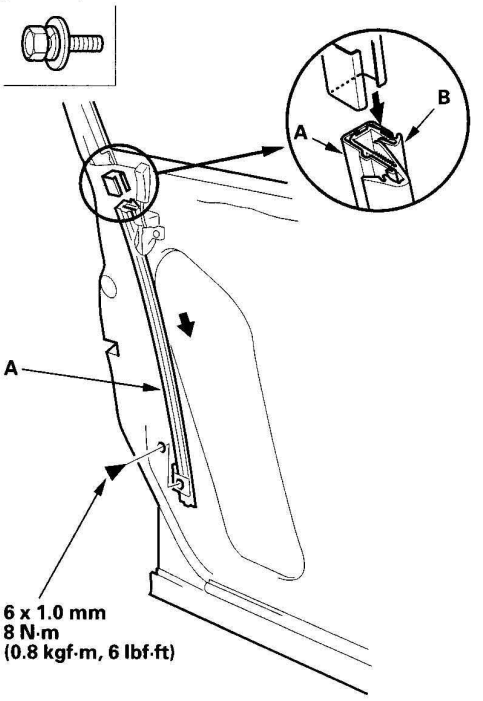
Front Door Outer Handle Replacement

NOTE : Put on gloves to protect your hands.

1. Raise the glass fully.
2. Remove these items:
   - Mirror mount cover (see step 2 on page 20-25)
   - Door panel (see page 20-6)
   - Plastic cover, as necessary (see page 20-2)
3. Remove the bolt, then remove the center lower channel (A) with the center lower glass run channel (B) by pulling it downward.

Fastener Location

▶ : Bolt, 1



(cont'd)

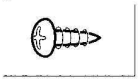
Protected by AR

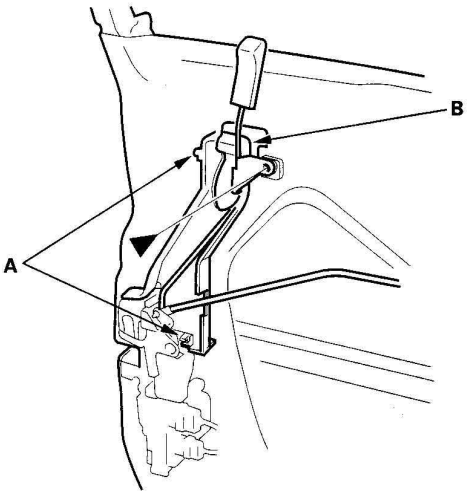
Front Door Outer Handle Replacement (cont'd)

4. Remove the screw and detach the hooks (A), then remove the lock rod protector (B).

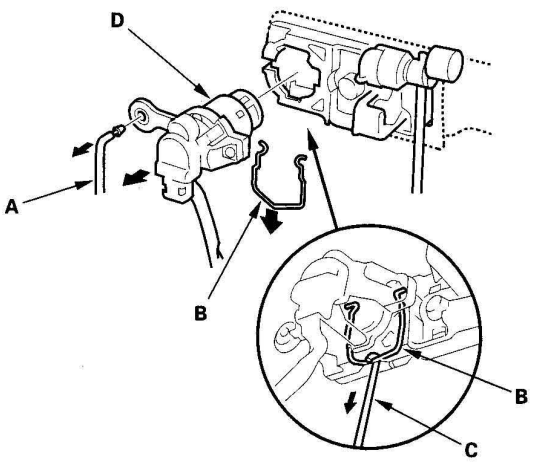
Fastener Location

▶: Screw, 1





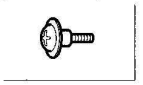
5. Disconnect the cylinder rod (A). Release the retainer clip (B) with a hooked shaped tool (C), then remove the lock cylinder (D).

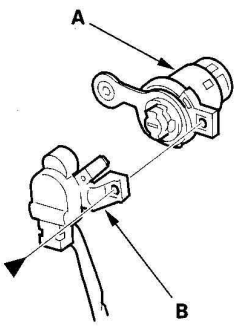


6. Remove the screw, then separate the lock cylinder (A) and cylinder switch (B).

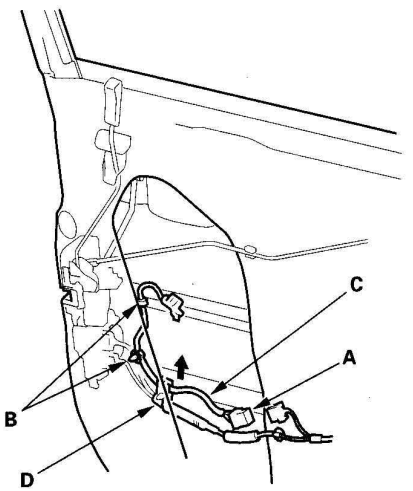
Fastener Location

▶: Screw, 1





7. Disconnect the cylinder switch connector (A), and detach the harness clips (B), and release the cylinder switch harness (C) from the harness clip (D).

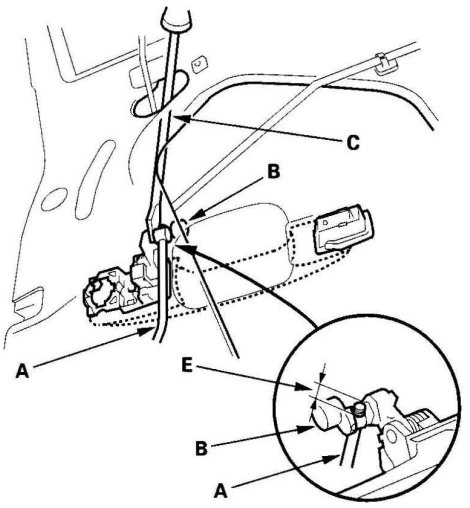


BACK

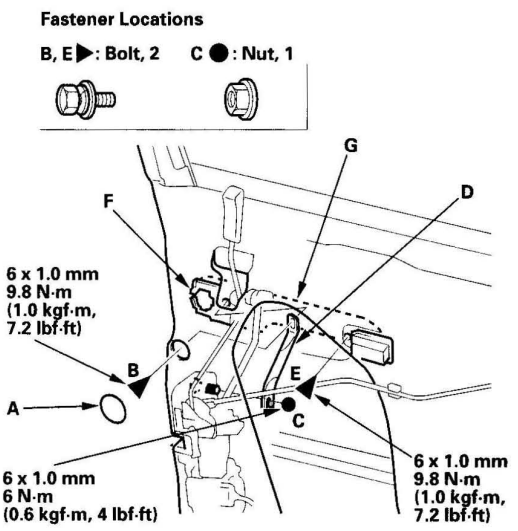
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8. Pry the outer handle rod (A) out of its joint (B) using a flat-tip screwdriver (C).

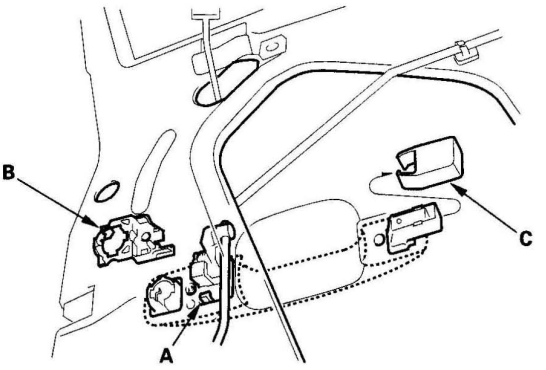
   NOTE:
   - To ease reassembly, note the distance (E) of the outer handle rod on the joint before disconnecting it.
   - Take care not to bend the outer handle rod.



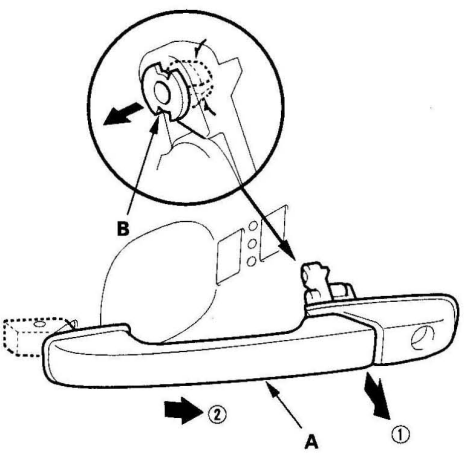
9. Remove the maintenance hole seal (A), and on '02 model, remove the bolt (B) and nut (C) securing the outer handle protector rod (D), then remove the rod. Remove the bolts (B,E) ('01 model) or bolt (E) ('02 model) securing the outer handle protector (F) and outer handle (G).



10. Release the hook (A), then remove the outer handle protector (B) and spacer (C).



11. Remove the outer handle (A). Replace the bushing (B) on the outer handle.



12. Install the outer handle in the reverse order of removal, and note these items:

    - Make sure the cylinder switch harness is routed properly.
    - Make sure the connector is plugged in properly, and each rod is connected securely.
    - Make sure the door locks and opens properly.
    - When installing the lock cylinder, leave the outer door handle bolts loose so the inner protector does not interfere with the lock cylinder.
    - Install the lock cylinder retaining clip on the handle, then install the lock cylinder. Be sure the clip is fully seated in the slot on the lock cylinder.

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Front Door Latch Replacement

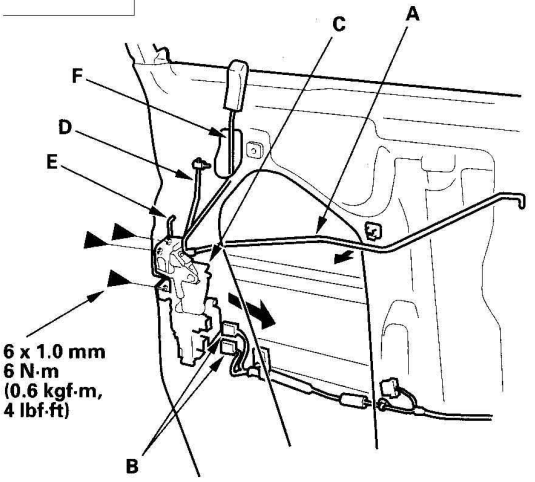
NOTE: Put on gloves to protect your hands.

1. Raise the glass fully.
2. Remove these items:
   - Door panel (see page 20-6)
   - Plastic cover, as necessary (see page 20-2)
   - Outer handle (see page 20-7)
3. Detach the inner handle rod (A), and disconnect the actuator connectors (B).

Fastener Locations

▶ : Screw, 3





4. Remove the screws, then remove the latch (C) through the hole in the door. Take care not to bend the outer handle rod (D), cylinder rod (E), lock rod (F), and inner handle rod (A).
5. Install the latch in the reverse order of removal, and note these items:
   - Make sure the actuator connectors are plugged in properly, and each rod is connected securely.
   - Make sure the door locks and opens properly.

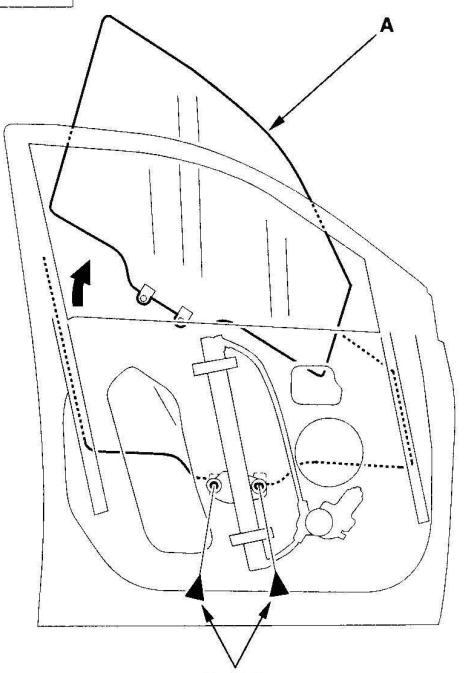
Front Door Glass and Regulator Replacement

1. Remove these items:
   - Door panel (see page 20-6)
   - Pull pocket bracket and plastic cover (see page 20-2)
2. Carefully raise the glass (A) until you can see the bolts, then remove them. Carefully pull the glass out through the window slot. Take care not to drop the glass inside the door.

Fastener Locations

▶ : Bolt, 2





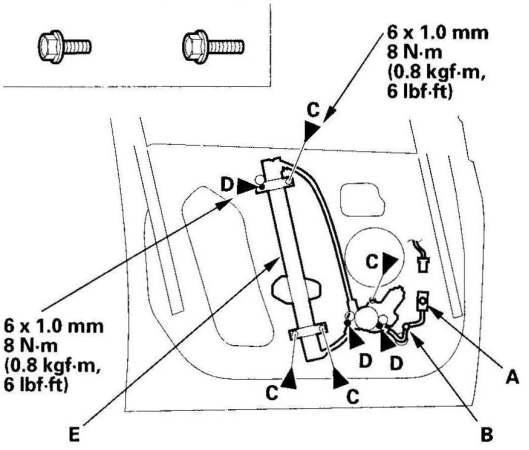
BACK

Protected by AR

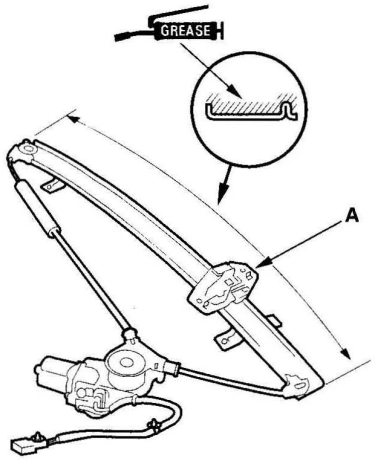
3. Disconnect and detach the connector (A) and harness clip (B) from the door. Remove the bolts (C) and loosen the bolts (D), then remove the regulator (E) through the hole in the door.

Fastener Locations

C▶: Bolt, 4 D▶: Bolt, 3



4. Grease all the sliding surfaces of the regulator (A) where shown.



5. Install the glass and regulator in the reverse order of removal, and note these items:

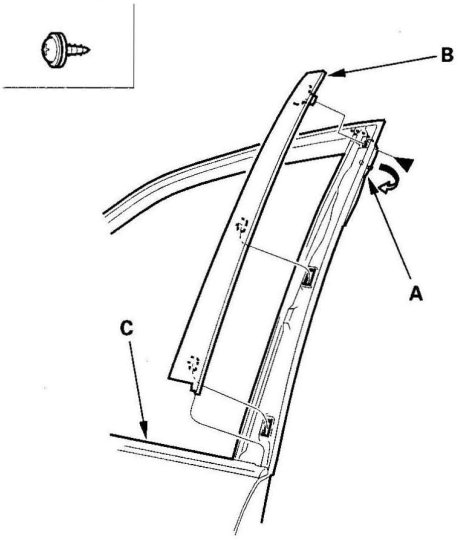
- Roll the glass up and down to see if it moves freely without binding.
- Make sure that there is no clearance between the glass and glass run channel when the glass is closed.
- Adjust the position of the glass as necessary (see page 20-22).

NOTE: Take care not to scratch the door.

1. Turn the door weatherstrip (A) at the rear upper corner portion, then remove the screw.

Fastener Location

▶: Screw, 1



2. Pull up the sash trim (B). Take care not to damage the door glass outer weatherstrip (C).

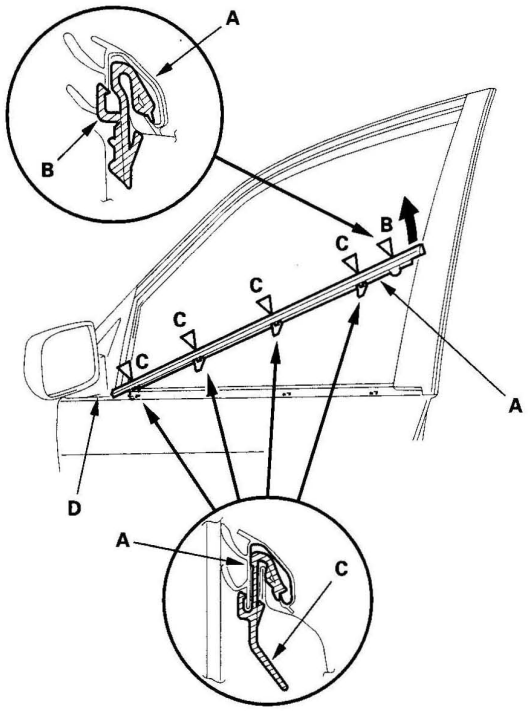
3. Install the sash trim in the reverse order of removal.

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Front Door Glass Outer Weatherstrip Replacement

NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the door and molding.

1. Starting at the rear, pry the door glass outer weatherstrip (A) up to detach the clip (B).



2. Detach the clips (C), then pull the forward end of the weatherstrip from under the power mirror base (D).

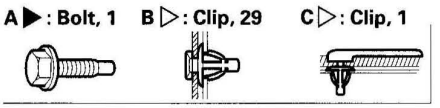
3. Install the outer weatherstrip in the reverse order of removal, and replace any damaged clips.

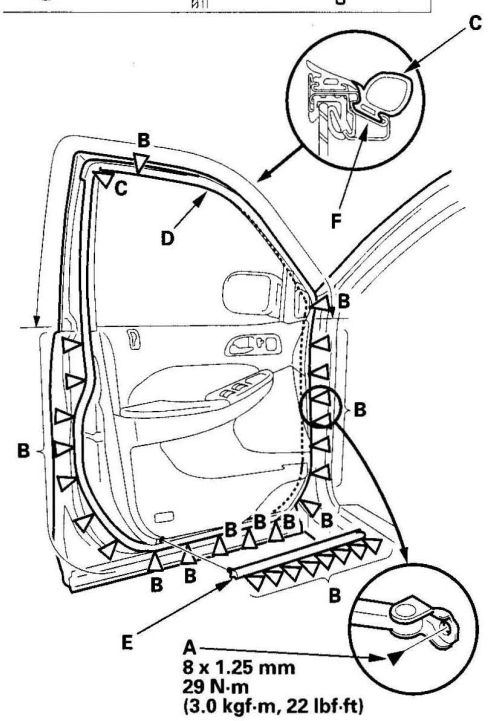
Front Door Weatherstrip and Front Door Lower Weatherstrip Replacement

NOTE:
- Take care not to scratch the door.
- Use a clip remover to remove the clips.

1. At the A-pillar, remove the door stop mounting bolt (A).

Fastener Locations





2. Detach the clips (B, C), then remove the door weatherstrip (D), and the door lower weatherstrip (E).

3. Install the weatherstrips in the reverse order of removal and note these items:

- Replace any damaged clips.
- Make sure the weatherstrip is installed in the holder (F) securely.
- Apply liquid thread lock to door stop mounting bolt before installation.
- Check for water leaks (see step 7 on page 20-22).

BACK

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Front Door Upper Seal Replacement

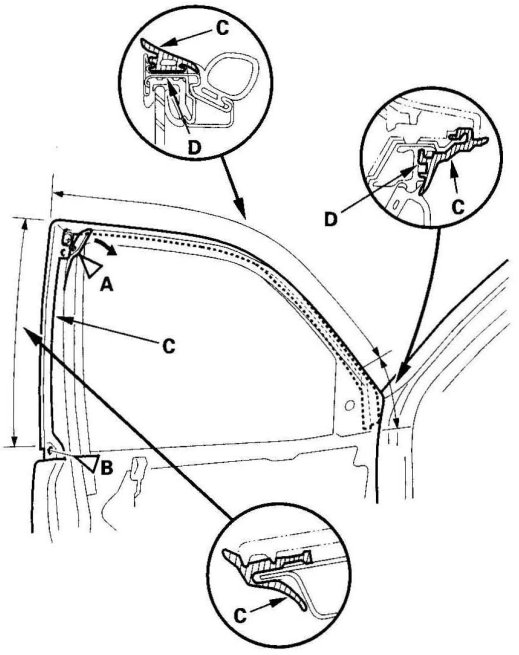
NOTE:
- Take care not to scratch the door.
- Use a clip remover to remove the clips.

1. Remove these items:
   - Power mirror, as necessary (see page 20-25)
   - Door sash trim (see page 20-11)
2. Detach the door weatherstrip clip (A) and lower clip (B), then remove the door upper seal (C).

Fastener Locations

A ▷: Clip, 1 **B ▷: Clip, 1**





3. Install the upper seal in the reverse order of removal, and note these items:
   - Replace any damaged clips.
   - Make sure the upper seal is installed in the holder (D) securely.

Front Door Side Sill Seal Replacement

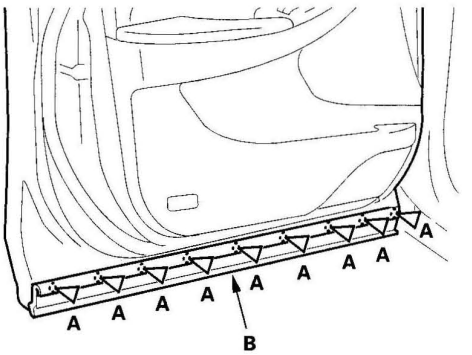
NOTE:
- Take care not to scratch the door.
- Use a clip remover to remove the clips.

1. Detach the clips (A), then remove the door side sill seal (B).

Fastener Locations

A ▷: Clip, 9





2. Install the side sill seal in the reverse order of removal. Replace any damaged clips.

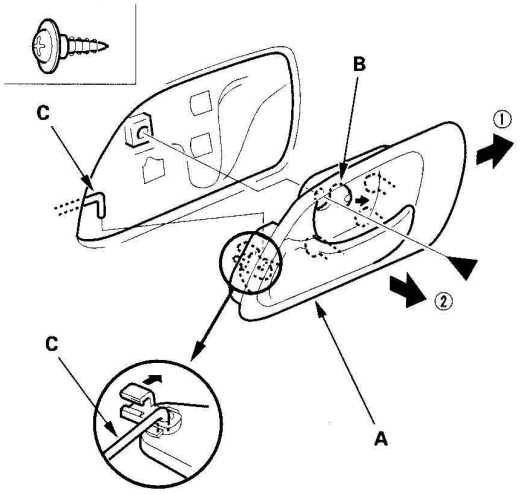
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Rear Door Panel Removal/Installation

Special Tools Required
Trim pad remover, Snap-on A177A or equivalent, commercially available.

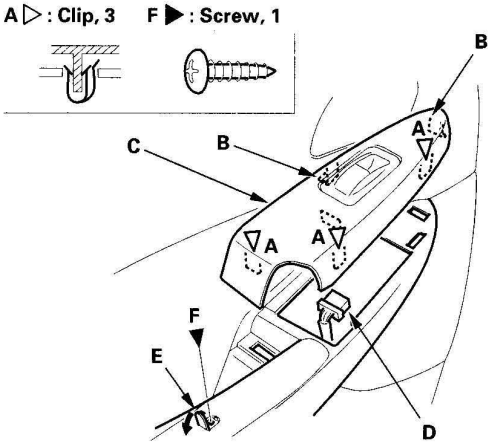
1. Remove the inner handle (A). Take care not to scratch the door panel.
   - 1 Pry out the cap (B), and remove the screw.
   - 2 Move the inner handle forward and half-way out, then disconnect the inner handle rod (C).

Fastener Location
▶: Screw, 1



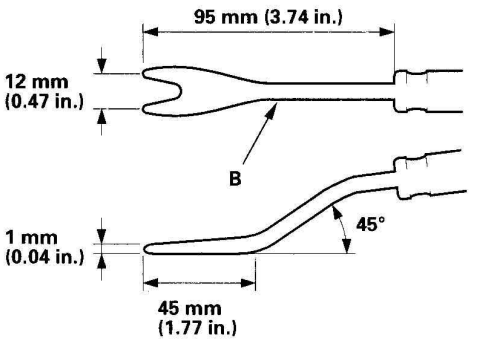
2. Detach the clips (A) and release the hooks (B), then remove the switch panel (C). Take care not to scratch the door panel. Disconnect the power window switch connector (D).

Fastener Locations
A ▷: Clip, 3 F ▶: Screw, 1

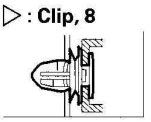


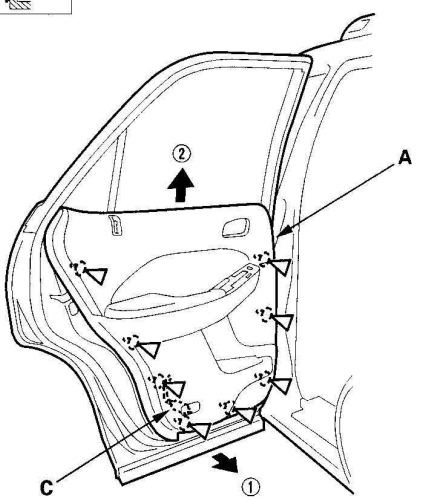
3. Pry out the cap (E), and remove the screw (F).

4. Release the clips that hold the door panel (A) with a commercially available trim pad remover (B), then remove the door panel by pulling it upward. Disconnect the courtesy light bulb socket (C). Remove the door panel with as little bending as possible to avoid creasing or breaking it.



Fastener Locations
▷: Clip, 8





5. Install the door panel in the reverse order of removal, and note these items:
   - Replace any damaged clips.
   - Make sure the connector is plugged in properly, and the inner handle rod and courtesy light bulb socket are connected properly.

BACK

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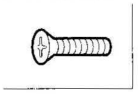
Rear Door Outer Handle Replacement

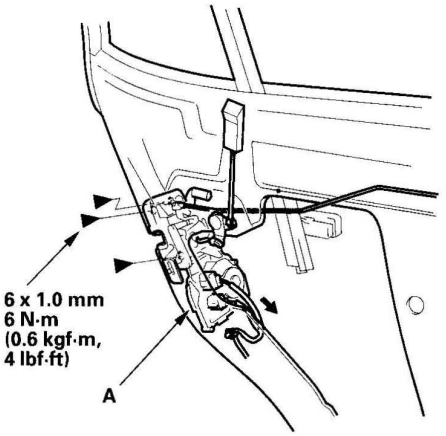
NOTE : Put on gloves to protect your hands.

1. Remove these items:
   - Door panel (see page 20-6)
   - Plastic cover, as necessary (see page 20-2)
2. Raise the glass fully.
3. Remove the screws securing the latch (A), then lower the latch.

Fastener Locations

▶ : Screw, 3

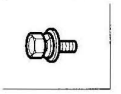


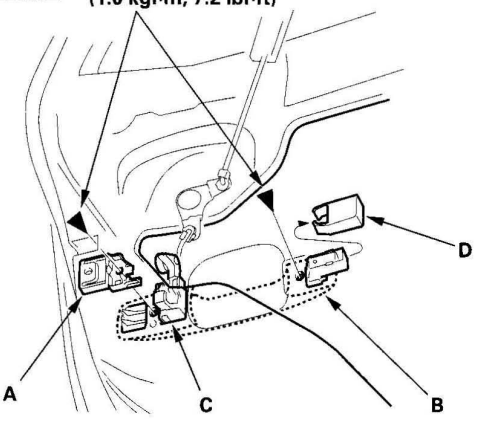


4. Remove the bolts securing the outer handle protector (A) and outer handle (B). Release the hook (C), then remove the protector and spacer (D).

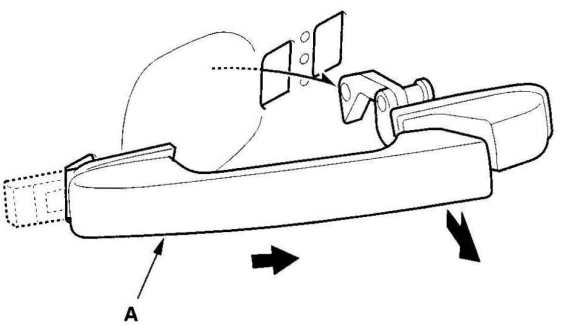
Fastener Locations

▶ : Bolt, 2





5. Remove the outer handle (A).



6. Install the outer handle in the reverse order of removal. Make sure the door locks and opens properly.

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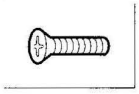
Rear Door Latch Replacement

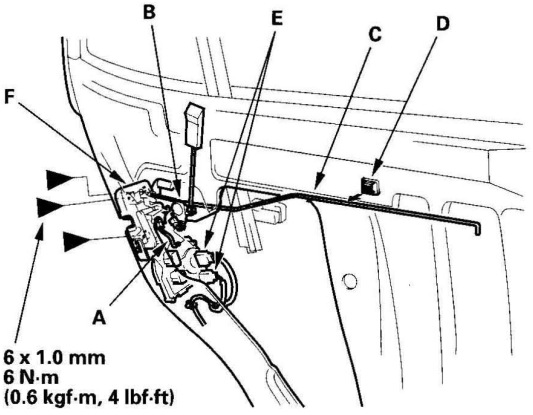
NOTE: Put on gloves to protect your hands.

1. Remove these items:
   - Door panel (see page 20-14)
   - Plastic cover, as necessary (see page 20-4)
2. Raise the glass fully.
3. Disconnect the lock rod (A) from the lock crank (B). Detach the inner handle rod (C) from the rod holder (D), and disconnect the actuator connectors (E). Take care not to bend any of the rods.

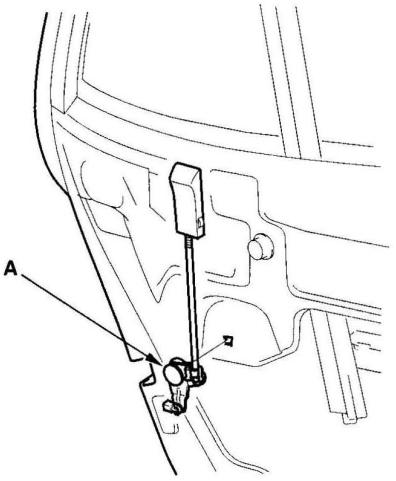
Fastener Locations

▶: Screw, 3





4. Remove the screws securing the latch (F), then remove the latch through the hole in the door. Take care not to bend any of the rods.
5. If necessary, detach the lock crank (A) from the door.



6. Install the latch in the reverse order of removal, and note these items:
   - Make sure the actuator connectors are plugged in properly, and each rod is connected securely.
   - Make sure the door locks and opens properly.

BACK

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Rear Door Glass, Quarter Glass and Regulator Replacement

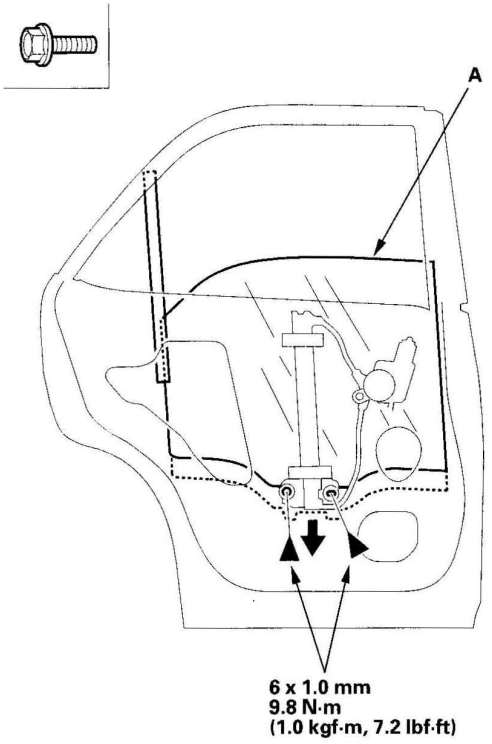
NOTE: Put on gloves to protect your hands.

1. Remove these items:
   - Door panel (see page 20-14)
   - Plastic cover (see page 20-4)

2. Carefully move the glass (A) until you can see the bolts, then remove them. Carefully lower the glass. Take care not to drop the glass inside the door.

Fastener Locations

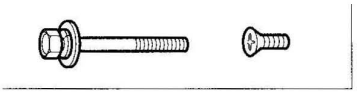
▶: Bolt, 2

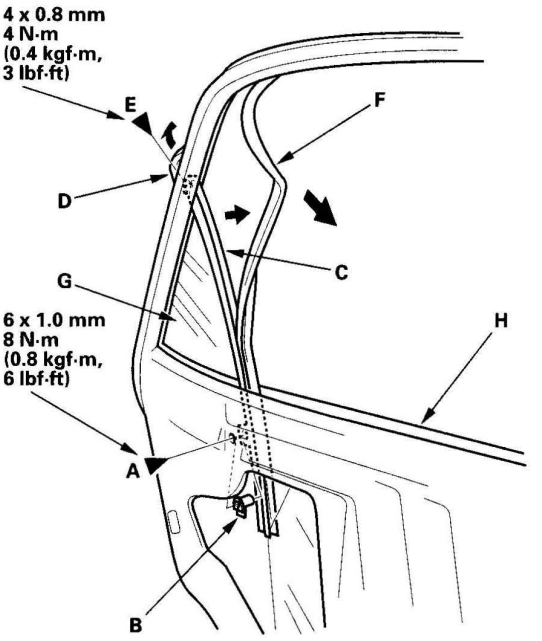


3. Remove the bolt (A) and collar (B) from the rear channel (C). Pull the upper seal (D) away as needed, and remove the screw (E). Pull the glass run channel (F) away as needed from the rear channel.

Fastener Locations

A ▶: Bolt, 1 **E ▶: Screw, 1**





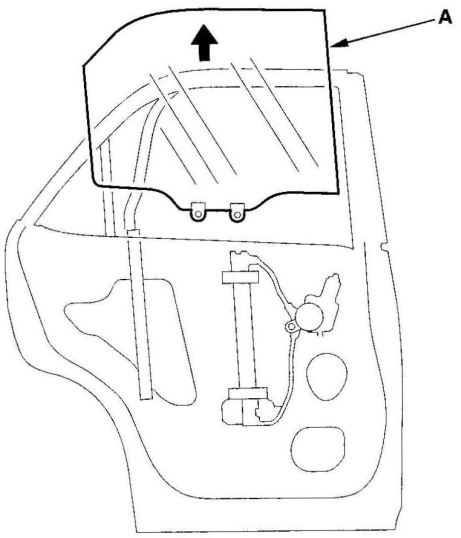
4. Move rear channel away from the quarter glass (G), then remove it out through the window slot. Take care not to damage the door molding (H).

(cont'd)

Protected by AR

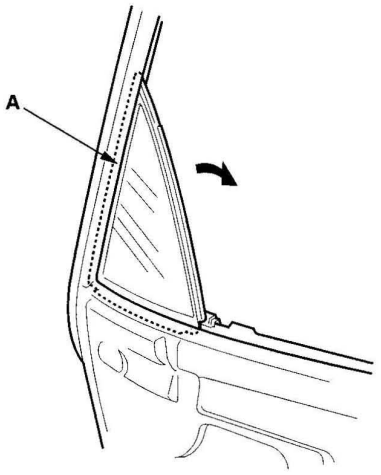
Rear Door Glass, Quarter Glass and Regulator Replacement (cont'd)

5. Carefully remove the glass (A) out through the window slot. Take care not to drop the glass inside the door.



6. Remove the door glass outer weatherstrip (see page 20-20).

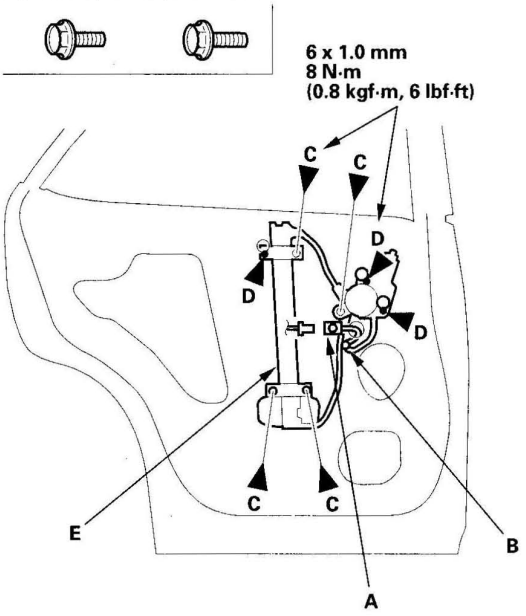
7. Remove the quarter glass (A).



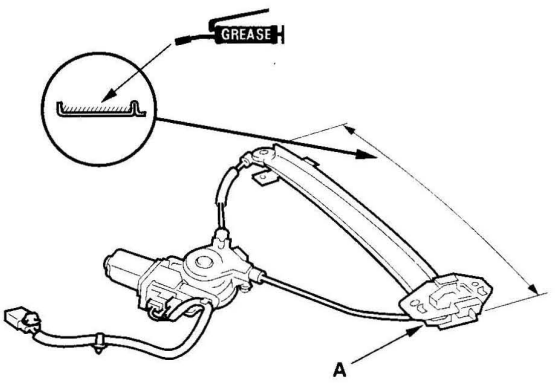
8. Disconnect and detach the connector (A) and harness clip (B) from the door. Remove the bolts (C), and loosen the bolts (D), then remove the regulator (E) through the hole in the door.

Fastener Locations

C ▶ : Bolt, 4 D ▶ : Bolt, 3



9. Grease all the sliding surfaces of the regulator (A) where shown.



BACK

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10. Install the door glass, quarter glass, and regulator in the reverse order of removal, and note these items:

    - Roll the glass up and down to see if it moves freely without binding.
    - Make sure that there is no clearance between the glass and glass run channel when the glass is closed.
    - Adjust the position of the glass as necessary (see page 20-22).

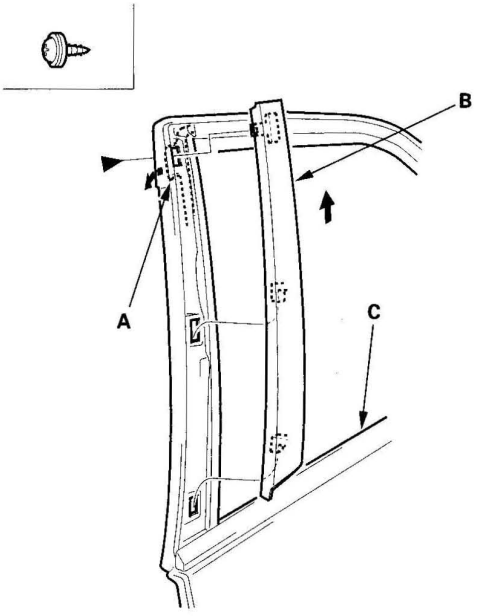
Rear Door Sash Trim Replacement

NOTE: Take care not to scratch the door.

1. Turn the door weatherstrip (A) at the front upper corner portion, then remove the screw.

Fastener Location

▶: Screw, 1



2. Pull up the sash trim (B). Take care not to damage the door glass outer weatherstrip (C).

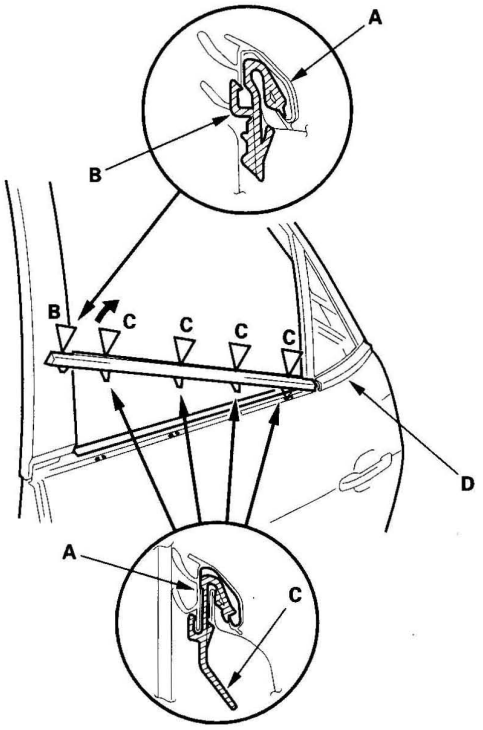
3. Install the sash trim in the reverse order of removal.

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Rear Door Glass Outer Weatherstrip Replacement

NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the door and molding.

1. Starting at the front, pry the door glass outer weatherstrip (A) up to detach the clip (B).



2. Detach the clips (C), then pull the weatherstrip forward to release the end of it from the joint of the quarter glass seal (D).

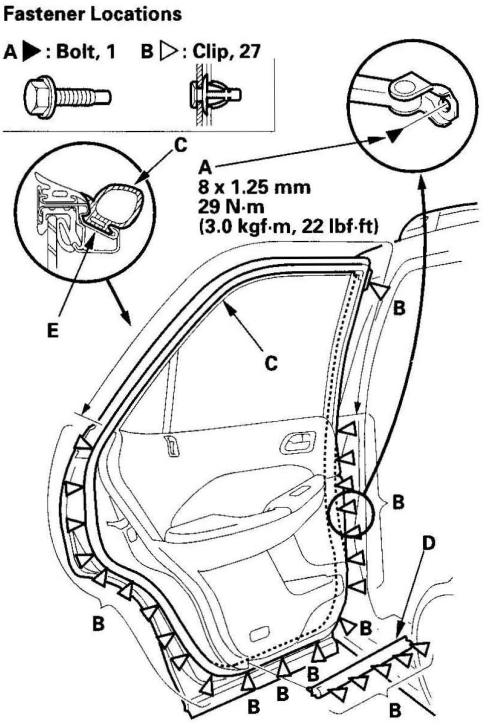
3. Install the outer weatherstrip in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - Make sure the end of outer weatherstrip is attached to the quarter glass seal securely.

Rear Door Weatherstrip and Rear Door Lower Weatherstrip Replacement

NOTE:
- Take care not to scratch the door.
- Use a clip remover to remove the clips.

1. At the B-pillar, remove the door stop mounting bolt (A).



2. Detach the clip (B), then remove the door weatherstrip (C), and the door lower weatherstrip (D).

3. Install the weatherstrip in the reverse order of removal and note these items:

   - Replace any damaged clips.
   - Make sure the weatherstrip is installed in the holder (E) securely.
   - Apply liquid thread lock to the door stop mounting bolt before installation.
   - Check for water leaks (see step 7 on page 20-22).

BACK

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Rear Door Upper Seal Replacement

NOTE:
- Take care not to scratch the door.
- Use a clip remover to remove the clips.

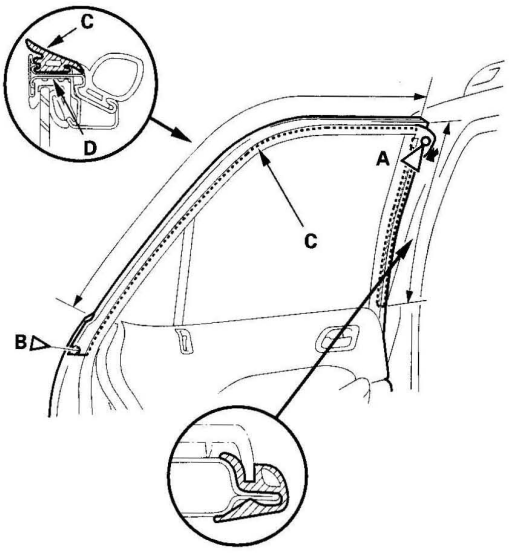
1. Remove the door sash trim (see page 20-19)

2. Detach the door weatherstrip clip (A) and rear clip (B), then remove the door upper seal (C).

Fastener Locations

A ▷: Clip, 1 B ▷: Clip, 1





3. Install the upper seal in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - Make sure the upper seal is installed in the holder (D) securely.

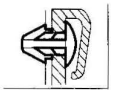
Rear Door Side Sill Seal Replacement

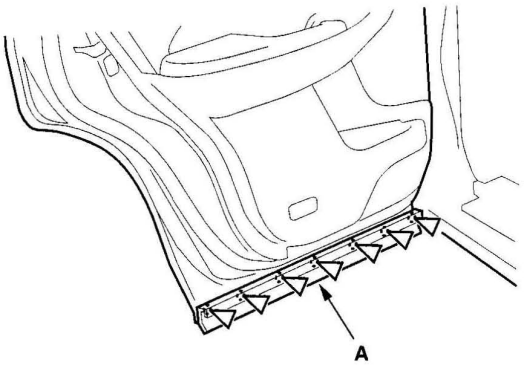
NOTE:
- Take care not to scratch the door.
- Use a clip remover to remove the clip.

1. Detach the clips, then remove the door side sill seal (A).

Fastener Locations

▷: Clip, 7





2. Install the side sill seal in the reverse order of removal. Replace any damaged clips.

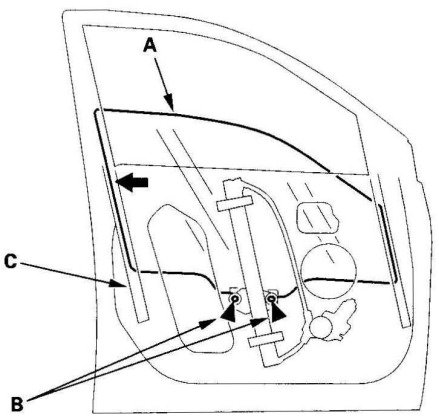
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Front and Rear Door Glass Adjustment

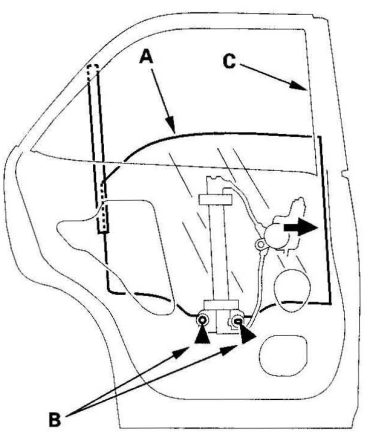
NOTE: Check the weatherstrips and glass run channel for damage or deterioration, and replace them if necessary.

1. Place the vehicle on a firm, level surface.
2. Remove these items:
   - Front door panel (see page 20-6), rear door panel (see page 20-14).
   - Front door plastic cover (see page 20-2), rear door plastic cover (see page 20-4).
3. Carefully move the glass (A) until you can see the glass mounting bolts (B), then loosen them.

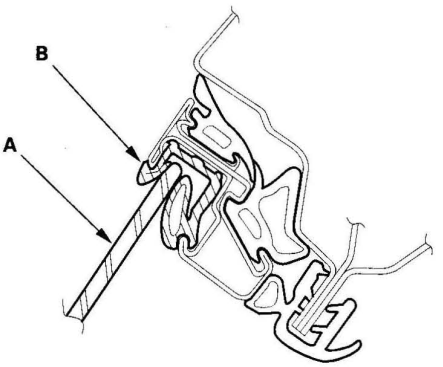
Front:



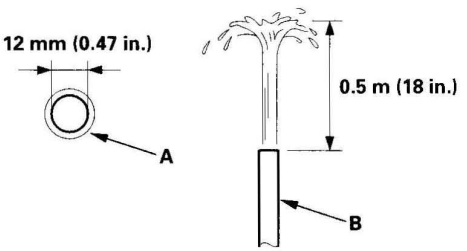
Rear:

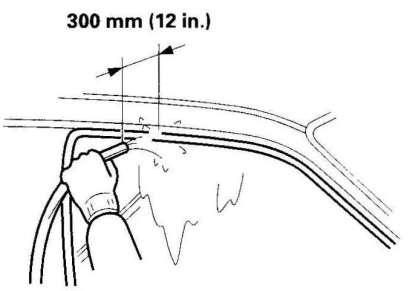


4. Push the glass (A) against the center channel (C), then tighten the glass mounting bolts.
5. Check that the glass moves smoothly.
6. Raise the glass fully, and check for gaps. Check that the glass (A) contacts the glass run channel (B) evenly.



7. Check for water leaks. Run water over the roof and on the sealing area as shown, and note these items:
   - Use a 12 mm (1/2 in.) diameter hose (A).
   - Adjust the rate of water flow as shown (B).
   - Do not use a nozzle.
   - Hold the hose about 300 mm (12 in.) away from the door.





8. Attach the plastic cover, and reinstall the door panel (see page 20-6).

BACK

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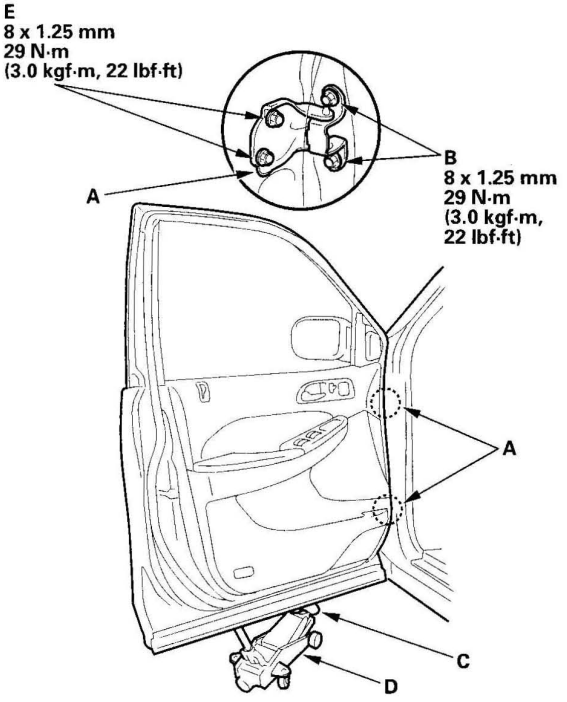
Front and Rear Door Position Adjustment

NOTE: After installing the door, check for a flush fit with the body, then check for equal gaps between the front, rear, and bottom door edges and the body. Check that the door and body edges are parallel. Before adjusting, replace the mounting bolts.

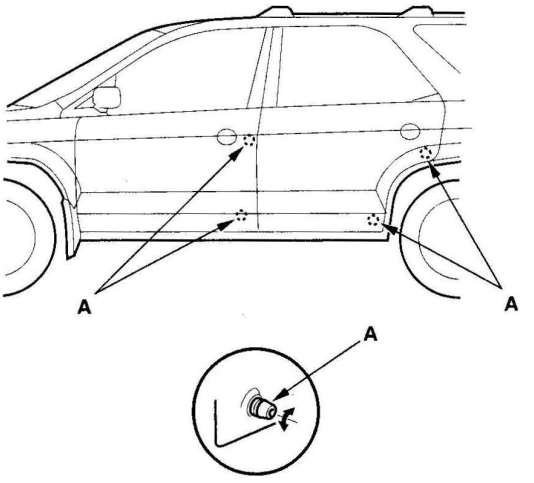
1. Place the vehicle on a firm, level surface when adjusting the doors.

2. Adjust at the hinges (A):

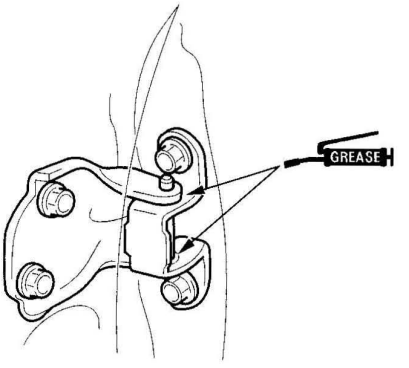
   - Loosen the door mounting bolts (B) slightly, and move the door in or out until it's flush with the body.
   - Remove the front inner fender (see page 20-121). With a shop towel (C) on the jack (D) slightly, loosen the hinge mounting bolts (E), and move the door backward or forward, up or down as necessary to equalize the gaps.



3. Check that the door and body edges are parallel. If necessary, adjust the door cushions (A) to make the rear of the doors flush with the body.



4. Grease the pivot portions of the hinges indicated by the arrows.

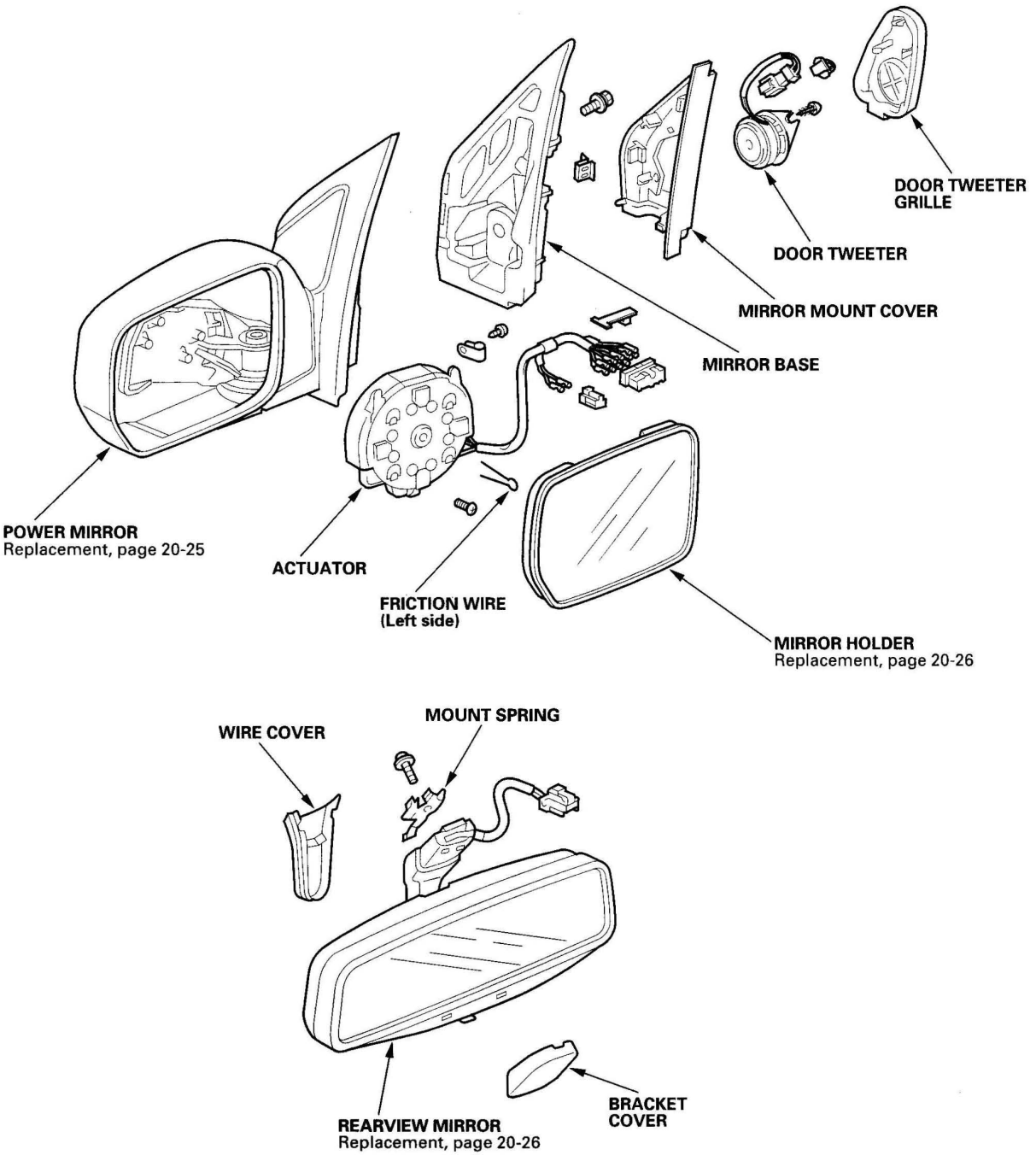


5. Apply touch-up paint to the hinge mounting bolts, and around the hinges.

6. Check for water leaks (see step 7 on page 20-22).

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Component Location Index



BACK

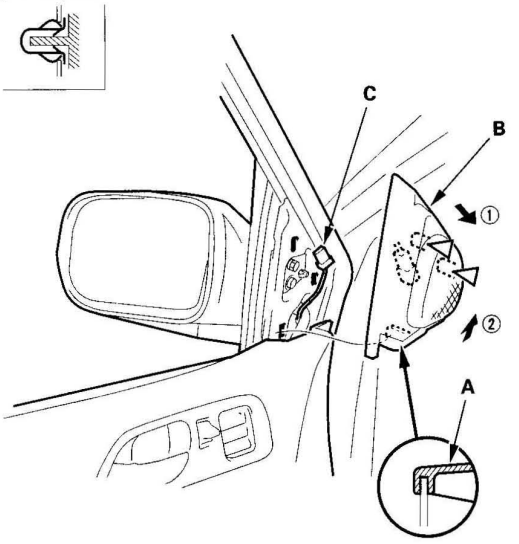
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Power Mirror Replacement

1. Lower the door glass fully.
2. Carefully detach the clips and release the hook (A), then pry out the mirror mount cover (B) by hand in the sequence shown.

Fastener Locations

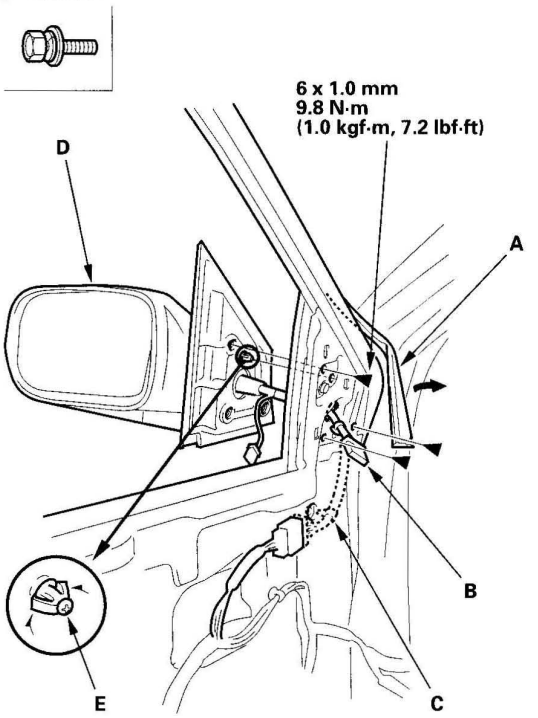
▷: Clip, 2



3. Disconnect the door tweeter connector (C).
4. Remove the door panel (see page 20-6).
5. Pull the front door upper seal (A) as necessary, disconnect the connector (B), and detach the harness clip (C), then remove the bolts securing the mirror. While holding the mirror (D), push out the clip (E), and remove the mirror. Take care not to scratch the door.

Fastener Locations

▶: Bolt, 3

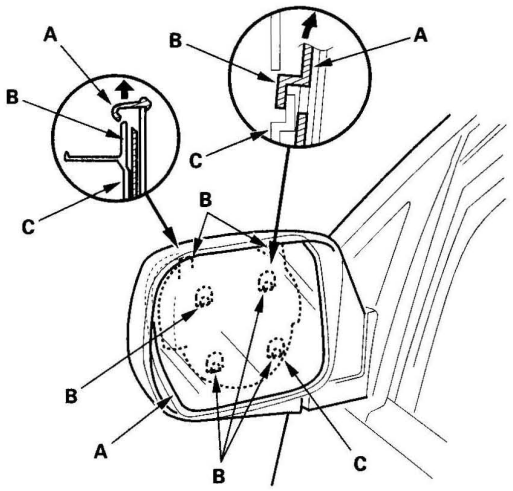


6. Install the mirror in the reverse order of removal, and note these items:
   - Make sure the connector is plugged in properly.
   - Attach the harness clip.

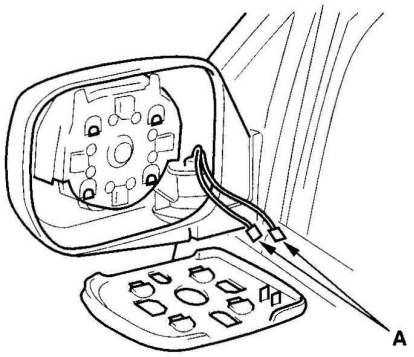
Protected by AR

Mirror Holder Replacement

1. Remove the mirror holder (A) by pulling it upward and releasing the hooks (B) from the actuator adapter plate (C).



2. Disconnect the mirror defogger terminals (A).



3. Install the mirror holder in the reverse of the removal, and note these items:

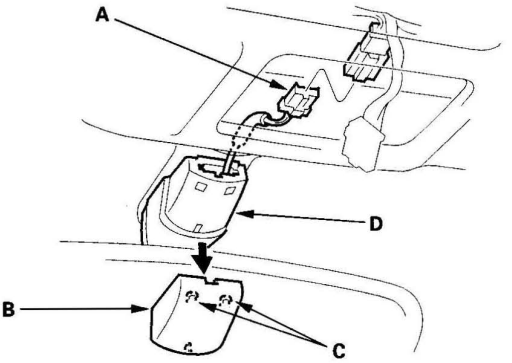
   - Make sure the terminals are plugged in properly.
   - Check the operation of the actuator.

Rearview Mirror Replacement

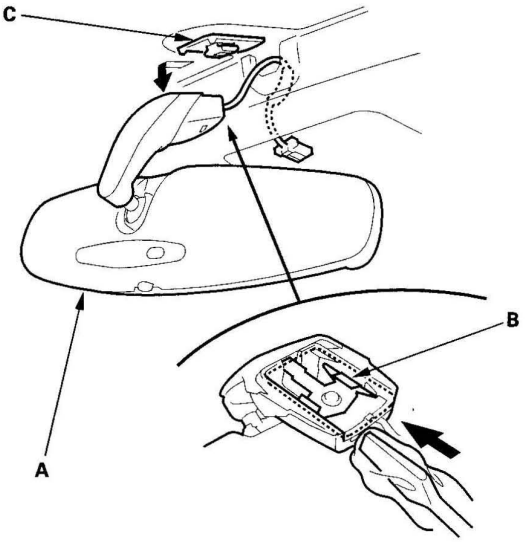
NOTE: When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.

1. Remove the roof console (see step 4 on page 20-59).

2. Disconnect the connector (A), and carefully remove the bracket cover (B) by releasing the hooks (C). Take care not to scratch the cover and mirror bracket (D).



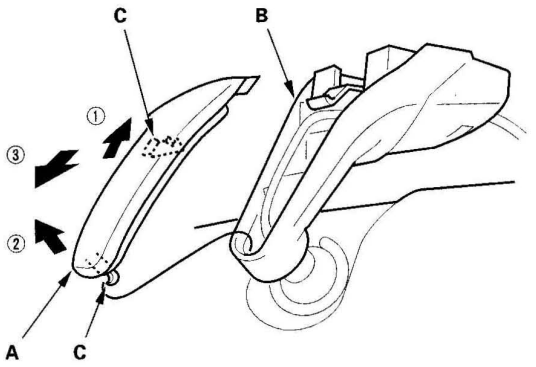
3. Slide the rearview mirror (A) forward to release the spring (B) by gently tapping the mirror bracket with a flat-tip screwdriver and a plastic hammer. Remove the mirror from the lug (C).



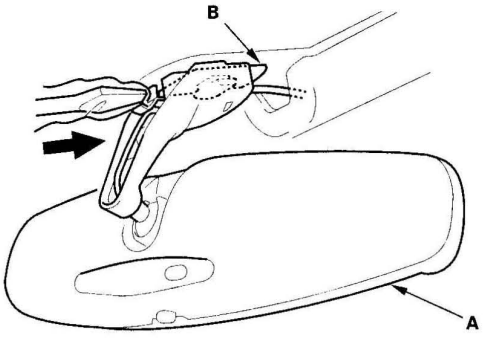
BACK

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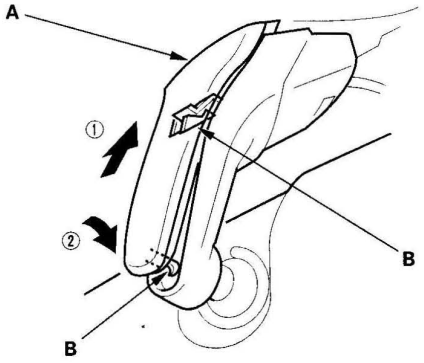
4. Remove the wire cover (A) from the mirror bracket (B) by releasing the hooks (C) in the sequence shown.



5. Install the rearview mirror (A) by sliding it over the lug (B) until the spring contacts the lug. Gently tap the mirror bracket with a flat-tip screwdriver and a plastic hammer. Be careful not to damage the wires.



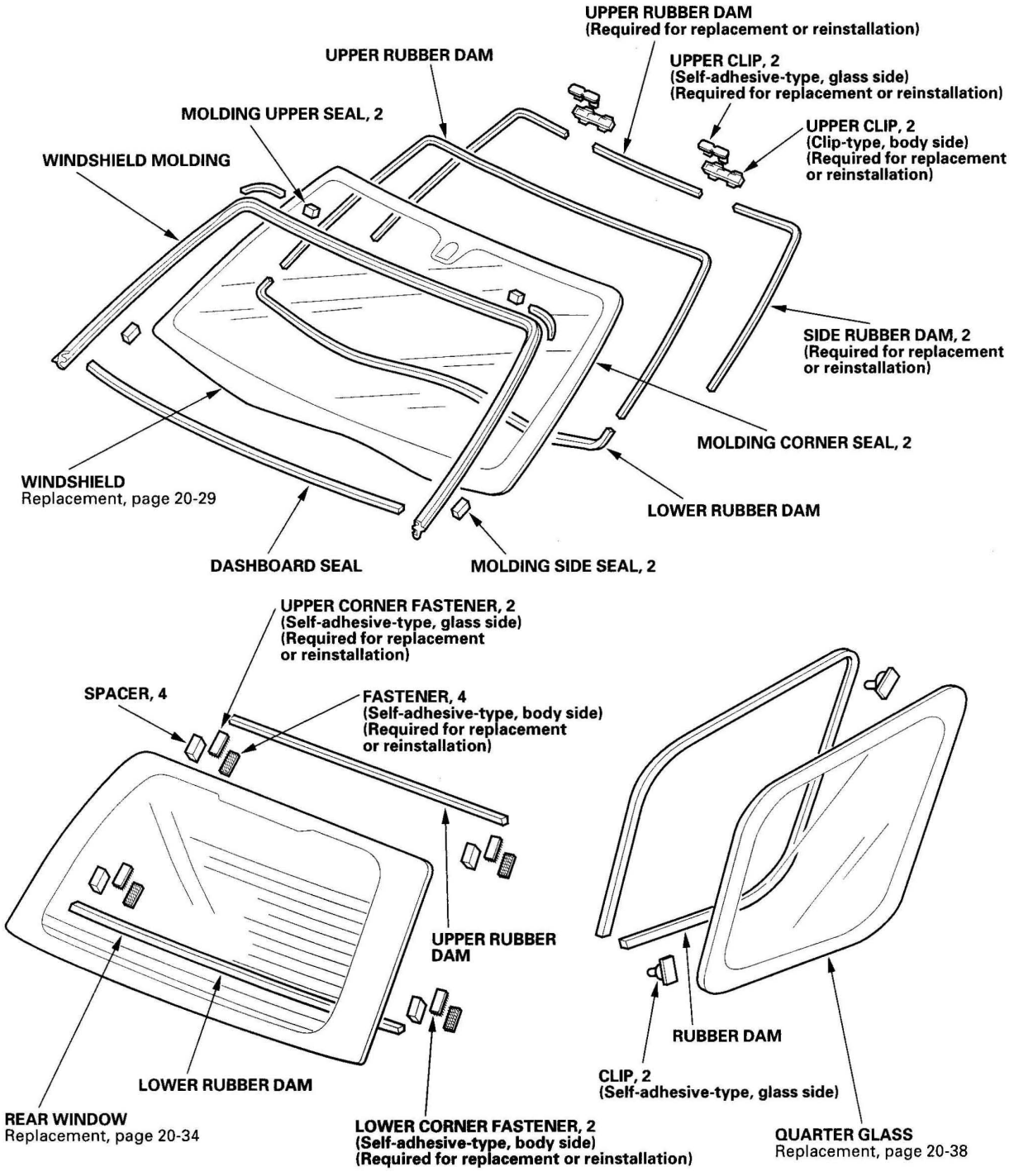
6. Install the wire cover (A) in the sequence shown. Take care not to damage the hooks (B).



7. Install the bracket cover, and connect the connector, then install the roof console.

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Component Location Index



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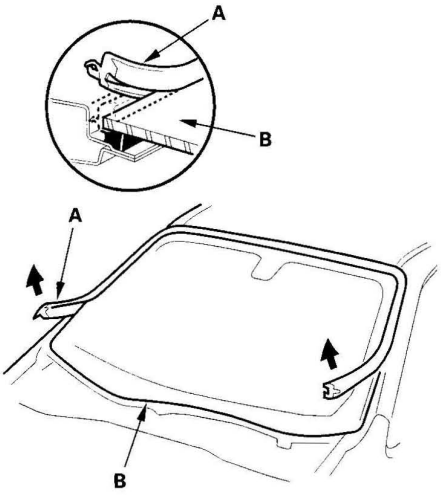
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Windshield Replacement

NOTE:
- Put on gloves to protect your hands.
- Wear eye protection while cutting the glass adhesive with piano wire.
- Use seat covers to avoid damaging any surfaces.

1. Remove these items:
   - Rearview mirror (see page 20-26)
   - A-pillar trim (see page 20-55)
   - Windshield wiper arms (see page 22-192)
   - Cowl cover (see page 20-115)

2. Remove the molding (A) from the edge of the windshield (B). If necessary, cut the molding with a utility knife.

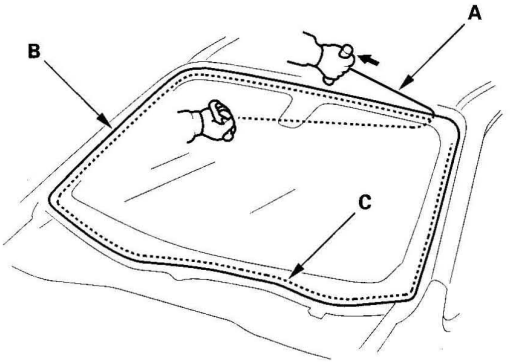


3. If the old glass is to be reinstalled, make alignment marks across the glass and body with a grease pencil.

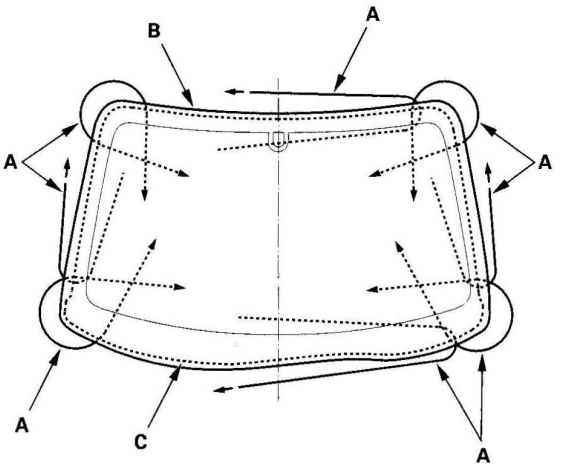
4. Pull down the front portion of the headliner (see page 20-59). Take care not to bend the headliner excessively, or you may crease or break it.

5. Apply protective tape along the edge of the dashboard and body. Using an awl, make a hole through the rubber dam, adhesive, and dashboard seal from inside the vehicle at the corner portion of the glass. Push a piece of piano wire through the hole, and wrap each end around a piece of wood.

6. With a helper on the outside, pull the piano wire (A) back and forth in a sawing motion. Hold the piano wire as close to the windshield (B) as possible to prevent damage to the body and dashboard. Carefully cut through the rubber dam and adhesive (C) around the entire windshield.



Cutting positions:



7. Carefully remove the windshield.

(cont'd)

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Windshield Replacement (cont'd)

8. With a knife, scrape the old adhesive smooth to a thickness of about 2 mm (0.08 in.) on the bonding surface around the entire windshield opening flange:

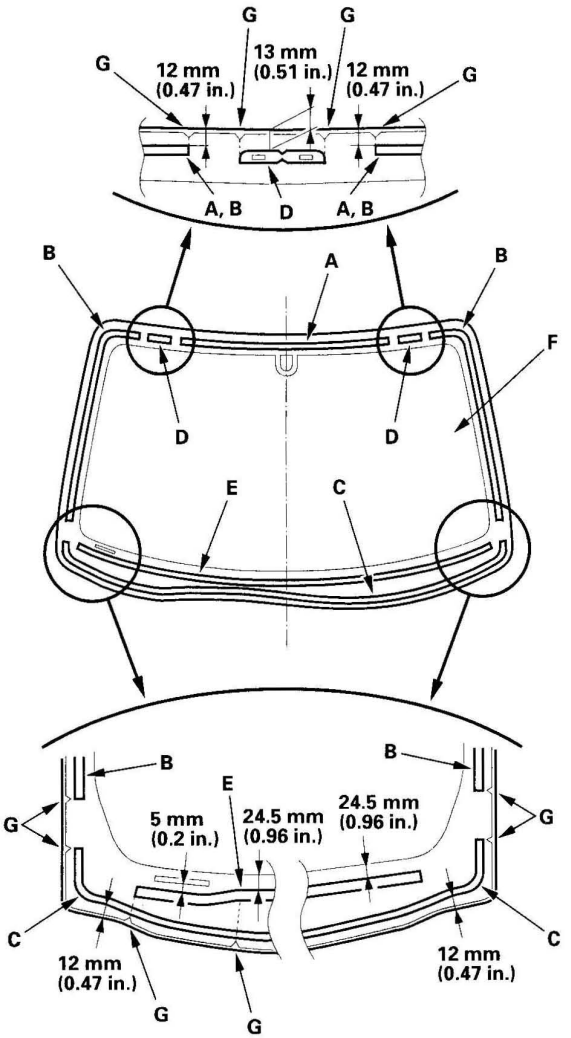
   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
   - Remove the rubber dam and fasteners from the body.

9. Clean the body bonding surface with a sponge dampened in alcohol. After cleaning, keep oil, grease and water from getting on the clean surface.

10. If the old windshield is to be reinstalled, use a putty knife to scrape off all of the old adhesive, the rubber dam and the dashboard seal, from the windshield. Clean the inside face and the edge of the windshield with alcohol where new adhesive is to be applied. Make sure the bonding surface is kept free of water, oil, and grease.

11. Glue the upper rubber dam (A), side rubber dam (B), lower rubber dam (C), clips (D), and dashboard seal (E) to the inside face of the windshield (F) as shown:

    - Be sure the side rubber dam, lower rubber dam and dashboard seal line up with the alignment marks (G).
    - Be careful not to touch the windshield where adhesive will be applied.

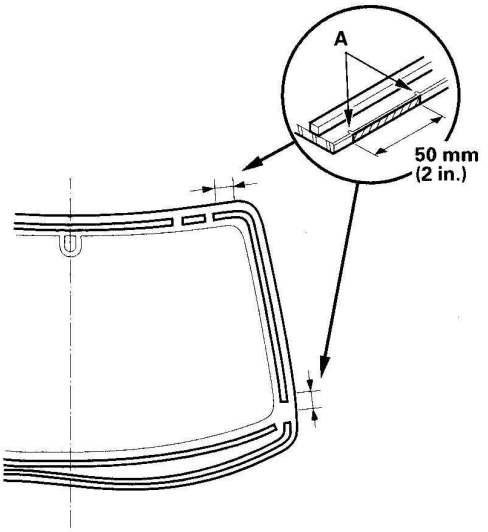


BACK

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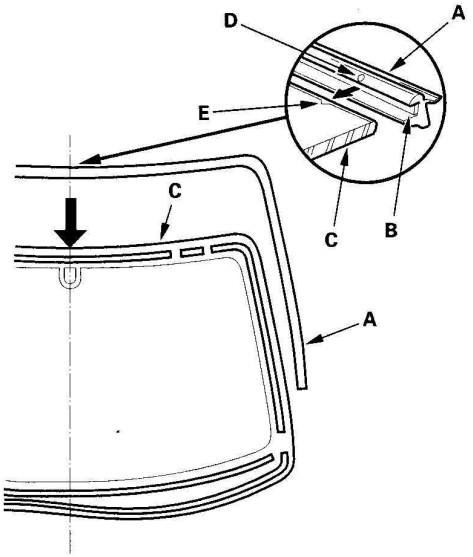
12. Apply primer (3M N-200, or equivalent) to the edge of the windshield between the alignment marks (A). Be careful not to touch the windshield where adhesive will be applied.

: **Apply primer here.**



13. Glue the molding (A) with adhesive tape (B) to the edge of the windshield (C):

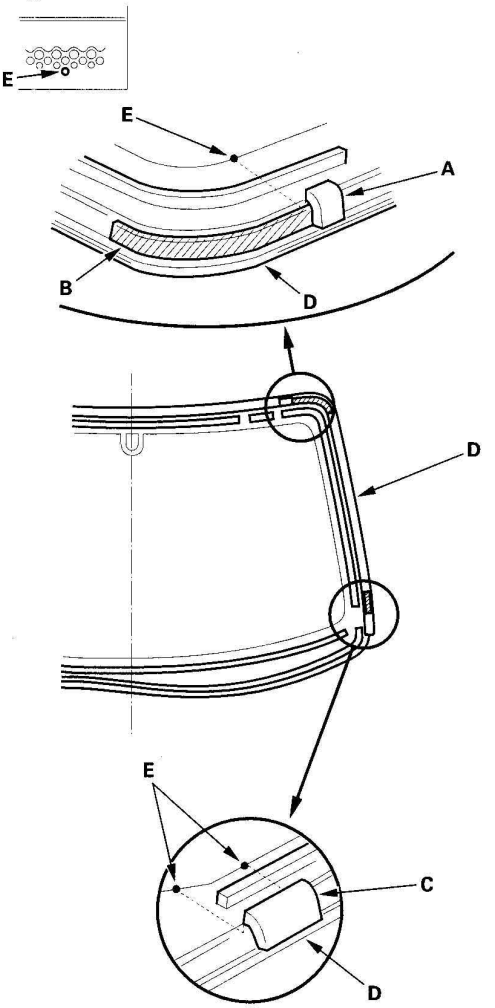
- Be sure the alignment mark (D) of the molding lines up with the alignment mark (E) of the windshield.
- Be careful not to touch the windshield where adhesive will be applied.



14. Glue the molding upper seal (A), molding corner seal (B), and molding side seal (C) to the inside surface of the molding (D) as shown:

- Be sure the molding upper seal and molding side seal line up with the alignment dots (E).
- Be careful not to touch the windshield where adhesive will be applied.

Alignment dot location:



(cont'd)

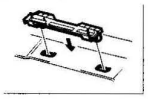
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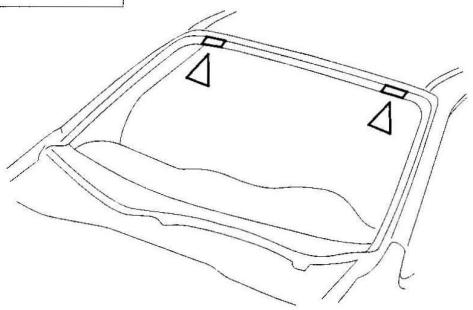
Windshield Replacement (cont'd)

15. Install the clips to the body.

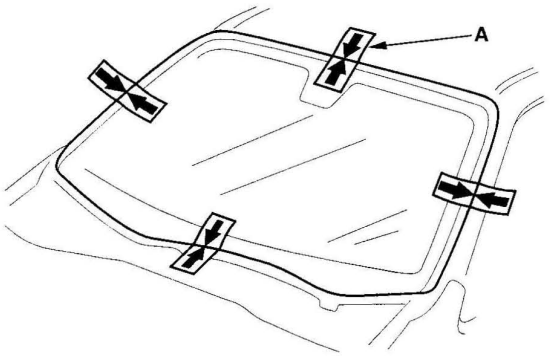
Fastener Locations

▷ : **Clip, 2**





16. Set the windshield in the opening, and center it. Make alignment marks (A) across the windshield and body with a grease pencil at the four points shown. Be careful not to touch the windshield where adhesive will be applied.

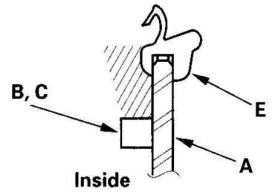


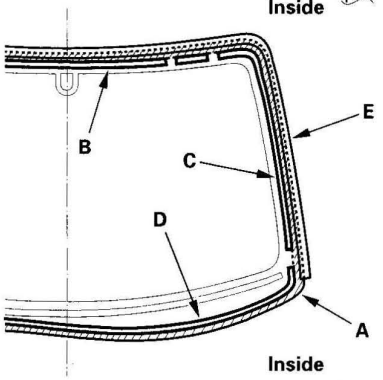
17. Remove the windshield.

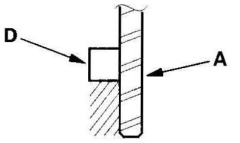
18. With a sponge, apply a light coat of glass primer around the edge of the windshield (A) between the upper rubber dam (B), side rubber dam (C), lower rubber dam (D), and molding (E) as shown, then lightly wipe it off with gauze or cheesecloth:

- Apply glass primer to the molding.
- Do not apply body primer to the windshield, and do not get body and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the windshield properly, causing a leak after the windshield is installed.
- Keep water, dust, and abrasive materials away from the primed surface.

▨ : **Apply glass primer here.**







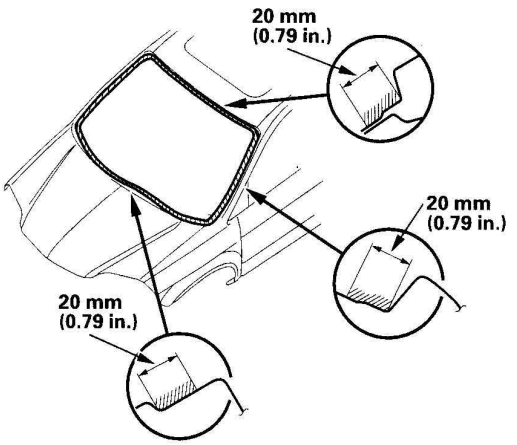
BACK

Protected by AR

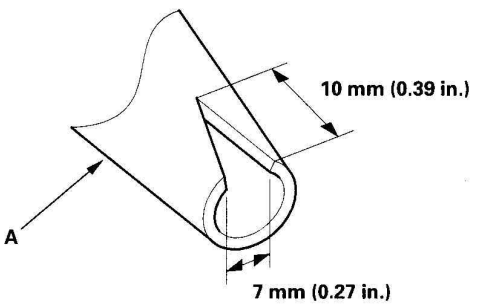
19. With a sponge, apply a light coat of body primer to the original adhesive remaining around the windshield opening flange. Let the body primer dry for at least 10 minutes:

    - Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
    - Never touch the primed surfaces with your hands.
    - Mask off the dashboard before painting the flange.

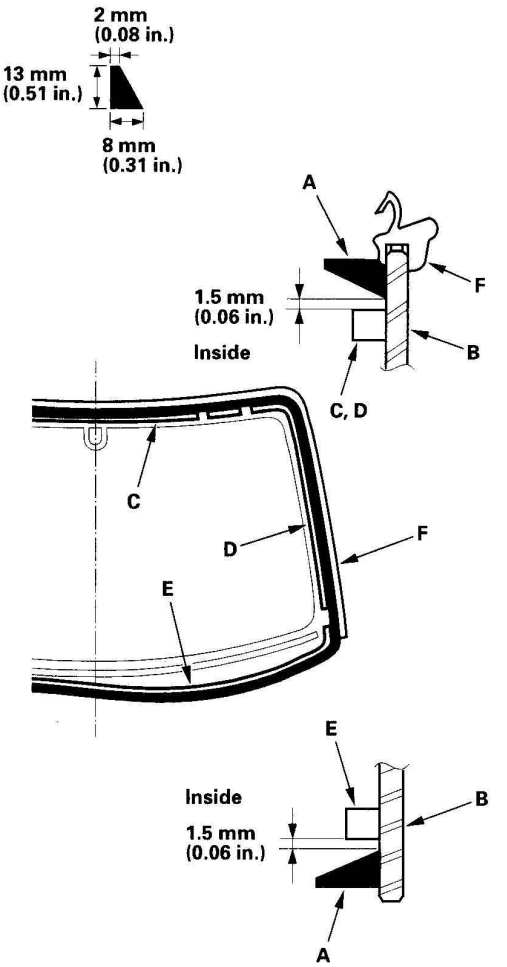
    : **Apply body primer here.**



20. Before filling a cartridge, cut a "V" in the end of the nozzle (A) as shown.



21. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive (A) around the edge of the windshield (B) between the upper rubber dam (C), side rubber dam (D), lower rubber dam (E), and molding (F) as shown. Apply the adhesive within 30 minutes after applying the glass primer. Make a slightly thicker bead at each corner.



(cont'd)

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Windshield Replacement (cont'd)

22. Use suction cups to hold the windshield over the opening, align it with the alignment marks made in step 16, and set it down on the adhesive. Lightly push on the windshield until its edges are fully seated on the adhesive all the way around. Do not open or close the doors until the adhesive is dry.

23. Scrape or wipe the excess adhesive off with a putty knife or towel. To remove adhesive from a painted surface or the windshield, wipe with a soft shop towel dampened with alcohol.

24. Let the adhesive dry for at least 1 hour, then spray water over the windshield and check for leaks. Mark leaking areas, and let the windshield dry, then seal with sealant:

    - Let the vehicle stand for at least 4 hours after windshield installation. If the vehicle has to be used within the first 4 hours, it must be driven slowly.
    - Keep the windshield dry for the first hour after installation.

25. Reinstall all remaining removed parts. Install the rearview mirror after the adhesive has dried thoroughly. Advise the customer not to do the following things for 2 to 3 days:

    - Slam the doors with all the windows rolled up.
    - Twist the body excessively (such as when going in and out of driveways at an angle or driving over rough, uneven roads).

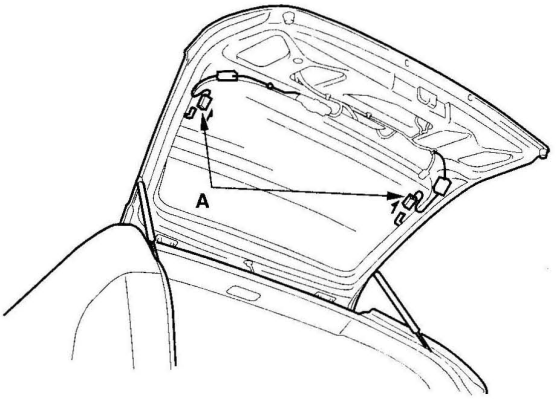
Rear Window Replacement

NOTE:
- Put on gloves to protect your hands.
- Wear eye protection while cutting the glass adhesive with piano wire
- Use seat covers to avoid damaging any surfaces.
- Do not damage the rear window defogger grid lines and terminals.

1. Remove these items:

    - Tailgate trim panel (see page 20-58)
    - Rear window wiper arm (see page 22-193)
    - High mount brake light (see page 22-117)

2. Disconnect the rear window defogger connectors (A).



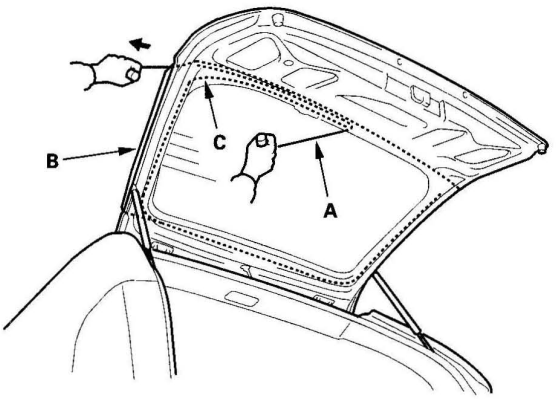
3. If the old glass is to be reinstalled, make alignment marks across the glass and body with a grease pencil.

4. Apply protective tape along the inside and outside edges of the tailgate. Using an awl, make a hole through the adhesive from inside the vehicle at the corner portion of the glass. Push the piano wire (C) through the hole, and wrap each end around a piece of wood.

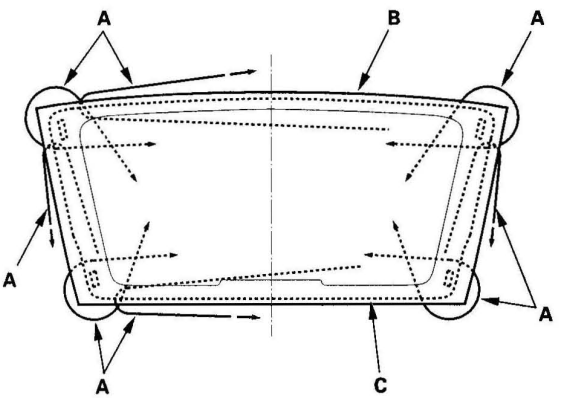
BACK

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5. With a helper on the outside, pull the piano wire (A) back and forth in a sawing motion. Hold the piano wire as close to the rear window (B) as possible to prevent damage to the tailgate, and carefully cut through the adhesive (C) around the entire rear window.



Cutting positions:



6. Carefully remove the rear window.

7. With a putty knife, scrape the old adhesive smooth to a thickness of about 2 mm (0.08 in.) on the bonding surface around the entire rear window opening flange:

   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding
   - Remove the fasteners from the tailgate.

8. Clean the tailgate bonding surface with a sponge dampened in alcohol. After cleaning, keep oil, grease, and water from getting on the surface.

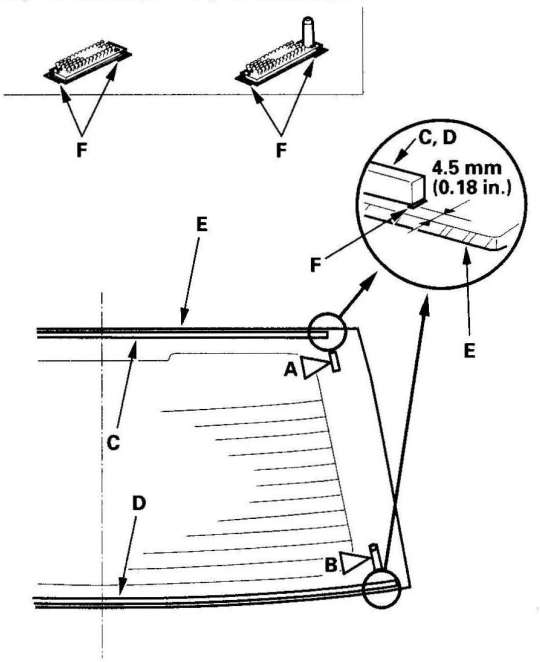
9. If the old rear window is to be reinstalled, use a putty knife to scrape off all of the old adhesive and rubber dam from the rear window. Clean the inside face and the edge of the rear window with alcohol where new adhesive is to be applied. Make sure the bonding surface is kept free of water, oil, and grease.

10. Glue the upper corner fasteners (A), lower corner fasteners (B), upper rubber dam (C), and lower rubber dam (D) to the inside surface of the rear window (E) as shown:

    - Be sure the fasteners and rubber dams line up with alignment marks (F).
    - Be careful not to touch the rear window where adhesive will be applied.

Fastener Locations

A ▷: Fastener, 2 B ▷: Fastener, 2



(cont'd)

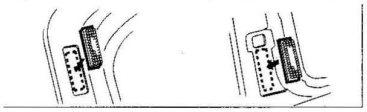
Protected by AR

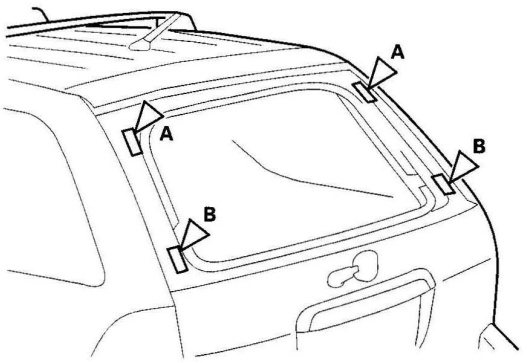
Rear Window Replacement (cont'd)

11. Glue the corner fasteners (A, B) to the tailgate as shown.

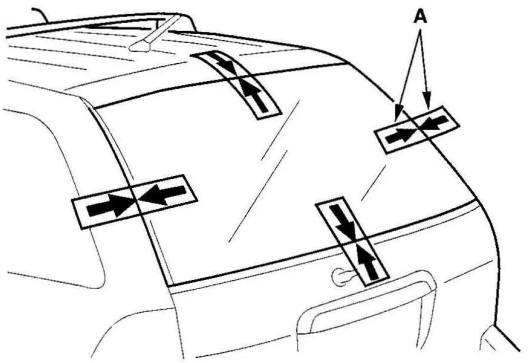
Fastener Locations

A ▷: Fastener, 2 B ▷: Fastener, 2





12. Set the rear window in the opening, and center it. Make alignment marks (A) across the rear window, tailgate, and body with a grease pencil at the four points shown. Be careful not to touch the rear window where adhesive will be applied.

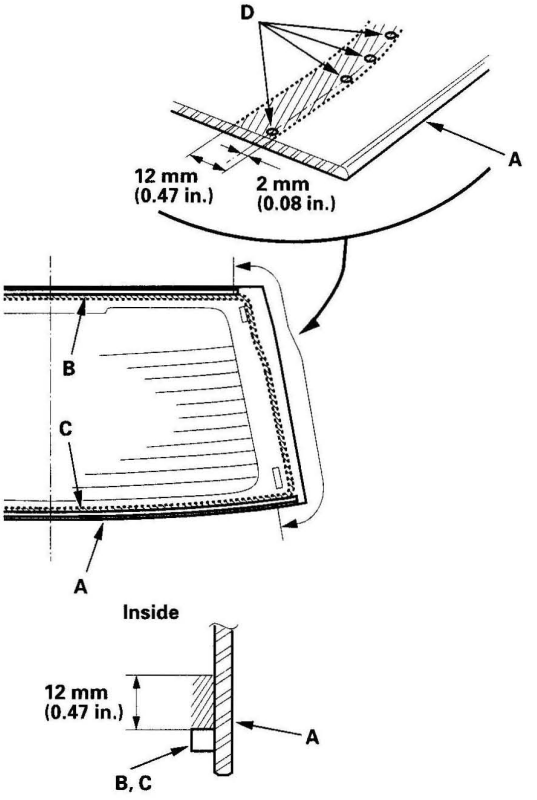


13. Remove the rear window.

14. With a sponge, apply a light coat of glass primer to the edge of the rear window (A) along the upper rubber dam (B) and lower rubber dam (C) as shown, then lightly wipe it off with gauze or cheesecloth:

- With the printed dots (D) on the rear window as a guide, apply the glass primer to both side portions of the rear window.
- Do not apply body primer to the rear window, and do not get tailgate and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the rear window properly, causing a leak after the rear window is installed.
- Keep water, dust, and abrasive materials away from the primed surface.

▨ : **Apply primer here.**



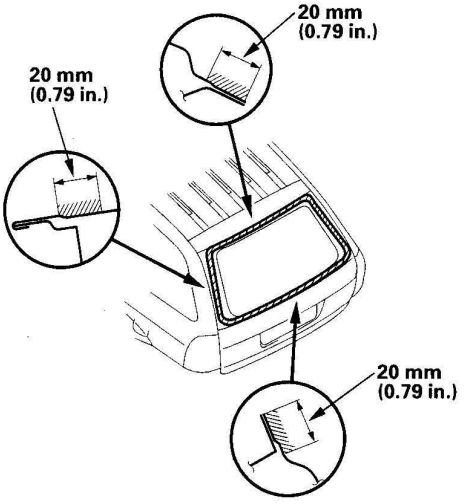
BACK

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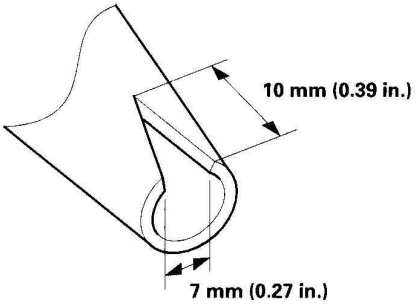
15. With a sponge, apply a light coat of body primer to the original adhesive remaining around the rear window opening flange. Let the body primer dry for at least 10 minutes:

    - Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
    - Never touch the primed surfaces with your hands.

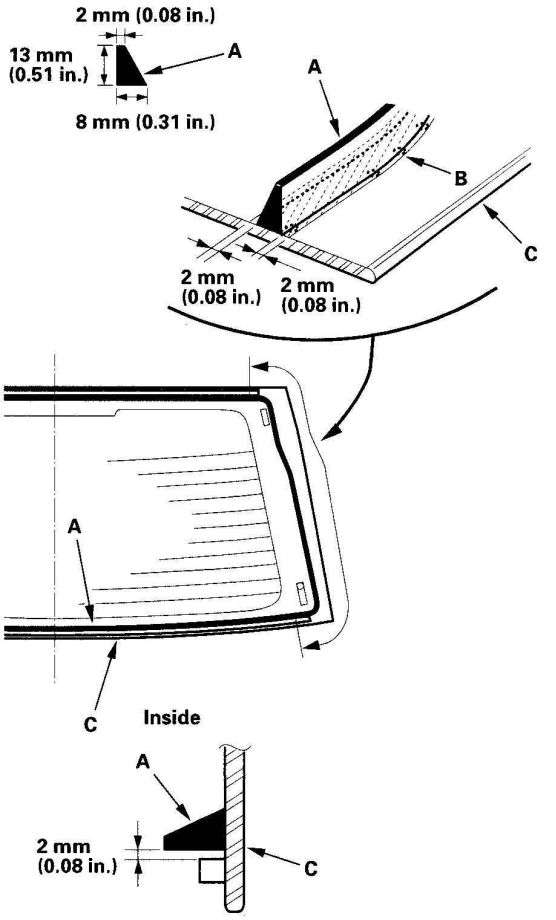
    : **Apply body primer here.**



16. Before filling a cartridge, cut a "V" in the end of the nozzle (A) as shown.



17. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive (A) on the glass primer trace (B) you applied on step 14, and around the edge of the rear window (C) as shown. Apply the adhesive within 30 minutes after applying the glass primer. Make a slightly thicker bead at each corner.



(cont'd)

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Rear Window Replacement (cont'd)

18. Use suction cups to hold the rear window over the opening, align it with the alignment marks you made in step 12, and set it down on the adhesive. Lightly push on the rear window until its edges are fully seated on the adhesive all the way around. Do not open or close the doors until the adhesive is dry.

19. Scrape or wipe the excess adhesive off with a putty knife or towel. To remove adhesive from a painted surface or the rear window, use a soft shop towel dampened with alcohol.

20. Let the adhesive dry for at least 1 hour, then spray water over the rear window and check for leaks. Mark the leaking areas, let the rear window dry, then seal with sealant. Let the vehicle stand for at least 4 hours after rear window installation. If the vehicle has to be used within the first 4 hours, it must be driven slowly.

21. Reinstall all remaining removed parts. Advise the customer not to do the following things for 2 to 3 days:

    - Slam the doors with all the windows rolled up.
    - Twist the body excessively (such as when going in and out of driveways at an angle or driving over rough, uneven roads).

Quarter Glass Replacement

NOTE:
- Put on gloves to protect your hands.
- Wear eye protection while cutting the glass adhesive with piano wire.
- Use seat covers to avoid damaging any surfaces.

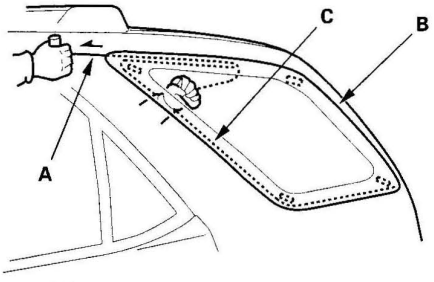
1. Remove these items:
   - D-pillar trim (see page 20-56)
   - Separation net cap (see step 8 on page 20-60)
   - Coat hanger (see step 9 on page 20-60)

2. Pull the upper portion of the rear side trim panel back, then remove the C-pillar trim (see page 20-56).

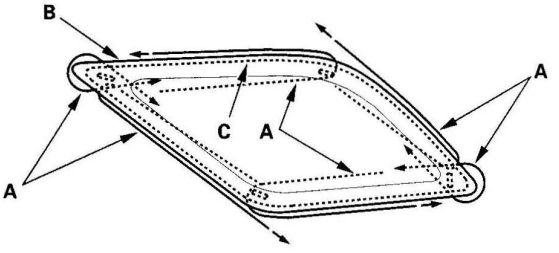
3. Pull down the rear side portion of the headliner as necessary (see step 12 on page 20-60).

4. Apply protective tape along the inside and outside edges of the body. Using an awl, make a hole through the adhesive from inside the vehicle. Push a piece of piano wire through the hole, and wrap each end around a piece of wood.

5. With a helper on the outside, pull the piano wire (A) back and forth in a sawing motion. Hold the piano wire as close to the quarter glass (B) as possible to prevent damage to the body, and carefully cut through the adhesive (C) around the entire quarter glass.



Cutting positions:



6. Carefully remove the quarter glass.

BACK

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7. With a putty knife, scrape the old adhesive smooth to a thickness of about 2 mm (0.08 in.) on the bonding surface around the entire quarter glass opening flange:

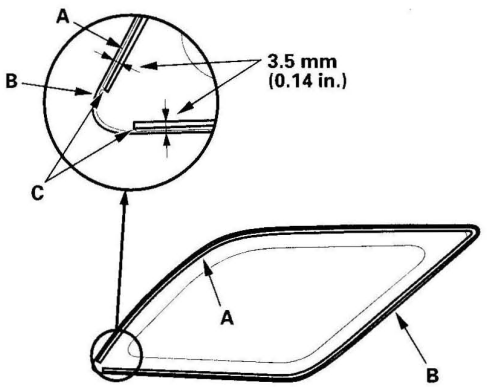
   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
   - Remove the fasteners from the body.

8. Clean the body bonding surface with a sponge dampened in alcohol. After cleaning, keep oil, grease, and water from getting on the surface.

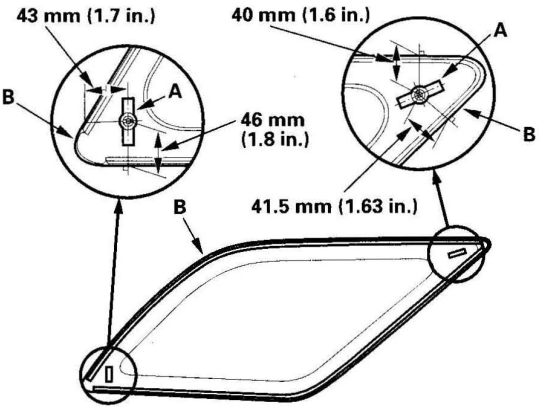
9. If the old quarter glass is to be reinstalled, use a putty knife to scrape off all of the old adhesive and the rubber dam from the glass. Clean the inside face and the edge of the glass with alcohol where new adhesive is to be applied. Make sure the bonding surface is kept free of water, oil, and grease.

10. Glue the rubber dam (A) to the inside surface of the glass (B) as shown:

    - Be sure both ends of the rubber dam line up with the alignment marks (C).
    - Be careful not to touch the glass where adhesive will be applied.

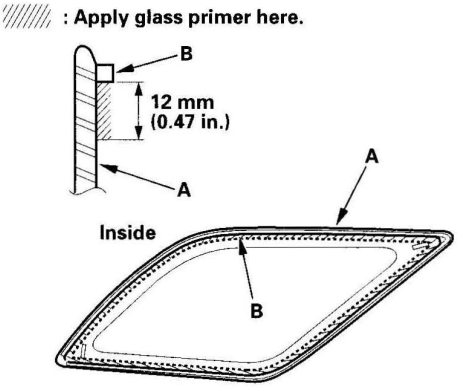


11. Glue the clips (A) to the inside face of the quarter glass (B) as shown. Be careful not to touch the quarter glass where adhesive will be applied.



12. With a sponge, apply a light coat of glass primer to the edge of the glass (A) and along the rubber dam (B) as shown, then lightly wipe it off with gauze or cheesecloth:

    - Do not apply body primer to the quarter glass, and do not get body and glass primer sponges mixed up.
    - Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the quarter glass properly, causing a leak after the quarter glass is installed.
    - Keep water, dust, and abrasive materials away from the primed surface.



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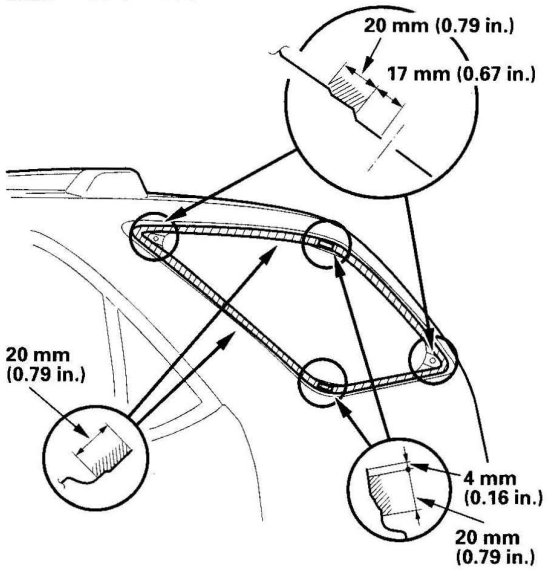
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Quarter Glass Replacement (cont'd)

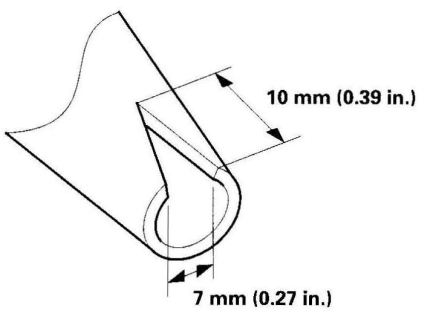
13. With a sponge, apply a light coat of body primer to the original adhesive remaining around the quarter glass opening flange. Let the body primer dry for at least 10 minutes:

    - Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
    - Never touch the primed surfaces with your hands.

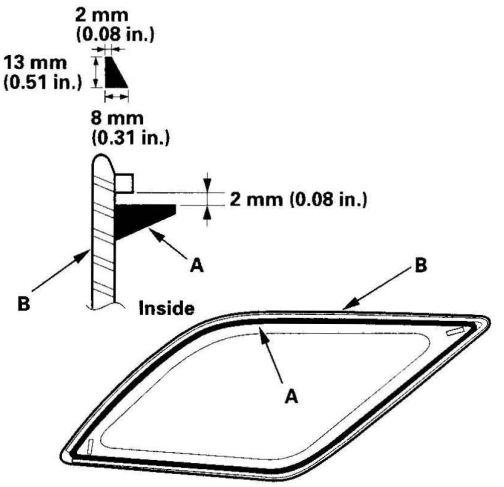
    : **Apply body primer here.**



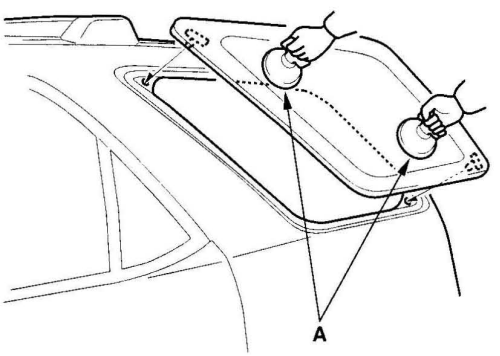
14. Before filling a cartridge, cut a "V" in the end of the nozzle (A) as shown.



15. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive (A) around the edge of the glass (B) as shown. Apply the adhesive within 30 minutes after applying the glass primer. Make a slightly thicker bead at each corner.



16. Use suction cups (A) to hold the quarter glass over the opening, align it and set it down on the adhesive. Lightly push on the quarter glass until its edges are fully seated on the adhesive all the way around. Do not open or close the doors until the adhesive is dry.



BACK

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17. Scrape or wipe the excess adhesive off with a putty knife or towel. To remove adhesive from a painted surface or the rear window, use a soft shop towel dampened with alcohol.

18. Let the adhesive dry for at least 1 hour, then spray water over the sliding door glass and check for leaks. Mark the leaking areas, let the quarter glass dry, then seal with sealant. Let the vehicle stand for at least 4 hours after quarter glass installation. If the vehicle has to be used within the first 4 hours, it must be driven slowly.

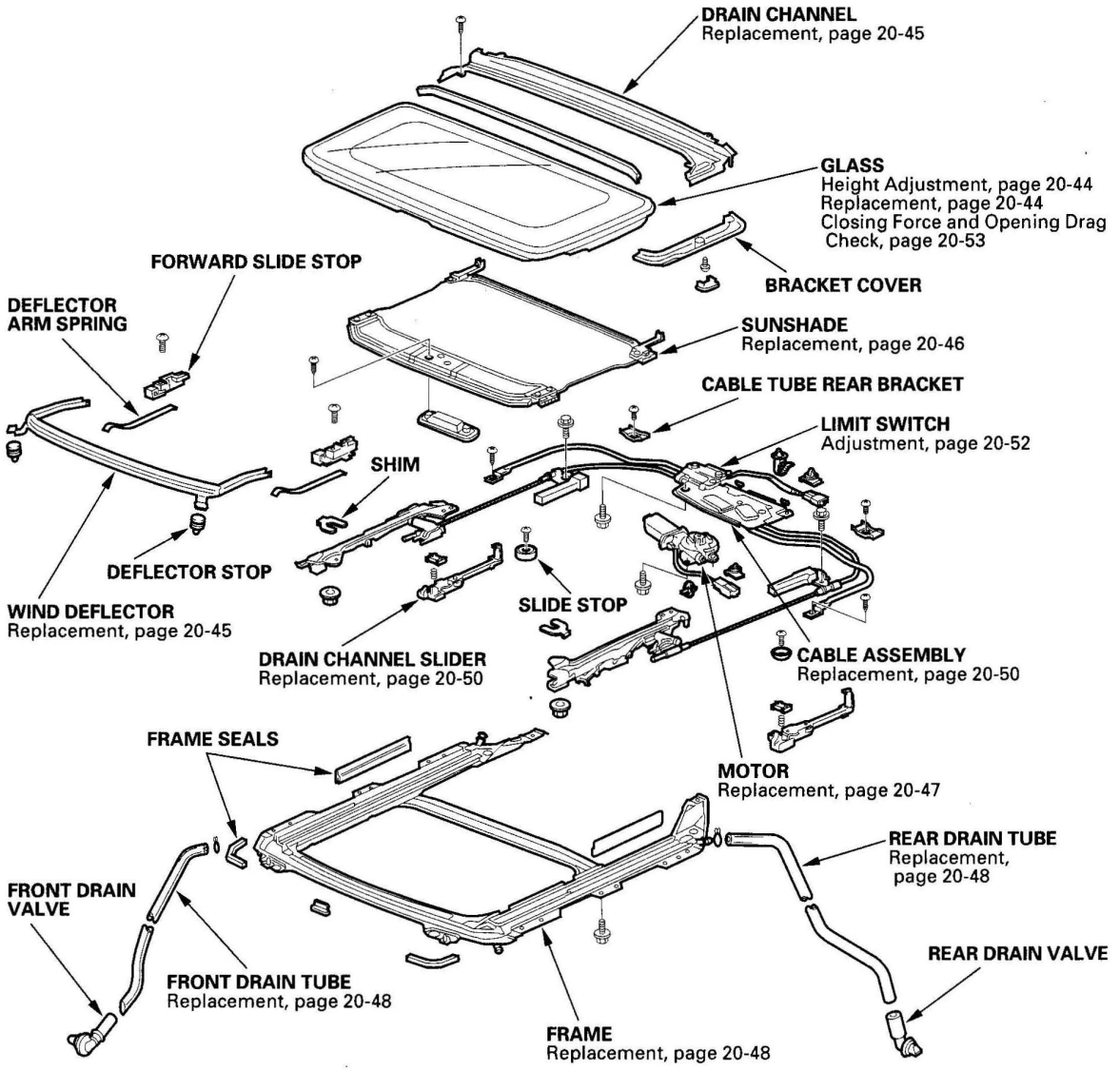
19. Reinstall all remaining removed parts. Advise the customer not to do the following things for 2 to 3 days:

    - Slam the doors with all the windows rolled up.
    - Twist the body excessively (such as when going in and out of driveways at an angle or driving over rough, uneven roads).

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Moonroof

Component Location Index



BACK

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Symptom Troubleshooting Index

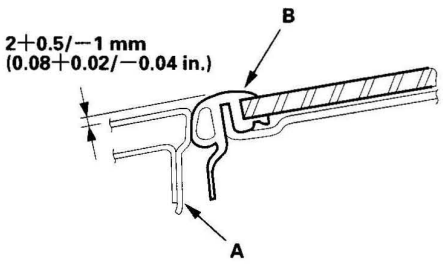
Symptom	Diagnostic procedure	Also check for
Water leaks	1. Check for a clogged drain tube. 2. Check for a gap between the glass weatherstrip and the roof panel. 3. Check for a defective or an improperly installed glass weatherstrip. 4. Check for a gap between the drain seal and the roof panel.	
Wind noise	1. Check for excessive clearance between the glass weatherstrip and the roof panel.	
Motor noise	1. Check for a loose motor. 2. Check for a worn gear or bearing. 3. Check for a deformed cable assembly.	
Glass does not move, but motor turns	1. Check for a defective gear or inner cable. 2. Check for foreign matter stuck between the guide rail and the slider. 3. Check for a loose inner cable. 4. Make sure the cable assembly is attached properly.	
Glass does not move and motor does not turn (glass can be moved with moonroof wrench)	1. Check for a blown fuse. 2. Check for a faulty moonroof switch. 3. Check the limit switch. 4. Check for a run down battery. 5. Check for a defective motor. 6. Check for a faulty relay.	

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Moonroof

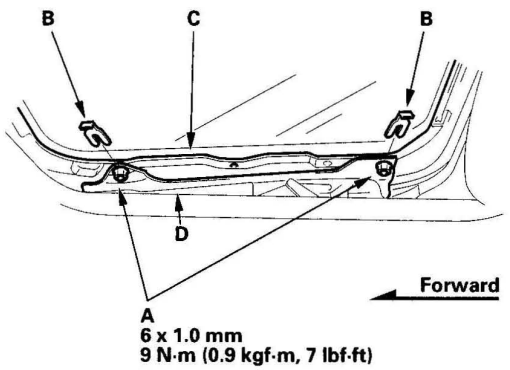
Glass Height Adjustment

The roof panel (A) should be even with the glass weatherstrip (B), to within 2+0.5/−1 mm (0.08+0.02/−0.04 in.) all the way around. If not, make the following adjustment:



1. Tilt the glass all the way up, and remove the bracket cover.
2. Loosen the nuts (A), then install or remove shims (B) between the glass frame (C) and glass bracket (D) on each side as needed.

   Shim thickness: Front and rear max. 2 mm (0.08 in.)



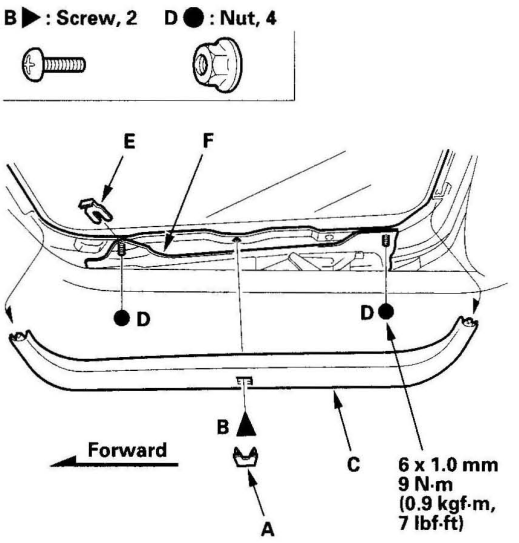
3. Repeat on opposite side if necessary.

Glass Replacement

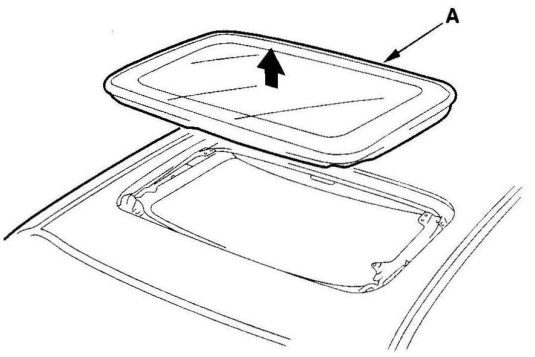
1. Tilt the glass all the way up.
2. Slide the sunshade all the way back.
3. Remove the caps (A) and screws (B), then remove both bracket covers (C). Remove the nuts (D) and shims (E) from both glass brackets (F).

Fastener Locations

B ▶ : Screw, 2 D ● : Nut, 4



4. Remove the moonroof glass (A) by lifting it up. Do not damage the roof panel.



5. Install the glass in the reverse order of the removal, and adjust the glass height.
6. Check for water leaks. Use free-flowing water flow from a hose without a nozzle. Do not use high-pressure water.

BACK

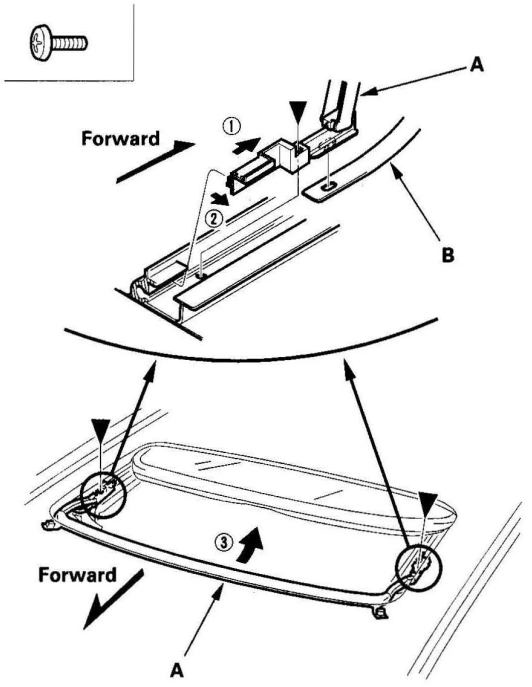
Protected by AR

Wind Deflector Replacement

1. Remove the screws, then remove the wind deflector (A) and the deflector arm spring (B) in the sequence shown. Take care not to scratch the roof panel.

Fastener Locations

▶ : Screw, 2



2. Install the deflector in the reverse order of removal.

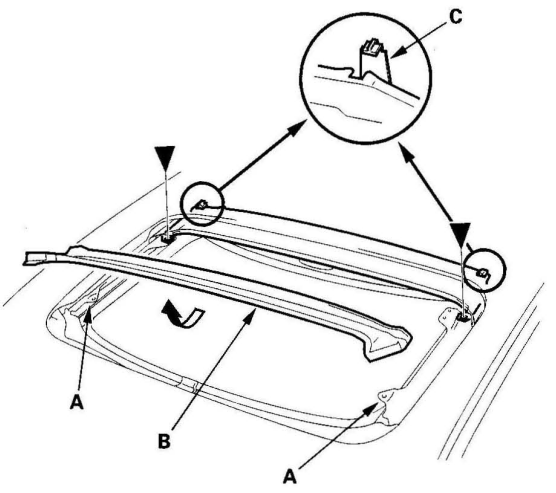
Drain Channel Replacement

1. Remove the moonroof glass (see page 20-44).

2. With the moonroof wrench, move both glass brackets (A) to the position where the moonroof normally pivots down, and remove the screws securing the drain channel (B).

Fastener Locations

▶ : Screw, 2



3. Release the drain channel (B) from both hooks (C) of the drain channel slider by pulling the drain channel forward.

4. Remove the drain channel.

5. Install the drain channel in the reverse order of removal, and note these items:

   - Push the drain channel onto the hooks until a faint click is heard.
   - Check the glass height adjustment.

6. Check for water leaks. Let the water run freely from a hose without a nozzle. Do not use a high-pressure spray.

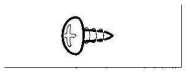
Protected by AR

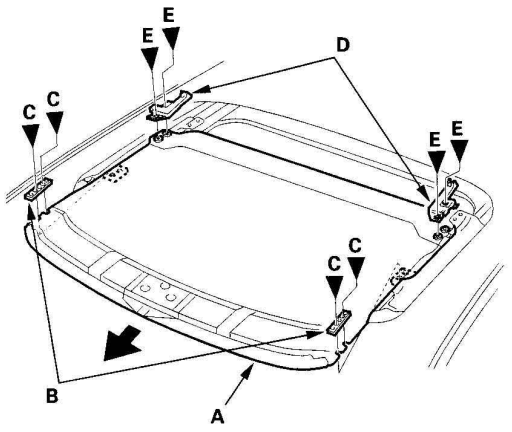
Sunshade Replacement

1. Remove the drain channel (see page 20-45).
2. Slide the sunshade (A) until you can see both sunshade slider spacers (B).

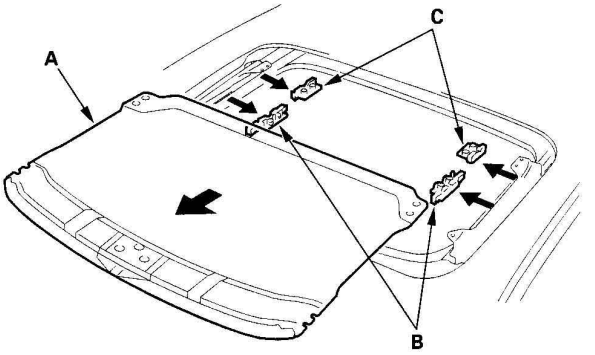
Fastener Locations

C, E ▶ : Screw, 8





3. Remove the screws (C), then remove both spacers.
4. While lifting the front portion of the sunshade, move the sunshade forward until you can see both rear hooks (D). Do not damage the sunshade and hooks.
5. Remove the screws (E), then remove both hooks.
6. Remove the sunshade (A).



7. Remove both front sunshade base sliders (B) and both rear sunshade base sliders (C).
8. Install the sunshade in the reverse order of removal, and check the glass height adjustment (see page 20-44).
9. Check for water leaks. Let the water flow freely from a hose without a nozzle. Do not use a high-pressure spray.

BACK

Protected by AR

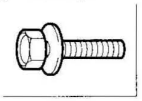
Motor Replacement

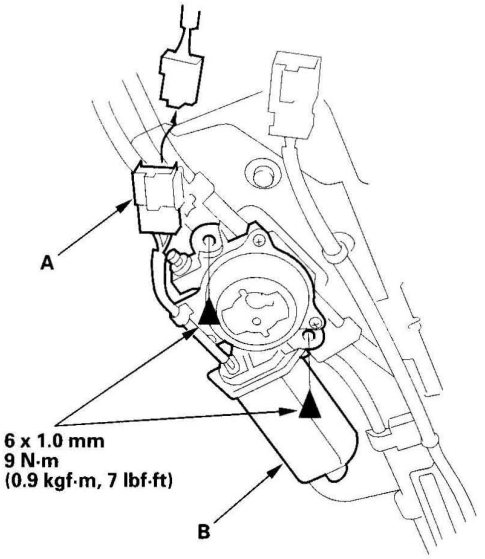
1. Remove the headliner (see page 20-59).

2. Put on gloves to protect your hands. Disconnect and detach the connector (A), and remove the bolts, then remove the motor (B).

Fastener Locations

▶ : Bolt, 2





3. Install the motor in the reverse order of removal, and note these items:

   - Make sure the connector is plugged in properly.
   - Check the motor operation.

Protected by AR

Frame and Drain Tube Replacement

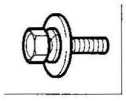
1. Remove these items:

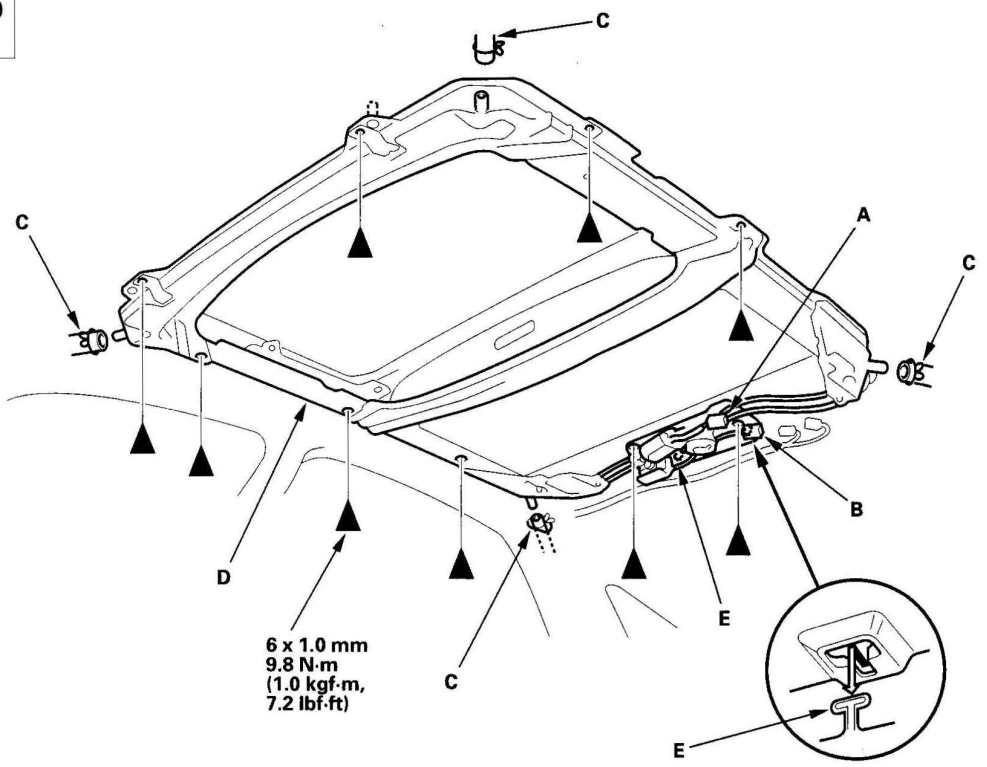
   - Headliner (see page 20-59)
   - Moonroof glass (see page 20-44)

2. Put on gloves to protect your hands. Disconnect the motor connector (A), open/close-tilt/close switch connector (B), and the drain tubes (C).

Fastener Locations

▶ : Bolt, 10





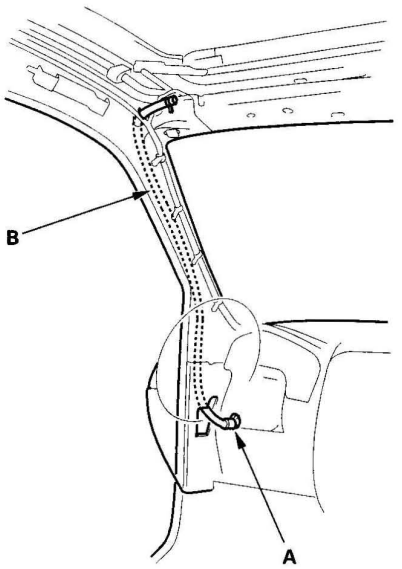
3. With an assistant holding the frame (D), remove the bolts, and release the rear hooks (E) by moving the frame forward, then remove the frame. Remove the front bolts last.

4. With the help of an assistant, carefully remove the frame through the door opening. Take care not to scratch the interior trim and body, or tear the seat covers.

BACK

Protected by AR

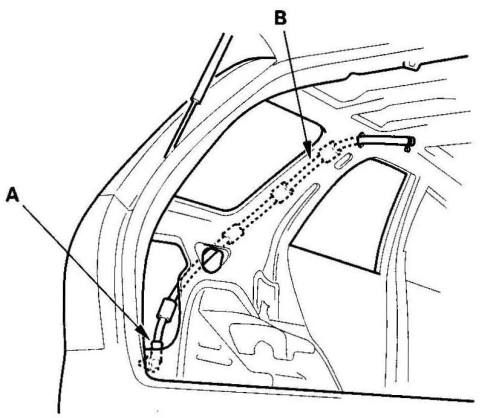
5. To remove a front drain valve (A) from the body remove the kick panel, left or right (see page 20-55). Tie a string to the end of the front drain tube (B) then pull the drain tube down out of the front pillar.



6. To remove a rear drain valve (A) from the body, remove these parts:

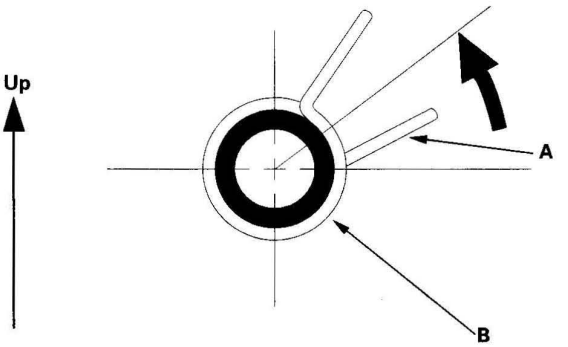
   - Rear side trim panel, left side (see page 20-57)
   - Rear speaker grille, right side (see page 20-57)

   Tie a string to the top end of the rear drain tube (B), then pull back the trunk side trim panel and pull the drain tube down out of the pillar.



7. Install the frame and drain tube in the reverse order of removal, and note these items:

   - Before installing the frame, clear the drain tubes and drain valves using compressed air.
   - Check the frame seal.
   - Clean the surface of the frame.
   - When installing the frame, first attach the rear hooks into the body holes.
   - Make sure the connectors are plugged in properly.
   - When connecting the drain tube, slide it over the frame nozzle at least 10 mm (0.39 in.).
   - Install the tube clip (A) on the drain tube (B) as shown.



8. Check for water leaks. Let the water run freely from a hose without a nozzle. Do not use a high-pressure spray.

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Drain Channel Slider and Cable Assembly Replacement

1. Remove the frame (see page 20-48).

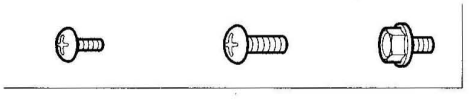
2. Remove these parts from the frame:

   - Drain channel (see page 20-45)
   - Sunshade (see page 20-46)
   - Moonroof motor (see page 20-47)

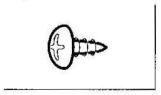
3. Put on gloves to protect your hands. Remove the screws (A, B), then remove the slide stops (C) and cable tube rear brackets (D) from both sides of the frame (E). Remove the cable tube side bracket mounting bolts (F) and the cable tube mounting screws (G) from both sides of the frame.

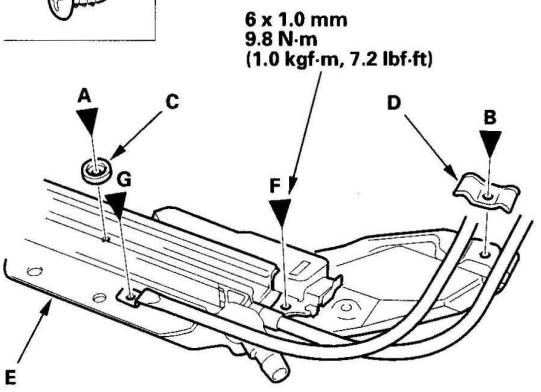
Fastener Locations

A ▶ : Screw, 2 B ▶ : Screw, 2 F ▶ : Bolt, 2

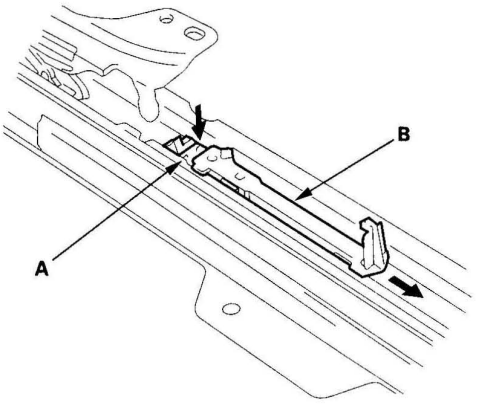


G ▶ : Screw, 2

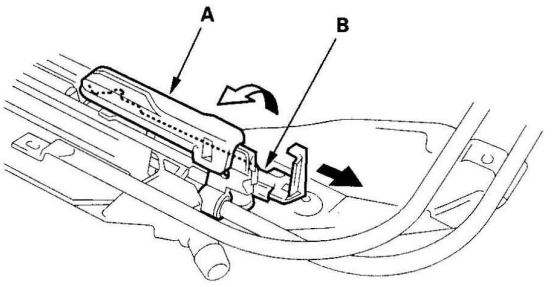




4. While pushing down on the hook (A), slide the drain channel sliders (B) back on both sides.



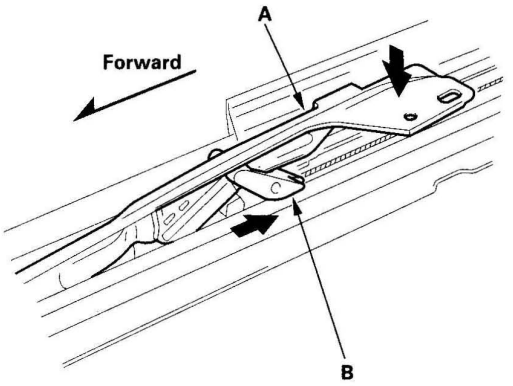
5. Turn both cable tube side brackets (A) up, and remove the drain channel sliders (B).



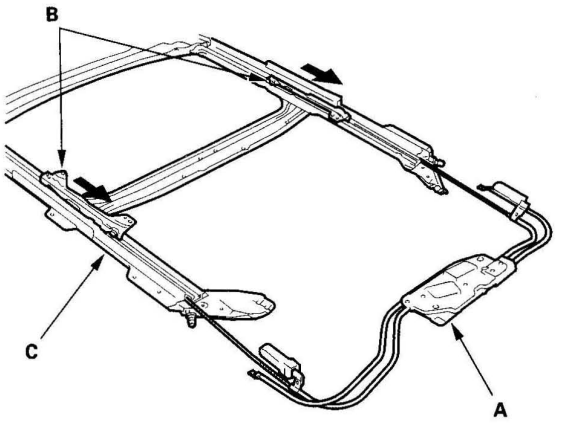
BACK

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6. Pivot the glass bracket (A) down by sliding the link lifter (B) back, then slide both glass brackets back with the link lifter.

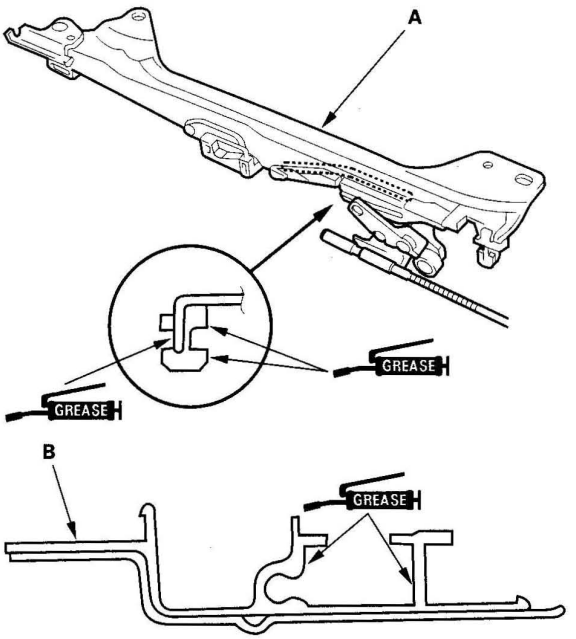


7. Slide the cable assembly (A) and both glass brackets (B) back, then remove them from the frame (C).



8. Install the sliders and cables in the reverse order of removal, and note these items:

- Damaged parts should be replaced.
- Apply multipurpose grease to the glass bracket (A) and guide rail portion of the frame (B) indicated by the arrows.
- Before reinstalling the moonroof motor, make sure both link lifters are parallel, and in the fully closed position.
- Before reinstalling the moonroof motor, install the frame and glass, then check the opening drag (see page 20-53).



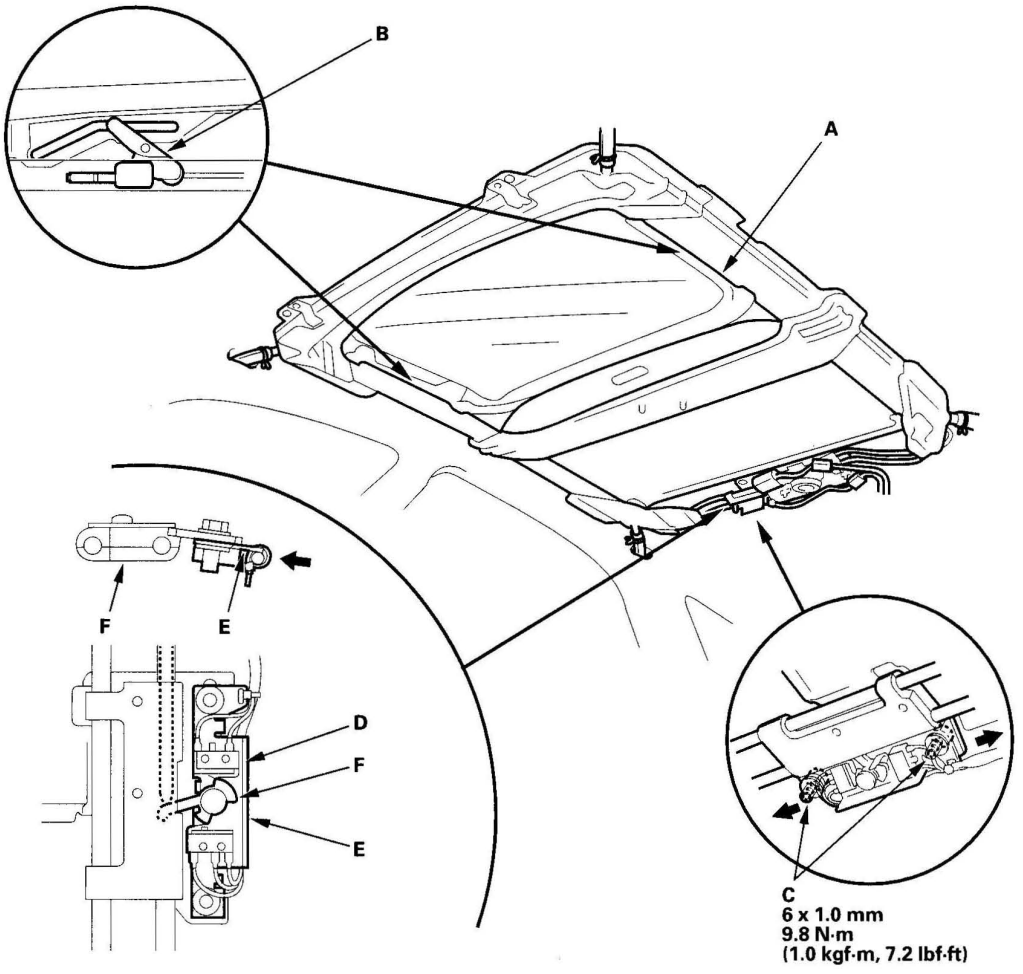
Protected by AR

Limit Switch Adjustment

1. Remove the headliner (see page 20-59).

2. With the moonroof wrench, close the glass (A) fully:

   - Make sure both link lifters (B) are parallel, and in the position shown.
   - Check the glass fit to the roof panel and the glass height (see page 20-44).



3. With an open-end wrench, loosen the limit switch mounting bolts (C).

4. Adjust the limit switch (D):

   - Move the switch plate (E) a little at a time, then secure it at the position where you hear a faint click when the switch cam (F) pushes the limit switch (open/close).
   - Check that the switch plate contacts the switch bracket (F).

5. Check the operation of the glass (from the tilt-up position to fully closed position, and from the fully open position to the fully closed position) by operating the moonroof switch.

BACK

Protected by AR

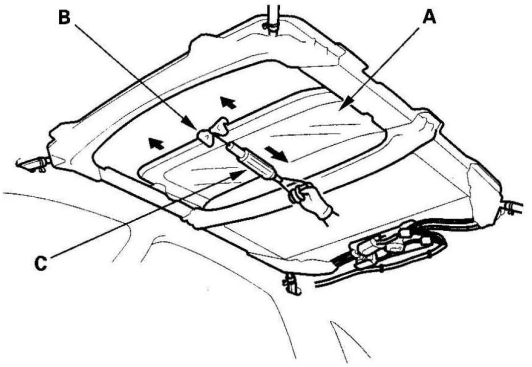
Closing Force and Opening Drag Check

1. Remove the headliner (see page 20-59).

2. Closing force check:

   - With a shop towel (A) on the leading edge of the glass (B), attach a spring scale (C) as shown.
   - Have an assistant hold the switch to close the glass while you measure the force required to stop it.
   - Read the force as soon as the glass stops moving, then immediately release the switch and spring scale.

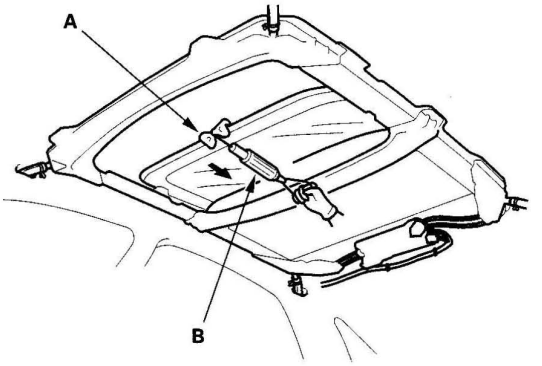
   Closing Force:
   200 – 290 N (20 – 30 kgf, 44 – 66 lbf)



3. If the force in not within specification, remove the moonroof motor (see page 20-47), then check:

   - The gear portion and the inner cable for breakage and damage. If the gear portion is broken, replace the motor. If the inner cable is damaged, remove the frame (see page 20-48), and replace the cable assembly (see page 20-50).
   - The moonroof motor (see page 20-47). If the motor fails to run or doesn't turn smoothly, replace it.
   - The opening drag. Go to step 4.

4. Opening drag check: Protect the leading edge of the glass with a shop towel (A). Measure the effort required to open the glass using a spring scale (B) as shown.

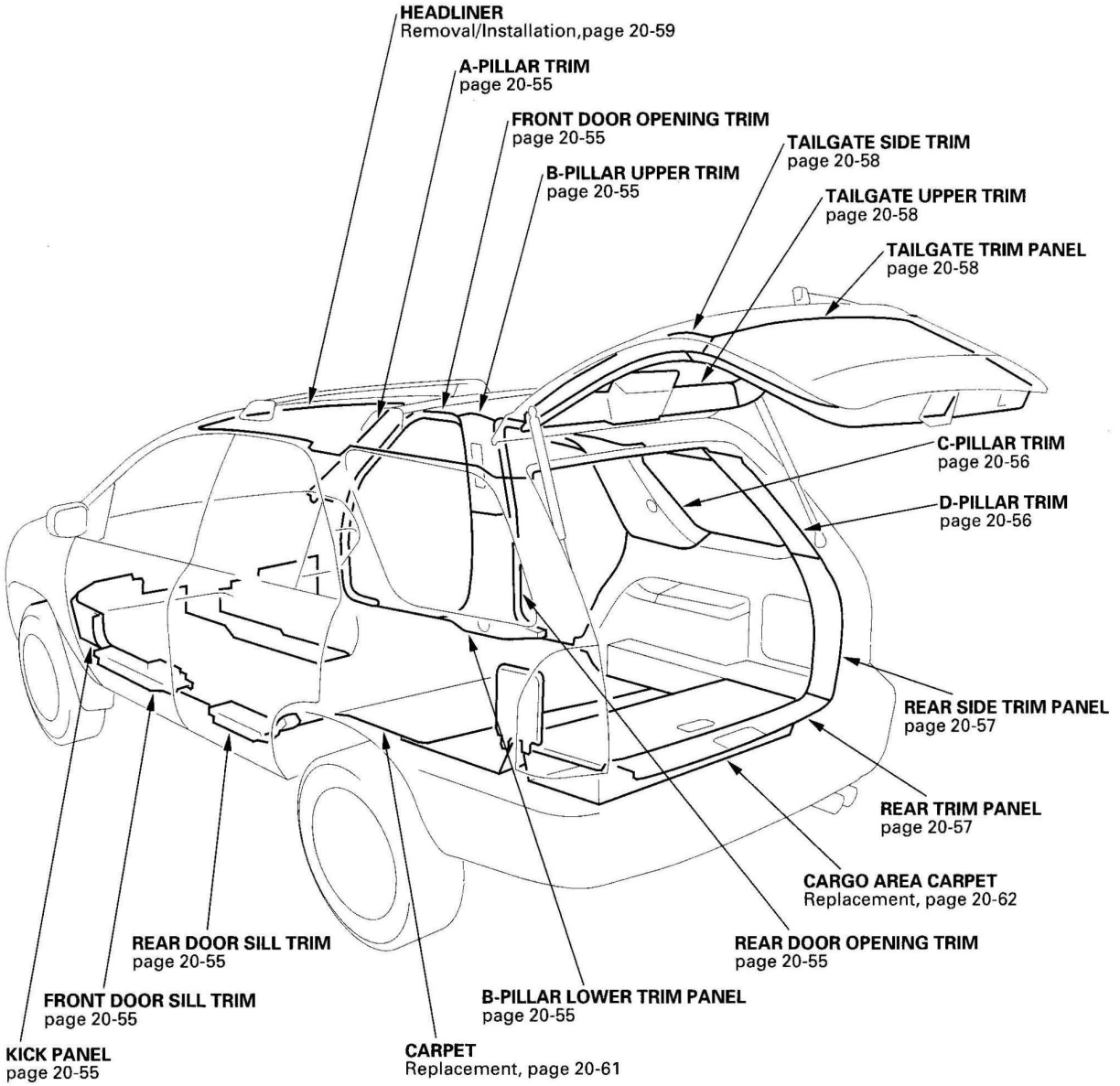


5. If the load is over 40 N (4 kgf, 9 lbf), check:

   - The side clearance and glass height adjustment (see page 20-44).
   - For broken or damaged sliding parts. If any sliding parts are damaged, replace them.

Protected by AR

Component Location Index



BACK

Protected by AR

Trim Removal/Installation - Door Area

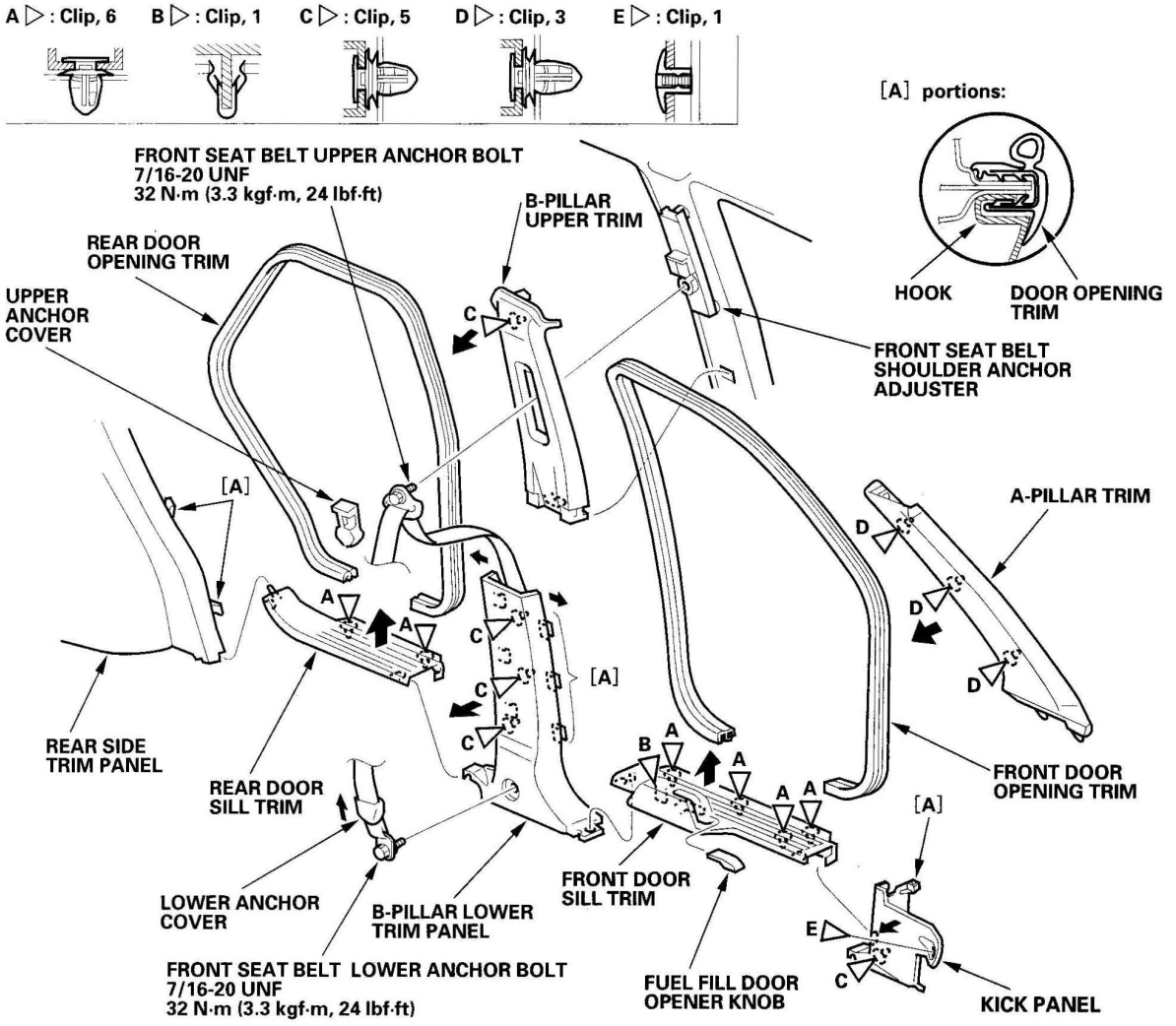
NOTE:
- Put on gloves to protect your hands.
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend or scratch the trims and panel.

Remove the trim as shown.

Install the trim in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Apply liquid thread lock to the front seat belt upper anchor bolt before installation.
- Before installing the anchor bolts, make sure there are not twists or kinks in the belts.

Fastener Locations



Protected by AR

Trim Removal/Installation - Rear Side Upper Area

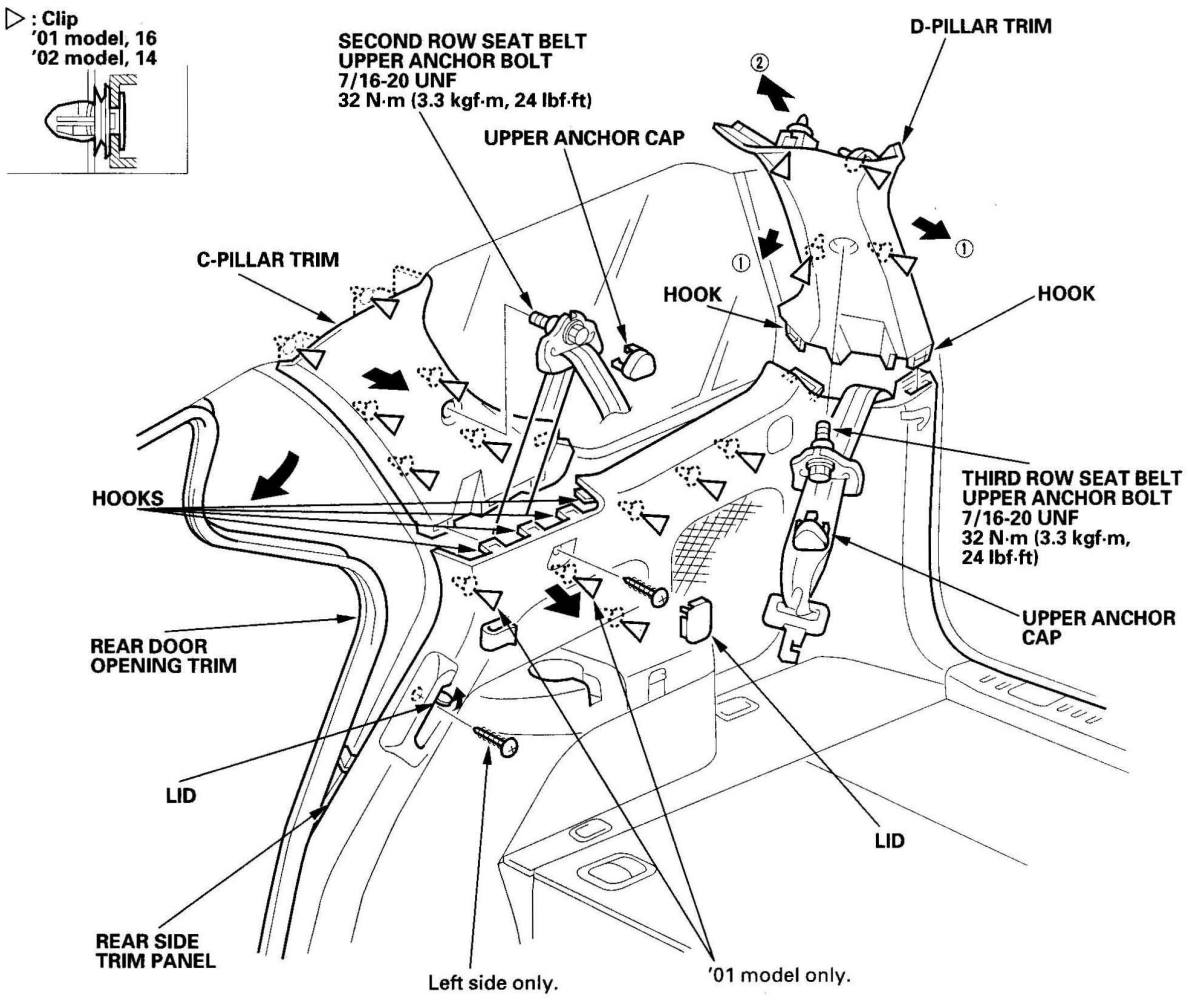
NOTE:
- Put on gloves to protect your hands.
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend or scratch the trim and panels.

Remove the trim as shown. To remove the C-pillar trim, pull the upper portion of the rear side trim panel back as necessary.

Install the trim in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Apply liquid thread lock to the second and third row seat belt upper anchor bolts before installation.
- Before installing the anchor bolts, make sure there are not twists or kinks in the belts.

Fastener Locations



BACK

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Trim Removal/Installation - Rear Side Lower Area

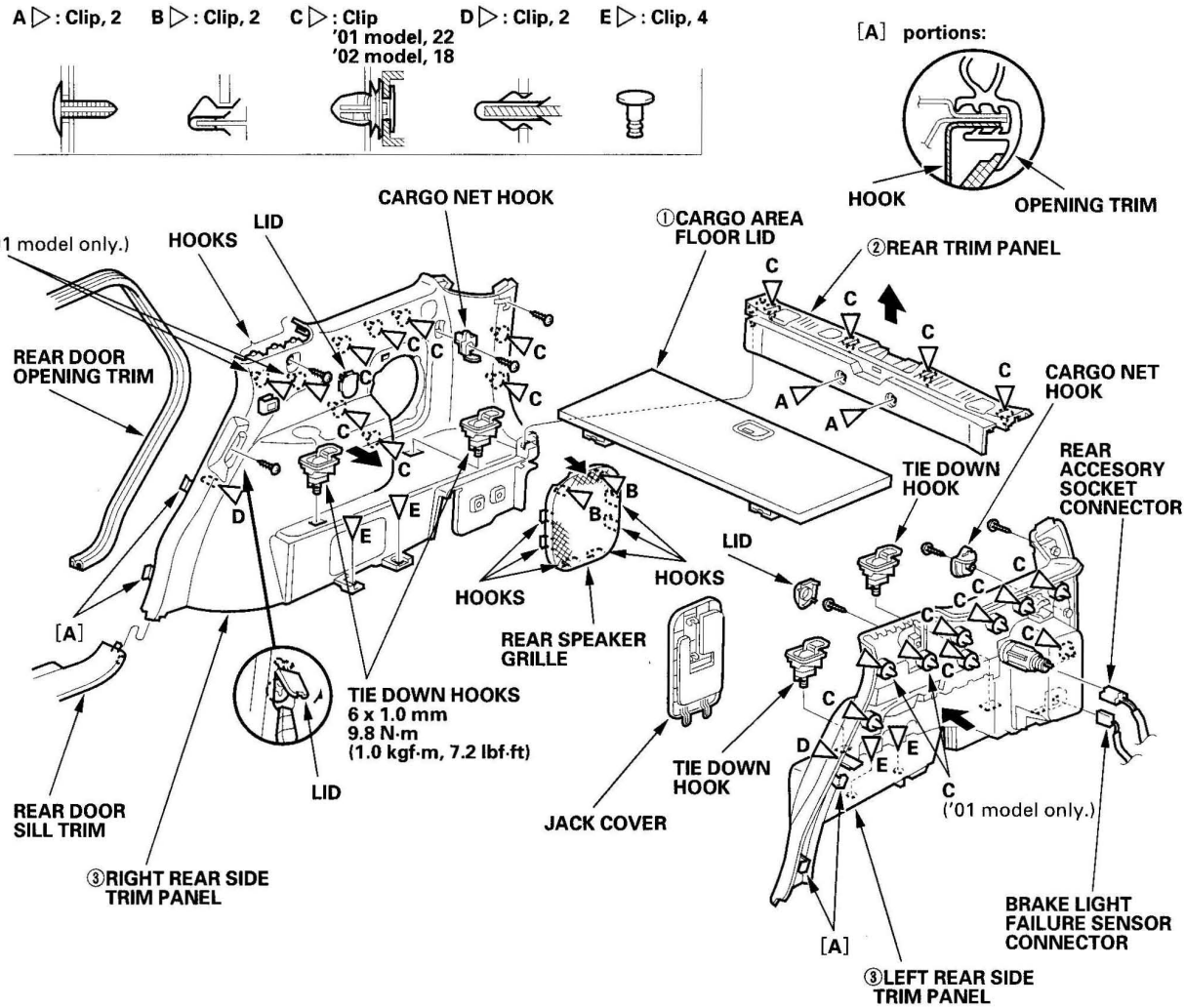
NOTE:
- Put on gloves to protect your hands.
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend or scratch the trim and panels.
- Be sure to disconnect the rear accessory socket and brake light failure sensor connectors when removing the left rear side trim panel.

Remove the trim in the sequence shown. To remove the rear side trim panel, remove the D-pillar trim (see page 20-56) and the third row seat (see page 20-101). Remove the jack before removing the left rear side trim panel.

Install the trim in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Make sure the rear accessory socket and brake light failure sensor connectors are plugged in properly.

Fastener Locations



Protected by AR

Trim Removal/Installation - Tailgate

NOTE:
- Put on gloves to protect your hands.
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend or scratch the trims and panel.

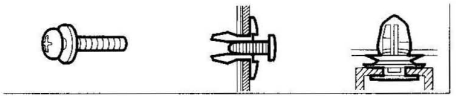
Remove the trim as shown.

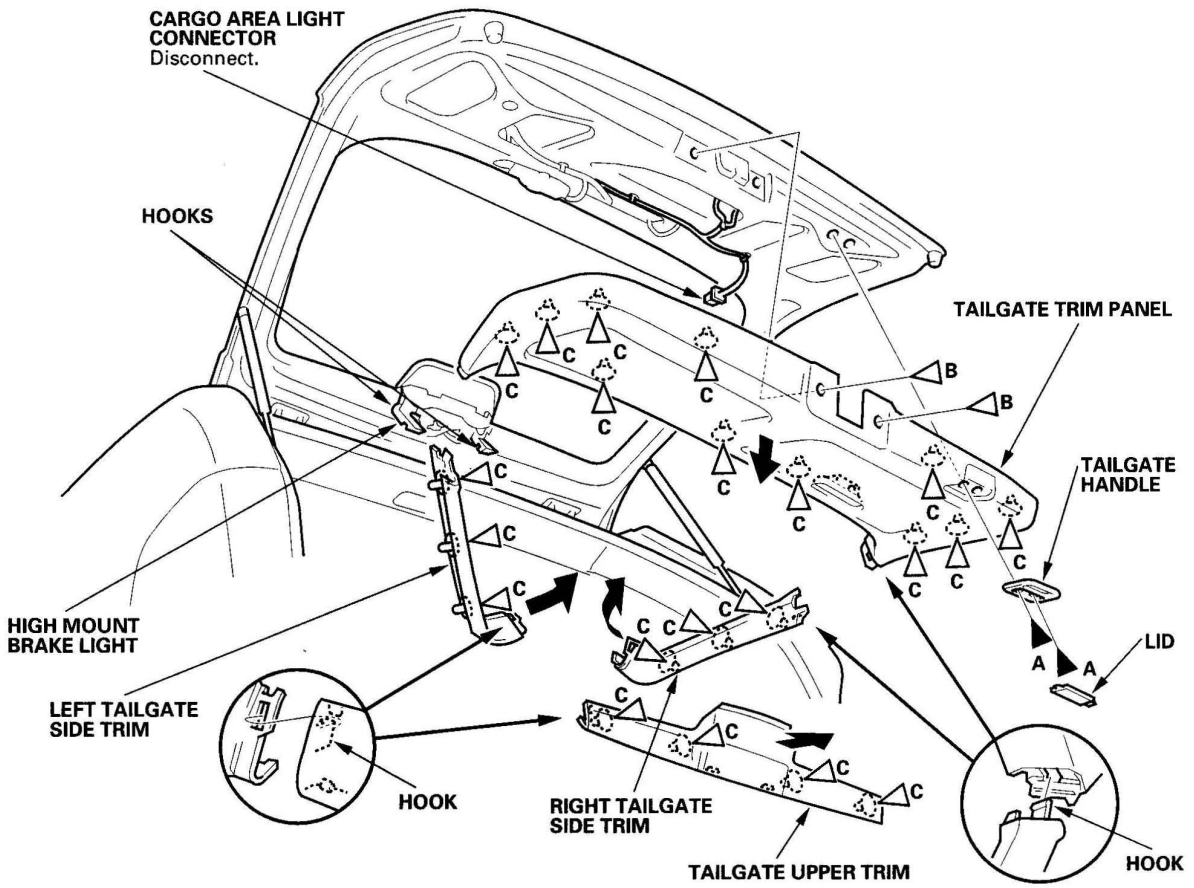
Install the trim in the reverse order of removal, and note these items:

- Make sure the cargo area light connector is plugged in properly.
- Replace any damaged clips.

Fastener Locations

A ▶ : Screw, 2 B ▷ : Clip, 2 C ▷ : Clip, 21





BACK

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Headliner Removal/Installation

NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend and scratch the headliner.
- Be careful not to damage the dashboard and other interior trim.

1. Remove these items (see page 20-55):

   - Front door opening trim, both sides as necessary
   - A-pillar trim, both sides
   - Rear door opening trim, both sides as necessary
   - Front seat belt upper anchor bolt, both sides
   - B-pillar upper trim, one side

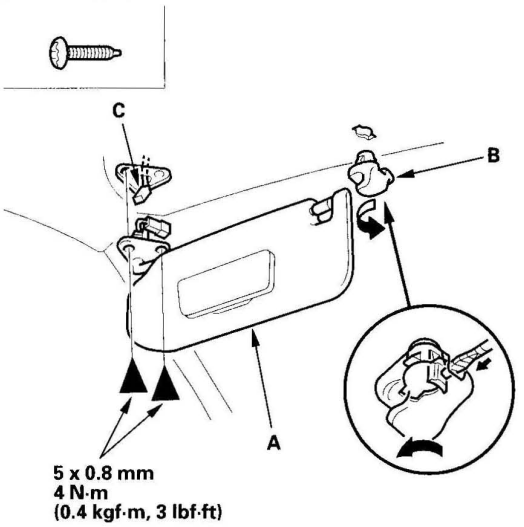
2. Remove these items (see page 20-56):

   - Second row seat belt upper anchor bolt, both sides
   - C-pillar trim, one side
   - Third row seat belt upper anchor bolt, both sides
   - D-pillar trim, both sides

3. Remove the ET screws, then remove the sunvisor (A) and holder (B) from each side. Disconnect the vanity mirror light connectors (C).

Fastener Locations

▶ : ET Screw, 4

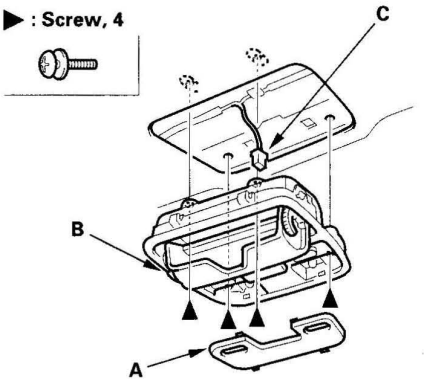


4. Remove the roof console.

   – 1 Remove the lens (A).
   – 2 Remove the screws.
   – 3 Pull out the roof console (B), and disconnect the front individual map light connector (C).

Fastener Locations

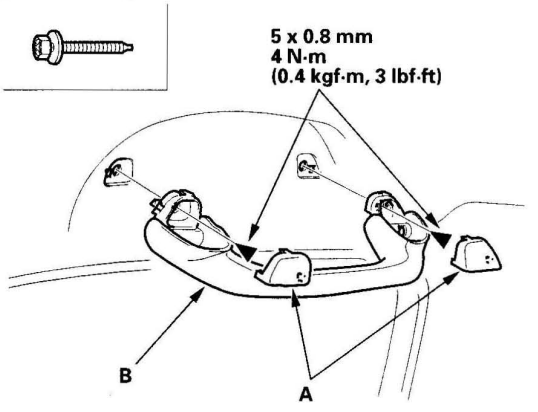
▶ : Screw, 4



5. Remove the caps (A), and remove the ET screws, then remove the grab handles (B) (driver's, passenger's and second row passenger's).

Fastener Locations

▶ : ET Screw, 8



6. Remove the center second row seat belt cover (see step 1 on page 23-8).

7. Remove the rear individual map lights (see page 22-126).

(cont'd)

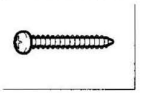
Protected by AR

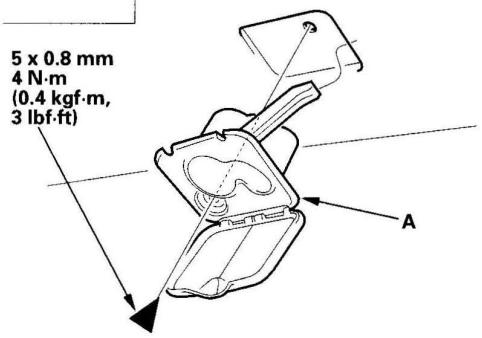
Headliner Removal/Installation (cont'd)

8. Remove the ET screws, then remove the separation net cap (A), both sides.

Fastener Locations

▶: Screw, 2

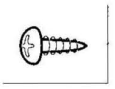


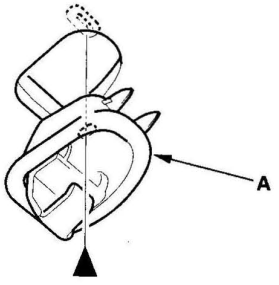


9. Remove the screws, then remove the coat hangers (A), both sides.

Fastener Locations

▶: Screw, 2



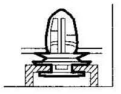


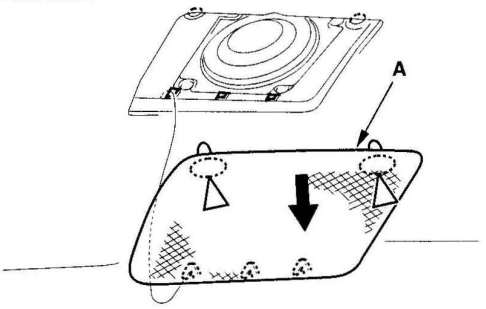
10. Remove the rear ceiling light (for some models) (see page 22-131).

11. If equipped, detach the clips and remove the rear roof speaker grille (A).

Fastener Locations

▷: Clip, 2



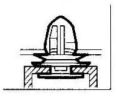


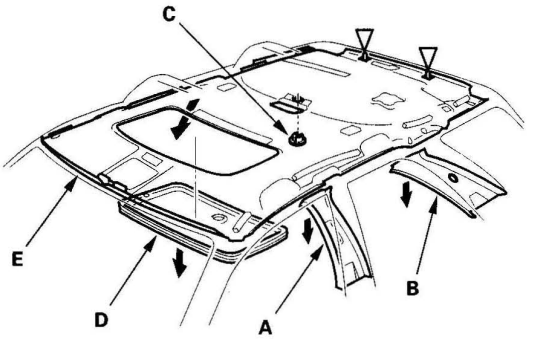
12. Remove the headliner:

– 1 Remove the upper portion of the B-pillar trim (A) (see page 20-55), and C-pillar trim (B) from one side of the vehicle (see page 20-56).
– 2 For moonroof model: Remove the socket plug (C) and roof trim (D).
– 3 With help of an assistant, detach the clips, and lower the headliner (E) on the side you removed the pillar trim.
– 4 Remove the headliner through the tailgate opening.

Fastener Locations

▷: Clip, 2





BACK

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13. Install the headliner in the reverse order of removal, and note these items:

    - When reinstalling the headliner through the tailgate opening, be careful not to fold or bend it. Also, be careful not to scratch the body.
    - For moonroof model: When reinstalling the roof trim, center the joining ends at the rear of the moonroof frame.
    - If the threads on a visor or separation net cap mounting ET screw are worn out, use an oversized screw made specifically for this application.
    - Visor mounting ET screws: P/N 90137-S30-0030
      Separation net cap mounting ET screws: P/N 90137-S3V-A010
    - Check that both sides of the headliner are securely attached to the trim.

Carpet Replacement

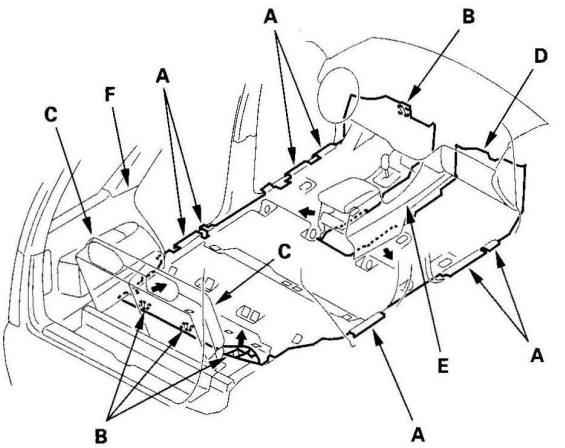
SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

NOTE:
- Put on gloves to protect your hands.
- Take care not to damage, wrinkle or twist the carpet.
- Be careful not to damage the dashboard or other interior trim pieces.

1. Remove these items:

    - Front seats, both sides (see page 20-77)
    - Second row seats, both sides (see page 20-86)
    - Front door sill trim, both sides (see page 20-55)
    - Rear door sill trim, both sides (see page 20-55)
    - B-pillar lower trim panel, both sides (see page 20-55)
    - Kick panel, both sides (see page 20-55)
    - Console side trim, both sides (see step 3 on page 20-66)
    - Console rear trim (see step 4 on page 20-66)
    - Third row seat front mounting bolts, both sides (see step 1 on page 20-101)

2. Release the retainers (A) and fasteners (B), lift both third row seat cushions (C) up, then pull the carpet (D) from under the center console (E) and both rear side trim panels (F). Remove the carpet.



3. Install the carpet in the reverse order of removal, and note these items:

    - Take care not to damage, wrinkle, or twist the carpet.
    - Make sure the seat harness is routed correctly.

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Cargo Area Carpet Replacement

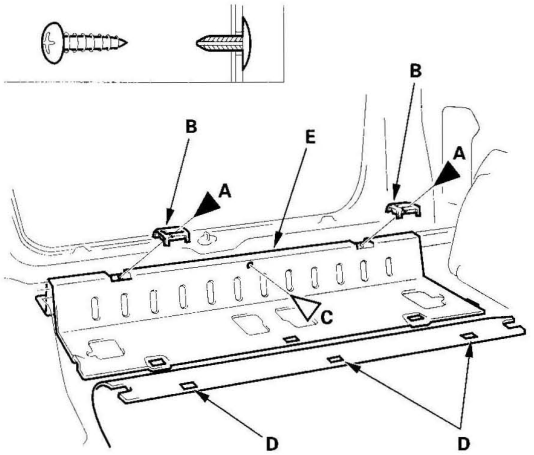
NOTE:
- Put on gloves to protect your hands.
- Be careful not to damage the interior trim parts.

1. Remove these items:
   - Third row seat, both sides (see page 20-101)
   - Rear trim panel (see page 20-57)
   - Rear side trim panel, both sides (see page 20-57)

2. Remove the screws (A), then remove the hinge (B).

Fastener Locations

A ▶: Screw, 2 C ▷: Clip, 1



3. Detach the clip (C) and release the fasteners (D), then remove the cargo area carpet (E).

4. Install the cargo area carpet in the reverse order of removal. Replace the damaged clips.

BACK

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CD Storage Box Removal and Installation

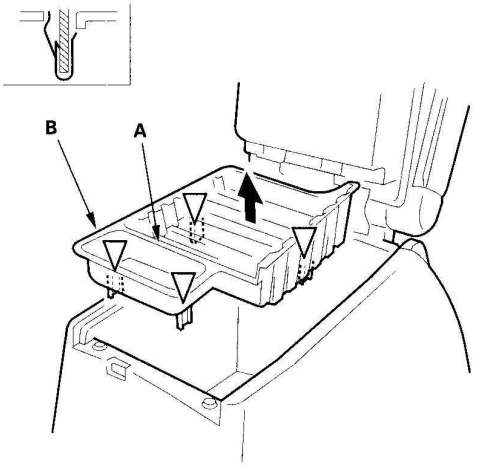
'01 Model

NOTE: Take care not to scratch the console.

1. Wrap the front divider (A) with a shop towel, then grap it with a pair of pliers. Pull the CD storage box (B) up to detach the clips, then remove it.

Fastener Locations

▷: Clip, 4



2. Install the CD storage box in the reverse order of removal. Push down on the clip portions of the box securely.

Console Armrest Removal and Installation

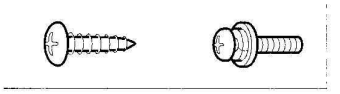
NOTE: Take care not to scratch the console and armrest.

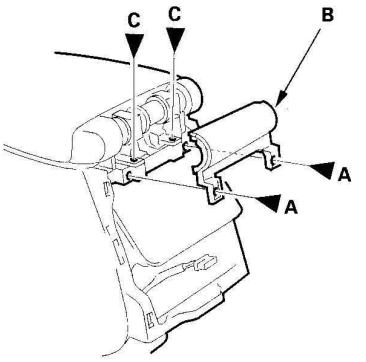
1. Remove the console rear trim (see step 4 on page 20-66).

2. Remove the screws (A), then remove the rear hinge cover (B). Remove the hinge mounting screws (C).

Fastener Locations

A ▶: Screw, 2 C ▶: Screw, 2

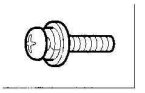


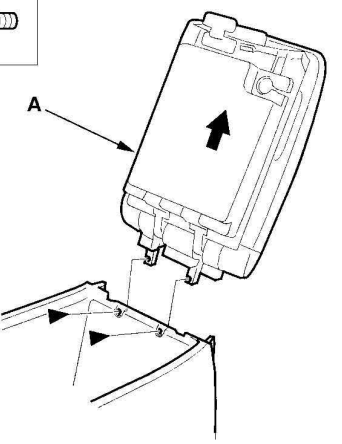


3. Open the armrest (A) and remove the hinge mounting screws, then remove the armrest.

Fastener Locations

▶: Screw, 2





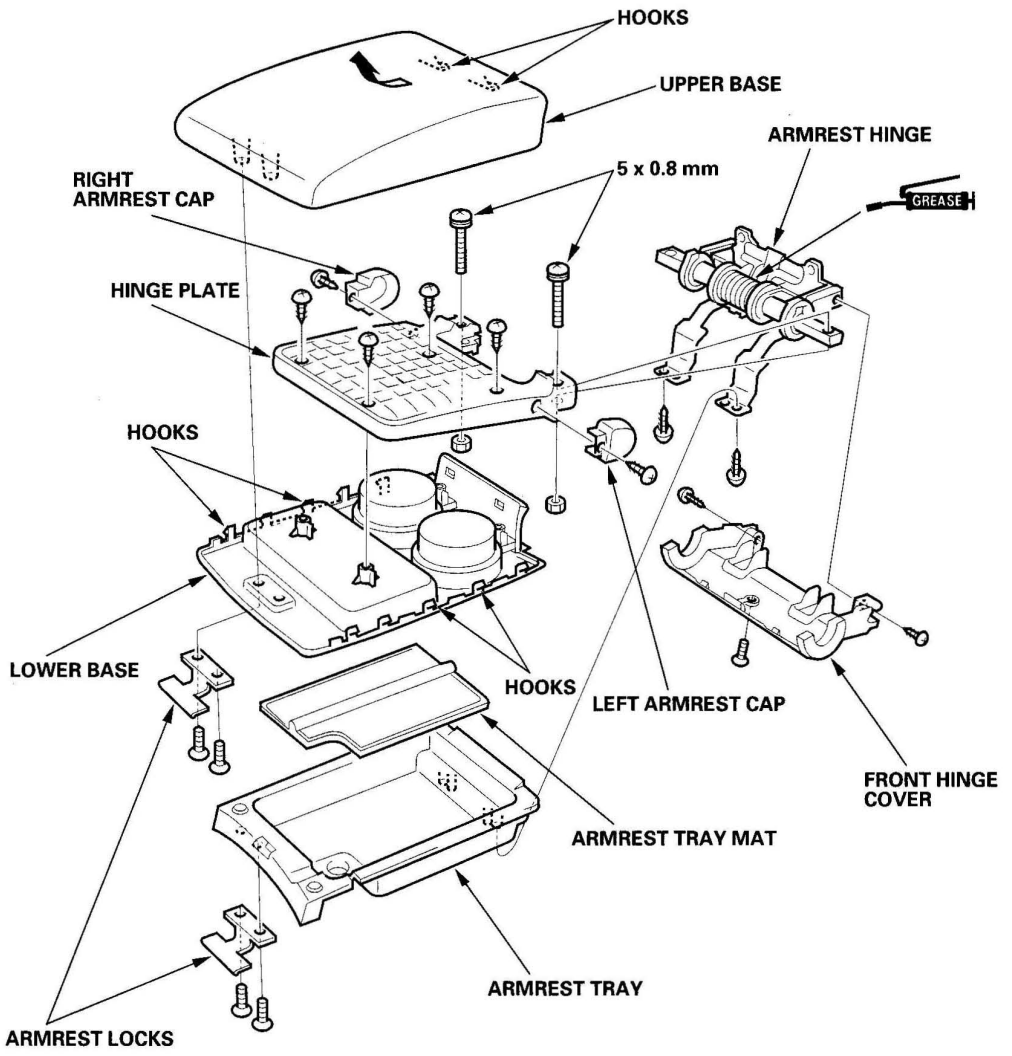
4. Install the armrest in the reverse order of removal.

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Console Armrest Disassembly/Reassembly

Disassemble the armrest as shown.

Reassemble the armrest in the reverse order of disassembly, and apply multipurpose grease to the spring of the armrest hinge.



BACK

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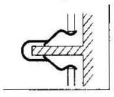
Center Console Removal/Installation

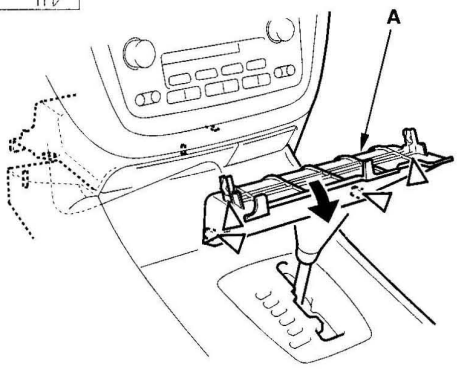
NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.
- Take care not to scratch the front seat, dashboard, and related parts.

1. Detach the clips by hand, and remove the center panel lower trim (A).

Fastener Locations

▷: Clip, 4

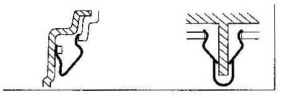


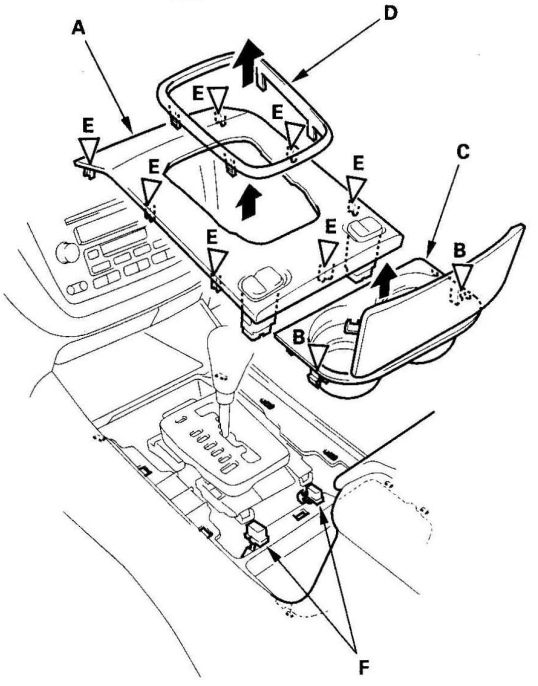


2. Remove the console panel (A):
   - 1 Detach the clips (B) by pulling the beverage holder (C) up, then remove it.
   - 2 Remove the shift indicator trim ring (D).
   - 3 Gently detach the clips (E), then remove the console panel.
   - 4 Disconnect the seat heater switch connectors (F).

Fastener Locations

B ▷: Clip, 2 E ▷: Clip, 7





(cont'd)

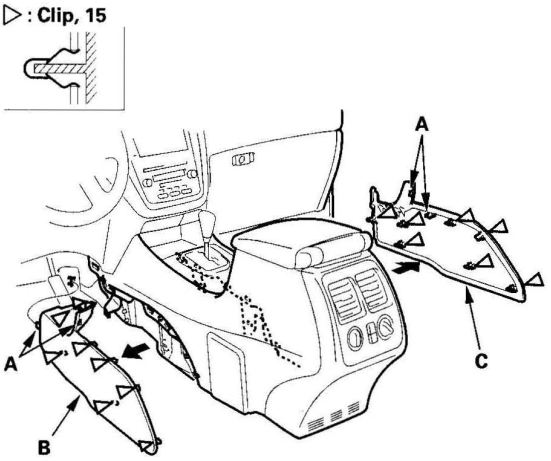
Protected by AR

Center Console Removal/Installation (cont'd)

3. Detach the clips and release the hooks (A), then remove the driver's console side trim (B) and passenger's console side trim (C).

Fastener Locations

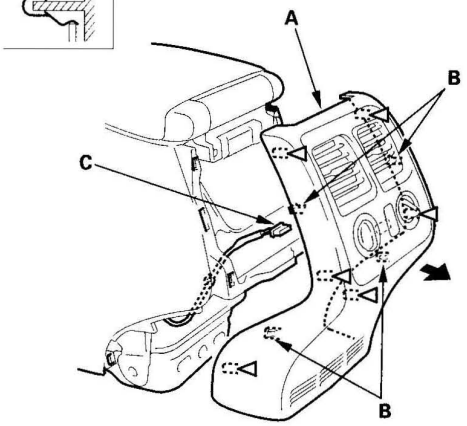
▷: Clip, 15



4. Gently pull out the console rear trim (A) to detach the clips and to release the hooks (B), then disconnect the rear heater-A/C passenger's control panel-unit connector (C).

Fastener Locations

▷: Clip, 6

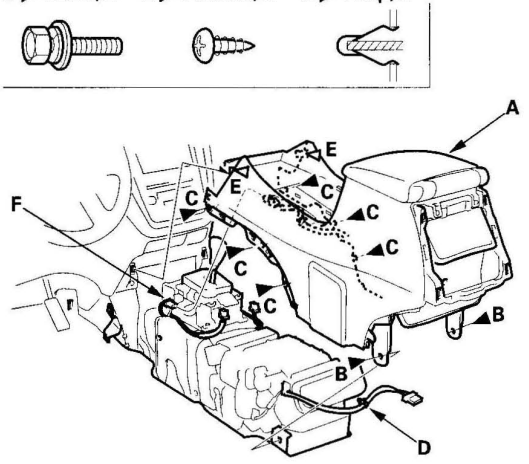


5. Remove the center console (A):

– 1 On both sides, remove the bolts (B) and screws (C).
– 2 Detach the harness clip (D).
– 3 Pull the center console back to detach the clips (E).
– 4 While lifting up on the console, disconnect the accessory socket connector (F), and remove the console.

Fastener Locations

B ▶: Bolt, 2 C ▶: Screw, 6 E ▷: Clip, 2



6. Install the center console in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Make sure all the connectors are plugged in properly.

BACK

Protected by AR

Instrument Panel Removal/ Installation

NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.
- Take care not to scratch the dashboard and related parts.

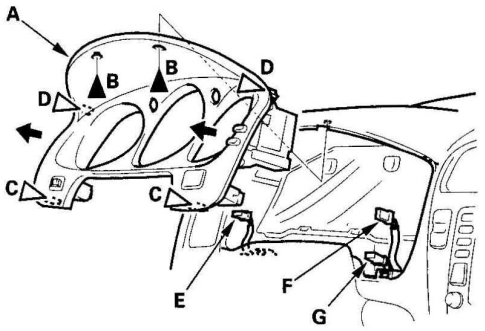
1. Tilt the steering column down.

2. Remove the instrument panel (A):

   – 1 Remove the screws (B).
   – 2 Gently pull out the panel to release the clips (C and D).
   – 3 Disconnect the dash lights brightness controller connector (E), select/reset switch connector (F), and VTM-4 lock switch connector (G).

Fastener Locations





3. Install the instrument panel in the reverse order or removal, and make sure each connector is plugged in properly.

Dashboard Lower Cover Removal/ Installation

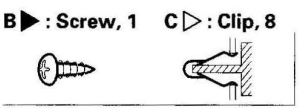
NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.
- Take care not to scratch the dashboard and related parts.

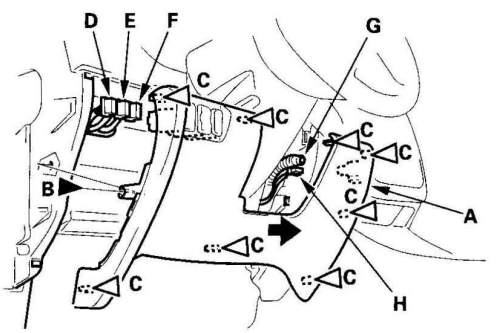
1. Remove the driver's dashboard side cover (see page 20-68).

2. Remove the dashboard lower cover (A).

   – 1 Remove the screw (B).
   – 2 Gently pull down on the lower cover to release the clips (C).
   – 3 Disconnect the cruise control main switch connector (D), moonroof switch connector (E), fog light switch connector (F), air hose (G), and in-car temperature sensor connector (H), then remove the cover.

Fastener Locations





3. Install the dashboard lower cover in the reverse order of removal, and make sure each connector is plugged in properly, and the air hose is connected properly.

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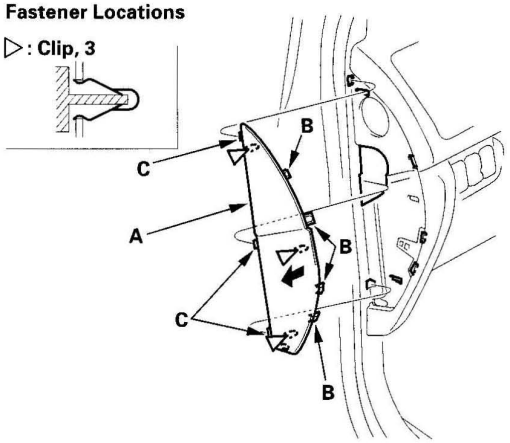
Dashboard Side Cover Removal/ Installation

NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.
- Take care not to scratch the dashboard and related parts.

1. From outside of the front door, remove the dashboard side cover (A).
   - 1 Gently pull out along the rear edge to release the clips and the hooks (B).
   - 2 Gently pull out on the side cover to release the top and bottom clips and the hooks (C), then remove the side cover.

Fastener Locations

▷: Clip, 3



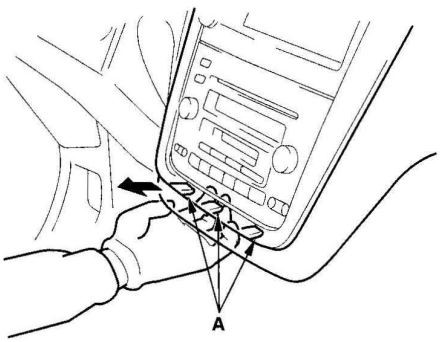
2. Install in the reverse order of removal. Push the clips into place securely.

Dashboard Center Panel Removal/ Installation

NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the dashboard and related parts.

1. Remove the center lower cover (see page 20-70).

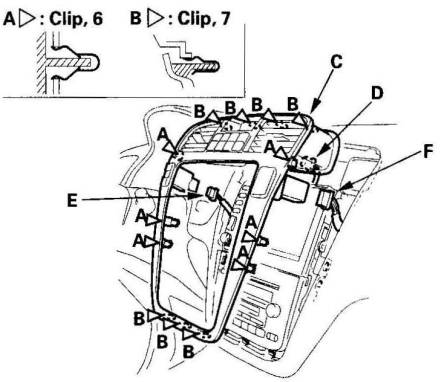
2. Push the bottom clips (A) back by hand, and pull out the bottom of the center panel.



3. Carefully detach the remaining clips (A,B) by hand, and pull out the center panel (C). Disconnect the climate control panel connector (D), interior lights switch connector (E), and the hazard warning switch connector (F). Take care not to scratch the dashboard with the panel clips.

Fastener Locations

A▷: Clip, 6 B▷: Clip, 7



4. Install the center panel in the reverse order of removal, and make sure each connector is plugged in properly.

BACK

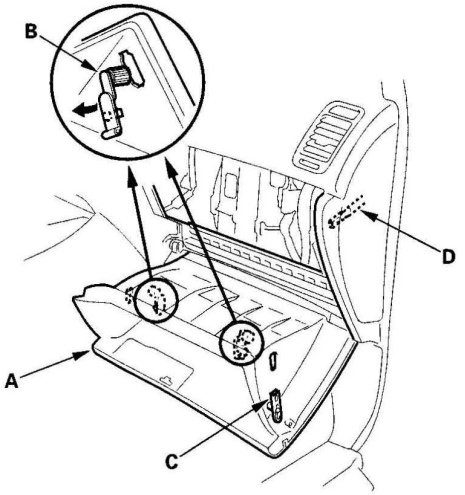
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Glove Box Removal/Installation

SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

NOTE:
- Take care not to scratch the dashboard and related parts.
- If the glove box swings down without any support, the hinges can be overextended and damaged. To prevent damage to glove box hinge, use a piece of foam or a bundle of shop towels to support it.

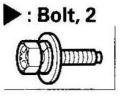
1. While holding the glove box (A), remove the glove box stop (B) on each side, then detach the lock (C) from the damper (D).

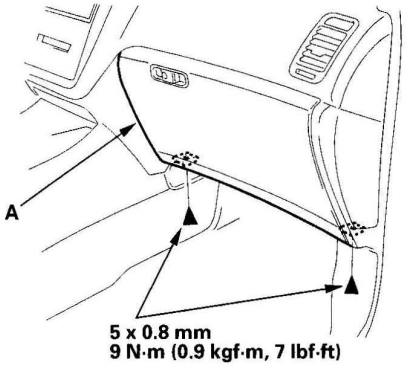


2. Remove the bolts, then remove the glove box (A).

Fastener Locations

▶: Bolt, 2

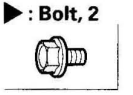


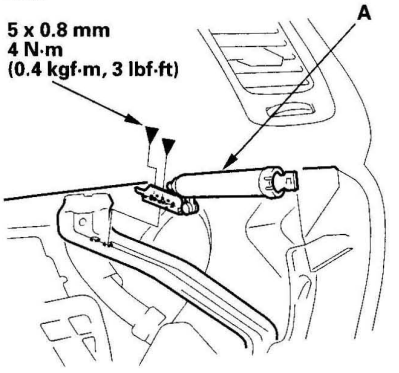


3. Remove the bolts, then remove the damper (A).

Fastener Locations

▶: Bolt, 2





4. Install the glove box in the reverse order of removal.

Protected by AR

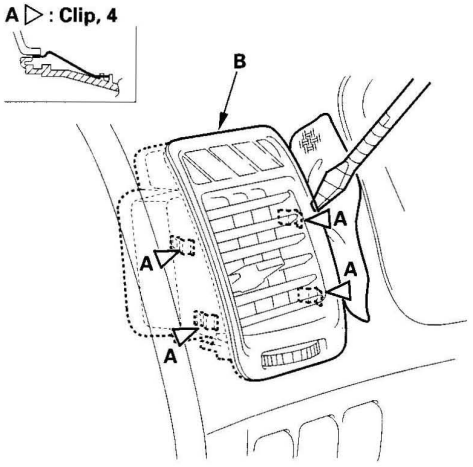
Dashboard Side Vent Removal/ Installation

NOTE: Driver's side is shown, and passenger's side is symmetrical.

1. Wrap a flat-tip screwdriver with protective tape, and apply protective tape around the related parts to prevent damage. Carefully insert a flat-tip screwdriver next to the clip (A), and detach the clips by prying on the passenger's side vent (B), then remove the vent. Take care not to scratch the dashboard and related parts.

Fastener Locations

A ▷ : Clip, 4



2. Set the vent in the opening, then push the clips securely into place.

Center Lower Cover Removal/ Installation

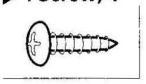
NOTE: Take care not to scratch the dashboard and related parts.

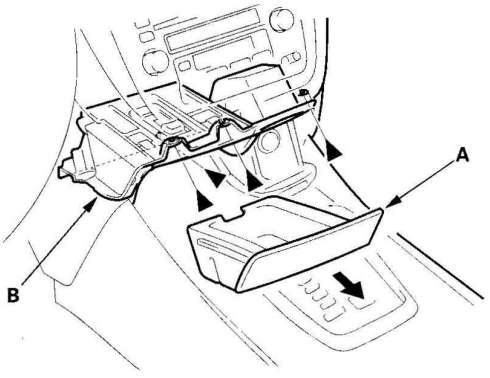
1. Remove the center panel lower trim (see step 1 on page 20-65).

2. Remove the coin pocket (A) and screws fastening the center lower cover (B).

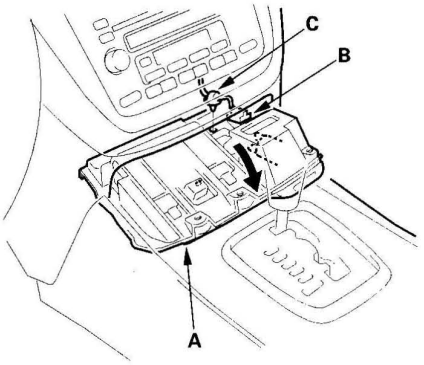
Fastener Locations

▶ : Screw, 4





3. Lower the center lower cover (A). Disconnect the accessory socket connector (B) and detach the harness clip (C), then remove the cover.



4. Install the center lower cover in the reverse order of removal. Make sure the accessory socket connector is plugged in properly.

BACK

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Dashboard Removal/Installation

SRS components are located in this area. Review the SRS component locations (see page 23-15), and precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts to prevent damage.
- Have an assistant help you when removing and installing the dashboard.
- Take care not to scratch the dashboard, body, and other related parts.
- Put on gloves to protect your hands.

1. Make sure you have the anti-theft codes for the radio and the navigation system, then write down the frequencies for the preset buttons.

2. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.

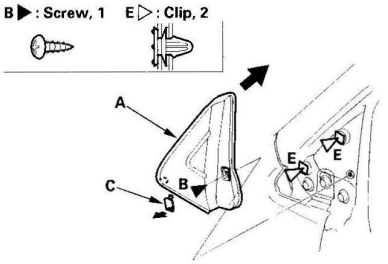
3. Remove these items:
   - Center console (see page 20-65)
   - Dashboard lower cover (see page 20-67)
   - Dashboard side cover, passenger's side (see page 20-68)
   - Glove box (see page 20-69)
   - Shift lever assembly (see page 14-161)

4. Remove these items (see page 20-55):
   - Front door opening trim, both sides
   - Kick panel, both sides
   - A-pillar trim, both sides

5. From outside of the driver's door, remove the front pillar corner trim (A).
   - 1 Pry out the cap (B), and remove the screw (C).
   - 2 Slide the trim upward along the A-piller to remove it.
   - 3 Remove the remaining clips from the body.

Fastener Locations

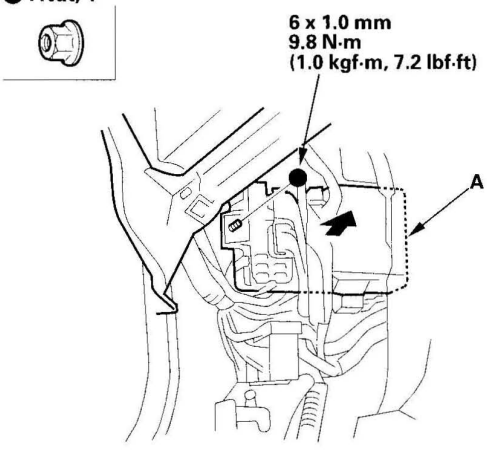
B ▶ : Screw, 1 E ▷ : Clip, 2



6. From under the dashboard on the driver's side, remove the nut, and pull out the fuse/relay box (A).

Fastener Location

● : Nut, 1

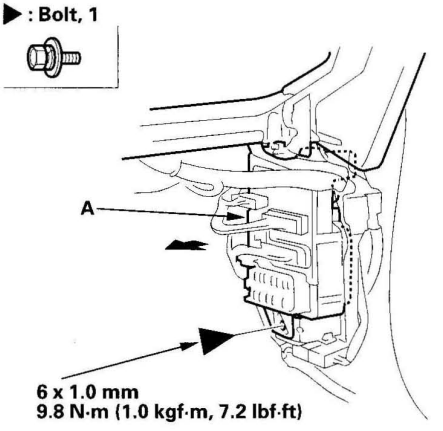


7. Remove the steering column (see page 17-25).

8. From under the passenger's dash, remove the bolt, and pull out the fuse/relay box (A).

Fastener Location

▶ : Bolt, 1

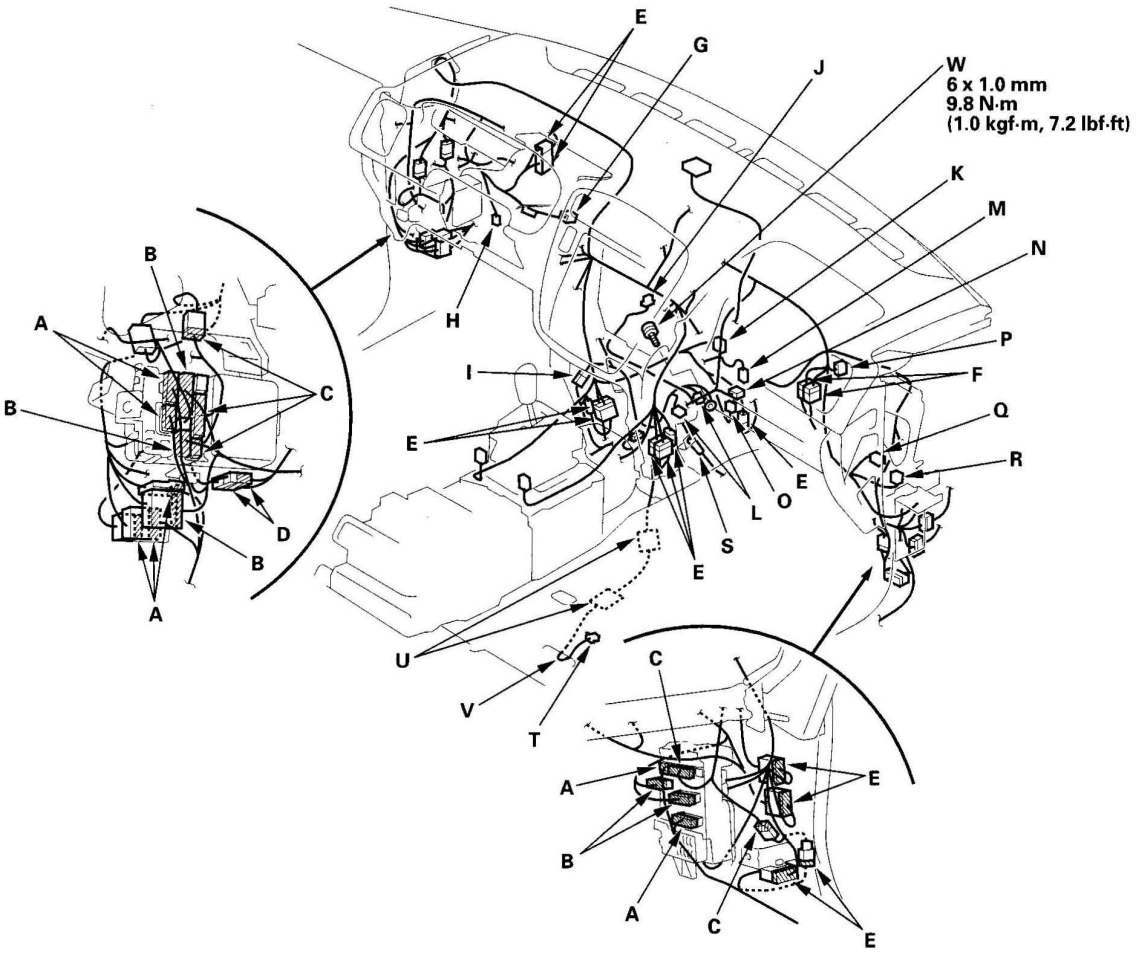


(cont'd)

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Dashboard Removal/Installation (cont'd)

9. Disconnect the side wire harness connectors (A), engine compartment wire harness connectors (B), door wire harness connectors (C), moonroof wire harness connectors (D), dashboard wire harness connectors (E), steering hanger beam wire harness connectors (F), brake pedal position switch connector (G), parking brake switch connector (H), SRS wire harness connector (I), mode motor connector (J), ECM/PCM connector (K), SRS control unit connector (L), evaporator temperature sensor connector (M), air mix control motor connector (N), intake manifold runner control module connector (O), recirculation control motor connector (P), power transistor connector (Q), blower motor connector (R), and antenna lead (S). With navigation, disconnect the GPS antenna connector (T).



10. With navigation, pull the carpet back as necessary (see page 20-61), and remove the harness cushions (U), then pull the GPS antenna harness (V) out.

11. Using a Torx, T30 bit, remove the ground bolt (W) at the SRS control unit.

12. Detach all of the harness and connector clips.

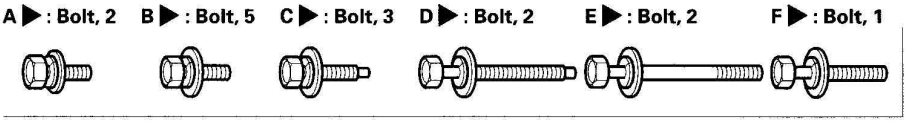
BACK

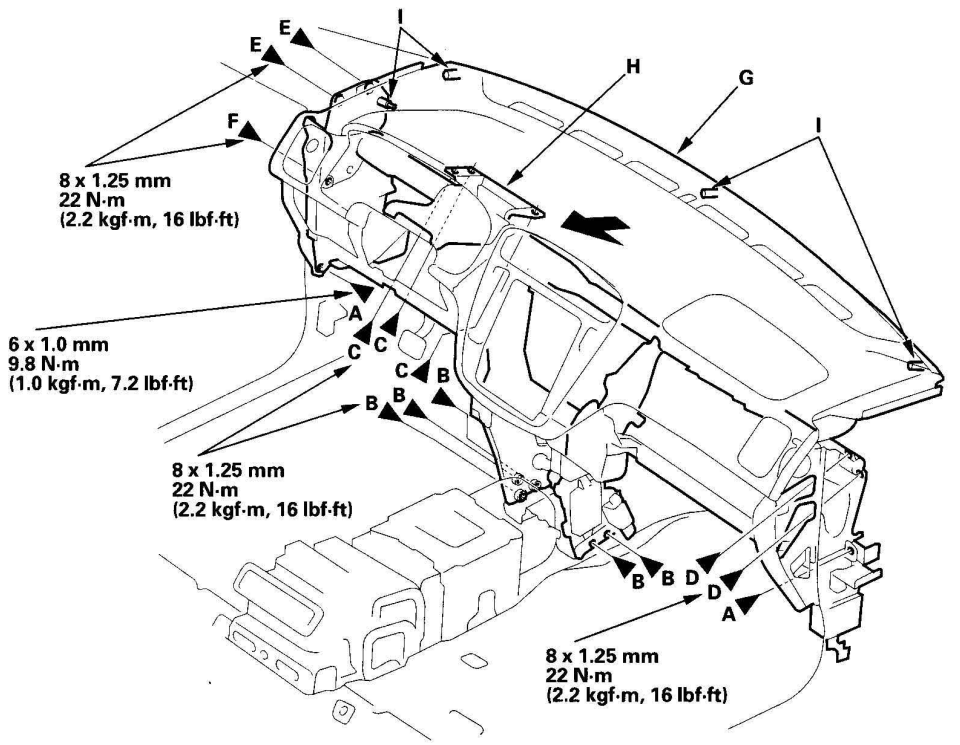
Protected by AR

13. Remove the bolts (A, B, C, D, E, F), and lift up on the dashboard (G) to release the dashboard and steering hanger beam (H) from the guide pins (I).

Fastener Locations

A ▶ : Bolt, 2 B ▶ : Bolt, 5 C ▶ : Bolt, 3 D ▶ : Bolt, 2 E ▶ : Bolt, 2 F ▶ : Bolt, 1





14. Carefully remove the dashboard through the front door opening:

15. Install the dashboard in the reverse order of removal, and note these items:

- Apply liquid thread lock to the B bolts before reinstallation.
- Make sure the dashboard fits onto the guide pins correctly.
- Before tightening the bolts, make sure the dashboard wire harness and steering hanger beam wire harness are not pinched.
- Make sure the connectors are plugged in properly, and the antenna lead is connected properly.
- Enter the anti-theft code for the radio and the navigation system, then enter the customer's radio station presets. Reset the clock.

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Steering Hanger Beam Replacement

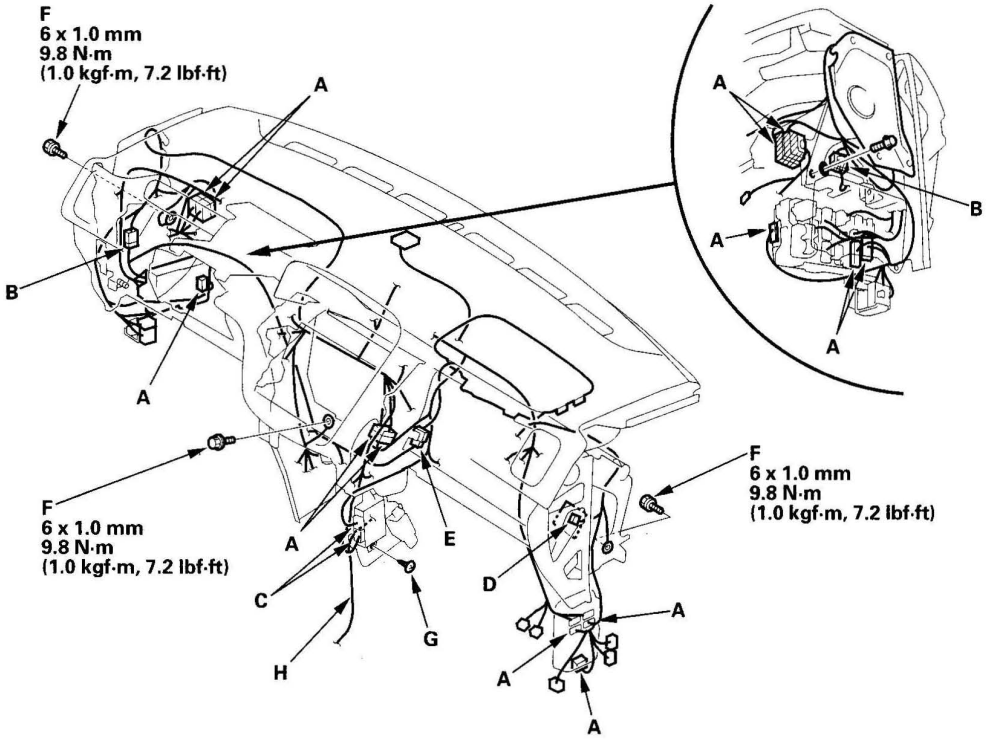
NOTE: Put on gloves to protect your hands.

1. Remove the dashboard (see page 20-71).

2. Remove the following parts from the dashboard:

   - Instrument panel (see page 20-67)
   - Dashboard side vent, passenger's side (see page 20-70)
   - Gauge assembly (see page 22-80)
   - Center lower cover (see page 20-70)
   - Audio unit (see page 22-157)

3. Disconnect the dashboard wire harness connectors (A), SRS wire harness connector (B), climate control unit connectors (C), and keyless entry control unit connector (D). Remove the passenger's airbag connector (E) from the steering hanger beam, then disconnect it.



4. Remove the ground bolts (F).

5. Detach all of the harness and connector clips. With navigation, remove the climate control unit mounting screw (G), detach the harness clips, then pull the GPS antenna harness (H) out from between the unit and the frame, and remove the harness from the steering hanger beam.

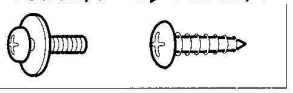
BACK

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6. From the front of the dashboard (A), remove the screws (B, C) and the front passenger's airbag mounting nuts (D).

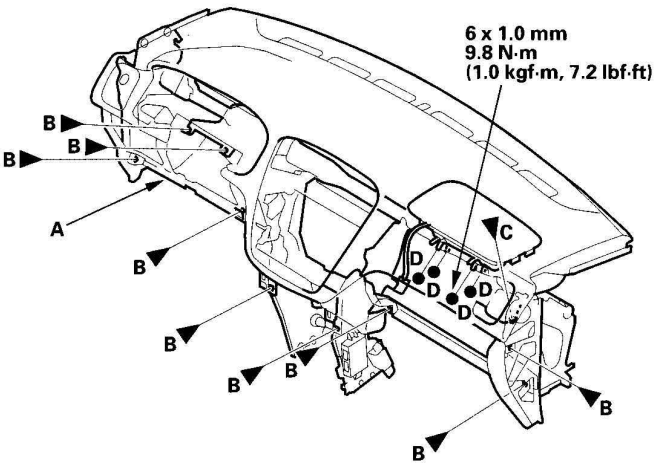
Fastener Locations

B ▶ : Screw, 9 C ▶ : Screw, 1



D ● : Nut, 4

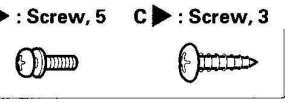


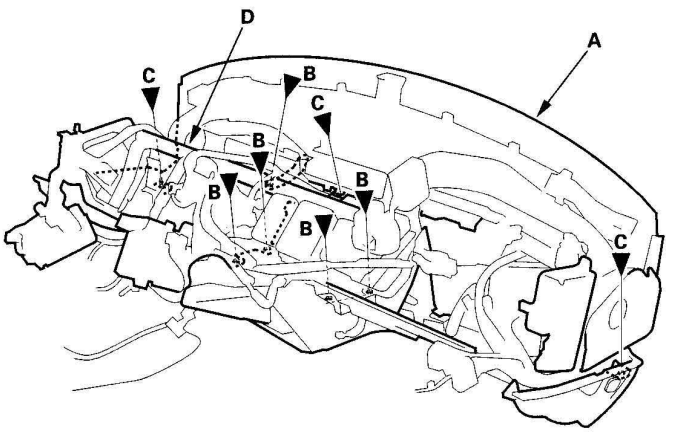


7. From the back of the dashboard (A), remove the screws (B, C).

Fastener Locations

B ▶ : Screw, 5 C ▶ : Screw, 3





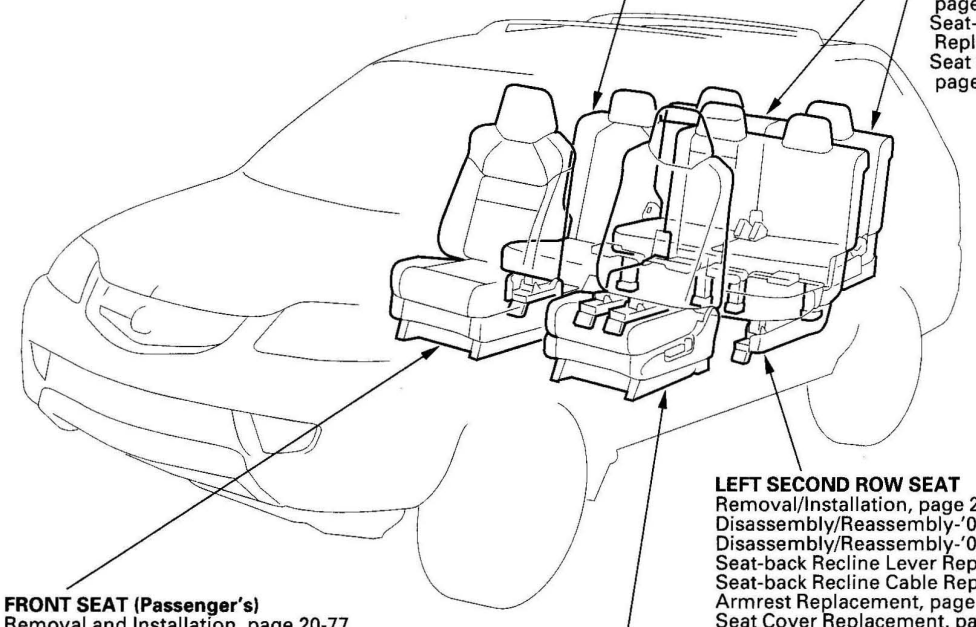
8. Separate the steering hanger beam (D) and dashboard.

9. Install the steering hanger beam in the reverse order of removal, and note these items:

- Make sure the dashboard wire harness and steering hanger beam wire harness are not pinched.
- Make sure the connectors are plugged in properly.

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BACK

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Front Seat Removal/Installation

SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to scratch the body or tear the seat covers.
- Put on gloves to protect your hands.
- Passenger's 8-way power seat is shown, driver's 8-way power seat is symmetrical, and passenger's manual seat is similar.

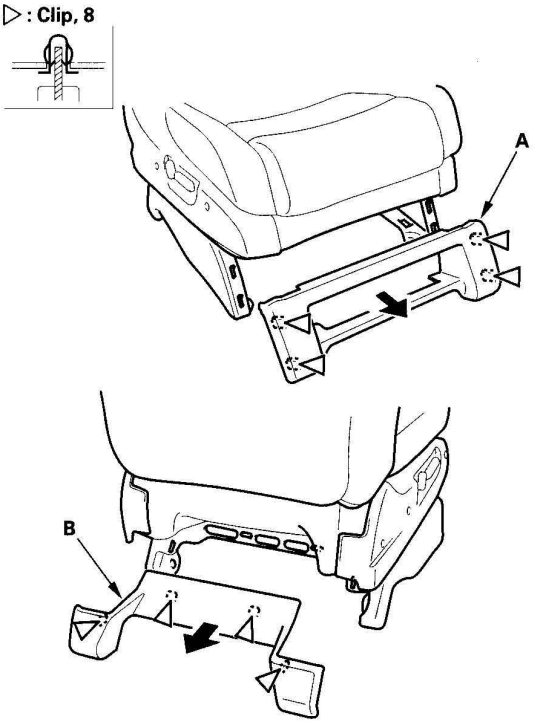
1. Make sure you have the anti-theft code for the radio and the navigation system, then write down the frequencies for the radio preset buttons.

2. Disconnect the negative cable from the battery, and wait at least 3 minutes before beginning work.

3. Detach the clips, and remove the front riser cover (A) and rear riser cover (B).

Fastener Locations

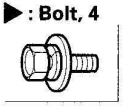
▷: Clip, 8

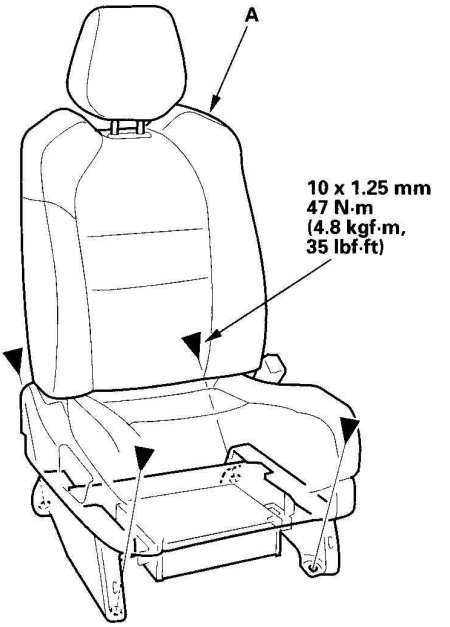


4. Remove the bolts securing the front seat (A).

Fastener Locations

▶: Bolt, 4



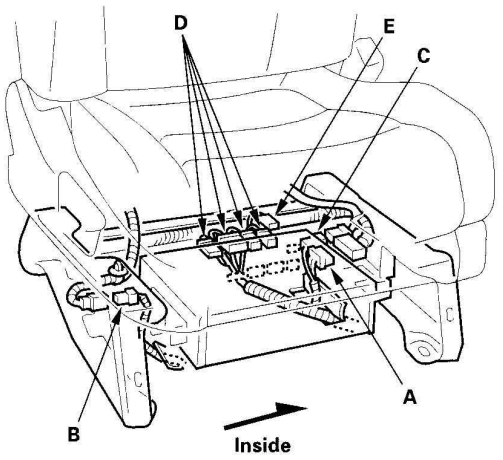


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Protected by AR

Front Seat Removal/Installation (cont'd)

5. Lift up the front seat, then disconnect the seat harness connector (A) and side airbag harness connector (B). On passenger's seat, disconnect the OPDS unit harness connector (C), and if equipped with navigation, disconnect the navigation unit connectors (D) and GPS antenna harness connector (E).



6. With the help of an assistant, carefully remove the front seat through the front door opening.

7. Install the front seat in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - Make sure the seat harness connector, side airbag connector, OPDS unit connector for passenger's seat, and if equipped, navigation unit connector and GPS antenna harness connector are plugged in properly.
   - Enter the anti-theft code for the radio and the navigation system, then enter the customer's radio station presets.

BACK

Protected by AR

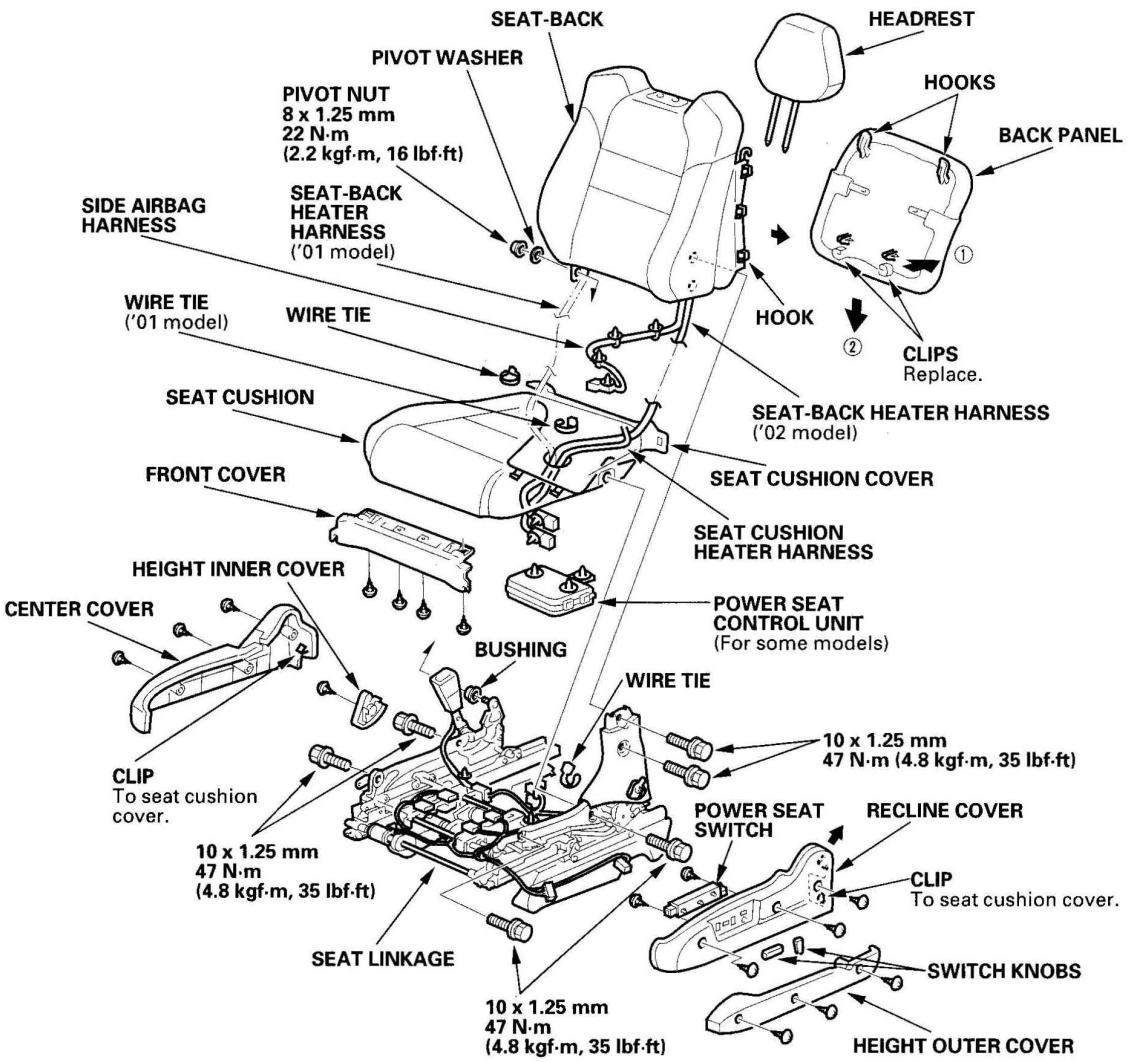
Front Seat Disassembly/Reassembly - Driver's 8-Way Power

SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

Disassemble the seat as shown.

Reassemble the seat in the reverse order of disassembly, and note these items:

- Route the seat wire harness correctly.
- Make sure the bushing and pivot washer are installed correctly.
- Apply multipurpose grease to the moving portion of the seat track.
- To prevent wrinkles in the seat-back cover, stretch the material evenly over the pad.



Protected by AR

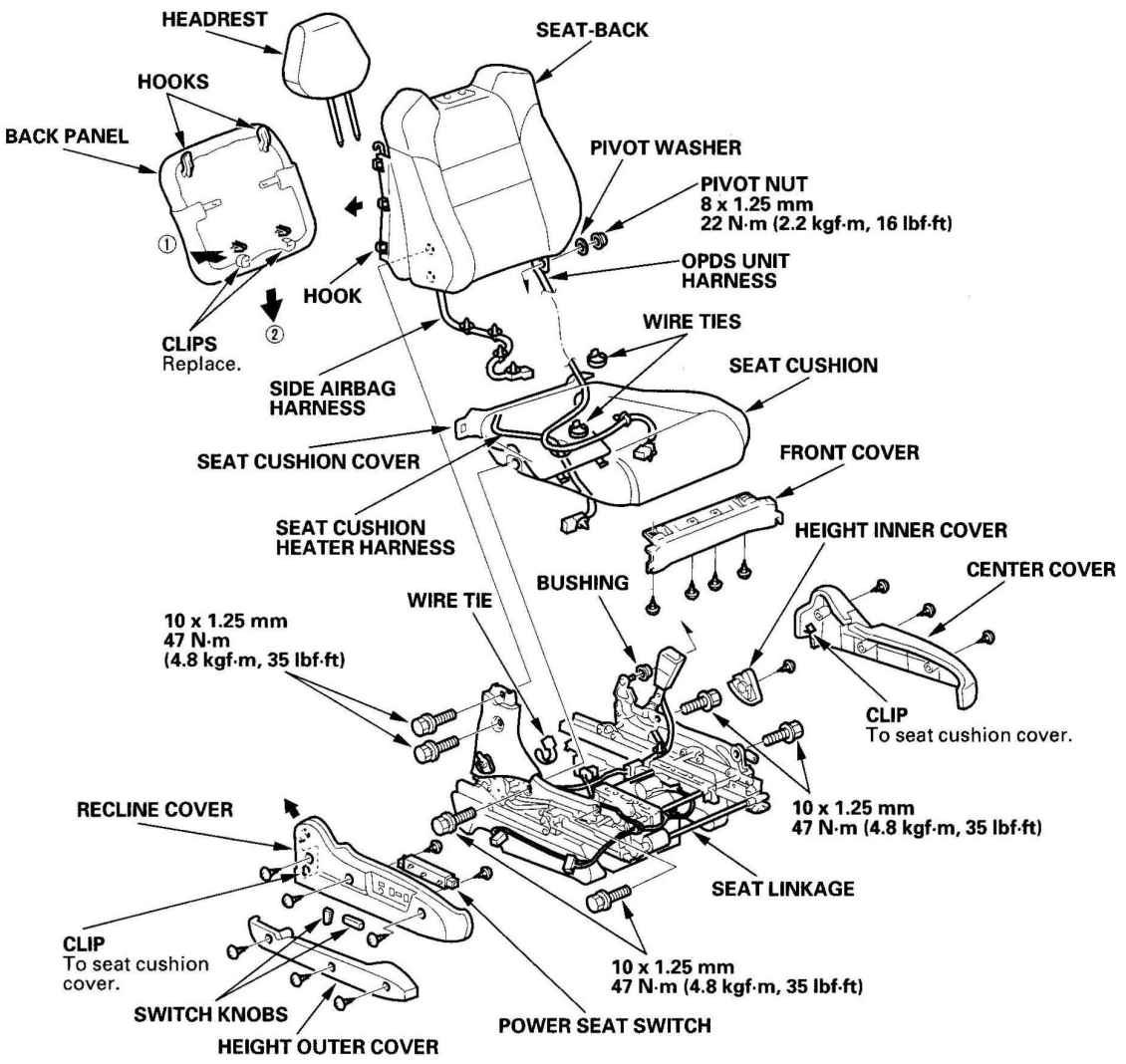
Front Seat Disassembly/Reassembly - Passenger's 8-Way Power

SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

Disassemble the seat as shown.

Reassemble the seat in the reverse order of disassembly, and note these items:

- Route the seat wire harness correctly.
- Make sure the bushing and pivot washer are installed correctly.
- Apply multipurpose grease to the moving portion of the seat track.
- To prevent wrinkles in the seat-back cover, stretch the material evenly over the pad.
- If the seat-back pad or the OPDS unit is replaced with new one, reinitialize the OPDS unit (see page 23-28).



BACK

Protected by AR

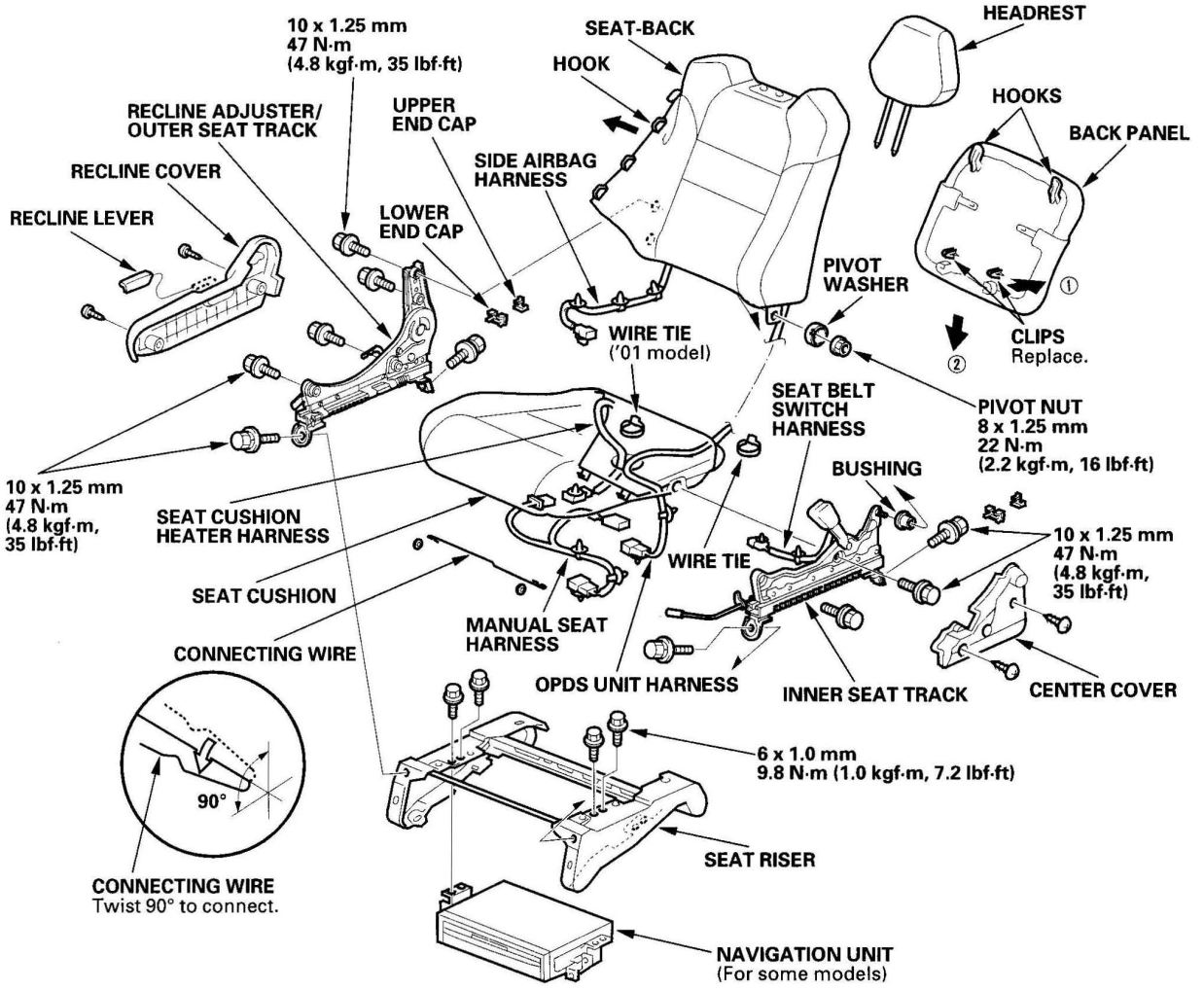
Front Seat Disassembly/Reassembly - Manual

SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

Disassemble the seat as shown.

Reassemble the seat in the reverse order of disassembly, and note these items:

- Route the seat wire harness correctly.
- Make sure the bushing and pivot washer are installed correctly.
- Apply multipurpose grease to the moving portion of the seat track.
- To prevent wrinkles in the seat-back cover, stretch the material evenly over the pad.
- If the seat-back pad or the OPDS unit is replaced with new one, reinitialize the OPDS unit (see page 23-28).



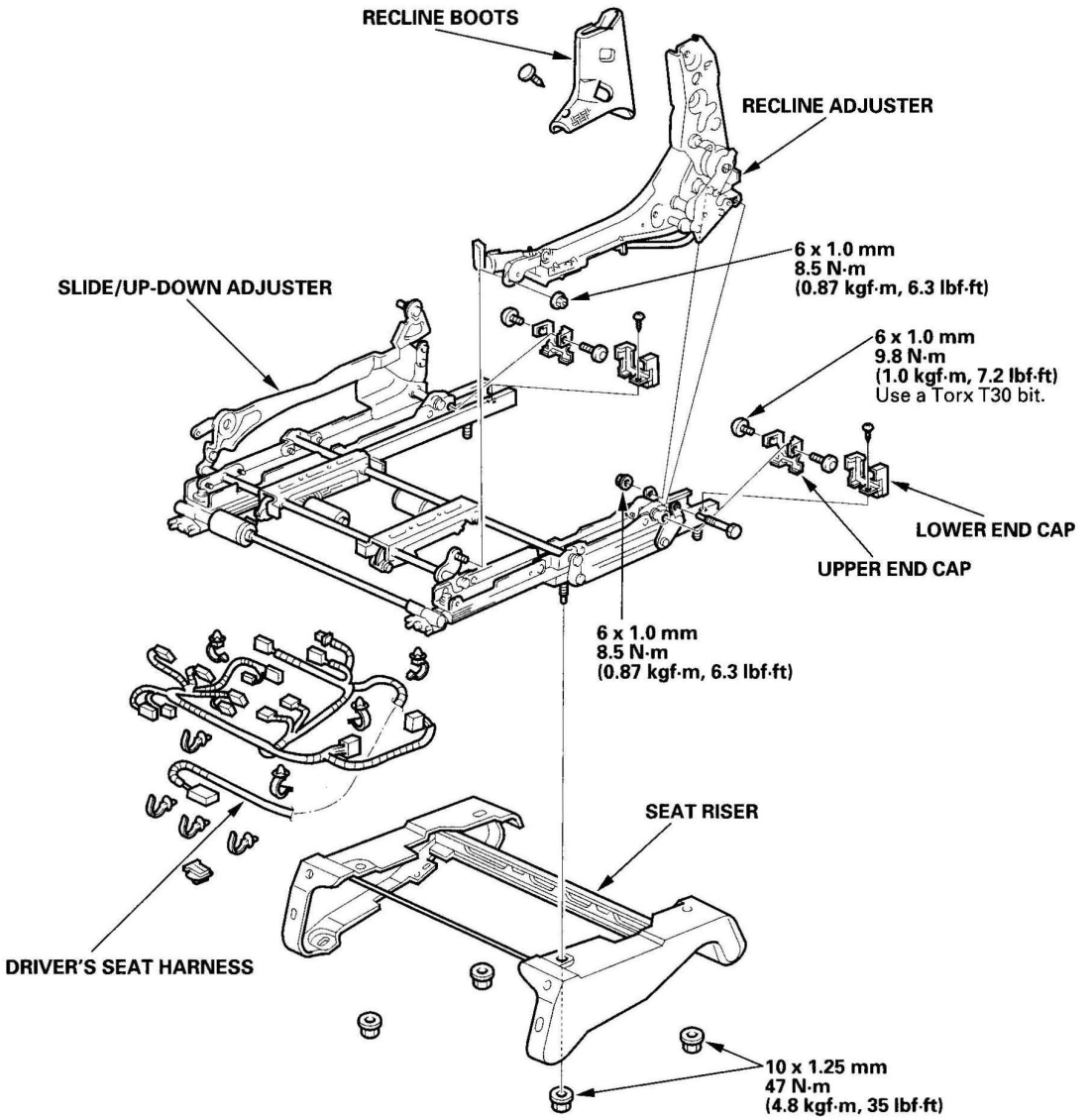
Protected by AR

Front Seat Linkage Disassembly/Reassembly - 8-Way Power

Disassemble the front seat linkage as shown.

Reassemble the front seat linkage in the reverse order of disassembly, and note these items:

- Replace the bushings with new ones.
- Apply multipurpose grease to the sliding and pivot portions.
- Check operation of the recline adjuster and slide/up-down adjuster.



BACK

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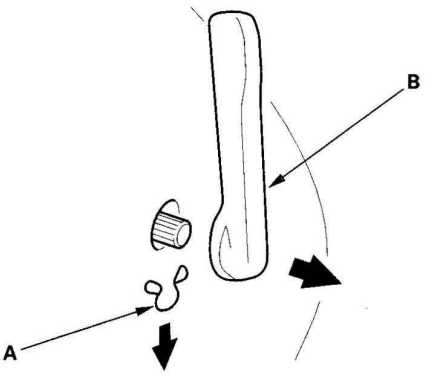
Front Seat Cover Replacement

SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

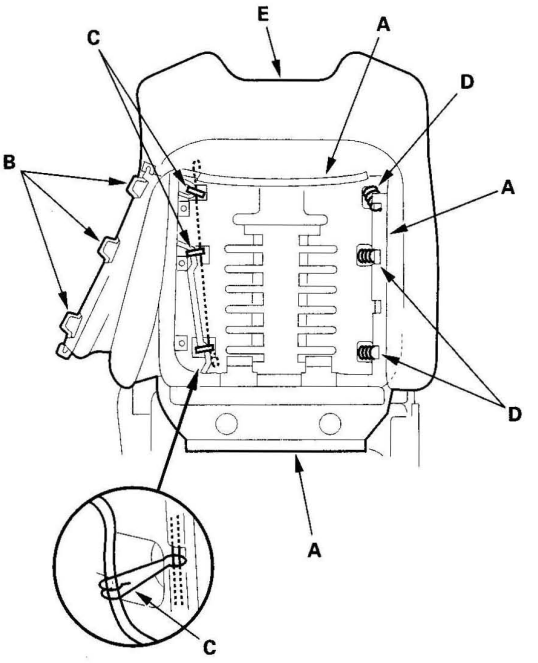
NOTE:
- Seats with airbags are marked "SIDE AIRBAG" on the seat-back. Because the component parts (seat-back cover, cushion, etc.) of seats with and without airbags are different, make sure you install only the correct replacement parts.
- Do not repair torn or frayed seat-back covers. If necessary, replace the seat-back cover.
- Take care not to tear the seams or damage the seat covers.
- Do not touch the OPDS sensor in the seat-back pad, and keep it away from oils. Oils can corrode the sensor causing it to fail.
- Put on gloves to protect your hands.

Seat-back Cover

1. Fold the seat-back forward.
2. Remove the headrest.
3. Remove the back panel, driver's 8-way power (see page 20-79), passenger's 8-way power (see page 20-80), manual (see page 20-81).
4. Driver's seat: Remove the clip (A), then remove the lumbar support knob (B).



5. Release the hook strips (A), hooks (B, C), and inside springs (D), then loosen the seat-back cover (E).

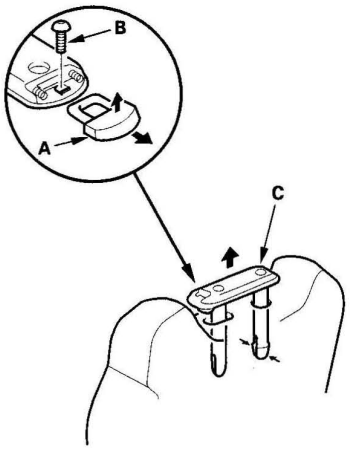


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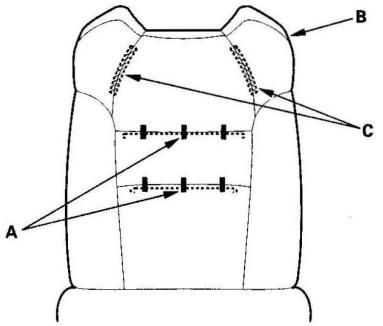
Front Seat Cover Replacement (cont'd)

6. Lift and pull out the release button (A), and remove the screw (B), then remove the headrest guide (C).

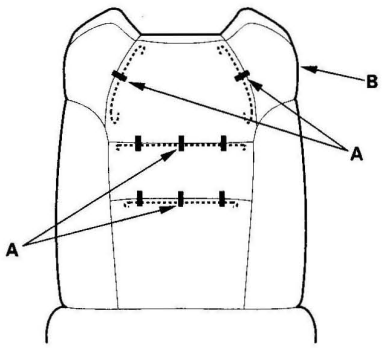


7. Pull back the edge of the seat-back cover all the way around. Release the clips (A) from under the seat-back cover (B), and on '01 model, release the fastener (C) under the seat-back cover, then remove the seat-back cover.

'01 model:

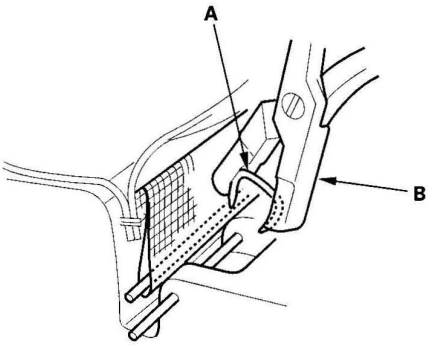


'02 model:



8. Install the seat-back cover in the reverse order of removal, and note these items:

- To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before securing the fasteners, hooks and inside springs.
- Replace the any clips (A) you removed with new ones using commercially available upholstery ring pliers (B).
- Use only original Acura replacement seat-back covers.

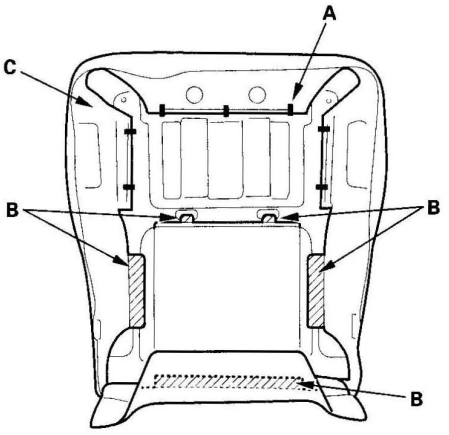


BACK

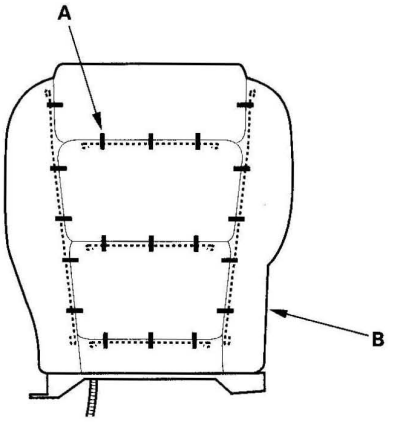
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Seat Cushion Cover

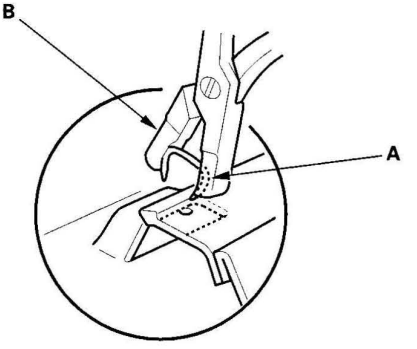
1. Remove the front seat (see page 20-77).
2. Remove the seat cushion, driver's 8-way power (see page 20-79), passenger's 8-way power (see page 20-80), manual (see page 20-81).
3. Release the clips (A) and hooks (B) from under the seat cushion, then loosen the seat cushion cover (C).



4. Pull back the edge of the seat cushion cover all the way around, and release the clips (A), then remove the seat cushion cover (B).



5. Install the seat cushion cover in the reverse order of removal, and note these items:
   - To prevent wrinkles when installing a seat cushion cover, make sure the material is stretched evenly over the pad before securing the clips and hooks.
   - Replace the any clips (A) you removed with new ones using commercially available upholstery ring pliers (B).



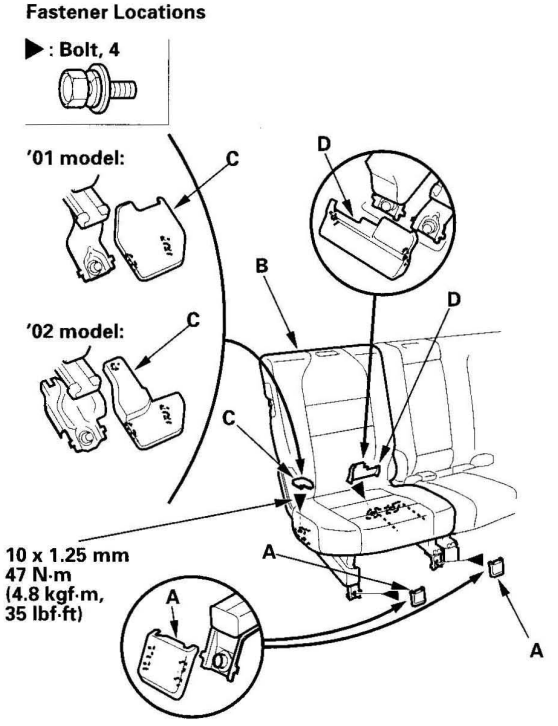
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Second Row Seat Removal/Installation

NOTE
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to scratch the body or tear the seat covers.
- Put on gloves to protect your hands.

Right Second Row Seat

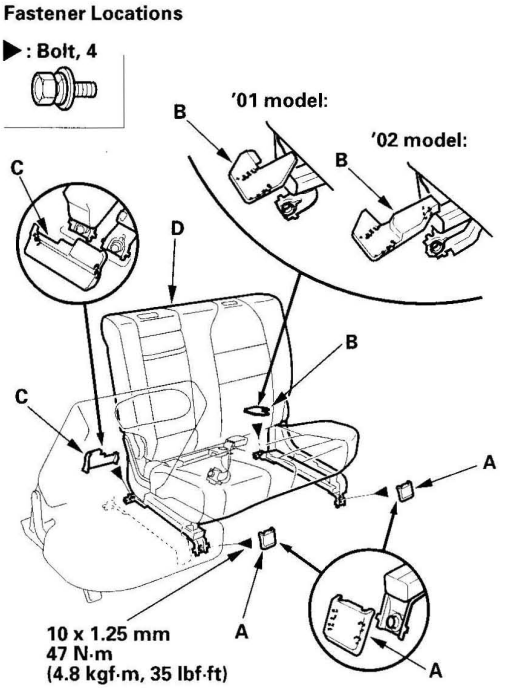
1. Remove the foot covers.
   - 1 Remove the front foot covers (A).
   - 2 Slide the right second row seat (B) forward fully, then remove the rear outer foot cover (C) and rear inner foot cover (D).



2. Slide the seat back, and remove the mounting bolts.
3. Fold the seat-back forward. With the help of an assistant, remove the right second row seat through the door opening.
4. Install the right second row seat in the reverse order of removal.

Left Second Row Seat

1. Remove the left second low seat belt center anchor bolt (see step 1 on page 23-9).
2. Slide the right second row seat forward fully.
3. Remove the front foot covers (A), rear outer foot cover (B), and rear inner foot cover (C).



4. Remove the mounting bolts.
5. Fold the seat-back forward. With the help of an assistant, remove the left second row seat (D) through the door opening.
6. Install the left second row seat in the reverse order of removal.

BACK

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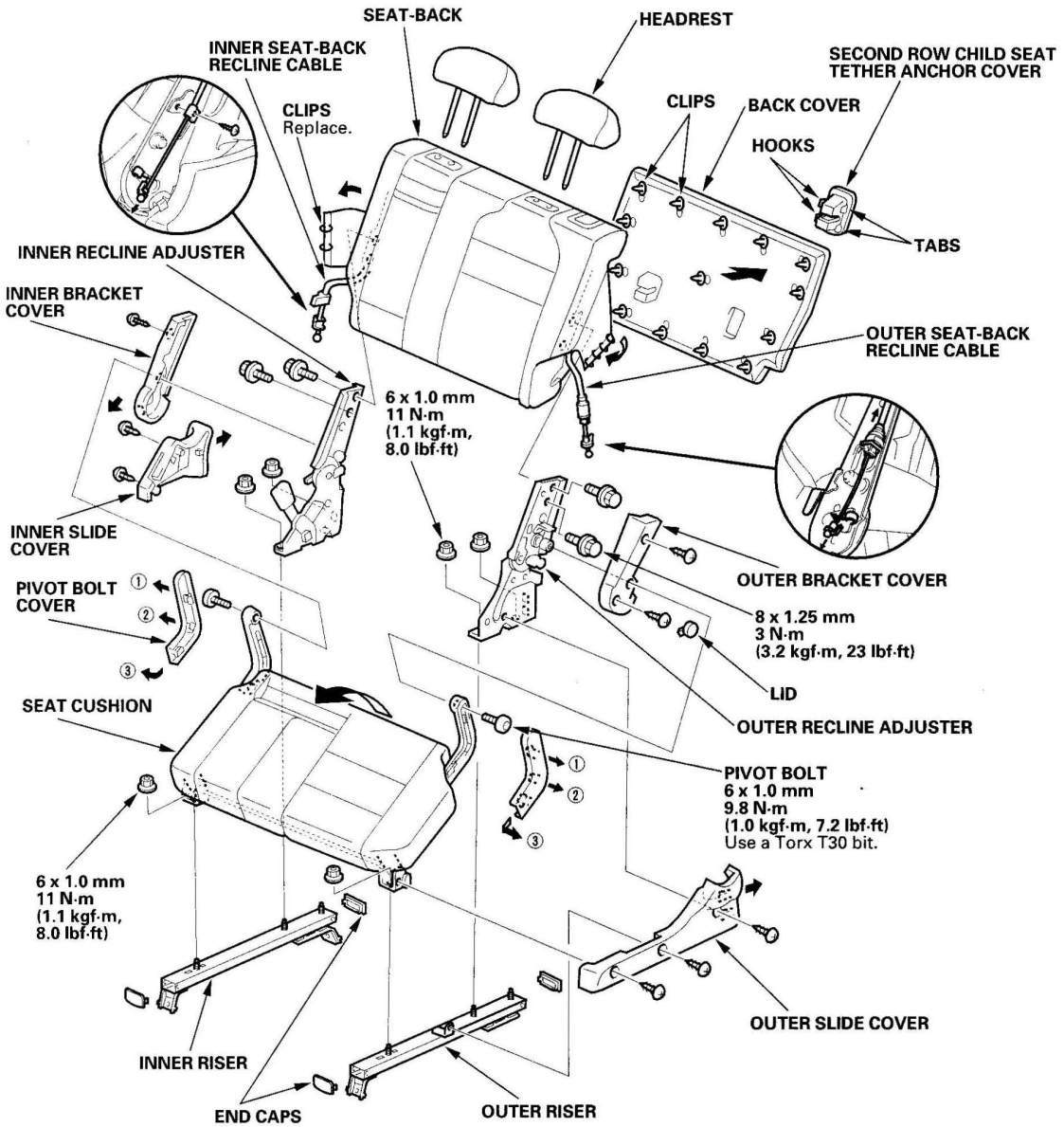
Left Second Row Seat Disassembly/Reassembly

'01 Model

Disassemble the left second row seat as shown. Take care not to bend the seat-back recline cables.

Reassemble the left second row seat in the reverse order of removal, and note these items:

- Replace any damaged clips as new ones.
- Make sure the seat-back recline cables are connected securely. If necessary, adjust the cable tension (see step 10 on page 20-94).
- To prevent wrinkles in the seat-back cover, stretch the material evenly over the pad.



BACK

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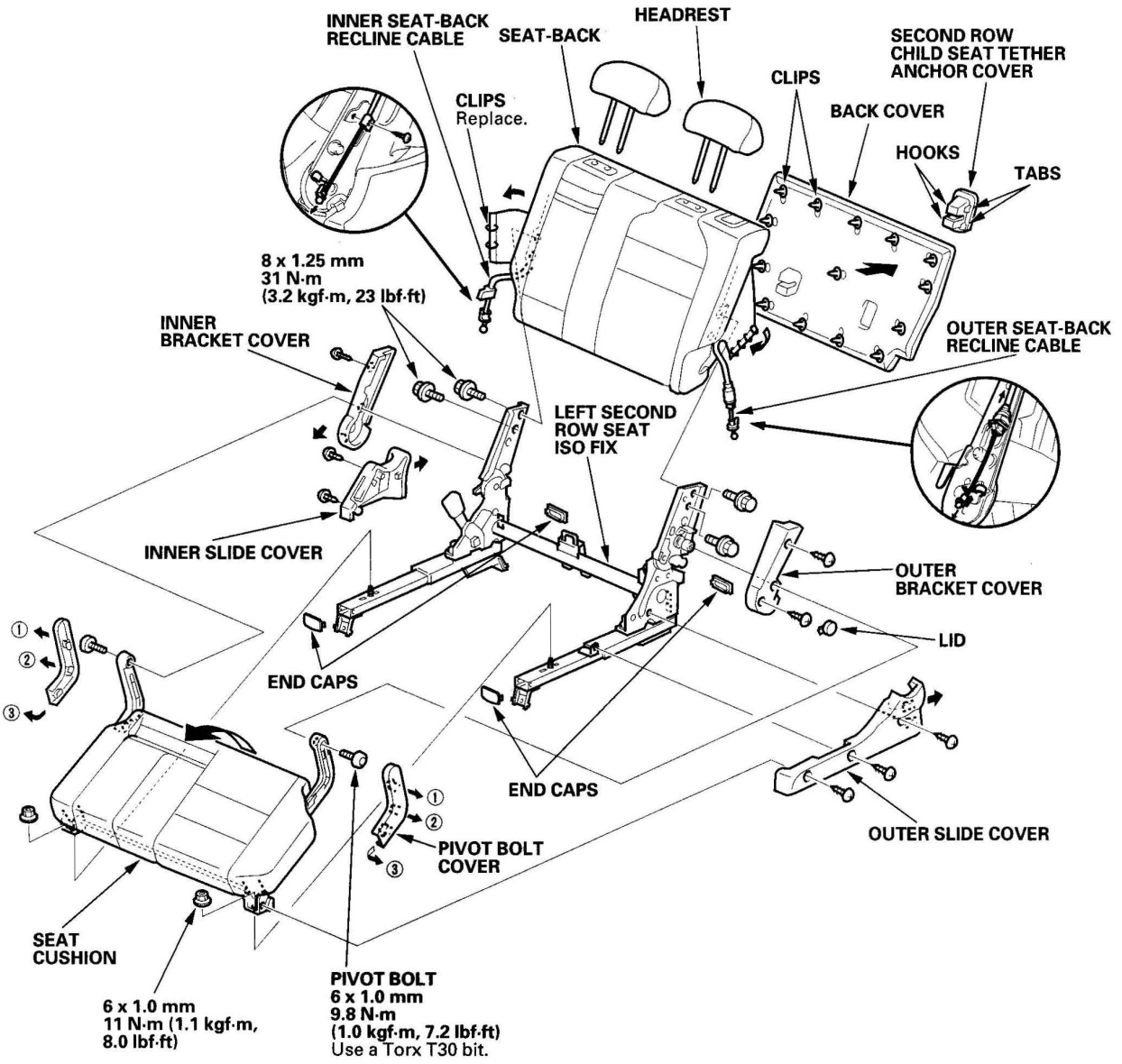
Left Second Row Seat Disassembly/Reassembly (cont'd)

'02 Model

Disassemble the left second row seat as shown. Take care not to bend the seat-back recline cables.

Reassemble the left second row seat in the reverse order of removal, and note these items:

- Replace any damaged clips as new ones.
- Make sure the seat-back recline cables are connected securely. If necessary, adjust the cable tension (see step 10 on page 20-94).
- To prevent wrinkles in the seat-back cover, stretch the material evenly over the pad.



BACK

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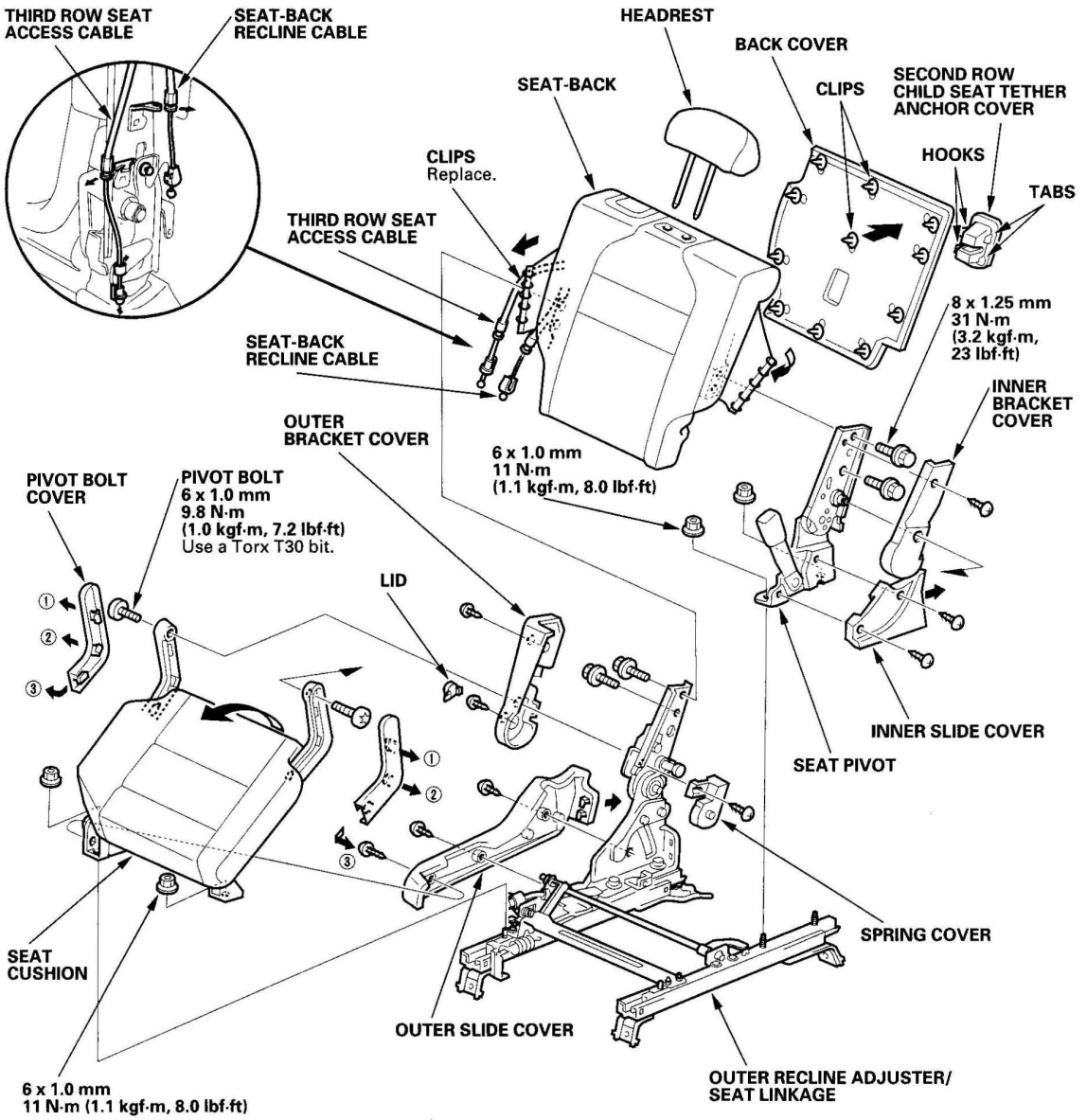
Right Second Row Seat Disassembly/Reassembly

'01 Model

Disassemble the right second row seat as shown. Take care not to bend the seat-back recline cable and third row seat access cable.

Reassemble the right second row seat in the reverse order of removal, and note these items:

- Replace any damaged clips as new ones.
- Make sure the seat-back recline cable and third row seat access cable are connected securely.
- To prevent wrinkles in the seat-back cover, stretch the material evenly over the pad.



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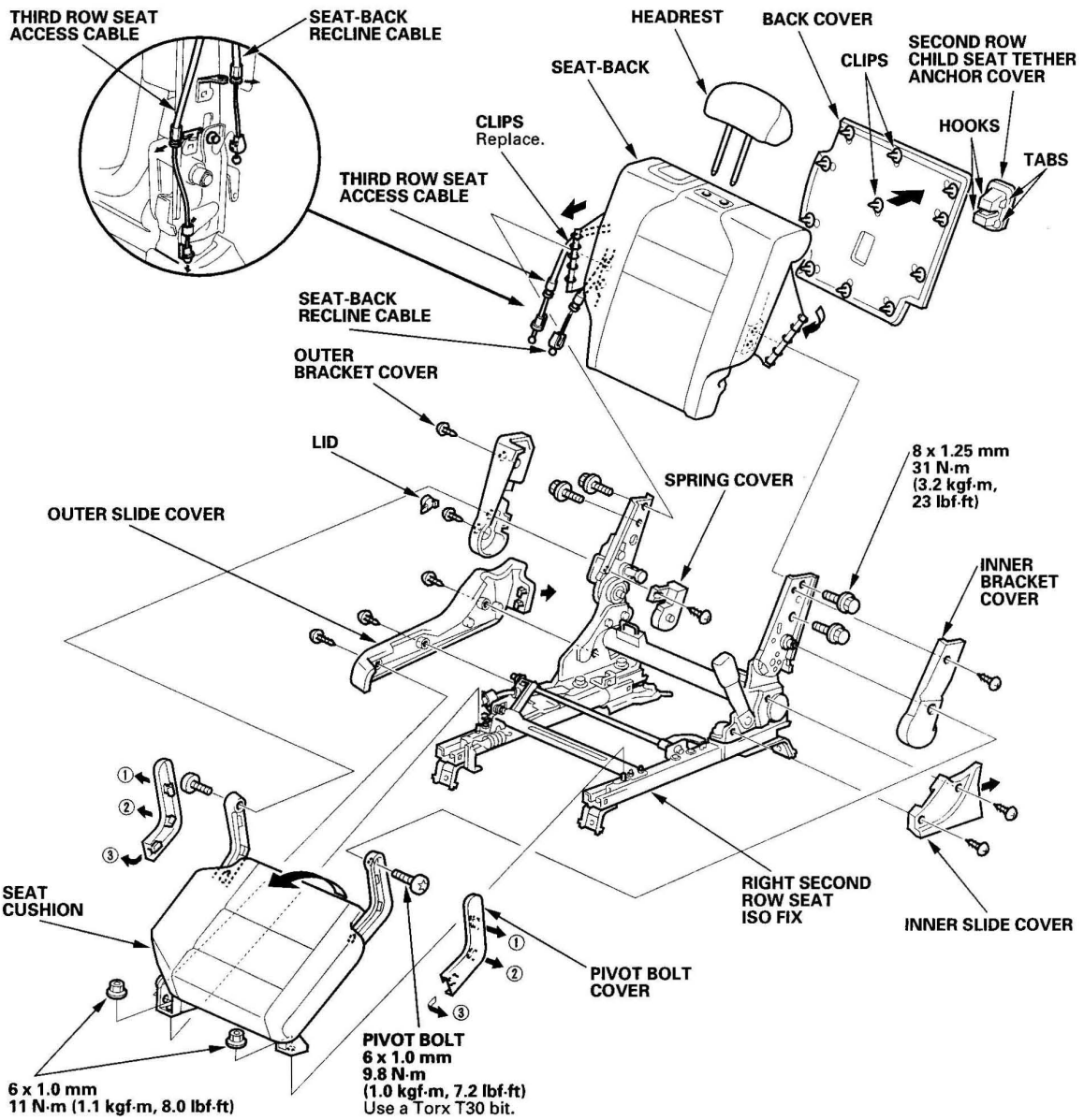
Right Second Row Seat Disassembly/Reassembly (cont'd)

'02 Model

Disassemble the right second row seat as shown. Take care not to bend the seat-back recline cable and third row seat access cable.

Reassemble the right second row seat in the reverse order of removal, and note these items:

- Replace any damaged clips as new ones.
- Make sure the seat-back recline cable and third row seat access cable are connected securely.
- To prevent wrinkles in the seat-back cover, stretch the material evenly over the pad.



BACK

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Right Second Row Seat Linkage Disassembly/Reassembly

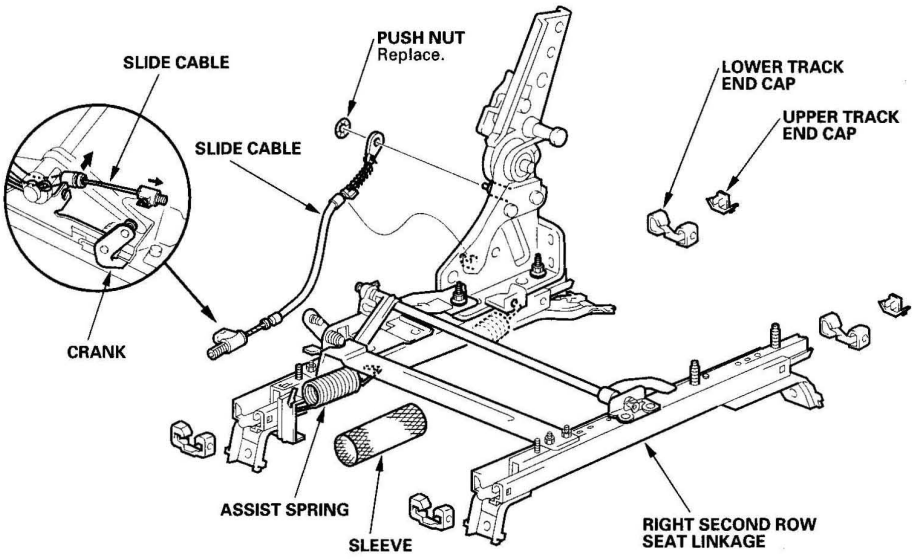
NOTE: Take care not to bend the slide cable.

Disassemble the right second row seat linkage as shown.

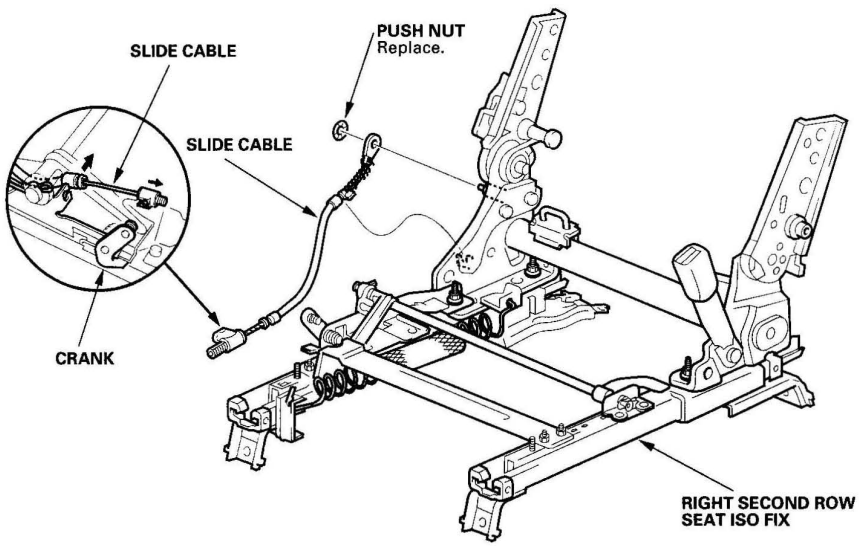
Reassemble the right second row seat linkage in the reverse order of disassembly, and note these items:

- Replace the push nut with a new one.
- Apply multipurpose grease to the sliding portions.
- Make sure the slide cable is connected securely, and if necessary, adjust the cable.

'01 model:



'02 model:



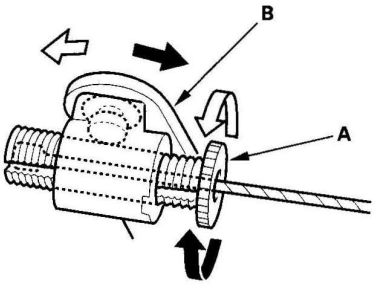
(cont'd)

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Right Second Row Seat Linkage Disassembly/Reassembly (cont'd)

Slide Cable Adjustment

Check the third row seat access operation. If necessary, turn the adjuster (A) clockwise or counterclockwise to move the crank (B) back and forth.



BACK

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Second Row Seat-back Recline Lever Replacement

NOTE:
- Take care not to tear the seams or damage the seat covers.
- Take care not to bend the cables.

1. Slide the right second row seat forward fully.

2. Left second row seat: Remove the left second row seat belt center anchor bolt (see step 1 on page 23-9).

3. Remove the pivot bolt cover. Using a Torx T30 bit, remove the pivot bolt from both sides, left second row seat on '01 model (see page 20-87), left second row seat on '02 model (see page 20-88), right second row seat on '01 model (see page 20-89), right second row seat on '02 model (see page 20-90).

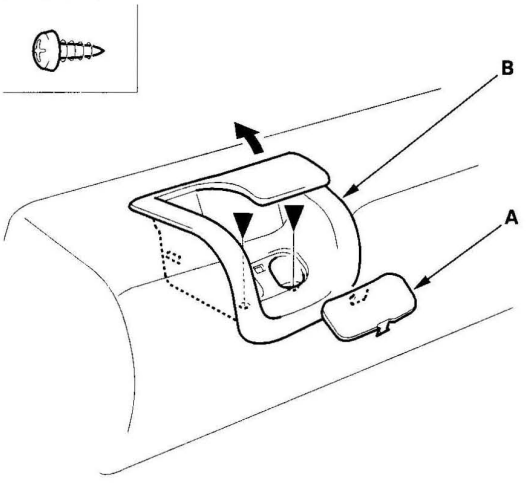
4. Remove the back cover (see step 5 on page 20-97), then release the clips from behind the seat-back, as necessary (see step 6 on page 20-98).

5. Lift the seat cushion up, and remove these items:
   - Outer and inner bracket covers, left second row seat on '01 model (see page 20-87), left second row seat on '02 model (see page 20-88).
   - Outer bracket cover, right second row seat on '01 model (see page 20-89), right second row seat on '02 model (see page 20-90).

6. Pry out the lid (A), and remove the screws securing the recline lever (B).

Fastener Locations

▶: Screw, 2

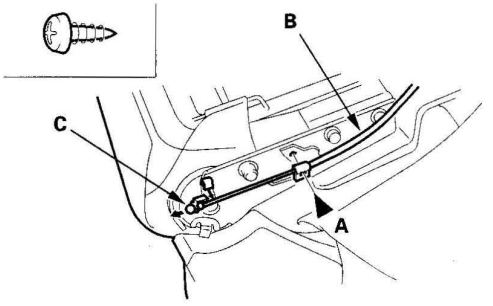


7. Left second row seat: Remove the screw (A) securing the inner recline cable (B), release the clips (C) and adjuster (D), then remove the inner recline cable and outer recline cable (E) from both brackets.

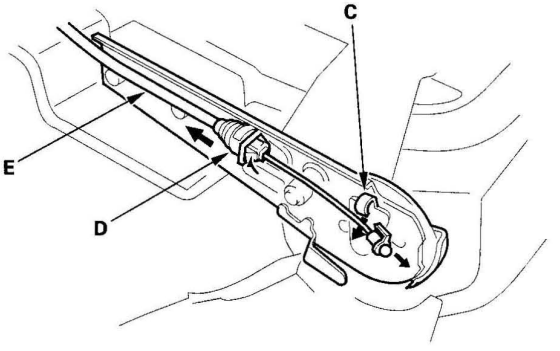
Inner:

Fastener Locations

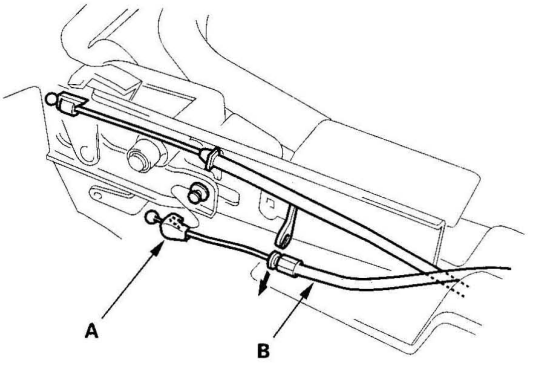
A ▶: Screw, 1



Outer:



8. Right second row seat: Detach the clip (A) and recline cable (B) from the bracket.

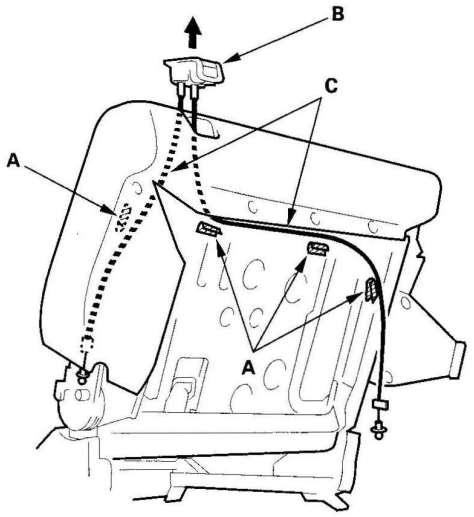


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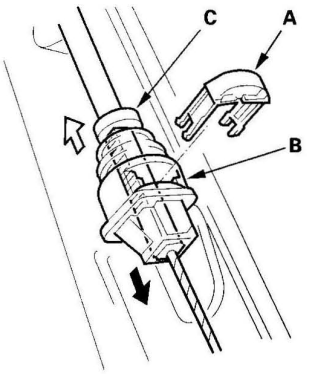
Second Row Seat-back Recline Lever Replacement (cont'd)

9. Peel the tapes (A) off, and pull the recline lever (B) with the recline cables (C). There is no inner recline cable on the right recline lever.



10. Install the lever in the reverse order of removal, and note these items:

- Make sure the recline cables are connected securely.
- For the left second row seat: If necessary, remove the clip (A) from the adjuster (B), and move the cable (C) up or down to obtain the proper tension of the outer recline cable, then reinstall the clip.

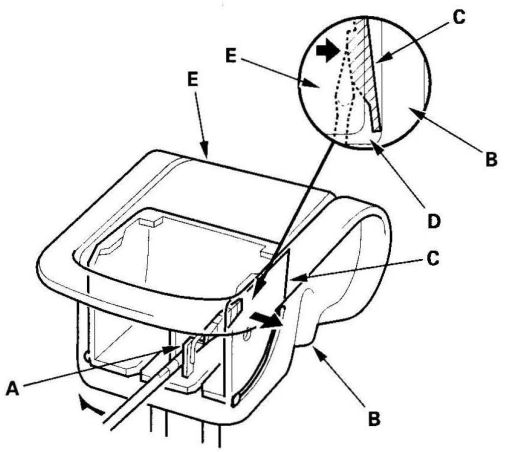


Second Row Seat-back Recline Cable Replacement

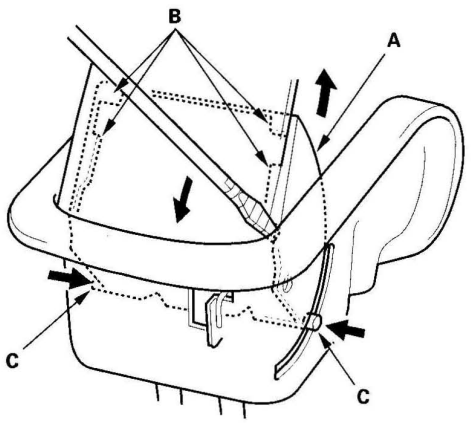
NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend the cable.

1. Remove the seat-back recline lever (see page 20-93).

2. Carefully insert a flat-tip screwdriver through hole (A) in the housing (B), then press the inside face of the cover (C) outward against the housing to make a gap (D) between the lever (E) and the cover.



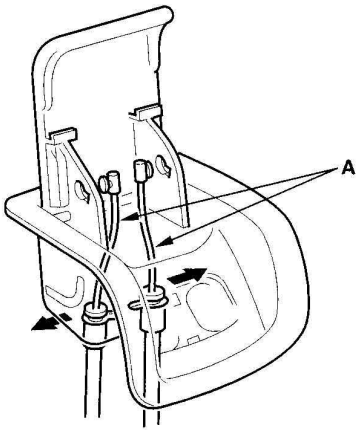
3. Carefully pry out the cover (A) with a flat-tip screwdriver at the gap while holding the lever open. Release the tabs (B), and push both stopper portions (C), then remove the cover.



BACK

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4. Disconnect the recline cables (A). There is no inner recline cable on the right recline lever.

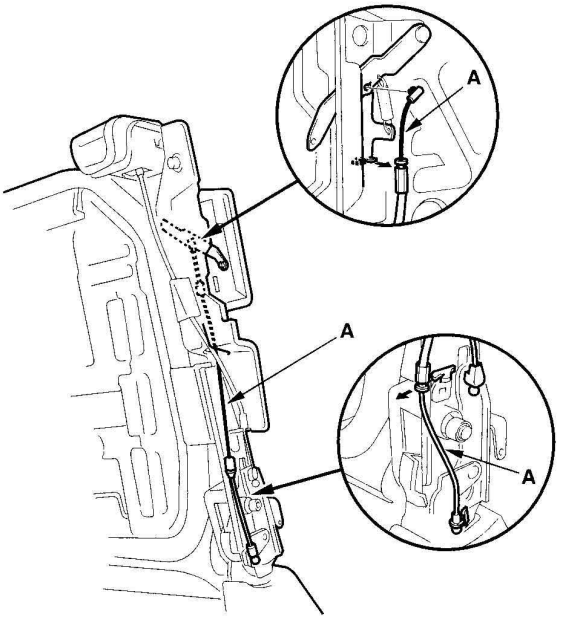


5. Install the second row seat-back recline cables in the reverse order of removal, and make sure the cables are connected securely.

Third Row Seat Access Cable Replacement

NOTE: Take care not to bend the cable.

1. Slide the right second row seat forward fully.
2. Remove the pivot bolt cover, and using a Torx T30 bit, remove the pivot bolt from both sides, '01 model (see page 20-89), '02 model (see page 20-90).
3. Remove the right second row seat-back cover/pad from the seat-back frame (see page 20-97).
4. Lift the right second row seat cushion up, and remove the outer bracket cover, '01 model (see page 20-89), '02 model (see page 20-90).
5. Disconnect the third row seat access cable (A) at both ends, then remove the cable.



6. Install the third row seat access cable in the reverse order of removal, and make sure the cable is connected securely.

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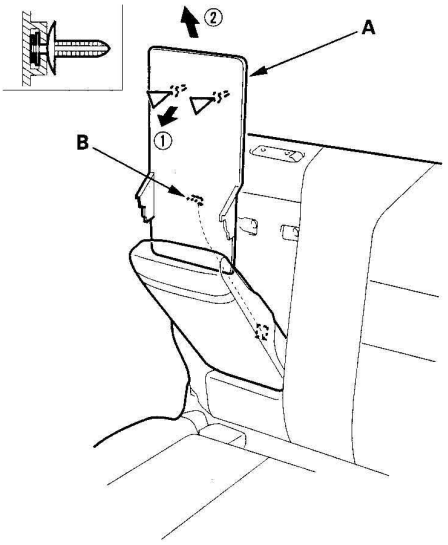
Second Row Seat Armrest Replacement

NOTE: Take care not to tear the seams or damage the seat covers.

1. Detach the clips of the armrest panel (A), then pull the panel upward to release the hook (B) and remove it.

Fastener Locations

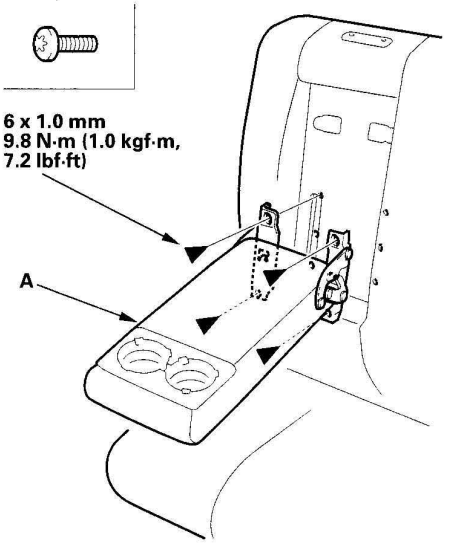
▷ : Clip, 2



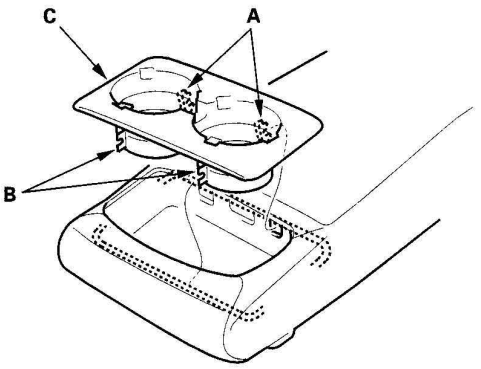
2. Using a Torx T30 bit, remove the screws, then remove the armrest (A).

Fastener Locations

▶ : Screw, 4



3. Pry the rear hooks (A) up, and release the front hooks (B), then remove the armrest beverage holder (C).



4. Install the armrest in the reverse order of removal, and replace any damaged clips.

BACK

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Second Row Seat Cover Replacement

NOTE:
- Take care not to tear the seams or damage the seat covers.
- Put on gloves to protect your hands.

Seat-back Cover

1. Slide the right second row seat forward fully.

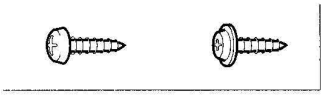
2. Remove the pivot bolt cover, and using a Torx T30 bit, remove the pivot bolt from both sides, left second row seat on '01 model (see page 20-87), left second row seat on '02 model (see page 20-88), right second row seat on '01 model (see page 20-89), right second row seat on '02 model (see page 20-90).

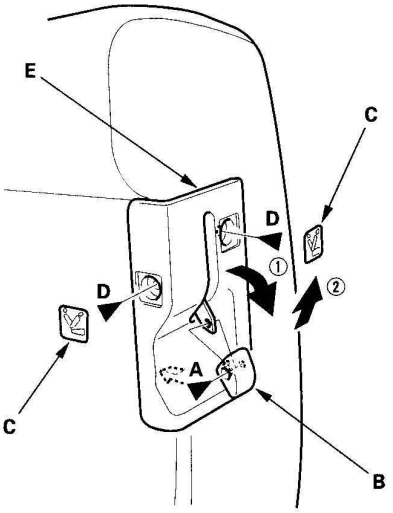
3. Remove the armrest, left second row seat (see page 20-96).

4. Right second seat: Remove the screw (A), then remove the third row seat access knob (B). Peel off the labels (C), and remove the screws (D), then remove the third row seat access trim (E).

Fastener Locations

A ▶ : Screw, 1 D ▶ : Screw, 2

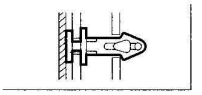




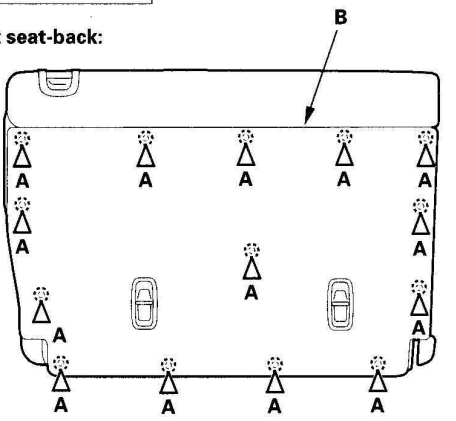
5. Fold the seat-back forward fully, detach the clips (A), and remove the back cover (B).

Fastener Locations

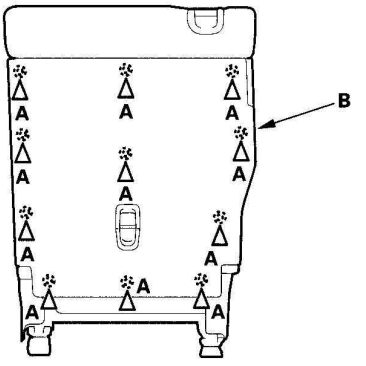
A ▶
Left seat-back: 14
Right seat-back: 11



Left seat-back:



Right seat-back:



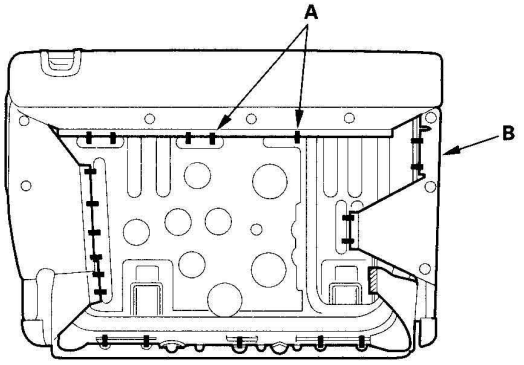
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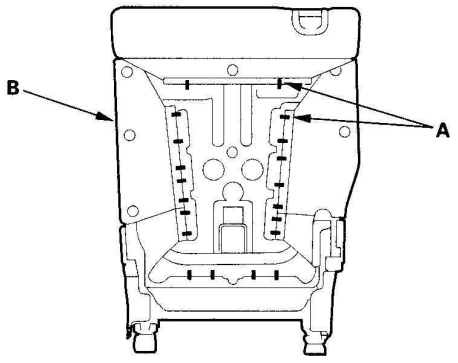
Second Row Seat Cover Replacement (cont'd)

6. Release all of the clips (A) from the back of the seat-back (B).

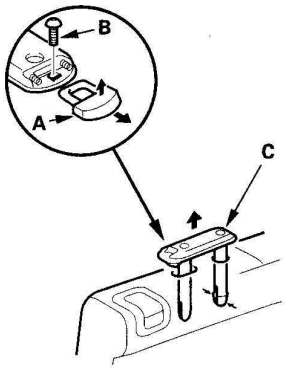
Left seat-back:



Right seat-back:

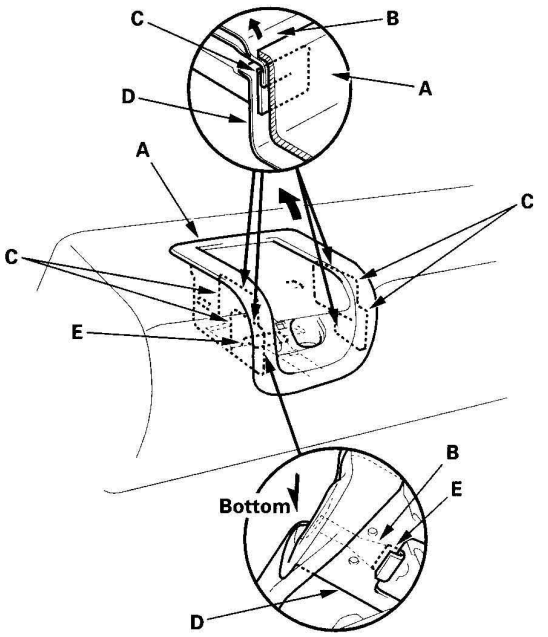


7. Lift and pull out the release button (A), and remove the screw (B), then remove the headrest guide (C).

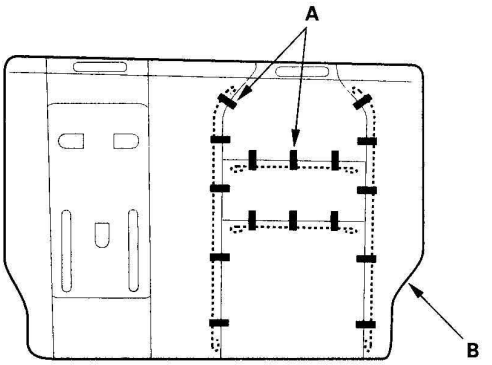


8. Remove the screws securing the recline lever (see step 6 on page 20-93).

9. While holding the recline lever (A) away from the seat-back cover (B), pull the retainers (C) out from under the lever. From under the recline bracket (D), release the hook (E).



10. Pull back the edge of the seat-back cover all the way around, and release the clips (A), then remove the seat-back cover (B).

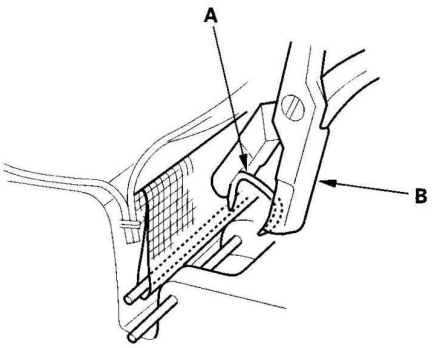


BACK

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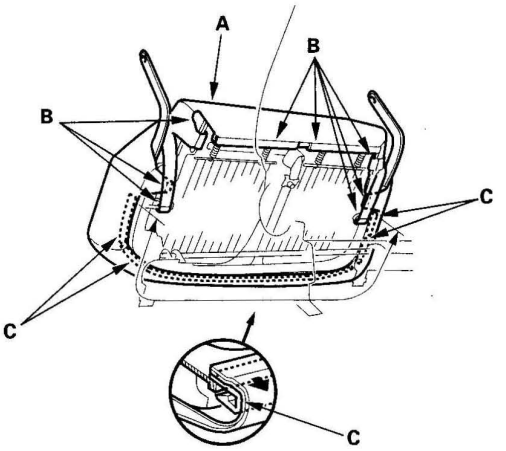
11. Install the seat-back cover in the reverse order of removal, and note these items:

    - To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before securing the hook and clips.
    - Replace any clips (A) you removed with new ones using commercially available upholstery ring pliers (B).



Seat Cushion Cover

1. Slide the right second row seat forward fully.
2. Left second row seat: Remove the left second row seat belt center anchor bolt (see step 1 on page 23-9).
3. Remove the pivot bolt cover, and using a Torx T30 bit, remove the pivot bolt from both sides, left second row seat on '01 model (see page 20-87), left second row seat on '02 model (see page 20-88), right second row seat on '01 model (see page 20-89), right second row seat on '02 model (see page 20-90).
4. Lift the seat cushion (A) up. Release all of the hook strips (B, C) from under the seat cushion.



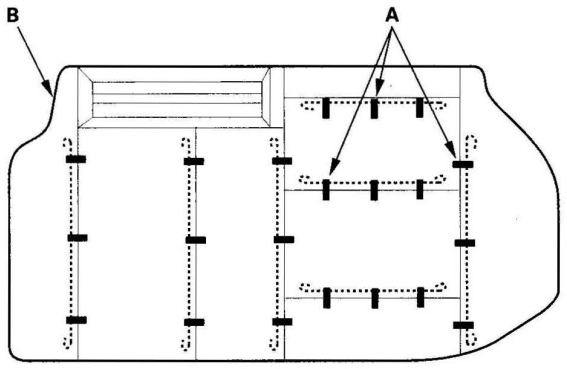
5. Left second row seat: Remove the seat belt buckle pocket (see step 4 on page 23-9), then remove the left second row seat belt buckle and center second row seat belt detachable anchor complete from the seat cushion (see step 6 on page 23-9).

(cont'd)

Protected by AR

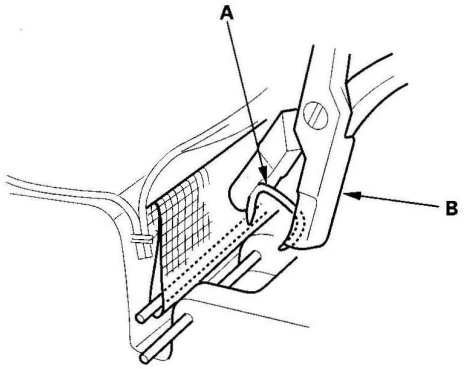
Second Row Seat Cover Replacement (cont'd)

6. Pull back the edge of the seat cushion cover all the way around, and release the clips (A), then remove the seat cushion cover (B).



7. Install the seat cushion cover in the reverse order of removal, and note these items:

   - To prevent wrinkles when installing a seat cushion cover, make sure the material is stretched evenly over the pad before securing the clips and hooks.
   - Replace any clips (A) you removed with new ones using commercially available upholstery ring pliers (B).



BACK

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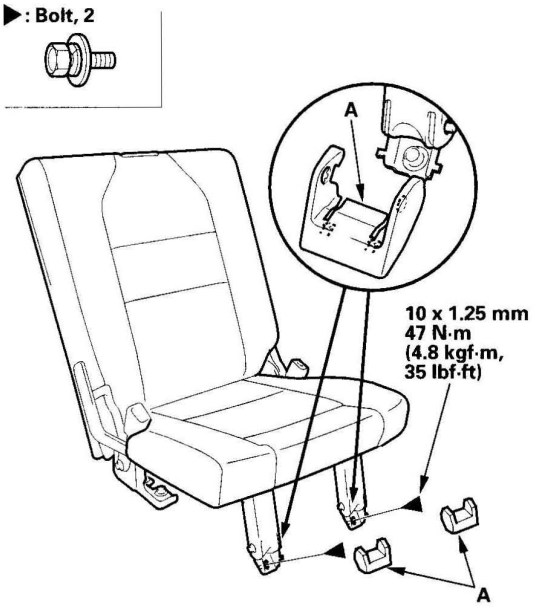
Third Row Seat Removal/Installation

NOTE
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to scratch the body or tear the seat covers.
- Put on gloves to protect your hands.

1. Remove the front mounting bolt covers (A), then remove the front mounting bolts.

Fastener Locations

▶: Bolt, 2

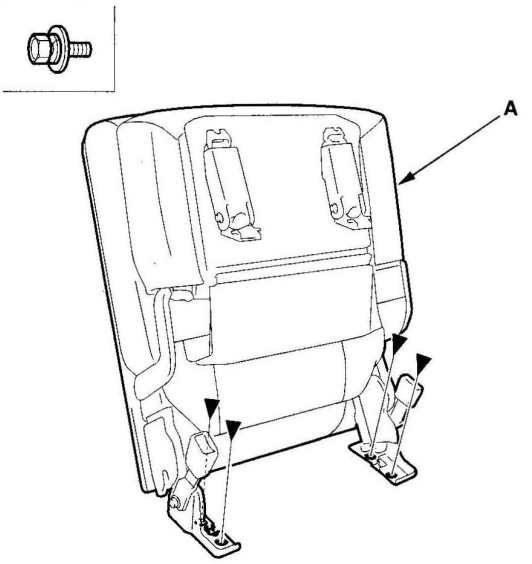


2. Lift the seat cushion up.

3. Remove the rear mounting bolts, then remove the third row seat (A) through the tailgate opening.

Fastener Locations

▶: Bolt, 4



4. Install the third row seat in the reverse order of removal.

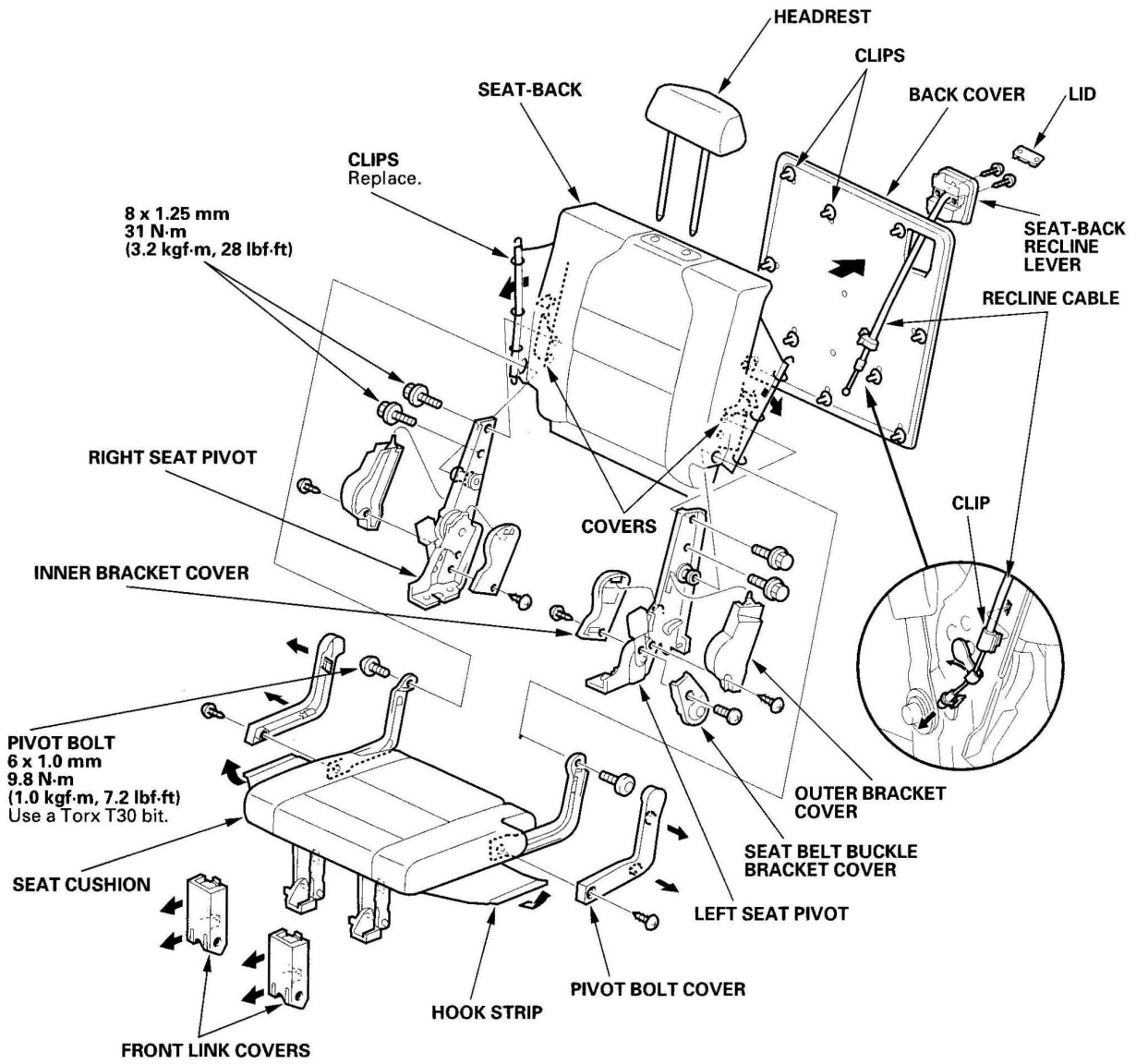
Protected by AR

Third Row Seat Disassembly/Reassembly

Disassemble the third row seat as shown. Take care not to bend the seat-back recline cable.

Reassemble the seat in the reverse order of removal, and note these items:

- Replace any damaged clips with new ones.
- Make sure the seat-back recline cable is connected securely.
- To prevent wrinkles in the seat-back cover, make sure the material is stretched evenly over the pad before securing the clip.



BACK

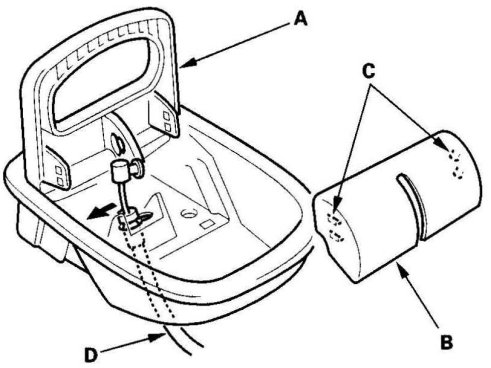
Protected by AR

Third Row Seat-back Recline Cable Replacement

NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend the cable.

1. Remove the third row seat back recline lever (see page 20-102).

2. While holding the lever (A) open, carefully pry out the cover (B) with a flat-tip screwdriver to release the tabs (C), then remove it.



3. Disconnect the recline cable (D).

4. Install the third row seat-back recline cable in the reverse order of removal, and make sure the cable is connected securely.

Third Row Seat Cover Replacement

NOTE:
- Take care not to scratch the interior trim.
- Take care not to tear the seams or damage the seat covers.
- Put on gloves to protect your hands.

Seat-back Cover

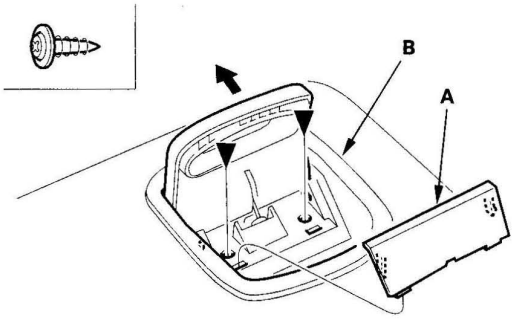
1. Remove both front mounting bolts, then lift the seat cushion up (see step 1 on page 20-101).

2. Remove the pivot bolt cover and pivot bolt from both sides, then remove the seat cushion (see page 20-102).

3. Pry out the lid (A), and remove the screws securing the third row seat-back recline lever (B).

Fastener Locations

▶: Screw, 2



(cont'd)

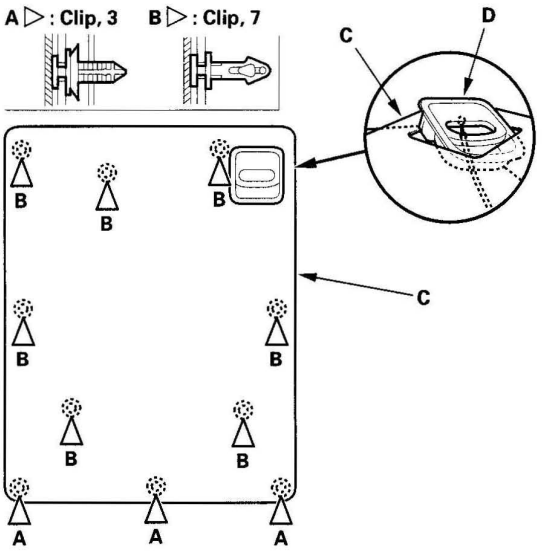
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Third Row Seat Cover Replacement (cont'd)

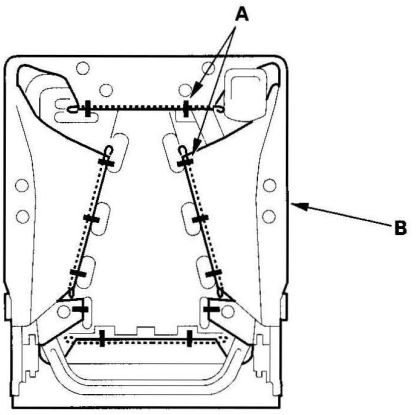
4. Detach the clips (A, B), and remove the back cover (C) apart from the frame, then turn the cover to pass the recline lever (D) through a hole in the cover.

Fastener Locations

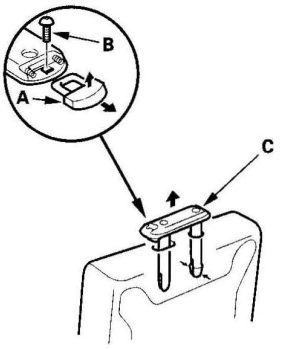
A ▷ : Clip, 3 B ▷ : Clip, 7



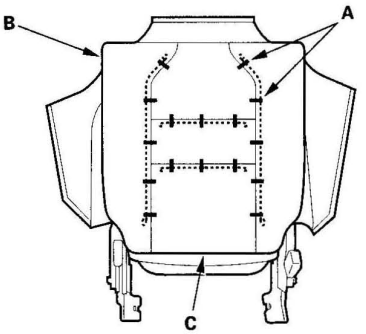
5. Release all of the clips (A) from behind the seat-back (B).



6. Lift and pull out the release button (A), and remove the screw (B), then remove the headrest guide (C).

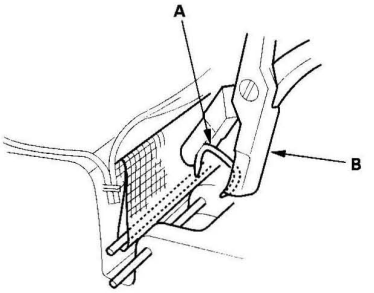


7. Pull back the edge of the seat-back cover (A) all the way around, then release all of the clips (B). Remove the seat back cover (C).



8. Install the seat-back cover in the reverse order of removal, and note these items:

- To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before securing the hook and clips.
- Replace any clips (A) you removed with new ones using commercially available upholstery ring pliers (B).



BACK

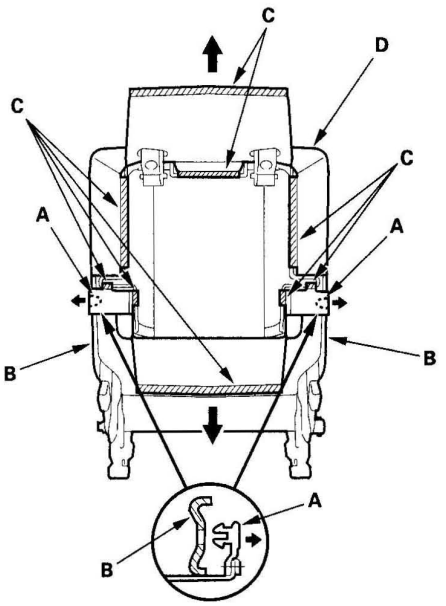
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Seat Cushion Cover

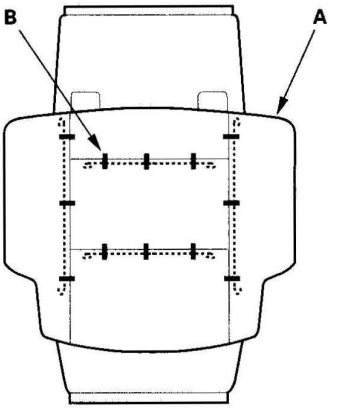
1. Remove both front mounting bolts, then lift the seat cushion up (see step 1 on page 20-101).

2. Remove the pivot bolt cover from both sides (see page 20-102).

3. Detach the retainers (A) from both sides of the link (B), and release all of the hook strips (C) from under the seat cushion (D).

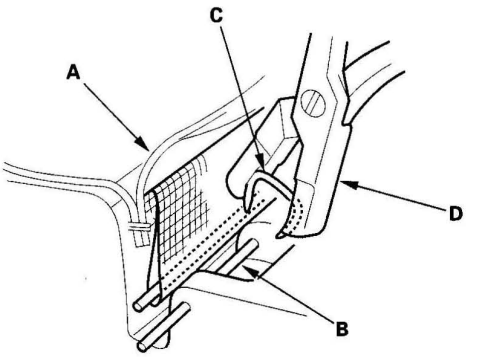


4. Pull back the edge of the seat cushion cover (A) all the way around, and release all of the clips (B), then remove the seat cushion cover.



5. Install the seat cushion cover in the reverse order of removal, and note these items:

   - To prevent wrinkles, make sure the material is stretched evenly over the pad before securing all the clips.
   - Replace all of the clips fastening the seat-back cover (A) and pad wire (B) with new ones (C) using commercially available upholstery ring pliers (D).



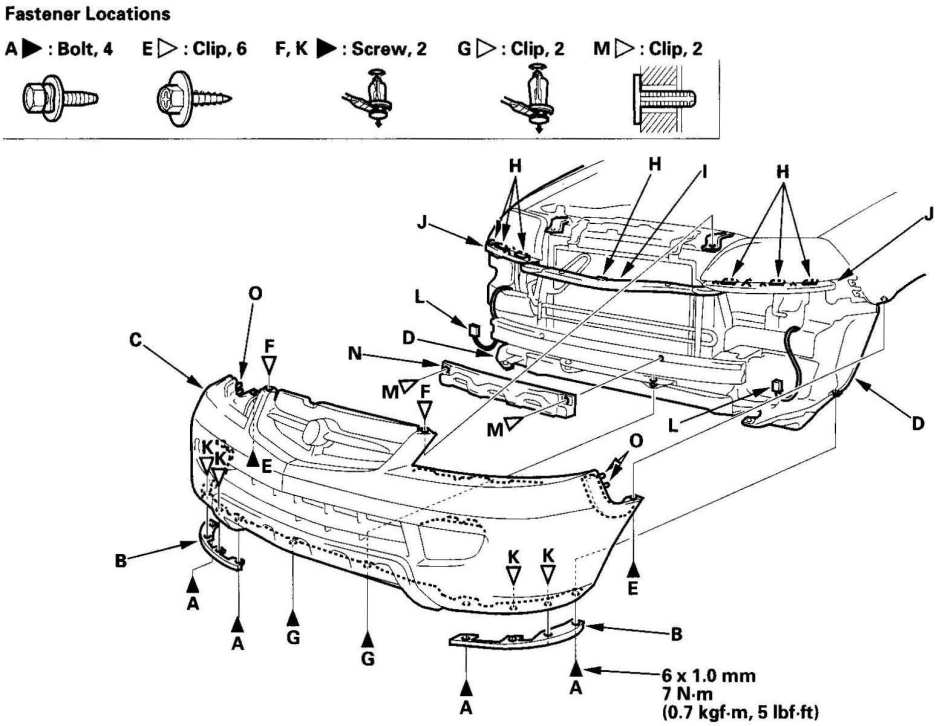
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Front Bumper Removal/Installation

NOTE:
- Have an assistant help you when removing and installing the front bumper.
- Take care not to scratch the front bumper and body.
- Put on gloves to protect your hands.

1. Remove the front bulkhead cover (see page 20-115).

2. Remove the bolts (A) securing both front under spoilers (B), front bumper (C), and both front inner fenders (D).



3. Remove the screws (E) and clips (F, G).

4. With the help of an assistant, pull the front bumper forward to release the hooks (H) of the center upper beam (I) and corner upper beam (J), then remove the bumper from the body. If necessary, remove the clips (K), then remove the under spoilers.

5. Disconnect both front fog light connectors (L).

6. If necessary, detach the clips (M) and remove the absorber (N).

7. Install the front bumper in the reverse order of removal, and note these items:
   - Make sure the front fog light connectors are plugged in properly.
   - Fit the front bumper side stiffener pins (O) into the holes in each front fender.
   - Make sure the front bumper engages the hooks (of the center and both corner upper beams) on each side securely.
   - Replace any damaged clips.

BACK

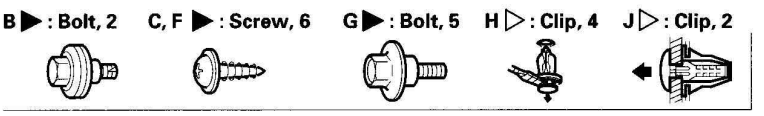
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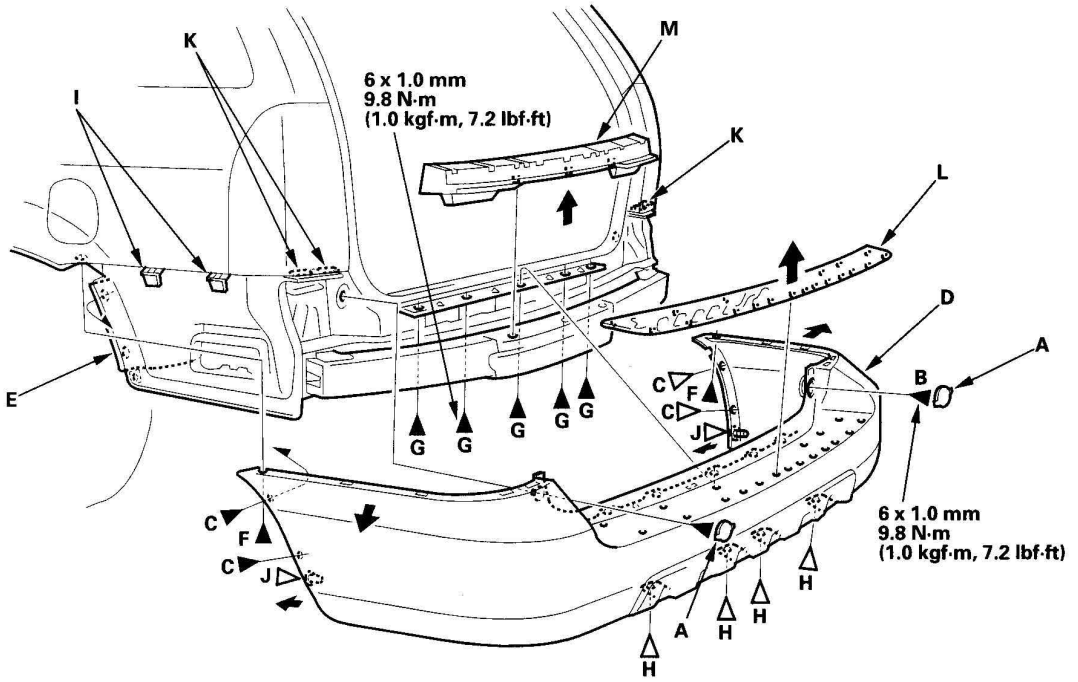
Rear Bumper Removal/Installation

NOTE:
- Have an assistant help you when removing and installing the rear bumper.
- Take care not to scratch the rear bumper and body.
- Put on gloves to protect your hands.

1. Pry out the caps (A), and remove the bolts (B) from each side.

Fastener Locations





2. Remove four screws (C) securing the rear bumper (D) and rear fender cover (E), and two screws (F) securing the bumper on the body.

3. Remove the bolts (G) from under the rear bumper. Remove the four clips (H) from the lower rear edge of the bumper.

4. With the help of an assistant, pull both side wheel arch portions of the bumper outward to detach them from the side clips (I), and pull them forward to detach the clips (J). Then remove the rear bumper from the hooks (K) by pulling the bumper rearward.

5. If necessary, detach the rear bumper step (L), and remove the absorber (M).

6. Install the rear bumper in the reverse order of removal, and note these items:

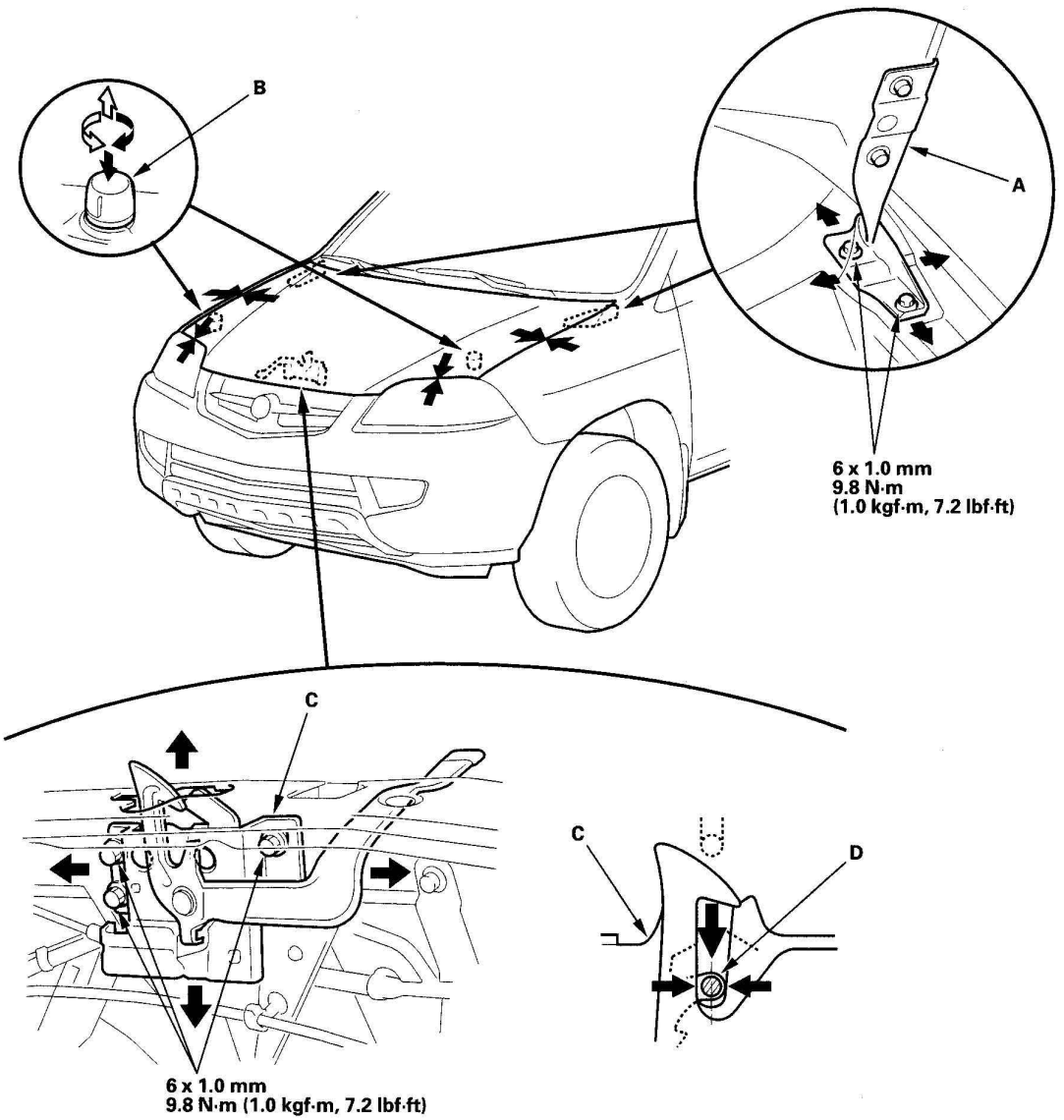
   - Make sure the rear bumper engages the side clips and the hooks (under the taillight) on each side securely.
   - Replace any damaged clips.

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Hood

Adjustment

1. Remove the support strut from each side of the hood (see page 20-109).
2. Slightly loosen each hood hinge bolt.
3. Adjust the hood alignment in this sequence.
   - Adjust the hood right and left, as well as forward and rearward, by using the elongated holes on the hood hinge (A).
   - Turn the hood edge cushions (B), as necessary, to make the hood fit flush with the body at front and side edges.
   - Adjust the hood latch (C) to obtain the proper height at the forward edge, and move the hood latch right or left until the striker (D) is centered in the hood latch.

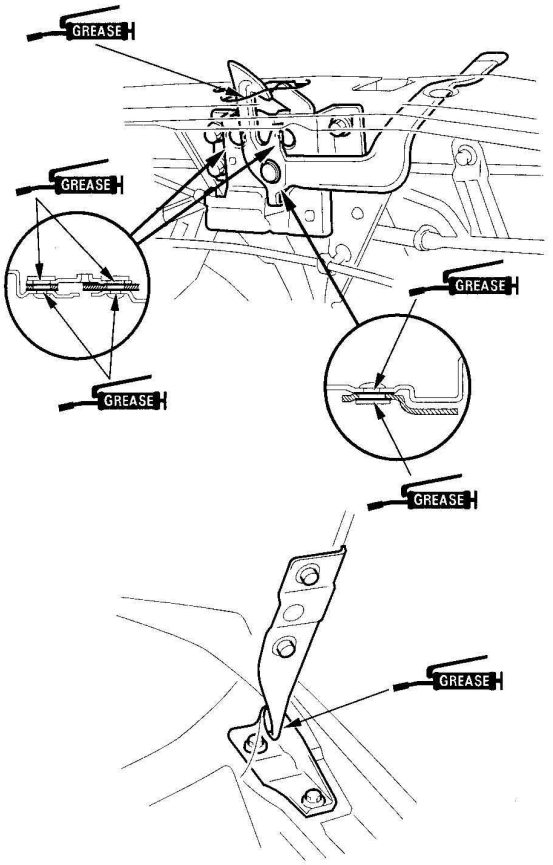


4. Tighten the bolts securely.

BACK

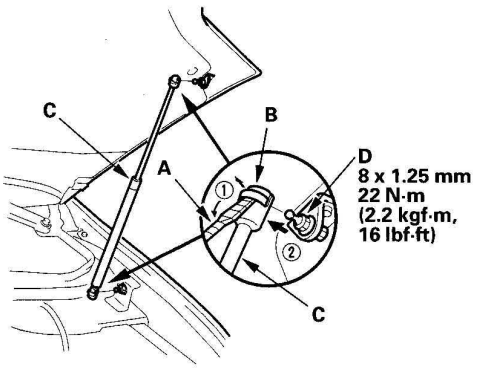
Protected by AR

5. Install the support strut on each side of the hood.
6. Check that the hood opens properly and locks securely.
7. Apply touch-up paint to the hinge mounting bolts and around the hinges.
8. Grease the locations of the hood latch and hood hinge indicated by the arrows.



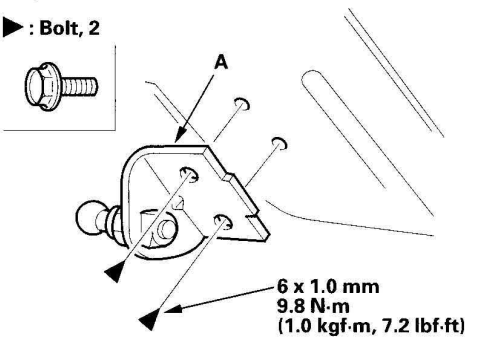
Hood Support Strut Replacement

1. With the help of an assistant, use a flat-tip screwdriver (A) to pry the support strut clips (B) of the support strut (C) on the hood and body, then release the support strut from the pivot bolts (D). Do not remove the clips from the support strut.

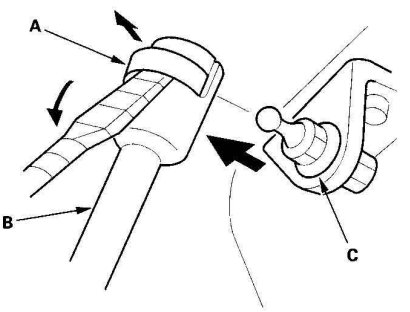


2. Remove the bolts, then remove the pivot bracket (B).

Fastener Locations



3. Reinstall the pivot brackets.
4. Set the clips (A) to the original position, then reattach the support strut (B) on the pivot bolts (C) by pushing on the support strut.



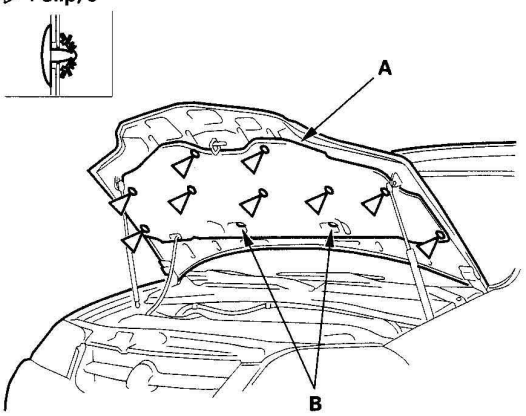
Protected by AR

Hood Insulator Replacement

1. Using a clip remover, detach the clips, then release the hood insulator (A) from the hooks (B). Take care not to bend the insulator and not to scratch the hood.

Fastener Locations

▷: Clip, 9



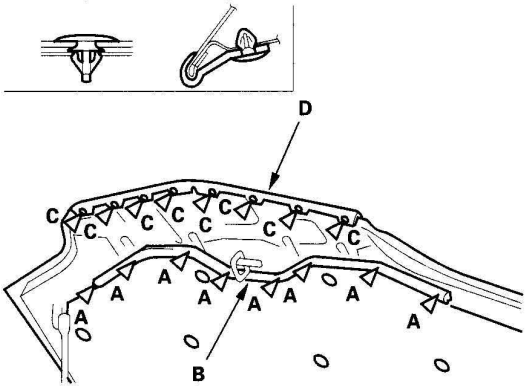
2. Install the hood insulator in the reverse order of removal, and replace any damaged clips.

Hood Seal Rubber and Hood Molding Replacement

1. Using a clip remover, detach the clips (A), then remove the hood seal (B). On Canadian models, detach the clips (C), then remove the hood molding (D). Take care not to scratch the hood.

Fastener Locations

A▷: Clip, 8 C▷: Clip, 8



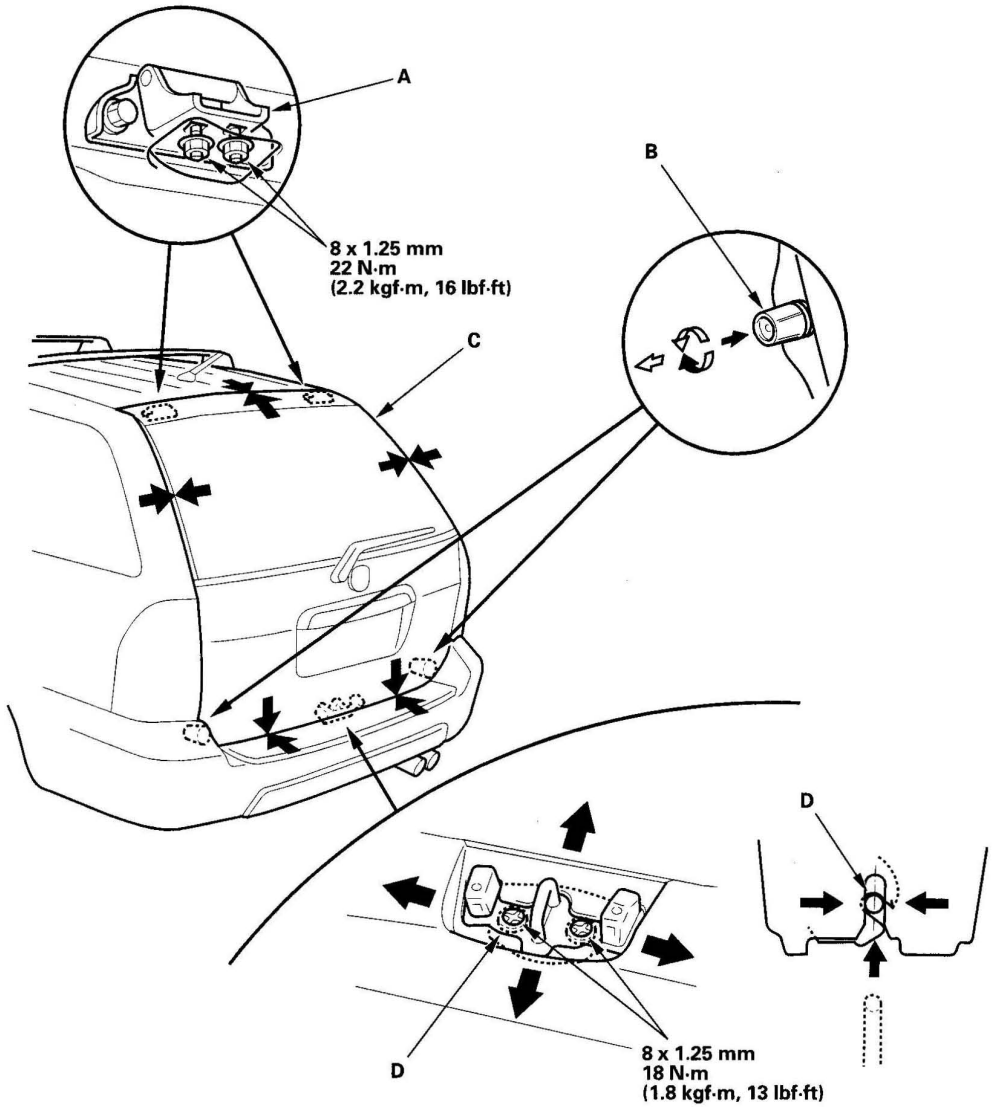
2. Install the hood seal and molding in the reverse order of removal, and replace any damaged clips.

BACK

Protected by AR

Tailgate Adjustment

1. Remove the support strut from each side (see page 20-112).
2. Slightly loosen each bolt and nut.
3. Adjust the tailgate alignment in the following sequence.
   - Pull down the rear portion of the headliner (see page 20-59). Take care not to bend the headliner excessively. Adjust the tailgate hinges (A) right and left, as well as forward and rearward, using the elongated holes.
   - Turn the tailgate edge cushions (B), in or out as necessary, to make the tailgate (C) fit flush with the body at the side edges.
   - Adjust the fit between the tailgate and tailgate opening by moving the striker (D).

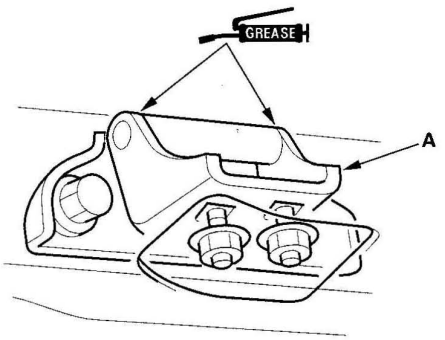


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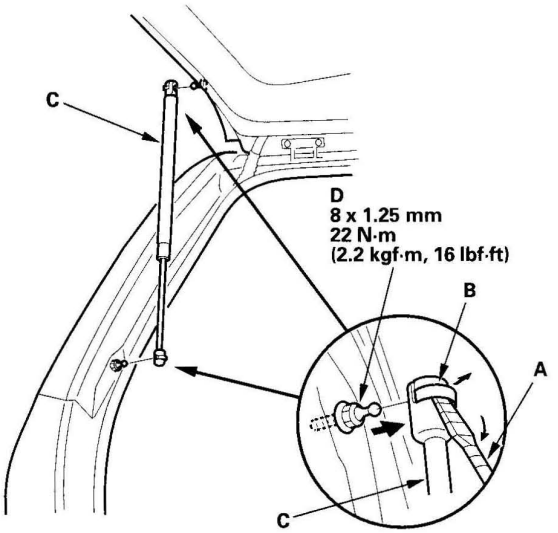
Tailgate Adjustment (cont'd)

4. Tighten each bolt and nut securely.
5. Check that the tailgate opens properly and locks securely.
6. Reinstall the support struts securely.
7. Apply touch-up paint to the hinge mounting nuts and around the hinges.
8. Grease the pivot portion of the tailgate hinges (A) as indicated by the arrows.

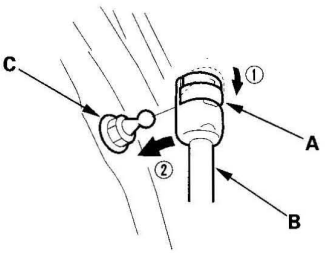


Tailgate Support Strut Replacement

1. With the help of an assistant, use a flat-tip screwdriver (A) to pry the support strut clips (B) from each end of the support strut (C) at the tailgate and body, then release the support strut from the pivot bolts (D). Do not remove the clips from the support strut.



2. Set the clips (A) to the original position, then reattach the support strut (B) on the pivot bolts (C) by pushing on the support strut.

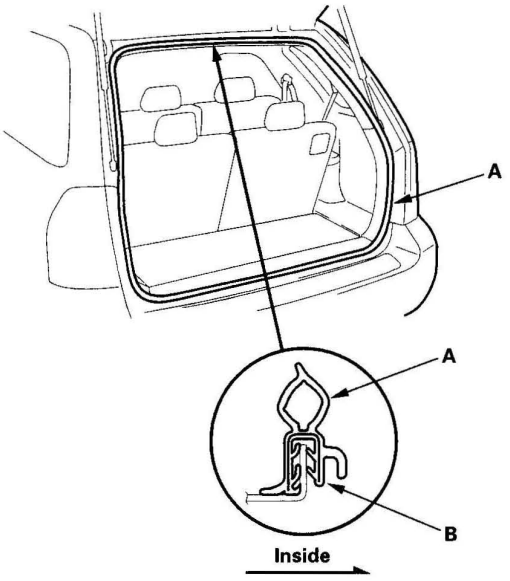


BACK

Protected by AR

Tailgate Weatherstrip Replacement

1. Remove the tailgate weatherstrip (A) by pulling out on it.



2. Locate the painted alignment mark (B) on the tailgate weatherstrip. Align the painted mark with the alignment tab in the the center of the tailgate opening, and install the tailgate weatherstrip all the way around in the direction shown. Make sure there are no wrinkles in the weatherstrip.

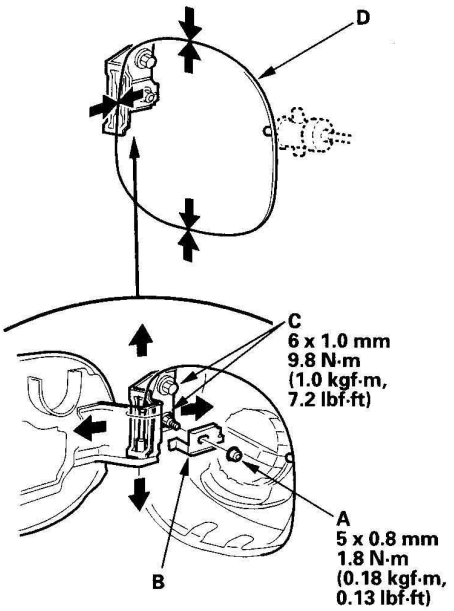
3. Check for water leaks.

Protected by AR

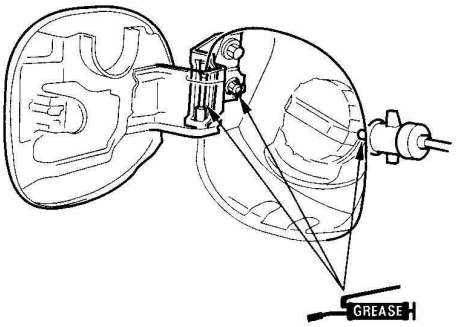
Fuel Fill Door

Adjustment

1. Remove the nut (A), and remove the fuel fill door open spring (B).



2. Slightly loosen the hinge mounting bolts (C).
3. Adjust the fuel fill door (D) in or out until it's flush with the body, and up or down as necessary to equalize the gaps.
4. Tighten the hinge mounting bolts.
5. Install the fuel fill door open spring.
6. Check that the fuel fill door opens properly and locks securely.
7. Grease each location indicated by the arrows.



8. Apply touch-up paint to the hinge mounting bolts and around the hinges.

BACK

Protected by AR

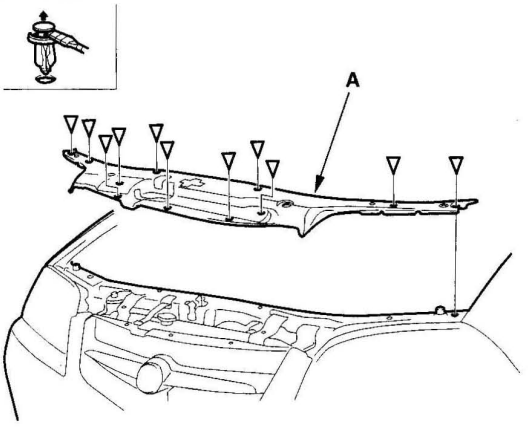
Front Bulkhead Cover Replacement

NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to scratch the front bulkhead and body.

1. Detach the clips, then remove the front bulkhead cover (A).

Fastener Locations

▷: Clip, 11



2. Install the front bulkhead cover in the reverse order of removal, and replace any damaged clips.

Cowl Cover Replacement

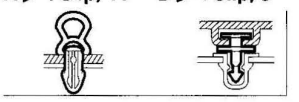
NOTE:
- Take care not to scratch the cowl cover and body.
- Use a clip remover to remove the hood rear seal clips.

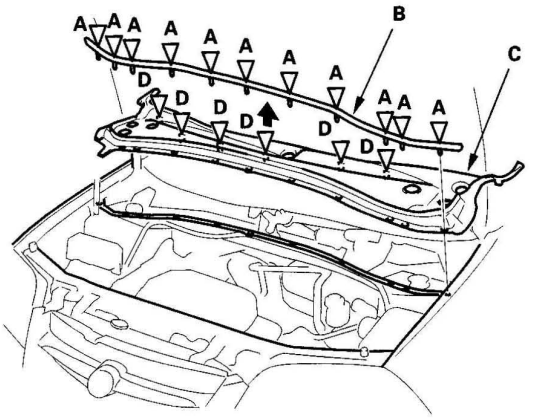
1. Remove the windshield wiper arms (see page 22-192).

2. Detach the clips (A), then remove the hood rear seal (B).

Fastener Locations

A▷: Clip, 11 D▷: Clip, 6





3. Pull the cowl cover (C) upward to detach the clips (D), then remove the cover.

4. Install the cowl cover in the reverse order of removal, and replace any damaged clips.

Protected by AR

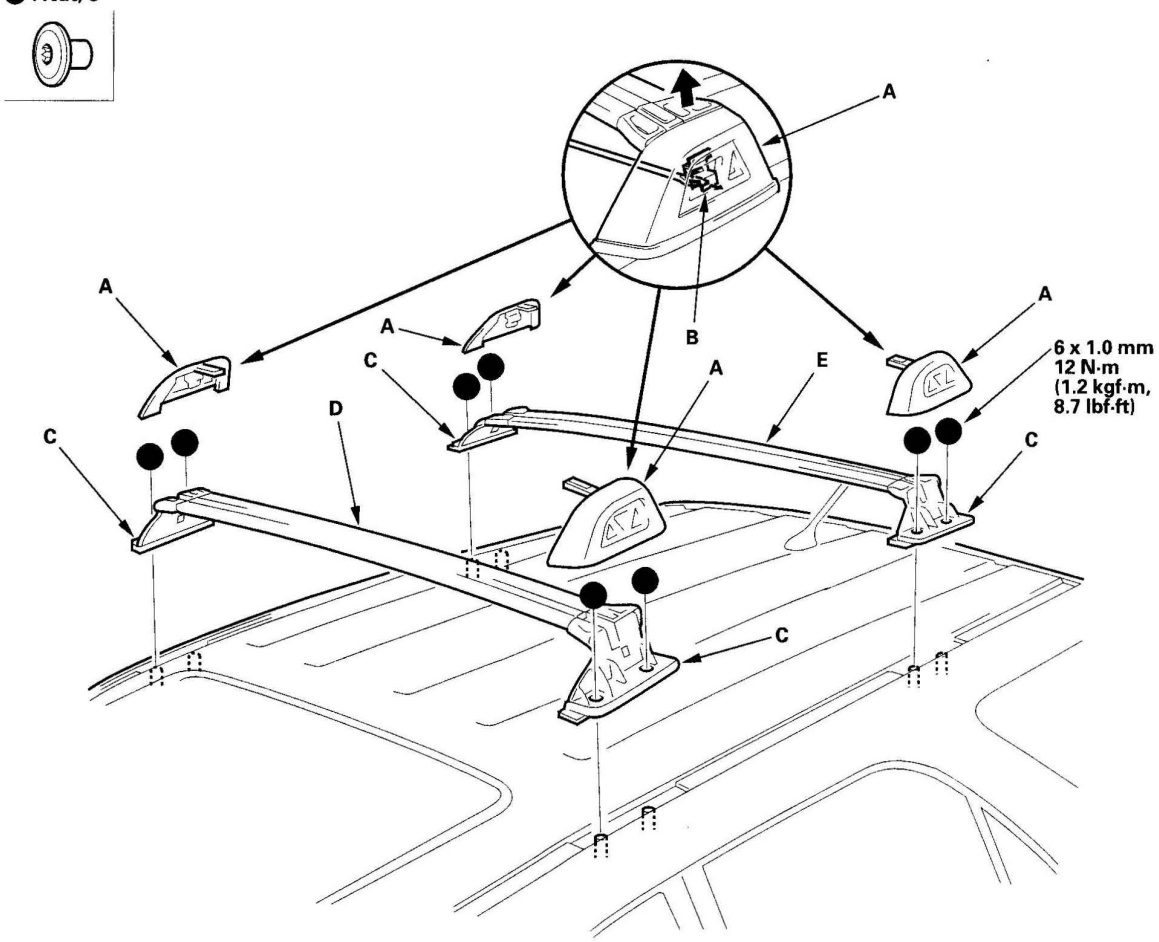
Roof Rack Replacement

NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to scratch each cover, roof rack and body.
- The front roof rack is wider than the rear roof rack. The rear cross rail has a caution label.

1. Remove the bracket covers (A) by sliding them in the direction shown while pushing the spring plate (B) through the hole on each bracket with a flat-tip screwdriver. With a Torx T30 bit, remove the nuts from each bracket (C).

Fastener Locations

● : Nut, 8



2. Remove the front roof rack (D) and rear roof rack (E). Do not remove the rubber pads from the brackets.

3. Install the front and rear roof racks in the reverse order of removal. Make sure the bracket covers are tightly snapped into place.

BACK

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Roof Molding Replacement

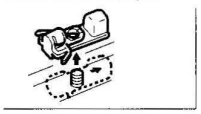
NOTE:
- Take care not to scratch the body.
- The steel core in the roof molding cannot be restored to its original shape once it is bent. Replace the roof molding when the steel core is bent.

1. If equipped, remove the front and rear roof racks (see page 20-116).

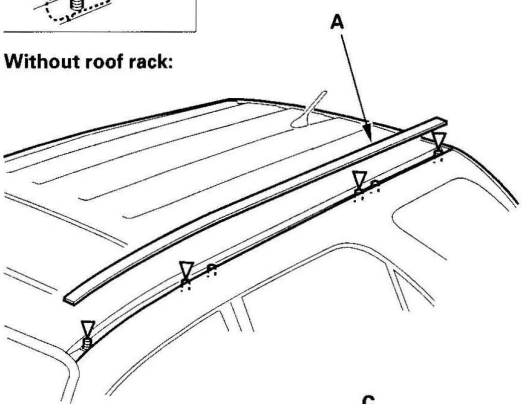
2. Using a flat-tip screwdriver wrapped with protective tape and a shop towel on the body, detach the clips by prying up the roof molding (A), or front roof molding (B) and rear roof molding (C), and middle molding (D) on vehicles without a roof rack.

Fastener Locations

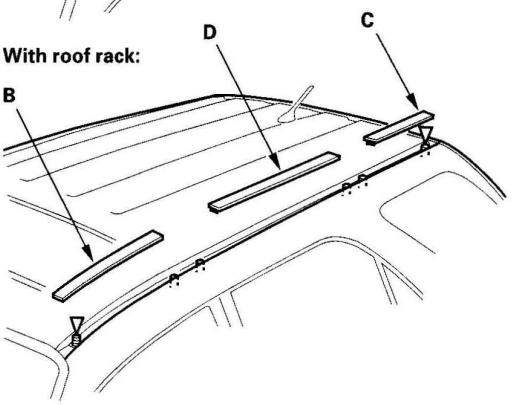
▷: Clip
Without roof rack, 4
With roof rack, 2



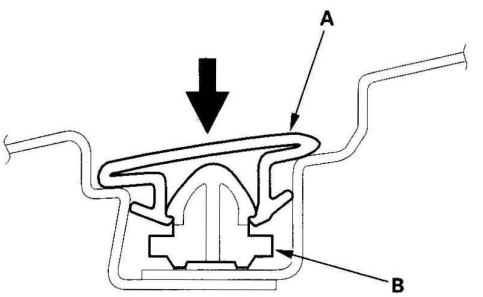
Without roof rack:



With roof rack:



3. Install the roof molding(s) in the reverse order of removal, and note these items:
   - Replace any damaged clips. The front end clip should be installed on the body with its hook toward the front, and the rear end clip should be installed with its hook toward the rear.
   - Make sure the roof moldings (A) are installed on the clips (B) securely.



Protected by AR

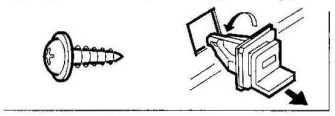
Side Sill Panel Replacement

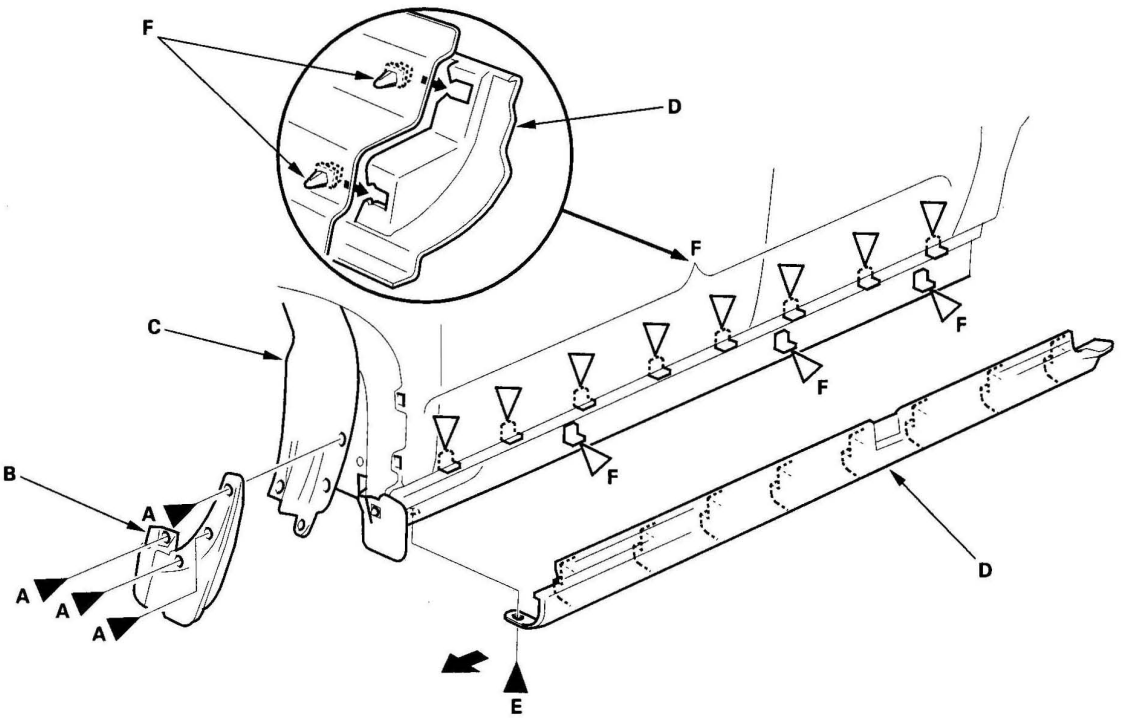
1. Remove the side sill panel.

   – 1 Remove the screws (A), then remove the front splash guard (B).
   – 2 Pull the inner fender (C) back as necessary.
   – 3 From under the side sill panel (D), remove the screw (E). Then slide the side sill panel forward and remove it. Side clips (F) will stay in the body.
   – 4 Remove the side clips from the body.

Fastener Locations

A, E ▶ : Screw, 5 F ▷ : Clip, 11





2. Replace any damaged clips.

3. Install the side clips on the side sill panel.

4. Hold the panel up, and fit all the side clips into the holes in the body, then push on the panel until the clips snap into place.

5. Reinstall the inner fender and front splash guard.

BACK

Protected by AR

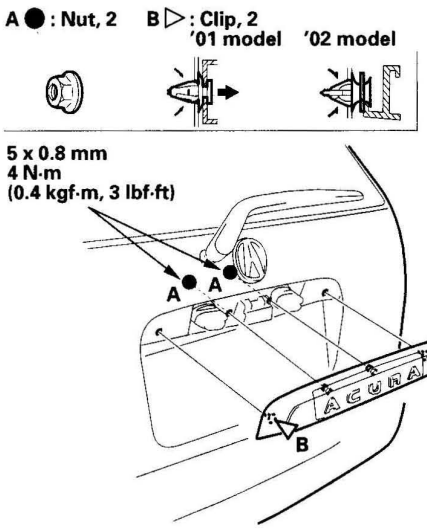
Rear License Trim Replacement

NOTE: Take care not to scratch the rear license trim and tailgate.

1. Remove the tailgate trim panel (see page 20-58).
2. Remove the nuts (A), and push out the clips (B) from inside, then remove the rear license trim (C).

Fastener Locations

A ● : Nut, 2 B ▷ : Clip, 2



3. Install the rear license trim in the reverse order of removal, and replace any damaged clips.

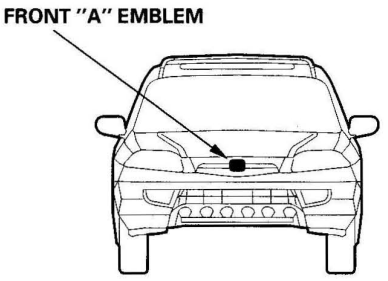
Protected by AR

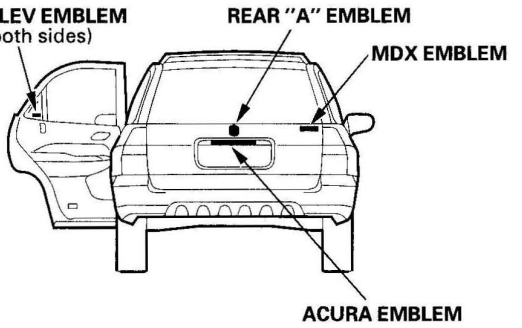
Emblem Replacement

NOTE: When removing the emblems, take care not to scratch the trunk lid.

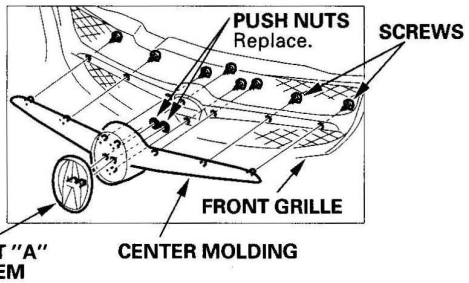
Apply the emblems where shown, and note these items:

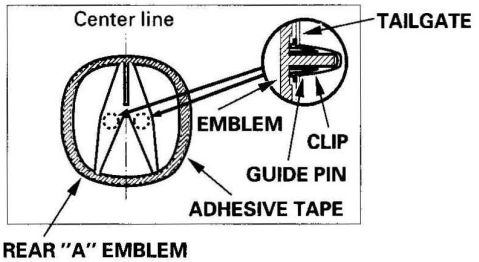
- Clean the body and rear license trim surface, and the rear door quarter glass inside surface with a sponge dampened in isopropyl alcohol.
- After cleaning, keep oil, grease, and water from getting on the surface.
- Apply the ULEV emblem on the inside surface of the rear door quarter glass, parallel with the glass mark as shown.

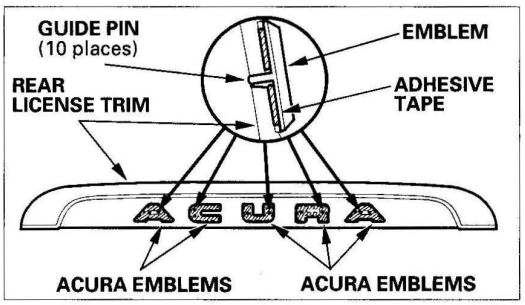


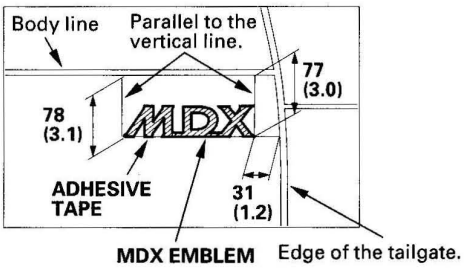


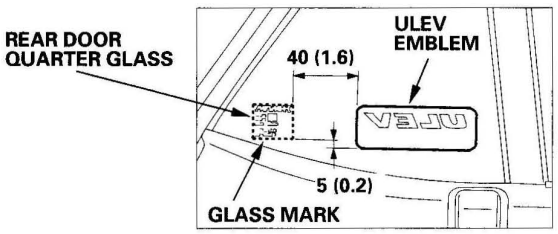
Unit: mm (in.)
Adhesive tape: 3M 4213, or equivalent











BACK

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Front Inner Fender Replacement

NOTE: Take care not to scratch the body.

1. Remove the front inner fender (A).

   –1 Remove the screws (B), then remove the front splash guard (C).
   –2 Remove the bolts (D) securing the front bumper (E) and front inner fender.
   –3 Remove the clips (F, G) securing the front inner fender (and splash shield (H)) on the body.
   –4 Remove the front inner fender.

Fastener Locations

B ▶ : Screw, 4 D ▶ : Bolt, 2 F ▷ : Clip, 1 G ▷ : Clip, 13



2. Install the inner fender in the reverse order of removal, and replace any damaged clips.

Protected by AR

Fenderwell

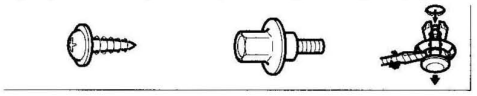
Rear Fender Cover Replacement

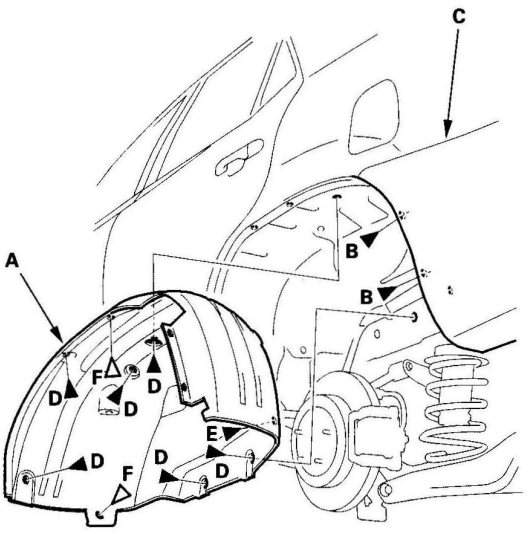
NOTE: Take care not to scratch the rear fender cover and body.

1. Remove the rear wheel (see step 1 on page 18-22).
2. Remove the rear fender cover (A).
   - –1 Remove the screws (B) securing the rear bumper (C) and rear fender cover.
   - –2 Remove the bolts (D), screw (E), and clips (F), then remove the rear fender cover.

Fastener Locations

B, E ▶: Screw, 3 D ▶: Bolt, 6 F ▷: Clip, 2



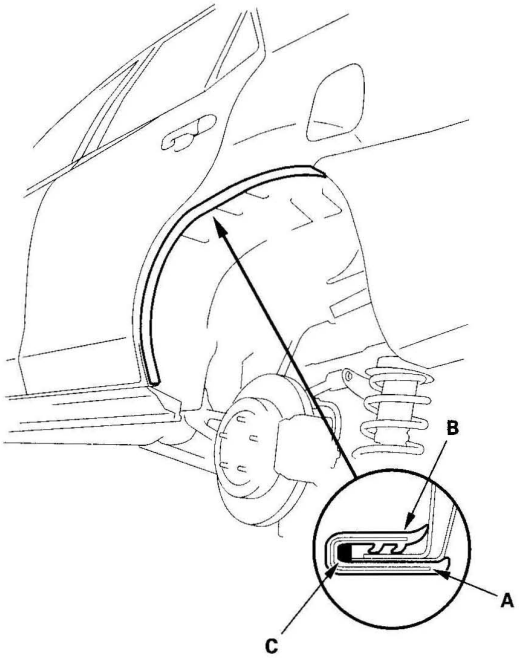


3. Install the rear fender cover in the reverse order of removal, and replace any damaged clips.

Fenderwell Trim Replacement

1. Remove the fenderwell trim (B) by pulling it out.

   NOTE: The steel core (A) in the fenderwell trim cannot be restored to its original shape once it is bent. Replace the fenderwell trim when the steel core is bent.



2. Clean the body bonding surface with a sponge dampened in alcohol. After cleaning, keep oil, grease and water from getting on the clean surface.
3. Apply clear sealant (C) into the channel of the fenderwell trim from end to end.

   Sealant: Cemedines P/N 08712-0004, or equivalent

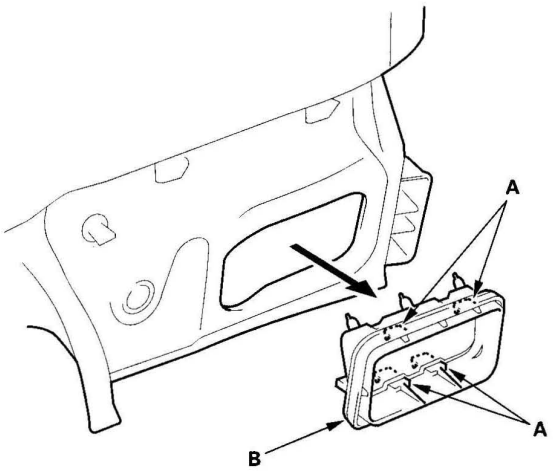
4. Install the fenderwell trim.
5. Scrape or wipe the excess sealant off with a towel. To remove sealant from a painted surface, wipe with a soft shop towel dampened in alcohol.

BACK

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Rear Air Outlet Replacement

1. Remove the rear bumper (see page 20-107).
2. Detach the hooks (A), then remove the rear air outlet (B). Take care not to scratch the body.

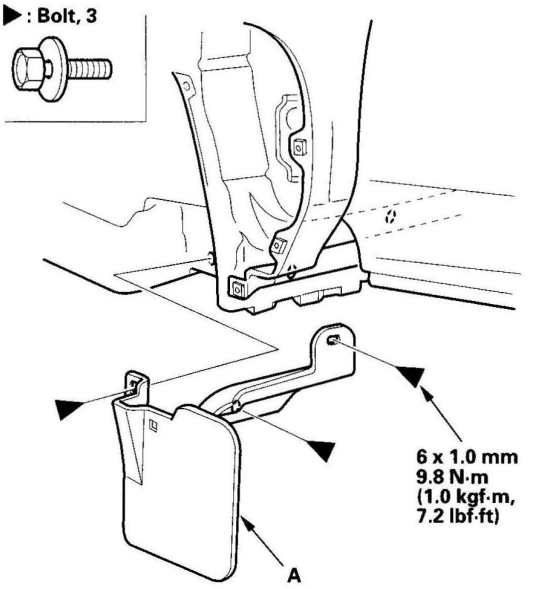


3. Install the rear air outlet in the reverse order of removal.

Left Front Splash Guard Reinforcement Replacement

1. Remove these items (see page 20-118):
   - Left front splash guard
   - Left inner fender, as necessary
   - Left side sill panel
2. Remove the bolts, then remove the left front splash guard reinforcement (A). Take care not to scratch the body.

Fastener Locations

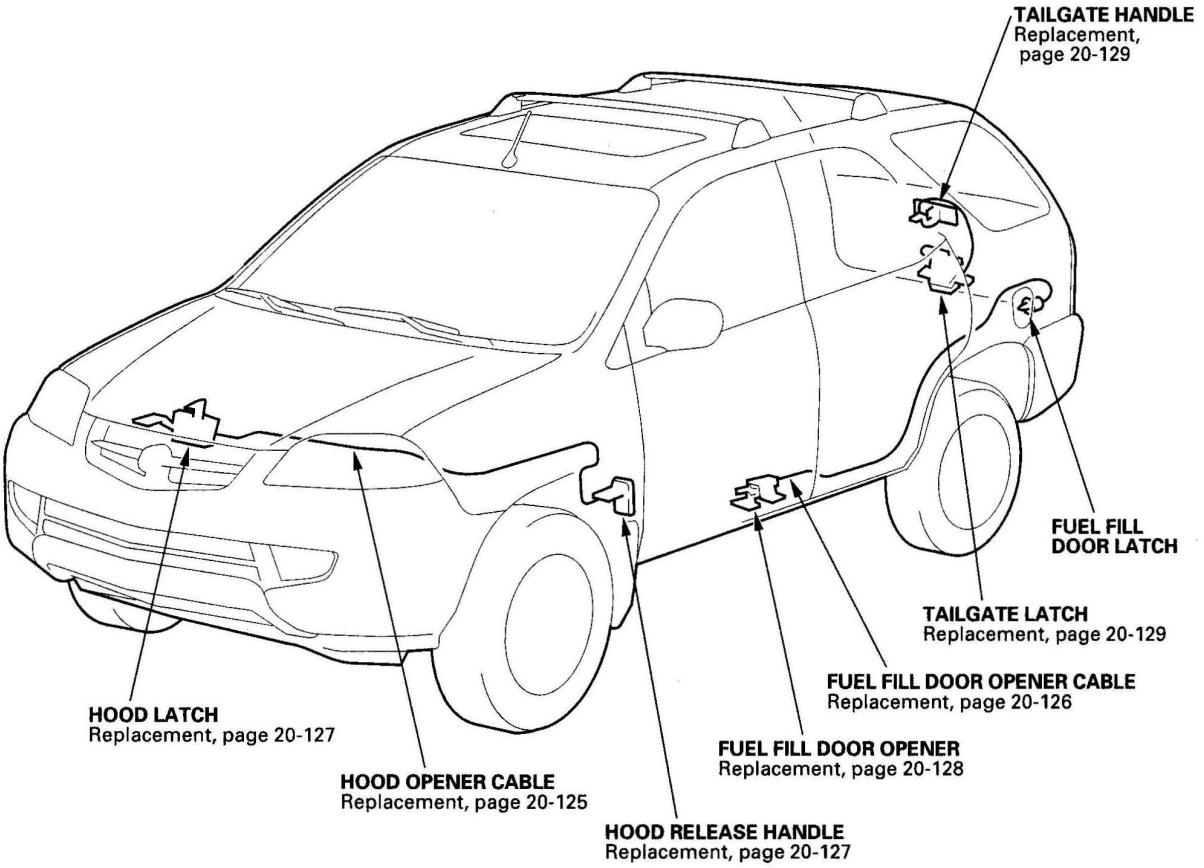


3. Install the reinforcement in the reverse order of removal.

Protected by AR

Openers

Component Location Index



BACK

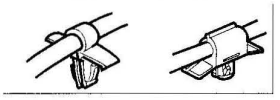
Protected by AR

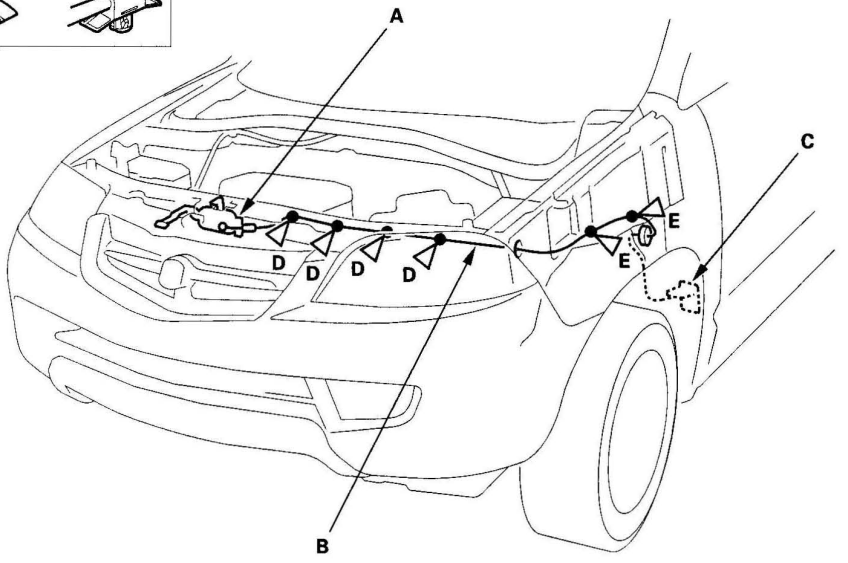
Hood Opener Cable Replacement

1. Remove the following parts from the left side of the vehicle:
   - Front inner fender (see page 20-121)
   - Kick panel (see page 20-55)
2. Remove the hood latch (A) (see page 20-127), and disconnect the hood opener cable (B).

Fastener Locations

D▷: Clip, 4 E▷: Clip, 2





3. Remove the hood release handle (C) (see page 20-127), and disconnect the hood opener cable.
4. Using a clip remover, detach the clips (D, E) from the body, then remove the hood opener cable from the vehicle. Take care not to bend the cable.
5. Install the cable in the reverse order of removal, and replace any damaged clips.

Protected by AR

Fuel Fill Door Opener Cable Replacement

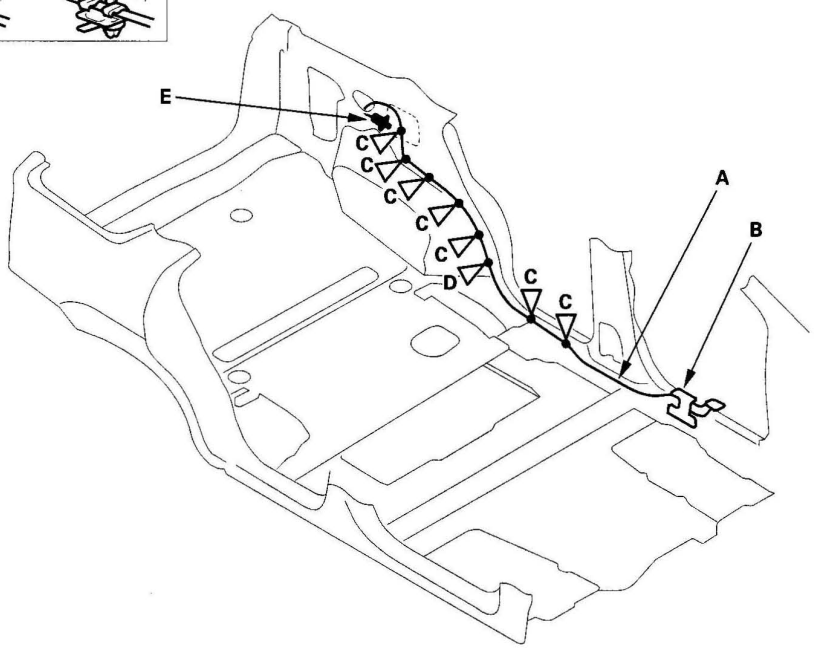
SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

1. Remove these items:
   - Front door sill trim, left side (see page 20-55)
   - Rear door sill trim, left side (see page 20-55)
   - Rear side trim panel (see page 20-57)
2. Pull the carpet back as necessary (see page 20-61).
3. Disconnect the fuel fill door opener cable (A) from the opener (B) (see step 3 on page 20-128).

Fastener Locations

C ▷ : Clip, 7 D ▷ : Clip, 1





4. Release the opener cable from the clips (C, D), then remove the fuel fill door latch (E) from the body by turning it 90°.
5. Remove the fuel fill door opener cable from the vehicle. Take care not to bend the cable.
6. Install the cable in the reverse order of removal.

BACK

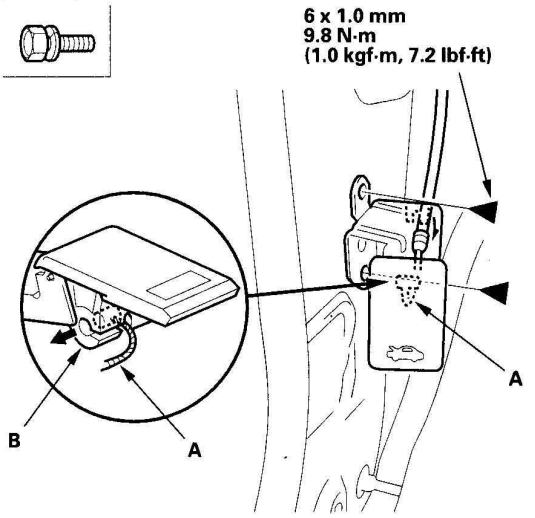
Protected by AR

Hood Release Handle Replacement

1. Remove the left kick panel (see page 20-55)
2. Remove the bolts, then remove the hood release handle.

Fastener Locations

▶ : Bolt, 2



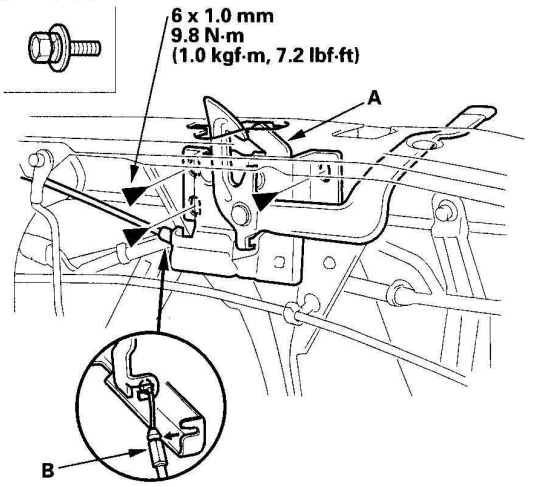
3. Disconnect the hood opener cable (A) from the hood release handle (B). Take care not to bend the cable.
4. Install the hood release handle in the reverse order of removal, and note these items:
   - Make sure the hood opener cable is connected properly.
   - Make sure the hood opens properly.

Hood Latch Replacement

1. Remove the bolts securing the hood latch (A) on the body.

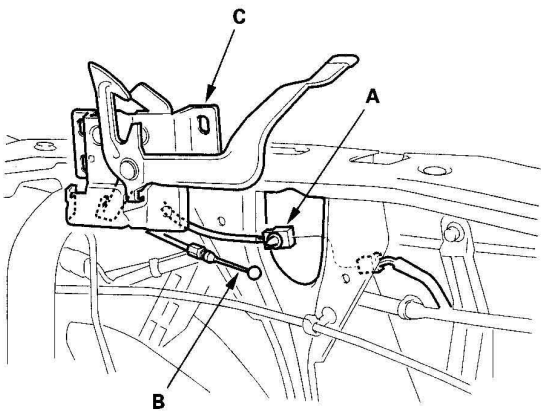
Fastener Locations

▶ : Bolt, 3



2. Detach the hood opener cable (B) from the latch, then remove the latch from the body.
3. On '01 model, detach the hood latch switch connector (A) from the body. Disconnect the hood opener cable (B) from the hood latch (C), and disconnect the hood latch switch connector and on '02 model, detach the harness clip (D). Take care not to bend the cable.

'01 model:

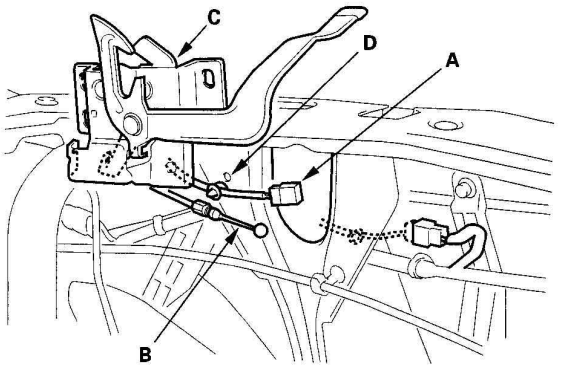


(cont'd)

Protected by AR

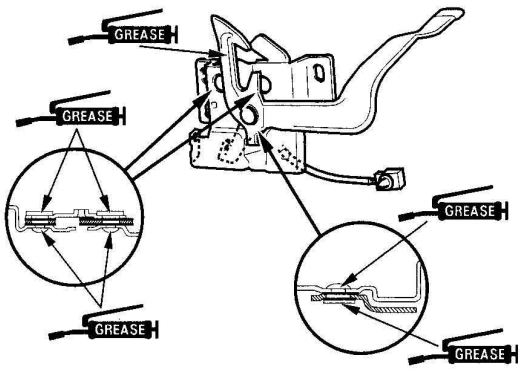
Hood Latch Replacement (cont'd)

'02 model:



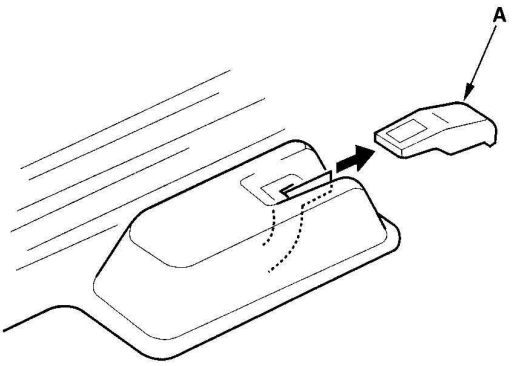
4. Install the hood latch in the reverse order of removal, and note these items:

   - Grease each location of the hood latch as indicated by the arrows.
   - Make sure the hood opener cable is connected properly and hood latch switch connector is plugged in properly.
   - Adjust the hood latch alignment (see page 20-108).
   - Make sure the hood locks securely.



Fuel Fill Door Opener Replacement

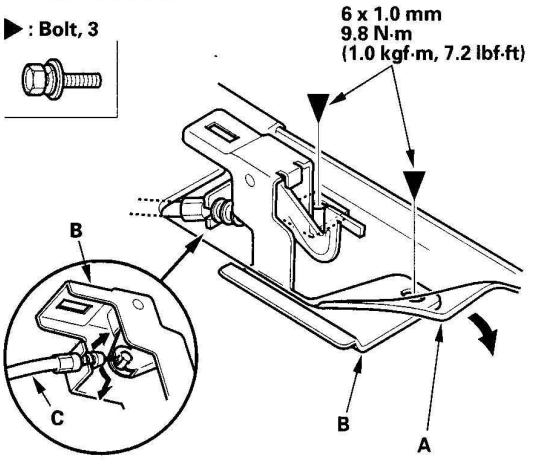
1. Remove the opener knob (A).



2. Remove the front door sill trim (see page 20-55).

3. Turn over the carpet (A) and remove the bolts, then remove the fuel fill door opener (B) from the floor.

Fastener Locations



4. Disconnect the fuel fill door opener cable (C), then remove the fuel fill door opener.

5. Install the fuel fill door opener in the reverse order of removal, and note these items:

   - Make sure the opener cable is connected properly.
   - Make sure the fuel fill door opens properly.

BACK

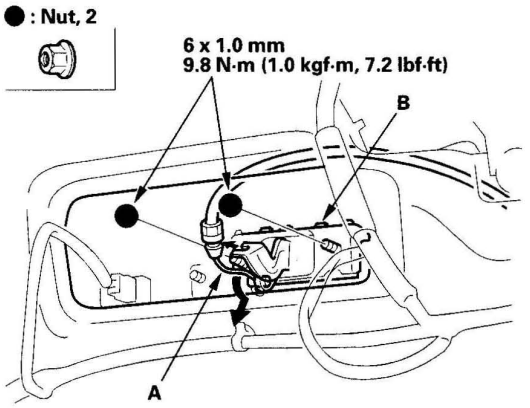
Protected by AR

Tailgate Handle Replacement

NOTE: Put on gloves to protect your hands.

1. Remove the tailgate trim panel (see page 20-58).
2. Disconnect the handle cable (A) from the tailgate handle (B).

Fastener Locations



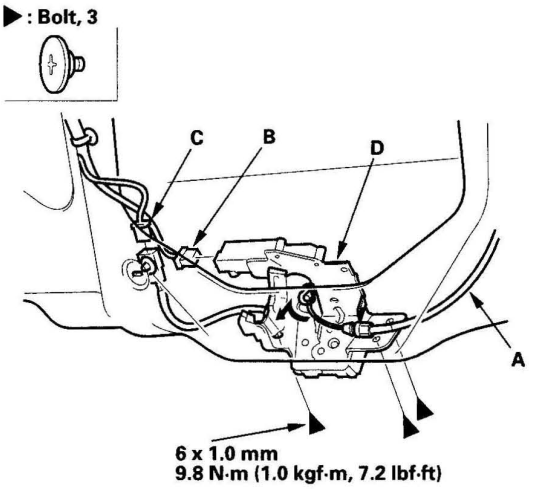
3. Remove the nuts, then remove the tailgate handle.
4. Install the tailgate handle in the reverse order of removal, and note these items:
   - Make sure the handle cable is connected securely.
   - Make sure the tailgate opens properly.

Tailgate Latch Replacement

NOTE: Put on gloves to protect your hands.

1. Remove the tailgate trim panel (see page 20-58).
2. Disconnect the handle cable (A), tailgate latch actuator connector (B), and tailgate latch switch connector (C), and detach the connector.

Fastener Locations



3. Remove the bolts, then remove the tailgate latch (D).
4. Install the tailgate latch in the reverse order of removal, and note these items:
   - Make sure the connectors are plugged in properly and the handle cable is connected properly.
   - Make sure the tailgate opens properly and locks securely.

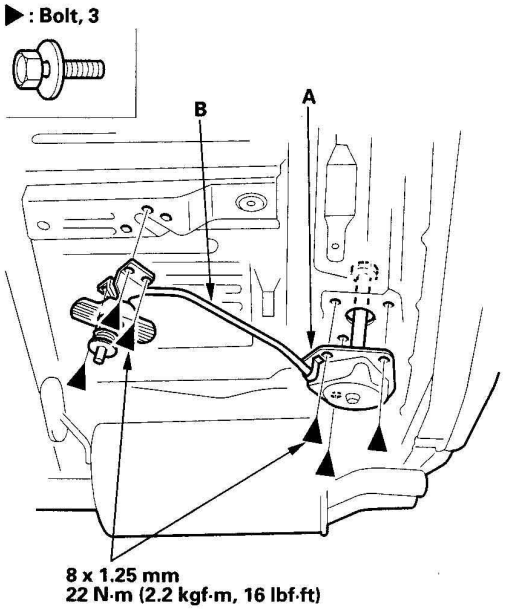
Protected by AR

Spare Tire Hoist Replacement

1. Remove the spare tire.
2. Remove the bolts, then remove the spare tire hoist (A). Take care not to bend the cable (B).

Fastener Locations

▶: Bolt, 3



3. Install the hoist in the reverse order of removal.

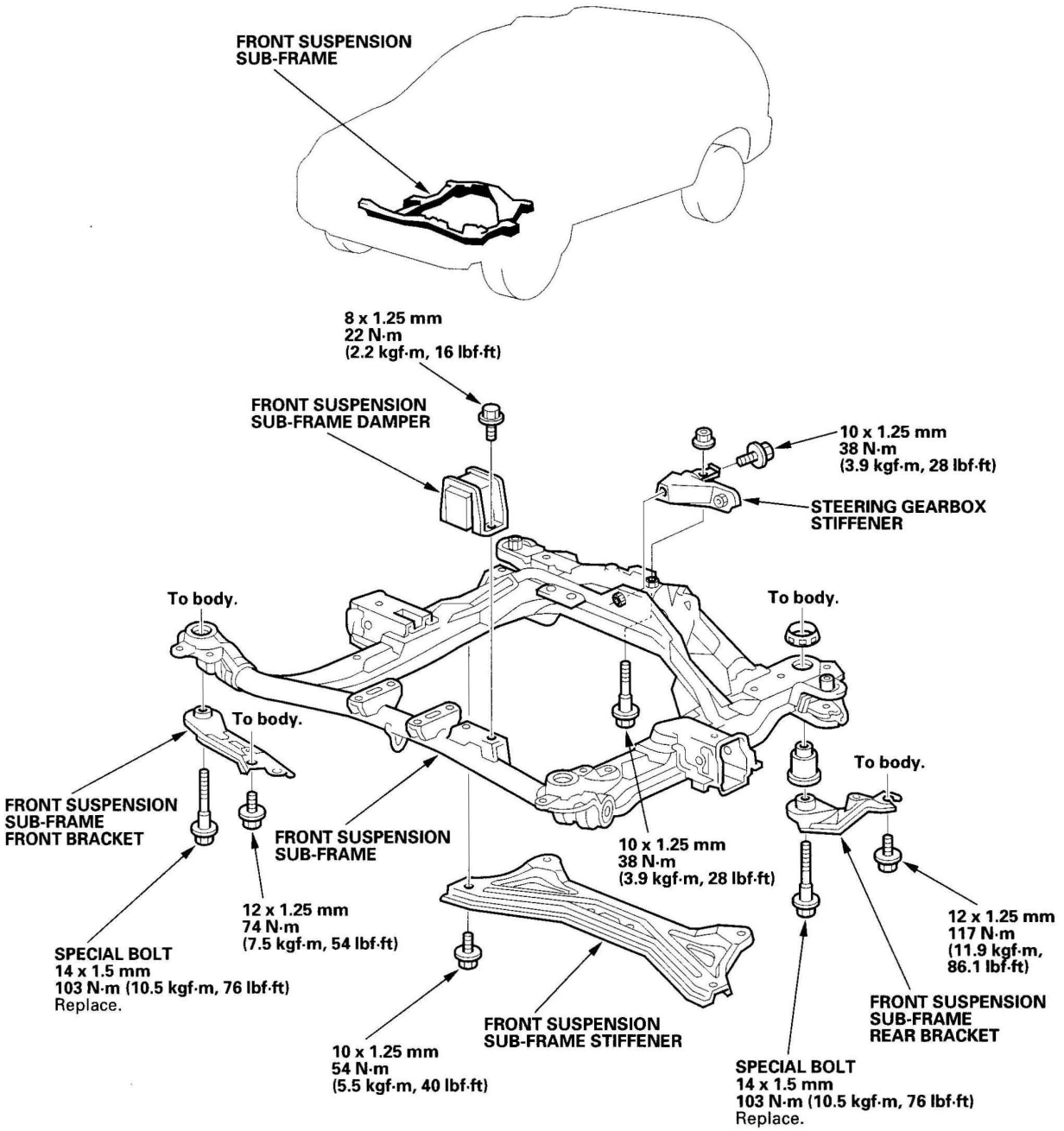
BACK

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Front Sub-frame Replacement

Sub-frame Torque:

After removing the sub-frame mounting bolts, be sure to replace them with new ones.

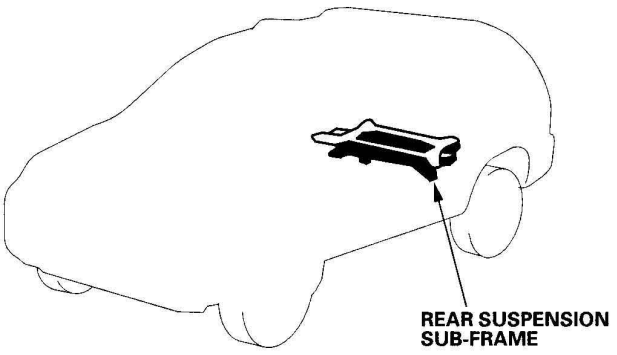


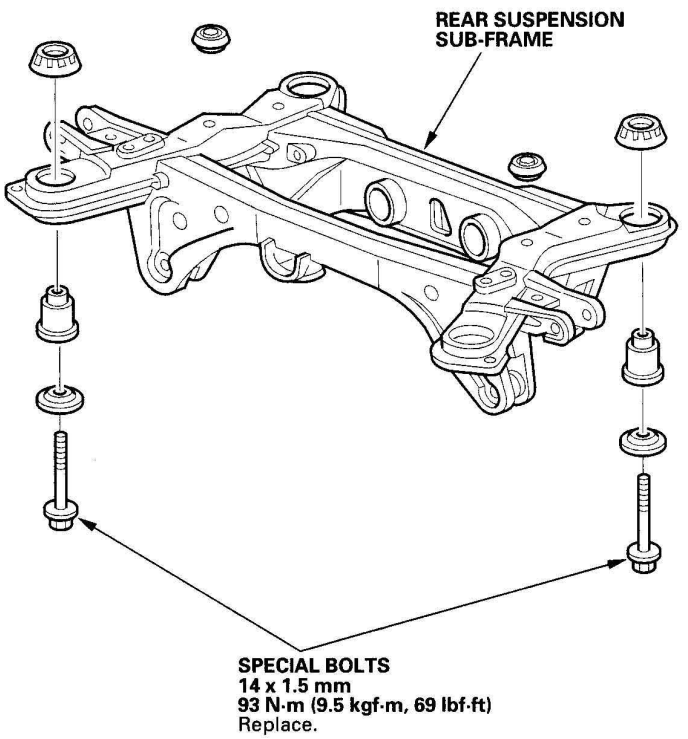
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Rear Sub-frame Replacement

Sub-frame Torque:

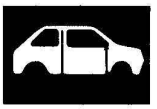
After removing the sub-frame mounting bolts, be sure to replace them with new ones.





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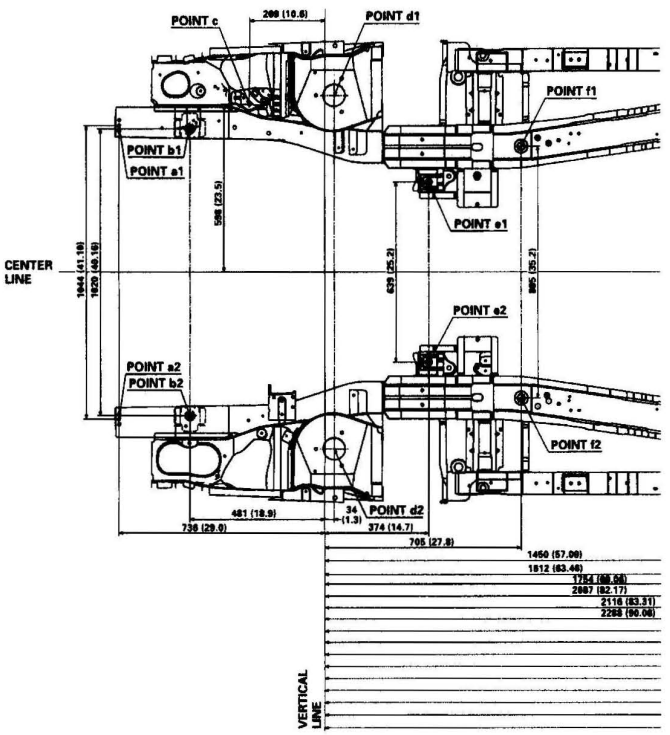
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Frame Repair Chart

Top view

Unit: mm (in.)
ø: Inner diameter

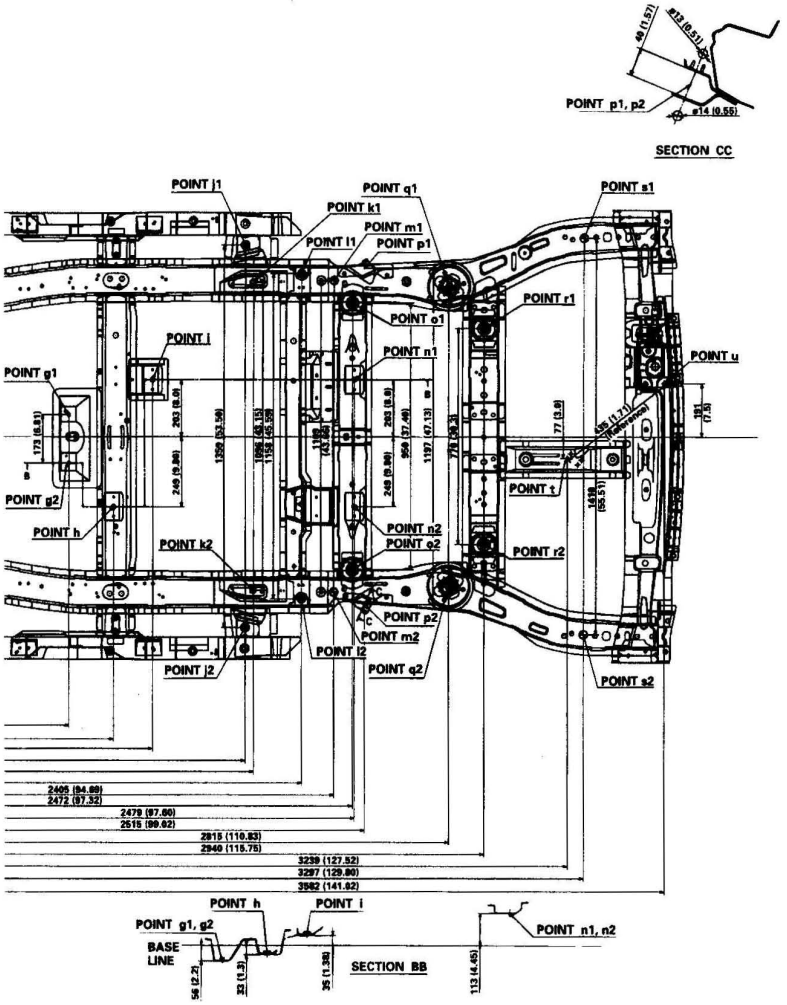
a1, a2	For bumper beam ø11 (0.43)		f1, f2	Locating hole ø28 (1.1)	
b1, b2	For sub-frame ø15 (0.59)		g1, g2	For propeller shaft ø11 (0.43)	
c	For engine mount ø11 (0.43)		h	For fuel tank ø15 (0.59)	
d1, d2	Damper center		i	For fuel tank ø15 (0.59)	
e1, e2	For sub-frame ø15 (0.59)		j1, j2	For suspension ø18 (0.71)	



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k1, k2	For suspension ø18 (0.71)	p1, p2	Damper center
l1, l2	Locating hole ø25 (0.98)	q1, q2	For suspension
m1, m2	Locating hole ø25 (0.98)	r1, r2	For rear sub-frame ø18 (0.71)
n1, n2	For fuel tank ø15 (0.59)	s1, s2	Locating hole ø25 (0.98)
o1, o2	For rear sub-frame ø16 (0.63)	t	For spare tire hoist
		u	For spare tire hoist



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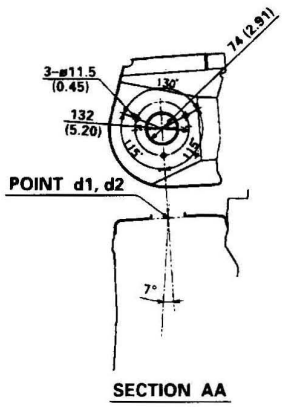
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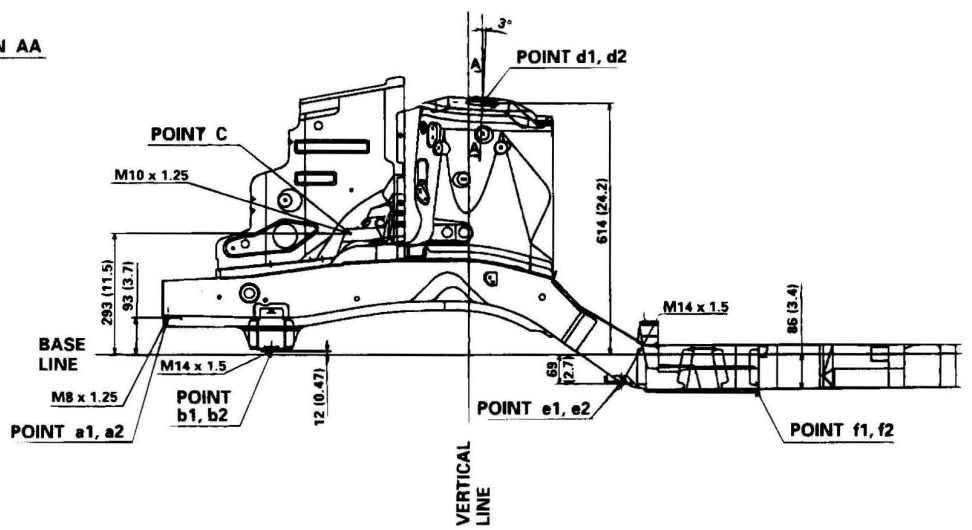
Frame Repair Chart (cont'd)

Side view

Unit: mm (in.)
ø: Inner diameter

a1, a2	For bumper beam ø11 (0.43)	f1, f2	Locating hole ø28 (1.1)
b1, b2	For sub-frame ø15 (0.59)	j1, j2	For suspension ø18 (0.71)
c	For engine mount ø11 (0.43)		
d1, d2	Damper center		
e1, e2	For sub-frame ø15 (0.59)		

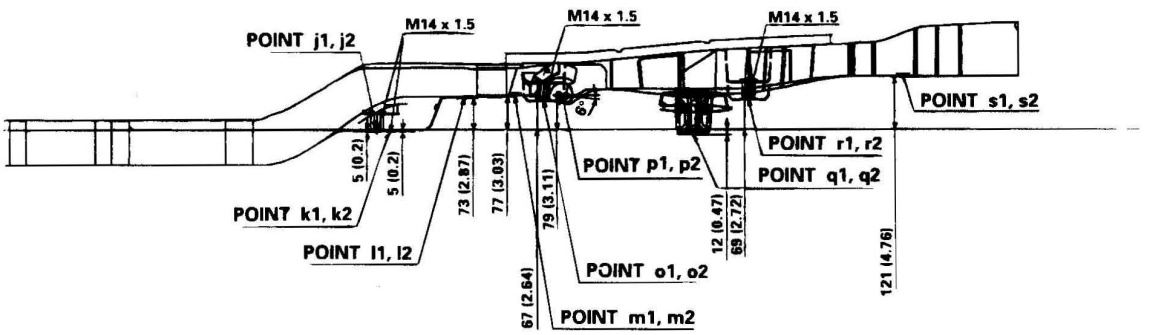




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k1, k2	For suspension ø18 (0.71)	p1, p2	Damper center
l1, l2	Locating hoist hole ø25 (0.98)	q1, q2	For suspension
m1, m2	Locating hole ø25 (0.98)	r1, r2	For rear sub-frame ø18 (0.71)
o1, o2	For rear sub-frame ø16 (0.63)	s1, s2	Locating hole ø25 (0.98)



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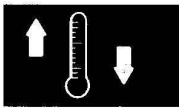
HVAC (Heating, Ventilation, and Air Conditioning)

Climate Control

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Rear Heater-A/C

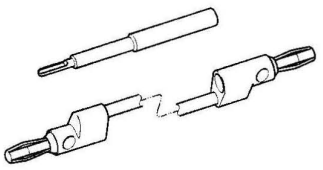
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Special Tools

Ref.No.	Tool Number	Description	Qty
①	07SAZ-001000A	Backprobe Set	2

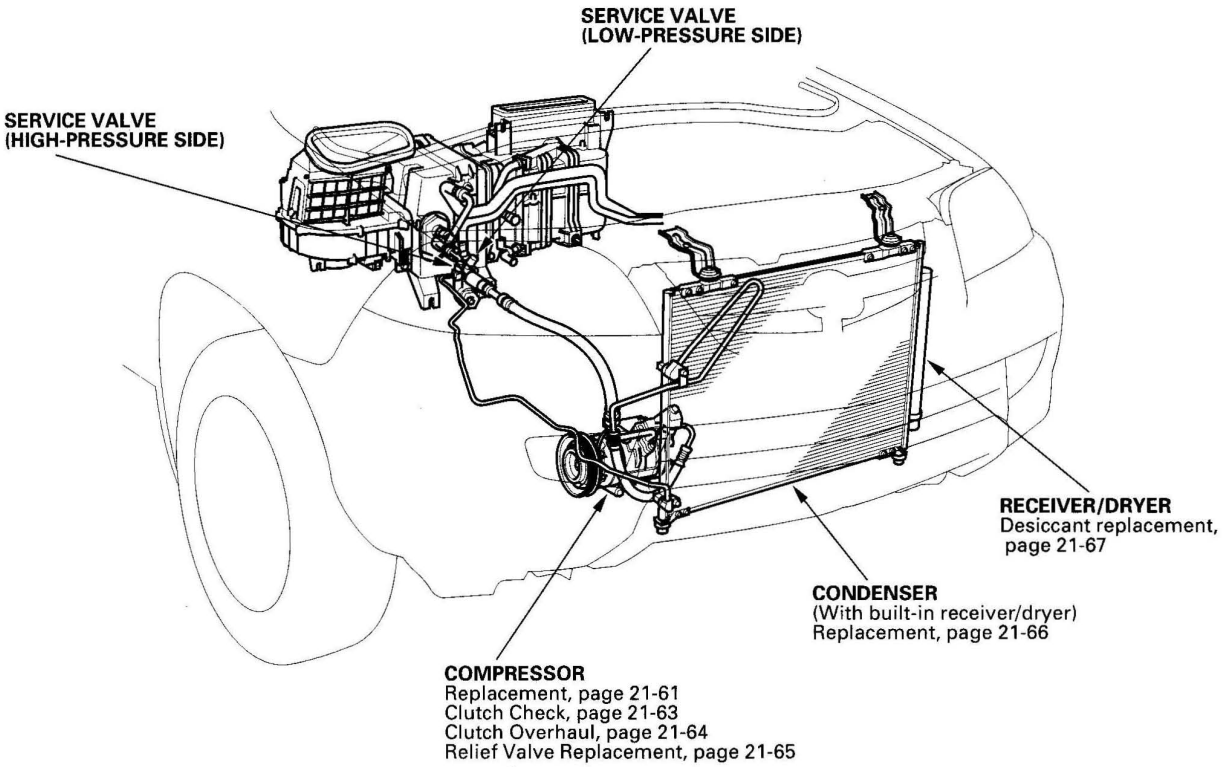


①

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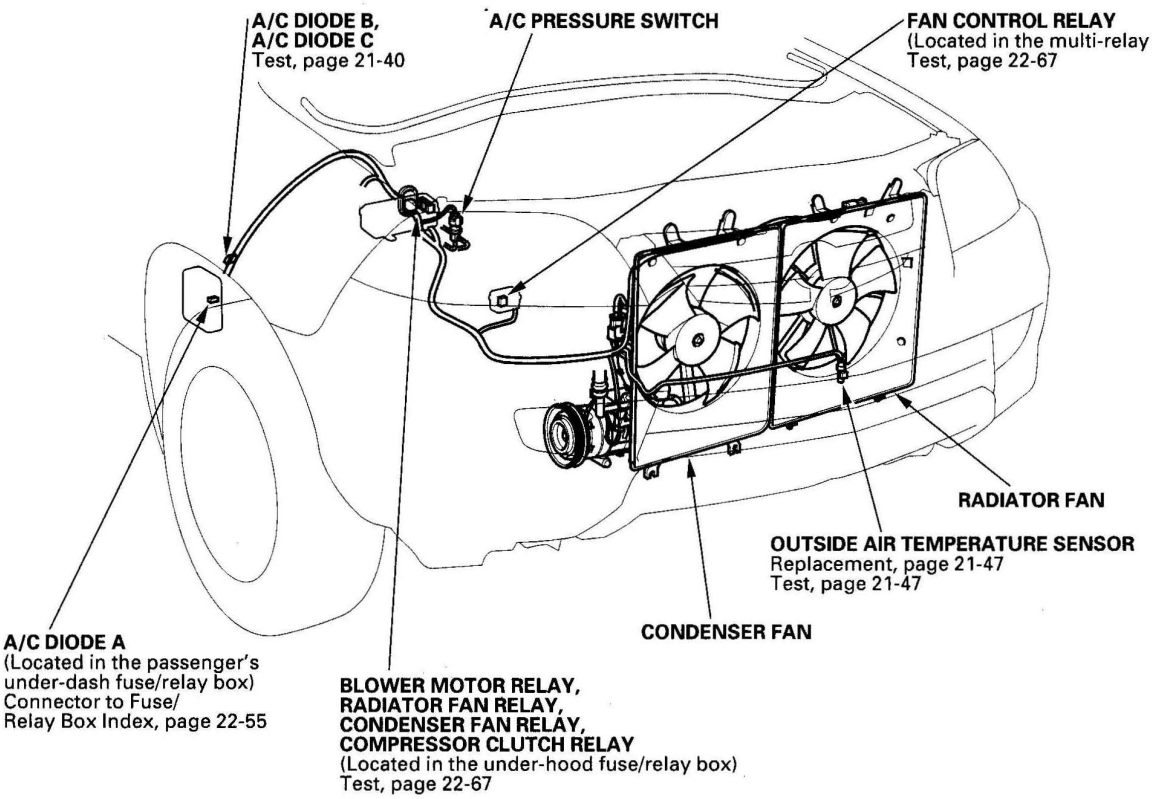
Component Location Index



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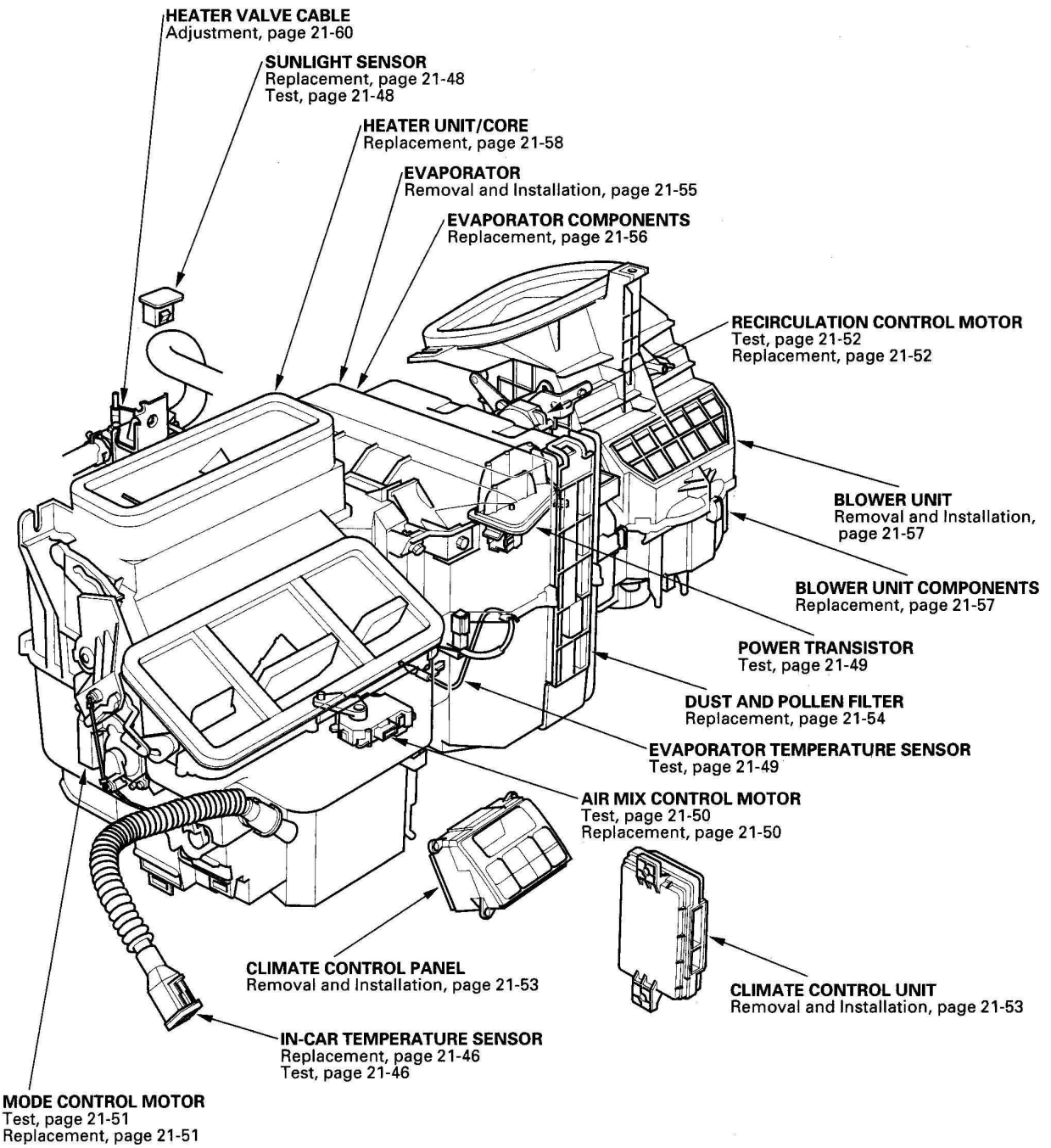
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Component Location Index (cont'd)



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A/C Service Tips and Precautions

⚠WARNING

- Compressed air mixed with R-134a forms a combustible vapor.
- The vapor can burn or explode causing serious injury.
- Never use compressed air to pressure test R-134 a service equipment or vehicle air conditioning systems.

⚠CAUTION

- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

The air conditioning system uses HFC-134a (R-134a) refrigerant and polyalkyleneglycol (PAG) refrigerant oil, which are not compatible with CFC-12 (R-12) refrigerant and mineral oil. Do not use R-12 refrigerant or mineral oil in this system, and do not attempt to use R-12 servicing equipment; damage to the air conditioning system or your servicing equipment will result.
Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove R-134a from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

- Always disconnect the negative cable from the battery whenever replacing air conditioning parts.
- Keep moisture and dirt out of the system. When disconnecting any lines, plug or cap the fittings immediately; don't remove the caps or plugs until just before you reconnect each line.
- Before connecting any hose or line, apply a few drops of refrigerant oil to the O-ring.
- When tightening or loosening a fitting, use a second wrench to support the matching fitting.
- When discharging the system, use a R-134a refrigerant recovery/recycling/charging station; don't release refrigerant into the atmosphere.

A/C Refrigerant Oil Replacement

Recommended PAG oil: DENSO ND-OIL 8

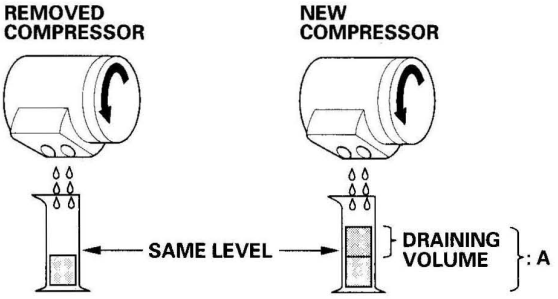
- P/N 38897-PR7-A01AH: 120 mℓ (4 fl·oz)
- P/N 38899-PR7-A01: 40 mℓ (1 1/3 fl·oz)

Add the recommended refrigerant oil in the amount listed if you replace any of the following parts.

- To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- Immediately after using the oil, reinstall the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if it gets on the paint, wash it off immediately.

Condenser .....35 mℓ (1 1/6 fl·oz, 1.2 Imp·oz)
Front evaporator .....40 mℓ (1 1/3 fl·oz, 1.4 Imp·oz)
Rear evaporator .....30 mℓ (1 fl·oz, 1.1 Imp·oz)
Line or hose .....10 mℓ (1/3 fl·oz, 0.4 Imp·oz)
Leakage repair .....25 mℓ (5/6 fl·oz, 0.9 Imp·oz)
Compressor .....For compressor replacement, subtract the volume of oil drained from the removed compressor from A, and drain the calculated volume of oil from the new compressor: A − Volume of removed compressor = Volume to drain from new compressor.

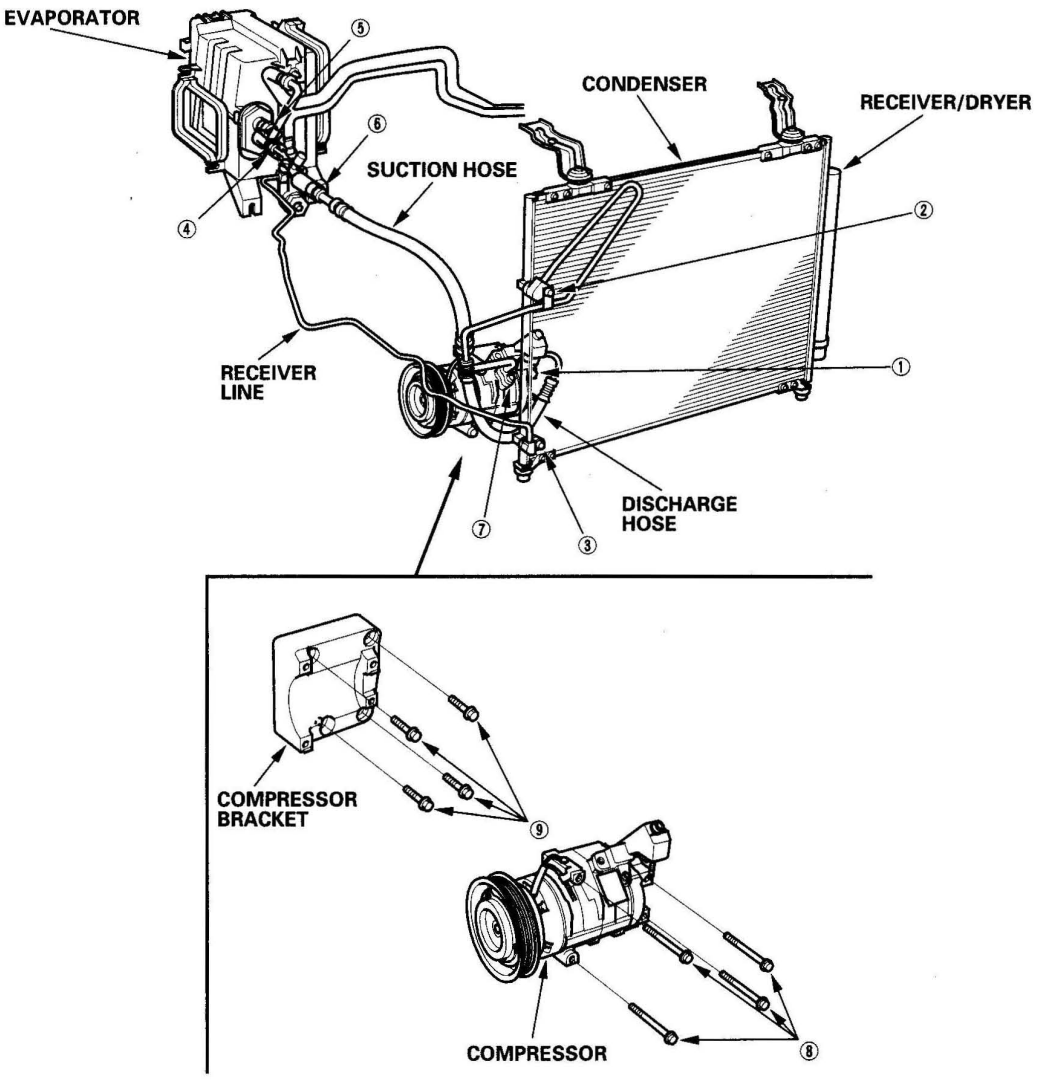
NOTE: Even if no oil is drained from the removed compressor, don't drain more than 50 mℓ (1 2/3 fl·oz, 1.8 Imp·oz) from the new compressor.



A: '01 Model 210 mℓ (7 fl·oz, 7.4 Imp·oz), '02 Model 180 mℓ (6 fl·oz, 6.3 Imp·oz),

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① Discharge hose to the compressor (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
② Discharge hose to the condenser (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
③ Receiver line to the condenser (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
④ Receiver line to the evaporator : 1.3 N·m (1.3 kgf·m, 9.4 lbf·ft)
⑤ Suction line to the evaporator : 31 N·m (3.2 kgf·m, 23 lbf·ft)
⑥ Suction hose to the suction line : 31 N·m (3.2 kgf·m, 23 lbf·ft)
⑦ Suction hose to the compressor (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑧ Compressor to the compressor bracket (8 x 1.25 mm) : 22 N·m (2.2 kgf·m, 16 lbf·ft)
⑨ Compressor bracket to the engine block (10 x 1.25 mm) : 44 N·m (4.5 kgf·m, 33 lbf·ft)

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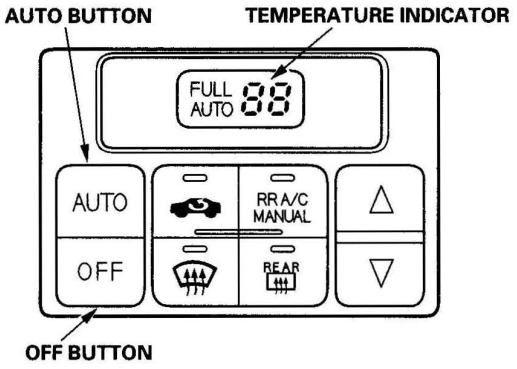
General Troubleshooting Information

How to Retrieve a DTC

The climate control unit has a self-diagnosis function.

Running the Self-diagnosis Function

1. Turn the ignition switch ON (II).
2. Press the AUTO button and then the OFF button. Continue to hold both buttons down for 1 minute.

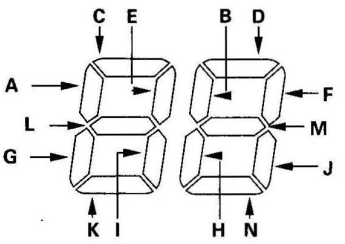


If there is any abnormality in the system, the temperature indicator will light up the segment (A through N) corresponding to the error. The temperature indicator will then alternate every second between displaying "88" (all segments lit) and the error code segment (A through N).

NOTE: The system will only display the DTC when the AUTO and OFF buttons are pressed. If you release the buttons, the display will go blank. To return the display, simply press the AUTO then the OFF buttons again.

To determine the meaning of the DTC, refer to the DTC Troubleshooting Index. If there is no abnormality, the segments will not light up.

TEMPERATURE INDICATOR



Resetting the Self-diagnosis Function

Turn the ignition switch OFF to cancel the self-diagnosis function. After completing repair work, run the self-diagnosis function again to make sure that there are no other malfunctions.

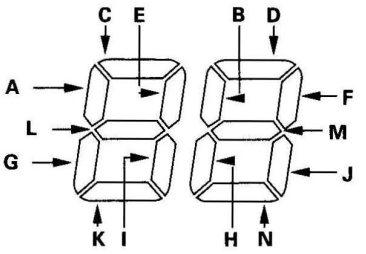
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DTC Troubleshooting Index

To retrieve the DTC, you must run the self-diagnosis function (see page 21-8). In the case of multiple problems, the respective indicator segments will come on. If indicator segments A, C, E, G, I, and L come on at the same time, there may be an open in the common ground wire of the sensors.

TEMPERATURE INDICATOR



DTC (Temperature Indicator segment)	Detection Item	Page
A	An open in the in-car temperature sensor circuit	(see page 21-16)
B	A short in the in-car temperature sensor circuit	(see page 21-17)
C	An open in the outside air temperature sensor circuit	(see page 21-17)
D	A short in the outside air temperature sensor circuit	(see page 21-19)
E	An open in the sunlight sensor circuit	(see page 21-19)
F	A short in the sunlight sensor circuit	(see page 21-20)
G	An open in the evaporator temperature sensor circuit	(see page 21-21)
H	A short in the evaporator temperature sensor circuit	(see page 21-22)
I	An open in the air mix control motor circuit	(see page 21-23)
J	A short in the air mix control motor circuit	(see page 21-23)
K	A problem in the air mix control linkage, door, or motor	(see page 21-24)
L	An open or short in the mode control motor circuit	(see page 21-25)
M	A problem in the mode control linkage, doors, or motor	(see page 21-26)
N	A problem in the blower motor circuit	(see page 21-27)

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Symptom Troubleshooting Index

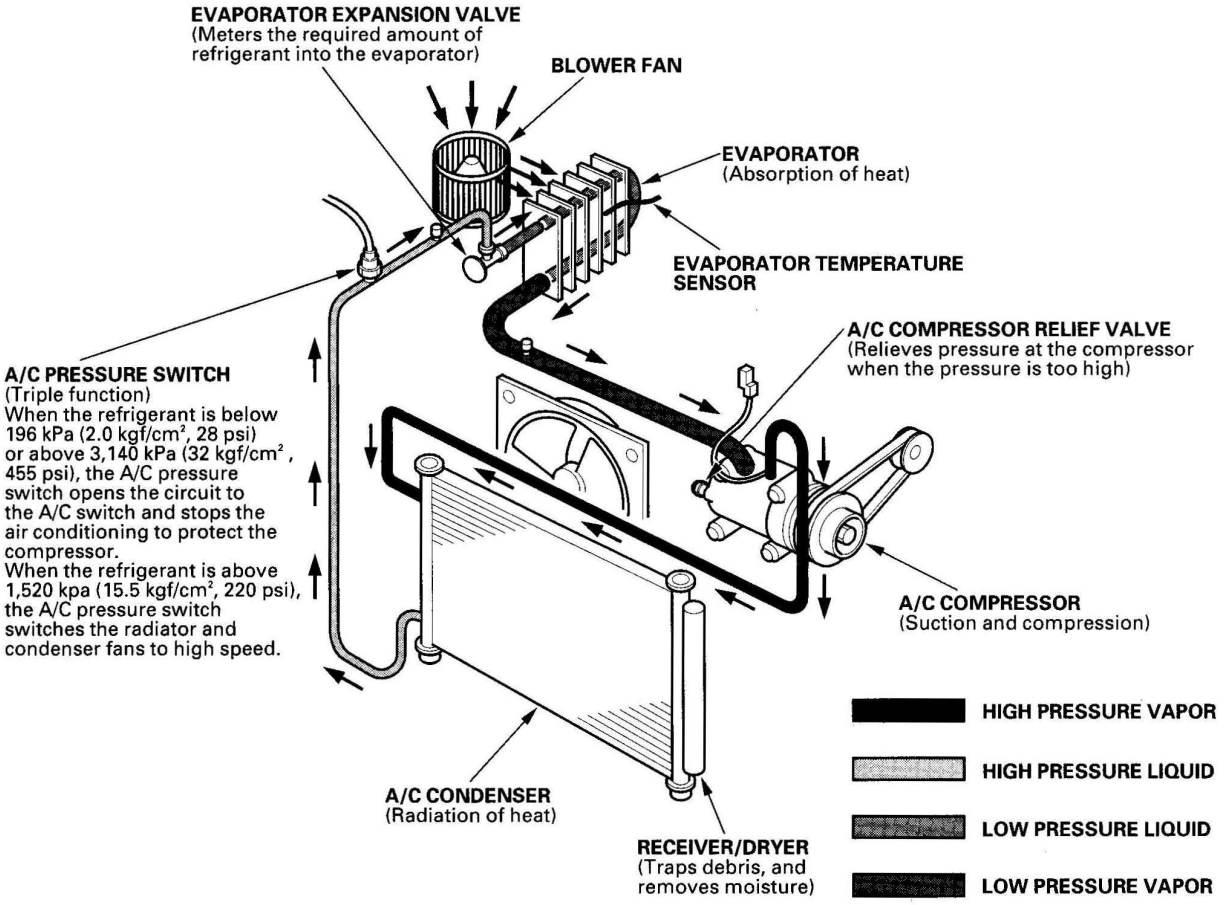
Symptom	Diagnostic procedure	Also check for
Recirculation control doors do not change between Fresh and Recirculate	Recirculation Control Motor Circuit Troubleshooting (see page 21-30)	• Blown fuse No. 3 (7.5A) in the driver's under-dash fuse/relay box • Cleanliness and tightness of all connectors
The blower motor does not run immediately even through the engine is fully warmed up NOTE: The temperature control dial or button must be set between 64°F (18°C) and 90°F (32°C)	ECT Sensor Circuit Troubleshooting (see page 21-31)	Cleanliness and tightness of all connectors
The climate control panel does not display	Climate Control Panel Circuit Troubleshooting (see page 21-32)	Cleanliness and tightness of all connectors
The manual switch does not operate	Manual controls Circuit Troubleshooting (see page 21-34)	Cleanliness and tightness of all connectors
Both heater and A/C do not work	Climate Control Power and Ground Circuits Troubleshooting (see page 21-35)	• Blown fuse No. 3 (7.5A) in the driver's under-dash fuse/relay box • Poor ground at No. G401 • Cleanliness and tightness of all connectors
Both fans do not run at low speed with the A/C on when the refrigerant pressure is below 1,520 kPa (15.5 kgf/cm², 220 psi)	Radiator and Condenser Fans Low Speed Circuit Troubleshooting (see page 21-36)	• Blown fuse No. 58 (30A) in the under-hood fuse/relay box, and No. 3 (7.5A) in the driver's under-dash fuse/relay box • Poor ground at No. G201 • Cleanliness and tightness of all connectors
Condenser fan does not run at high speed when the engine coolant temperature is above 210°F (99°C) or the refrigrant pressure is above 1,520 kPa (15.5 kg/cm², 220 psi) with the A/C on	Condenser Fan High Speed Circuit Troubleshooting (see page 21-39)	• Blown fuse No. 3 (7.5A) in the driver's under-dash fuse/relay box • Poor ground at No. G201 • Cleanliness and tightness of all connectors
Both fans do not run at high speed with the A/C on when the refrigerant pressure is above 1,520 kPa (15.5 kg/cm², 220 psi)	Radiator and Condenser Fans High Speed Circuit Troubleshooting (see page 21-40)	Cleanliness and tightness of all connectors
Compressor clutch does not engage	Compressor Clutch Circuit Troubleshooting (see page 21-41)	• Blown fuse No. 59 (7.5A) in the under-hood fuse/relay box, and No. 3 (7.5A) in the driver's under-dash fuse/relay box • Cleanliness and tightness of all connectors
A/C System does not come on (both fans and compressor)	A/C Pressure Switch Circuit Troubleshooting (see page 21-44)	Cleanliness and tightness of all connectors

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System Description

The air conditioning system removes heat from the passenger compartment by circulating refrigerant through the system as shown below.



This vehicle uses HFC-134a (R-134a) refrigerant which does not contain chlorofluorocarbons. Pay attention to the following service items:

- Do not mix refrigerants CFC-12 (R-12) and HFC-134a (R-134a). They are not compatible.
- Use only the recommended polyalkyleneglycol (PAG) refrigerant oil (DENSO ND-OIL8) designed for the R-134a compressor. Intermixing the recommended (PAG) refrigerant oil with any other refrigerant oil will result in compressor failure.
- All A/C system parts (compressor, discharge line, suction line, evaporator, condenser, receiver/dryer, expansion valve, O-rings for joints) have to be proper for refrigerant R-134a. Do not confuse with R-12 parts.
- Use a halogen gas leak detector designed for refrigerant R-134a.
- R-12 and R-134a refrigerant servicing equipment are not interchangeable. Use only a recovery/recycling/charging station that is U.L.-listed and is certified to meet the requirements of SAE J2210 to service R-134a air conditioning system.
- Always recover the refrigerant R-134a with an approved recovery/recycling/charging station before disconnecting any A/C fitting.

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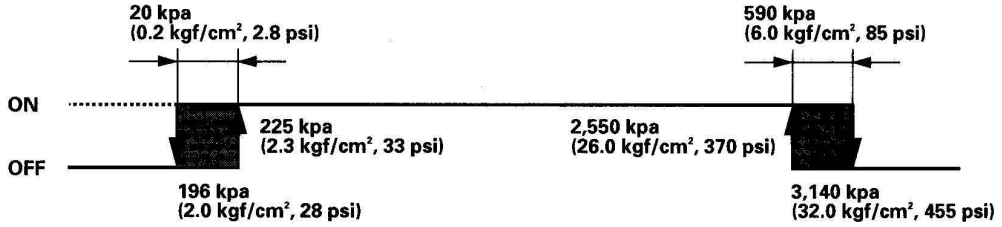
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System Description (cont'd)

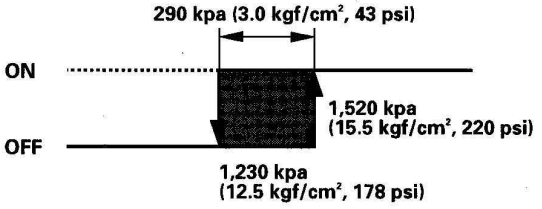
A/C Pressure Switch

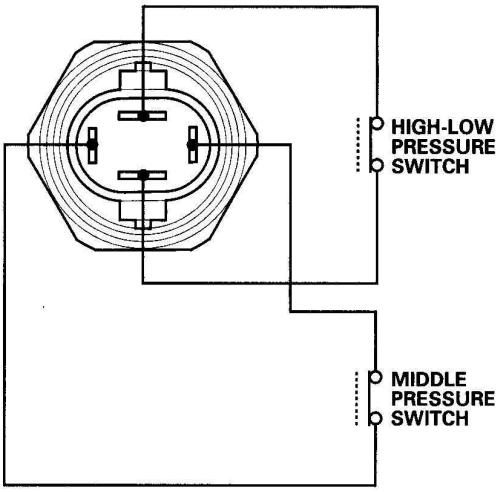
The A/C pressure switch consists of a High-Low pressure switch (A/C pressure switch A) and a Middle pressure switch (A/C pressure switch B).

- High-Low pressure switch
  If the refrigerant pressure becomes too high (due to blockage), or too low (due to leakage), the A/C pressure switch sends a signal to the PCM to prevent the compressor from operating.



- Middle pressure switch
  If the refrigerant pressure goes above or below 1,520 kpa (15.5 kgf/cm², 220 psi), the A/C pressure switch sends a signal to the climate control unit to change the speed of the condensor fan and radiator fan (High-Low).





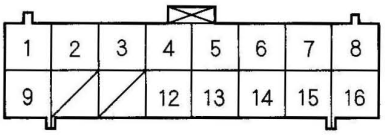
BACK

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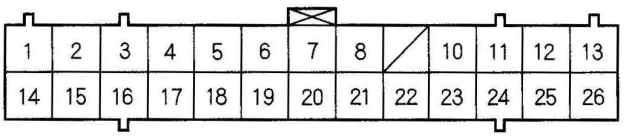
Climate Control Unit Inputs and Outputs

CLIMATE CONTROL UNIT CONNECTORS

CONNECTOR A (16P)



CONNECTOR B (26P)



Wire side of female terminals

CONECTOR A (□ on Circuit Diagram)

Cavity	Wire color	Signal	
1	ORN/WHT	REAR UNIT A/C BUS	INPUT
2	WHT/RED	PANEL DS0	INPUT
3	WHT/YEL	PANEL DS1	INPUT
4	LT BLU	PANEL D3	OUTPUT
5	WHT/BLK	PANEL D2	OUTPUT
6	WHT/BLU	PANEL D1	OUTPUT
7	BRN	PANEL D0	OUTPUT
8	RED/GRN	DISPLAY UNIT SO	OUTPUT
9	BRN/YEL	REAR WINDOW DEFOGGER RELAY	INPUT
10	———	———	———
11	———	———	———
12	YEL/GRN	PANEL LATCH	INPUT
13	YEL/WHT	PANEL DATA	INPUT
14	YEL/BLK	PANEL CLK1	INPUT
15	GRN/ORN	DISPLAY UNIT SI	INPUT
16	YEL/BLU	DISPLAY UNIT CLK2	OUTPUT

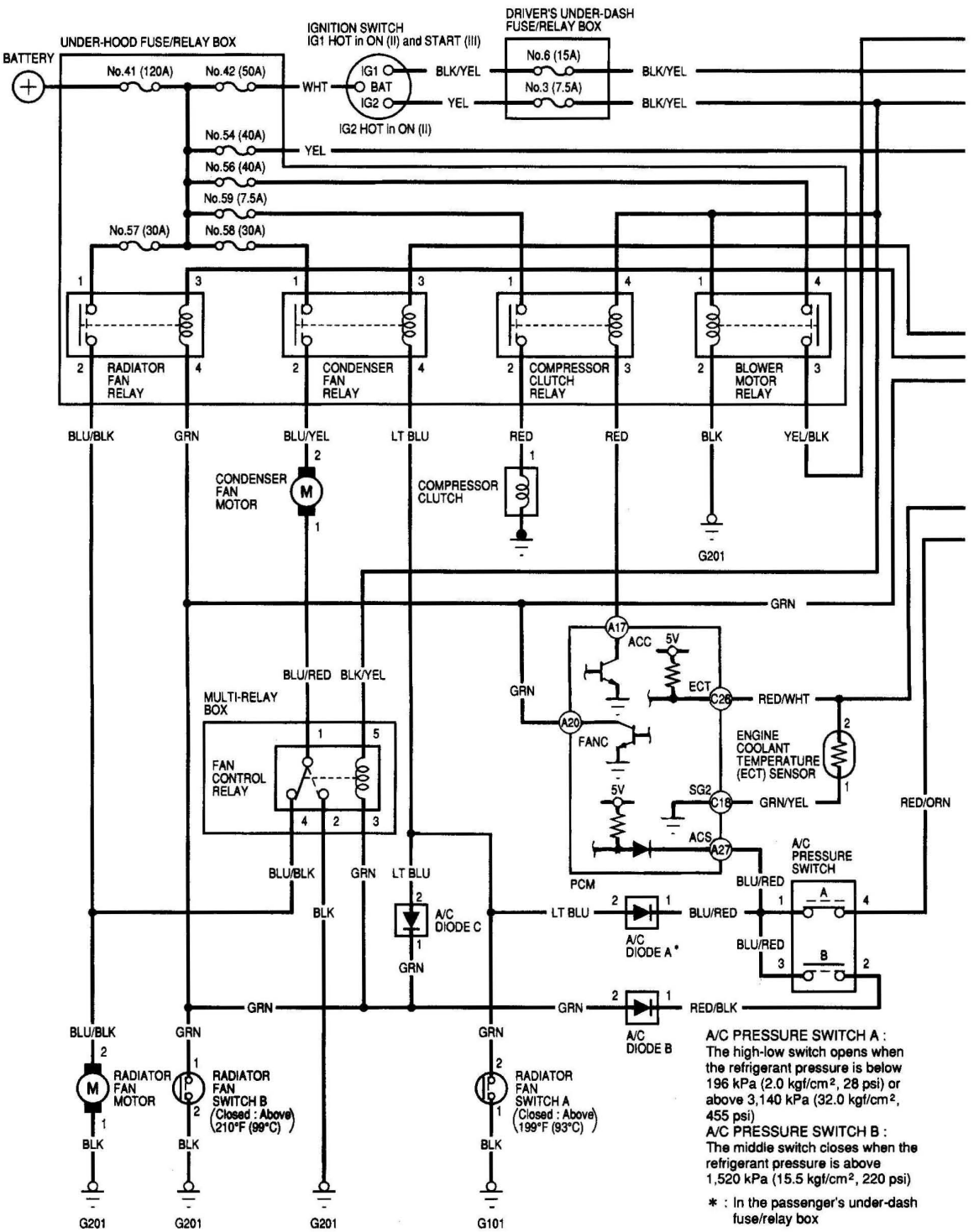
CONECTOR B (○ on Circuit Diagram)

Cavity	Wire color	Signal	
1	YEL/GRN	SENSOR COMMON GROUND	INPUT
2	BLU/WHT	PCM (VSS)	OUTPUT
3	GRY	AIR MIX POTENTIAL +5 V	OUTPUT
4	RED/ORN	A/C PRESSURE SWITCH	INPUT
5	GRN/BLK	MODE 1	OUTPUT
6	GRN/YEL	MODE 2	OUTPUT
7	LT GRN/BLK	MODE 3	OUTPUT
8	BLU/GRN	MODE 4	OUTPUT
9	———	———	———
10	BLU/WHT	MODE VENT	OUTPUT
11	BLU/BLK	MODE DEF	OUTPUT
12	ORN/BLK	POWER TRANSISTER	OUTPUT
13	BLK/YEL	IG2 (Power)	INPUT
14	BLU/RED	BLOWER FEEDBACK	INPUT
15	BLK	GROUND	OUTPUT
16	BLK/WHT	PANEL GROUND	INPUT
17	YEL/RED	IN-CAR TEMPERATURE SENSOR	OUTPUT
18	BRN/WHT	OUTSIDE AIR TEMPERATURE SENSOR	OUTPUT
19	WHT/RED	SUNLIGHT SENSOR	OUTPUT
20	BRN	EVAPORATOR TEMPERATURE SENSOR	OUTPUT
21	PNK/BLK	AIR MIX POTENTIAL	OUTPUT
22	RED/WHT	ENGINE COOLANT TEMPERATURE (ECT) SENSOR	OUTPUT
23	GRN/RED	FRESH	INPUT
24	GRN/WHT	RECIRCULATE	INPUT
25	RED/YEL	AIR MIX HOT	OUTPUT
26	RED/WHT	AIR MIX COOL	OUTPUT

BACK

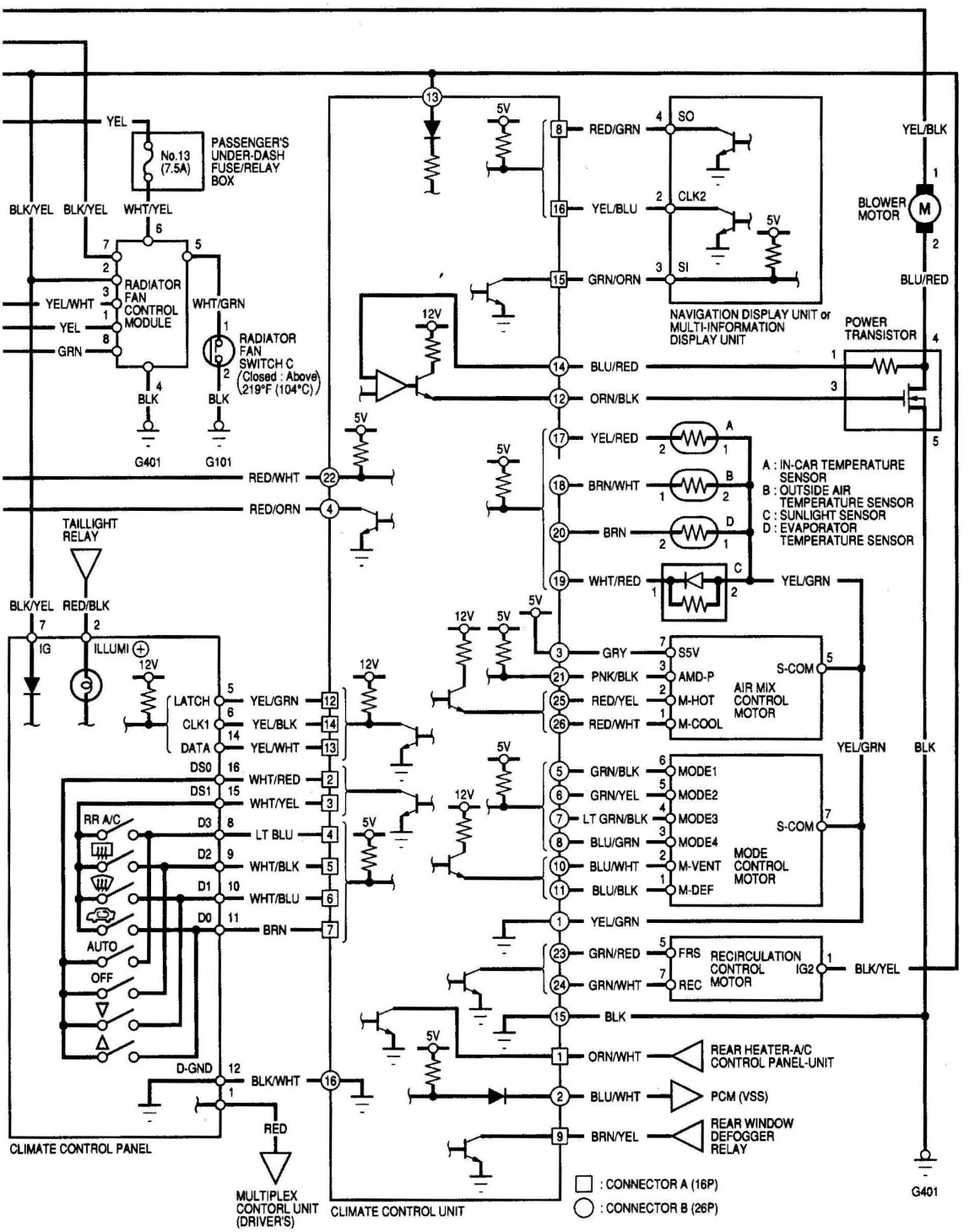
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Circuit Diagram



BACK

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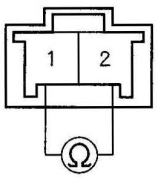
DTC Troubleshooting

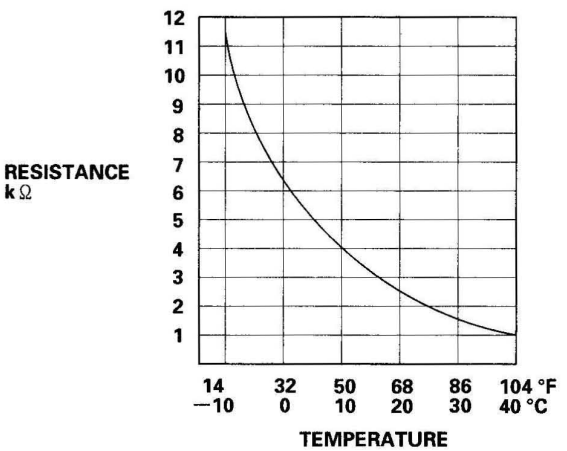
DTC indicator light A: An open in the in-car temperature sensor circuit

1. Remove the in-car temperature sensor (see page 21-46).

2. Measure the resistance between the No. 1 and No. 2 terminals of the in-car temperature sensor.
*Check for a change in resistance by heating or cooling the sensor with a hair drier.

IN-CAR TEMPERATURE SENSOR





Is the resistance within the specifications shown on the graph?

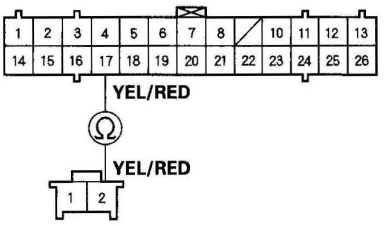
YES — Go to step 3.

NO — Replace the in-car temperature sensor. ■

3. Disconnect climate control unit connector B (26P).

4. Check for continuity between the No. 17 terminal of climate control unit connector B (26P) and the No. 2 terminal of the in-car temperature sensor 2P connector.

CLIMATE CONTROL UNIT CONNECTOR B (26P)
Wire side of female terminals



IN-CAR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

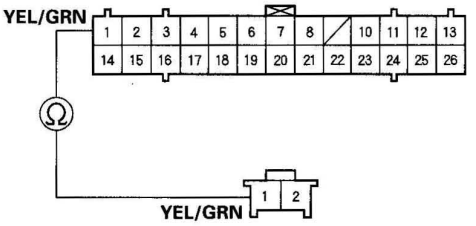
Is there continuity?

YES — Go to step 5.

NO — Repair open in the wire between the climate control unit and the in-car temperature sensor. ■

5. Check for continuity between the No. 1 terminal of climate control unit connector B (26P) and the No. 1 terminal of the in-car temperature sensor 2P connector.

CLIMATE CONTROL UNIT CONNECTOR B (26P)
Wire side of female terminals



IN-CAR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

YES — Check for loose wires or poor connections at climate control unit connector B (26P) and at the in-car temperature sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

NO — Repair open in the wire between the climate control unit and the in-car temperature sensor. ■

BACK

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DTC indicator light B: A short in the in-car temperature sensor circuit

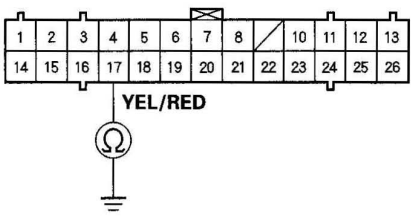
1. Remove the in-car temperature sensor (see page 21-46).
2. Test the in-car temperature sensor (see page 21-46).

   Is the resistance within the specifications shown on the graph?

   YES – Go to step 3.

   NO – Replace the in-car temperature sensor. ■
3. Disconnect climate control unit connector B (26P).
4. Check for continuity between the No. 17 terminal of climate control unit connector B (26P) and body ground.

CLIMATE CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there continuity?

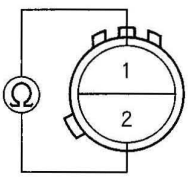
YES – Repair short to body ground in the wire between the climate control unit and the in-car temperature sensor. ■

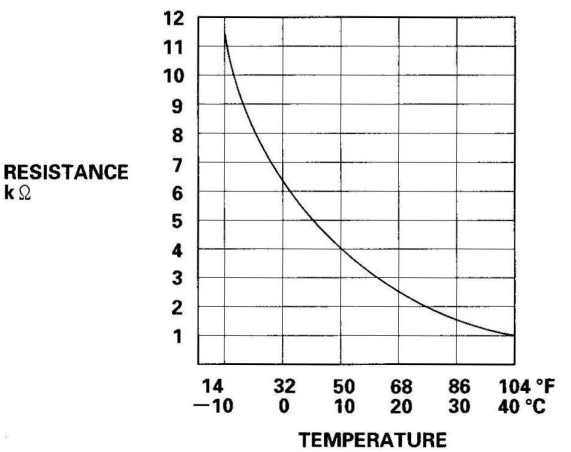
NO – Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

DTC indicator light C: An open in the outside air temperature sensor circuit

1. Remove the outside air temperature sensor (see page 21-47).
2. Measure the resistance between the No. 1 and No. 2 terminals of the outside air temperature sensor. *Dip the sensor in ice water, and measure the resistance. Then pour hot water on the sensor, and check for a change in resistance.

OUTSIDE AIR TEMPERATURE SENSOR





**Is the resistance within the specifications shown on the graph?*

YES – Go to step 3.

NO – Replace the outside air temperature sensor. ■

3. Disconnect climate control unit connector B (26P).

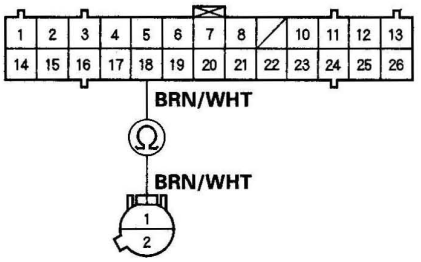
(cont'd)

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DTC Troubleshooting (cont'd)

4. Check for continuity between the No. 18 terminal of climate control unit connector B (26P) and the No. 1 terminal of the outside air temperature sensor 2P connector.

CLIMATE CONTROL UNIT CONNECTOR B (26P)
Wire side of female terminals



OUTSIDE AIR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

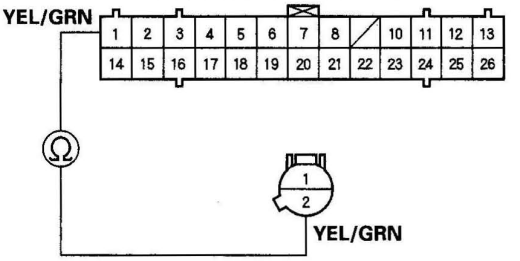
Is there continuity?

YES—Go to step 5.

NO—Repair open in the wire between the climate control unit and the outside air temperature sensor.■

5. Check for continuity between the No. 1 terminal of climate control unit connector B (26P) and the No. 2 terminal of the outside air temperature sensor 2P connector.

CLIMATE CONTROL UNIT CONNECTOR B (26P)
Wire side of female terminals



OUTSIDE AIR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

YES—Check for loose wires or poor connections at climate control unit connector B (26P) and at the outside air temperature sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

NO—Repair open in the wire between the climate control unit and the outside air temperature sensor.■

BACK

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DTC indicator light D: A short in the outside air temperature sensor circuit

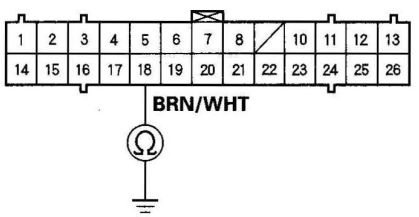
1. Remove the outside air temperature sensor (see page 21-47).
2. Test the outside air temperature sensor (see page 21-47).

   Is the resistance within the specifications shown on the graph?

   YES – Go to step 3.

   NO – Replace the outside air temperature sensor. ■
3. Disconnect climate control unit connector B (26P).
4. Check for continuity between the No. 18 terminal of climate control unit connector B (26P) and body ground.

CLIMATE CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there continuity?

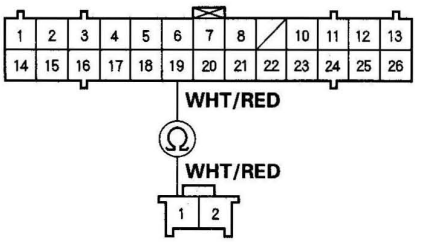
YES – Repair short to body ground in the wire between the climate control unit and the outside air temperature sensor. ■

NO – Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

DTC indicator light E: An open in the sunlight sensor circuit

1. Disconnect the sunlight sensor 2P connector.
2. Disconnect climate control unit connector B (26P).
3. Check for continuity between the No. 19 terminal of climate control unit connector B (26P) and the No. 1 terminal of the sunlight sensor 2P connector.

CLIMATE CONTROL UNIT CONNECTOR B (26P)
Wire side of female terminals



SUNLIGHT SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

YES – Go to step 4.

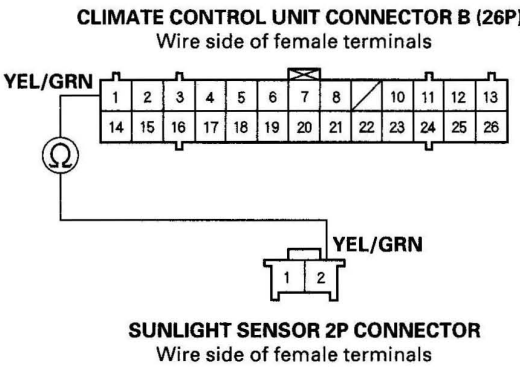
NO – Repair open in the wire between the climate control unit and the sunlight sensor. ■

(cont'd)

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DTC Troubleshooting (cont'd)

4. Check for continuity between the No. 1 terminal of climate control unit connector B (26P) and the No. 2 terminal of the sunlight sensor 2P connector.



Is there continuity?

YES—Go to step 5.

NO—Repair open in the wire between the climate control unit and the sunlight sensor. ■

5. Reconnect the sunlight sensor 2P connector.
6. Reconnect climate control unit connector B (26P).
7. Test the sunlight sensor (see page 21-48).

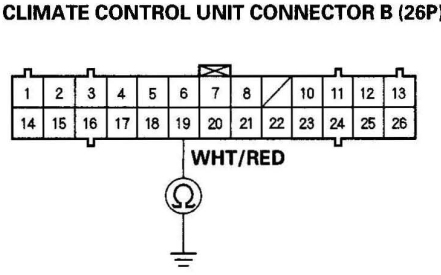
Is the sunlight sensor OK?

YES—Check for loose wires or poor connections at climate control unit connector B (26P) and at the sunlight sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

NO—Replace the sunlight sensor. ■

DTC indicator light F: A short in the sunlight sensor circuit

1. Disconnect the sunlight sensor 2P connector.
2. Disconnect climate control unit connector B (26P).
3. Check for continuity between the No. 19 terminal of climate control unit connector B (26P) and body ground.



Wire side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between the climate control unit and the sunlight sensor. ■

NO—Go to step 4.

4. Reconnect the sunlight sensor 2P connector.
5. Reconnect climate control unit connector B (26P).
6. Test the sunlight sensor (see page 21-48).

Is the sunlight sensor OK?

YES—Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

NO—Replace the sunlight sensor. ■

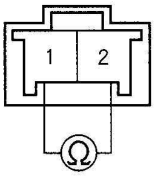
BACK

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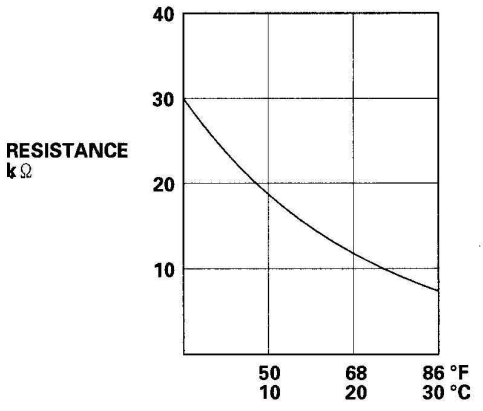
DTC indicator light G: An open in the evaporator temperature sensor circuit

1. Disconnect the evaporator temperature sensor 2P connector.
2. Measure the resistance between the No. 1 and No. 2 terminals of the evaporator temperature sensor.

EVAPORATOR TEMPERATURE SENSOR



Terminal side of male terminals



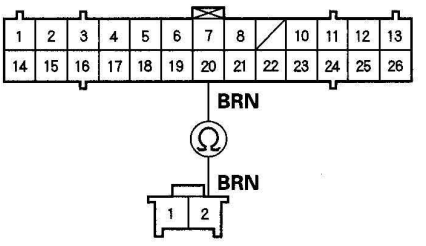
Is the resistance within the specifications shown on the graph?

YES – Go to step 3.

NO – Replace the evaporator temperature sensor. ■

3. Disconnect climate control unit connector B (26P).
4. Check for continuity between the No. 20 terminal of climate control unit connector B (26P) and the No. 2 terminal of the evaporator temperature sensor 2P connector.

CLIMATE CONTROL UNIT CONNECTOR B (26P)
Wire side of female terminals



EVAPORATOR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

YES – Go to step 5.

NO – Repair open in the wire between the climate control unit and the evaporator temperature sensor. ■

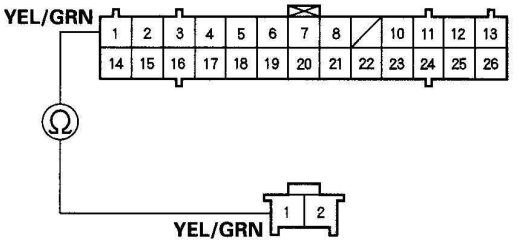
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DTC Troubleshooting (cont'd)

5. Check for continuity between the No. 1 terminal of climate control unit connector B (26P) and the No. 1 terminal of the evaporator temperature sensor 2P connector.

CLIMATE CONTROL UNIT CONNECTOR B (26P)
Wire side of female terminals



EVAPORATOR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

YES—Check for loose wires or poor connections at climate control unit connector B (26P) and at the evaporator temperature sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

NO—Repair open in the wire between the climate control unit and the evaporator temperature sensor.■

DTC indicator light H: A short in the evaporator temperature sensor circuit

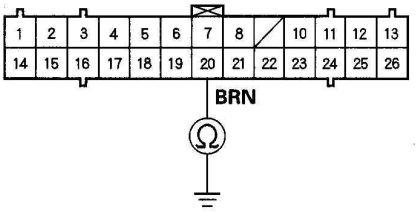
1. Disconnect the evaporator temperature sensor 2P connector.
2. Test the evaporator temperature sensor (see page 21-49).

   Is the resistance within the specifications shown on the graph?

   YES—Go to step 3.

   NO—Replace the evaporator temperature sensor.■
3. Disconnect climate control unit connector B (26P).
4. Check for continuity between the No. 20 terminal of climate control unit connector B (26P) and body ground.

CLIMATE CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between the climate control unit and the evaporator temperature sensor.■

NO—Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

BACK

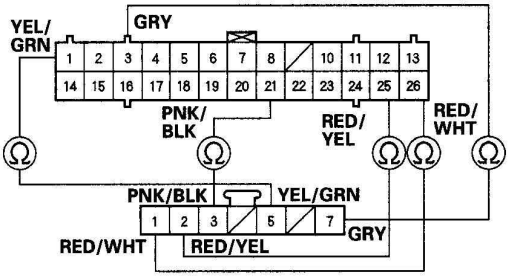
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DTC indicator light I: An open in the air mix control motor circuit

1. Disconnect the air mix control motor 7P connector.
2. Disconnect climate control unit connector B (26P).
3. Check for continuity between the following terminals of climate control unit connector B (26P) and the air mix control motor 7P connector.

26P:	7P:
No. 1	No. 5
No. 3	No. 7
No. 21	No. 3
No. 25	No. 2
No. 26	No. 1

CLIMATE CONTROL UNIT CONNECTOR B (26P)
Wire side of female terminals



AIR MIX CONTROL MOTOR 7P CONNECTOR
Wire side of female terminals

Is there continuity?

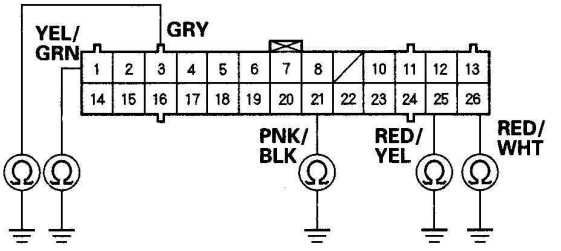
YES—Check for loose wires or poor connections at climate control unit connector B (26P) and at the air mix control motor 7P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

NO—Repair any open in the wire(s) between the climate control unit and the air mix control motor. ■

DTC indicator light J: A short in the air mix control motor circuit

1. Disconnect the air mix control motor 7P connector.
2. Disconnect climate control unit connector B (26P).
3. Check for continuity between body ground and climate control unit connector B (26P) terminals No. 1, 3, 21, 25 and 26 individually.

CLIMATE CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there continuity?

YES—Repair any short to body ground in the wire(s) between the climate control unit and the air mix control motor. ■

NO—Go to step 4.

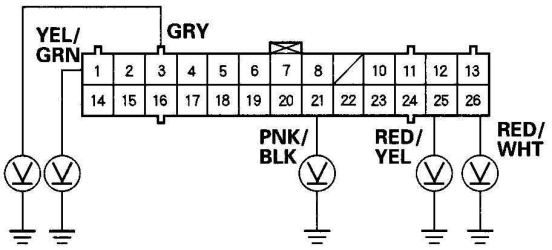
(cont'd)

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DTC Troubleshooting (cont'd)

4. Turn the ignition switch ON (II), and check the same terminals for voltage.

CLIMATE CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there any voltage?

YES—Repair any short to power in the wire(s) between the climate control unit and the air mix control motor. This short also damages the climate control unit. Repair the short to power before replacing the climate control unit. ■

NO—Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

DTC indicator light K: A problem in the air mix control linkage, door, or motor

1. Test the air mix control motor (see page 21-50).

   Is the air mix control motor OK?

   YES—Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

   NO—Go to step 2.

2. Remove the air mix control motor (see page 21-50).

3. Check the air mix control linkage and door for smooth movement.

   Do the air mix control linkage and door move smoothly?

   YES—Replace the air mix control motor. ■

   NO—Repair the air mix control linkage or door. ■

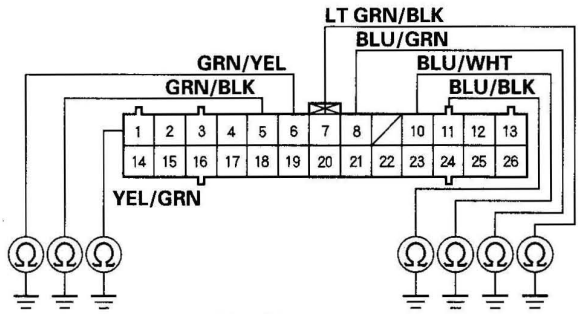
BACK

Protected by AR

DTC indicator light L: An open or short in the mode control motor circuit

1. Disconnect the mode control motor 7P connector.
2. Disconnect climate control unit connector B (26P).
3. Check for continuity between body ground and climate control unit connector B (26P) terminals No. 1, 5, 6, 7, 8, 10 and 11 individually.

CLIMATE CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

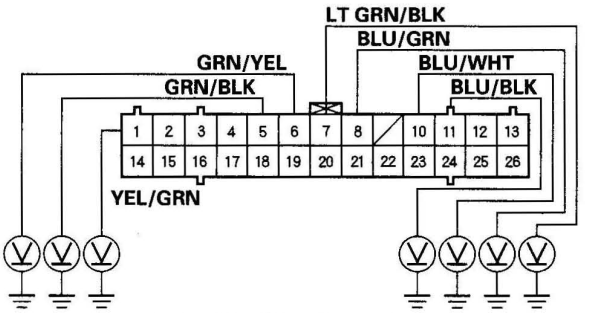
Is there continuity?

YES—Repair any short to body ground in the wire(s) between the climate control unit and the mode control motor. ■

NO—Go to step 4.

4. Turn the ignition switch ON (II), and check the same terminals for voltage.

CLIMATE CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there any voltage?

YES—Repair any short to power in the wire(s) between the climate control unit and the mode control motor. This short also damages the climate control unit. Repair the short to power before replacing the climate control unit. ■

NO—Go to step 5.

(cont'd)

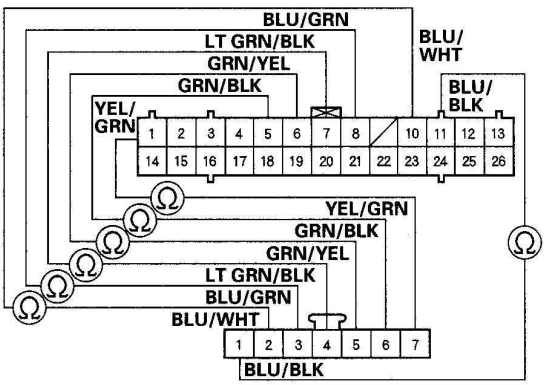
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DTC Troubleshooting (cont'd)

5. Turn the ignition switch OFF, and check for continuity between following terminals of climate control unit connector B (26P) and the mode control motor 7P connector.

26P:	7P:
No. 1	No. 7
No. 5	No. 6
No. 6	No. 5
No. 7	No. 4
No. 8	No. 3
No. 10	No. 2
No. 11	No. 1

CLIMATE CONTROL UNIT CONNECTOR B (26P)
Wire side of female terminals



MODE CONTROL MOTOR 7P CONNECTOR
Wire side of female terminals

Is there continuity?

YES – Check for loose wires or poor connections at climate control unit connector B (26P) and at the mode control motor 7P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

NO – Repair any open in the wire(s) between the climate control unit and the mode control motor. ■

DTC indicator light M: A problem in the mode control linkage, doors, or motor

1. Test the mode control motor (see page 21-51).

   Is the mode control motor OK?

   YES – Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

   NO – Go to step 2.

2. Remove the mode control motor (see page 21-51).

3. Check the mode control linkage and doors for smooth movement.

   Do the mode control linkage and doors move smoothly?

   YES – Replace the mode control motor. ■

   NO – Repair the mode control linkage or doors. ■

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DTC indicator light N: A problem in the blower motor circuit

1. Check the No. 56 (40A) fuse in the under-hood fuse/relay box, and the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

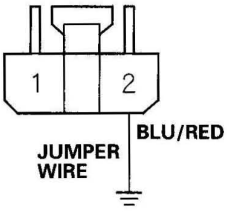
   Are the fuses OK?

   YES—Go to step 2.

   NO—Replace the fuse(s), and recheck.■

2. Connect the No. 2 terminal of the blower motor 2P connector to body ground with a jumper wire.

BLOWER MOTOR 2P CONNECTOR



Wire side of female terminals

3. Turn the ignition switch ON (II).

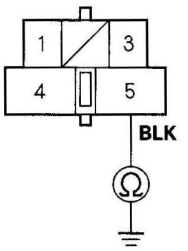
   Does the blower motor run?

   YES—Go to step 4.

   NO—Go to step 17.

4. Turn the ignition switch OFF.
5. Disconnect the jumper wire.
6. Disconnect the power transistor 5P connector.
7. Check for continuity between the No. 5 terminal of the power transistor 5P connector and body ground.

POWER TRANSISTOR 5P CONNECTOR



Wire side of female terminals

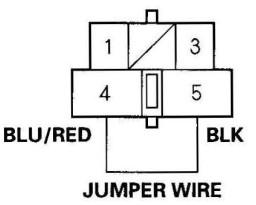
Is there continuity?

YES—Go to step 8.

NO—Check for an open in the wire between the power transistor and body ground. If the wire is OK, check for poor ground at G401.■

8. Connect the No. 4 and No. 5 terminals of the power transistor 5P connector with a jumper wire.

POWER TRANSISTOR 5P CONNECTOR



Wire side of female terminals

9. Turn the ignition switch ON (II).

   Does the blower motor run at high speed?

   YES—Go to step 10.

   NO—Repair open in the wire between the power transistor and the blower motor.■

10. Turn the ignition switch OFF.
11. Disconnect the jumper wire.

(cont'd)

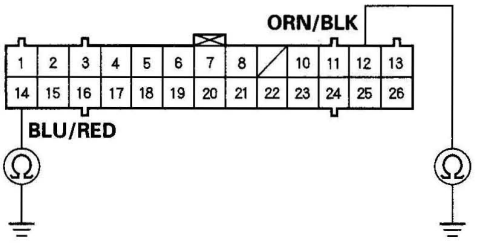
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DTC Troubleshooting (cont'd)

12. Disconnect climate control unit connector B (26P).

13. Check for continuity between the No. 12 and No. 14 terminals of climate control unit connector B (26P) and body ground individually.

CLIMATE CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there continuity?

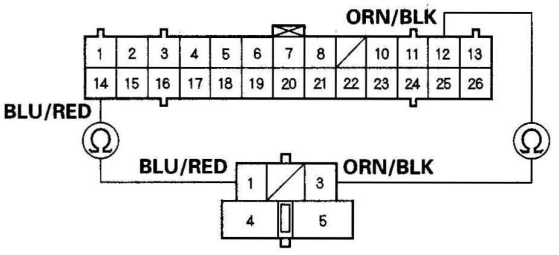
YES – Repair any short to body ground in the wire(s) between the climate control unit and the power transistor. ■

NO – Go to step 14.

14. Check for continuity between the following terminals of climate control unit connector B (26P) and power transistor 5P connector.

26P:	5P:
No. 12	No. 3
No. 14	No. 1

CLIMATE CONTROL UNIT CONNECTOR B (26P)
Wire side of female terminals



POWER TRANSISTOR 5P CONNECTOR
Wire side of female terminals

Is there continuity?

YES – Go to step 15.

NO – Repair any open in the wire(s) between the climate control unit and the power transistor. ■

15. Reconnect climate control unit connector B (26 P).

16. Test the power transistor (see page 21-49).

Is the power transistor OK?

YES – Check for loose wires or poor connections at climate control unit connector B (26P) and at the power transistor 5P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

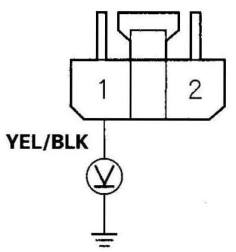
NO – Replace the power transistor. ■

17. Disconnect the jumper wire.

18. Disconnect the blower motor 2P connector.

19. Measure the voltage between the No. 1 terminal of the blower motor 2P connector and body ground.

BLOWER MOTOR 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Replace the blower motor. ■

NO – Go to step 20.

20. Turn the ignition switch OFF.

21. Remove the blower motor relay from the under-hood fuse/relay box, and test it (see page 22-67).

Is there relay OK?

YES – Go to step 22.

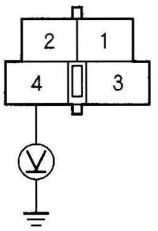
NO – Replace the blower motor relay. ■

BACK

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22. Measure the voltage between the No. 4 terminal of the blower motor relay 4P socket and body ground.

BLOWER MOTOR RELAY 4P SOCKET



Is there battery voltage?

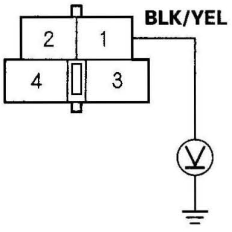
YES – Go to step 23.

NO – Replace the under-hood fuse/relay box. ■

23. Turn the ignition switch ON (II).

24. Measure the voltage between the No.1 terminal of the blower motor relay 4P socket and body ground.

BLOWER MOTOR RELAY 4P SOCKET



Is there battery voltage?

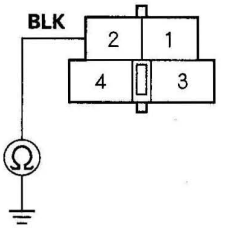
YES – Go to step 25.

NO – Repair open in the wire between the No. 3 fuse in the driver's under-dash fuse/relay box and the blower motor relay. ■

25. Turn the ignition switch OFF.

26. Check for continuity between the No. 2 terminal of the blower motor relay 4P socket and body ground.

BLOWER MOTOR RELAY 4P SOCKET



Is there contnuity?

YES – Repair open in the YEL/BLK wire between the blower motor relay and the blower motor. ■

NO – Check for an open in the wire between the blower motor relay and body ground. If the wire is OK, check for poor ground at G201. ■

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Recirculation Control Motor Circuit Troubleshooting

1. Check the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES – Go to step 2.

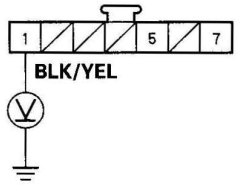
   NO – Replace the fuse, and recheck.■

2. Disconnect the recirculation control motor 7P connector.

3. Turn the ignition switch ON (II).

4. Measure the voltage between the No. 1 terminal of the recirculation control motor 7P connector and body ground.

RECIRCULATION CONTROL MOTOR 7P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 5.

NO – Repair open in the wire between the No. 3 fuse in the driver's under-dash fuse/relay box and the recirculation control motor .■

5. Turn the ignition switch OFF.

6. Test the recirculation control motor (see page 21-52).

   Is the recirculation control motor OK?

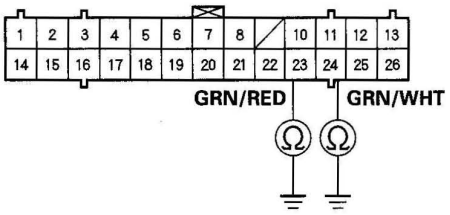
   YES – Go to step 7.

   NO – Go to step 12.

7. Disconnect climate control unit connector B (26P).

8. Check for continuity between the No. 23 and No. 24 terminals of climate control unit connector B (26P) and body ground individually.

CLIMATE CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

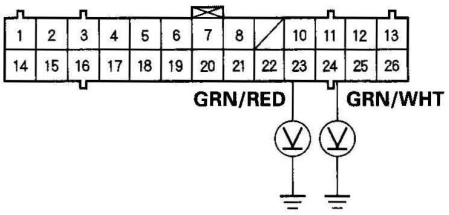
Is there continuity?

YES – Repair any short to body ground in the wire(s) between the climate control unit and the recirculation control motor.■

NO – Go to step 9.

9. Turn the ignition switch ON (II), and check the same wires for voltage.

CLIMATE CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there any voltage?

YES – Repair any short to power in the wire(s) between the climate control unit and the recirculation control motor. This short also damages the climate control unit. Repair the short to power before replacing the climate control unit.■

NO – Go to step 10.

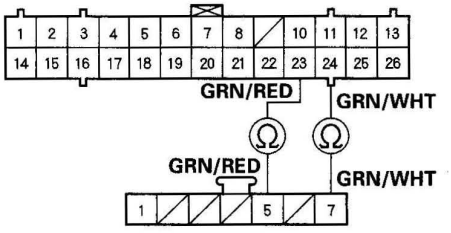
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10. Turn the ignition switch OFF.

11. Check for continuity between the following terminals of climate control unit connector B (26P) and the recirculation control motor 7P connector.
    26P: 7P:
    No. 23 No. 5
    No. 24 No. 7

CLIMATE CONTROL UNIT CONNECTOR B (26P)
Wire side of female terminals



RECIRCULATION CONTROL MOTOR 7P CONNECTOR
Wire side of female terminals

Is there continuity?

YES – Check for loose wires or poor connections at climate control unit connector B (26P) and at recirculation control motor 7P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

NO – Repair any open in the wire(s) between the climate control unit and the recirculation control motor. ■

12. Remove the recirculation control motor (see page 21-52).

13. Check the recirculation control linkage and doors for smooth movement.

Do the recirculation control linkage and doors move smoothly?

YES – Replace the recirculation control motor. ■

NO – Repair the recirculation control linkage or doors. ■

1. Check the malfunction indicator lamp (MIL).

Does the malfunction indicator lamp come on?

YES – Refer to the fuel and emissions section (see page 11-3).

NO – Go to step 2.

2. Turn the ignition switch OFF.

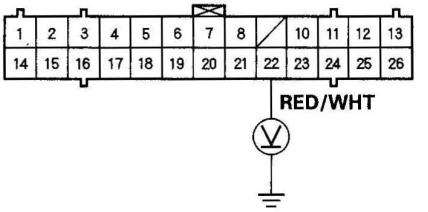
3. Disconnect the ECT sensor 2P connector.

4. Disconnect climate control unit connector B (26P).

5. Turn the ignition switch ON (II).

6. Measure the voltage between the No. 22 terminal of climate control unit connector B (26P) and body ground.

CLIMATE CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there about 5 V?

YES – Check for loose wires or poor connections at climate control unit connector B (26P) and at the ECT sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

NO – Repair open in the wire between the climate control unit and the ECT sensor. ■

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Climate Control Panel Circuit Troubleshooting

1. Check the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

   Is the fuses OK?

   YES – Go to step 2.

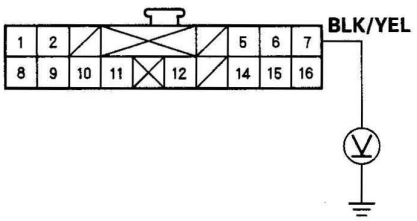
   NO – Replace the fuse and recheck. ■

2. Disconnect the climate control panel 16P connector.

3. Turn the ignition switch ON (II).

4. Measure the voltage between the No. 7 terminal of climate control panel 16P connector and body ground.

CLIMATE CONTROL PANEL 16P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 5.

NO – Repair open in the wire between the No. 3 fuse in the driver's under-dash fuse/relay box and the climate control panel. ■

5. Turn the ignition switch OFF.

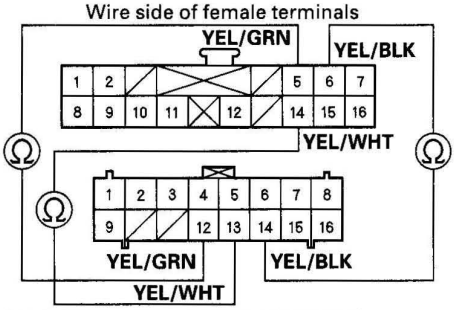
6. Disconnect climate control unit connectors A (16P) and B (26P).

7. Check for continuity between the following terminals of the climate control panel 16P connector and climate control unit connectors A (16P) and B (26P).

PANEL 16P	UNIT 16P
No. 5	No. 12
No. 6	No. 14
No. 14	No. 13

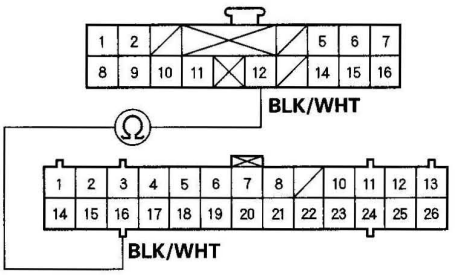
PANEL 16P	UNIT 26P
No. 12	No. 16

CLIMATE CONTROL PANEL 16P CONNECTOR
Wire side of female terminals



CLIMATE CONTROL UNIT CONNECTOR A (16P)
Wire side of female terminals

CLIMATE CONTROL PANEL 16P CONNECTOR
Wire side of female terminals



CLIMATE CONTROL UNIT CONNECTOR B (26P)
Wire side of female terminals

Is there continuity?

YES – Go to step 8.

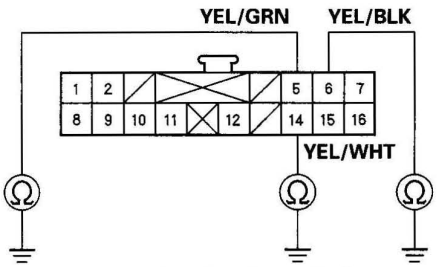
NO – Repair any open in the wire(s) between the climate control panel and climate control unit. ■

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8. Check the continuity between the No. 5, 6, and 14 terminals of the climate control panel 16P connector and body ground individually.

CLIMATE CONTROL PANEL 16P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Repair any short to body ground in the wire(s) between the climate control panel and the climate control unit. ■

NO – Check for loose wires or poor connections at climate control unit connector A (16P) and B (26P) and at the climate control panel 16P connector. If the connections are good, substitute a known-good climate control panel, and recheck. If the symptom/indication is still present, substitute a known-good climate control unit, and recheck. ■

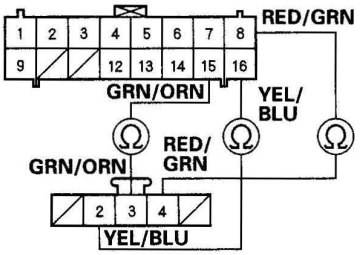
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Manual Controls Circuit Troubleshooting

1. Disconnect navigation or multi-information display unit connector A (5P).
2. Disconnect climate control unit connector A (16P).
3. Check for continuity between the following terminals of climate control unit connector A(16P) and navigation or multi-information display unit connector A (5P).

16P	5P
No. 8	No. 4
No. 15	No. 3
No. 16	No. 2

CLIMATE CONTROL UNIT CONNECTOR A (16P)
Wire side of female terminals



NAVIGATION or MULTI-INFORMATION DISPLAY UNIT CONNECTOR A (5P)
Wire side of female terminals

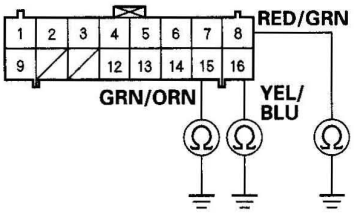
Is there continuity?

YES—Go to step 4.

NO—Repair any open in the wire(s) between the climate control unit and the navigation or multi-information display unit.■

4. Check for continuity between the body ground and climate control unit connector A (16P) teminals No. 8, 15 and 16 individually.

CLIMATE CONTROL UNIT CONNECTOR A (16P)



Wire side of female terminals

Is there continuity?

YES—Repair any short to body ground in the wire(s) between the climate control unit and the navigation or multi-information display unit.■

NO—Check for loose wires or poor connections at climate control unit connector A (16P) and at navigation or multi-information display unit connector A (5P). If the connections are good, substitute a known-good climate control unit ,and recheck. If the problem still exists, replace the navigation or multi-information display unit.■

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Climate Control Power and Ground Circuits Troubleshooting

1. Check the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

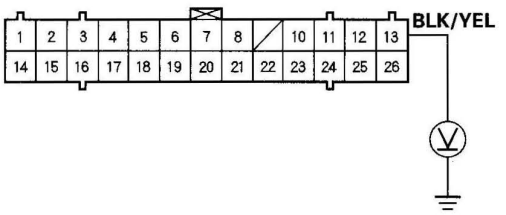
   Is the fuse OK?

   YES – Go to step 2.

   NO – Replace the fuse, and recheck. ■

2. Disconnect climate control unit connector B (26P).
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 13 terminal of climate control unit connector B (26P) and body ground.

CLIMATE CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

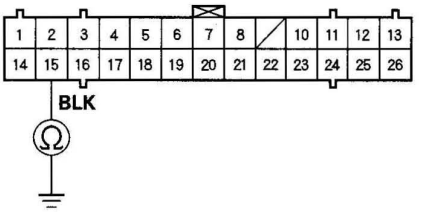
Is there battery voltage?

YES – Go to step 5.

NO – Repair open in the wire between the No. 3 fuse in the driver's under-dash fuse/relay box and the climate control unit. ■

5. Turn the ignition switch OFF.
6. Check for continuity between the No. 15 terminal of climate control unit connector B (26P) and body ground.

CLIMATE CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there continuity?

YES – Check for loose wires or poor connections at climate control unit connector B (26P). If the connections are good,substitute a known-good climate control unit, and recheck. If the symptom/ indication goes away, replace the original climate control unit. ■

NO – Check for an open in the wire between the climate control unit and body ground. If the wire is OK, check for poor ground at G401. ■

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Radiator and Condenser Fans Low Speed Circuit Troubleshooting

1. Check the No. 58 (30A) fuse in the under-hood fuse/relay box, and the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

   Are the fuses OK?

   YES – Go to step 2.

   NO – Replace the fuse(s), and recheck. ■

2. Remove the condenser fan relay from the under-hood fuse/relay box, and test it (see page 22-67).

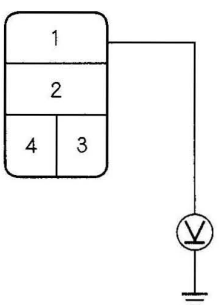
   Is the relay OK?

   YES – Go to step 3.

   NO – Replace the condenser fan relay. ■

3. Measure the voltage between the No. 1 terminal of the condenser fan relay 4P socket and body ground.

   CONDENSER FAN RELAY 4P SOCKET



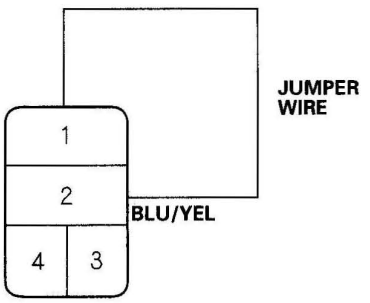
   Is there battery voltage?

   YES – Go to step 4.

   NO – Replace the under-hood fuse/relay box. ■

4. Connect the No. 1 and No. 2 terminals of the condenser fan relay 4P socket with a jumper wire.

   CONDENSER FAN RELAY 4P SOCKET



   Does the condenser fan run?

   YES – Go to step 5.

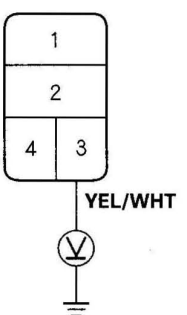
   NO – Go to step 14.

5. Disconnect the jumper wire.

6. Turn the ignition switch ON (II).

7. Measure the voltage between the No. 3 terminal of the condenser fan relay 4P socket and body ground.

   CONDENSER FAN RELAY 4P SOCKET



   Is there battery voltage?

   YES – Go to step 8.

   NO – Go to step 32.

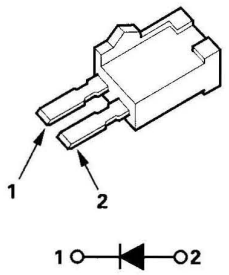
8. Turn the ignition switch OFF.

BACK

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9. Reinstall the condenser fan relay.
10. Remove A/C diode A from the passenger's under-dash fuse/relay box.
11. Check for current flow in both directions between the No. 1 and No. 2 terminals of A/C diode A.

A/C DIODE A



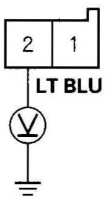
Is there current flow in only one direction?

YES – Go to step 12.

NO – Replace A/C diode A. ■

12. Turn the ignition switch ON (II).
13. Measure the voltage between the No. 2 terminal of A/C diode A 2P socket and body ground.

A/C DIODE A 2P SOCKET



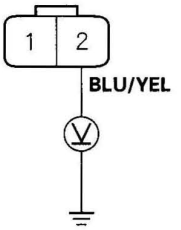
Is there battery voltage?

YES – Repair open in the wire between A/C diode A and the A/C pressure switch. ■

NO – Repair open in the wire between the condenser fan relay and A/C diode A. ■

14. Disconnect the jumper wire.
15. Reinstall the condenser fan relay.
16. Disconnect the condenser fan 2P connector.
17. Turn the ignition switch ON (II), then turn the A/C and fan switches ON.
18. Measure the voltage between the No. 2 terminal of the condenser fan 2P connector and body ground.

CONDENSER FAN 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 19.

NO – Repair open in the wire between the condenser fan relay and the condenser fan. ■

19. Turn the A/C and fan switches OFF, then turn the ignition switch OFF.
20. Reconnect the condenser fan 2P connector.

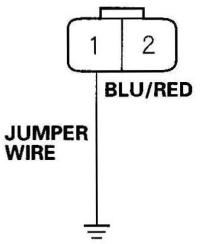
(cont'd)

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Radiator and Condenser Fans Low Speed Circuit Troubleshooting (cont'd)

21. Connect the No.1 terminal of the condenser fan 2P connector to body ground with jumper wire.

CONDENSER FAN 2P CONNECTOR



Wire side of female terminals

22. Turn the ignition switch ON (II), then turn the A/C and fan switches ON.

    Does the condenser fan run?

    YES – Go to step 23.

    NO – Replace the condenser fan motor. ■

23. Turn the A/C and fan switches OFF, then turn the ignition switch OFF.

24. Disconnect the jumper wire.

25. Remove the fan control relay from the multi-relay box, and test it (see page 22-67).

    Is the relay OK?

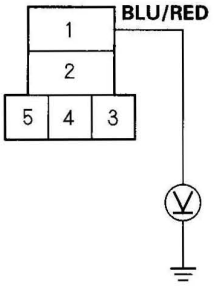
    YES – Go to step 26.

    NO – Replace the fan control relay. ■

26. Turn the ignition switch ON (II), then turn the A/C and fan switches ON.

27. Measure the voltage between the No. 1 terminal of the fan control relay 5P socket and body ground.

FAN CONTROL RELAY 5P SOCKET



Is there battery voltage?

YES – Go to step 28.

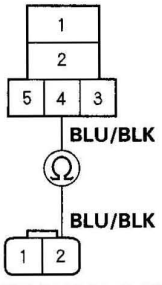
NO – Repair open in the wire between the condenser fan and the fan control relay. ■

28. Turn the A/C and fan switches OFF, then turn the ignition switch OFF.

29. Disconnect the radiator fan 2P connector.

30. Check for continuity between the No. 4 terminal of the fan control relay 5P socket and the No. 2 terminal of the radiator fan 2P connector.

FAN CONTROL RELAY 5P SOCKET



RADIATOR FAN 2P CONNECTOR
Wire side of female terminals

Is there continuity?

YES – Go to step 31.

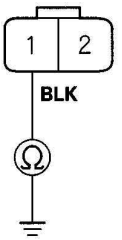
NO – Repair open in the wire between the fan control relay and the radiator fan. ■

BACK

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31. Check for continuity between the No. 1 terminal of the radiator fan 2P connector and body ground.

RADIATOR FAN 2P CONNECTOR



Wire side of female terminals

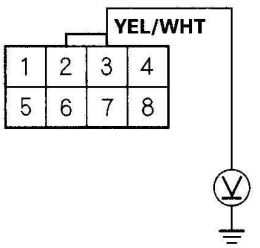
Is there continuity?

YES – Replace the radiator fan motor. ■

NO – Check for an open in the wire between the radiator fan and body ground. If the wire is OK, check for poor ground at G201. ■

32. Measure the voltage between the No. 3 terminal of the radiator fan control module 8P connector and body ground with the 8P connector connected.

RADIATOR FAN CONTROL MODULE 8P CONNECTOR



Wire side of female terminals

Is the battery voltage?

YES – Repair open in the wire between the condenser fan relay and the radiator fan control module. ■

NO – Perform the radiator fan control module input tests (see page 10-26). ■

Condenser Fan High Speed Circuit Troubleshooting

1. Check the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES – Go to step 2.

   NO – Replace the fuse, and recheck. ■

2. Remove the fan control relay from the multi-relay box, and test it (see page 22-67).

   Is the relay OK?

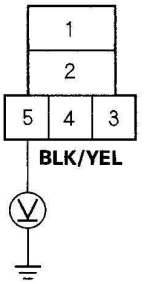
   YES – Go to step 3.

   NO – Replace the fan control relay. ■

3. Turn the ignition switch ON (II).

4. Measure the voltage between the No. 5 terminal of the fan control relay 5P socket and body ground.

FAN CONTROL RELAY 5P SOCKET



Is there battery voltage?

YES – Go to step 5.

NO – Repair open in the wire between the No. 3 fuse in the driver's under-dash fuse/relay box and the fan control relay. ■

5. Turn the ignition switch OFF.

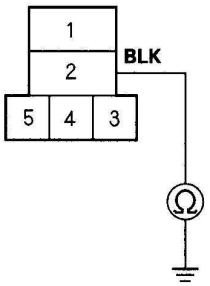
(cont'd)

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Condenser Fan High Speed Circuit Troubleshooting (cont'd)

6. Check for continuity between the No. 2 terminal of the fan control relay 5P socket and body ground.

FAN CONTROL RELAY 5P SOCKET



Is there continuity?

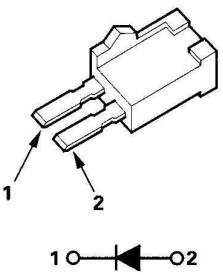
YES – Repair open in the wire between the fan control relay and A/C diode B. ■

NO – Check for an open in the wire between the fan control relay and body ground. If the wire is OK, check for poor ground at G201. ■

Radiator and Condenser Fans High Speed Circuit Troubleshooting

1. Remove A/C diode B from the right side of the dashboard.
2. Check for current flow in both directions between the No. 1 and No. 2 terminals of A/C diode B.

A/C DIODE B



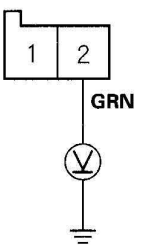
Is there current flow in only one direction?

YES – Go to step 3.

NO – Replace A/C diode B. ■

3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 2 terminal of A/C diode B 2P connector and body ground.

A/C DIODE B 2P SOCKET



Wire side of female terminals

Is there battery voltage?

YES – Go to step 5.

NO – Repair open in the wire between the radiator fan relay and A/C diode B. ■

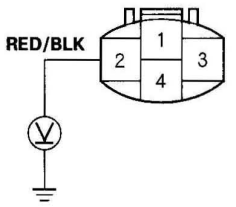
5. Turn the ignition switch OFF.

BACK

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6. Reinstall A/C diode B.
7. Disconnect the A/C pressure switch 4P connector.
8. Turn the ignition switch ON (II).
9. Measure the voltage between the No. 2 terminal of the A/C pressure switch 4P connector and body ground.

A/C PRESSURE SWITCH 4P CONNECTOR



Wire side of female terminals

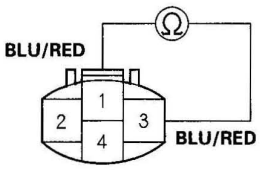
Is there battery voltage?

YES – Go to step 10.

NO – Repair open in the wire between A/C diode B and the A/C pressure switch. ■

10. Turn the ignition switch OFF
11. Check for continuity between the No. 1 and No. 3 terminals of the A/C pressure switch 4P connector.

A/C PRESSURE SWITCH 4P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Replace the A/C pressure switch. ■

NO – Repair open in the wire between A/C pressure switch terminals No. 1 and No. 3. ■

Compressor Clutch Circuit Troubleshooting

1. Check the No. 59 (7.5A) fuse in the under-hood fuse /relay box, and the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

   Are the fuses OK?

   YES – Go to step 2.

   NO – Replace the fuse(s), and recheck. ■

2. Check the engine coolant temperature (use the Honda PGM Tester PGM-FI data list if possible).

   Is the coolant temperature above normal?

   YES – Troubleshoot and repair the cause of the high engine coolant temperature. ■

   NO – Go to step 3.

3. Remove the compressor clutch relay from the under-hood fuse/relay box, and test it (see page 22-67).

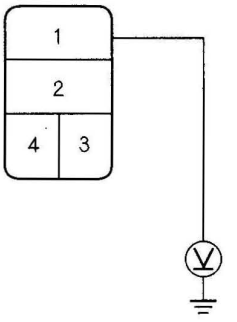
   Is the relay OK?

   YES – Go to step 4.

   NO – Replace the compressor clutch relay. ■

4. Measure the voltage between the No.1 terminal of the compressor clutch relay 4P socket and body ground.

COMPRESSOR CLUTCH RELAY 4P SOCKET



Is there battery voltage?

YES – Go to step 5.

NO – Replace the under-hood fuse/relay box. ■

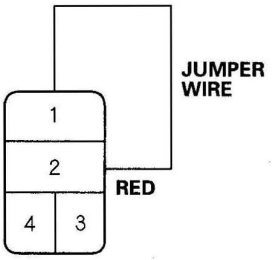
(cont'd)

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Compressor Clutch Circuit Troubleshooting (cont'd)

5. Connect the No. 1 and No. 2 terminals of the compressor clutch relay 4P socket with a jumper wire.

COMPRESSOR CLUTCH RELAY 4P SOCKET



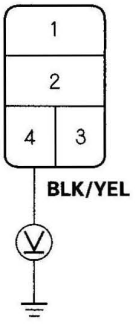
Does the compressor clutch click ?

YES – Go to step 6.

NO – Go to step 15.

6. Disconnect the jumper wire.
7. Turn the ignition switch ON (II).
8. Measure the voltage between the No. 4 terminal of the compressor clutch relay 4P socket and body ground.

COMPRESSOR CLUTCH RELAY 4P SOCKET



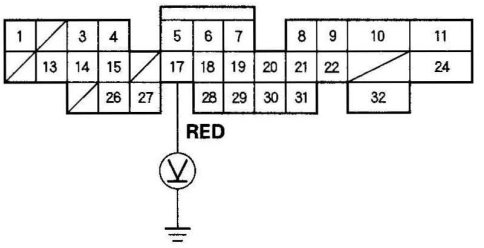
Is there battery voltage?

YES – Go to step 9.

NO – Repair open in the wire between the No. 3 fuse in the driver's under-dash fuse/relay box and the compressor clutch relay. ■

9. Turn the ignition switch OFF.
10. Reinstall the compressor clutch relay.
11. Make sure the A/C switch is OFF.
12. Turn the ignition switch ON (II).
13. Using the Backprobe Set, measure the voltage between the No. 17 terminal of PCM connector A (32P) and body ground with the PCM connectors connected.

PCM CONNECTOR A (32P)



Wire side of female terminals

Is there battery voltage?

YES – Go to step 14.

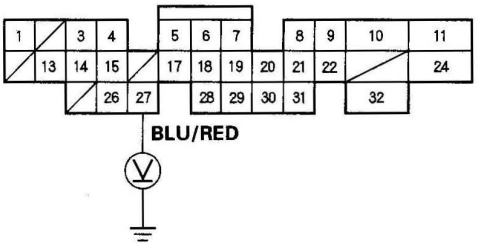
NO – Repair open in the wire between the compressor clutch relay and the PCM. ■

BACK

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14. Using the Backprobe Set, measure the voltage between the No. 27 terminal of PCM connector A (32P) and body ground with the PCM connectors connected.

PCM CONNECTOR A (32P)



Wire side of female terminals

Is there battery voltage?

YES—Check for loose wires or poor connections at PCM connector A (32P). If the connections are good, substitute a known-good PCM, and recheck. If the symptom/indication goes away, replace the original PCM. ■

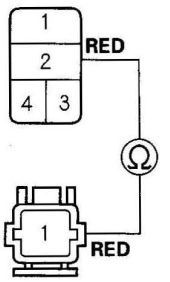
NO—Repair open in the wire between the PCM and the A/C pressure switch. ■

15. Disconnect the jumper wire.

16. Disconnect the compressor clutch 1P connector.

17. Check for continuity between the No. 2 terminal of the compressor clutch relay 4P socket and the No. 1 terminal of the compressor clutch 1P connector.

COMPRESSOR CLUTCH RELAY 4P SOCKET



COMPRESSOR CLUTCH 1P CONNECTOR
Terminal side of male terminals

Is there continuity?

YES—Check the compressor clutch clearance and the compressor clutch field coil (see page 21-63). ■

NO—Repair open in the wire between the compressor clutch relay and the compressor clutch. ■

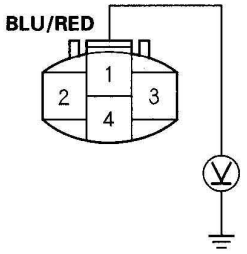
BACK

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A/C Pressure Switch Circuit Troubleshooting

1. Disconnect the A/C pressure switch 4P connector.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the No. 1 terminal of the A/C pressure switch 4P connector and body ground.

A/C PRESSURE SWITCH 4P CONNECTOR



Wire side of female terminals

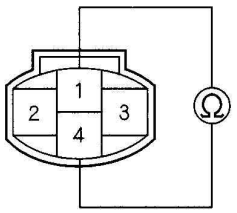
Is there battery voltage?

YES — Go to step 4.

NO — Repair open in the wire between A/C diode A, the PCM, and the A/C pressure switch. ■

4. Turn the ignition switch OFF.
5. Check for continuity between the No. 1 and No. 4 terminals of the A/C pressure switch.

A/C PRESSURE SWITCH



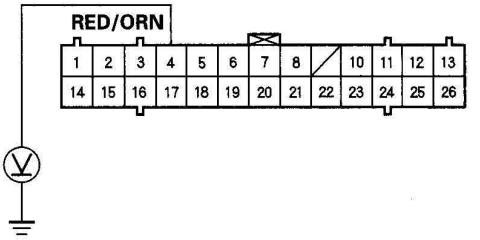
Is there continuity?

YES — Go to step 6.

NO — Go to step 10.

6. Reconnect the A/C pressure switch 4P connector.
7. Disconnect climate control unit connector B (26P).
8. Turn the ignition switch ON (II).
9. Measure the voltage between the No. 4 terminal of climate control unit connector B (26P) and body ground.

CLIMATE CONTROL UNIT CONNECTOR B (26P)



Wire side of female terminals

Is there battery voltage?

YES — Check for loose wires or poor connections at climate control unit connector B (26P) and at the A/C pressure switch 4P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

NO — Repair the open in the wire between the climate control unit and the A/C pressure switch. ■

10. Check for proper A/C system pressure.

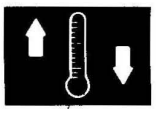
Is the pressure within specifications?

YES — Replace the A/C pressure switch. ■

NO — Repair the A/C pressure problem. ■

BACK

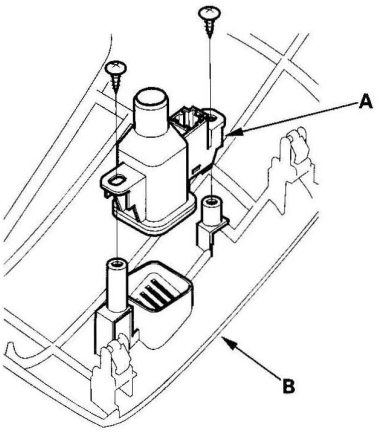
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In-car Temperature Sensor Replacement

1. Remove the dashboard lower cover (see page 20-67).
2. Remove the self-tapping screws and the in-car temperature sensor (A) from the driver's dashboard lower cover (B).



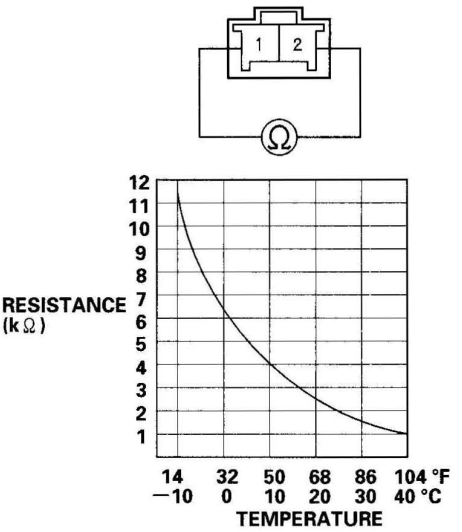
3. Install the sensor in the reverse order of removal. Be sure to connect the air hose securely.

In-car Temperature Sensor Test

Check for a change in resistance by heating or cooling the sensor with a hair drier.

Compare the resistance reading between the No. 1 and No. 2 terminals of the in-car temperature sensor with the specifications shown in the graph; the resistance should be within the specifications.

IN-CAR TEMPERATURE SENSOR

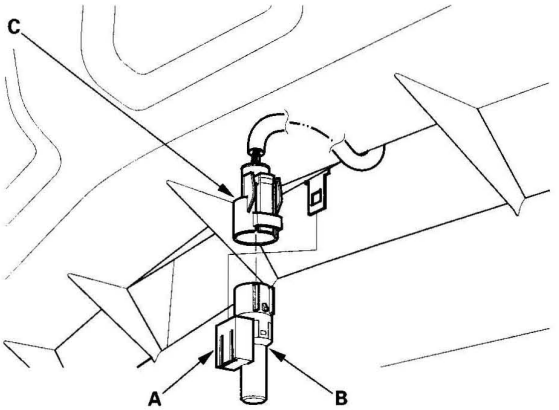


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Outside Air Temperature Sensor Replacement

1. Lift the tab (A) to release the lock, and remove the outside air temperature sensor (B) from the back of the front bumper beam. Disconnect the 2P connector (C) from the outside air temperature sensor.



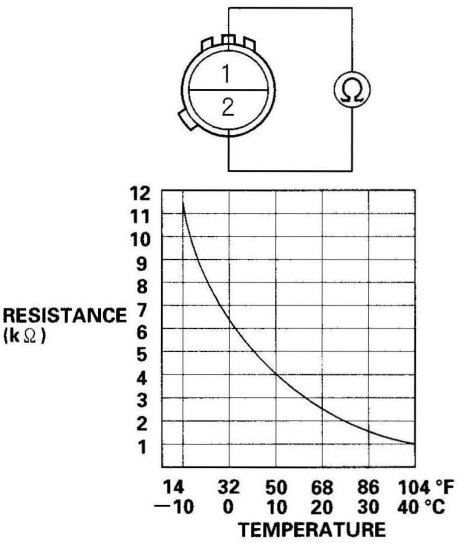
2. Install the sensor in the reverse order of removal.

Outside Air Temperature Sensor Test

Dip the sensor in ice water, and measure the resistance. Then pour hot water on the sensor, and check for a change in resistance.

Compare the resistance reading between the No. 1 and No. 2 terminals of the outside air temperature sensor with the specifications shown in the graph; the resistance should be within the specifications.

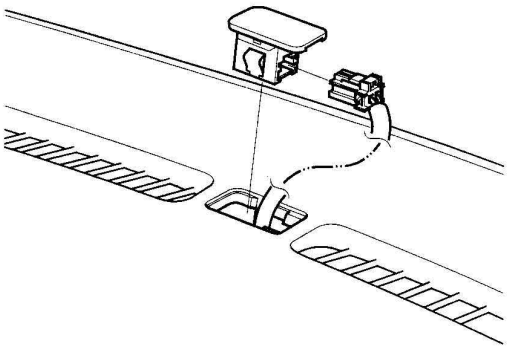
OUTSIDE AIR TEMPERATURE SENSOR



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Sunlight Sensor Replacement

1. Remove the sunlight sensor from the dashboard, then disconnect the 2P connector. Be careful not to damage the sensor and the dashboard.

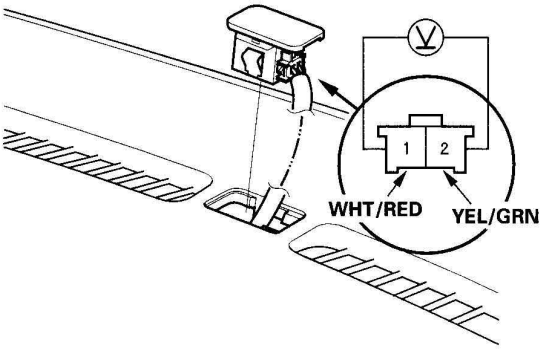


2. Install the sensor in the reverse order of removal.

Sunlight Sensor Test

Turn the ignition switch ON (II). Measure the voltage between the terminals with the (+) probe on the No. 1 terminal and the (−) probe on the No. 2 terminal with the 2P connector connected. The voltage will not change under the light of a flashlight or a fluorescent lamp. Voltage should be:

- 3.6 − 3.7 V or more with the sensor out of direct sunlight.
- 3.3 − 3.5 V or less with the sensor in direct sunlight.



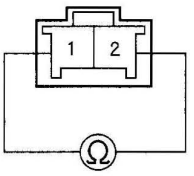
BACK

Protected by AR

Evaporator Temperature Sensor Test

1. Dip the sensor in ice water, and measure the resistance between its terminals.

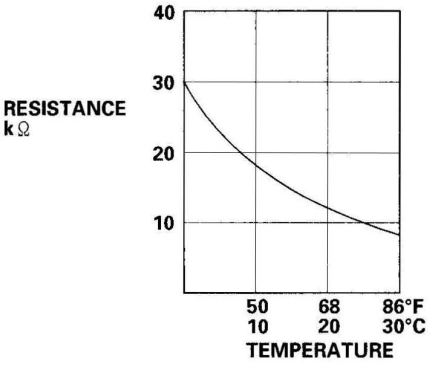
EVAPORATOR TEMPERATURE SENSOR



Terminal side of male terminals

2. Then pour hot water on the sensor, and check for a change in resistance.

3. Compare the resistance readings with the specifications shown in the graph; the resistance should be within the specifications.



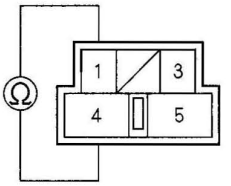
Power Transistor Test

1. Disconnect the 5P connector from the power transistor.

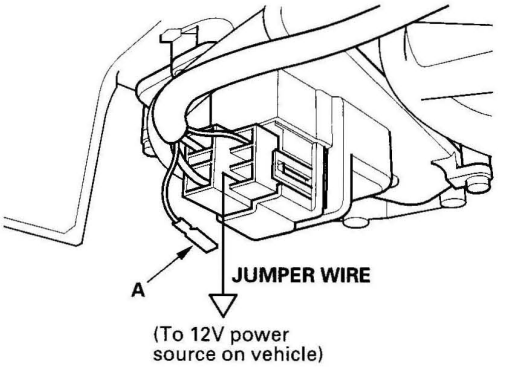
2. Measure the resistance between the No. 1 and No. 4 terminals of the power transistor. It should be approximately 1.4 — 1.5 kΩ.

   - If the resistance is within the specifications, go to step 3.
   - If the resistance is not within the specifications, replace the power transistor.

POWER TRANSISTOR



3. Carefully release the lock tab on the No. 3 terminal (ORN/BLK) (A) in the 5P connector, then remove the terminal and insulate it from body ground.



4. Reconnect the 5P connector to the power transistor.

5. Supply 12 volts to the No. 3 cavity with a jumper wire.

6. Turn the ignition switch ON (II), and check that the blower motor runs.

   - If the blower motor does not run, replace the power transistor.
   - If the blower motor runs, the power transistor is OK.

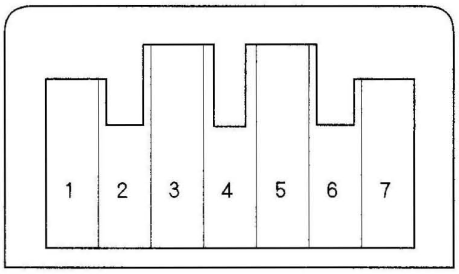
BACK

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Air Mix Control Motor Test

1. Disconnect the 7P connector from the air mix control motor.
2. Connect battery power to the No. 1 terminal of the air mix control motor, and ground the No. 2 terminal; the air mix control motor should run, and stop at Max Cool. If it doesn't, reverse the connections; the air mix control motor should run, and stop at Max Hot. If the air mix control motor does not run, remove it, then check the air mix control linkage and door for smooth movement.
   - If the linkage and door move smoothly, replace the air mix control motor.
   - If the linkage or door sticks or binds, repair them as needed.

AIR MIX CONTROL MOTOR

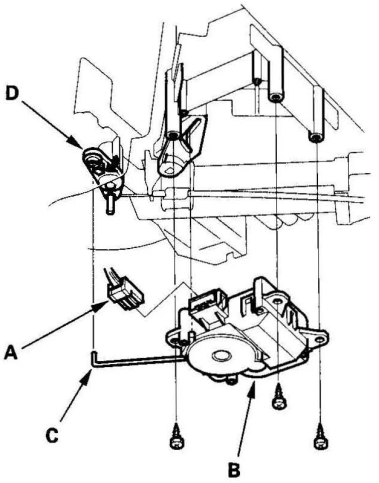


3. Measure the resistance between the No. 5 and No. 7 terminals. It should be between 4.2 k to 7.8 kΩ.
4. Measure the resistance between the No. 3 and No. 5 terminals.

   Max Cool—0.58 k to 1.09 kΩ
   Max Hot—3.52 k to 6.55 kΩ

Air Mix Control Motor Replacement

1. Disconnect the 7P connector (A) from the air mix control motor (B). Remove the rod (C) of the air mix control motor from the air mix control linkage (D). Remove the self-tapping screws and the air mix control motor from the heater unit.



2. Install the motor in the reverse order of removal. Make sure the rod is properly engaged with the linkage. After installation, make sure the motor runs smoothly.

BACK

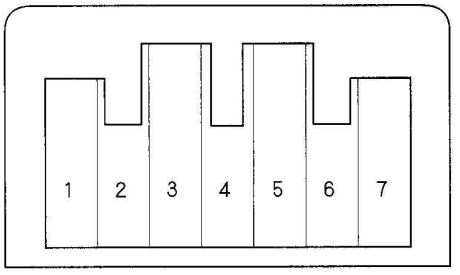
Protected by AR

Mode Control Motor Test

1. Disconnect the 7P connector from the mode control motor.

2. Connect battery power to the No. 2 terminal of the mode control motor, and ground the No. 1 terminal; the mode control motor should run smoothly, and stop at Vent. If it doesn't, reverse the connections; the mode control motor should run smoothly, and stop at Defrost. When the mode control motor stops running, disconnect battery power immediately.

MODE CONTROL MOTOR



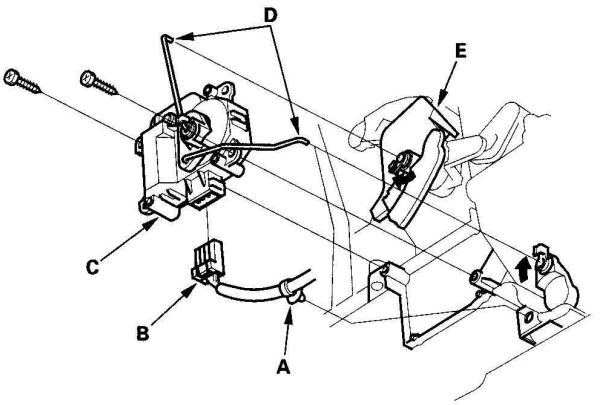
3. Use a digital multimeter with an output of 1 mA or less at the 20 kΩ range. With the mode control motor running as in step 2, check for continuity between the No. 3, 4, 5, 6 terminals and the No. 7 terminal individually. There should be continuity for a moment at each terminal.

4. If the mode control motor does not run in step 2, remove it, then check the mode control linkage and doors for smooth movement.

   - If the linkage and doors move smoothly, replace the mode control motor.
   - If the linkage or doors stick or bind, repair them as needed.

Mode Control Motor Replacement

1. Remove the wire harness clip (A), then disconnect the 7P connector (B) from the mode control motor (C). Remove the rods (D) of the mode control motor from the mode control linkage (E). Remove the self-tapping screws and the mode control motor from the heater unit.



2. Install the motor in the reverse order of removal. After installation, make sure the motor runs smoothly.

Protected by AR

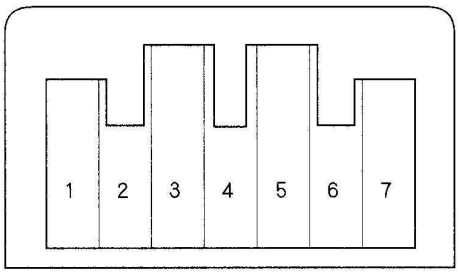
Recirculation Control Motor Test

1. Disconnect the 7P connector from the recirculation control motor.

   NOTICE
   Incorrectly applying power and ground to the recirculation control motor will damage it. Follow the instructions carefully.

2. Connect battery power to the No. 1 terminal of the recirculation control motor, and ground the No. 5 and No. 7 terminals; the recirculation control motor should run smoothly. To avoid damaging the recirculation control motor, do not reverse power and ground. Disconnect the No. 5 or No. 7 terminals from ground; the recirculation control motor should stop at Fresh or Recirculate. Don't cycle the recirculation control motor for a long time.

RECIRCULATION CONTROL MOTOR



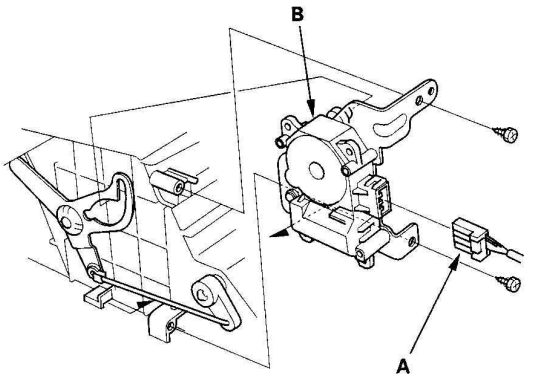
3. If the recirculation control motor does not run in step 2, remove it, then check the recirculation control linkage and doors for smooth movement.

   - If the linkage and doors move smoothly, replace the recirculation control motor.
   - If the linkage or doors stick or bind, repair them as needed.

Recirculation Control Motor Replacement

1. Remove the glove box (see page 20-69).

2. Disconnect the 7P connector (A) from the recirculation control motor (B). Remove the self-tapping screws and the recirculation control motor from the blower unit.



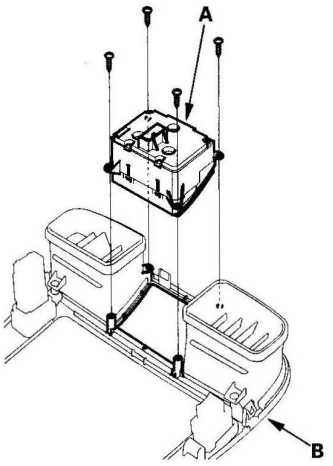
3. Install the motor in the reverse order of removal. Make sure the pin on the motor is properly engaged with the linkage. After installation, make sure the motor runs smoothly.

BACK

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Climate Control Panel Removal and Installation

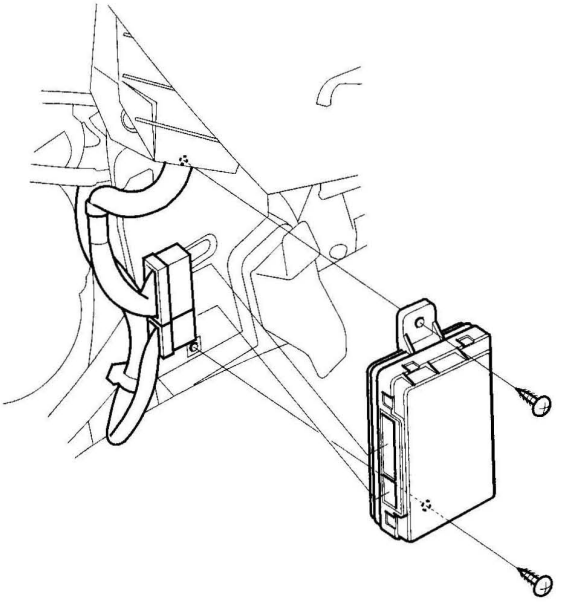
1. Remove the center panel (see page 20-68).
2. Remove the self-tapping screws and the climate control panel (A) from the center panel (B).



3. Install the control panel in the reverse order of removal. After installation, operate the control panel controls to see whether it works properly.
4. Run the self-diagnosis function to confirm that there are no problems in the system (see page 21-8).

Climate Control Unit Removal and Installation

1. Remove the center console (see page 20-65).
2. Disconnect the connectors from the climate control unit, then remove the self-tapping screws and the climate control unit.



3. Install the control unit in the reverse order of removal. After installation, operate the control panel controls to see whether it works properly.
4. Run the self-diagnosis function to confirm that there are no problems in the system (see page 21-8).

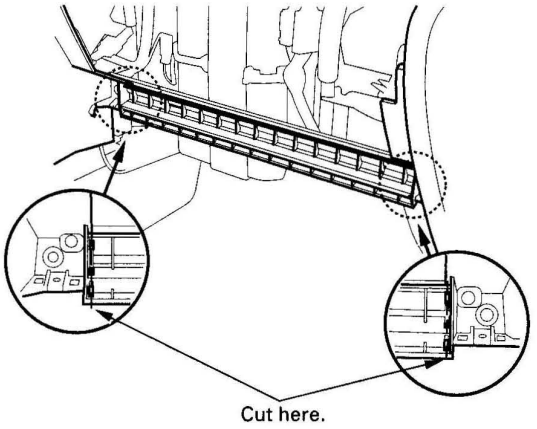
Protected by AR

Dust and Pollen Filter Replacement

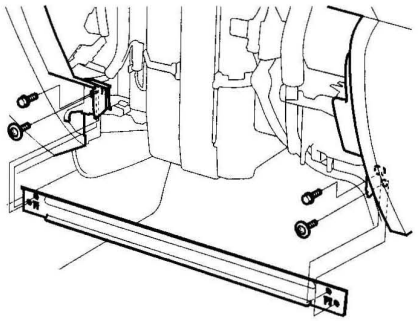
The dust and pollen filter should be replaced every 30,000 miles (48,000 km) or 24 months whichever comes first. Replace the filter more often if the airflow is less than usual.

1. Remove the glove box (see page 20-69).

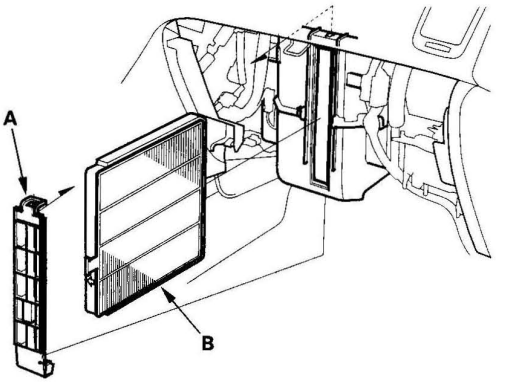
2. Cut the plastic cross brace in the glove box opening with diagonal cutters in the area shown, and discard it.



3. Remove the bolts, the screws and the glove box frame.



4. Remove the filter lid (A) from the evaporator, then pull out the filter (B).



5. Install the filter in the reverse order of removal. Make sure that there is no air leaking out of the evaporator.

6. Install the glove box frame and glove box in the reverse order of removal.

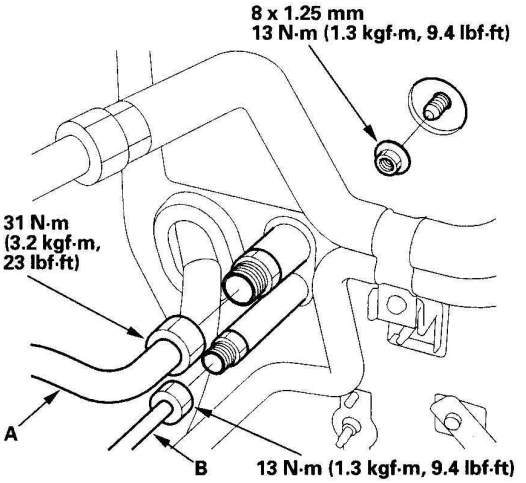
BACK

Protected by AR

Evaporator Removal and Installation

1. Recover the refrigerant with a recovery/recycling/charging station (see page 21-68).

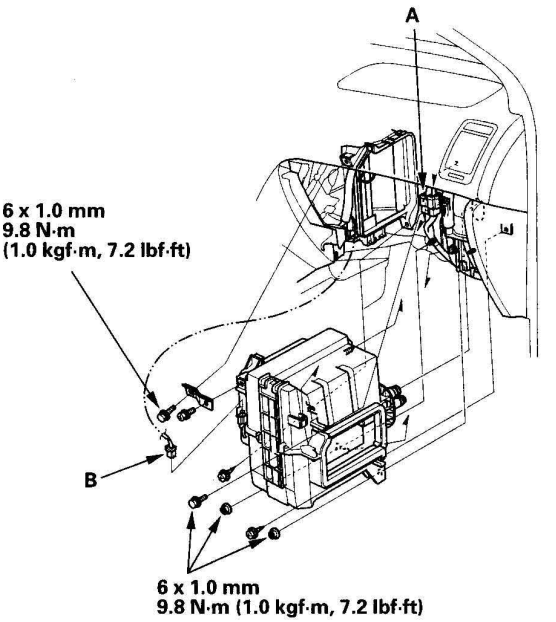
2. Disconnect the suction line (A) and receiver line (B) from the evaporator. Remove the mounting nut. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



3. Remove the glove box (see page 20-69).

4. Remove the plastic cross brace, then remove the glove box frame (see page 21-54).

5. Remove the wire harness connectors (A). Disconnect the evaporator temperature sensor connector (B). Remove the self-tapping screws, the mounting nuts, the mounting bolts, the bracket (C) and the evaporator (D).



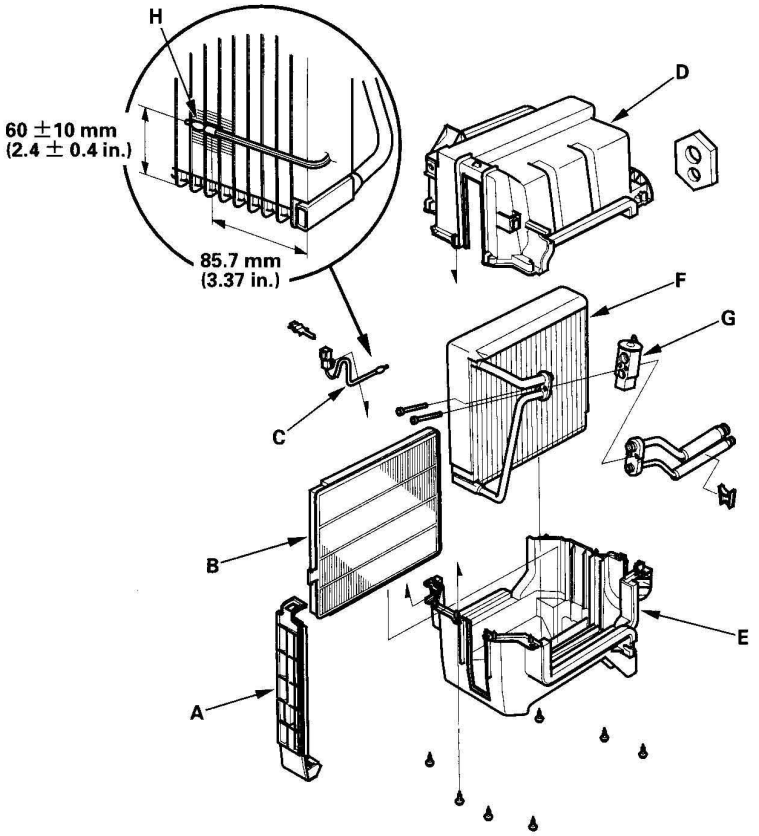
6. Install the evaporator in the reverse order of removal, and note these items.

- If you're installing a new evaporator, add refrigerant oil (DENSO ND-OIL 8) (see page 21-6).
- Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
- Immediately after using the oil, reinstall the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
- Make sure that there is no air leakage.
- Charge the system (see page 21-70).

Protected by AR

Evaporator Components Replacement

1. Remove the filter lid (A), then pull out the dust and pollen filter (B).



2. Pull out the evaporator temperature sensor (C) from the evaporator fins.
3. Remove the screws, carefully separate the upper housing (D) from the lower housing (E), then remove the evaporator core (F).
4. If necessary, remove the expansion valve (G).
5. Reassemble the evaporator in the reverse order of disassembly, and note these items:
   - Replace all O-rings with new ones at each fittitng and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
   - Immediately after using the oil, reinstall the cap on the container, and seal it to avoid moisture absorption.
   - Reinstall the evaporator temperature sensor bulb (H) and clip in its original location.
   - Make sure no air is leaking form the upper housing and the lower housing fitting.

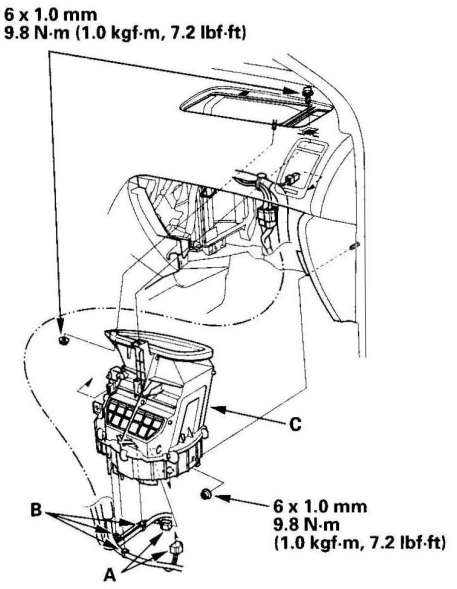
BACK

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Blower Unit Removal and Installation

SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

1. Make sure you have the anti-theft code for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative cable from the battery.
3. Remove the front passenger's airbag (see page 23-118).
4. Remove the evaporator (see page 21-55).
5. Disconnect the connectors (A) from the blower motor, the power transistor, and the recirculation control motor, then remove the wire harness clips (B). Remove the mounting nuts, the mounting bolt and the blower unit (C).

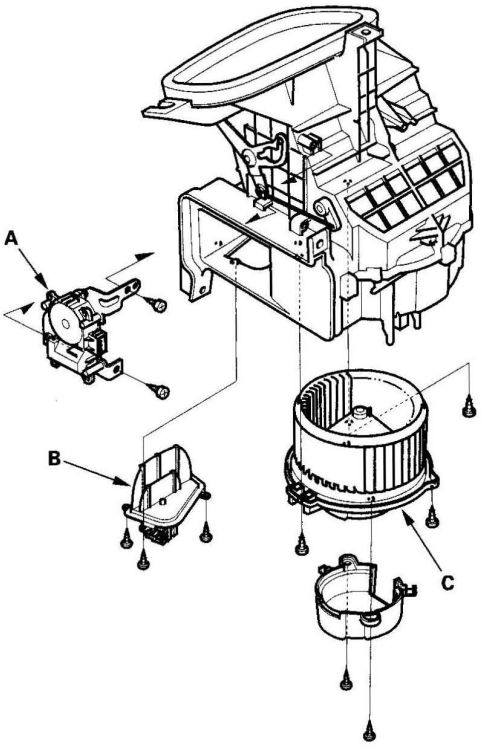


6. Install the unit in the reverse order of removal, and note these items:
   - Make sure that there is no air leakage.
   - Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Blower Unit Components Replacement

Note these items when overhauling the blower unit:

- The recirculation control motor (A), the power transistor (B) and the blower motor (C) can be replaced without removing the blower unit.
- Before reassembly, make sure that the recirculation control linkage and doors move smoothly without binding.
- After reassembly, make sure the recirculation control motor runs smoothly (see page 21-52).



Protected by AR

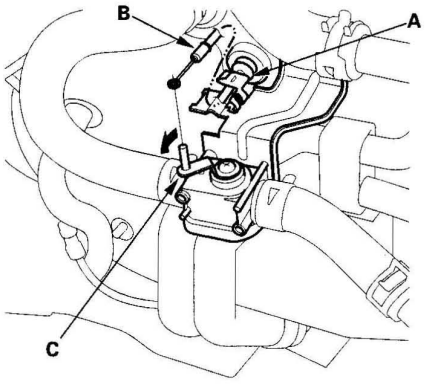
Heater Unit/Core Replacement

SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

1. Make sure you have the anti-theft code for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.

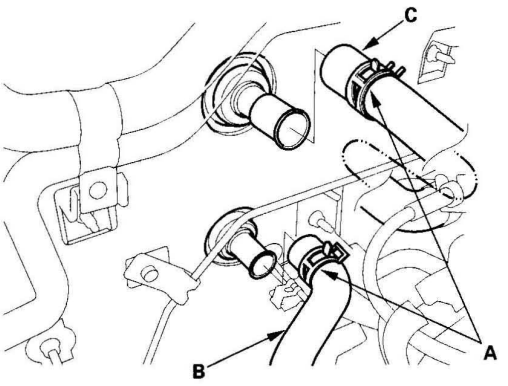
2. Disconnect the negative cable from the battery.

3. From under the hood, open the cable clamp (A), then disconnect the heater valve cable (B) from the heater valve arm (C). Turn the heater valve arm to the fully opened position as shown.

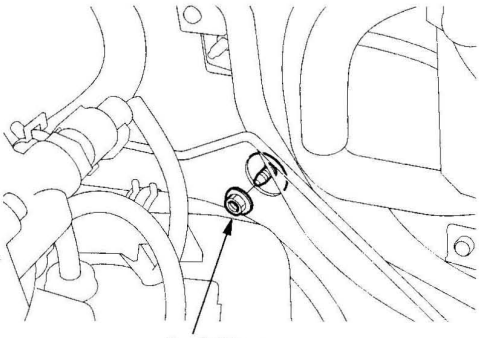


4. When the engine is cool, drain the engine coolant from the radiator (see page 10-8).

5. Slide the hose clamps (A) back, then disconnect the inlet heater hose (B) and the outlet heater hose (C) from the heater unit. Engine coolant will run out when the hoses are disconnected; drain it into a clean drip pan. Be sure not to let coolant spill on the electrical parts or the painted surfaces. If any coolant spills, rinse it off immediately.



6. Remove the mounting nut from the heater unit. Take care not to damage or bend the fuel lines and the brake lines, etc.



8 x 1.25 mm
13 N·m (1.3 kgf·m, 9.4 lbf·ft)

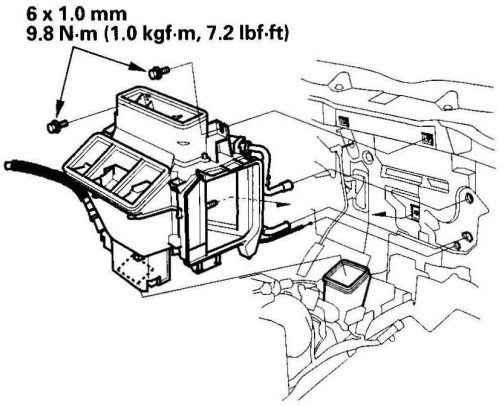
BACK

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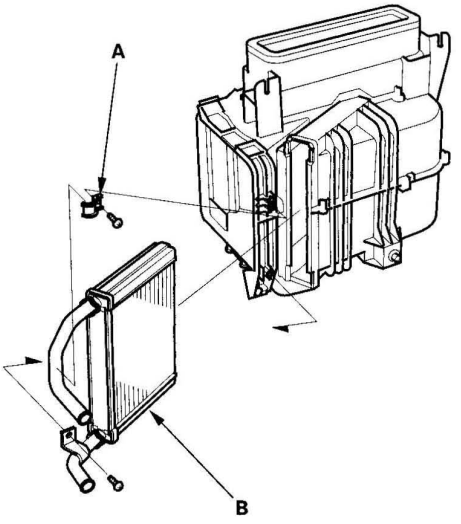
7. Remove the dashboard (see page 20-71).

8. Remove the evaporator (see page 21-55).

9. Remove the mounting bolts and the heater unit.



10. Remove the self-tapping screws and the clamp (A), then carefully pull out the heater core (B) so you don't bend the inlet and outlet pipes.



11. Install the heater core in the reverse order of removal.

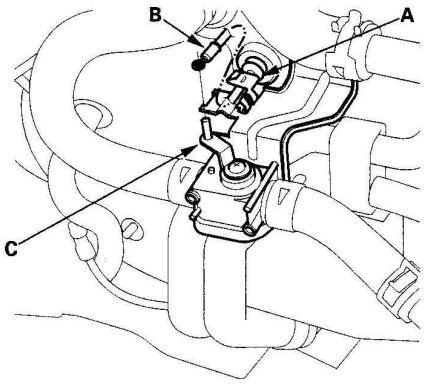
12. Install the heater unit in the reverse order of removal, and note these items:

- Do not interchange the inlet and outlet heater hoses, and install the hose clamps securely.
- Refill the cooling system with engine coolant (see page 10-8).
- Adjust the heater valve cable (see page 21-60).
- Make sure that there is no coolant leakage.
- Make sure that there is no air leakage.
- Enter the anti-theft code for the radio, then enter the customer's radio station presets.

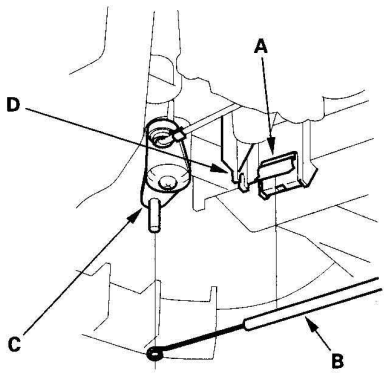
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Heater Valve Cable Adjustment

1. From under the hood, open the cable clamp (A), then disconnect the heater valve cable (B) from the heater valve arm (C).



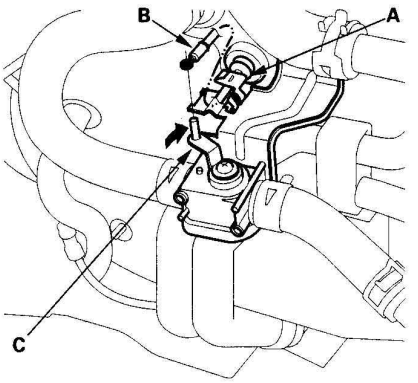
2. From under the dash, disconnect the heater valve cable housing from the cable clamp (A), and disconnect the heater valve cable (B) from the air mix control linkage (C).



3. Set the temperature control button on Max Cool (60°F or 18°C) with the ignition switch ON (II).

4. Attach the heater valve cable (B) to the air mix control linkage (C) as shown above. Hold the end of the heater valve cable housing against the stop (D), then snap the heater valve cable housing into the cable clamp (A).

5. From under the hood, turn the heater valve arm (C) to the fully closed position as shown, and hold it. Attach the heater valve cable (B) to the heater valve arm, and gently pull on the heater valve cable housing to take up any slack, then install the heater valve cable housing into the cable clamp (A).

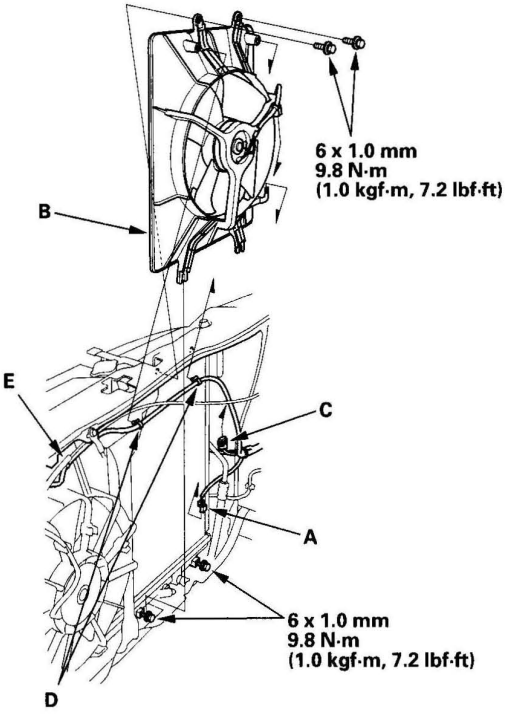


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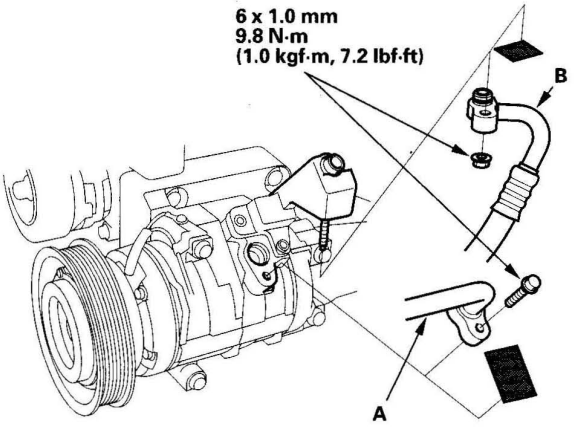
Protected by AR

Compressor Replacement

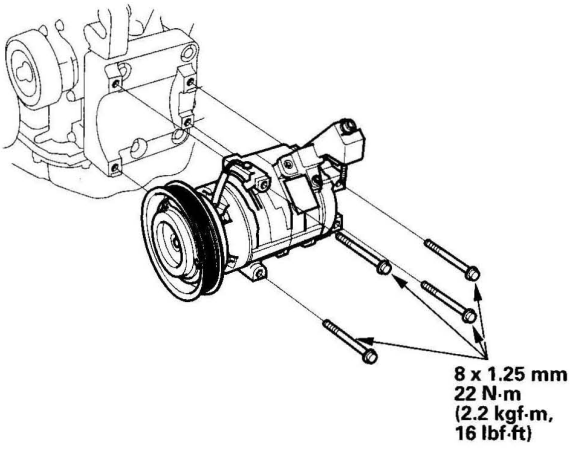
1. If the compressor is marginally operable, run the engine at idle speed, and let the air conditioning work for a few minutes, then shut the engine off.
2. Make sure you have the anti-theft code for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
3. Disconnect the negative cable from the battery.
4. Recover the refrigerant with a recovery/recycling/charging station (see page 21-68).
5. Remove the alternator (see page 4-24).
6. Remove the compressor clutch connector (A) from the condenser fan shroud (B), then disconnect the connector. Disconnect the condenser fan connector (C), then remove the wire harness clips (D) from the condenser fan shroud. Remove the cruise control actuator cable (E) from the clamp. Loosen the lower mounting bolts, then remove the upper mounting bolts and the condenser fan shroud. Be careful not to damage the radiator fins when removing the condenser fan shroud.



7. Remove the bolt and the nut, then disconnect the suction line (A) and discharge line (B) from the compressor. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



8. Remove the mounting bolts and the compressor. Be careful not to damage the radiator fins when removing the compressor.

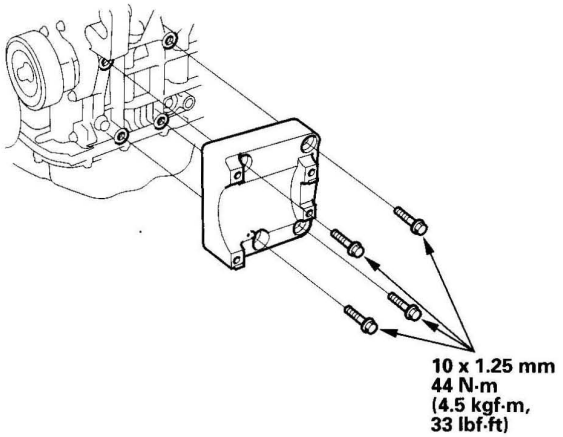


(cont'd)

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Compressor Replacement (cont'd)

9. If necessary, remove the mounting bolts and the compressor brecket.



10. Install the compressor in the reverse order of removal, and note these items:

- If you're installing a new compressor, you must calculate the amount of refrigerant oil to be removed from it (see page 21-6).
- Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
- Use refrigerant oil (DENSO ND-OIL 8) for HFC-134a DENSO piston type compressor only.
- To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- Immediately after using the oil, reinstall the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
- Be careful not to damage the radiator fins when installing the compressor and the condenser fan shroud.
- Charge the system (see page 21-70).
- Enter the anti-theft code for the radio, then enter the customer's radio station presets.

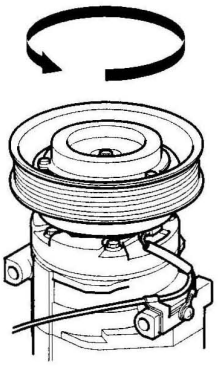
BACK

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Compressor Clutch Check

1. Check the pressure plate for discoloration, peeling, or other damage. If there is damage, replace the clutch set (see page 21-64).

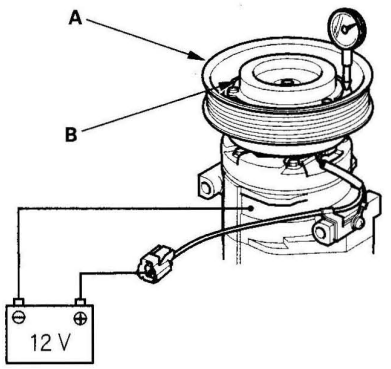
2. Check the pulley bearing play and drag by rotating the pulley by hand. Replace the clutch set with a new one if it is noisy or has excessive play/drag (see page 21-64).



3. Measure the clearance between the pulley (A) and the pressure plate (B) with a dial indicator. Zero out the indicator, then apply battery voltage to the compressor clutch. Measure the movement of the pressure plate when the voltage is applied. If the clearance is not within the specified limits, the pressure plate must be reshimed (see page 21-64).

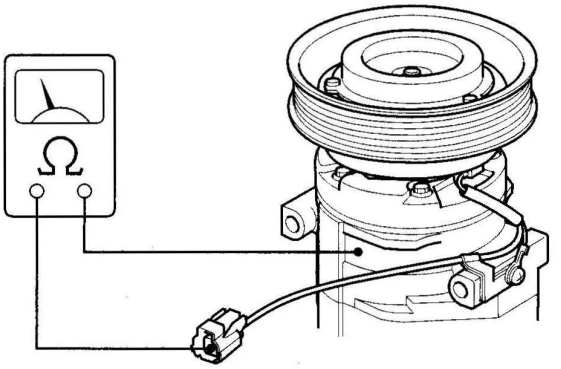
   Clearance: 0.5±0.15 mm (0.020±0.006 in.)

   NOTE: The shims are available in three thicknesses: 0.1 mm, 0.3 mm and 0.5 mm.



4. Check resistance of the field coil. If resistance is not within specifications, replace the field coil (see page 21-64).

   Field Coil Resistance: 3.4—3.8 ohms at 68°F (20°C)

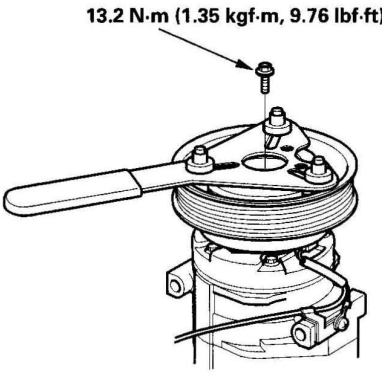


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Compressor Clutch Overhaul

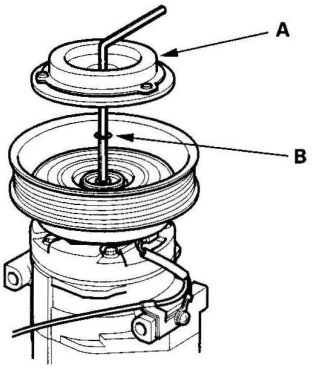
Special Tool Required
A/C clutch holder, Robinair 10204, Kent-Moore J37872, or Honda Tool and Equipment KMT-J33939, commercially available

1. Remove the center bolt while holding the pressure plate with a commercially available A/C clutch holder.

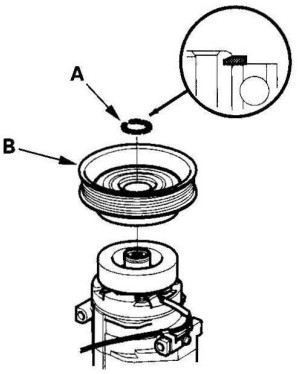


2. Remove the pressure plate (A) and shim(s) (B), taking care not to lose the shim(s). If the clutch needs adjustment, increase or decrease the number and thickness of shims as nesessary, then reinstall the pressure plate, and recheck its clearance (see page 21-63).

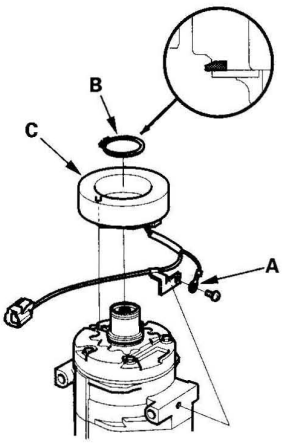
   NOTE: The shims are available in three thicknesses: 0.1 mm, 0.3 mm and 0.5 mm.



3. If you are replacing the field coil, remove the snap ring (A) with snap ring pliers, then remove the pulley (B). Be careful not to damage the pulley and compressor.



4. Remove the screw from the field coil ground terminal (A). Remove the snap ring (B) with snap ring pliers, then remove the field coil (C). Be careful not to damage the field coil and compressor.



BACK

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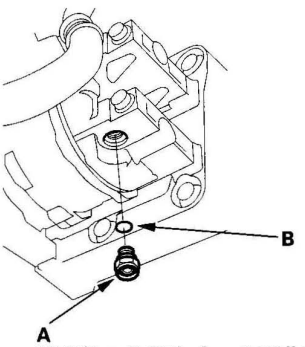
5. Reassemble the clutch in the reverse order of disassembly, and note these items:

   - Install the field coil with the wire side facing down, and align the boss on the field coil with the hole in the compressor.
   - Clean the pulley and compressor sliding surfaces with contact cleaner or other non-petroleum solvent.
   - Install new snap rings, note the installation direction, and make sure they are fully seated in the groove.
   - Make sure that the pulley turns smoothly after it's reassembled.
   - Route and clamp the wires properly or they can be damaged by the pulley.

Compressor Relief Valve Replacement

1. Recover the refrigerant with a recovery/recycling/charging station (see page 21-68).

2. Remove the relief valve (A) and the O-ring (B). Plug the opening to keep foreign matter from entering the system and the compressor oil from running out.



13.2 N·m (1.35 kgf·m, 9.76 lbf·ft)

3. Clean the mating surfaces.

4. Replace the O-ring with a new one at the relief valve, and apply a thin coat of refrigerant oil before installing it.

5. Remove the plug, and install and tighten the relief valve.

6. Charge the system (see page 21-70).

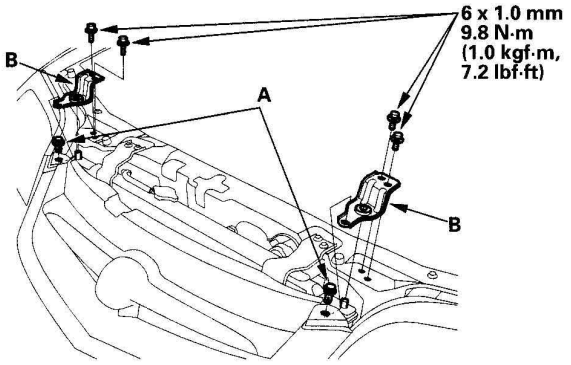
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Condenser Replacement

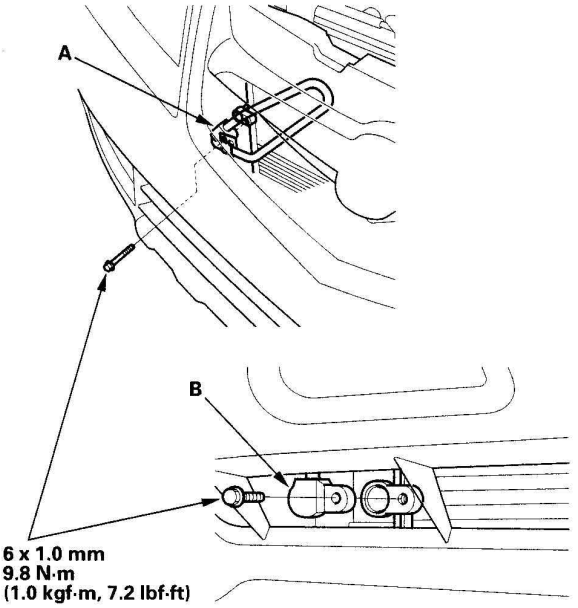
1. Recover the refrigerant with a recovery/recycling/charging station (see page 21-68).

2. Remove the front bulkhead cover, and the hood latch (see page 20-127).

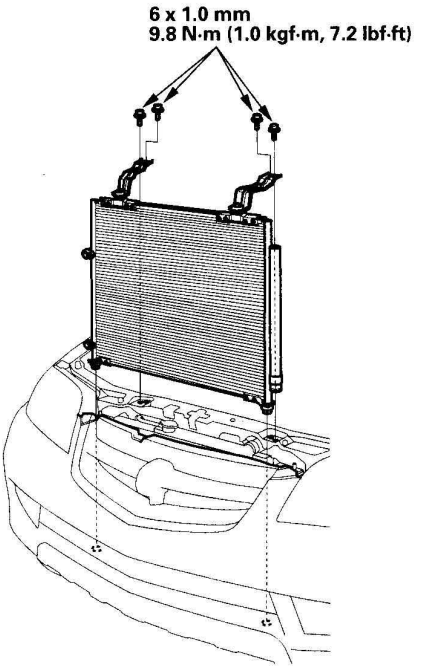
3. Remove the clips (A), then remove the bolts and the radiator upper mount brackets (B).



4. Remove the bolts, then disconnect the discharge line (A) and receiver line (B) from the condenser. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



5. Remove the bolts, then remove the condenser by lifting it up. Be careful not to damage the radiator and condenser fins when removing the condenser.



6. Install the condenser in the reverse order of removal, and note these items:

   - If you're installing a new condenser, add refrigerant oil (DENSO ND-OIL 8) (see page 21-6).
   - Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
   - Immediately after using the oil, reinstall the cap on the container, and seal it to avoid moisture absorption.
   - Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
   - Be careful not to damage the radiator and condenser fins when installing the condenser.
   - Charge the system (see page 21-70).

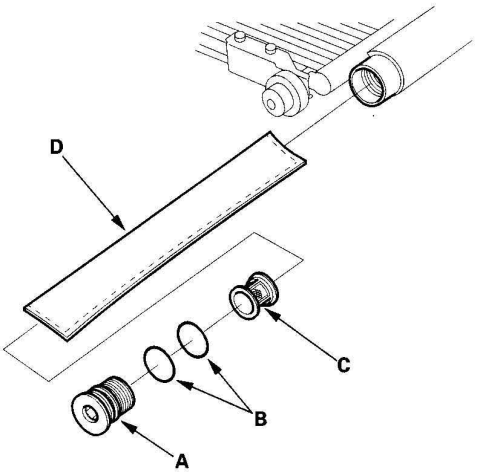
BACK

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Receiver/Dryer Desiccant Replacement

1. Remove the condensor (see page 21-66).

2. Remove the cap (A) from the bottom of the condenser, then remove the O-rings (B), the filter (C) and the desiccant (D).



3. Install the desiccant in the reverse order of removal, and note these items:

   Replace the O-rings with new ones, and apply a thin coat of refrigerant oil (DENSO ND-OIL 8) before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.

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Refrigerant Recovery

⚠CAUTION

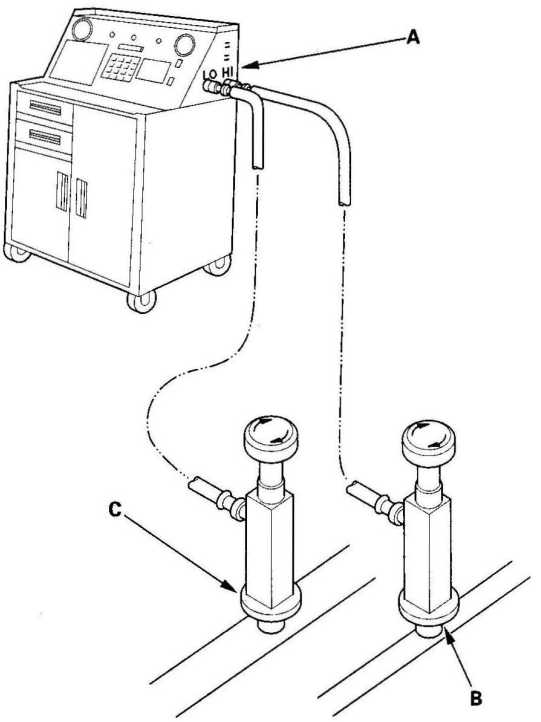
- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant recovery/recycling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instructions.



2. Measure the amount of refrigerant oil removed from the A/C system after the recovery process is completed. Be sure to put the same amount of new refrigerant oil back into the A/C system before charging.

BACK

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System Evacuation

⚠CAUTION

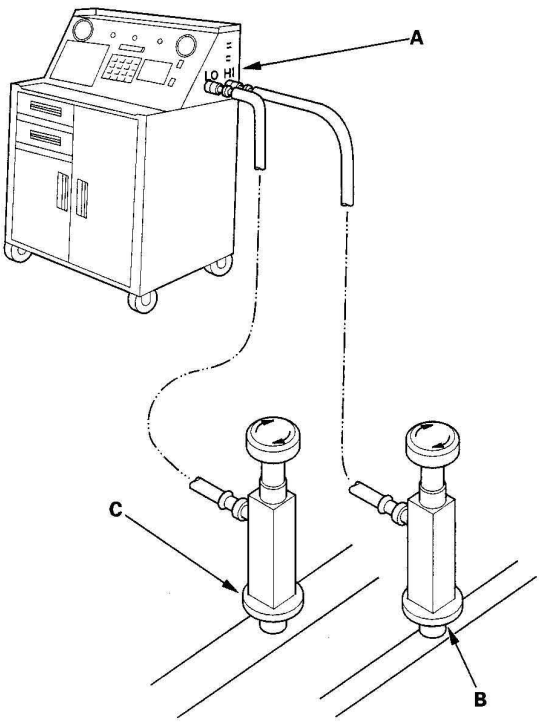
- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. When an A/C System has been opened to the atmosphere, such as during installation or repair, it must be evacuated using a R-134a refrigerant recovery/recycling/charging station (If the system has been open for several days, the receiver/dryer should be replaced, and the system should be evacuated for several hours.)
2. Connect a R-134a refrigerant recovery/recycling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instructions. Evacuate the system.



3. If the low-pressure does not reach more than 93.3 kPa (700 mm Hg, 27.6 in.Hg) in 15 minutes, there is probably a leak in the system. Partially charge the system, and check for leaks (see step 3 on page 21-71).

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System Charging

⚠CAUTION

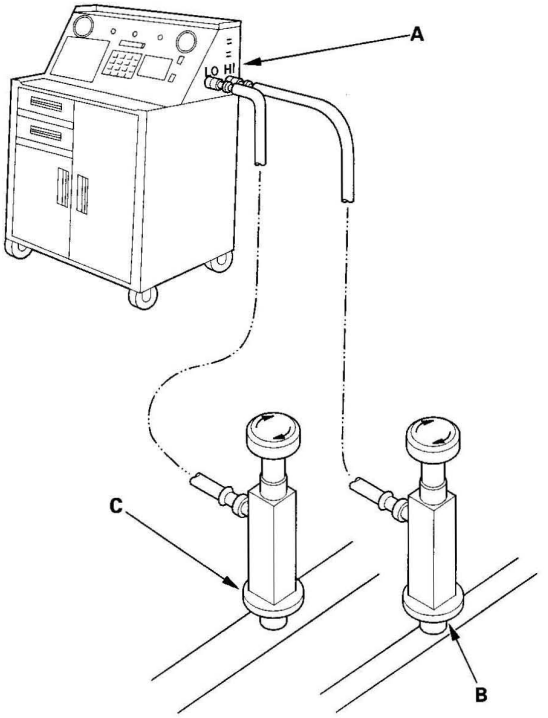
- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant recovery/recycling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instructions.



2. Evacuate the system (see page 21-69).
3. Add the same amount of new refrigerant oil to the system that was removed during recovery. Use only DENSO ND-OIL 8 refrigerant oil.
4. Charge the system with the specified amount of R-134a refrigerant. Do not overcharge the system; the compressor will be damaged.

   Select the appropriate units of measure for your refrigerant charging station.

   Refrigerant capacity:
   700 to 750 g
   0.70 to 0.75 kg
   1.5 to 1.7 lbs
   24.7 to 26.5 oz
5. Check for refrigerant leaks (see page 21-71).
6. Check for system performance (see page 21-72).

BACK

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Refrigerant Leak Test

Special Tool Required
Leak detector, Honda Tool and Equipment YGK-H-10PM
commercially available

⚠WARNING

- Compressed air mixed with R-134a froms a combustible vapor.
- The vapor can burn or explode causing serious injury.
- Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning system.

⚠CAUTION

- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

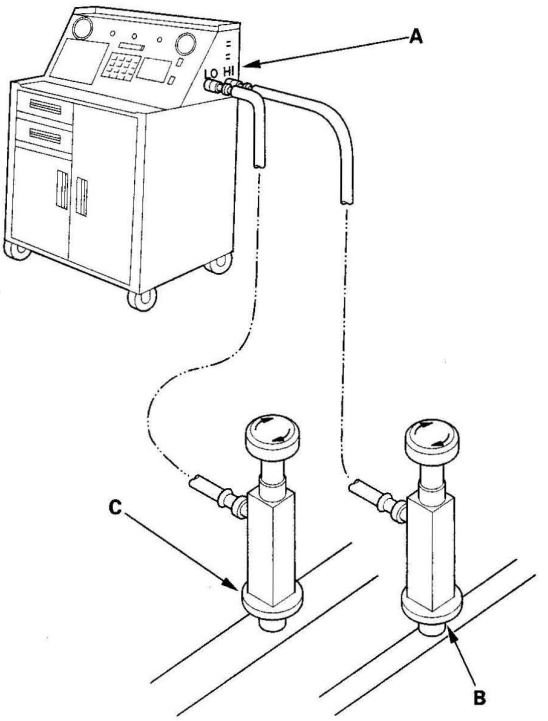
Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

Additional health and safety information may be obtained from the refrigerant and lulbricant manufacturers.

1. Connect a R-134a refrigerant recovery/recycling/ charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instructions.



2. Open high pressure valve to charge the system to the specified capacity, then close the supply valve, and disconnect the charging station fitings.

   Select the appropriate units of measure for your refrigerant charging station.

   Refrigerant capacity:
   700 to 750 g
   0.70 to 0.75 kg
   1.5 to 1.7 lbs
   24.7 to 26.5 oz

3. Check the system for leaks using a R-134a refrigerant leak detector with an accuracy of 14 g (0.5 oz) per year or better.

4. If you find leaks that require the system to be opened (to repair or replace hoses, fittings, etc.), recover the system.

5. After checking and repairing leaks, the system must be evacuated.

BACK

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A/C System Tests

Performance Test

⚠ WARNING

- Compressed air mixed with R-134a forms a combustible vapor.
- The vapor can burn or explode causing serious injury.
- Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning systems.

⚠ CAUTION

- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

The performance test will help determine if the air conditioner system is operating within specifications.

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

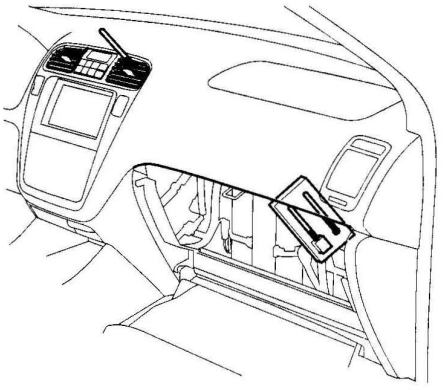
R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant recovery/recycling/charging station to the high-pressure service port and the low-pressure service port, following the equipment manufacturer's instructions.

2. Determine the relative humidity and air temperature.

3. Insert a thermometer in the center air vent.



4. Test conditions:
   - Avoid direct sunlight.
   - Open hood.
   - Open front doors.
   - Set the temperature control button on Max Cool (60°F or 18°C), the mode control switch on Vent and the recirculation control switch on Recirculate.
   - Turn the A/C switch on and the fan switch on Max.
   - Run the engine at 1,500 rpm.
   - No driver or passengers in vehicle.

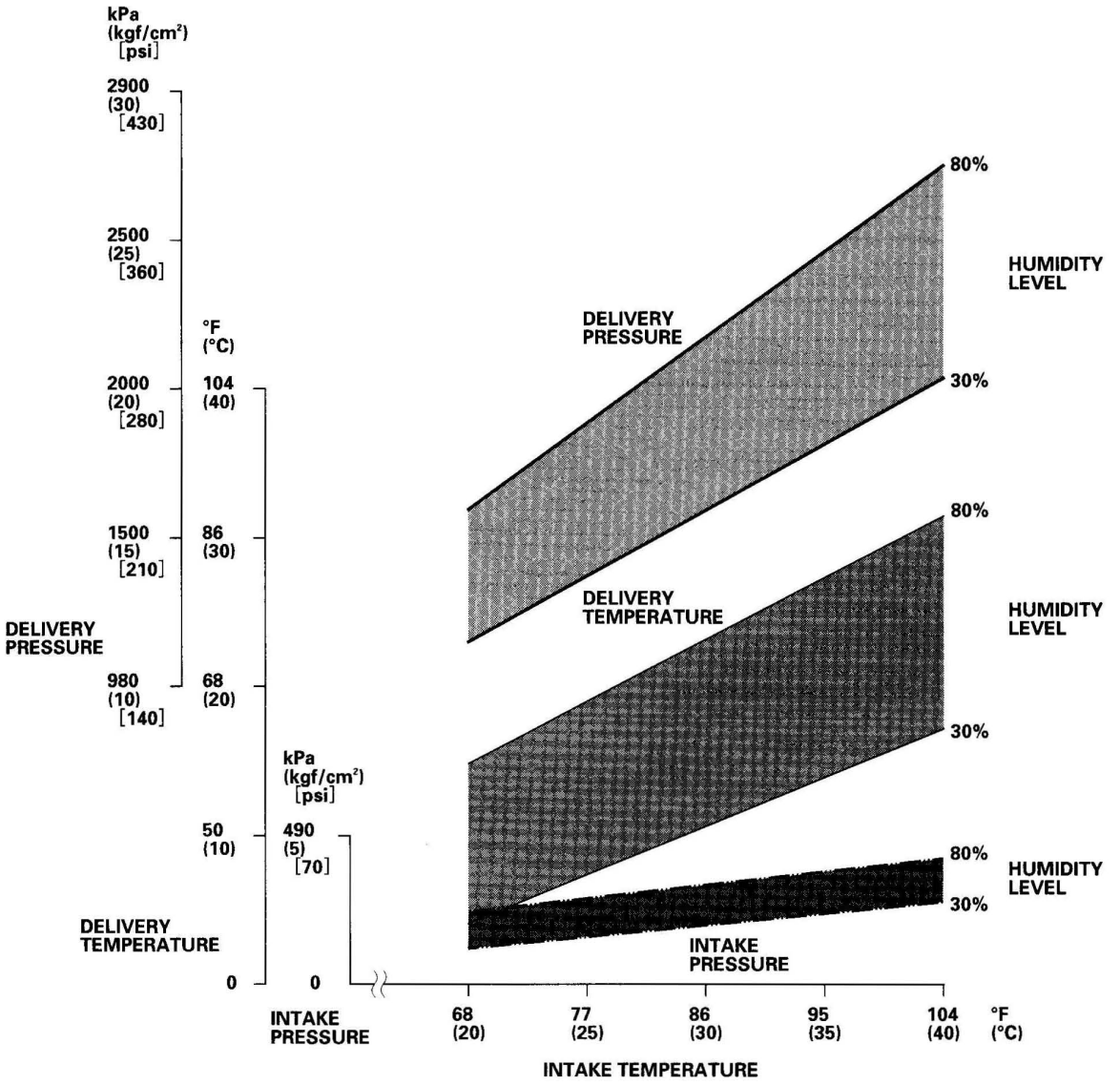
5. After running the air conditioning for 10 minutes under the above test conditions, read the delivery temperature from the thermometer in the dash vent, the intake temperature near the blower unit behind the glove box, and the high and low system pressure from the A/C gauges.

BACK

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6. To complete the charts:

- Mark the delivery temperature along the vertical line.
- Mark the intake temperature (ambient air temperature) along the bottom line.
- Draw a line straight up from the air temperature to the humidity.
- Mark a point 10 % above and 10 % below the humidity level.
- From each point, draw a horizontal line across the delivery temperature.
- The delivery temperature should fall between the two lines.
- Complete the low-side pressure test and high-side pressure test in the same way.
- Any measurements outside the line may indicate the need for further inspection.



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A/C System Tests (cont'd)

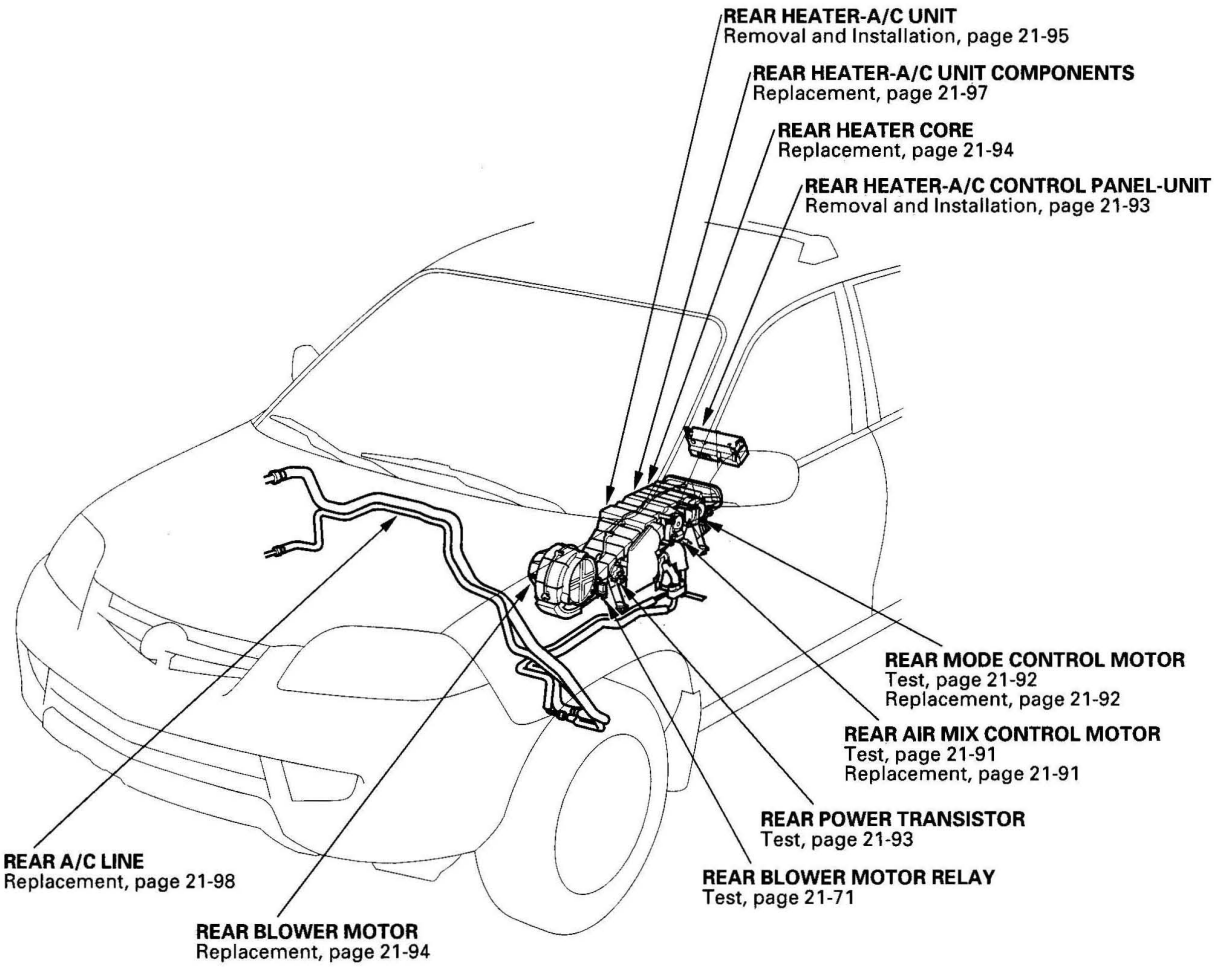
Pressure Test

Test results	Related symptoms	Probable cause	Remedy
Discharge (high) pressure abnormally high	After stopping compressor, pressure drops to about 196 kPa (2.0 kgf/cm², 28 psi) quickly, and then falls gradually.	Air in system	Recover, evacuate (see page 21-69), and recharge with specified amount (see page 21-70).
	Reduced or no air flow through condenser	• Clogged condenser or radiator fins • Condenser or radiator fan not working properly	• Clean • Check voltage and fan rpm. • Check fan direction.
	Line to condenser is excessively hot.	Restricted flow of refrigerant in system	Restricted lines
Discharge pressure abnormally low	High and low pressures are balanced soon after stopping compressor. Low side is higher than normal.	• Faulty compressor discharge valve • Faulty compressor seal	Replace the compressor.
	Outlet of expansion valve is not frosted, low-pressure gauge indicates vacuum.	• Faulty expansion valve • Moisture in system	• Replace • Recover, evacuate, and recharge with specified amount.
Suction (low) pressure abnormally low	Expansion valve is not frosted, and low-pressure line is not cold. Low-pressure gauge indicates vacuum.	• Frozen expansion valve (Moisture in system) • Faulty expansion valve	• Recover, evacuate, and recharge with specified amount. • Replace the expansion valve.
	Discharge temperature is low, and the air flow from vents is restricted.	Frozen evaporator	Run the fan with compressor off, then check evaporator temperature sensor.
	Expansion valve is frosted.	Clogged expansion valve	Clean or replace.
	Receiver/dryer outlet is cool, and inlet is warm (should be warm during operation).	Clogged receiver/dryer	Replace desiccant (see page 21-67).
Suction pressure abnormally high	Low-pressure hose and check joint are cooler than the temperature around evaporator.	Expansion valve open too long	Repair or replace.
	Suction pressure is lowered when condenser is cooled by water.	Excessive refrigerant in system	Recover, evacuate, and recharge with specified amount.
	High and low-pressure are equalized as soon as the compressor is stopped, and both gauges fluctuate while running.	• Faulty gasket • Faulty high-pressure valve • Foreign particle stuck in high-pressure valve	Replace the compressor.
Suction and discharge pressures abnormally high	Reduced air flow through condenser.	• Clogged condenser or radiator fins • Condenser or radiator fan not working properly	• Clean • Check voltage and fan rpm. • Check fan direction.
Suction and discharge pressure abnormally low	Low-pressure hose and metal end areas are cooler than evaporator.	Clogged or kinked low-pressure hose parts	Repair or replace.
	Temperature around expansion valve is too low compared with that around receiver/dryer.	Clogged high-pressure line	Repair or replace.
Refrigerant leaks	Compressor clutch is dirty.	Compressor shaft seal leaking	Replace the compressor.
	Compressor bolt(s) are dirty.	Leaking around bolt(s)	Tighten bolt(s) or replace compressor.
	Compressor gasket is wet with oil.	Gasket leaking	Replace the compressor.

BACK

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Component Location Index



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General Troubleshooting Information

How to Retrieve a DTC

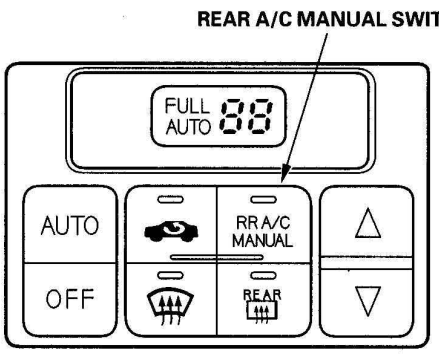
The Rear Heater-A/C Control Panel-Unit has a self-diagnosis function.

Running the Self-diagnosis Function

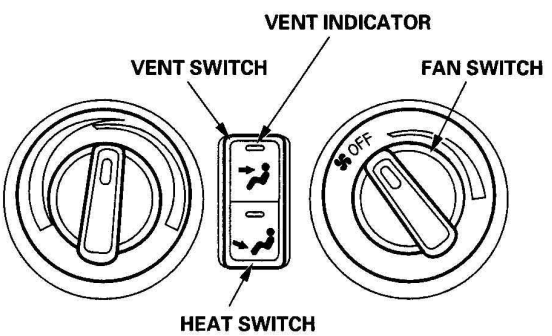
1. Turn the fan switch OFF.
2. Turn the ignition switch ON (II).
3. Turn the rear A/C manual switch ON.
4. Press the vent switch and then the heat switch. Continue to hold both switches down for 1 minute. If there is any abnormality in the system, the vent indicator will come on for 2 seconds; then it will blink the Diagnostic Trouble Code (DTC) to indicate a faulty component. If no DTCs are found, the indicator will not blink after the initial 2-second indication.

   NOTE: The system will only display the DTC when the vent and heat switches are pressed. If you release the switches, the display will go blank. To return the display, simply press the vent then the heat switches again.

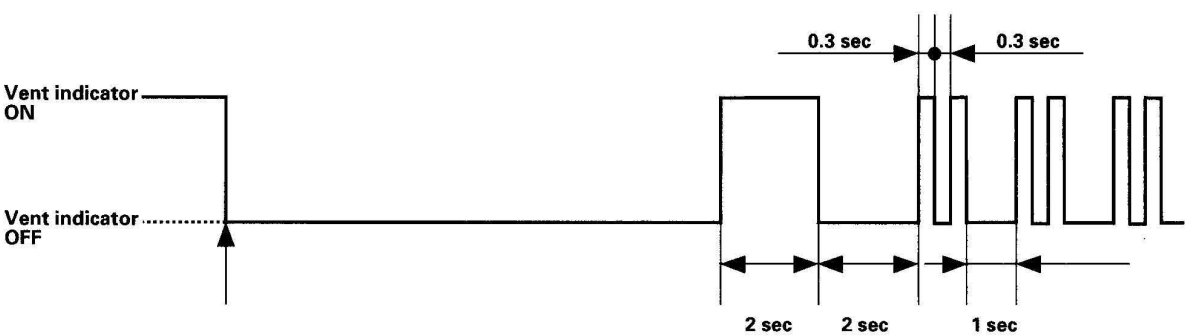
CLIMATE CONTROL PANEL



REAR HEATER-A/C CONTROL PANEL-UNIT



Example of DTC indication Pattern (DTC 2)



Resetting the Self-diagnoses Function

Turn the ignition switch OFF to cancel the self-diagnosis function. After completing repair work, run the self-diagnosis function again to make sure that there are no other malfunctions.

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DTC Troubleshooting Index

DTC (Vent Indicator Blinks)	Detection Item	Page
1	A problem in the rear blower motor circuit	(see page 21-82)
2	A problem in the rear air mix control linkage, door, or motor	(see page 21-85)
3	An open in the rear air mix control motor circuit	(see page 21-85)
4	A short in the rear air mix control motor circuit	(see page 21-86)
5	A problem in the A/C bus (communication line) circuit	(see page 21-87)

In case of multiple problems, the vent indicator will indicate only the DTC with the least number of blinks.

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Symptom Troubleshooting Index

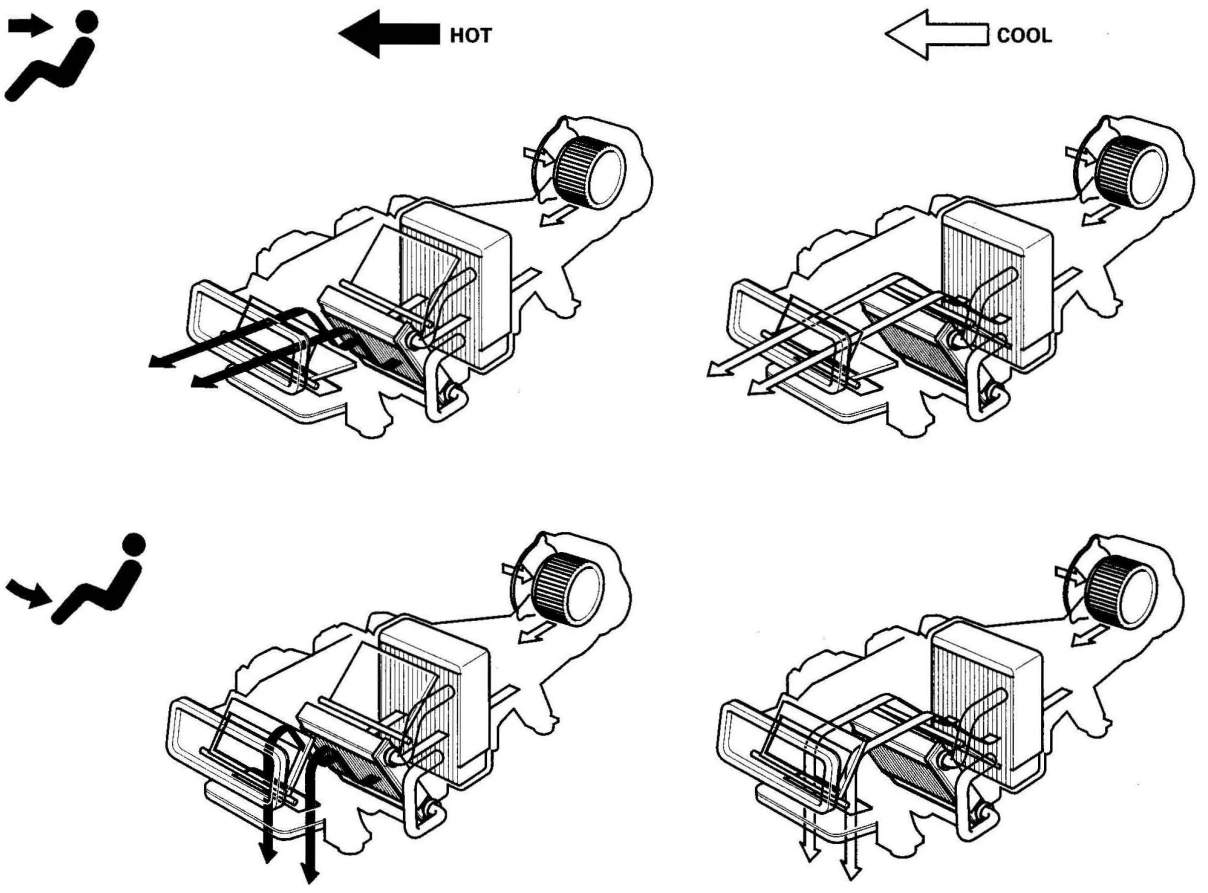
Symptom	Diagnostic procedure	Also check for
Rear mode control door does not change between Vent and Heat	Rear Mode Control Motor Circuit Troubleshooting (see page 21-88)	• Blown fuse No. 3 (7.5A) in the driver's under-dash fuse/relay box • Cleanliness and tightness of all connectors
Both heater and A/C do not work	Rear Heater-A/C Control Power and Ground Circuits Troubleshooting (see page 21-90)	• Blown fuse No. 3 (7.5A) in the driver's under-dash fuse/relay box • Poor ground at No. G501 • Cleanliness and tightness of all connectors

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System Description

Rear Heater-A/C Door Positions



(cont'd)

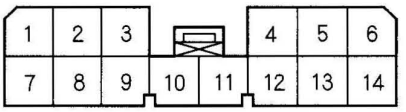
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System Description (cont'd)

Rear Heater-A/C Control Panel-Unit Inputs and Outputs

REAR HEATER-A/C CONTROL PANEL-UNIT 14P CONNECTOR



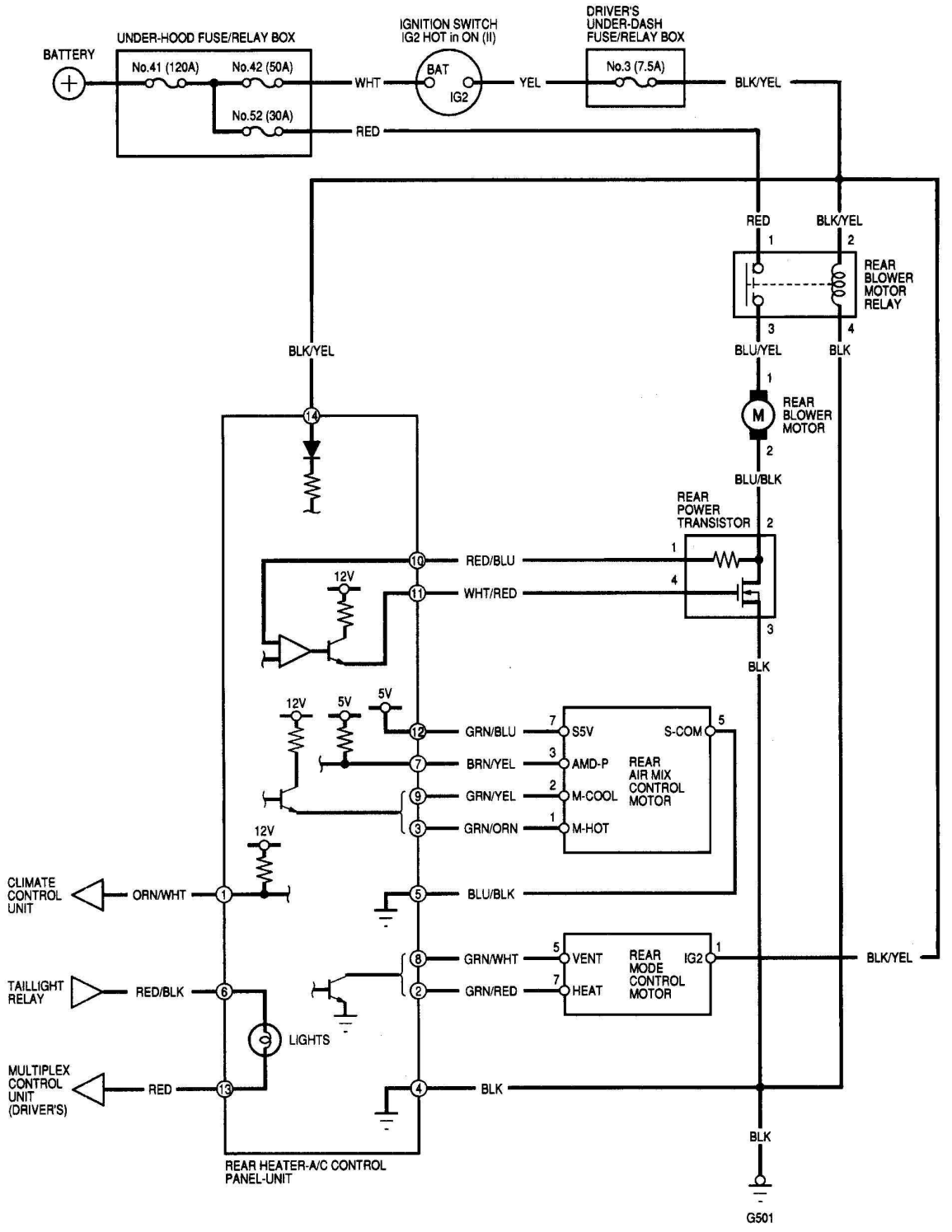
Wire side of female terminals

Cavity	Wire color	Signal	
1	ORN/WHT	FRONT UNIT A/C BUS	OUTPUT
2	GRN/RED	MODE HEAT	INPUT
3	GRN/ORN	AIR MIX HOT	OUTPUT
4	BLK	GROUND	OUTPUT
5	BLU/BLK	AIR MIX MOTOR GROUND	INPUT
6	RED/BLK	TAILLIGHT RELAY	INPUT
7	BRN/YEL	AIR MIX POTENTIAL	OUTPUT
8	GRN/WHT	MODE VENT	INPUT
9	GRN/YEL	AIR MIX COOL	OUTPUT
10	RED/BLU	BLOWER FEEDBACK	INPUT
11	WHT/RED	POWER TRANSISTER	OUTPUT
12	GRN/BLU	AIR MIX POTENTIAL +5V	OUTPUT
13	RED	MULTIPLEX CONTROL UNIT, DRIVER'S − (Dash lights brightness control)	OUTPUT
14	BLK/YEL	IG2 (Power)	INPUT

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Circuit Diagram



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DTC Troubleshooting

DTC 1: A Problem in the Rear Blower Motor Circuit

1. Check the No. 52 (30A) fuse in the under-hood fuse/relay box, and the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

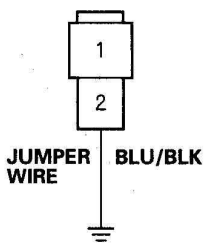
   Are the fuses OK?

   YES—Go to step 2.

   NO—Replace the fuse(s), and recheck.■

2. Connect the No. 2 terminal of the rear blower motor 2P connector to body ground with a jumper wire.

REAR BLOWER MOTOR 2P CONNECTOR



Wire side of female terminals

3. Turn the ignition switch ON (II).

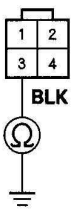
   Does the rear blower motor run?

   YES—Go to step 4.

   NO—Go to step 17.

4. Turn the ignition switch OFF.
5. Disconnect the jumper wire.
6. Disconnect the rear power transistor 4P connector.
7. Check for continuity between the No. 3 terminal of the rear power transistor 4P connector and body ground.

REAR POWER TRANSISTOR 4P CONNECTOR



Wire side of female terminals

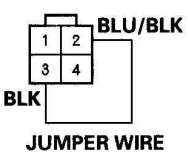
Is there continuity?

YES—Go to step 8.

NO—Check for an open in the wire between the rear power transistor and body ground. If the wire is OK, check for poor ground at G501.■

8. Connect the No. 2 and No. 3 termials of the rear power transistor 4P connector with a jumper wire.

REAR POWER TRANSISTOR 4P CONNECTOR



Wire side of female terminals

9. Turn the ignition switch ON (II).

   Does the rear blower motor run at high speed?

   YES—Go to step 10.

   NO—Repair open in the wire between the rear power transistor and the rear blower motor.■

10. Turn the ignition switch OFF.
11. Disconnect the jumper wire.

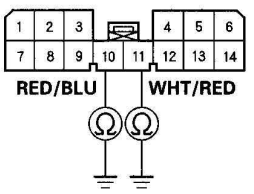
BACK

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12. Disconnect the rear heater-A/C control panel-unit 14P connector.

13. Check for continuity between the No. 10 and No. 11 terminals of the rear heater-A/C control panel-unit 14P connector and body ground individually.

REAR HEATER-A/C CONTROL PANEL-UNIT 14P CONNECTOR



Wire side of female terminals

Is there continuity?

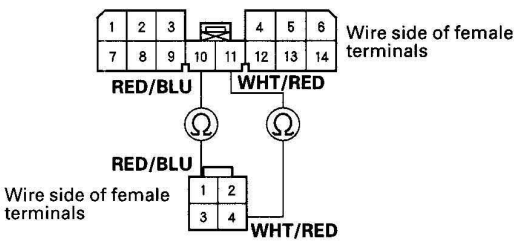
YES – Repair any short to body ground in the wire(s) between the rear heater-A/C control panel-unit and the rear power transistor. ■

NO – Go to step 14.

14. Check for continuity between the following terminals of the rear heater-A/C control unit 14P connector and the rear power transistor 4P connector.

14P:	4P:
No. 10	No. 1
No. 11	No. 4

REAR HEATER-A/C CONTROL PANEL-UNIT 14P CONNECTOR



REAR POWER TRANSISTOR 4P CONNECTOR

Is there continuity?

YES – Go to step 15.

NO – Repair any open in the wire(s) between the rear heater-A/C control panel-unit and the rear power transistor. ■

15. Reconnect the rear heater-A/C control panel-unit 14P connector.

16. Test the rear power transistor (see page 21-93).

Is the rear power transistor OK?

YES – Check for loose wires or poor connections at the rear heater-A/C control panel-unit 14P connector and at the rear power transistor 4P connector. If the connections are good, substitute a known-good rear heater-A/C control panel-unit, and recheck. If the symptom/indication goes away, replace the original rear heater-A/C control panel-unit. ■

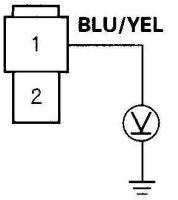
NO – Replace the rear power transistor. ■

17. Disconnect the jumper wire.

18. Disconnect the rear blower motor 2P connector.

19. Measure the voltage between the No. 1 terminal of the rear blower motor 2P connector and body ground.

REAR BLOWER MOTOR 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Replace the rear blower motor (see page 21-94). ■

NO – Go to step 20.

(cont'd)

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DTC Troubleshooting (cont'd)

20. Turn the ignition switch OFF.

21. Remove the rear blower motor relay from the left side of rear heater-A/C unit, and test it (see page 22-67).

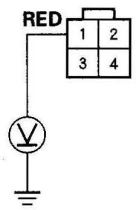
    Is there relay OK?

    YES – Go to step 22.

    NO – Replace the rear blower motor relay. ■

22. Measure the voltage between the No. 1 terminal of the rear blower motor relay 4P connector and body ground.

    REAR BLOWER MOTOR RELAY 4P CONNECTOR



Wire side of female terminals

    Is there battery voltage?

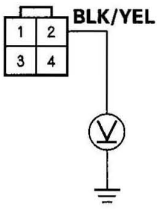
    YES – Go to step 23.

    NO – Repair open in the wire between the No. 52 fuse in the under-hood fuse/relay box and the rear blower motor relay. ■

23. Turn the ignition switch ON (II).

24. Measure the voltage between the No. 2 terminal of the rear blower motor relay 4P connector and body ground.

    REAR BLOWER MOTOR RELAY 4P CONNECTOR



Wire side of female terminals

    Is there battery voltage?

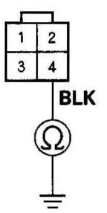
    YES – Go to step 25.

    NO – Repair open in the wire between the No. 3 fuse in the driver's under-dash fuse/relay box and the rear blower motor relay. ■

25. Turn the ignition switch OFF.

26. Check for continuity between the No. 4 terminal of the rear blower motor relay 4P connector and body ground.

    REAR BLOWER MOTOR RELAY 4P CONNECTOR



Wire side of female terminals

    Is there contnuity?

    YES – Repair open in the wire between the rear blower motor relay and the rear blower motor. ■

    NO – Check for an open in the wire between the rear blower motor relay and body ground. If the wire is OK, check for poor ground at G501. ■

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DTC 2: A Problem in the Rear Air Mix Control Linkage, Door, or Motor

1. Test the rear air mix control motor (see page 21-91).

   Is the rear air mix control motor OK?

   YES – Substitute a known-good rear heater-A/C control panel-unit, and recheck. If the symptom/indication goes away, replace the original rear heater-A/C control panel-unit. ■

   NO – Go to step 2.

2. Remove the rear air mix control motor (see page 21-91).

3. Check the rear air mix control linkage and door for smooth movement.

   Do the rear air mix control linkage and door move smoothly?

   YES – Replace the rear air mix control motor. ■

   NO – Repair the rear air mix control linkage and door. ■

DTC 3: An Open in the Rear Air Mix Control Motor Circuit

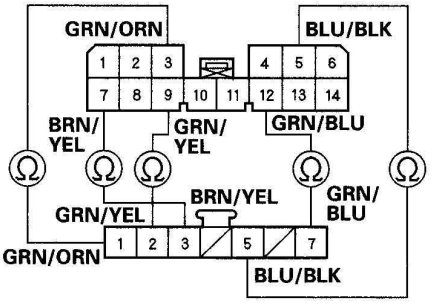
1. Disconnect the rear air mix control motor 7P connector.

2. Disconnect the rear heater-A/C control panel-unit 14P connector.

3. Check for continuity between following terminals of the rear heater-A/C control panel-unit 14P connector and the rear air mix control motor 7P connector.

14P:	7P:
No. 3	No. 1
No. 5	No. 5
No. 7	No. 3
No. 9	No. 2
No. 12	No. 7

REAR HEATER-A/C CONTROL PANEL-UNIT 14P CONNECTOR
Wire side of female terminals



REAR AIR MIX CONTROL MOTOR 7P CONNECTOR
Wire side of female terminals

Is there continuity?

YES – Check for loose wires or poor connections at the rear heater-A/C control panel-unit 14P connector and at the rear air mix control motor 7P connector. If the connections are good, substitute a known-good rear heater-A/C control panel-unit, and recheck. If the symptom/indication goes away, replace the original rear heater-A/C control panel-unit. ■

NO – Repair any open in the wire(s) between the rear heater-A/C control panel-unit and the rear air mix control motor. ■

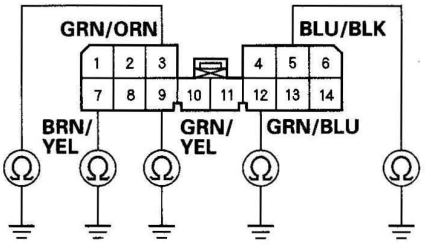
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DTC Troubleshooting (cont'd)

DTC 4: A Short in the Rear Air Mix Control Motor Circuit

1. Disconnect the rear air mix control motor 7P connector.
2. Disconnect the rear heater-A/C control panel-unit 14P connector.
3. Check for continuity between body ground and the rear heater-A/C control panel-unit 14P connector terminals No. 3, 5, 7, 9 and 12 individually.

REAR HEATER-A/C CONTROL PANEL-UNIT 14P CONNECTOR



Wire side of female terminals

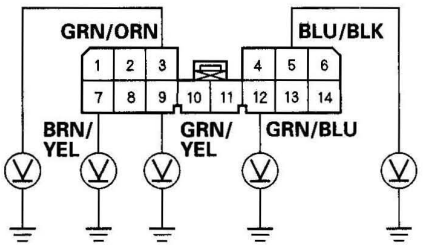
Is there continuity?

YES—Repair any short to body ground in the wire(s) between the rear heater-A/C control panel-unit and the rear air mix control motor. ■

NO—Go to step 4.

4. Turn the ignition switch ON (II), and check the same terminals for voltage.

REAR HEATER-A/C CONTROL PANEL-UNIT 14P CONNECTOR



Wire side of female terminals

Is there any voltage?

YES—Repair short to power in the wire between the rear heater-A/C control panel-unit and the rear air mix control motor. This short also damages the rear heater-A/C control panel-unit. Repair the short to power before replacing the rear heater-A/C control panel-unit. ■

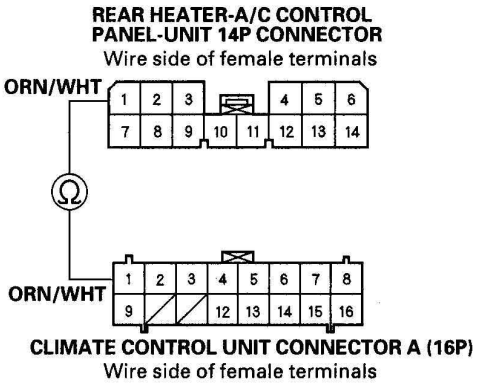
NO—Substitute a known-good rear heater-A/C control panel-unit, and recheck. If the symptom/indication goes away, replace the original rear heater-A/C control panel-unit. ■

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DTC 5: A Problem in the A/C Bus (Communication Line) Circuit

1. Disconnect the rear heater-A/C control panel-unit 14P connector.
2. Disconnect climate control unit connector A (16P).
3. Check for continuity between the No. 1 terminal of the rear heater-A/C control panel-unit 14P connector and the No. 1 terminal of climate control unit connector A (16P).

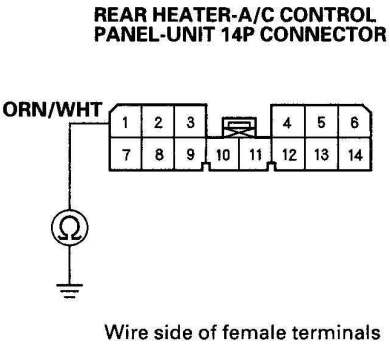


Is there continuity?

YES—Go to step 4.

NO—Repair open in the wire between the rear heater-A/C control panel-unit and the climate control unit. ■

4. Check for continuity between the No. 1 terminal of the rear heater-A/C control panel-unit 14P connector and body ground.



Is there continuity?

YES—Repair short to body ground in the wire between the rear heater-A/C control panel-unit and the climate control unit. ■

NO—Check for loose wires or poor connections at the rear heater-A/C control panel-unit 14P connector and at climate control unit connector A (16P). If the connections are good, substitute a known-good rear heater-A/C control panel-unit, and recheck. If the problem still exists, replace the climate control unit. ■

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Rear Mode Control Motor Circuit Troubleshooting

1. Check the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

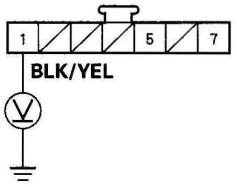
   Is the fuse OK?

   YES – Go to step 2.

   NO – Replace the fuse, and recheck. ■

2. Disconnect the rear mode control motor 7P connector.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 1 terminal of the rear mode control motor 7P connector and body ground.

REAR MODE CONTROL MOTOR 7P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 5.

NO – Repair open in the wire between the No. 3 fuse in the driver's under-dash fuse/relay box and the rear mode control motor. ■

5. Turn the ignition switch OFF.
6. Test the rear mode control motor (see page 21-92).

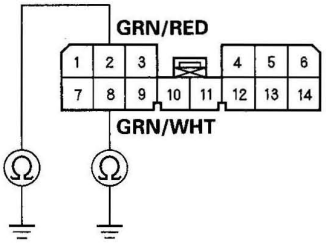
   Is the rear mode control motor OK?

   YES – Go to step 7.

   NO – Go to step 12.

7. Disconnect the rear heater-A/C control panel-unit 14P connector.
8. Check for continuity between the No. 2 and No. 8 terminals of the rear heater-A/C control panel-unit 14P connector and body ground individually.

REAR HEATER-A/C CONTROL PANEL-UNIT 14P CONNECTOR



Wire side of female terminals

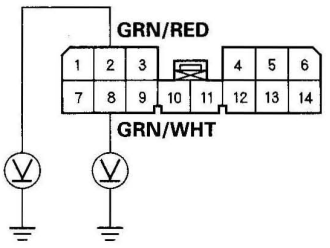
Is there continuity?

YES – Repair short to body ground in the wire(s) between the rear heater-A/C control unit and the rear mode control motor. ■

NO – Go to step 9.

9. Turn the ignition switch ON(II), and check the same terminals for voltage.

REAR HEATER-A/C CONTROL PANEL-UNIT 14P CONNECTOR



Wire side of female terminals

Is there any voltage?

YES – Repair short to power in the wire(s) between the rear heater-A/C control panel-unit and the rear mode control motor. This short also damages the rear heater-A/C control panel-unit. Repair the short to power before replacing the rear heater-A/C control panel-unit. ■

NO – Go to step 10.

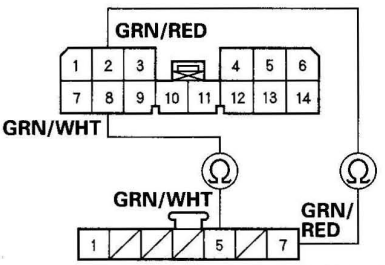
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10. Turn the ignition switch OFF.

11. Check for continuity between the following terminals of the rear heater-A/C control panel-unit 14P connector and the rear mode control motor 7P connector.
    14P: 7P:
    No. 2 No. 7
    No. 8 No. 5

REAR HEATER-A/C CONTROL PANEL-UNIT 14P CONNECTOR
Wire side of female terminals



REAR MODE CONTROL MOTOR 7P CONNECTOR
Wire side of female terminals

Is there continuity?

YES—Check for loose wires or poor connections at the rear heater-A/C control panel-unit 14P connector and at rear mode control motor 7P connector. If the connections are good, substitute a known-good rear heater-A/C control panel-unit, and recheck. If the symptom/indication goes away, replace the original rear heater-A/C control panel-unit. ■

NO—Repair open in the wire(s) between the rear heater-A/C control panel-unit and the rear mode control motor. ■

12. Remove the rear mode contol motor (see page 21-92).

13. Check the rear mode control linkage and door for smooth movement.

    Do the rear mode control linkage and door move smoothly?

    YES—Replace the rear mode control motor. ■

    NO—Repair the rear mode control linkage or door. ■

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Rear Heater-A/C Control Power and Ground Circuits Troubleshooting

1. Check the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES – Go to step 2.

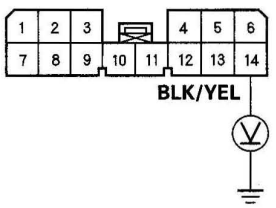
   NO – Replace the fuse, and recheck. ■

2. Disconnect the rear heater-A/C control panel-unit 14P connector.

3. Turn the ignition switch ON (II).

4. Measure the voltage between the No. 14 terminal of the rear heater-A/C control panel-unit 14P connector and body ground.

REAR HEATER-A/C CONTROL PANEL-UNIT 14P CONNECTOR



Wire side of female terminals

   Is there battery voltage?

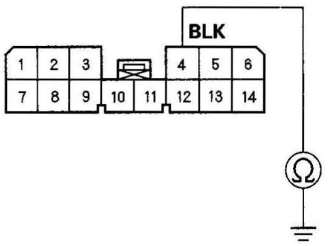
   YES – Go to step 5.

   NO – Repair open in the wire between the No. 3 fuse in the driver's under-dash fuse/relay box and the rear heater-A/C control panel-unit. ■

5. Turn the ignition switch OFF.

6. Check for continuity between the No. 4 terminal of the rear heater-A/C control panel-unit 14P connector and body ground.

REAR HEATER-A/C CONTROL PANEL-UNIT 14P CONNECTOR



Wire side of female terminals

   Is there continuity?

   YES – Check for loose wires or poor connections at the rear heater-A/C control panel-unit 14P connector. If the connections are good, substitute a known-good rear heater-A/C control panel-unit, and recheck. If the symptom/indication goes away, replace the original rear heater-A/C control panel-unit. ■

   NO – Check for an open in the wire between the rear heater-A/C control panel-unit and body ground. If the wire is OK, check for poor ground at G501. ■

BACK

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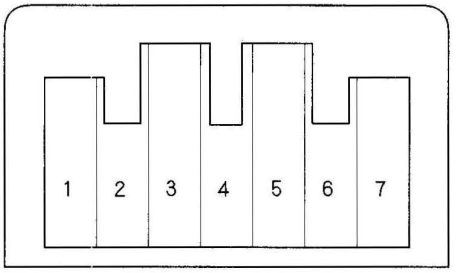
Rear Air Mix Control Motor Test

1. Disconnect the 7P connector from the rear air mix control motor.

2. Connect battery power to the No. 1 terminal of the rear air mix control motor, and ground the No. 2 terminal; the rear air mix control motor should run, and stop at Max Hot. If it doesn't, reverse the connections; the rear air mix control motor should run, and stop at Max Cool. If the rear air mix control motor does not run, remove it, then check the rear air mix control linkage and door for smooth movement.

   - If the linkage and door move smoothly, replace the rear air mix control motor.
   - If the linkage or door is sticks or binds, repair them as needed.

AIR MIX CONTROL MOTOR



3. Measure the resistance between the No. 5 and No. 7 terminals. It should be between 4.2 k to 7.8 kΩ.

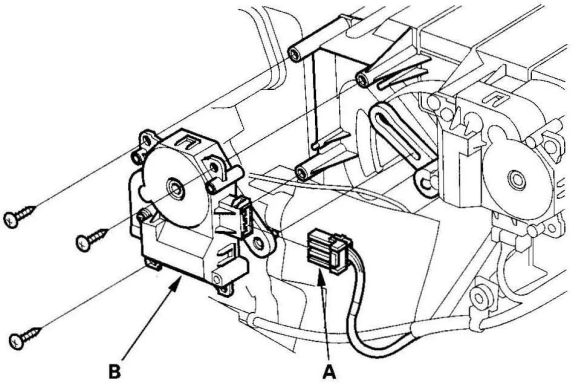
4. Measure the resistance between the No. 3 and No. 5 terminals.

   Max Cool – 3.52 k to 6.55 kΩ
   Max Hot – 0.58 k to 1.09 kΩ

Rear Air Mix Control Motor Replacement

1. Remove the center console (see page 20-65).

2. Disconnect the 7P connector (A) from the rear air mix control motor (B). Remove the self-tapping screws and the rear air mix control motor from the rear heater-A/C unit.



3. Install the motor in the reverse order of removal. Make sure the pin on the motor is properly engaged with the linkage. After installation, make sure the motor runs smoothly.

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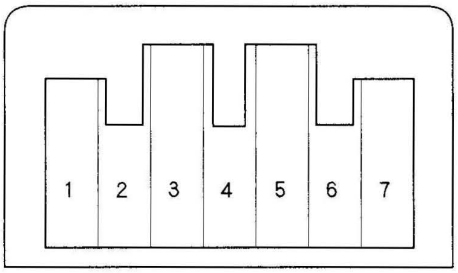
Rear Mode Control Motor Test

1. Disconnect the 7P connector from the rear mode control motor.

   NOTICE
   Incorrectly applying power and ground to the rear mode control motor will damage it. Follow the instructions carefully.

2. Connect battery power to the No. 1 terminal of the rear mode control motor, and ground the No. 5 and No. 7 terminals; the rear mode control motor should run smoothly. To avoid damaging the rear mode control motor, do not reverse power and ground. Disconnect the No. 5 or No. 7 terminals from ground; the rear mode control motor should stop at Vent or Heat. Don't cycle the rear mode control motor for a long time.

REAR MODE CONTROL MOTOR



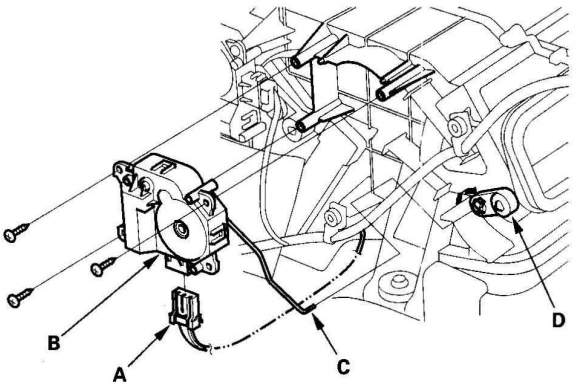
3. If the rear mode control motor does not run in step 2, remove it, then check the rear mode control linkage and door for smooth movement.

   - If the linkage and door move smoothly, replace the rear mode control motor.
   - If the linkage or door sticks or binds, repair them as needed.

Rear Mode Control Motor Replacement

1. Remove the center console (see page 20-65).

2. Disconnect the 7P connector (A) from the rear mode control motor (B). Remove the rod (C) of the rear mode control motor from the rear mode control linkage (D). Remove the self-tapping screws and the rear mode control motor from the rear heater-A/C unit.



3. Install the motor in the reverse order of removal. After installation, make sure the motor runs smoothly.

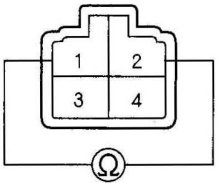
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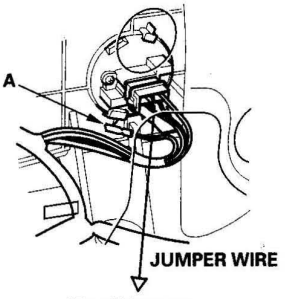
Rear Power Transistor Test

1. Disconnect the 4P connector from the rear power transistor.
2. Measure the resistance between the No. 1 and No. 2 terminals of the rear power transistor. It should be approximately 1.4 — 1.5 kΩ.
   - If the resistance is within the specifications, go to step 3.
   - If the resistance is not within the specifications, replace the rear power transistor.

REAR POWER TRANSISTOR



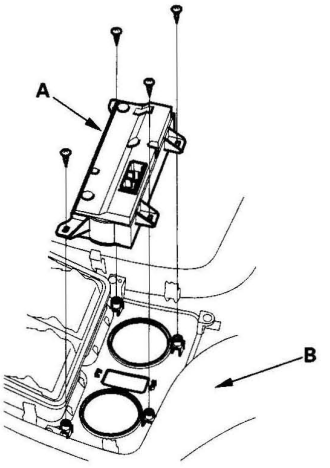
3. Carefully release the lock tab on the No. 4 terminal (WHT/RED) (A) in the 4P connector, then remove the terminal and insulate it from body ground.



4. Reconnect the 4P connector to the rear power transistor.
5. Supply 12 volts to the No. 4 cavity with a jumper wire.
6. Turn the ignition switch ON (II), and check that the rear blower motor runs.
   - If the rear blower motor does not run, replace the rear power transistor.
   - If the rear blower motor runs, the rear power transistor is OK.

Rear Heater-A/C Control Panel-Unit Removal and Installation

1. Remove the console rear trim (see page 20-64).
2. Remove the self-tapping screws and the rear heater-A/C control unit (A) from the console rear trim (B).

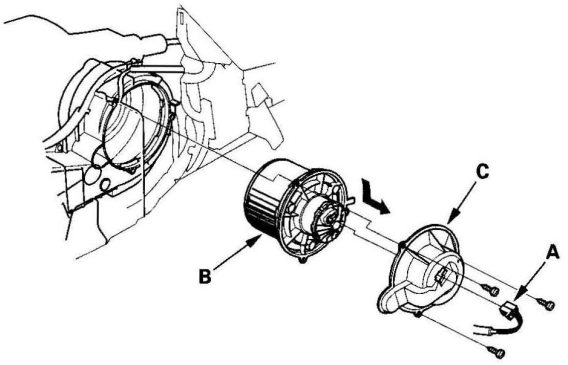


3. Install the control unit in the reverse order of removal. After installation, operate the control unit controls to see whether it works properly.
4. Run the self-diagnosis function to confirm that there are no problems in the system.

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Rear Blower Motor Replacement

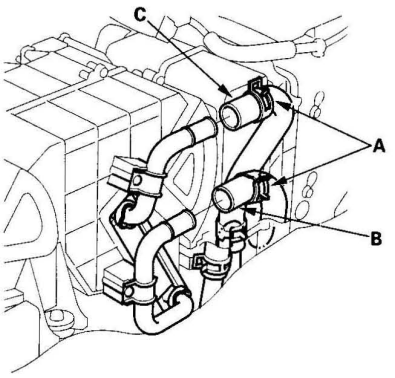
1. Remove the center console (see page 20-65).
2. Disconnect the 2P connector (A) from the rear blower motor (B), then remove the self-tapping screw and the cover (C). Turn the rear blower motor clockwise to the stop, and remove it.



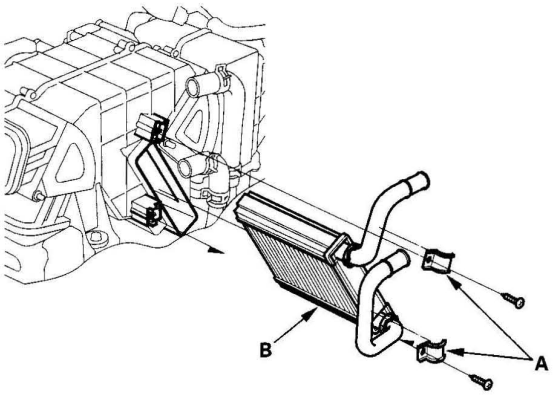
3. Install the motor in the reverse order of removal.

Rear Heater Core Replacement

1. When the engine is cool, drain the engine coolant from the radiator (see page 10-8).
2. Remove the center console (see page 20-65).
3. Slide the hose clamps (A) back, then disconnect the inlet heater hose (B) and the outlet heater hose (C) from the rear heater core. Engine coolant will run out when the hoses are disconnected; drain it into a clean drip pan. Be sure not to let coolant spill on the electrical parts or the painted surfaces. If any coolant spills, rinse it off immediately.



4. Remove the self-tapping screws and the clamps (A). Carefully pull out the rear heater core (B) so you don't bend the inlet and outlet pipes.



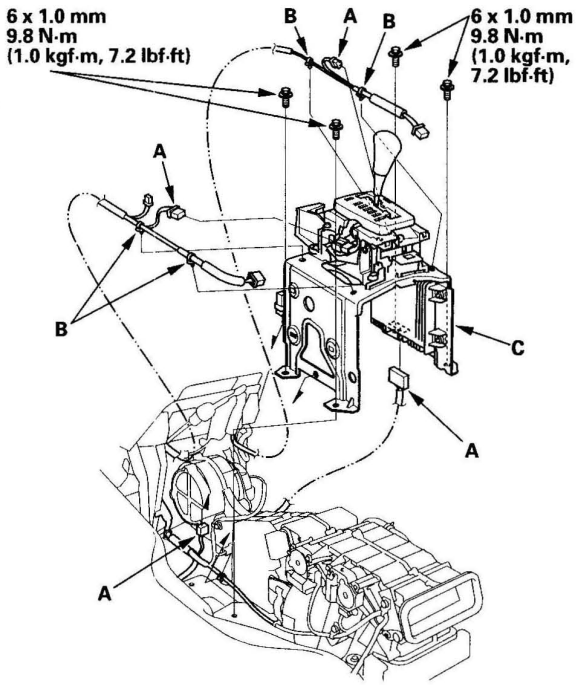
5. Install the heater core in the reverse order of removal, and note these items:
   - Do not interchange the inlet and outlet heater hoses, and install the hose clamps securely.
   - Refill the cooling system with engine coolant (see page 10-8).
   - Make sure that there is no coolant leakage.

BACK

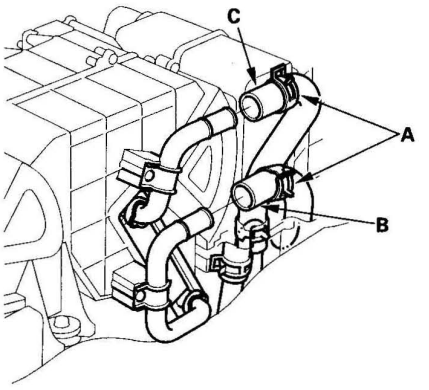
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Rear Heater-A/C Unit Removal and Installation

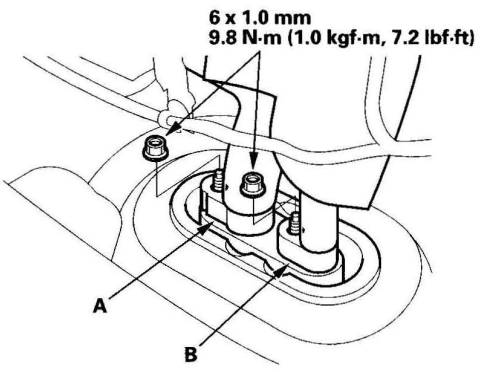
1. When the engine is cool, drain the engine coolant from the radiator (see page 10-8).
2. Recover the refrigerant with a recovery/recycling/charging station (see page 21-68).
3. Remove the center console (see page 20-65).
4. Remove the shift cable from the shift lever (see page 14-165).
5. Disconnect the connectors (A) from the shift lock solenoid, the mode switch, the front stereo amplifier and the rear blower motor relay, then remove the wire harness clips (B). Remove the bolts and the shift lever bracket (C).



6. Slide the hose clamps (A) back, then disconnect the inlet heater hose (B) and the outlet heater hose (C) from the rear heater core. Engine coolant will run out when the hoses are disconnected; drain it into a clean drip pan. Be sure not to let coolant spill on the electrical parts or the painted surfaces. If any coolant spills, rinse it off immediately.



7. Remove the nuts at the rear evaporator suction line (A) and the receiver line (B) connections.

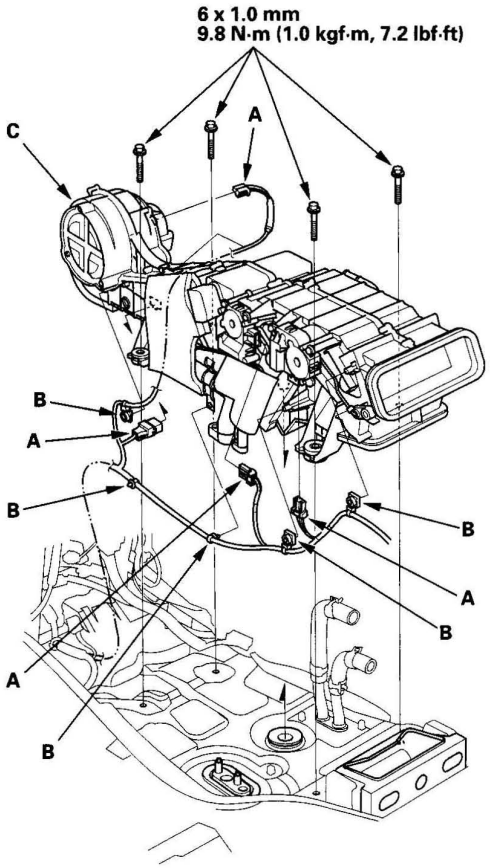


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Rear Heater-A/C Unit Removal and Installation (cont'd)

8. Disconnect the connectors (A) from the rear blower motor, the rear power transister, the rear air mix control motor and the rear mode control motor, then remove the wire harness clips (B). Remove the mounting bolts and the rear heater-A/C unit (C). Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



9. Install the unit in the reverse order of removal, and note these items:

- If you're installing a new rear evaporator, add refrigerant oil (DENSO ND-OIL 8) (see page 21-6).
- Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
- Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
- Do not interchange the inlet and outlet heater hoses, and install the hose clamps securely.
- Refill the cooling system with engine coolant (see page 10-8).
- Make sure that there is no coolant leakage.
- Charge the system (see page 21-70).

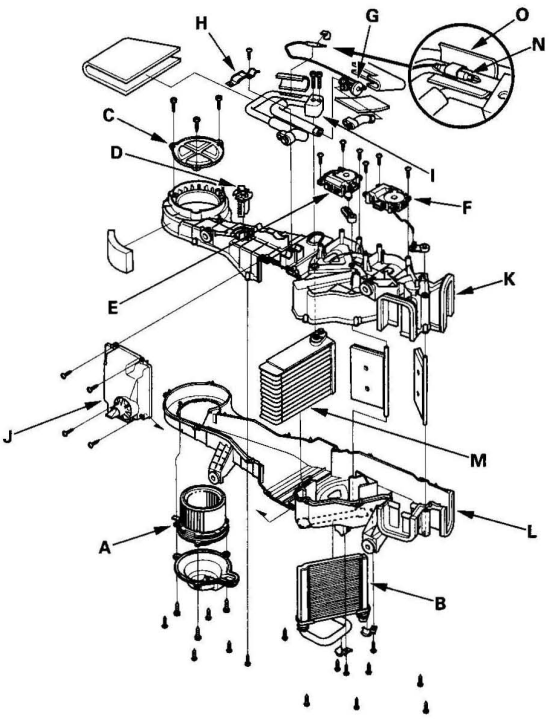
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Rear Heater-A/C Unit Components Replacement

NOTE: The rear blower motor (A), the rear heater core (B), the blower screen (C), the rear power transistor (D), the rear air mix control motor (E), the rear mode control motor (F) and the rear expansion valve (G) can be replaced without removing the rear heater-A/C unit.

1. Remove the self-tapping screw and the clamp (H), then remove the bolts and the rear evaporator lines (I) with the rear expansion valve. If necessary, remove the rear expansion valve. Use a second wrench to hold the other fitting on the valve so the rear evaporator lines won't twist. Leave the first fitting loosely connected so you can use it to hold the valve while you loosen the second fitting.



2. If necessary, remove the rear blower motor (see page 21-94), the rear heater core (see page 21-94), the blower screen, the rear power transistor, the rear air mix control motor (see page 21-91) and the rear mode control motor (see page 21-92).

3. Remove the self-tapping screws and the lower housing (J). Remove the self-tapping screws, and carefully separate the left upper housing (K) from the right upper housing (L). Remove the rear evaporator core (M).

4. Reassemble the unit in the reverse order of disassembly, and note these items;

   - Replace all O-rings with new ones at each fitting and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
   - Immediately after using the oil, reinstall the cap on the container, and seal it to avoid moisture absorption.
   - Make sure no air is leaking from the left upper housing and the right upper housing fitting and from the upper housings and the lower housing fitting.
   - Install the capillary tube (N) directly against the outlet line, and wrap it with electrical tape (O).
   - Before reassembly, make sure that the rear air mix control linkage and door move smoothly without binding.
   - Before reassembly, make sure that the rear mode control linkage and door move smoothly without binding.
   - After reassembly, make sure the rear air mix control motor runs smoothly (see page 21-91).
   - After reassembly, make sure the rear mode control motor runs smoothly (see page 21-92).
   - Make sure that there is no coolant leakage.

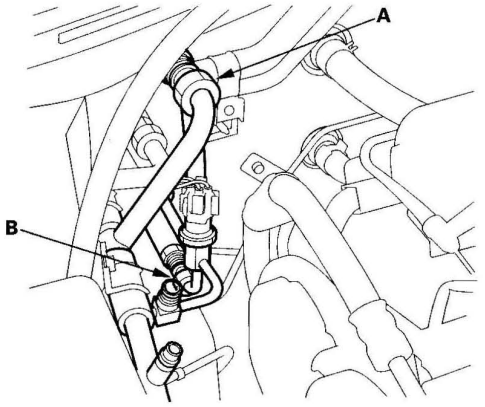
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Rear A/C Line Replacement

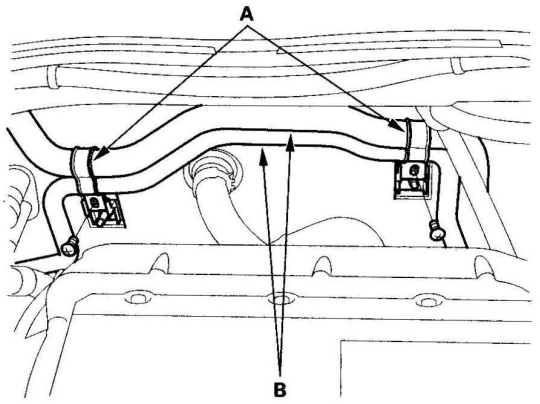
Removal

1. Recover the refrigerant with a recovery/recycling/charging station (see page 21-68).

2. Disconnect the rear A/C suction line (A) and receiver line (B) at the front evaporator.

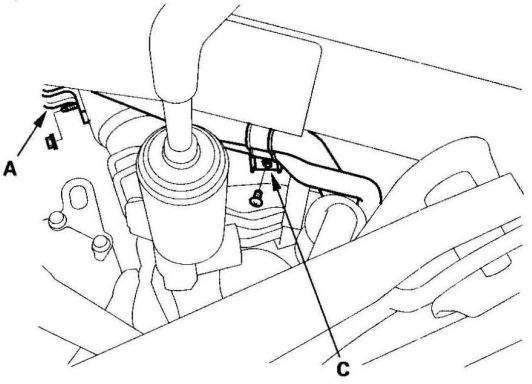


3. Remove the screws from the two clamps (A) along the engine compartment bulkhead, then free the rear A/C lines (B) from the clamps.

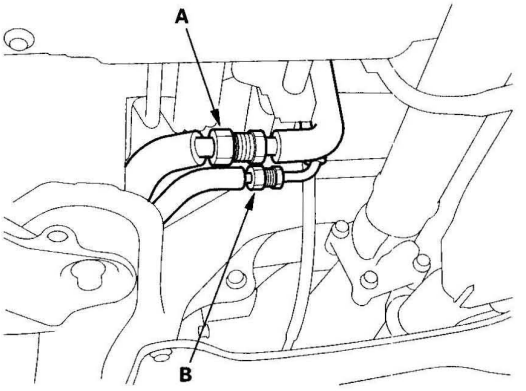


4. Raise the vehicle on a hoist, and remove the left front wheel.

5. Remove the 6 mm flange nut from the A/C line clamps/bracket (A) above the steering rack on the driver's side. Remove the screw (B) from the A/C line bracket and the screw from the clamp (C) next to the steering rack.



6. Disconnect the rear A/C suction line (A) and receiver line (B) at the rear evaporator connections.



7. Free the rear A/C lines from the bracket above the steering gearbox.

8. Remove the rear A/C lines (receiver line, then suction line) from the top of the engine compartment. If necessary, bend the rear A/C lines as needed for removal.

   NOTE: Be careful not to bend or snag the brake lines, wire harness, or other components when removing the rear A/C lines.

BACK

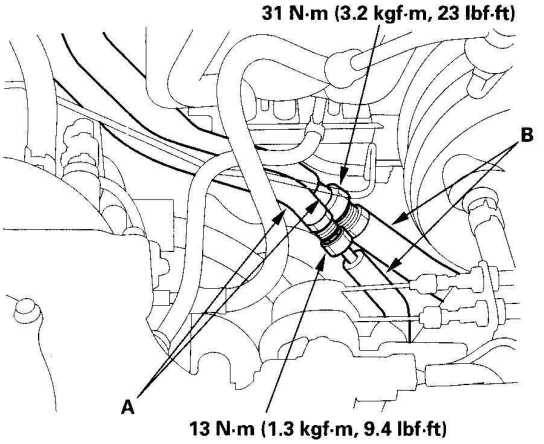
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Installation

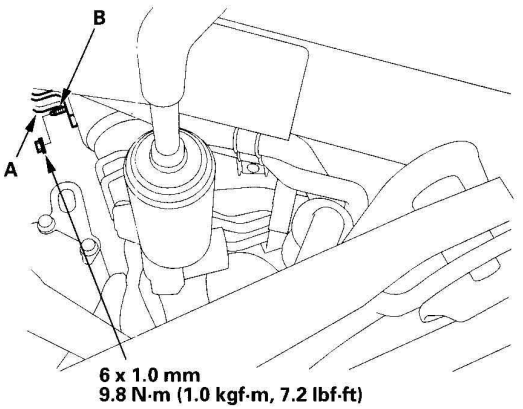
NOTE:
- Use care not to bend the replacement A/C lines during installation.
- Be careful not to bend or snag the brake lines, wire harness, or other components when installing the replacement A/C lines.

1. Route the lower replacement rear A/C lines (suction line, then receiver line) from the top of the engine compartment down to the rear evaporator connections. Do not connect the lines yet.

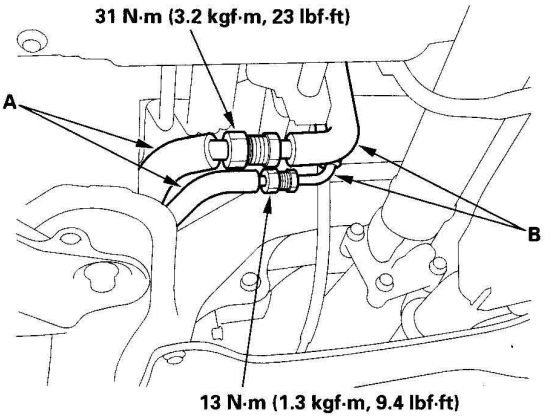
2. Route the upper replacement A/C lines along the engine compartment bulkhead, and loosely connect the upper lines (A) to the lower lines (B). Do not tighten the connections yet.



3. Install the A/C line bracket (A) on the lower replacement A/C line. Slide the bracket onto its mounting stud (B), but do not install the 6 mm flange nut yet.



4. Apply a few drops of refrigerant oil to the connections, then connect the lower lines (A) to the rear evaporator lines (B). Do not tighten the connections yet.

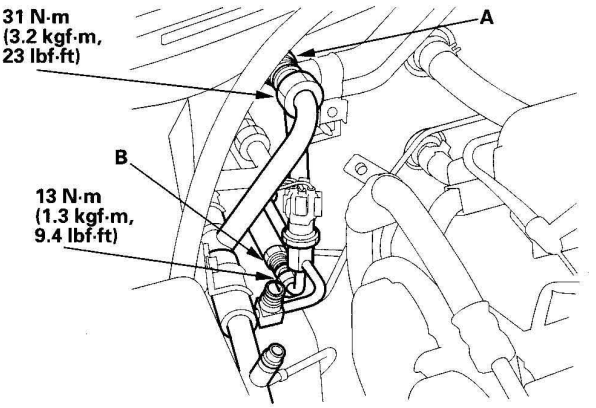


5. Install the screw in the A/C line clamp (next to the steering gearbox) on the lower A/C lines.

6. Install the 6 mm flange nut onto the A/C line clamp/bracket mounting stud, and tighten it.

7. Tighten the lower A/C lines at the rear evaporator connections.

8. Apply a few drops of refrigerant oil to the connections, then connect the rear A/C suction line (A) and receiver line (B) to the front evaporator lines. Do not tighten the connections yet.



9. Install the screws into the two A/C line clamps along the engine compartment bulkhead.

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Rear A/C Line Replacement (cont'd)

10. Tighten the upper-A/C-line-to-front-evaporator cennections.
11. Tighten the upper-to-lower A/C line connections.
12. Add refrigerant oil (see page 21-6).
13. Charge the system (see page 21-70).
14. Reinstall the left front wheel.

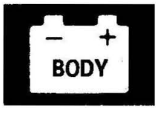
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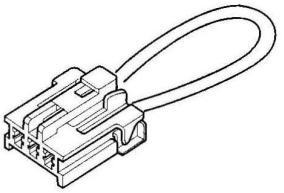
Navigation System 22-313



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Special Tools

Ref. No.	Tool Number	Description	Qty
①	07WAZ-001010A	MPCS Service Connector	1



①

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General Troubleshooting Information

Tips and Precautions

Before Troubleshooting

1. Check applicable fuses in the appropriate fuse/relay box.

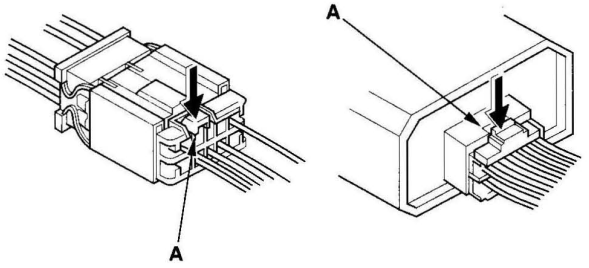
2. Check the battery for damage, state of charge, and clean and tight connections.

NOTICE

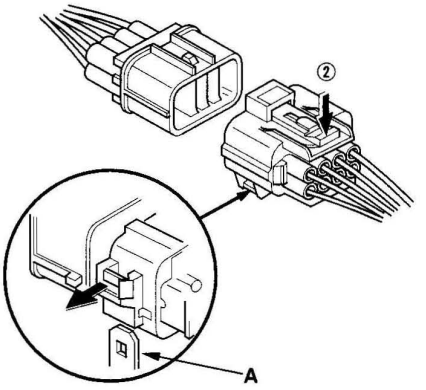
- Do not quick-charge a battery unless the battery ground cable has been disconnected, otherwise you will damage the alternator diodes.
- Do not attempt to crank the engine with the battery ground cable loosely connected or you will severely damage the wiring.

Handling Connectors

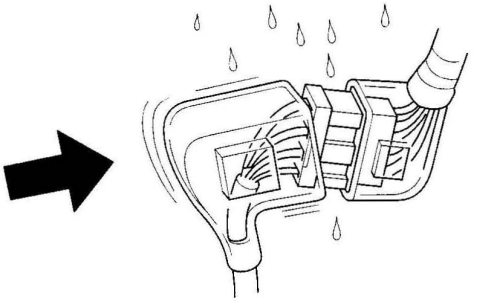
- Make sure the connectors are clean and have no loose wire terminals.
- Make sure multiple cavity connectors are packed with grease (except watertight connectors).
- All connectors have push-down release type locks (A).



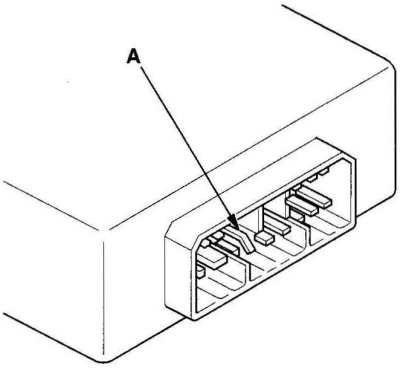
- Some connectors have a clip on their side used to attach them to a mount bracket on the body or on another component. This clip has a pull type lock.
- Some mounted connectors cannot be disconnected unless you first release the lock and remove the connector from its mount bracket (A).



- Never try to disconnect connectors by pulling on their wires; pull on the connector halves instead.
- Always reinstall plastic covers.



- Before connecting connectors, make sure the terminals (A) are in place and not bent.

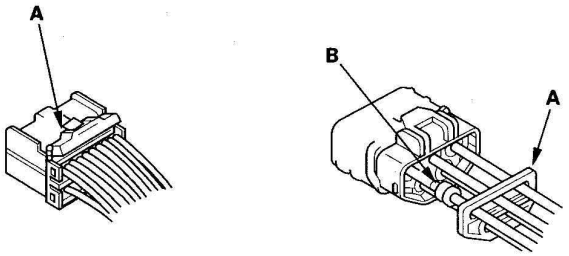


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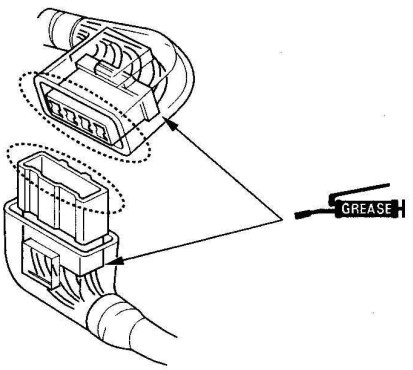
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General Troubleshooting Information (cont'd)

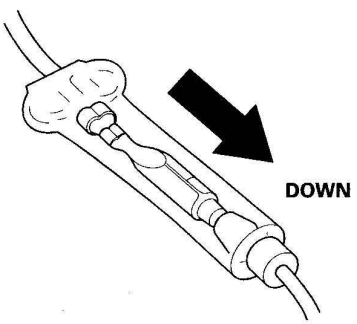
- Check for loose retainer (A) and rubber seals (B).



- The backs of some connectors are packed with grease. Add grease if necessary. If the grease is contaminated, replace it.

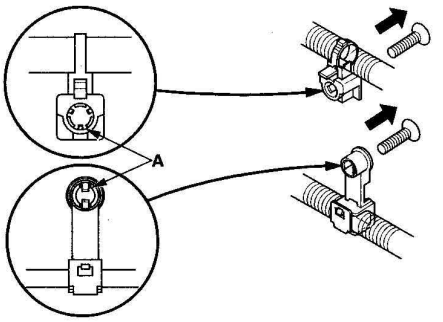


- Insert the connector all the way and make sure it is securely locked.
- Position wires so that the open end of the cover faces down.

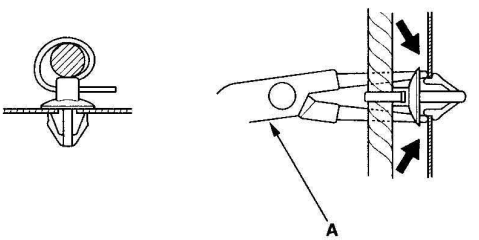


Handling Wires and Harnesses

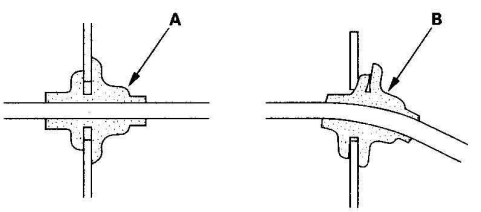
- Secure wires and wire harnesses to the frame with their respective wire ties at the designated locations.
- Remove clips carefully; don't damage their locks (A).



- Slip pliers (A) under the clip base and through the hole at an angle, then squeeze the expansion tabs to release the clip.



- After installing harness clips, make sure the harness doesn't interfere with any moving parts.
- Keep wire harnesses away from exhaust pipes and other hot parts, from sharp edges of brackets and holes, and from exposed screws and bolts.
- Seat grommets in their grooves properly (A). Do not leave grommets distorted (B).

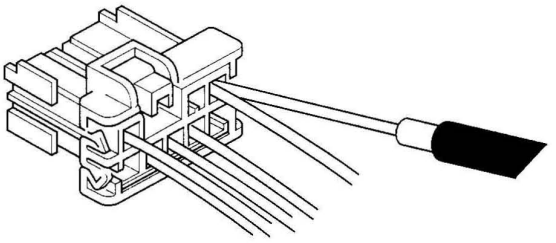


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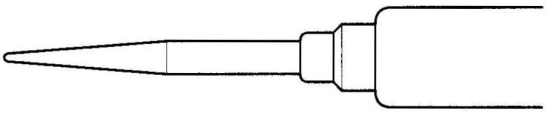
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Testing and Repairs

- Do not use wires or harnesses with broken insulation. Replace them or repair them by wrapping the break with electrical tape.
- After installing parts, make sure that no wires are pinched under them.
- When using electrical test equipment, follow the manufacturer's instructions and those described in this manual.
- If possible, insert the probe of the tester from the wire side (except waterproof connector).



- Use a probe with a tapered tip.



- Refer to the instructions in the Honda Terminal Kit for identification and replacement of connector terminals.

(cont'd)

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General Troubleshooting Information (cont'd)

Five-step Troubleshooting

1. Verify The Complaint
   Turn on all the components in the problem circuit to verify the customer complaint. Note the symptoms. Do not begin disassembly or testing until you have narrowed down the problem area.

2. Analyze The Schematic
   Look up the schematic for the problem circuit. Determine how the circuit is supposed to work by tracing the current paths from the power feed through the circuit components to ground. If several circuits fail at the same time, the fuse or ground is a likely cause.

   Based on the symptoms and your understanding of the circuit operation, identify one or more possible causes of the problem.

3. Isolate The Problem By Testing The Circuit
   Make circuit tests to check the diagnosis you made in step 2. Keep in mind that a logical, simple procedure is the key to efficient troubleshooting. Test for the most likely cause of failure first. Try to make tests at points that are easily accessible.

4. Fix The Problem
   Once the specific problem is identified, make the repair. Be sure to use proper tools and safe procedures.

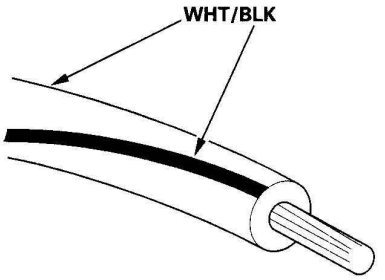
5. Make Sure The Circuit Works
   Turn on all components in the repaired circuit in all modes to make sure you've fixed the entire problem. If the problem was a blown fuse, be sure to test all of the circuits on the fuse. Make sure no new problems turn up and the original problem does not recur.

Wire Color Codes

The following abbreviations are used to identify wire colors in the circuit schematics:

WHT	White
YEL	Yellow
BLK	Black
BLU	Blue
GRN	Green
RED	Red
ORN	Orange
PNK	Pink
BRN	Brown
GRY	Gray
PUR	Purple
LT BLU	Light Blue
LT GRN	Light Green

The wire insulation has one color or one color with another color stripe. The second color is the stripe.

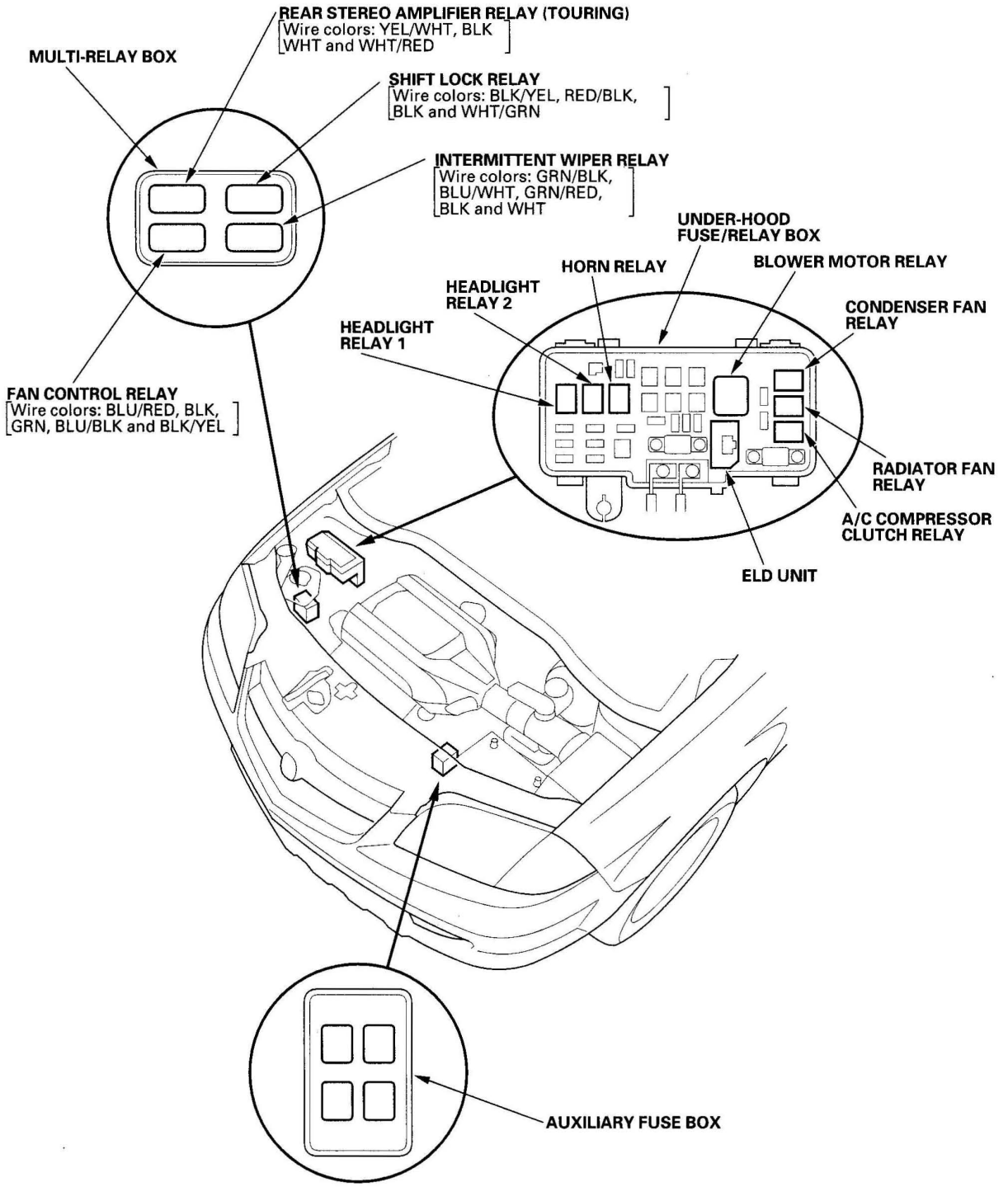


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Relay and Control Unit Locations

Engine Compartment

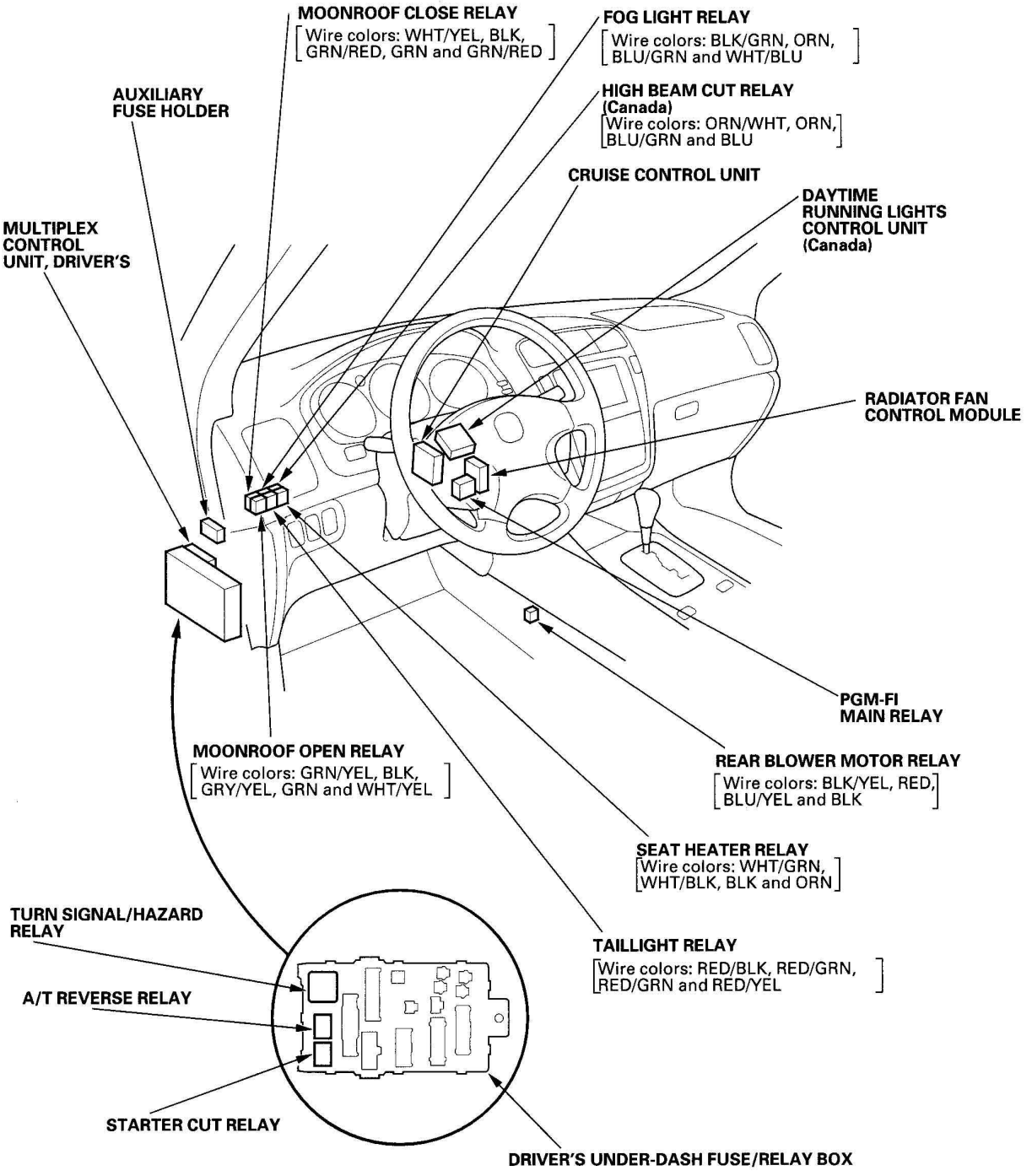


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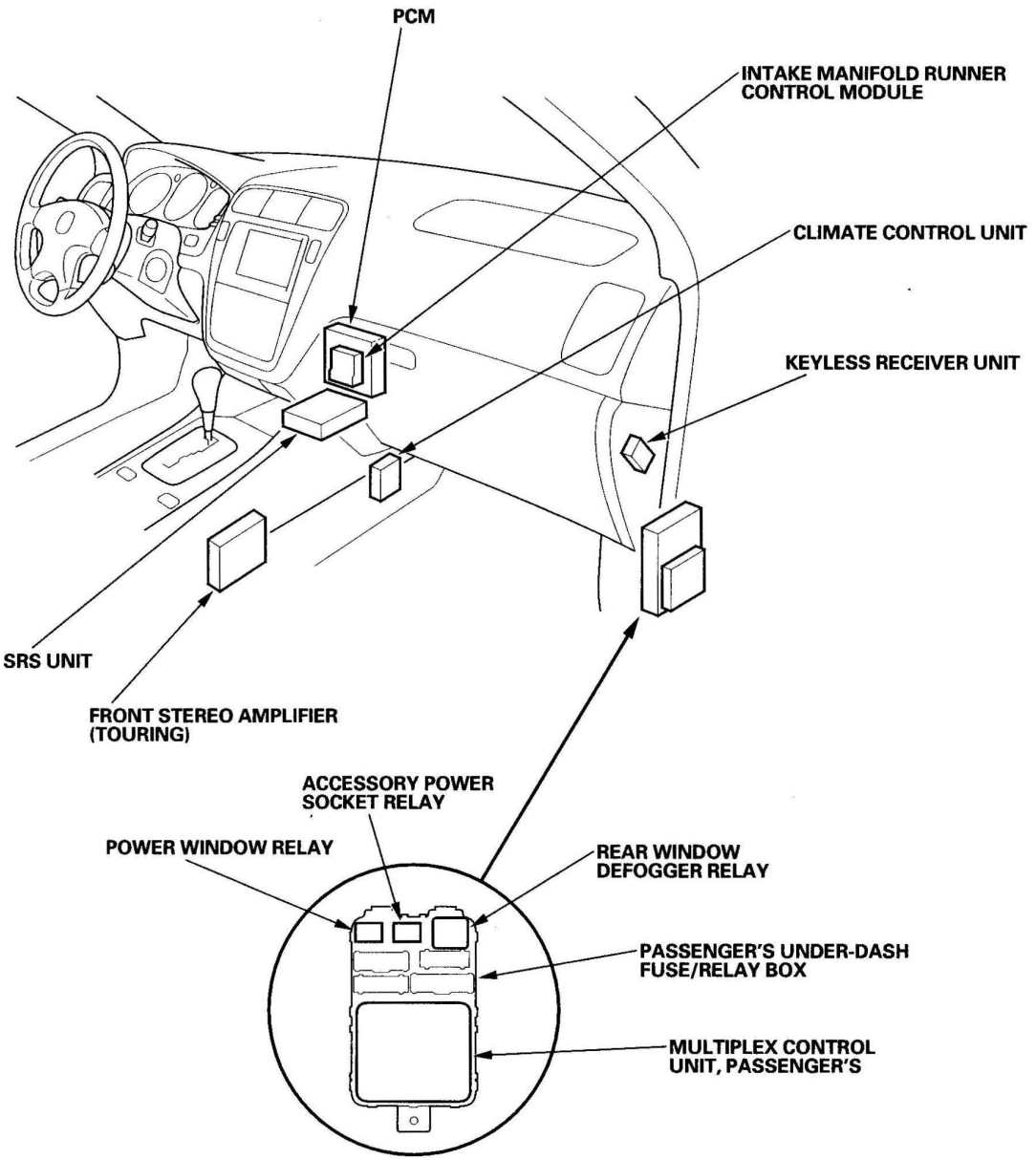
Relay and Control Unit Locations

Dashboard



BACK

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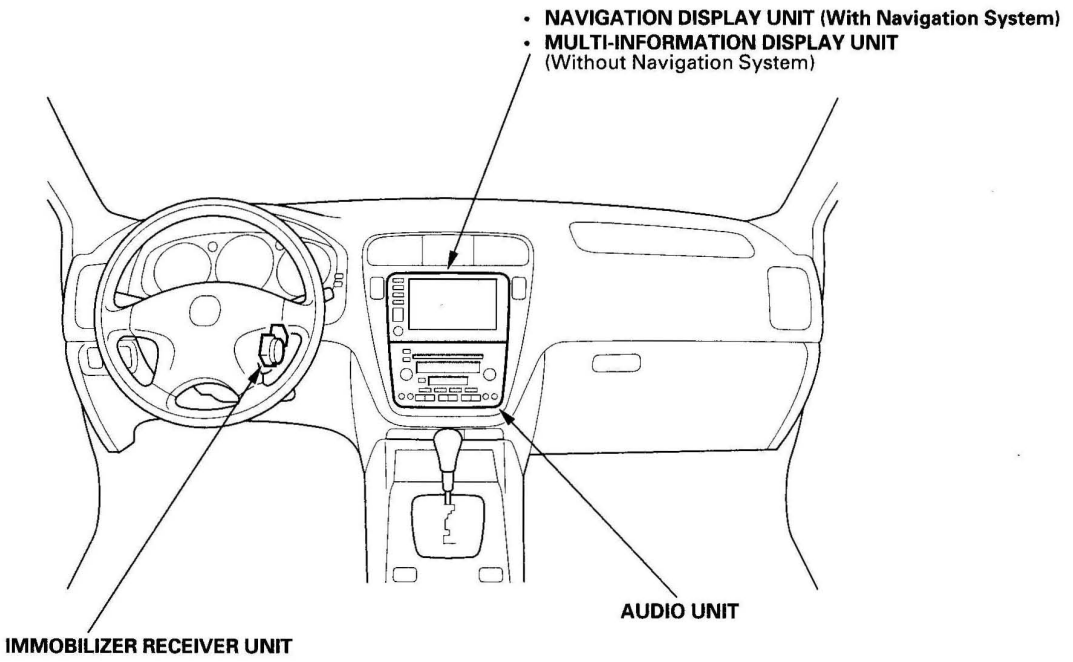
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Relay and Control Unit Locations

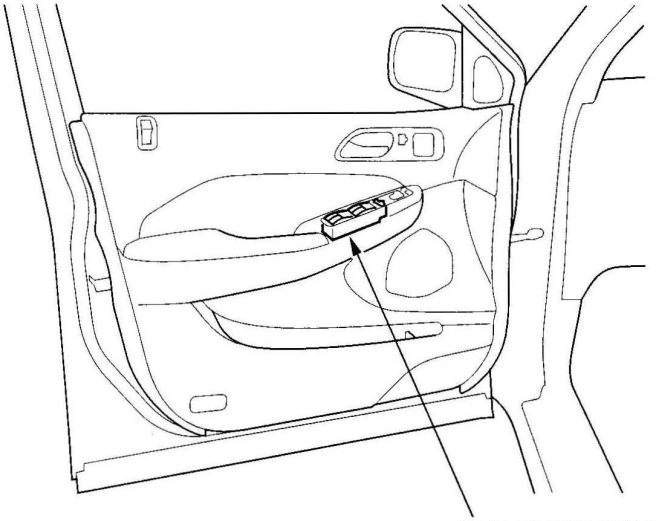
Dashboard (cont'd)

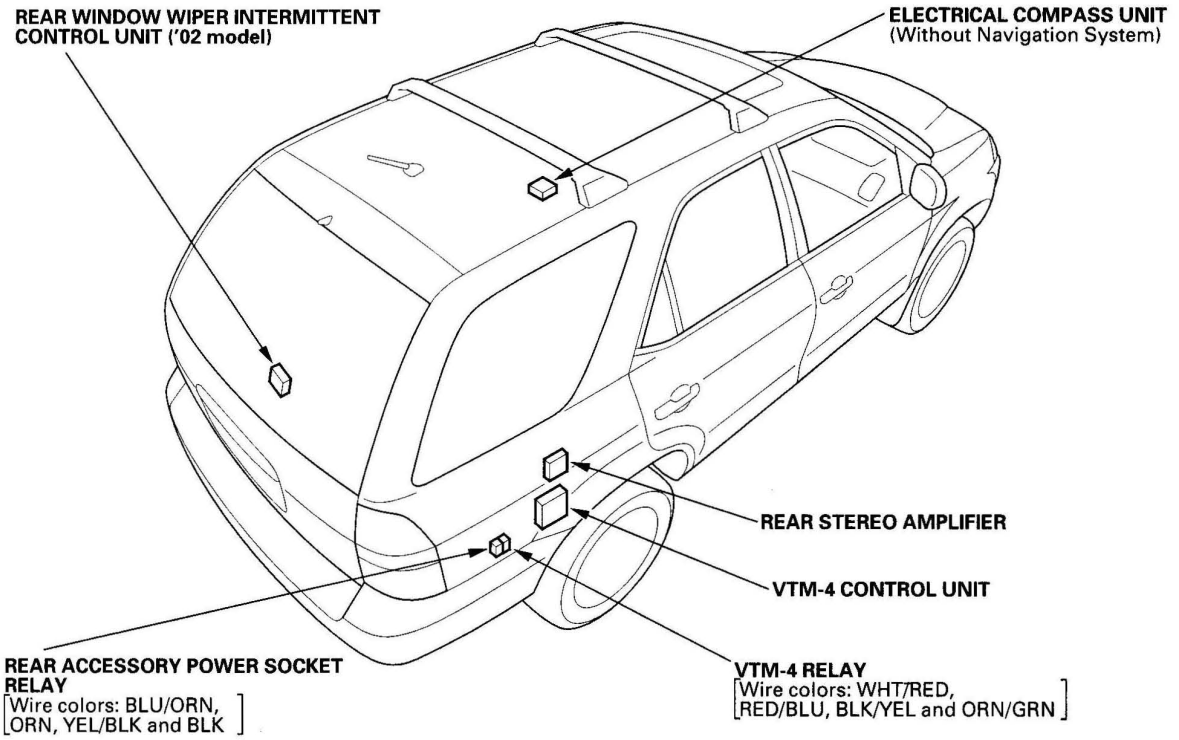


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Door, Rear Side Trim and Roof





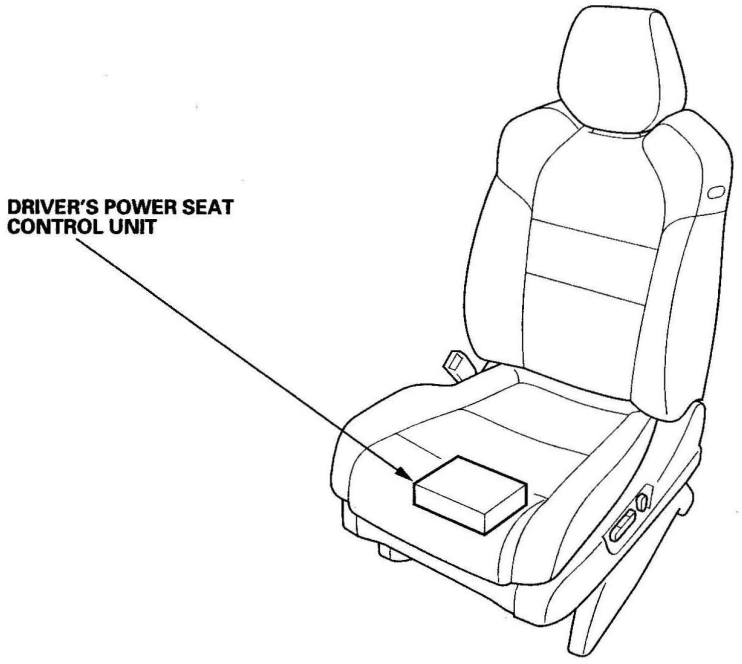
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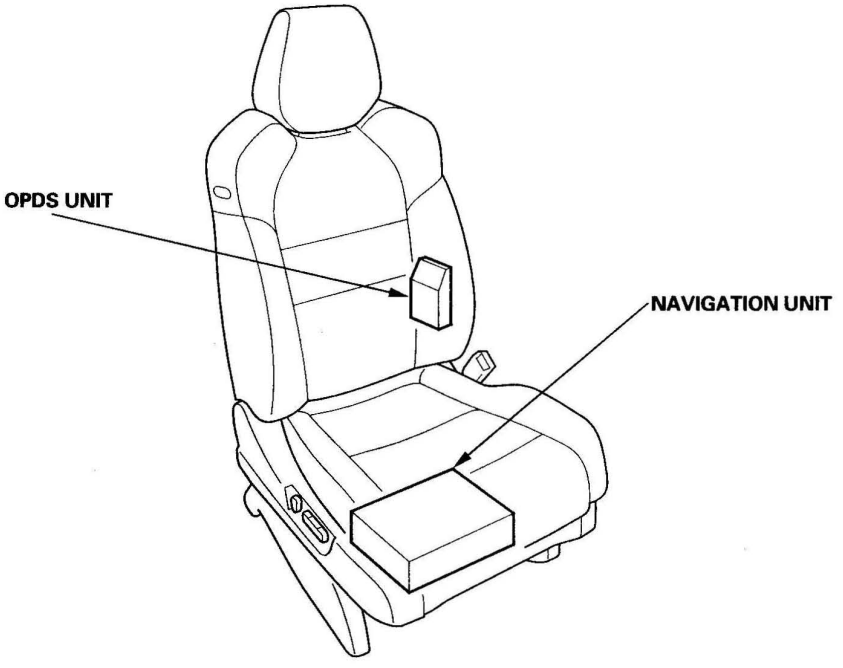
Relay and Control Unit Locations

Seats

DRIVER'S SEAT:



PASSENGER'S SEAT:



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Connector Index

Identification numbers have been assigned to in-line connectors. The number is preceded by the letter "C" for connectors, "G" for ground terminals or "T" for non-ground terminals.

Harness	Location			
	Engine Compartment	Dashboard	Others (Floor, Seat, Door, Tailgate and Roof)	Notes
Starter cable	T1, T2 and (+)			(see page 22-14)
Battery ground cable	T3 G1 and (−)			(see page 22-14)
Engine ground cable	T4 G2			(see page 22-14)
Engine wire harness	C101 through C107, C151 and C161, T101 and T102, G101 and G102			(see page 22-16)
A/T sub-harness	C151, G151			(see page 22-20)
Knock sensor sub-harness	C161			(see page 22-21)
Right engine compartment wire harness	G201	C201 through C203		(see page 22-22)
Left engine compartment wire harness	C101 through C103, T301, G301 and G302	C301 through C303		(see page 22-24)
Dashboard wire harness B (left branch)		C301, C302, C401, C402, C551, C552, C601 G401		(see page 22-26)
Dashboard wire harness B (right branch)		C201, C202, C403, C404		(see page 22-26)
Dashboard wire harness A (left branch)		C303, C401, C402, C501, C602, C603, C631, C632, C701, C801 C951 G501 and G502		(see page 22-30)
Dashboard wire harness A (right branch)		C203, C403, C404, C581, C651, C652, C681, C682, C683, C751 G503		(see page 22-30)
PCM sub-harness		C501		(see page 22-44)
Console accessory power socket sub-harness			C951	(see page 22-44)
Left side wire harness		C601 through C603	C604 through C606 G601 and G602	(see page 22-34)
Right side wire harness		C651 and C652	C605, C653, C654 G651 and G652	(see page 22-36)
Left floor wire harness		C631 and C632	C633 through C635, C805 G631	(see page 22-38)
Right floor wire harness		C681 through C683		(see page 22-39)
Tailgate wire harness			C606, C851, C852, C853	(see page 22-42)
Tailgate sub-harness			C851, C852, C853	(see page 22-43)
Moonroof wire harness			C551 and C552	(see page 22-45)
Roof wire harness			C581 and C654	(see page 22-46)
SRS main harness		C801 and C802 G801		(see page 22-40)
SRS side harness		C802	C803 through C805	(see page 22-40)
SRS side sub-harness			C803 and C804	(see page 22-40)
OPDS unit harness			C635	(see page 22-40)
Driver's door wire harness			C701 and C702	(see page 22-48)
Driver's door sub-harness			C702	(see page 22-48)
Front passenger's door wire harness			C751	(see page 22-49)
Left rear door wire harness			C604	(see page 22-50)
Right rear door wire harness			C653	(see page 22-51)
Driver's seat wire harness (With DPMS)			C633	(see page 22-52)
Driver's seat wire harness (Without DPMS)			C633	(see page 22-53)
Passenger's seat wire harness			C634	(see page 22-54)
Ignition switch lead				(see page 22-47)

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Connector to Harness Index

Starter Cable

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
T1	6		Right side of engine compartment	Under-hood fuse/relay box	
T2	4		Left side of engine compartment	Starter motor	
(+)			Battery	Battery positive terminal	

Battery Ground Cable

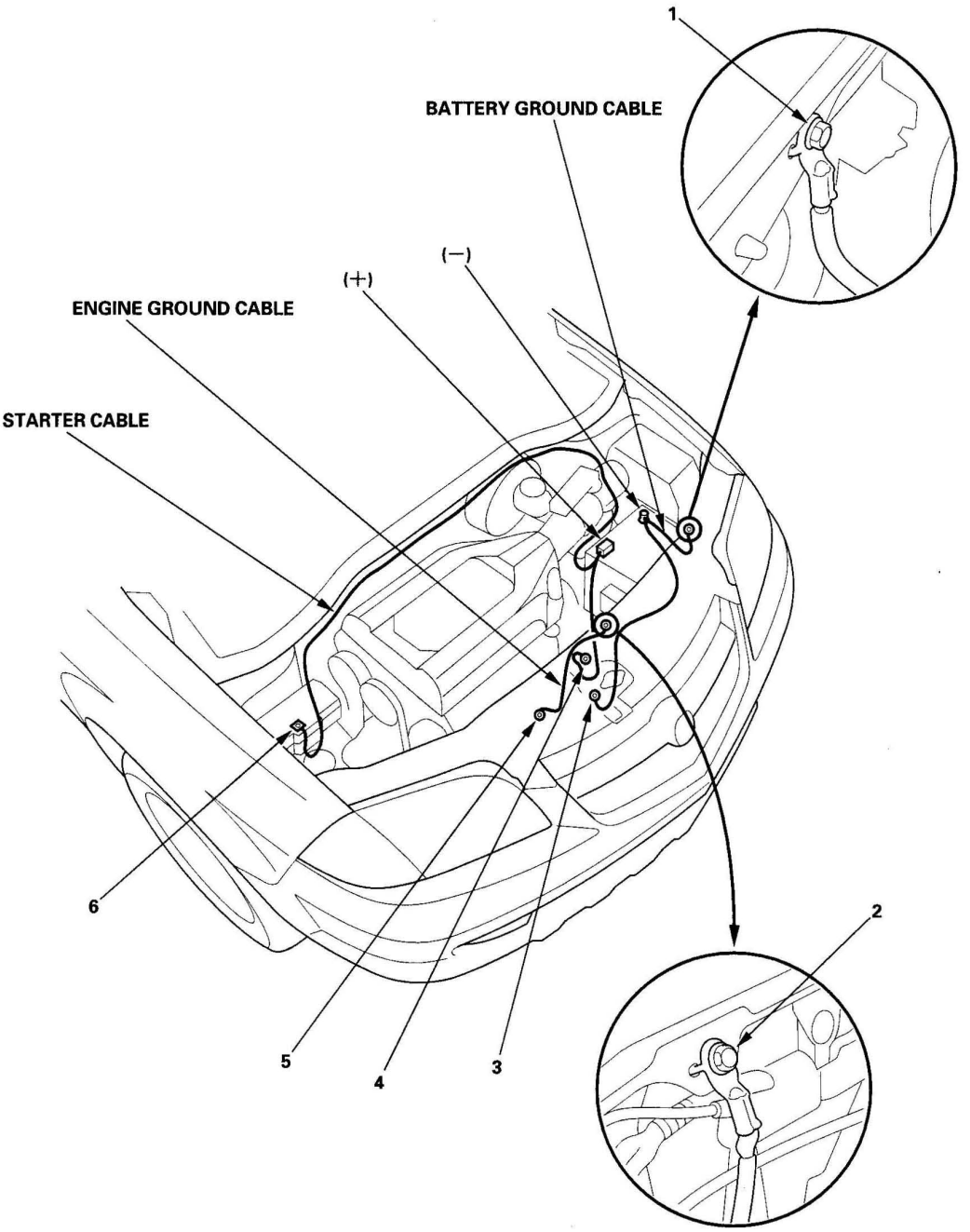
Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
T3	3		Left side of engine compartment	Transmission housing	
G1	1		Left side of engine compartment	Body ground via battery ground cables	
(−)			Battery	Battery negative terminal	

Engine Ground Cable

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
T4	5		Middle of engine compartment	Valve cover	
G2	2		Front of engine compartment	Body ground via engine ground cable	

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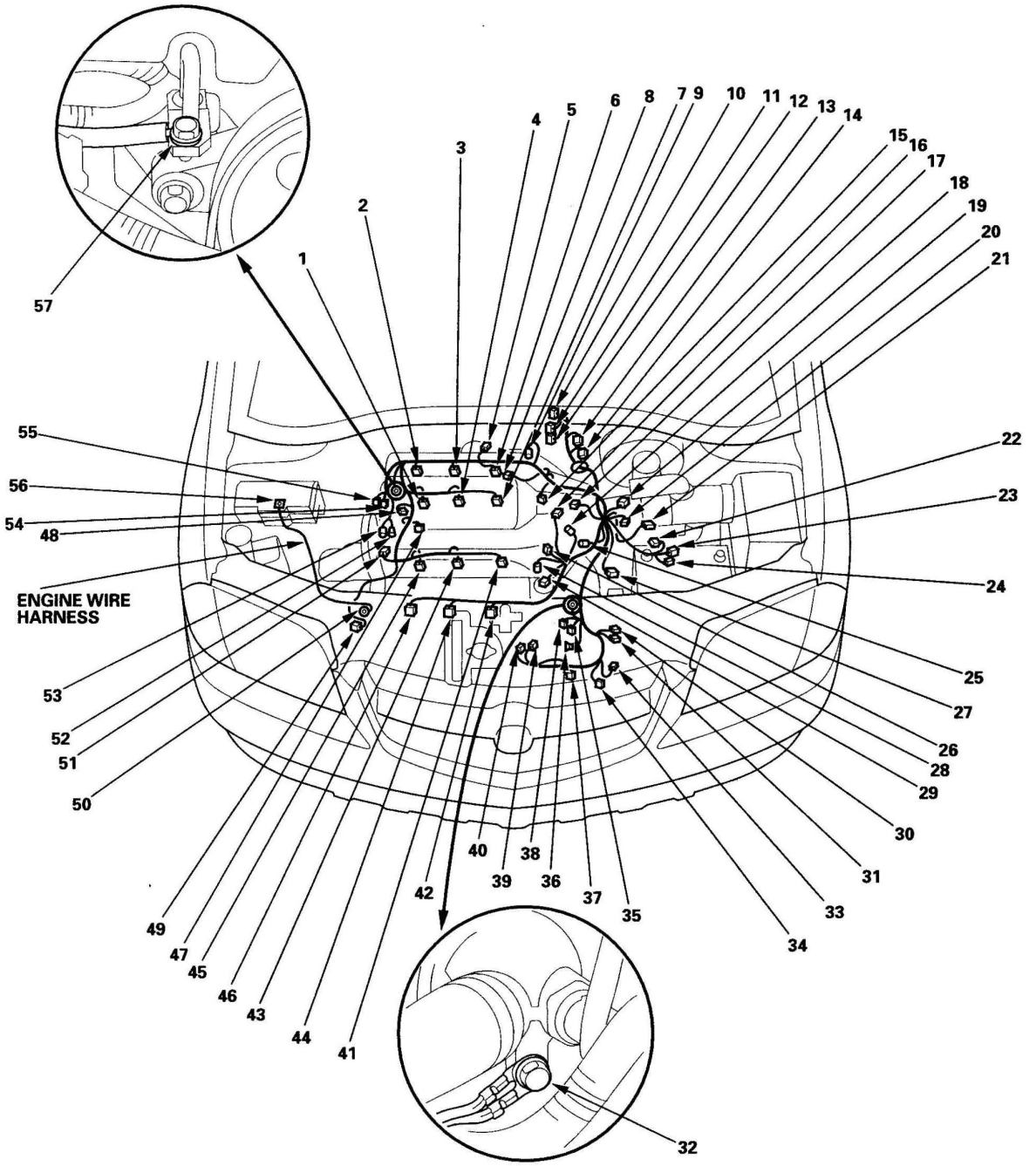
Connector to Harness Index (cont'd)

Engine Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Alternator	49	4	Middle of engine compartment		
A/T pressure control solenoid valve A	31	2	Left side of engine compartment		
A/T pressure control solenoid valve B	30	2	Left side of engine compartment		
A/T pressure control solenoid valve C	37	2	Left side of engine compartment		
CKP sensor	54	2	Right side of engine compartment		
Countershaft speed sensor	20	3	Left side of engine compartment		
EGR valve and EGR valve lift sensor	29	6	Left side of engine compartment		
Engine coolant temperature (ECT) sensor	28	2	Left side of engine compartment		
Engine oil pressure switch	52	1	Right side of engine compartment		
EVAP canister purge valve	16	2	Middle of engine compartment		
Fourth clutch pressure switch	33	1	Transmission housing		
Idle air control (IAC) valve	26	3	Left side of engine compartment		
Ignition coil No. 1	2	3	Middle of engine compartment		
Ignition coil No. 2	3	3	Middle of engine compartment		
Ignition coil No. 3	6	3	Middle of engine compartment		
Ignition coil No. 4	46	3	Middle of engine compartment		
Ignition coil No. 5	44	3	Middle of engine compartment		
Ignition coil No. 6	42	3	Middle of engine compartment		
Injector No. 1	1	2	Middle of engine compartment		
Injector No. 2	4	2	Middle of engine compartment		
Injector No. 3	7	2	Middle of engine compartment		
Injector No. 4	45	2	Middle of engine compartment		
Injector No. 5	43	2	Middle of engine compartment		
Injector No. 6	41	2	Middle of engine compartment		
Intake air temperature (IAT) sensor	9	2	Middle of engine compartment		
Intake manifold runner control actuator	5	2	Middle of engine compartment		
Mainshaft speed sensor	34	3	Left side of engine compartment		
MAP sensor	17	3	Left side of engine compartment		
PCM connector B	10	25	Under middle of dash		
PCM connector C	11	31	Under middle of dash		
PCM connector D	12	16	Under middle of dash		
Primary heated oxygen sensor (PHO2S)	8	4	Left side of engine compartment		
Radiator fan switch A	25	2	Left side of engine compartment		
Radiator fan switch C	48	2	Right side of engine compartment		

BACK

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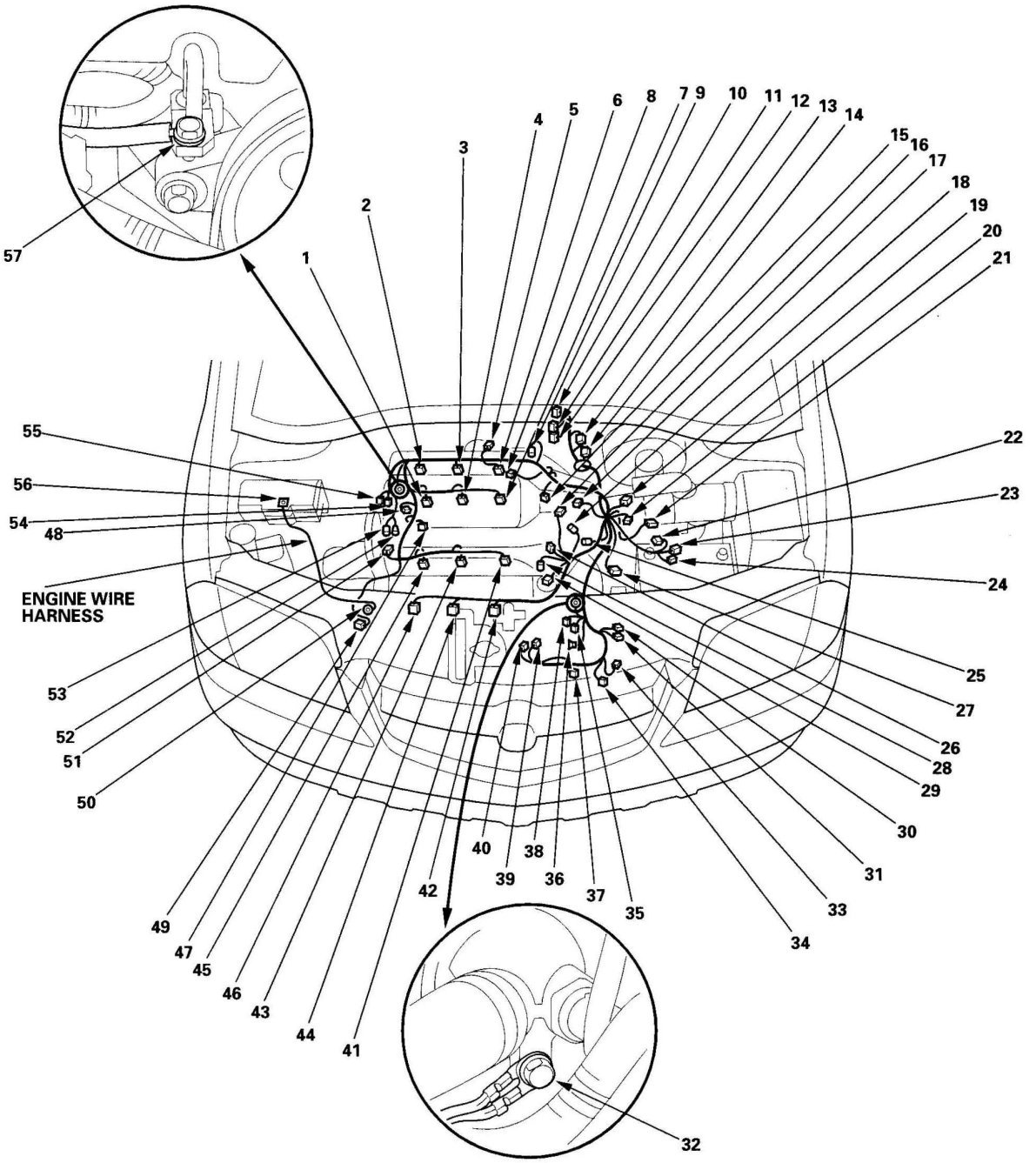
Connector to Harness Index (cont'd)

Engine Wire Harness (cont'd)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Shift solenoid valve A	40	2	Left side of engine compartment		
Shift solenoid valve B	35	2	Left side of engine compartment		
Shift solenoid valve C	39	2	Left side of engine compartment		
Starter solenoid	36	1	Left side of engine compartment		
TDC sensor 1 and sensor 2	51	4	Right side of engine compartment		
Throttle position (TP) sensor	18	3	Left side of engine compartment		
Torque converter clutch solenoid valve	38	2	Left side of engine compartment		
Transmission range switch	21	10	On transmission housing		
VTEC pressure switch	53	2	Right side of engine compartment		
VTEC solenoid valve	55	1	Right side of engine compartment		
C101	23	14	Left side of engine compartment	Left engine compartment wire harness (see page 22-24)	
C102	22	10	Left side of engine compartment	Left engine compartment wire harness (see page 22-24)	
C103	24	1	Left side of engine compartment	Left engine compartment wire harness (see page 22-24)	
C104 (Junction connector A)	15	8	Left side of engine compartment		
C105 (Junction connector B)	19	14	Left side of engine compartment		
C106 (Junction connector C)	14	20	Under middle of dash		
C107 (Junction connector D)	13	20	Under middle of dash		
C151	27	8	Left side of engine compartment	A/T sub-harness (see page 22-20)	
C161	47	1	Middle of engine compartment	Knock sensor sub-harness (see page 22-21)	
T101	56		Under-hood fuse/relay box		
T102	50		Alternator		
G101	32		Left side of engine compartment	Engine ground via engine wire harness	
G102	57		Right side of engine compartment	Engine ground via engine wire harness	

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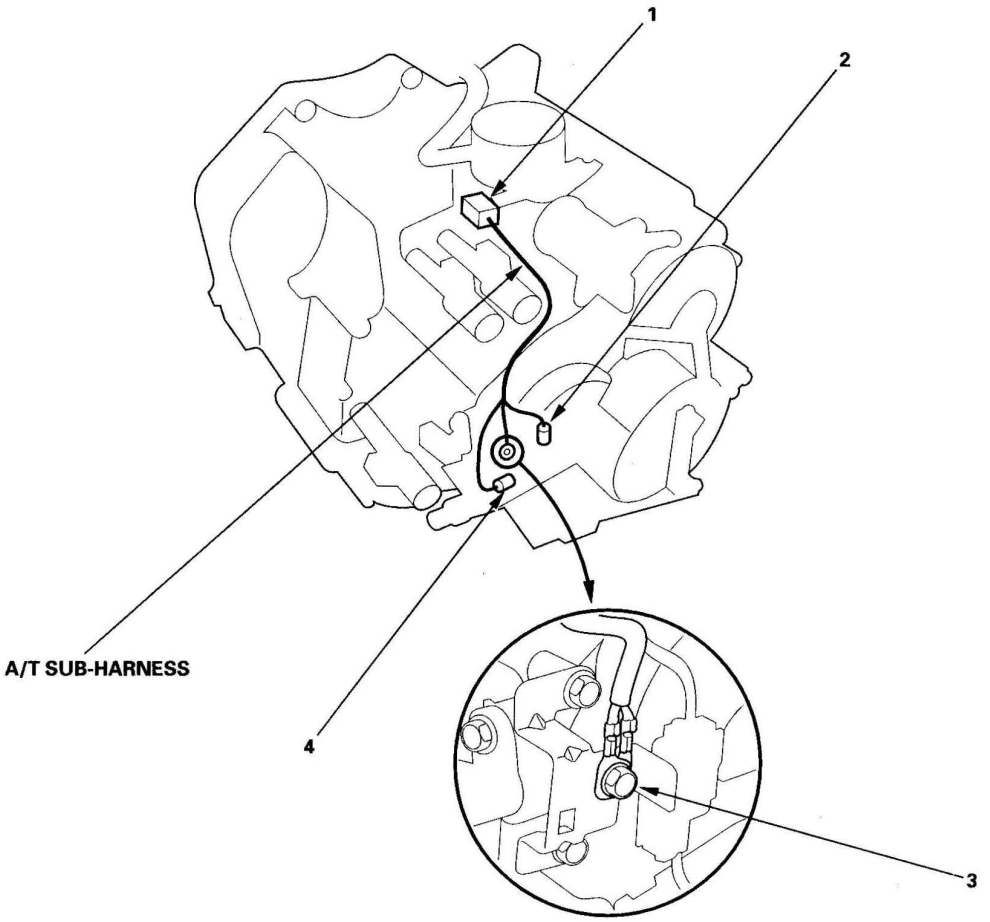
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Connector to Harness Index (cont'd)

A/T Sub-harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
A/T fluid temperature sensor	2	2	On transmission housing		
Third clutch pressure switch	4	1	On transmission housing		
C151	1	8	On transmission housing	Engine wire harness (see page 22-16)	
G151	3		On transmission housing	Engine ground, via A/T sub-harness	

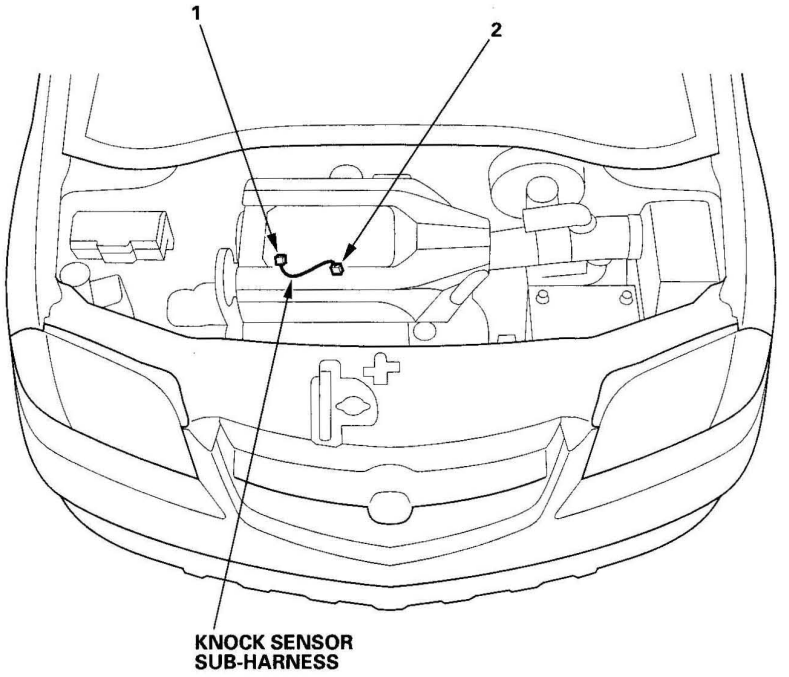


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Knock Sensor Sub-harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Knock sensor	2	1	Middle of engine compartment		
C161	1	1	Right side of engine compartment	Engine wire harness (see page 22-16)	



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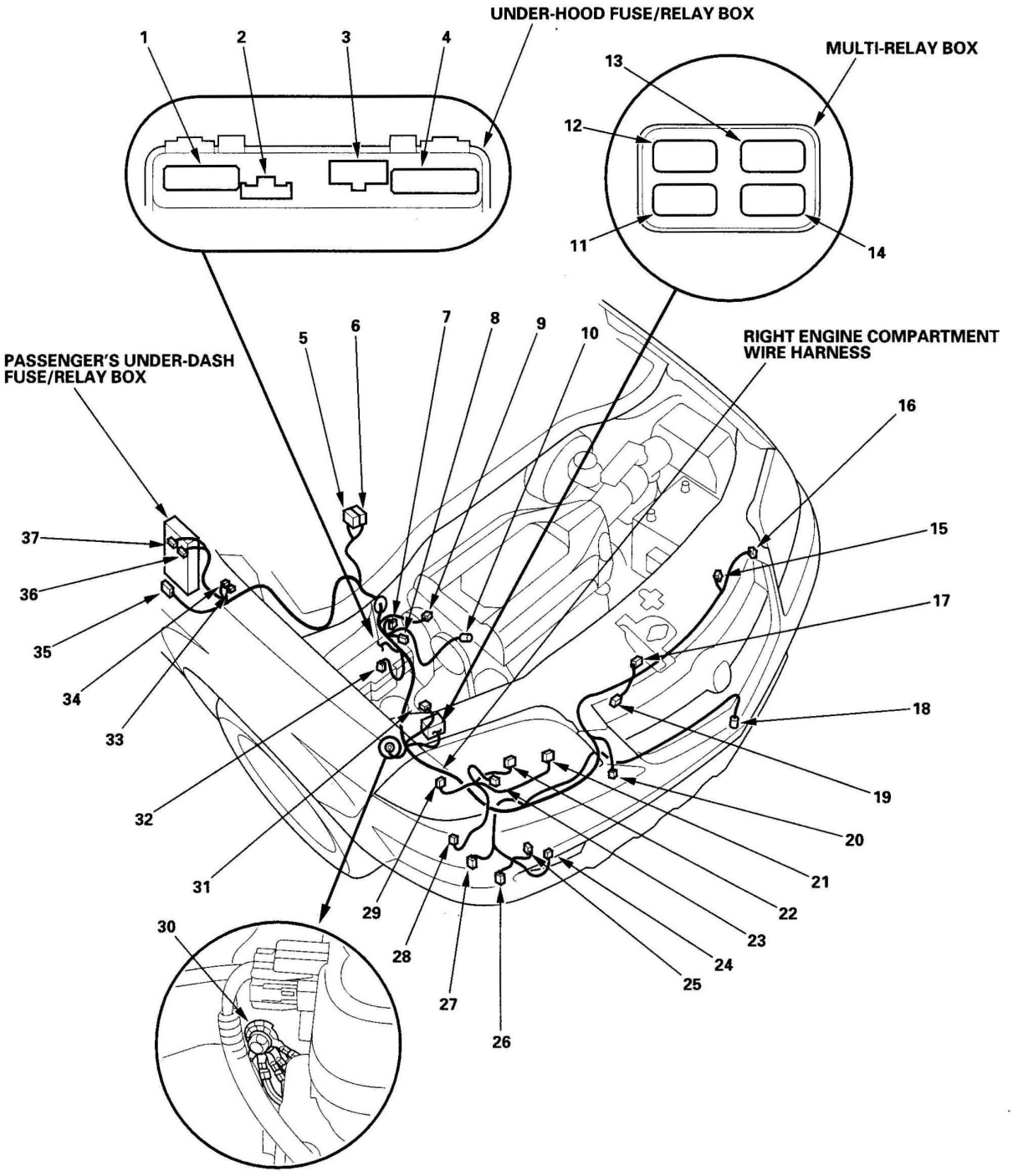
Connector to Harness Index (cont'd)

Right Engine Compartment Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
ABS right front wheel sensor	8	2	Right side of engine compartment		
A/C compressor clutch	20	1	Middle of engine compartment		
A/C pressure switch	7	4	Middle of engine compartment		
Condenser fan moter	19	2	Middle of engine compartment		
Cruise control actuator	31	4	Right side of engine compartment		
Diode (for A/C)	33	2	Middle of engine compartment		
Diode (for A/C)	34	2	Right side of engine compartment		
ELD unit	32	3	In under-hood fuse/relay box		
Fan control relay	11	5	In multi-relay box		
Horn (high)	28	1	Right side of engine compartment		
Outside air temperature sensor	18	2	Behind middle of front bumper		
Passenger's under-dash fuse/relay box connector A (see page 22-57)	36	3	Behind right kick panel		
Passenger's under-dash fuse/relay box connector B (see page 22-57)	37	18	Behind right kick panel		
Power steering pressure (PSP) switch	10	2	Right side of engine compartment		
Radiator fan motor	15	2	Middle of engine compartment		
Radiator fan switch B	16	2	Middle of engine compartment		
Rear stereo amplifier relay	12	4	In multi-relay box		TOURING
Rear window washer motor	26	2	Behind right side of front bumper		
Right fog light	24	2	Behind right front fog light		
Right front parking/side marker light	23	3	Behind right front headlight		
Right front turn signal lights	29	2	Behind right front headlight		
Right headlight (high)	21	2	Behind right front headlight		
Right headlight (low)	22	2	Behind right front headlight		
Secondary heated oxygen sensor (Secondary HO2S)	9	4	Right side of engine compartment		
Security hood switch	17	2	Behind hood latch		
Shift lock relay	13	5	In multi-relay box		
Under-hood fuse/relay box connector A (see page 22-55)	4	18	Behind under-hood fuse/relay box		
Under-hood fuse/relay box connector B (see page 22-55)	3	7	Behind under-hood fuse/relay box		
Under-hood fuse/relay box connector C (see page 22-55)	2	3	Behind under-hood fuse/relay box		
Under-hood fuse/relay box connector D (see page 22-55)	1	16	Behind under-hood fuse/relay box		
Washer fluid level switch	25	2	Behind right side of front bumper		
Windshield washer motor	27	2	Behind right side of front bumper		
Windshield wiper intermittent relay	14	5	In multi-relay box		
C201	5	16	Under right side of dash	Dashboard wire harness B (see page 22-26)	
C202	6	7	Under right side of dash	Dashboard wire harness B (see page 22-26)	
C203	35	20	Under right side of dash	Dashboard wire harness A (see page 22-30)	
G201	30		Right side of engine compartment	Body ground, via right engine compartment wire harness	

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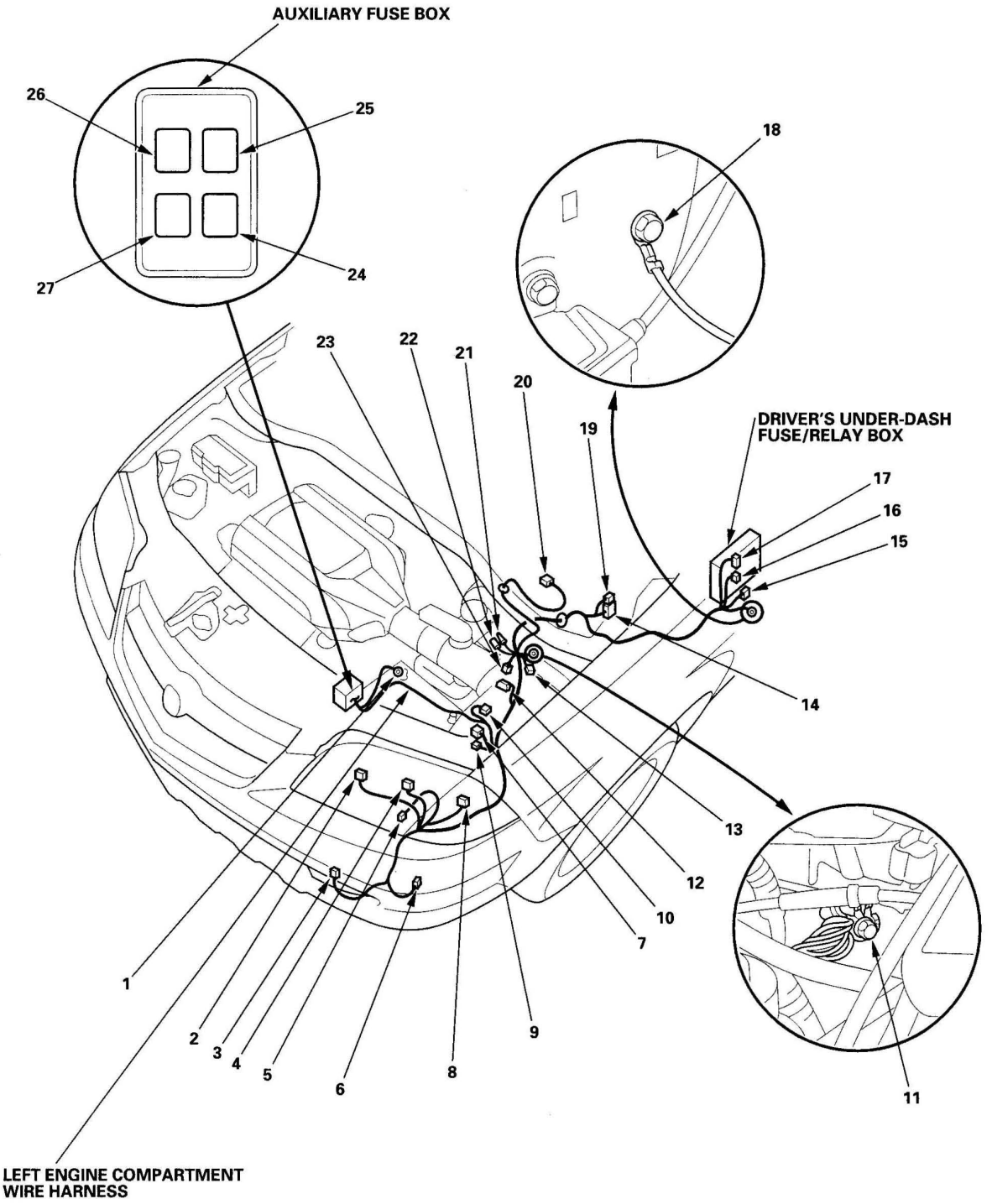
Connector to Harness Index (cont'd)

Left Engine Compartment Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
ABS left front wheel sensor	23	2	Left side of engine compartment		
ABS modulator-control unit	12	26	Left side of engine compartment		
Auxiliary-fuse box A (see page 22-58)	26		Left side of engine compartment		
Auxiliary-fuse box B (see page 22-58)	25		Left side of engine compartment		
Auxiliary-fuse box C (see page 22-58)	27		Left side of engine compartment		
Auxiliary-fuse box D (see page 22-58)	24		Left side of engine compartment		
Brake fluid level switch connector (+)	22	1	Left side of engine compartment		
Brake fluid level switch connector (−)	21	1	Left side of engine compartment		
Driver's under-dash fuse/relay box connector C (see page 22-56)	16	5	Under left side of dash		
Driver's under-dash fuse/relay box connector D (see page 22-56)	17	20	Under left side of dash		
Horn (low)	6	1	Left side of engine compartment		
Left fog light	3	2	Behind left front fog light		
Left front parking/side marker light	5	3	Behind left headlight		
Left front turn signal lights	8	2	Behind left headlight		
Left headlight (high)	2	2	Behind left headlight		
Left headlight (low)	4	2	Behind left headlight		
Test tachometer connector	13	2	Left side of engine compartment		
Windshield wiper motor	20	5	Left side of engine compartment		
C101	10	10	Left side of engine compartment	Engine wire harness (see page 22-16)	
C102	7	14	Left side of engine compartment	Engine wire harness (see page 22-16)	
C103	9	1	Left side of engine compartment	Engine wire harness (see page 22-16)	
C301	14	20	Under left side of dash	Dashboard wire harness B (see page 22-26)	
C302	19	2	Under left side of dash	Dashboard wire harness B (see page 22-26)	
C303	15	16	Under left side of dash	Dashboard wire harness A (see page 22-30)	
T301	1		Left side of engine compartment		
G301	11		Left side of engine compartment	Body ground, via left engine compartment wire harness	
G302	18		Left side of engine compartment	Body ground, via left engine compartment wire harness	

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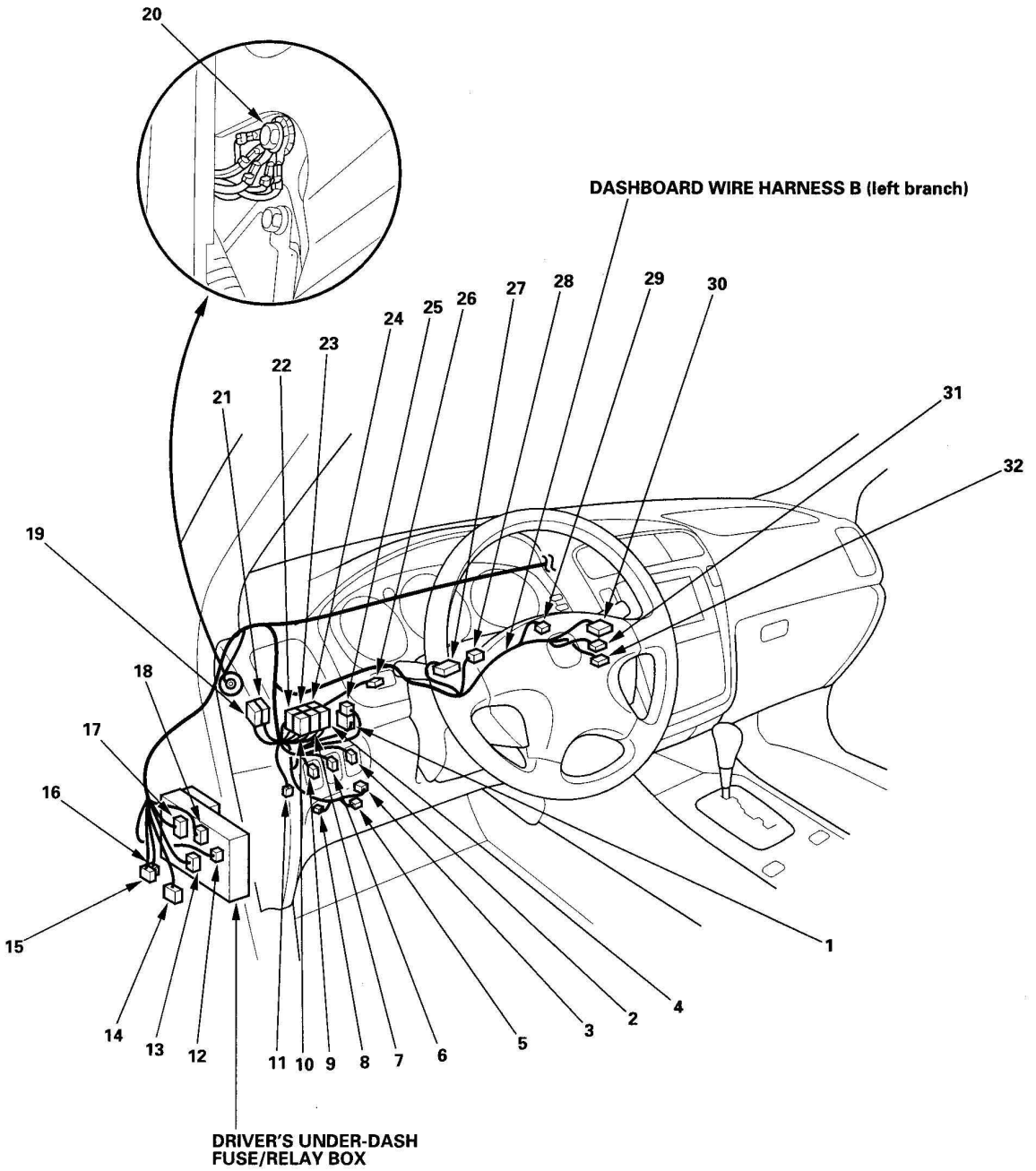
Connector to Harness Index (cont'd)

Dashboard Wire Harness B (Left branch)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Brake pedal position switch	3	4	Under left side of dash		
Cable reel	29	4	In steering column cover		
Combination light switch	27	14	In steering column cover		
Cruise main switch	9	5	Middle of dash		
Dash lights brightness controller	26	6	Middle of dash		
Diode (for daytime running lights)	8	2	Under left side of dash		Canada
Driver's under-dash fuse/relay box connector L (see page 22-56)	17	22	Under left side of dash		
Driver's under-dash fuse/relay box connector M (see page 22-56)	18	20	Under left side of dash		
Driver's under-dash fuse/relay box connector N (see page 22-56)	13	7	Under left side of dash		
Driver's under-dash fuse/relay box connector P (see page 22-56)	12	3	Under left side of dash		
Fog light relay	7	4	Under left side of dash		
Fog light switch	2	8	Middle of dash		
High beam cut relay	10	4	Under left side of dash		Canada
Ignition key switch	32	7	In steering column cover		
Immobilizer receiver unit	31	5	In steering column cover		
Moonroof close relay	4	5	Under left side of dash		
Moonroof open relay	24	5	Under left side of dash		
Moonroof switch	6	6	Middle of dash		
Multiplex control inspection connector	5	3	Under left side of dash		
Parking brake switch	11	1	Under left side of dash		
Rear window wiper/washer switch	28	8	In steering column cover		
Seat heater relay	22	4	Under left side of dash		
Taillight relay	23	4	Under left side of dash		
Windshield wiper/washer switch	30	8	In steering column cover		
C301	1	20	Under left side of dash	Left engine compartment wire harness (see page 22-24)	
C302	25	2	Under left side of dash	Left engine compartment wire harness (see page 22-24)	
C401	19	24	Under middle of dash	Dashboard wire harness A (see page 22-30)	
C402	21	14	Under middle of dash	Dashboard wire harness A (see page 22-30)	
C551	15	6	Under left side of dash	Moonroof wire harness (see page 22-45)	
C552	16	5	Under left side of dash	Moonroof wire harness (see page 22-45)	
C601	14	12	Under left side of dash	Left side wire harness (see page 22-34)	
G401	20		Under left side of dash	Body ground, via dashboard wire harness B	

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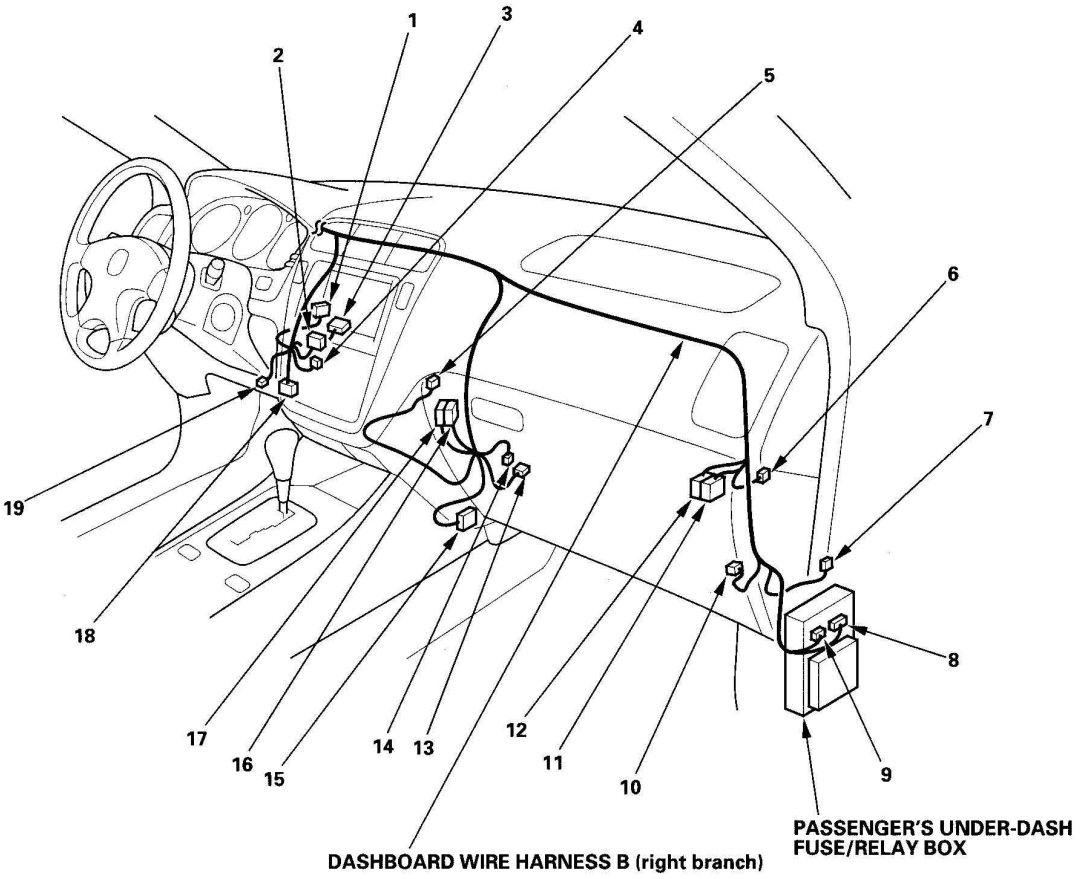
Connector to Harness Index (cont'd)

Dashboard Wire Harness B (Right branch)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Air mix control motor	13	7	Under right side of dash		
Blower motor	7	2	Under right side of dash		
Climate control unit connector B	15	26	Under right side of dash		
Cruise control unit	1	14	Under middle of dash		
Data link connector (DLC)	18	16	Under middle of dash		
Daytime running lights control unit	3	14	Under middle of dash		Canada
Evaporator temperature sensor	14	2	Under right side of dash		
In-car temperature sensor	19	2	Under middle of dash		
Mode control motor	5	7	Under right side of dash		
Passenger's under-dash fuse/relay box connector I (see page 22-57)	8	16	Under right side of dash		
Passenger's under-dash fuse/relay box connector J (see page 22-57)	9	16	Under right side of dash		
PGM-FI main relay	2	7	Under middle of dash		
Power transistor	10	5	Under right side of dash		
Radiator fan control module	4	8	Under middle of dash		
Recirculation control motor	6	7	Under right side of dash		
C201	12	16	Under right side of dash	Right engine compartment wire harness (see page 22-22)	
C202	11	7	Under right side of dash	Right engine compartment wire harness (see page 22-22)	
C403	16	16	Under middle of dash	Dashboard wire harness A (see page 22-30)	
C404	17	3	Under middle of dash	Dashboard wire harness A (see page 22-30)	

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Connector to Harness Index (cont'd)

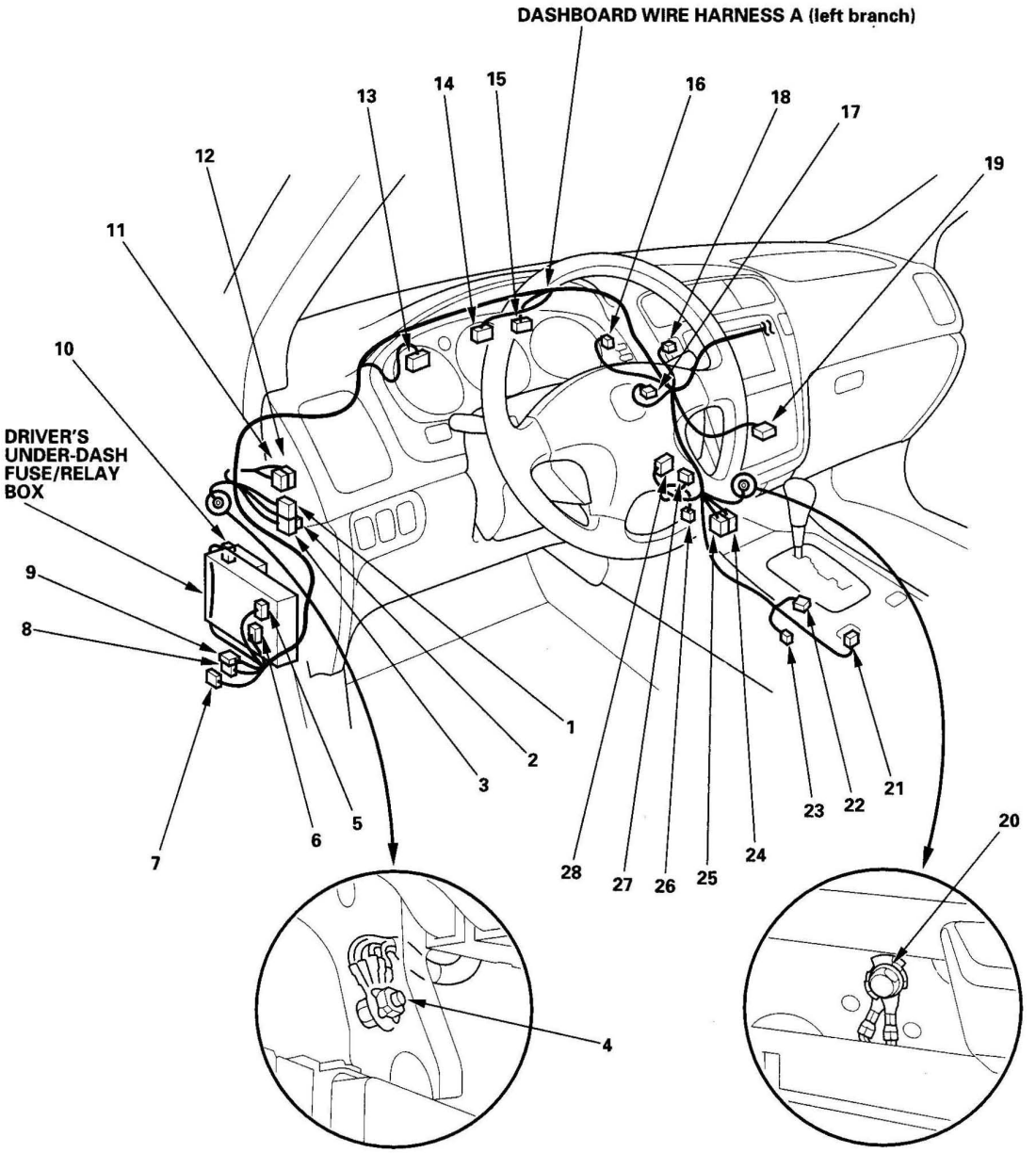
Dashboard Wire Harness A (Left branch)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Audio unit	19	20	Middle of dash		
A/T gear position indicator panel light/ 1st-hold switch/parking pin switch connector	22	6	Behind center console panel		
Auxiliary fuse holder	2	2	Under left side of dash		
Driver's seat heater switch	21	6	Behind center console panel		
Driver's under-dash fuse/relay box connector J (see page 22-56)	5	18	Under left side of dash		
Driver's under-dash fuse/relay box connector K (see page 22-56)	6	18	Under left side of dash		
Gauge assembly connector A	13	30	Behind gauges		
Gauge assembly connector B	15	18	Behind gauges		
Gauge assembly connector C	14	14	Behind gauges		
Intake manifold runner control (IMRC) module	27	14	Under middle of dash		
Interior light switch	18	6	Middle of dash		
Multiplex control unit, driver's connector B	10	22	Under left side of dash		
PCM connector A	28	32	Under middle of dash		
Select/reset switch	16	5	Middle of dash		
VTM-4 lock switch	17	6	Middle of dash		
C303	8	16	Under left side of dash	left engine compartment wire harness (see page 22-24)	
C401	11	24	Under middle of dash	Dashboard wire harness B (see page 22-26)	
C402	12	14	Under middle of dash	Dashboard wire harness B (see page 22-26)	
C501	26	4	Under middle of dash	PCM sub-harness (see page 22-44)	
C602	7	10	Under left side of dash	Left side wire harness (see page 22-34)	
C603	9	3	Under left side of dash	Left side wire harness (see page 22-34)	
C631	25	16	Under middle of dash	Left floor wire harness (see page 22-38)	
C632	24	12	Under middle of dash	Left floor wire harness (see page 22-38)	*1
C632	24	2	Under middle of dash	Left floor wire harness (see page 22-38)	'01 model
C701	3	16	Under left side of dash	Driver's door wire harness (see page 22-48)	
C801	1	8	Under left side of dash	SRS main harness (see page 22-40)	
C951	23	2	Under middle of dash	Console accessory power socket sub-harness (see page 22-44)	
G501	4		Under left side of dash	Body ground, via dashboard wire harness A	
G502	20		Under middle of dash	Body ground, via dashboard wire harness A	

*1: '01 model TOURING and '02 model

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Connector to Harness Index (cont'd)

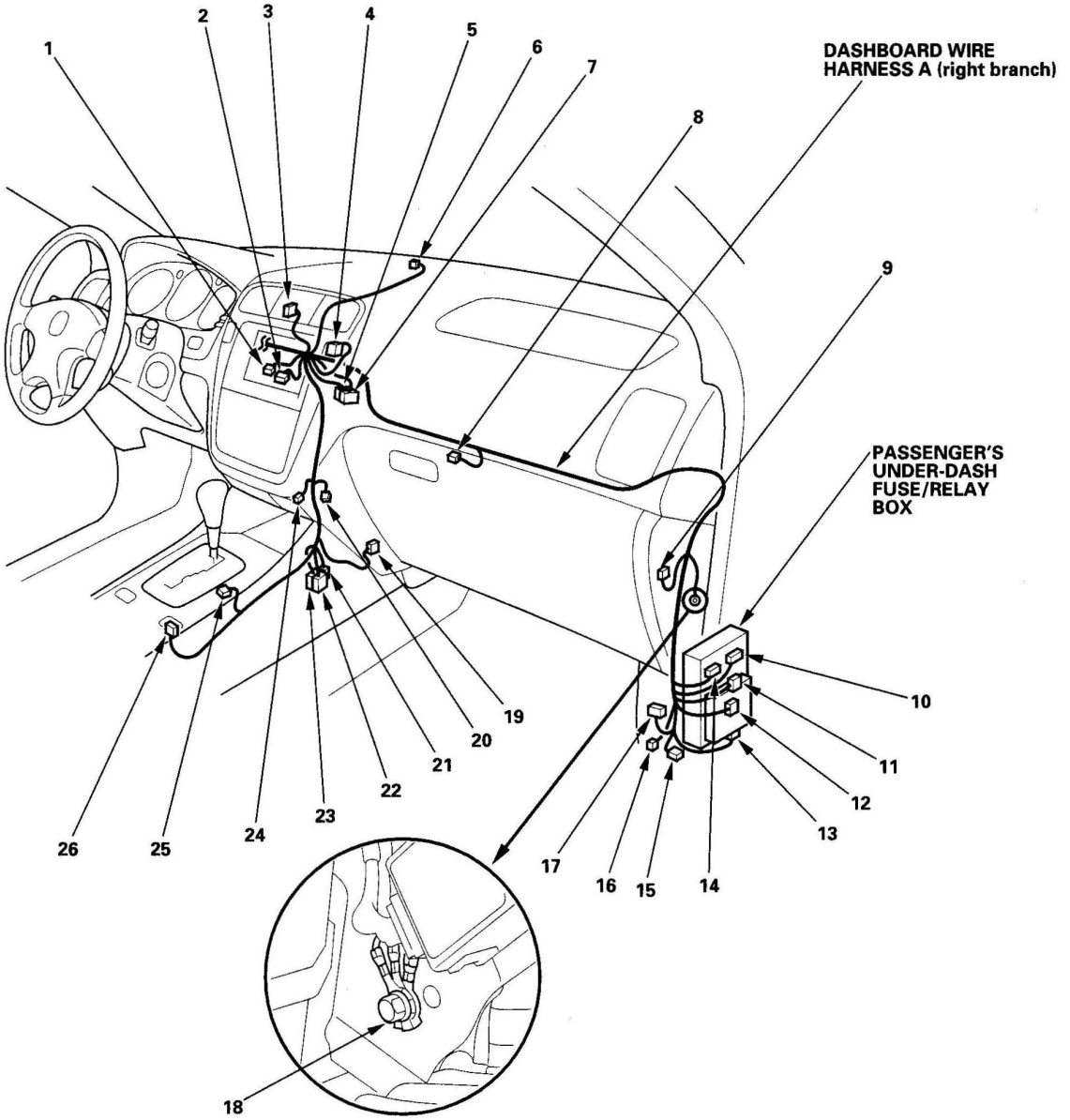
Dashboard Wire Harness A (Right branch)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
A/T shift lock solenoid	25	2	Behind center console panel		
Cigarette lighter connector (Optional)	20	4	Under middle of dash		
Climate control unit connector A	19	16	Under middle of dash		
Climate control panel	3	16	Middle of dash		
Display connector A	2	5	Middle of dash		
Display connector B	1	20	Middle of dash		
Front accessory power socket	24	2	Middle of dash		
Front passenger's seat heater switch	26	6	Behind center console panel		
Hazard warning switch	4	10	Middle of dash		
Glove box light	8	2	Behind glove box		
Keyless receiver unit	9	7	Behind glove box		
Multiplex control unit, passenger's	13	22	Under right side of dash		
Passenger's under-dash fuse/relay box connector G (see page 22-57)	10	18	Under right side of dash		
Passenger's under-dash fuse/relay box connector H (see page 22-57)	14	18	Under right side of dash		
Sunlight sensor	6	2	Middle of dash		
C203	12	20	Under right side of dash	Right engine compartment wire harness (see page 22-22)	
C403	7	16	Under middle of dash	Dashboard wire harness B (see page 22-26)	
C404	5	3	Under middle of dash	Dashboard wire harness B (see page 22-26)	
C581	11	14	Under right side of dash	Roof wire harness (see page 22-46)	
C651	15	24	Under right side of dash	Right side wire harness (see page 22-36)	
C652	16	2	Under right side of dash	Right side wire harness (see page 22-36)	Without BOSE
C681	22	24	Under middle of dash	Right floor wire harness (see page 22-39)	With BOSE
C682	21	4	Under middle of dash	Right floor wire harness (see page 22-39)	*1
C682	21	3	Under middle of dash	Right floor wire harness (see page 22-39)	*2
C682	21	2	Under middle of dash	Right floor wire harness (see page 22-39)	*3
C683	23	24	Under middle of dash	Right floor wire harness (see page 22-39)	*2
C683	23	20	Under middle of dash	Right floor wire harness (see page 22-39)	*1
C751	17	16	Under right side of dash	Front passenger's door wire harness (see page 22-49)	
G503	18		Under right side of dash	Body ground, via dashboard wire harness A	

*1: '01-02 models with Navigation and BOSE
*2: '01-02 models with Navigation without BOSE
*3: '02 model with BOSE

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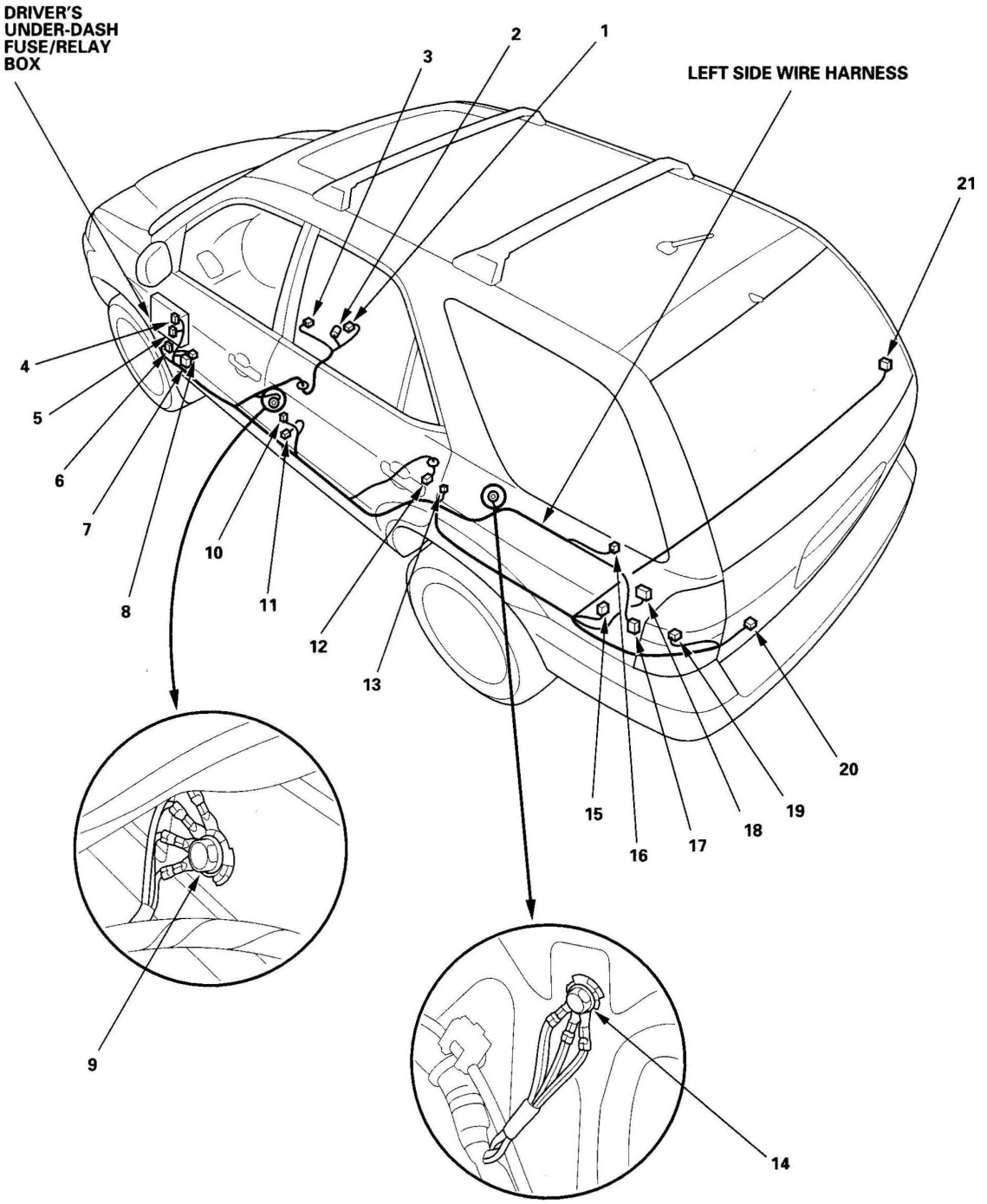
Connector to Harness Index (cont'd)

Left Side Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Brake lights failure sensor	19	6	Left side of cargo area		
Driver's door switch	10	1	Left B-pillar		
Driver's under-dash fuse/relay box connector E (see page 22-56)	5	10	Under left side of dash		
Driver's under-dash fuse/relay box connector F (see page 22-56)	4	14	Under left side of dash		
EVAP bypass solenoid valve	1	2	Under left side of floor		
EVAP canister vent shut valve	3	2	Under left side of floor		
Fuel pump/fuel sending unit	12	5	Fuel tank		
Fuel tank pressure (FTP) sensor	2	3	Under left side of floor		
Left rear door switch	13	1	Left C-pillar		
Left taillight	17	5	Behind left taillight		
Rear accessory power socket	16	2	Left side of cargo area		
Rear window wiper intermittent control unit	15	8	Left side of cargo area		'02 model
Trailer lighting connector	20	6	Left side of cargo area		
C601	6	12	Under left side of dash	Dashboard wire harness B (see page 22-26)	
C602	7	10	Under left side of dash	Dashboard wire harness A (see page 22-30)	
C603	8	3	Under left side of dash	Dashboard wire harness A (see page 22-30)	
C604	11	12	Left B-pillar	Left rear door wire harness (see page 22-50)	
C605	21	20	Right side of cargo area	Right side wire harness (see page 22-36)	
C606	18	14	Left side of cargo area	Tailgate wire harness (see page 22-42)	
G601	9		Left side of floor	Body ground, via left side wire harness	
G602	14		Behind left rear lining	Body ground, via left side wire harness	

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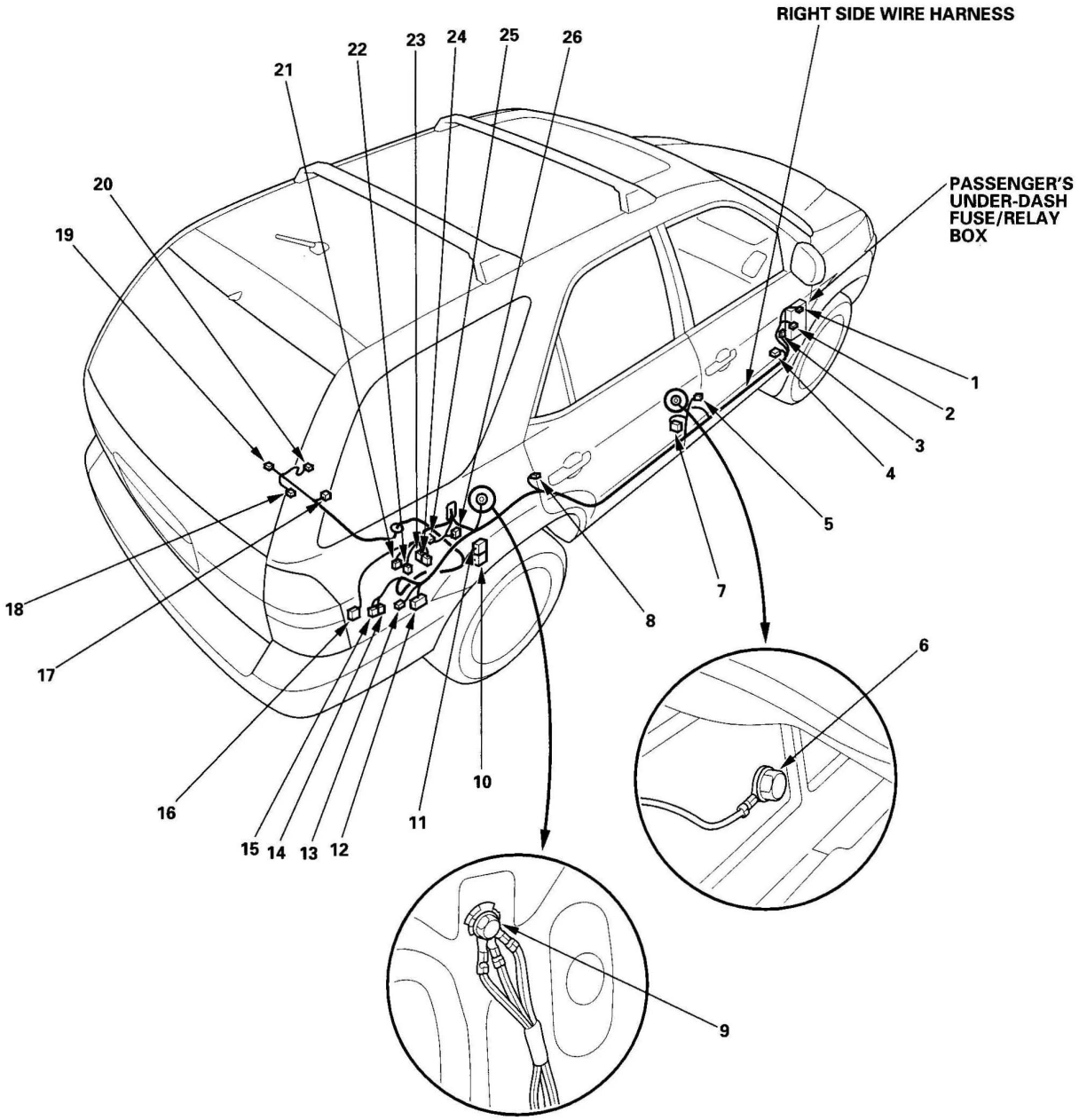
Connector to Harness Index (cont'd)

Right Side Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
ABS left rear wheel sensor	19	2	Under rear floor		
ABS right rear wheel sensor	18	2	Under rear floor		
Electromagnetic clutch (left)	20	2	Under rear floor		
Electromagnetic clutch (right)	17	4	Under rear floor		
Front passenger's door switch	5	1	Right B-pillar		
Passenger's under-dash fuse/relay box connector C (see page 22-57)	2	20	Under right side of dash		
Passenger's under-dash fuse/relay box connector K (see page 22-57)	1	3	Under right side of dash		
Rear accessory power socket relay	14	4	Right side of cargo area		
Rear stereo amplifier connector A	22	8	Right side of cargo area		
Rear stereo amplifier connector B	23	5	Right side of cargo area		
Rear stereo amplifier connector C	24	4	Right side of cargo area		
Rear stereo amplifier connector	26	10	Right side of cargo area		Without BOSE
Rear woofer	21	5	Right side of cargo area		
Rear woofer	25	2	Right side of cargo area		Without BOSE
Right rear door switch	8	1	Right C-pillar		
Right taillight	16	5	Behind right taillight		
VTM-4 relay	15	4	Right side of cargo area		
VTM-4 control unit connector A	11	22	Right side of cargo area		
VTM-4 control unit connector B	10	26	Right side of cargo area		
C605	12	20	Right side of cargo area	Left side wire harness (see page 22-34)	
C651	4	24	Under right side of dash	Dashboad wire harness A (see page 22-30)	
C652	3	2	Under right side of dash	Dashboad wire harness A (see page 22-30)	Without BOSE
C653	7	12	Right B-pillar	Right rear door wire harness (see page 22-51)	
C654	13	3	Right side of cargo area	Roof wire harness (see page 22-46)	With BOSE
G651	6		Right side of floor	Body ground, via right side wire harness	
G652	9		Behind right rear lining	Body ground, via right side wire harness	

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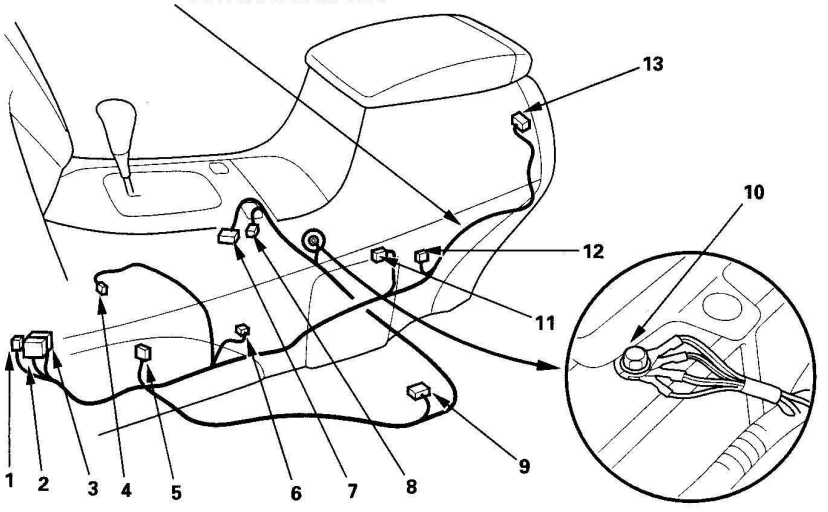
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Connector to Harness Index (cont'd)

Left Floor Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Rear air mix control motor	11	7	Under center console		
Rear blower motor	4	2	Under center console		
Rear blower motor relay	5	4	Under center console		
Rear mode control motor	12	7	Under center console		
Rear power transistor	6	4	Under center console		
Rear heater-A/C passenger's control unit	13	14	Under center console		
C631	2	16	Under middle of dash	Dashboard wire harness A (see page 22-30)	
C632	3	12	Under middle of dash	Dashboard wire harness A (see page 22-30)	
C632	3	2	Under middle of dash	Dashboard wire harness A (see page 22-30)	Without DPMS
C633	9	18	Under driver's seat	Driver's seat wire harness (see page 22-52)	
C633	9	10	Under driver's seat	Driver's seat wire harness (see page 22-53)	Without DPMS
C634	7	10	Under front passenger's seat	Passenger's seat wire harness (see page 22-54)	
C634	7	6	Under front passenger's seat	Passenger's seat wire harness (see page 22-54)	Without DPMS
C635	8	4	Under front passenger's seat	OPDS unit harness (see page 22-40)	
C805	1	2	Under middle of dash	SRS side harness (see page 22-40)	
G631	10		Under rear console	Body ground, via left floor wire harness	

LEFT FLOOR WIRE HARNESS



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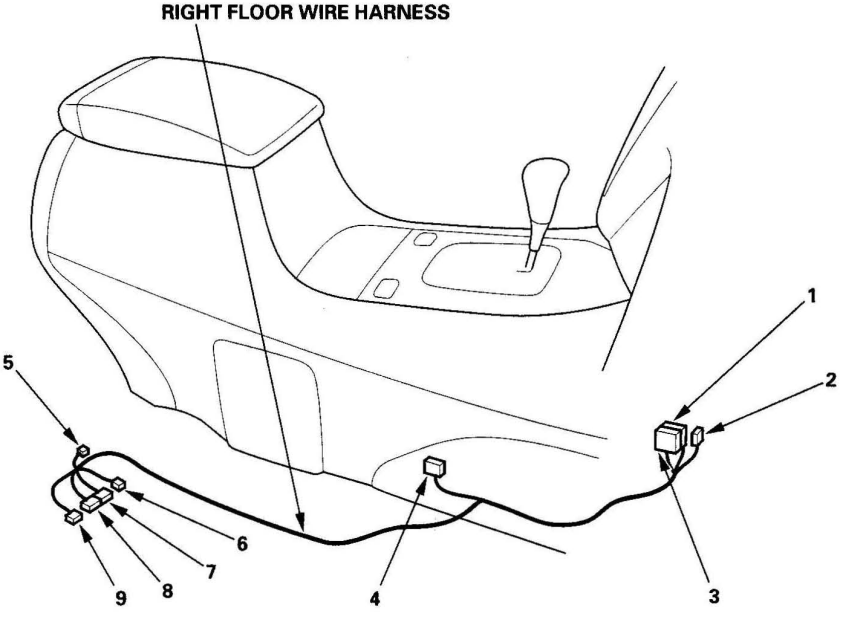
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Right Floor Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Front stereo amplifier	4	26	Under center console		With BOSE
Navigation service check connector	5	2	Under front passenger's seat		
Navigation unit connector A	8	16	Under front passenger's seat		
Navigation unit connector B	7	12	Under front passenger's seat		
Navigation unit connector C	6	8	Under front passenger's seat		
Navigation unit connector D	9	5	Under front passenger's seat		
C681	3	24	Under middle of dash	Dashboard wire harness A (see page 22-30)	With BOSE
C682	2	4	Under middle of dash	Dashboard wire harness A (see page 22-30)	*1
C682	2	3	Under middle of dash	Dashboard wire harness A (see page 22-30)	*2
C682	2	2	Under middle of dash	Dashboard wire harness A (see page 22-30)	*3
C683	1	20	Under middle of dash	Dashboard wire harness A (see page 22-30)	*1
C683	1	24	Under middle of dash	Dashboard wire harness A (see page 22-30)	*2

*1: '01-02 models with Navigation and BOSE
*2: '01-02 models with Navigation without BOSE
*3: '02 model with BOSE

RIGHT FLOOR WIRE HARNESS



(cont'd)

BACK

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Connector to Harness Index (cont'd)

SRS Main Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Cable reel	2	2	In steering column cover		
Driver's under-dash fuse/relay box connector B (see page 22-56)	21	2	Under left side of dash		
Front passenger's airbag assembly	4	4	Behind glove box		
Memory erase signal (MES) connector	20	2	Under left side of dash		
SRS unit connector A	19	18	Under middle of dash		
SRS unit connector C	17	8	Under middle of dash		
C801	1	8	Under middle of dash	Dashboard wire harness A (see page 22-30)	
C802	16	4	Under middle of dash	SRS side harness	
G801	3		Under middle of dash	Body ground via SRS main harness	

SRS Side Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's seat belt tensioner	12	2	Left B-pillar		
Driver's side airbag inflator	14	2	Left B-pillar		
Driver's side impact sensor	13	2	Behind driver's seat		
SRS unit connector B	18	14	Under middle of dash		
C802	16	4	Under middle of dash	SRS main harness	
C803	10	2	Under center console	SRS main harness	
C804	11	4	Under center console	SRS side sub-harness	
C805	15	2	Under middle of dash	Left floor wire harness (see page 22-38)	

SRS Side Sub-harness

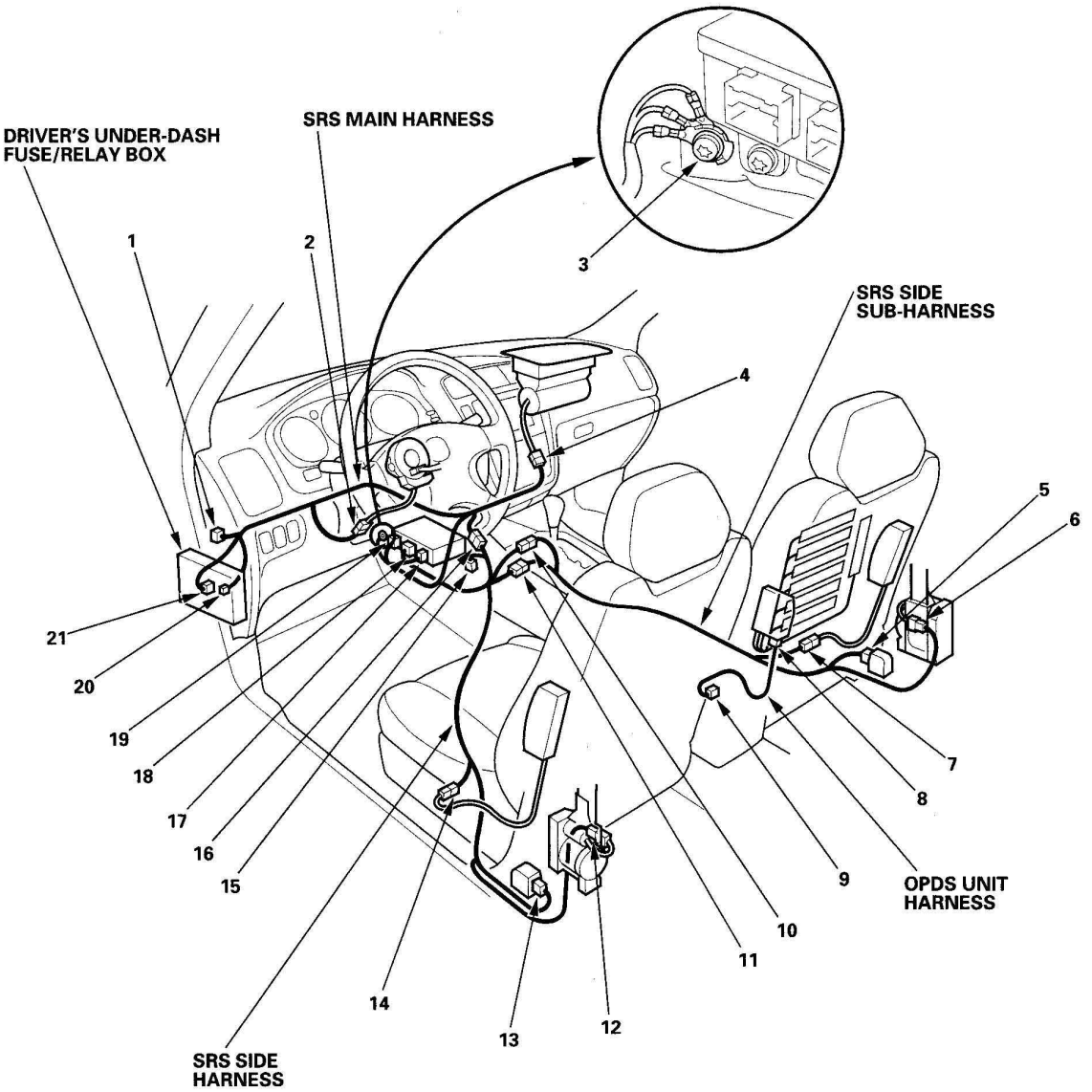
Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Front passenger's seat belt tensioner	6	2	Right B-pillar		
Front passenger's side airbag inflator	7	2	Right B-pillar		
Front passenger's side impact sensor	5	2	Behind front passenger's seat		
C803	11	4	Under center console	SRS side harness	
C804	10	2	Under center console	SRS side harness	

OPDS Unit Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
OPDS unit	8	8	In front passenger's seat		
C635	9	4	Under front passenger's seat	Left floor wire harness (see page 22-38)	

BACK

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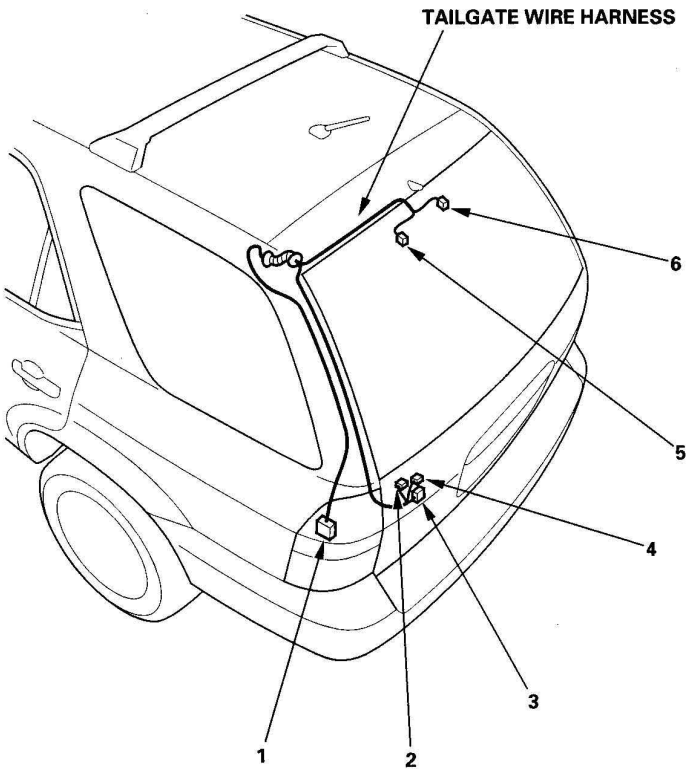
BACK

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Connector to Harness Index (cont'd)

Tailgate Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
High mount brake light connector A	5	2	Behind high mount brake light		
High mount brake light connector B	6	2	Behind high mount brake light		
C606	1	14	Left side of cargo area	Left side wire harness (see page 22-34)	
C851	3	6	Behind tailgate trim panel	Tailgate sub-harness (see page 22-43)	
C852	2	2	Behind tailgate trim panel	Tailgate sub-harness (see page 22-43)	
C853	4	3	Behind tailgate trim panel	Tailgate sub-harness (see page 22-43)	

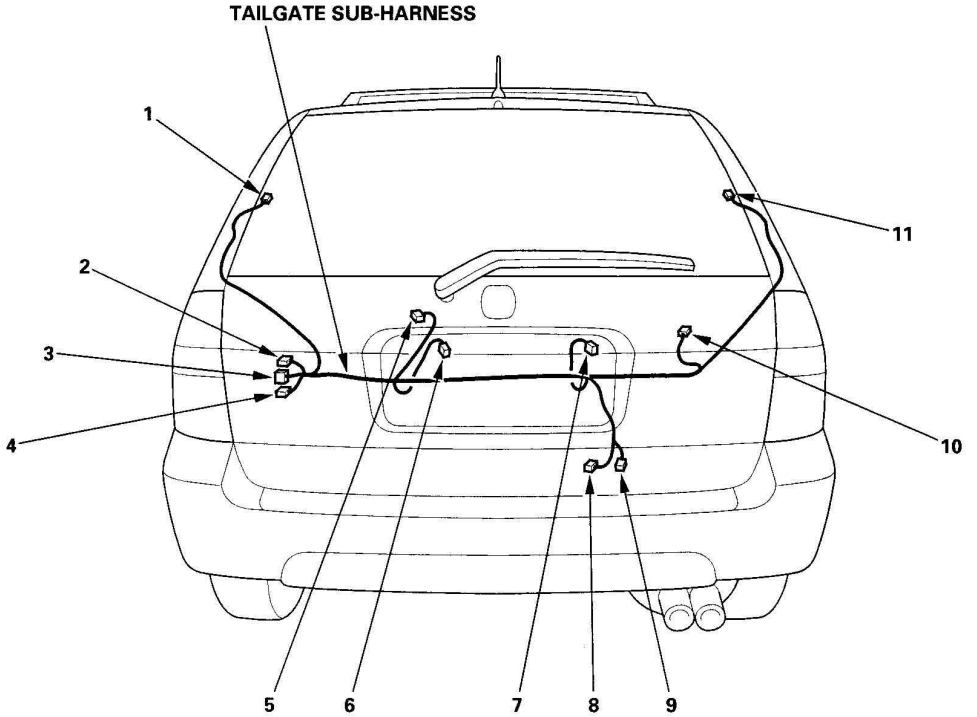


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Tailgate Sub-Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Cargo area light	10	3	Behind tailgate trim panel		
License plate light connector A	6	2	Behind tailgate trim panel		
License plate light connector B	7	2	Behind tailgate trim panel		
Rear window defogger connector A (+)	1	1	Behind left tailgate side trim		
Rear window defogger connector B (−)	11	1	Behind right tailgate side trim		
Rear window wiper motor	5	4	Behind tailgate trim panel		
Tailgate latch switch	9	2	Behind tailgate trim panel		
Tailgate lock actuator	8	2	Behind tailgate trim panel		
C851	3	6	Behind tailgate trim panel	Tailgate wire harness (see page 22-42)	
C852	4	2	Behind tailgate trim panel	Tailgate wire harness (see page 22-42)	
C853	2	3	Behind tailgate trim panel	Tailgate wire harness (see page 22-42)	



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BACK

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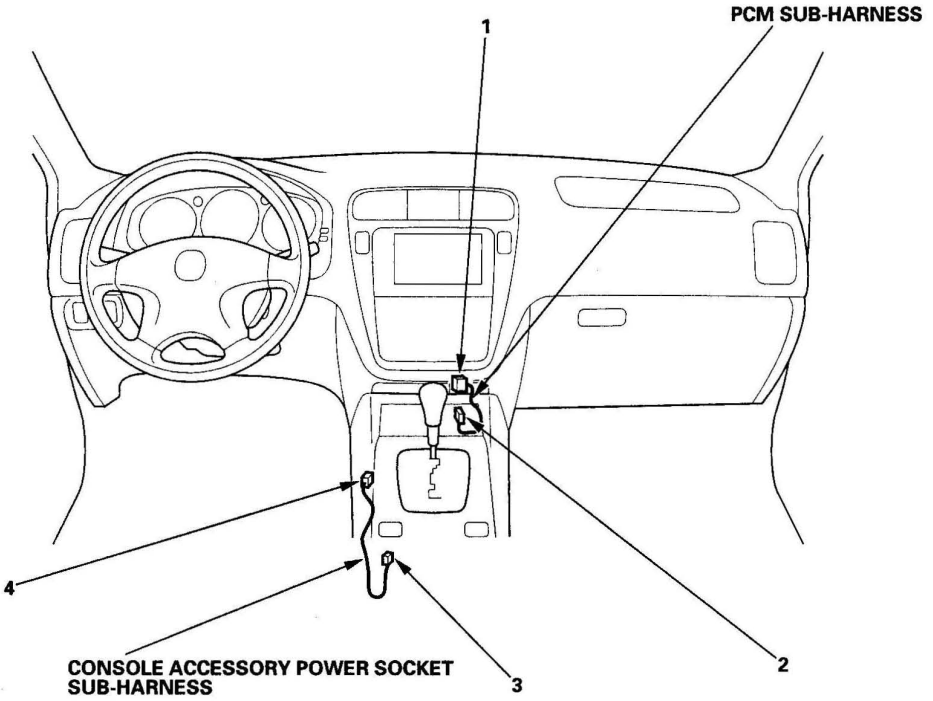
Connector to Harness Index (cont'd)

PCM Sub-harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
PCM connector E	1	20	Under middle of dash		
C501	2	4	Under middle of dash	Dashboard wire harness A (see page 22-30)	

Console Accessory Power Socket Sub-harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Console accessory power socket	3	2	Behind center console		
C951	4	2	Under middle of dash	Dashboard wire harness A (see page 22-30)	

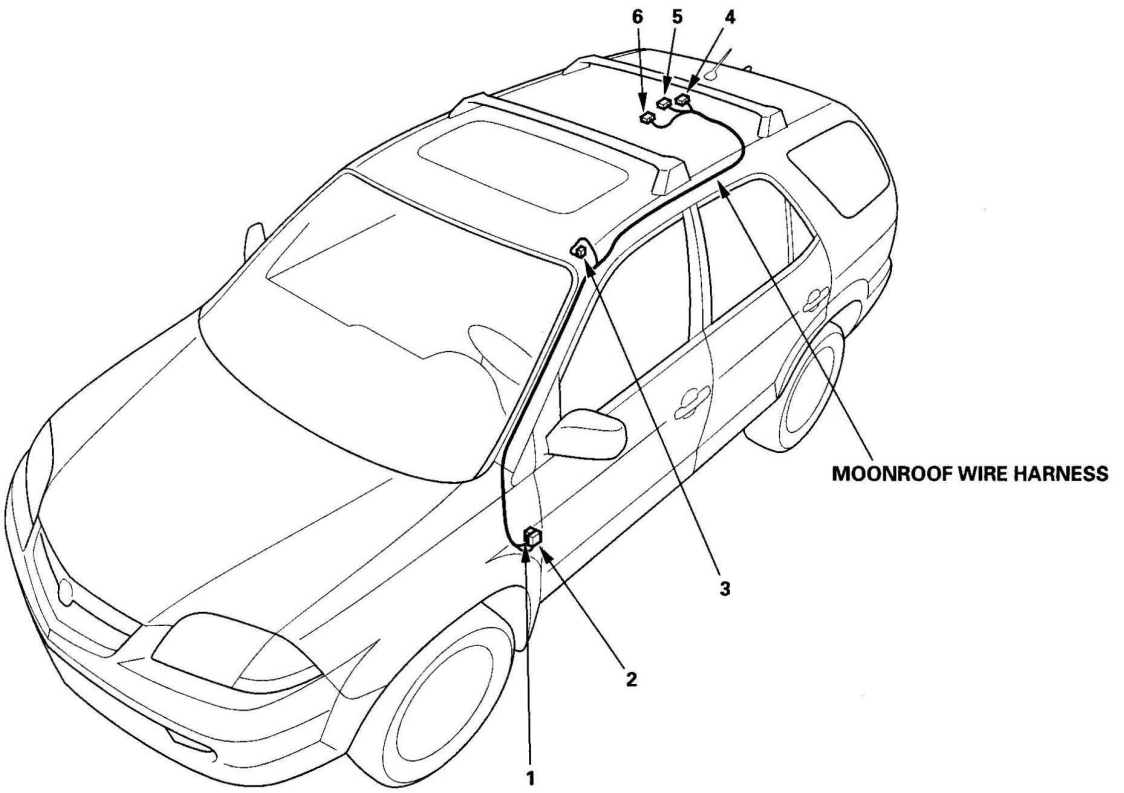


BACK

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Moonroof Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's vanity mirror light	6	2	Roof		
Moonroof motor	3	2	Roof		
Moonroof position sensor	5	4	Roof		
Rear individual map light	4	3	Roof		
C551	2	6	Under left side of dash	Dashboard wire harness B (see page 22-26)	
C552	1	5	Under left side of dash	Dashboard wire harness B (see page 22-26)	



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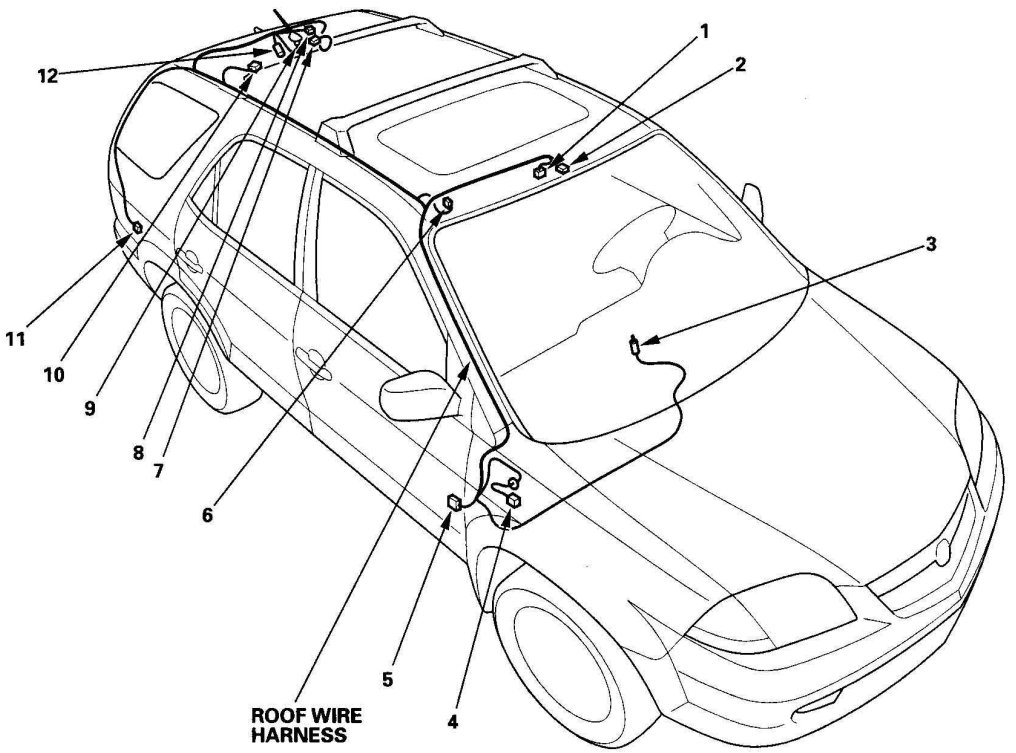
BACK

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Connector to Harness Index (cont'd)

Roof Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Antenna amplifier	9	1	Roof		
Antenna sub lead	3		Under middle of dash		
Automatic dimming inside mirror	2	3	Roof		
Electrical compass unit	10	6	Roof		Without navigation
Front individual map light	1	3	Roof		
Keyless buzzer	4	2	Behind right fender		
Passenger's vanity mirror light	6	2	Roof		
Rear ceiling light	7	3	Roof		
Roof antenna	12		Roof		
Tweeter	8	2	Roof		With BOSE
C581	5	14	Under right side of dash	Dashboard wire harness A (see page 22-30)	
C654	11	3	Right side of cargo area	Right side wire harness (see page 22-36)	With BOSE

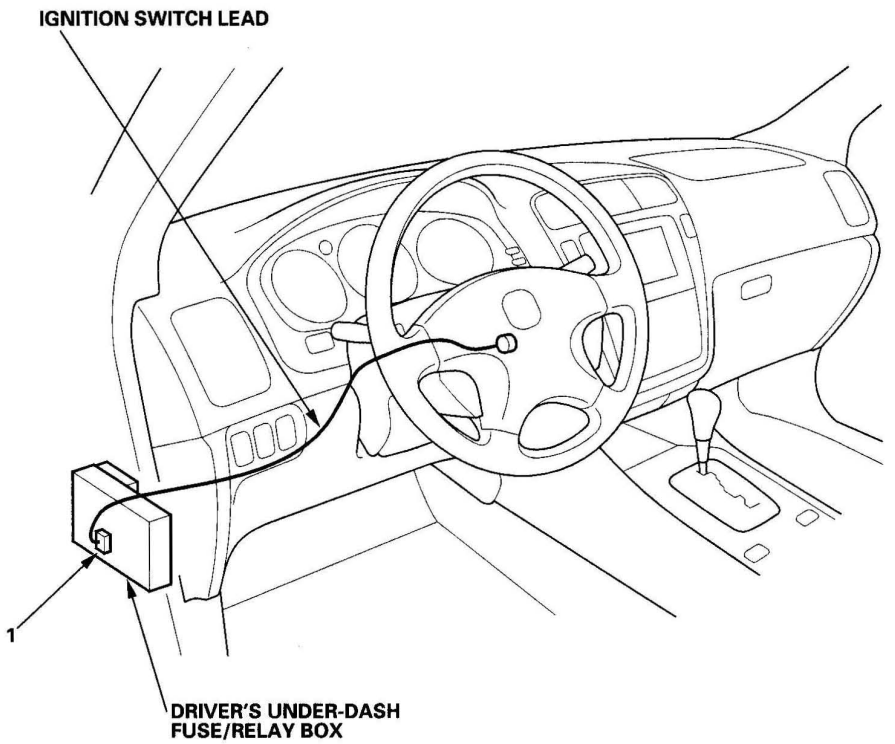


BACK

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Ignition Switch Lead

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's under-dash fuse/relay box connector A (see page 22-56)	1	6	Under left side of dash		



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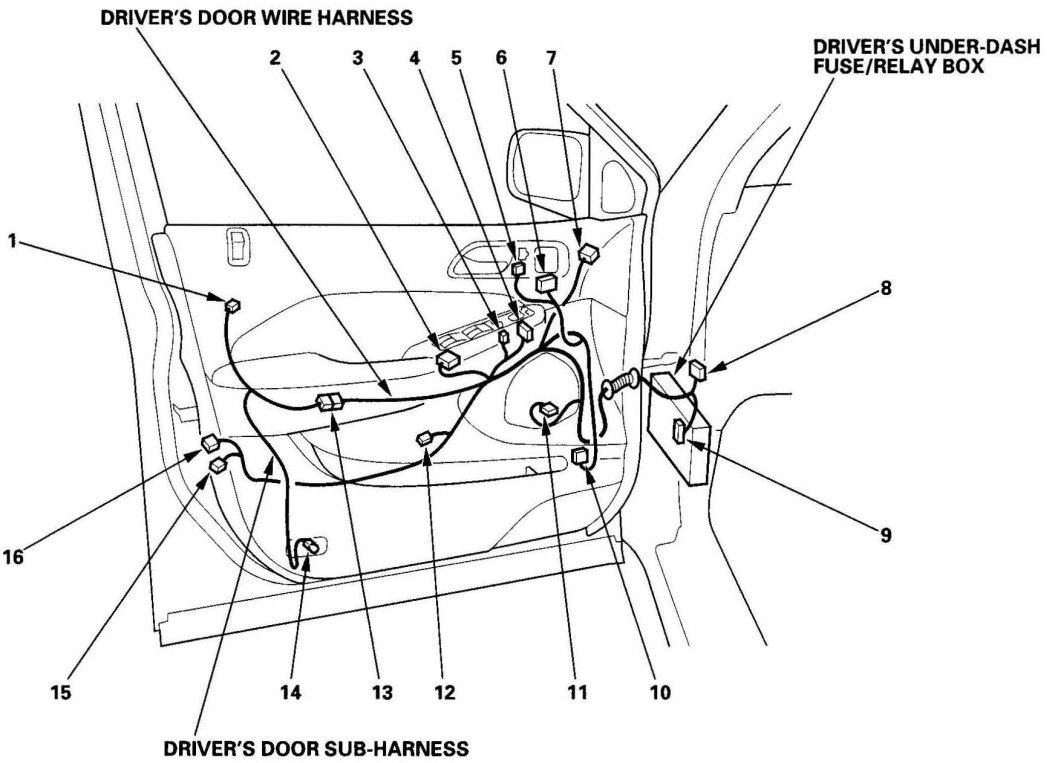
Connector to Harness Index (cont'd)

Driver's Door Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's door key cylinder switch	12	3	Driver's door		
Driver's door lock actuator	15	2	Driver's door		
Driver's door lock knob switch	16	3	Driver's door		
Driver's door lock switch	5	3	Driver's door		
Driver's door speaker	11	2	Driver's door		
Driver's power window motor	10	4	Driver's door		
Driver's under-dash fuse/relay box connector H (see page 22-56)	9	18	Under left side of dash		
Driving position memory switch	6	10	Driver's door		
Left power mirror actuator	7	12	Driver's door		With DPMS
Left power mirror actuator	7	8	Driver's door		Without DPMS
Multiplex control unit, door connector A	2	20	Driver's door		
Multiplex control unit, door connector B	3	2	Driver's door		
Power mirror switch	4	10	Driver's door		
C701	8	16	Under left side of dash	Dashboard wire harness A (see page 22-30)	
C702	13	4	Driver's door	Driver's door sub-harness	

Driver's Door Sub-harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's door courtesy light	14	2	Driver's door		
Security indicator	1	2	Driver's door		
C702	13	4	Driver's door	Driver's door wire harness	

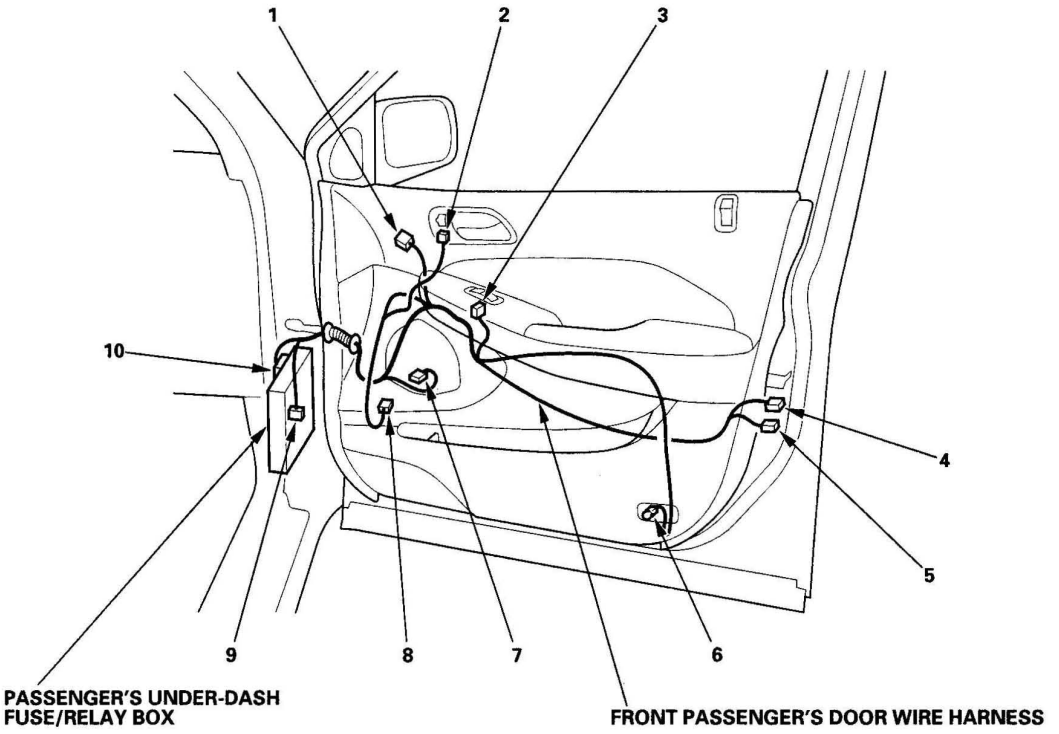


BACK

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Front Passenger's Door Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Front passenger's door courtesy light	6	2	Front passenger's door		
Front passenger's door lock actuator	5	2	Front passenger's door		
Front passenger's door lock knob switch	4	3	Front passenger's door		
Front passenger's door lock switch	2	3	Front passenger's door		
Front passenger's door speaker	7	2	Front passenger's door		
Front passenger's power window motor	8	2	Front passenger's door		
Front passenger's power window switch	3	6	Front passenger's door		
Passenger's under-dash fuse/relay box connector E (see page 22-57)	10	20	Front passenger's door		
Right power mirror actuator	1	12	Front passenger's door		With DPMS
Right power mirror actuator	1	8	Front passenger's door		Without DPMS
C751	9	16	Under right side of dash	Dashboard wire harness A (see page 22-30)	

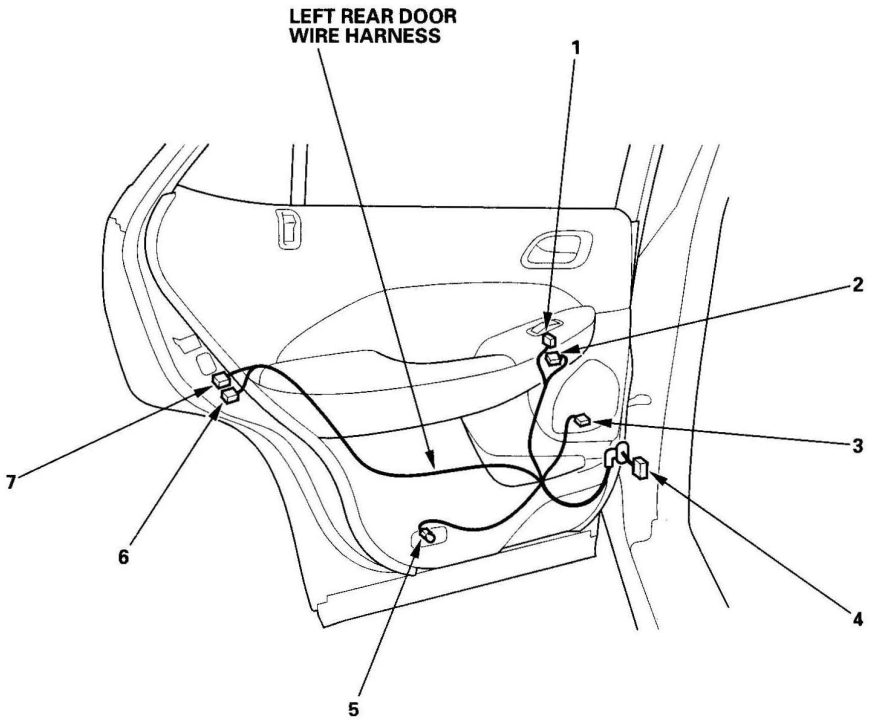


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Connector to Harness Index (cont'd)

Left Rear Door Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Left rear door courtesy light	5	2	Left rear door		
Left rear door speaker	3	2	Left rear door		
Left rear power door lock actuator	6	2	Left rear door		
Left rear power door lock knob switch	7	3	Left rear door		
Left rear power window motor	2	2	Left rear door		
Left rear power window switch	1	6	Left rear door		
C604	4	12	Left B-pillar	Left side wire harness (see page 22-34)	

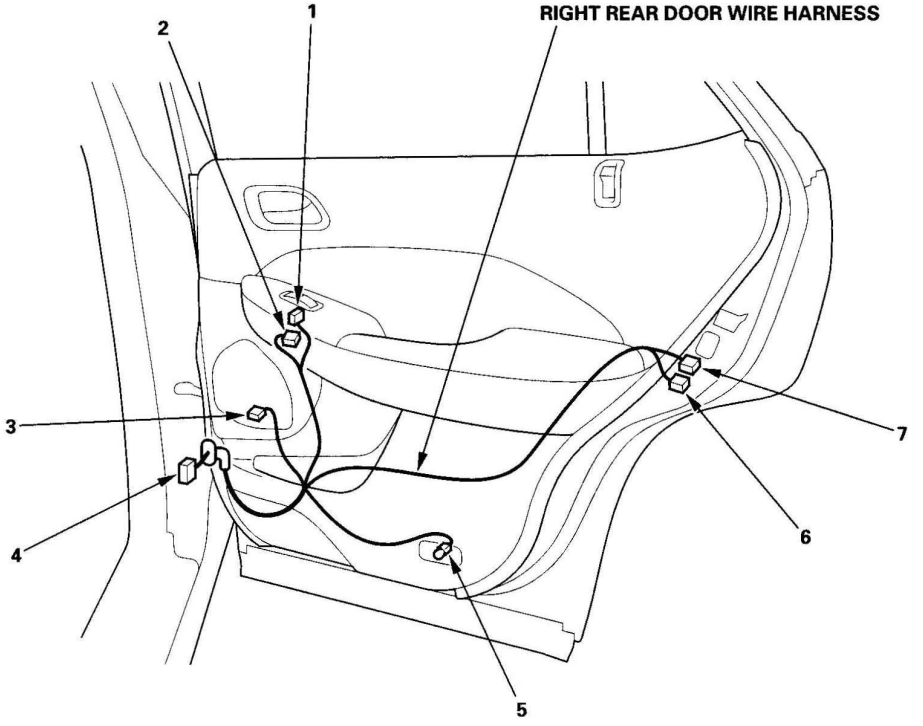


BACK

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Right Rear Door Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Right rear door courtesy light	5	2	Right rear door		
Right rear door speaker	3	2	Right rear door		
Right rear power door lock actuator	6	2	Right rear door		
Right rear power door lock knob switch	7	3	Right rear door		
Right rear power window motor	2	2	Right rear door		
Right rear power window switch	1	6	Right rear door		
C653	4	12	Right B-pillar	Right side wire harness (see page 22-36)	



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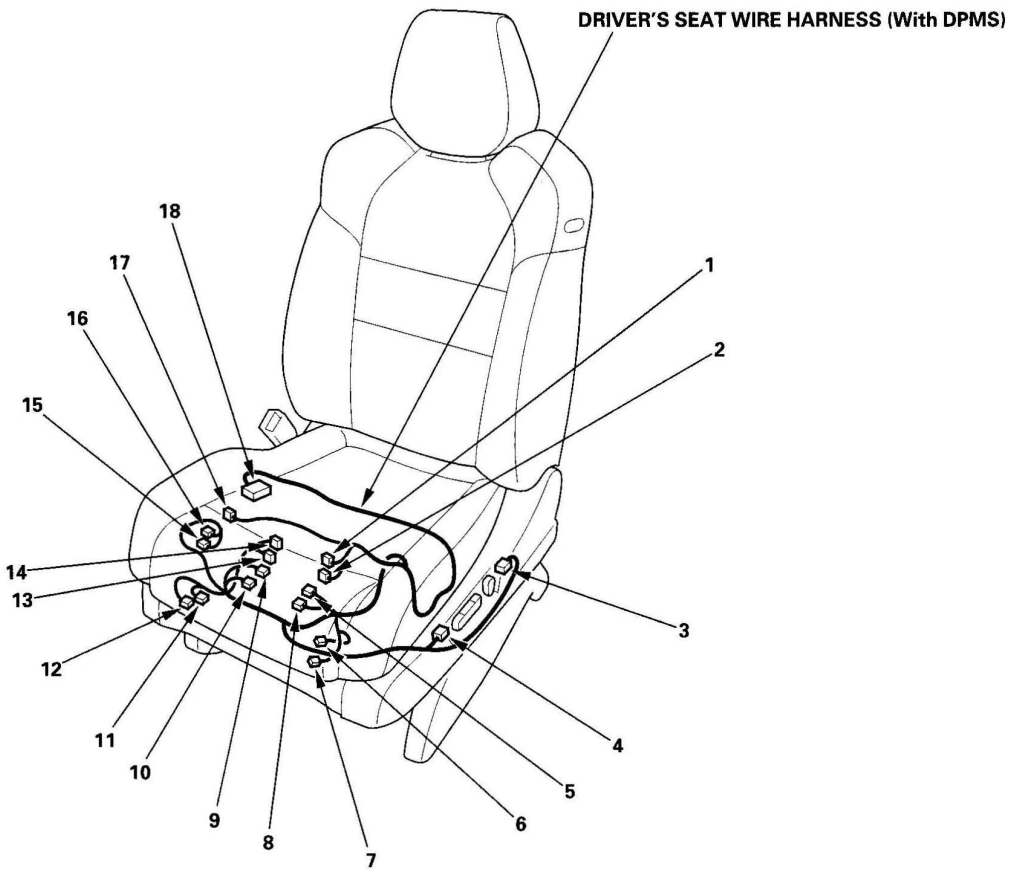
BACK

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Connector to Harness Index (cont'd)

Driver's Seat Wire Harness (With DPMS)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's power seat adjustment switch connector A	4	6	Left side of driver's seat		
Driver's power seat adjustment switch connector B	3	6	Left side of driver's seat		
Driver's power seat control unit connector A	8	20	Under driver's seat		
Driver's power seat control unit connector B	5	8	Under driver's seat		
Driver's power seat control unit connector C	10	12	Under driver's seat		
Driver's power seat control unit connector D	9	6	Under driver's seat		
Driver's seat belt switch	17	3	Under driver's seat		
Driver's seat back heater	2	2	Under driver's seat		
Driver's seat cushion heater	1	4	Under driver's seat		
Front up-down motor	16	2	Under driver's seat		
Front up-down position sensor	15	4	Under driver's seat		
Rear up-down motor	14	2	Under driver's seat		
Rear up-down position sensor	13	4	Under driver's seat		
Recline motor	6	2	Under driver's seat		
Recline position sensor	7	4	Under driver's seat		
Slide motor	11	2	Under driver's seat		
Slide position sensor	12	4	Under driver's seat		
C633	18	18	Under driver's seat	Left floor wire harness (see page 22-38)	



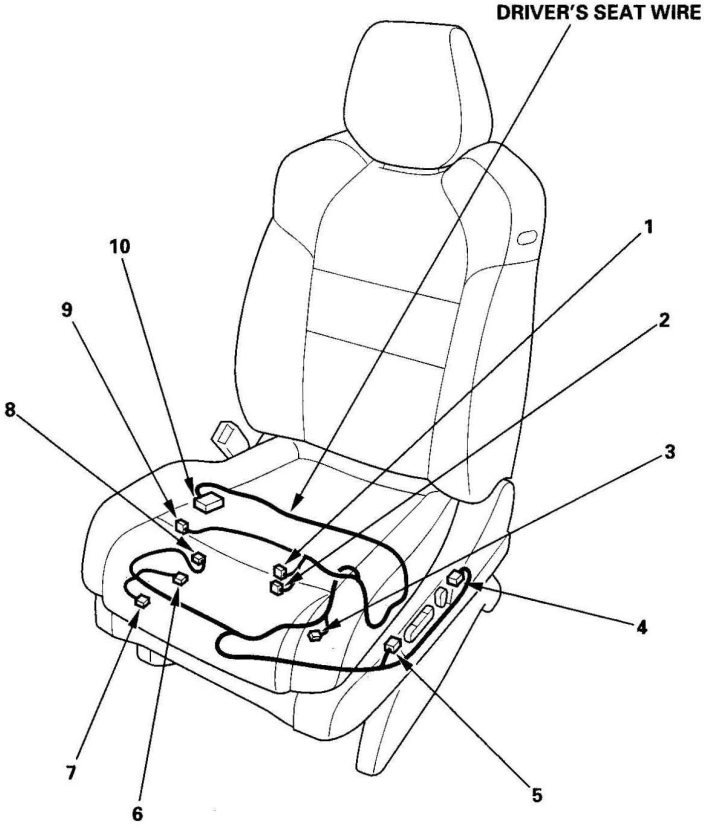
BACK

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Driver's Seat Wire Harness (Without DPMS)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's power seat adjustment switch connector A	5	6	Left side of driver's seat		
Driver's power seat adjustment switch connector B	4	6	Left side of driver's seat		
Driver's seat belt switch	9	3	Under driver's seat		
Driver's seat back heater	2	2	Under driver's seat		
Driver's seat cushion heater	1	4	Under driver's seat		
Front up-down motor	8	2	Under driver's seat		
Rear up-down motor	6	2	Under driver's seat		
Recline motor	3	2	Under driver's seat		
Slide motor	7	2	Under driver's seat		
C633	10	10	Under driver's seat	Left floor wire harness (see page 22-38)	

DRIVER'S SEAT WIRE HARNESS (Without DPMS)



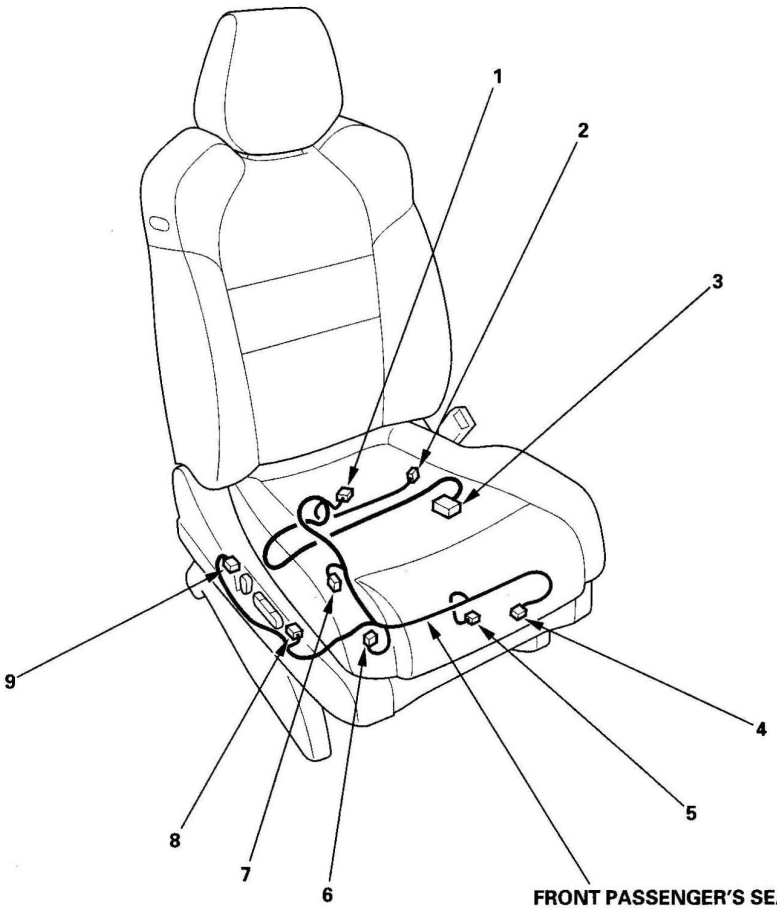
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Connector to Harness Index (cont'd)

Passenger's Seat Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Front passenger's power seat adjustment switch connector A	8	6	Right side of front passenger's seat		*
Front passenger's power seat adjustment switch connector B	9	6	Right side of front passenger's seat		*
Front passenger's seat belt switch	2	3	Under front passenger's seat		
Front passenger's seat cushion heater	1	4	Under front passenger's seat		
Front up-down motor	4	2	Under front passenger's seat		*
Rear up-down motor	5	2	Under front passenger's seat		*
Recline motor	7	2	Under front passenger's seat		*
Slide motor	6	2	Under front passenger's seat		*
C634	3	10	Under front passenger's seat	Left floor wire harness (see page 22-38)	*
C634	3	6	Under front passenger's seat	Left floor wire harness (see page 22-38)	

*: With 8-way adjustable power seat



FRONT PASSENGER'S SEAT WIRE HARNESS

BACK

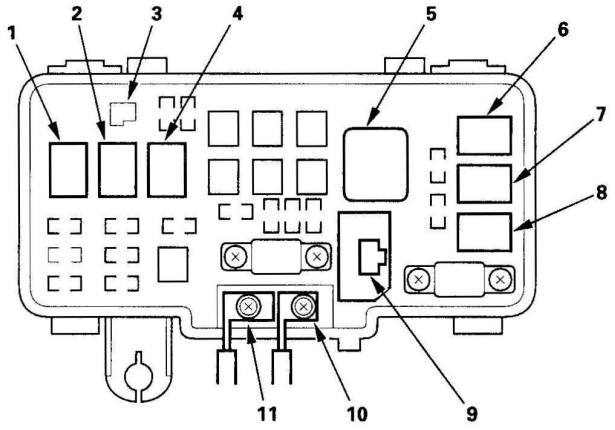
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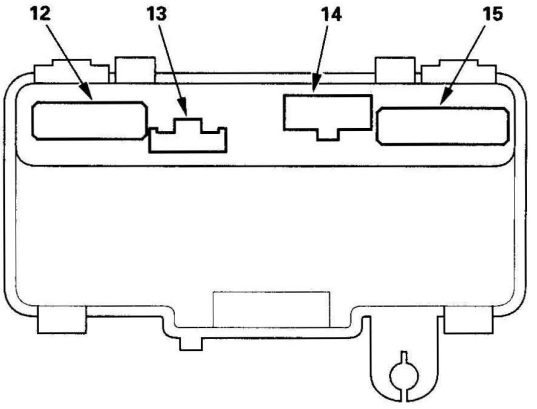
Fuse/Relay Boxes

Connector to Fuse/Relay Box Index

Under-hood Fuse/Relay Box

Socket	Ref	Terminal	Connects to
A	15	18	Right engine compartment wire harness (see page 22-22)
A/C compressor clutch relay	8	4	
B	14	7	Right engine compartment wire harness (see page 22-22)
Blower motor relay	5	4	
C	13	3	Right engine compartment wire harness (see page 22-22)
Condenser fan relay	6	4	
D	12	16	Right engine compartment wire harness (see page 22-22)
Diode	3	—	Not used
ELD unit	9	3	Right engine compartment wire harness (see page 22-22)
Horn relay	4	4	
Headlight relay 1	1	4	
Headlight relay 2	2	4	
Radiator fan relay	7	4	
T1	11		Starter cable (see page 22-14)
T101	10		Engine wire harness (see page 22-16)





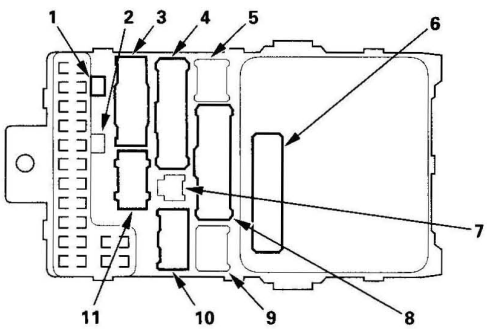
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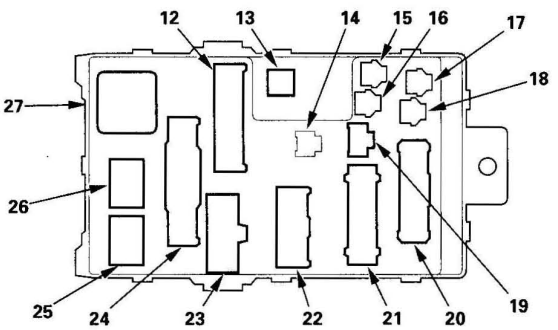
Connector to Fuse/Relay Box Index (cont'd)

Driver's Under-dash Fuse/Relay Box

Socket	Ref	Terminal	Connects to
A	22	6	Ignition switch lead (see page 22-47)
B	13	2	SRS main harness (see page 22-40)
C	10	5	Left engine compartment wire harness (see page 22-24)
D	4	20	Left engine compartment wire harness (see page 22-24)
Diode	1	———	Driver's door courtesy light
Diode	2	———	Left rear door courtesy light
E	11	10	Left side wire harness (see page 22-34)
F	3	14	Left side wire harness (see page 22-34)
G	5	6	Not used
H	8	18	Driver's door wire harness (see page 22-48)
I	9	———	Not used
J	20	18	Dashboard wire harness A (see page 22-30)
K	21	18	Dashboard wire harness A (see page 22-30)
L	24	22	Dashboard wire harness B (see page 22-26)
M	12	20	Dashboard wire harness B (see page 22-26)
Multiplex control unit, driver's, connector A	6	24	(Plugs directly into the fuse box)
N	23	7	Dashboard wire harness B (see page 22-26)
P	19	3	Dashboard wire harness B (see page 22-26)
R	18	1	Optional connector
Reverse relay	26	4	
S	17	1	Optional connector
Starter cut relay	25	4	
T	16	1	Optional connector
Turn signal/hazard relay	27	4	
U	15	1	Optional connector
V	14	———	Not used
W	7	———	Memory erase signal (MES) connector



(View of front side)



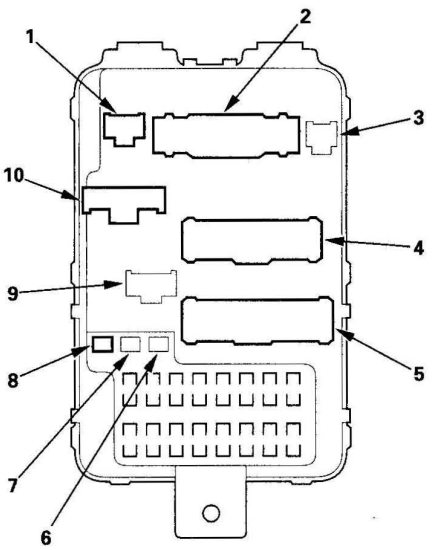
(View of back side)

BACK

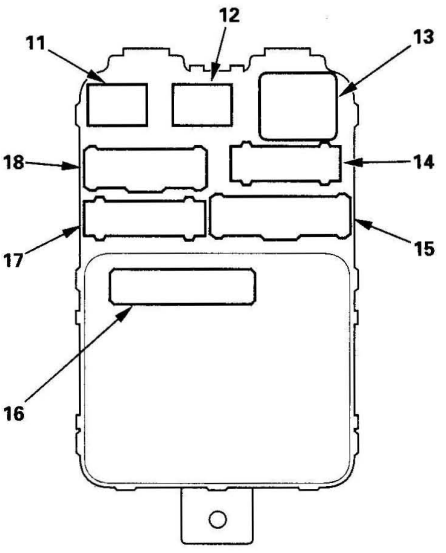
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Passenger's Under-dash Fuse/Relay Box

Socket	Ref	Terminal	Connects to
A	10	3	Right engine compartment wire harness (see page 22-22)
Accessory power socket relay	12	4	
B	4	18	Right engine compartment wire harness (see page 22-22)
C	5	20	Right side wire harness (see page 22-36)
D	9	4	Not used
Diode A	6	———	(for A/C)
Diode	7	———	Right rear door courtesy light
Diode	8	———	Front passenger's door courtesy light
E	2	20	Front passenger's door wire harness (see page 22-49)
F	3	———	Not used
G	15	18	Dashboard wire harness A (see page 22-30)
H	17	18	Dashboard wire harness A (see page 22-30)
I	14	16	Dashboard wire harness B (see page 22-26)
J	18	16	Dashboard wire harness B (see page 22-26)
K	1	3	Right side wire harness (see page 22-36)
Multiplex control unit, passenger's, connector A	16	24	(Plugs directly into the fuse box)
Power window relay	11	4	
Rear window defogger relay	13	4	



(View of front side)



(View of back side)

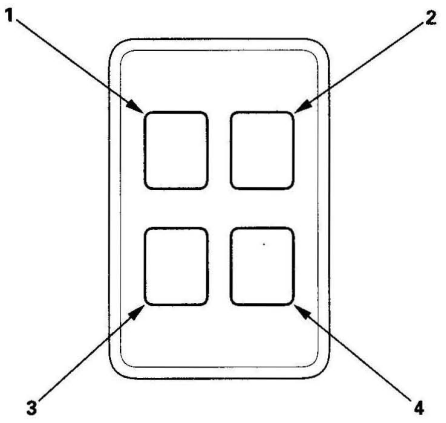
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Protected by AR

Connector to Fuse/Relay Box Index (cont'd)

Auxililary-fuse Box

Socket	Ref	Terminal	Connects to
A	1	———	Left engine compartment wire harness (see page 22-24)
B	2	———	Left engine compartment wire harness (see page 22-24)
C	3	———	Left engine compartment wire harness (see page 22-24)
D	4	———	Left engine compartment wire harness (see page 22-24)



BACK

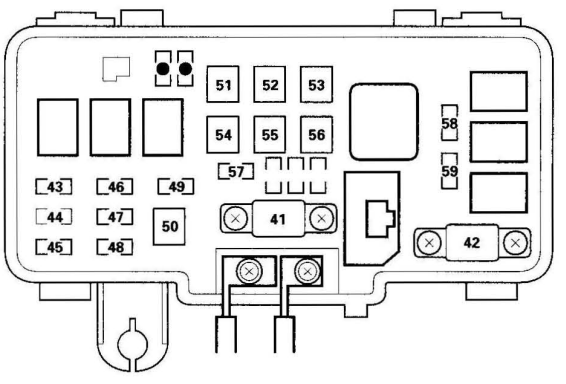
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Power Distribution

Fuse to Component Index

Under-hood Fuse/Relay Box

Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
41	120A	———	Battery, Power distribution
42	50A	WHT	Ignition switch (BAT)
43	20A	RED/GRN	Daytime running lights control unit (Canada), Headlight (right)
44	———	———	Not used
45	20A	RED/YEL	Daytime running lights control unit (Canada), High beam cut relay (Canada), Headlight (left), High beam indicator light
46	15A	WHT/GRN	Data link connector (DLC), PGM-FI main relay, PCM, Immobilizer receiver unit
47	20A	WHT/YEL	ABS modulator assembly, Brake lights, Cruise control unit, High mount brake light, Horns, Ignition Key light, Key Interlock solenoid, Multiplex control unit, driver's, PCM, Trailer lighting connector
48	20A	WHT	Audio unit, Stereo amplifier (Bose sound system)
49	15A	WHT/GRN	Hazard warning lights
50	20A	BLK/GRN	Fog lights
51	40A	WHT/BLU	No. 1 fuse (in the passenger's under-dash fuse/relay box), power window relay
52	30A	RED	Rear blower motor
53	30A	WHT/GRN	Rear window defogger
54	40A	YEL	No. 9, 10, 11, 12 and 13 fuses (in the passenger's under-dash fuse/relay box)
55	40A	YEL/GRN	No. 2, 3, 4, 5, 6 and 14 fuses (in the passenger's under-dash fuse/relay box)
56	40A	YEL/BLK	Blower motor
57	30A	BLU/BLK	Radiator fan motor
58	30A	BLU/YEL	Condenser fan motor
59	7.5A	RED	A/C compressor clutch



●: Spare fuse

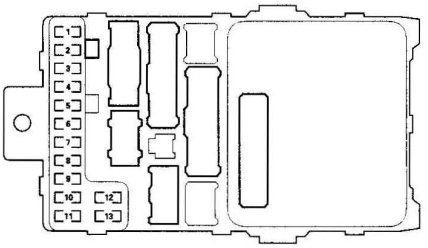
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Fuse to Component Index (cont'd)

Driver's Under-dash Fuse/Relay Box

Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
1	15A	GRN or RED/WHT	SRS unit (VA)
		RED/WHT	PGM-FI main relay
2	10A	GRN or BLK/WHT	SRS unit (VB)
3	7.5A	BLK/YEL	A/C compressor clutch relay, Blower motor relay, Climate control unit, Climate control panel, Fan control relay, Radiator fan control module, Rear blower motor relay, Rear heater-A/C passenger's control unit, Rear window defogger relay, Recirculation control motor, Rear mode control motor
4	7.5A	ORN	ABS modulator assembly, Power mirror actuator, Power mirror defogger, Seat heater relay, VTM-4 control unit
		Fuse/relay box socket	Optional connector
5	10A	YEL/RED	Automatic dimming inside mirror, Daytime running lights control unit (Canada), Electrical compass unit (without navigation system), Multi-information display unit (without navigation system), Rear wiper motor, Rear washer motor, Rear window wiper intermittent control unit ('02 model)
6	15A	BLK/YEL	Alternator, Charging system light, Cruise control main switch, Cruise control unit, Driver's power seat control unit, ELD unit, EVAP bypass solenoid valve, EVAP control canister vent shut valve, EVAP purge control solenoid valve, Intake manifold runner control module, PCM, Primary and secondary heated oxygen sensors, Radiator fan control module, Shift lock relay, VTM-4 control unit, VTM-4 relay
7	7.5A	YEL/GRN	OPDS unit
8	7.5A	YEL/BLK	Accessory power socket relay, Rear accessory power socket relay, Shift lock solenoid
		Fuse/relay box socket	Optional connector
9	10A	YEL	A/T reverse relay, Automatic inside dimming mirror, Back-up lights, Brake failure sensor, Gauge assembly, Keyless receiver unit, Multiplex control unit, passenger's, Navigation unit, Trailer lighting connector, VTM-4 lock switch
		Fuse/relay box socket	Driver's multiplex control unit
10	7.5A	YEL/RED	Turn signal/hazard relay
11	15A	BLK/YEL	Ignition coils
12	30A	GRN/BLK	Windshield wiper motor, Windshield washer motor, Intermittent wiper relay
13	7.5A	BLU/ORN	PCM, PGM-FI main relay

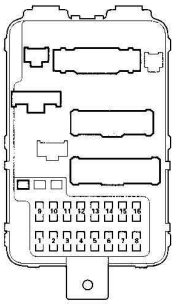


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Passenger's Under-dash Fuse/Relay Box

Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
1	30A	GRN	Moonroof motor
2	20A	RED	Driver's power seat control unit, Driver's power seat rear up-down motor, Driver's power seat recline motor
3	20A	GRY	Front passenger's power seat front up-down motor, Front passenger's power seat slide motor
4	20A	BLU	Driver's power seat control unit, Driver's power seat front up-down motor, Driver's power seat slide motor
5	20A	BRN	Front passenger's power seat rear up-down motor, Front passenger's power seat recline motor
6	10A	RED/BLU	Daytime running lights control unit (Canada)
7	20A	WHT/YEL	Left rear power window motor, Moonroof relays
8	20A	BLU/BLK	Front passenger's power window motor
9	15A	WHT/RED	Accessory power socket (front/rear), Audio unit, Cigarette lighter connector (option), Multi-information display unit (without navigation), Navigation display unit, Navigation unit
10	15A	RED/GRN	A/T gear position indicator panel light, Audio unit light, Cigarette lighter connector (option), Climate control panel light, Cruise main switch light, Dash lights brightness controller, Driving position memory switch light, Fog light switch light, Front side marker lights, Gauge lights, Glove box light, License plate lights, Hazard warning switch light, Interior light switch light, Multiplex control unit, driver's, Multi-information display unit light (without navigation), Moonroof switch light, Navigation unit, Navigation display unit light, Rear climate control panel light, Seat heater switch lights, Select/reset switch light, Taillights, Trailer lighting connector, Vanity mirror lights, VTM-lock switch light
11	10A	WHT/BLU	Courtesy lights, Cargo area light, Individual map lights, Multi-information display unit (without navigation), Navigation unit, Navigation display unit, Rear ceiling light
12	20A	Fuse/relay box socket	Passenger's multiplex control unit
13	7.5A	WHT/YEL	Driver's power seat control unit, Driving position memory switch, Gauge assembly, Keyless receiver unit, Driver's multiplex control unit, Door multiplex control unit, PCM, Radiator fan control module, Security indicator light
		Fuse/relay box socket	Passenger's multiplex control unit
14	20A	WHT/GRN	Front seat heaters
15	20A	GRN/WHT	Driver's power window motor
16	20A	WHT/BLK	Right rear power window motor



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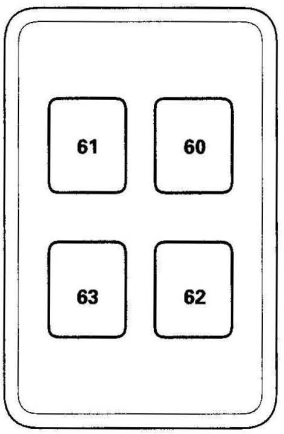
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Power Distribution

Fuse to Component Index (cont'd)

Auxiliary Fuse Box

Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
60	20A	WHT/RED	VTM-4 control unit
61	20A	BLU/ORN	Rear accessory power socket
62	20A	WHT/GRN	ABS modulator assembly
63	40A	WHT	ABS modulator assembly

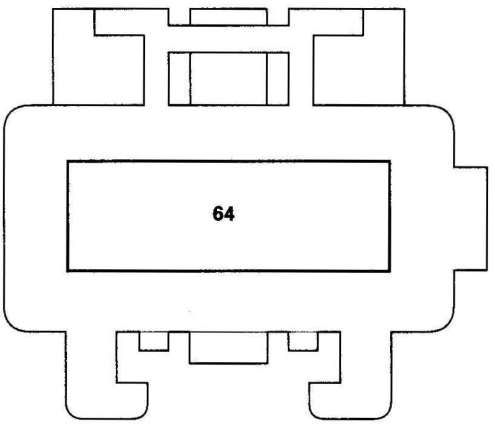


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Auxiliary Fuse Holder

Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
64	7.5A	BLU/RED	No. 47 (20 A) fuse (in the under-hood fuse/relay box)
		WHT/BLU	Horn (low)



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Ground Distribution

Ground to Components Index

Ground	Component or circuit grounded
G1	Battery, Transmission housing
G2	Engine block
G101, G102	PCM (PG1 and PG2 are BLK; LG1 and LG2 are BRN/YEL) BLK: Transmission range switch, EGR valve, EGR position valve, IAC valve, Ignition coils, PGM-FI main relay, Radiator fan switch A and C BRN/BLK: Data link connector (DLC), Immobilizer receiver unit, VTM-4 control unit (two wires) BRN/YEL: VTEC pressure switch
	Shielding between the PCM and these components have braided wires, except secondary HO2S (which is BRN/BLK): CKP sensor, Knock sensor (KS), Primary and secondary HO2S, TDC 1/2 sensors, VTM-4 control unit
G151	Torque converter clutch solenoid valve, Shift control solenoid valve A, Shift control solenoid valve B, Shift control solenoid valve C
G201	Blower motor relay, Cruise control actuator, ELD unit, Fan control relay, Hood switch, Intermittent wiper relay, Radiator fan switch B, Radiator fan motor, Rear washer motor, Rear audio amplifier relay (TOURING), Right fog light, Right front parking/side marker light, Right front turn signal light, Right headlight (low beam), Shift lock relay, Windshield washer motor, Windshield wiper motor
G301	ABS modulator assembly, Brake fluid level switch, Left front parking/side marker light, Left front turn signal light, Left fog light, Left headlight (low beam)
G302	ABS modulator assembly
G401	Cruise control unit, Cruise control main switch, Climate control unit, Combination light switch (two wires), Daytime running lights control unit (two wires) (Canada), Data link connector (DLC), Driver's door key cylinder switch, Driver's door lock switch, Driver's door lock knob switch, Driving position memory switch, Driver's vanity mirror lights, Ignition key switch, Low hold switch, Moonroof open/close relay, Moonroof switch, Driver's multiplex control unit, Door multiplex control unit, Multiplex control inspection connector, Parking pin switch, Power transistor, Power mirror switch (two wires), Radiator fan control module, Rear window wiper/washer switch ('01 model), Seat heater relay, Turn signal/hazard relay, Windshield wiper/washer switch
G501	Automatic inside dimming mirror, Cigarette lighter connector (option), Console accessory power socket, Electrical compass unit (without Navigation system), Gauge assembly (two wires), Fuel gauge sending unit, Glove box light, Front accessory power socket, Homelink unit, Intake manifold runner control (IMRC) module, Keyless buzzer, Driver's multiplex control unit, Multi-information display unit (without Navigation system), Navigation unit, Passenger's vanity mirror lights, Seat heater switches, Rear heater-A/C passenger's control unit, Rear blower motor relay, Rear power transister, Select/reset switch, Spotlight
G502	Audio unit, Front stereo amplifier (TOURING), Multi-information display unit (without Navigation system), Navigation display unit, Navigation unit
G503	Keyless receiver unit, Interior light switch, Passenger's multiplex control unit, Power steering pressure switch (PSP) switch, Washer level switch
G601	BLK: Brake light failure sensor, Driver's power window motor, Door multiplex control unit, Power mirror switch, Power window master switch, Left power mirror defogger, Left taillight, Left rear door lock knob switch BRN/BLK: Fuel pump (FP)
G602	License plate lights, High mount brake lights (two wires), Rear accessory power socket, Rear window defogger, Rear window wiper motor, Tailgate latch switch, Trailer lighting connector, Rear window wiper intermittent control unit ('02 model)
G631	Driver's power seat control unit (three wires), Driver's power seat switch (two wires) (without driving position memory system), Passenger's power seat switch (two wires), OPDS unit, Seat belt switches, Seat heaters
G651	Accessory power socket relay, Front passenger's door lock switch, Front passenger's door lock knob switch, Passenger's multiplex control unit, Power window relay, Right power mirror defogger
G652	Rear accessory power socket relay, Rear stereo amplifier, Rear stereo amplifier (two wires) (TOURING), Right taillight, Right rear door lock knob switch, VTM-4 control unit
G801	Memory erase signal (MES) connector, SRS unit (two wires)

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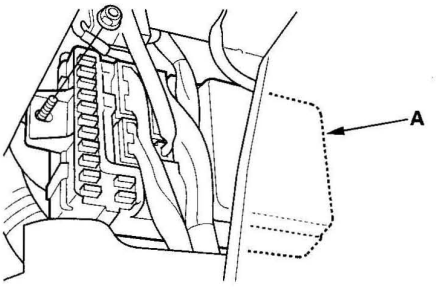
Under-dash Fuse/Relay Box

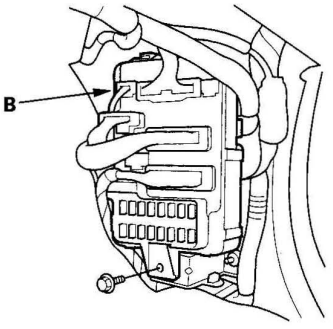
Removal and Installation

SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

Removal

1. Make sure you have the anti-theft codes for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait at least three minutes.
3. Driver's fuse box: Remove the left kick panel and dashboard lower cover (see page 20-67).
   Passenger's fuse box: Remove the right kick panel and glove box (see page 20-69).
4. Remove the mounting bolt, and pull the driver's under-dash fuse/relay box (A) or passenger's under-dash fuse/relay box (B) away from the body.





5. Disconnect the driver's or passenger's under-dash fuse/relay box connectors, and remove the driver's or passenger's under-dash fuse/relay box.

   NOTE: The SRS main harness connector is a spring-loaded lock type (see page 23-20).

Installation

1. Connect the connectors to the driver's or passenger's under-dash fuse/relay box, then install the driver's or passenger's under-dash fuse/relay box in the reverse order of removal.
2. Install the removed parts in the reverse order of removal.
3. Connect both the negative cable and positive cable to the battery, enter the anti-theft codes for the radio and the navigation system, then enter the customer's radio station presets.
4. Confirm that all systems work properly.

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Battery Test

⚠ WARNING

A battery can explode if you do not follow the proper procedure, causing serious injury to anyone nearby. Follow all procedures carefully and keep sparks and open flames away from the battery.

Use either a JCI or Bear ARBST tester, and follow the manufacturer's procedures. If you don't have one of these computerized testers, follow this conventional test procedure:

1. Be sure the temperature of the electrolyte is between 70°F (21°C) and 100°F (38°C).
2. Inspect the battery case for cracks or leaks.
   - If the case is damaged, replace the battery. ■
   - If the case looks OK, go to step 3.
3. Check the indicator EYE.
   - If the EYE indicates the battery is charged, go to step 4.
   - If the EYE indicates a low charge, go to step 7.
4. Apply a 300 amp load for 15 seconds to remove the surface charge.
5. Wait 15 seconds, then apply a test load of 280 amps for 15 seconds.
6. Record battery voltage.
   - If voltage is above 9.6 volts, the battery is OK. ■
   - If voltage is below 9.6 volts, go to step 7.
7. Charge the battery on High (40 amps) until the EYE shows the battery is charged, plus an additional 30 minutes. If the battery charge is very low, it may be necessary to bypass the charger's polarity protection circuitry.
   - If the EYE indicates the battery is charged within three hours, the battery is OK. ■
   - If the EYE indicates the battery is not charged within three hours, replace the battery. ■

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Power Relay Test

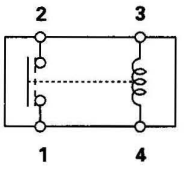
Use this chart to identify the type of relay, then do the test listed for it.
NOTE: See page 22-124 for the turn signal/hazard relay input test.

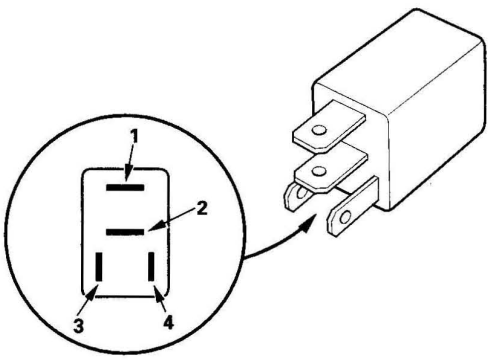
Relay	Test
Accessory power socket relay	Normally-open type A
A/C compressor clutch relay	
Condenser fan relay	
Fog light relay	
Headlight relay 1	
Headlight relay 2	
High beam cut relay (Canada)	
Horn relay	
Power window relay	
Radiator fan relay	
Reverse relay	
Rear accessory power socket relay	
Rear stereo amplifier relay (TOURING)	
Seat heater relay	
Starter cut relay	
Taillight relay	
VTM-4 relay	
Blower motor relay	Normally-open type B
Rear blower motor relay	
Rear window defogger relay	
Fan control relay	Five-terminal type
Intermittent wiper relay	
Moonroof open relay	
Moonroof close relay	
Shift lock relay	

Normally-open type A:

Check for continuity between the terminals.

- There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 3 and No. 4 terminals.
- There should be no continuity between the No. 1 and No. 2 terminals when power is disconnected.





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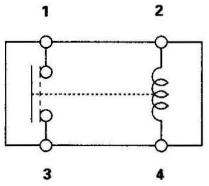
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Power Relay Test (cont'd)

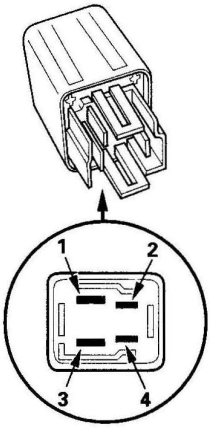
Normally-open type B:

Check for continuity between the terminals.

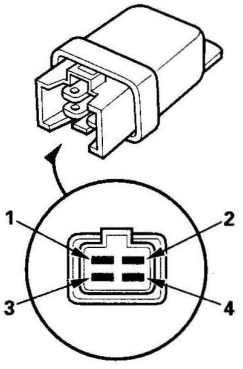
- There should be continuity between the No. 1 and No. 3 terminals when power and ground are connected to the No. 2 and No. 4 terminals.
- There should be no continuity between the No. 1 and No. 3 terminals when power is disconnected.



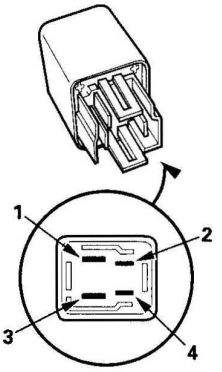
Rear window defogger relay



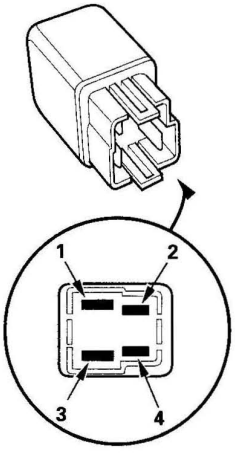
Rear blower motor relay



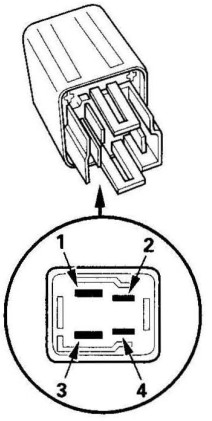
Blower motor relay, type 1:



Blower motor relay, type 2:



Blower motor relay, type 3:



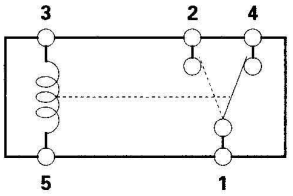
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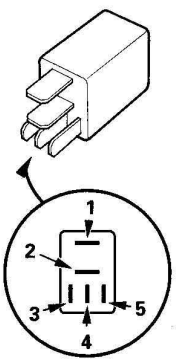
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Five-terminal type:

Check for continuity between the terminals.

- There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 3 and No. 5 terminals.
- There should be continuity between the No. 1 and No. 4 terminals when power is disconnected.





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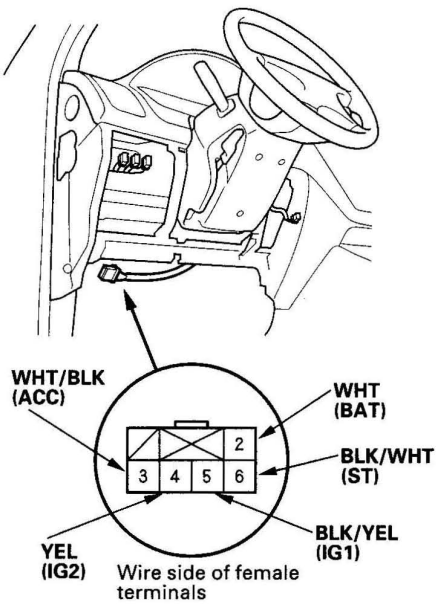
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Ignition Switch

Test

SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

1. Make sure you have the anti-theft codes for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative cable.
3. Remove the dashboard lower cover (see page 20-67)
4. Disconnect the 6P connector from the driver's under-dash fuse/relay box.



5. Check for continuity between the terminals in each switch position according to the table.

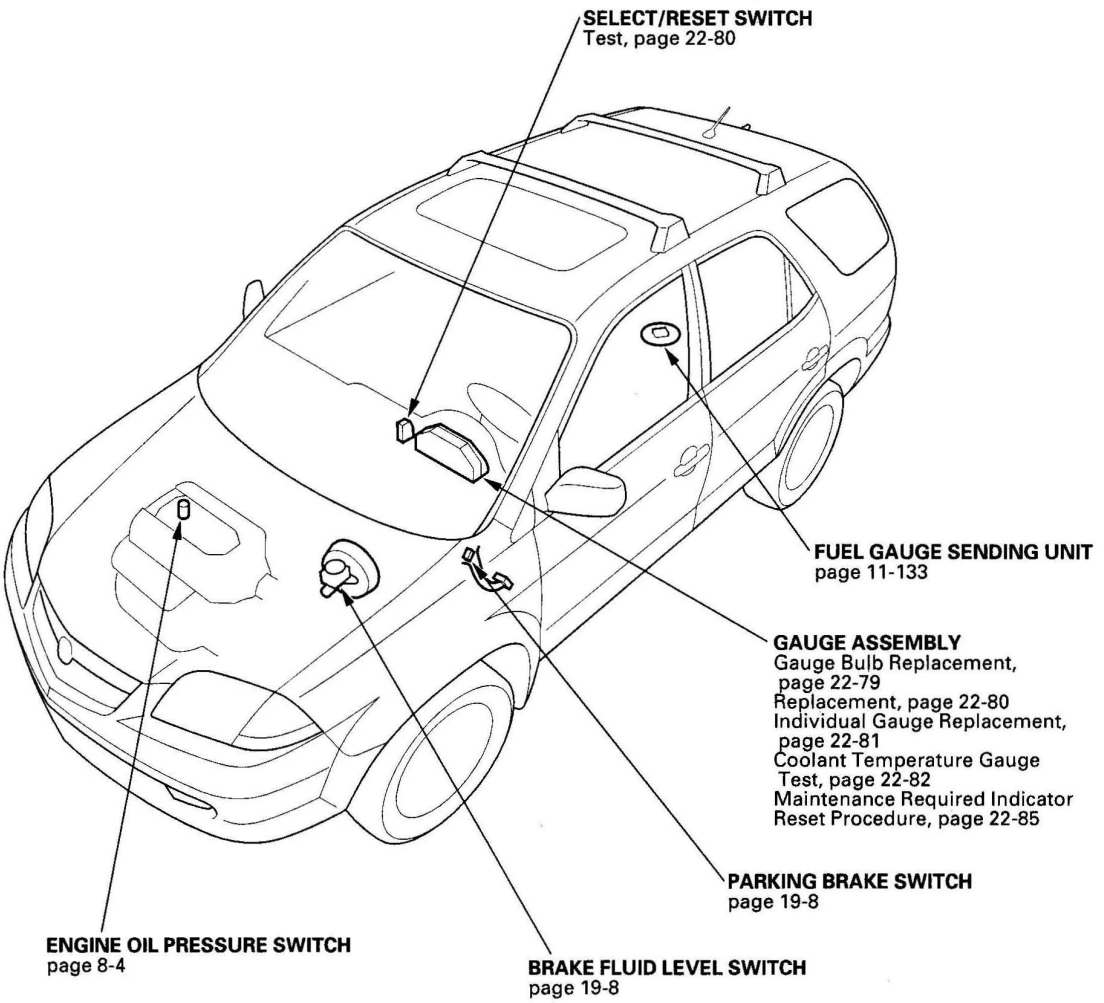
Terminal / Position	WHT/BLK (3)	WHT (2)	BLK/YEL (5)	YEL (4)	BLK/WHT (6)
O (LOCK)					
I (ACC)	○——	——○			
II (ON)	○——	——○	——○	——○	
III (START)		○——	——○		——○

6. If the continuity checks do not agree with the table, replace the steering lock.
7. After reconnecting the battery, enter the anti-theft codes for the radio and the navigation system, then enter the customer's radio station presets.

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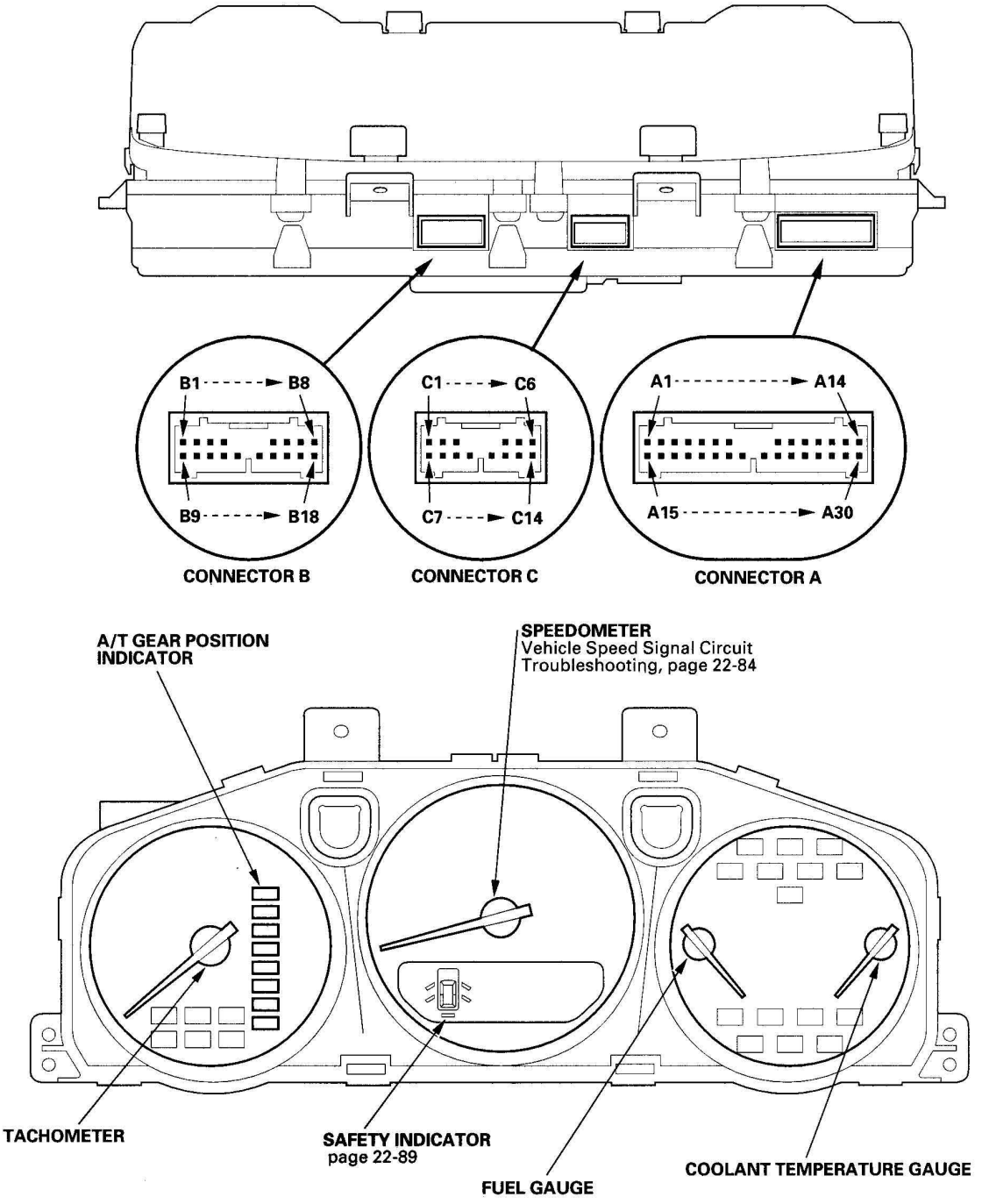
Component Location Index



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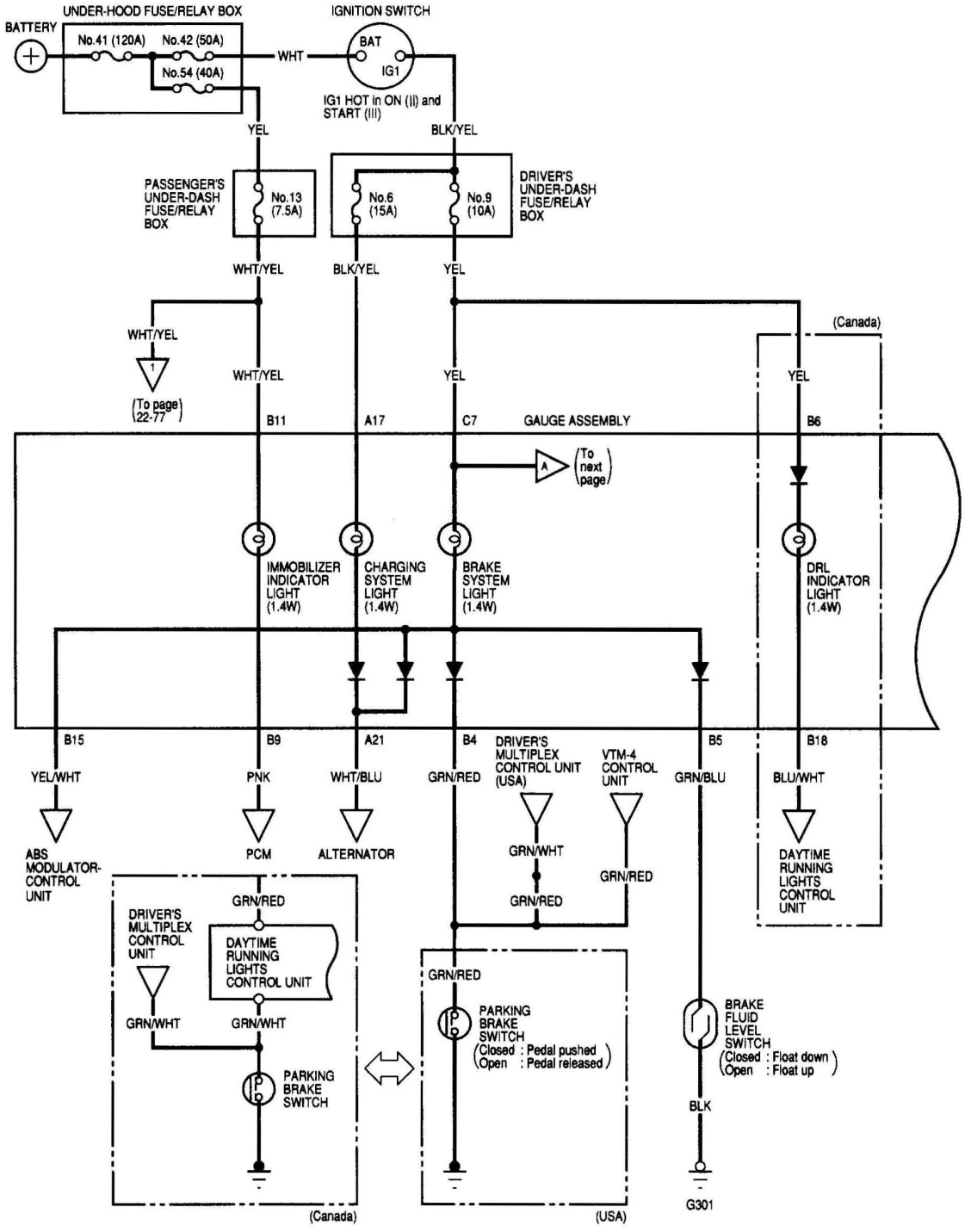
Component Location Index (cont'd)



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Circuit Diagram

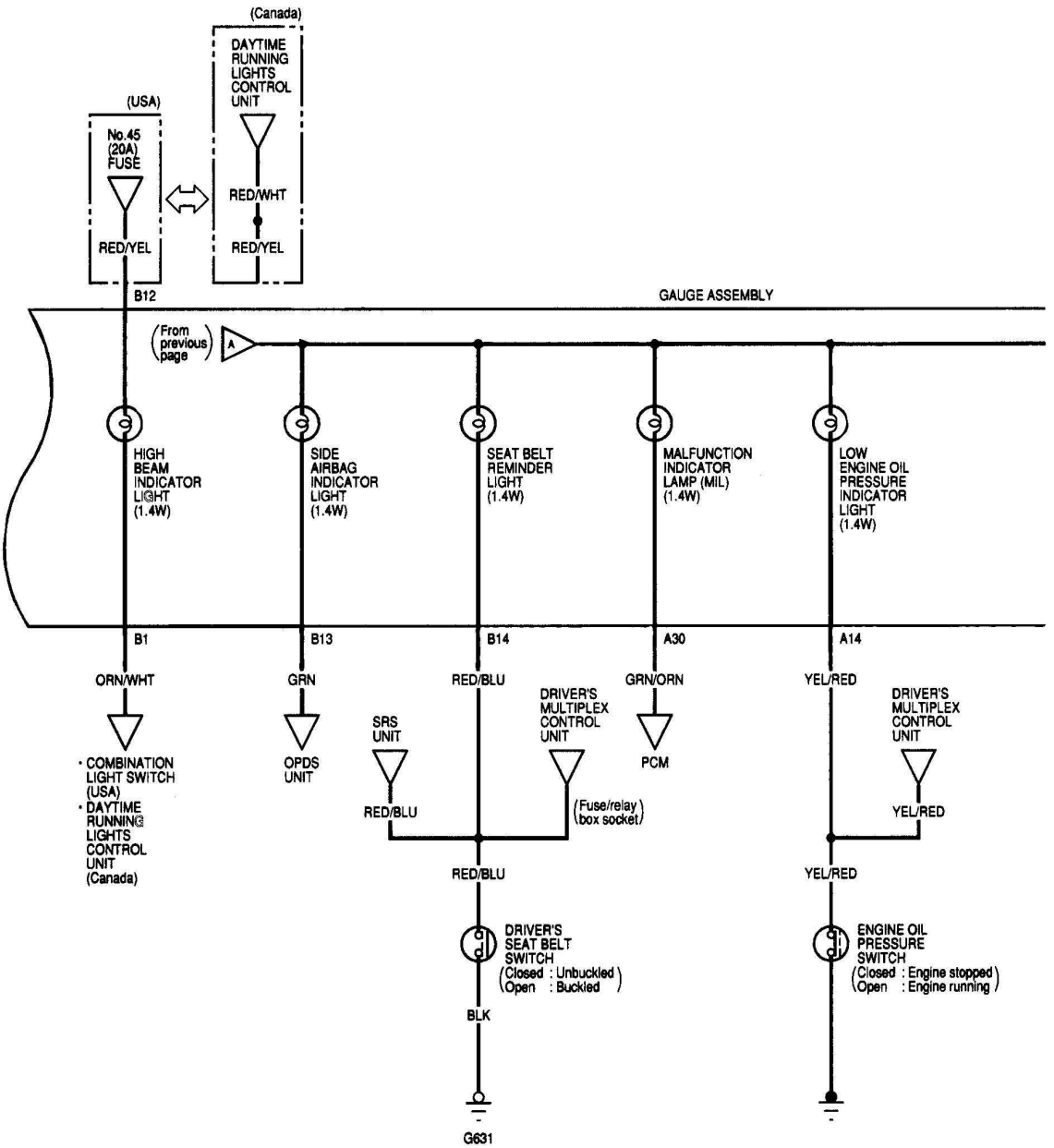


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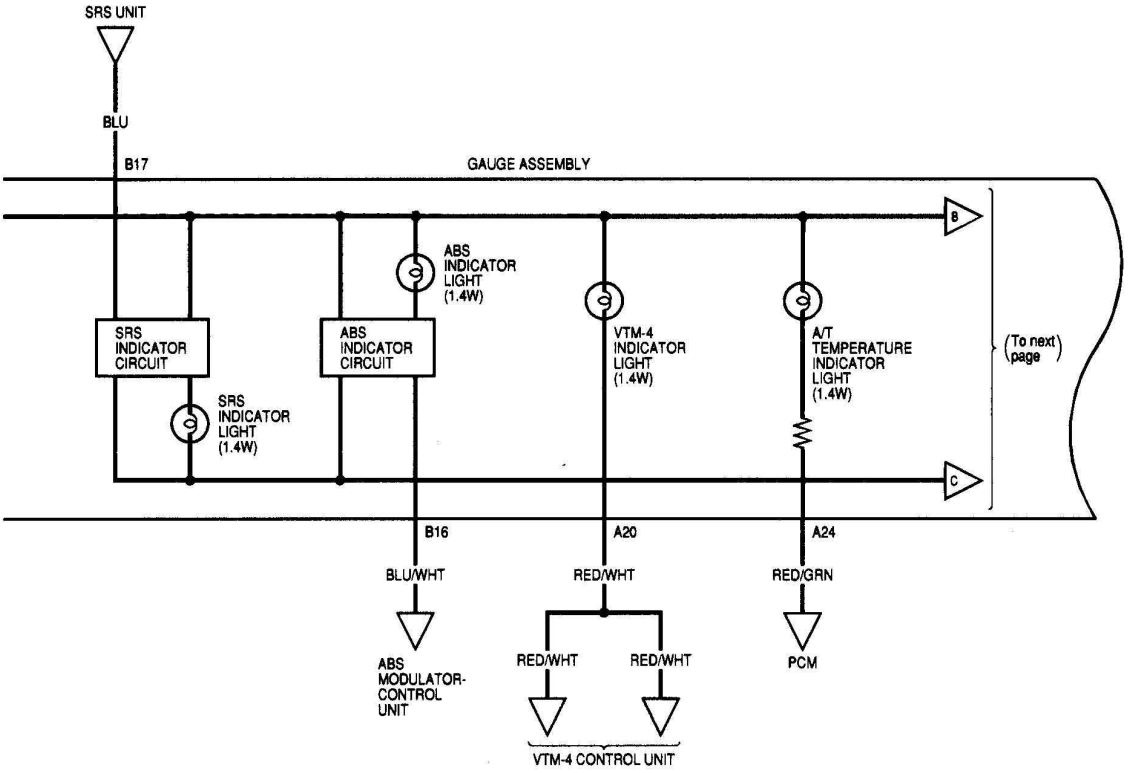
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Circuit Diagram (cont'd)



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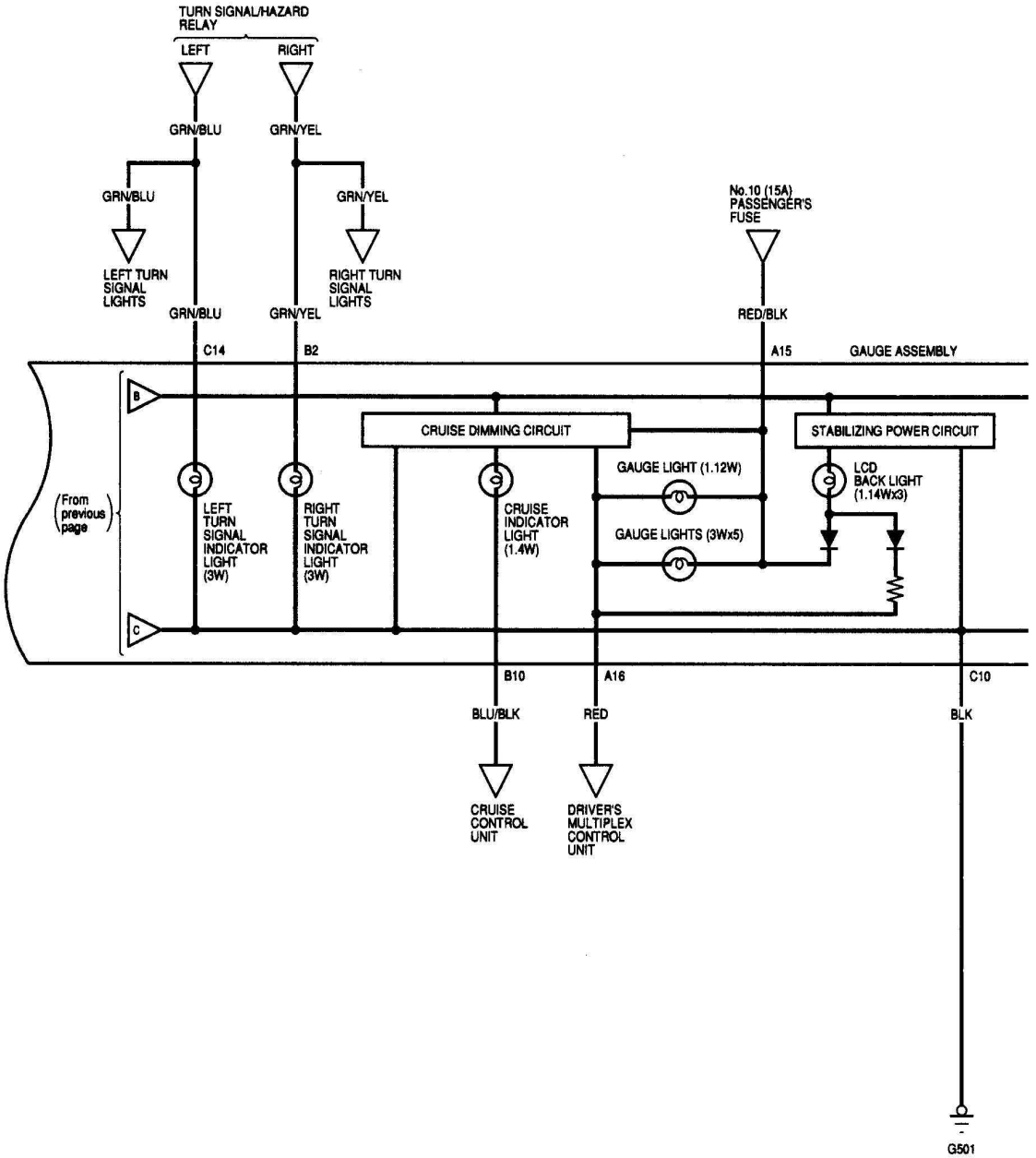


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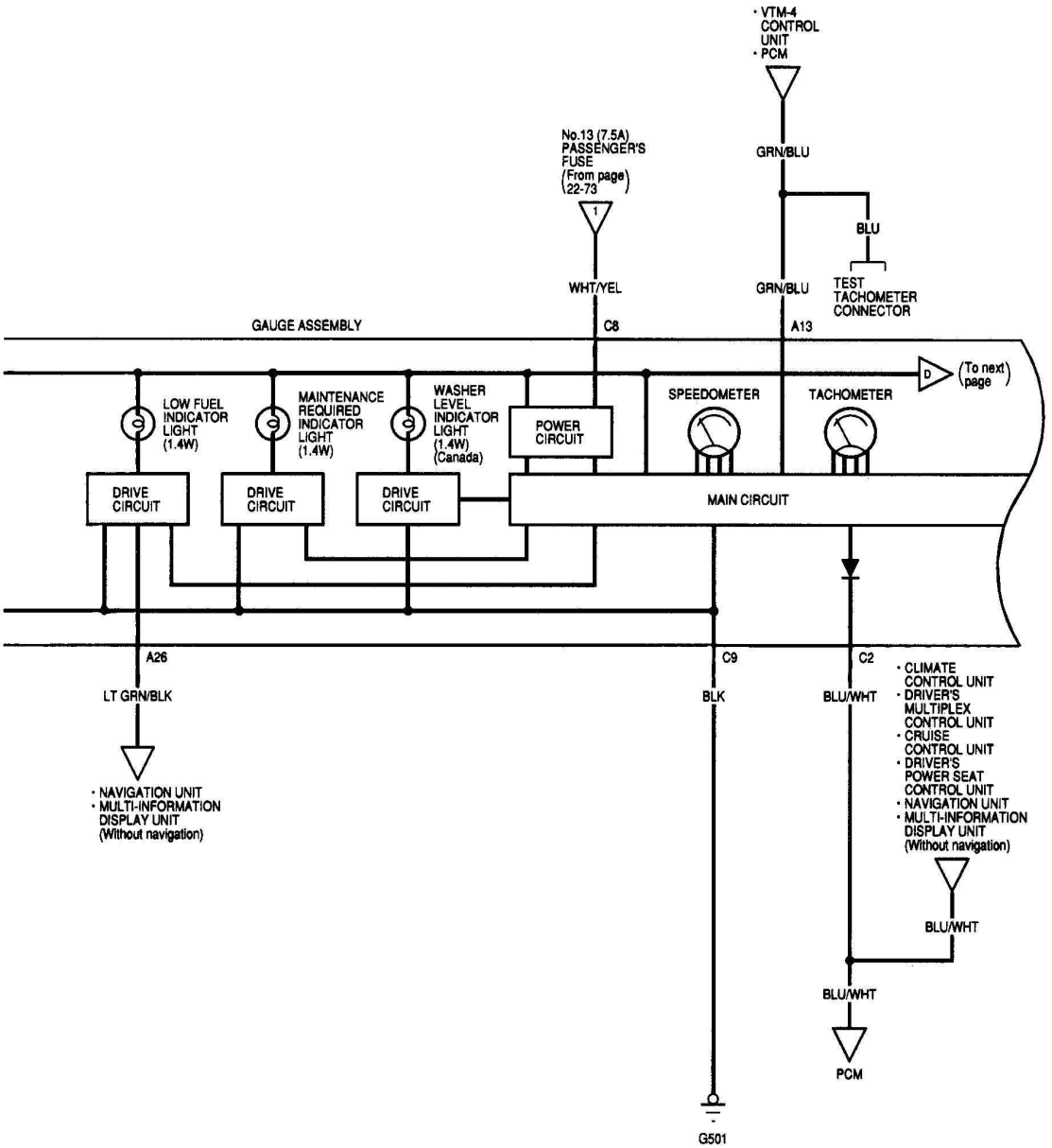
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Circuit Diagram (cont'd)



BACK

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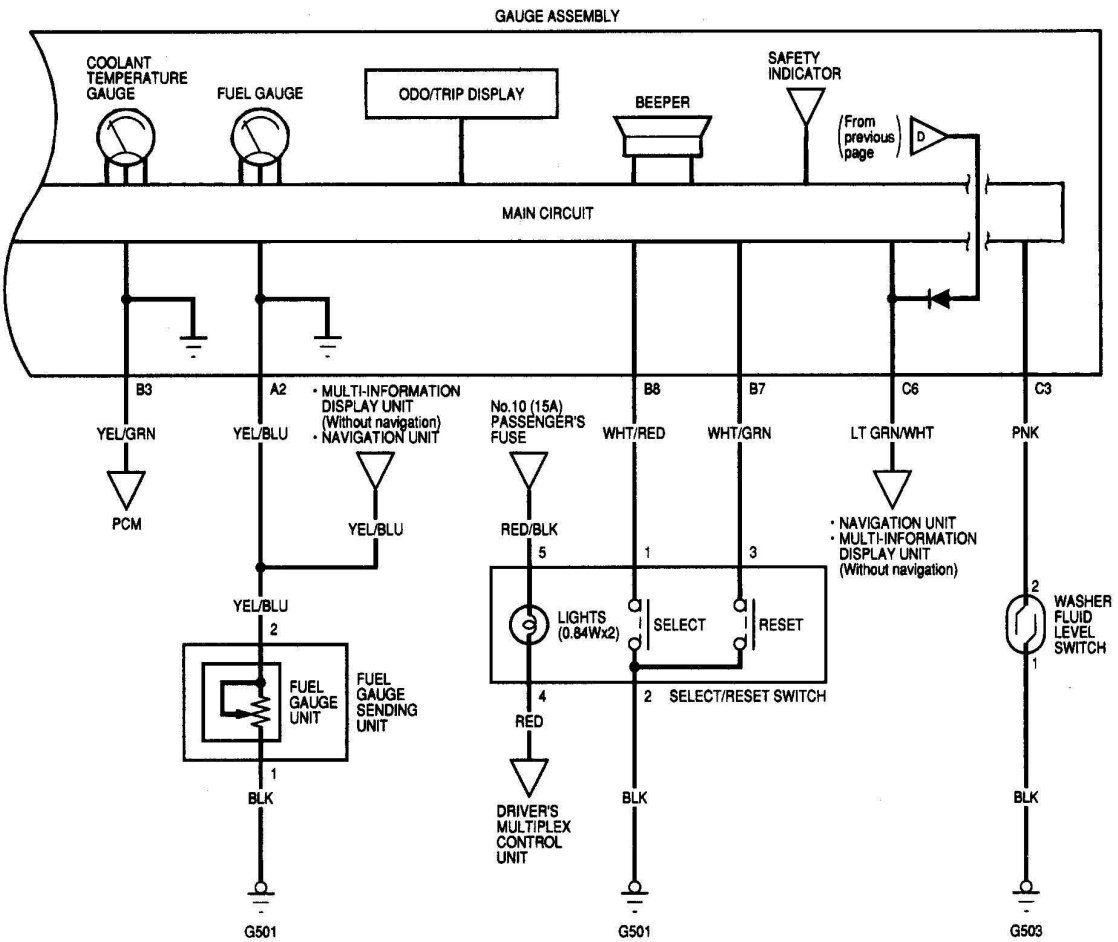


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Circuit Diagram (cont'd)

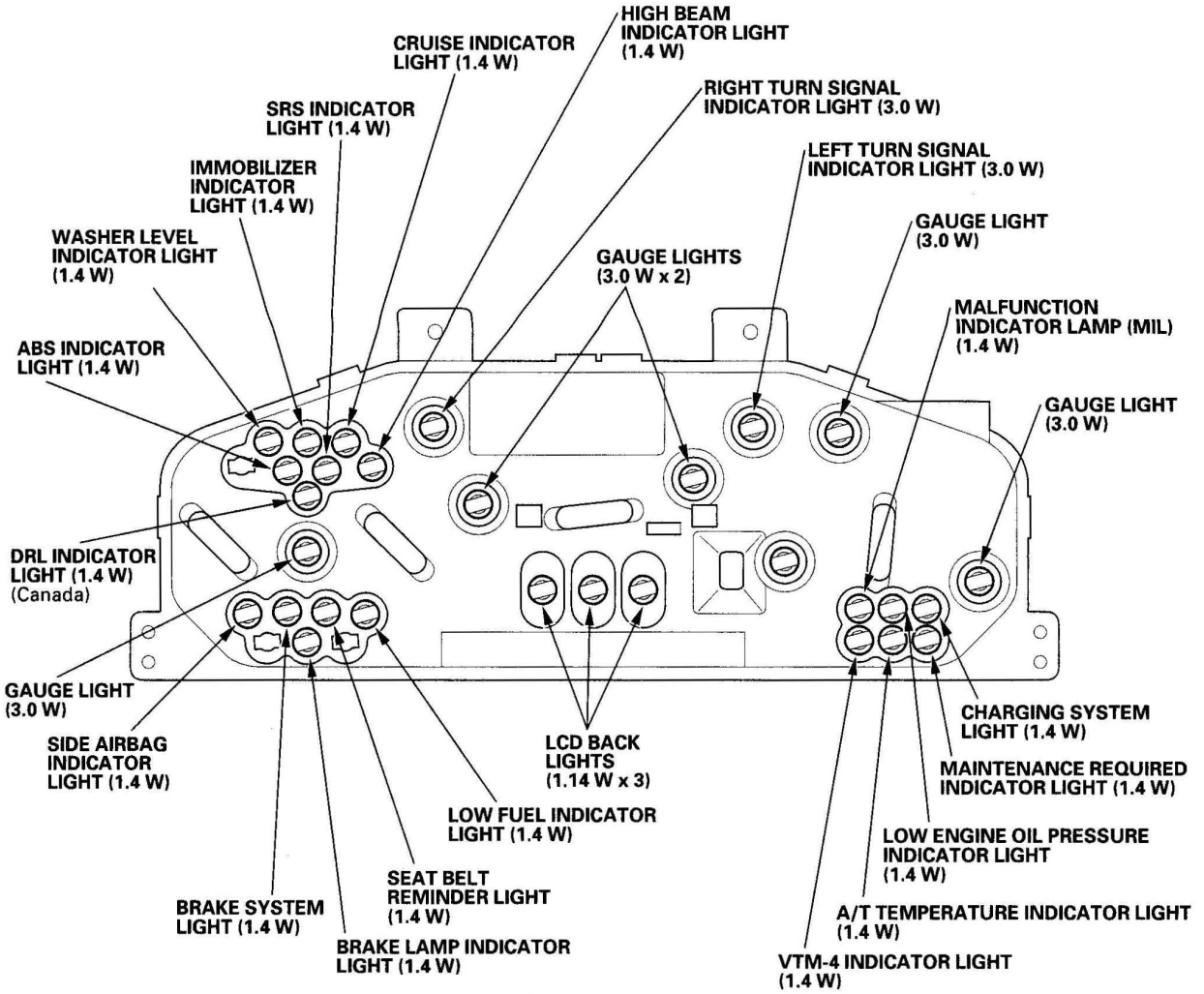


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Gauge Bulb Replacement

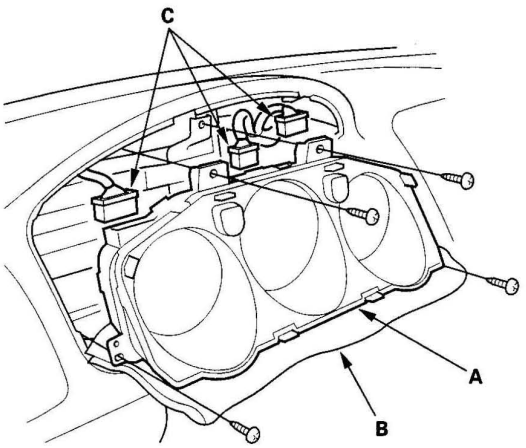
Exploded View



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Gauge Assembly Replacement

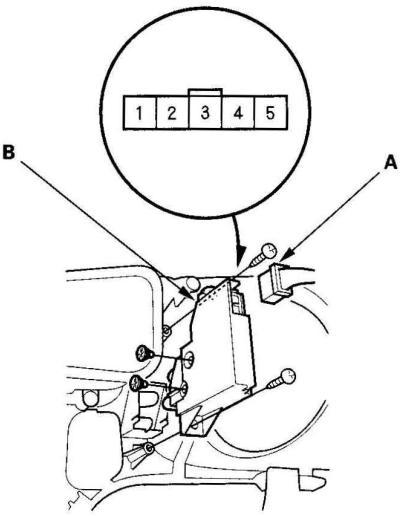
1. Remove the instrument panel (see page 20-67).
2. Remove the screws from the gauge assembly (A), and spread a protective cloth (B) on the upper column cover.



3. Disconnect the connectors (C), and remove the gauge assembly.
4. Install in the reverse order of removal.

Select/Reset Switch Test

1. Remove the instrument panel (see page 20-67).
2. Disconnect the 5P connector (A) from the select/reset switch (B).



3. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	1	2	3	4		5
OFF						
SELECT switch ON	○	○		○	○	○
RESET switch ON		○	○			

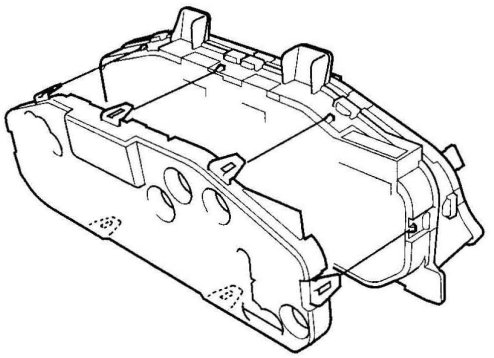
4. If the continuity checks do not agree with the table, remove the two screws, and replace the switch.

BACK

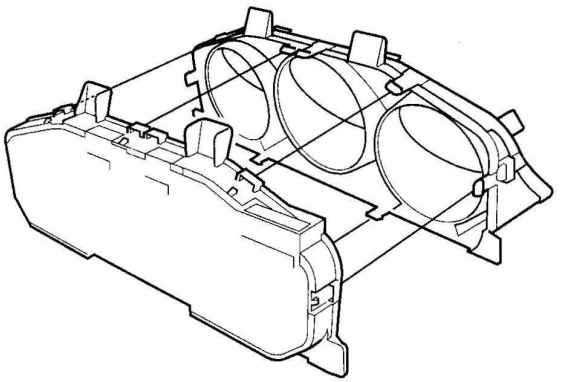
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Individual Gauge Replacement

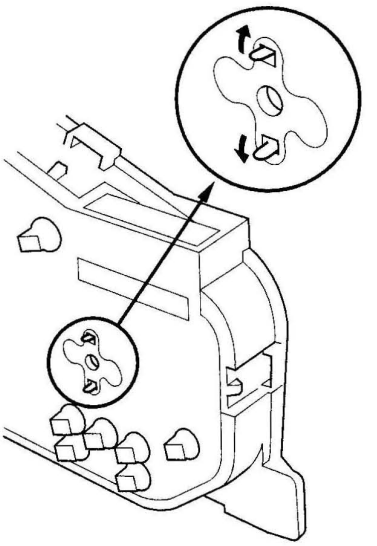
1. Remove the gauge assembly (see page 22-80).
2. Remove the cover from the gauge assembly back side.



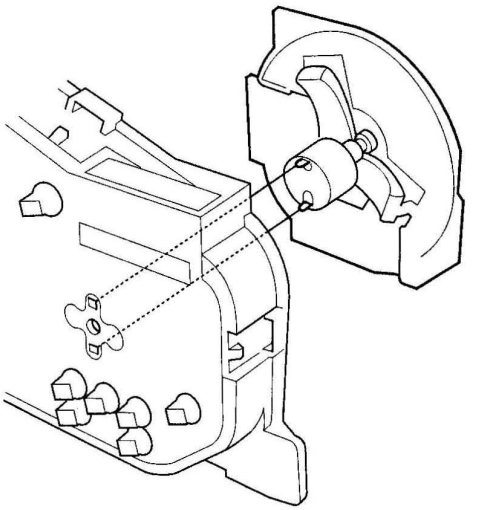
3. Remove the meter lens and visor from the gauge assembly.



4. Pry up the tabs with a screwdriver.



5. Remove the meter assembly.



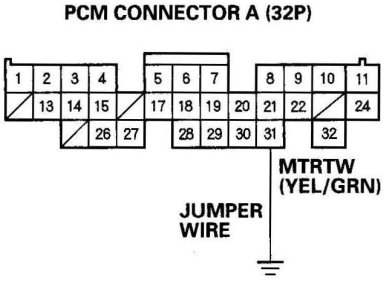
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Coolant Temperature Gauge Test

Coolant Temperature Gauge Needle Does Not Move at ALL

1. Check for fuel and emissions-related DTCs. If you find any, repair the problem, and clear the DTC before continuing.

2. Turn the ignition switch OFF, and connect PCM connector terminal A31 to body ground with a jumper wire.



Wire side of female terminals

3. Turn the ignition switch ON (II).

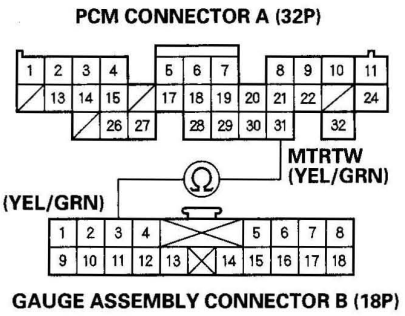
   After 30 seconds or more, does the temperature gauge needle move to the Hot side?

   YES—Check connections, If OK, substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

   NO—Go to step 3.

4. Turn the ignition switch OFF, and disconnect PCM connector A (32P).

5. Check for continuity between PCM connector terminal A31 and gauge assembly connector terminal B3.



GAUGE ASSEMBLY CONNECTOR B (18P)

Wire side of female terminals

Is there continuity?

YES—Replace the fuel and temperature gauge assembly or the printed circuit board (PCB).■

NO—Repair open in the wire between PCM connector terminal A31 and gauge connector terminal B3.■

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Coolant Temperature Gauge Needle Goes Past the Hot Mark:

1. Check for fuel and emissions related DTCs. If you find any, repair the problem, and clear the DTC before continuing.

2. Turn the ignition switch OFF, and disconnect PCM connector A (32P).

3. Turn the ignition switch ON (II), and watch the coolant temperature gauge.

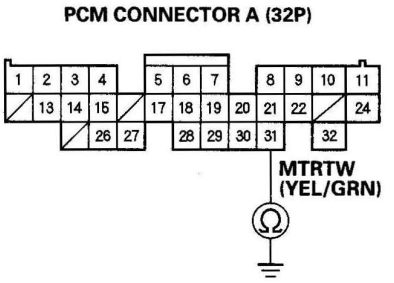
   Does the temperature gauge needle stay on the cold mark? (you may have to watch it for about 30 seconds.)

   YES—Substitute a known-good PCM and recheck, (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

   NO—Go to step 3.

4. Turn the ignition switch OFF, and disconnect gauge assembly connector B (18P).

5. Check for continuity between PCM connector terminal A31 and body ground.



Wire side of female terminals

Is there continuity?

YES—Repair short to ground PCM connector A31 and gauge connector terminal B3.■

NO—Replace the fuel and temperature gauge assembly or the printed circuit board (PCB).■

BACK

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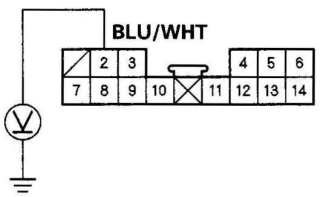
Vehicle Speed Signal Circuit Troubleshooting

Before testing:

- Check to see if Diagnostic Trouble Code (DTC) P0720 (9) is indicated. If it is, troubleshoot the DTC (see page 14-79).
- Inspect the No. 9 (10A) fuse in the driver's under-dash fuse/relay box.
- Check for continuity between the gauge assembly 14P connector C9 and C10 terminals and body ground (G501).

1. Raise the vehicle, and make sure it is securely supported.
2. Disconnect gauge assembly connector C (14P).
3. Connect the C2 terminal to the positive probe of a voltmeter, and connect the negative probe to body ground. To prevent damage to the gauge assembly, lay the gauge assembly on a shop towel.

GAUGE ASSEMBLY 14P CONNECTOR C



Wire side of female terminals

4. Put the vehicle in neutral with the ignition switch ON (II).
5. Slowly rotate (over 3 mph (2 km/h)) one wheel with the other wheel blocked.

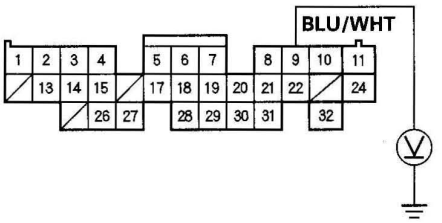
   Does voltage pulse from 0 to about 5 V or more?

   YES—Replace the speedometer or the printed circuit board (PCB).■

   NO—Turn the ignition switch OFF, and go to step 6.

6. Connect the No. 9 terminal of the PCM 32P connector to the positive probe of a voltmeter, and connect the negative probe to body ground.

PCM 32P CONNECTOR (Connected)



Wire side of female terminals

7. Put the vehicle in neutral with the ignition switch ON (II).
8. Slowly rotate (over 3 mph (2 km/h)) one wheel with the other wheel blocked.

   Does voltage pulse from 0 to about 5 V or more?

   YES—Repair open in the BLU/WHT wire between the gauge assembly and the PCM, the cruise control unit, or the driver's multiplex control unit.■

   NO—Turn the ignition switch OFF, and go to step 9.

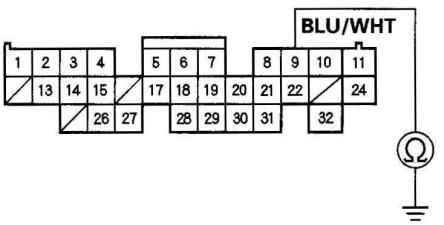
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9. Disconnect PCM connector A (32P), driver's multiplex control unit connector B, multi-information display unit connector B (without navigation), navigation connector C (with navigation), climate control unit connector B, driver's power seat control unit connector A, gauge assembly connector C, and the cruise control unit.

10. Check for continuity between No. 9 terminal and body ground.

PCM 32P CONNECTOR (Disconnected)



Wire side of female terminals

Is there continuity?

YES – Repair short to ground in the BLU/WHT wire between the PCM and driver's multiplex control unit connector B, multi-information display unit connector B (without navigation), navigation connector C (with navigation), climate control unit connector B, driver's power seat control unit connector A, gauge assembly connector C, or the cruise control unit.

NO – Check for these problems:

- Bent, loose or corroded terminals.
- A faulty PCM.■

Maintenance Required Indicator Reset Procedure

How to Reset:

Push the select switch and reset switch at the same time, turn the ignition switch ON (II), and hold them more than 10 seconds.

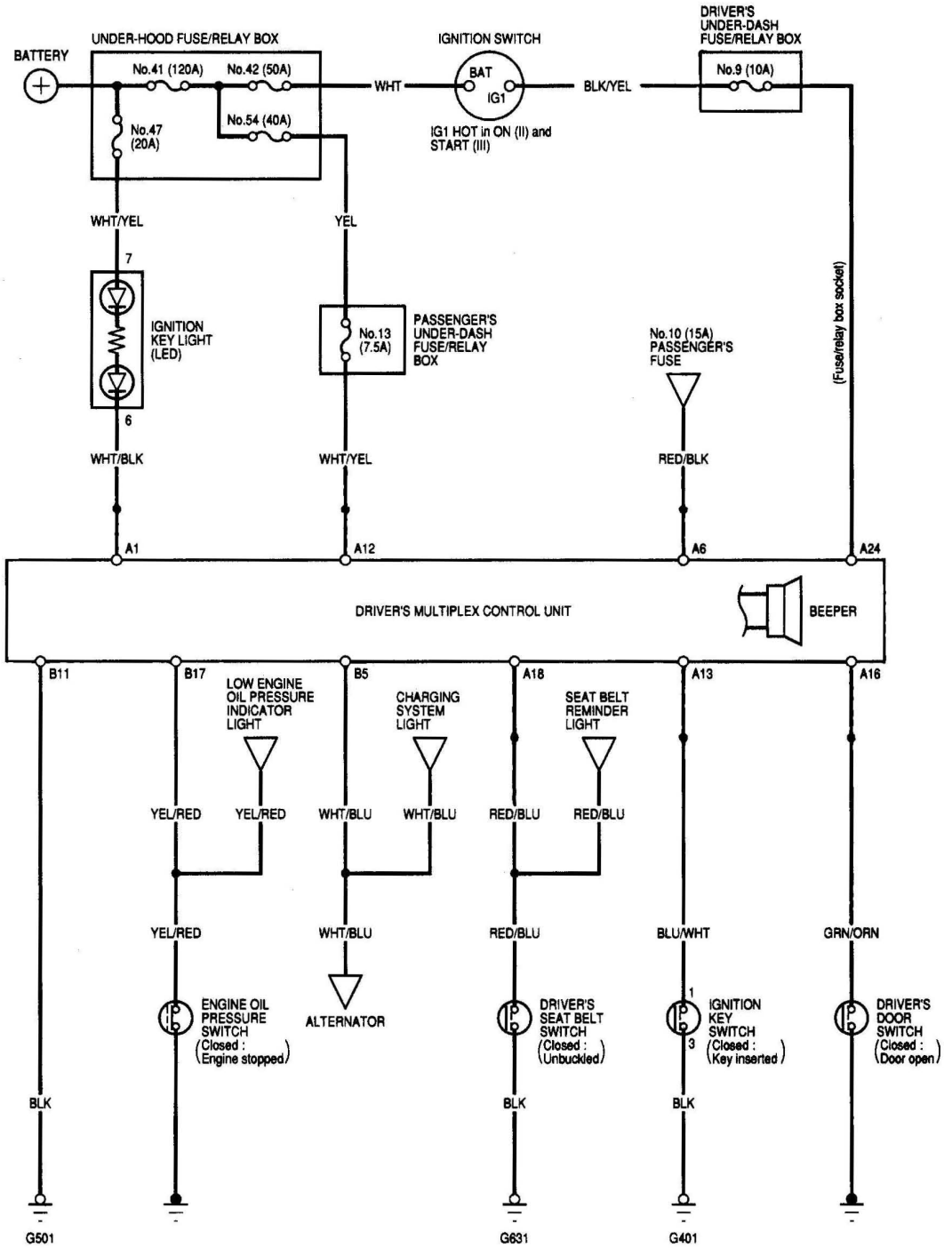
Blinking Pattern:

Miles (km)	Maintenance Reminder Light
At 5,900 (9,440) to 6,100 (9,760)	Blinks for 10 seconds when the ignition switch is turned ON (II).
At 7,400 (11,840) to 7,600 (12,160)	Comes on and stays on while the ignition switch is ON (II).

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Lights-on, Key-in, Seat Belt Reminder, Key Light Timer, and Engine Oil Pressure Indicator Systems

Circuit Diagram



BACK

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Control Unit Input Test

1. Before testing, troubleshoot the multiplex control system (see page 22-212).

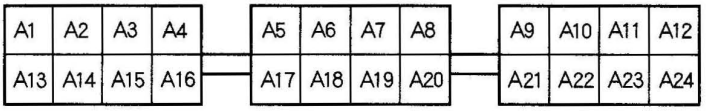
Driver's Multiplex Control Unit

2. Remove the driver's multiplex control unit from the driver's under-dash fuse/relay box.

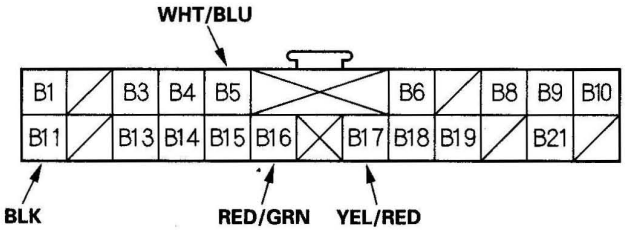
3. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

DRIVER'S UNDER-DASH FUSE/RELAY BOX SOCKET



DRIVER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

4. Make these input tests at the fuse/relay box socket (multiplex connector A) and the multiplex connector B.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the control unit must be faulty; replace it.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
A24		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10A) fuse in the driver's under-dash fuse/relay box • An open in the wire

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Control Unit Input Test (cont'd)

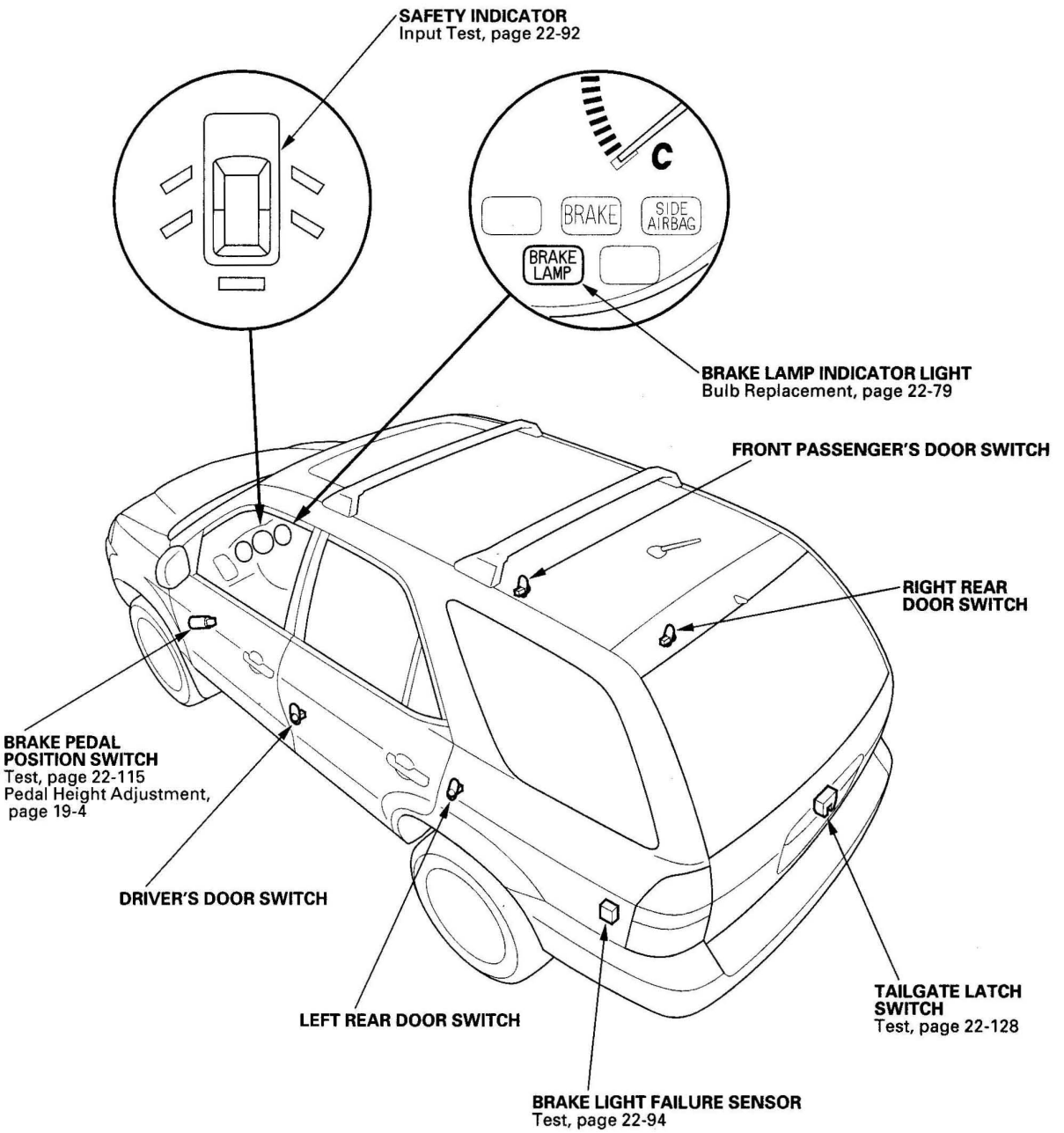
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A6	Fuse/relay box socket	Combination light switch ON (≣D) Jump 12 volts to B16 (RED/GRN) terminal	Check for voltage to ground: There should be battery voltage.	• Blown No. 10 (15A) fuse in the passenger's under-dash fuse/relay box • Faulty taillight relay • Faulty combination light switch • Faulty driver's under-dash fuse/relay box • An open in the wire
A16		Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch • An open in the wire
		Driver's door closed	Check for voltage to ground. There should be 5 V or more.	• Faulty driver's door switch • Short to ground.
A18		Ignition switch ON (II) Driver's seat belt unbuckled.	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's seat belt switch • Poor ground (G631) • An open in the wire
		Driver's seat belt buckled	Check for voltage to ground. There should be 5 V or more.	• Faulty driver's seat belt switch • Short to ground
A1		Under all conditions	Attach to ground: Ignition key light should come on.	• Blown No. 47 (20A) fuse in the under-hood fuse/relay box • Faulty LED (ignition key light) • An open in the wire
A13		Ignition key is inserted into the ignition switch.	Check for continuity to ground: There should be continuity.	• Faulty ignition key switch • Poor ground (G401) • An open in the wire
		Ignition key removed from the ignition switch	Check for continuity to ground. There should be no continuity.	• Faulty ignition key switch • Short to ground
B5	WHT/BLU	Engine running	Check for voltage to ground: There should be battery voltage.	• Faulty charging system • An open in the wire • Short to ground
B11	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire
B17	YEL/RED	Ignition switch OFF	Check for continuity to ground: There should be continuity.	• Faulty engine oil pressure switch • An open in the wire
		Ignition switch ON (II)	Check the low engine oil indicator light operation. The indicator light should come on.	• Blown bulb • An open in the wire
		Start the engine.	Check for voltage to ground: There should be battery voltage.	• Insufficient oil • Improper lubrication • Faulty engine oil pressure switch • An open in the wire • A short in the wire

BACK

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Safety Indicator System

Component Location Index

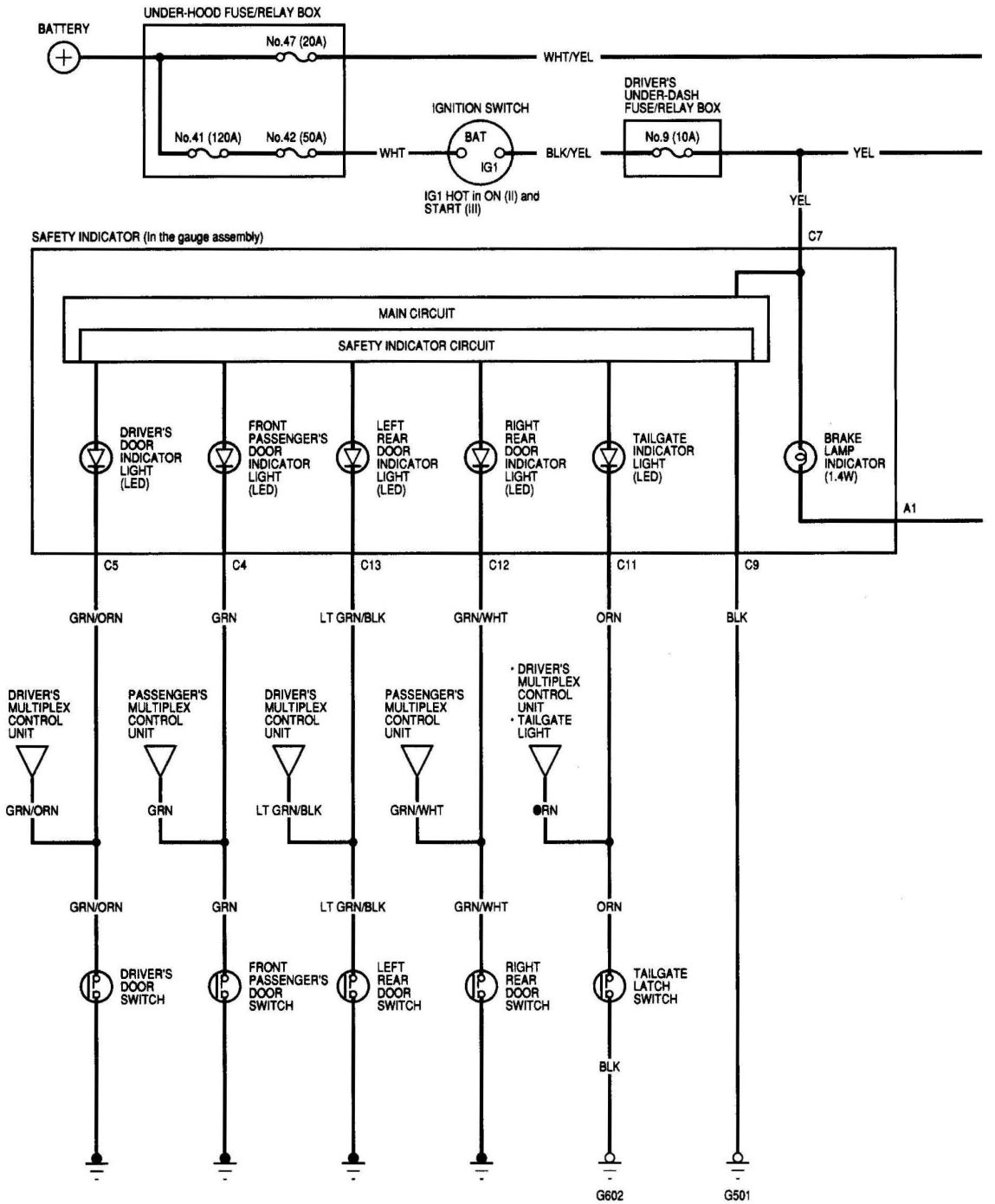


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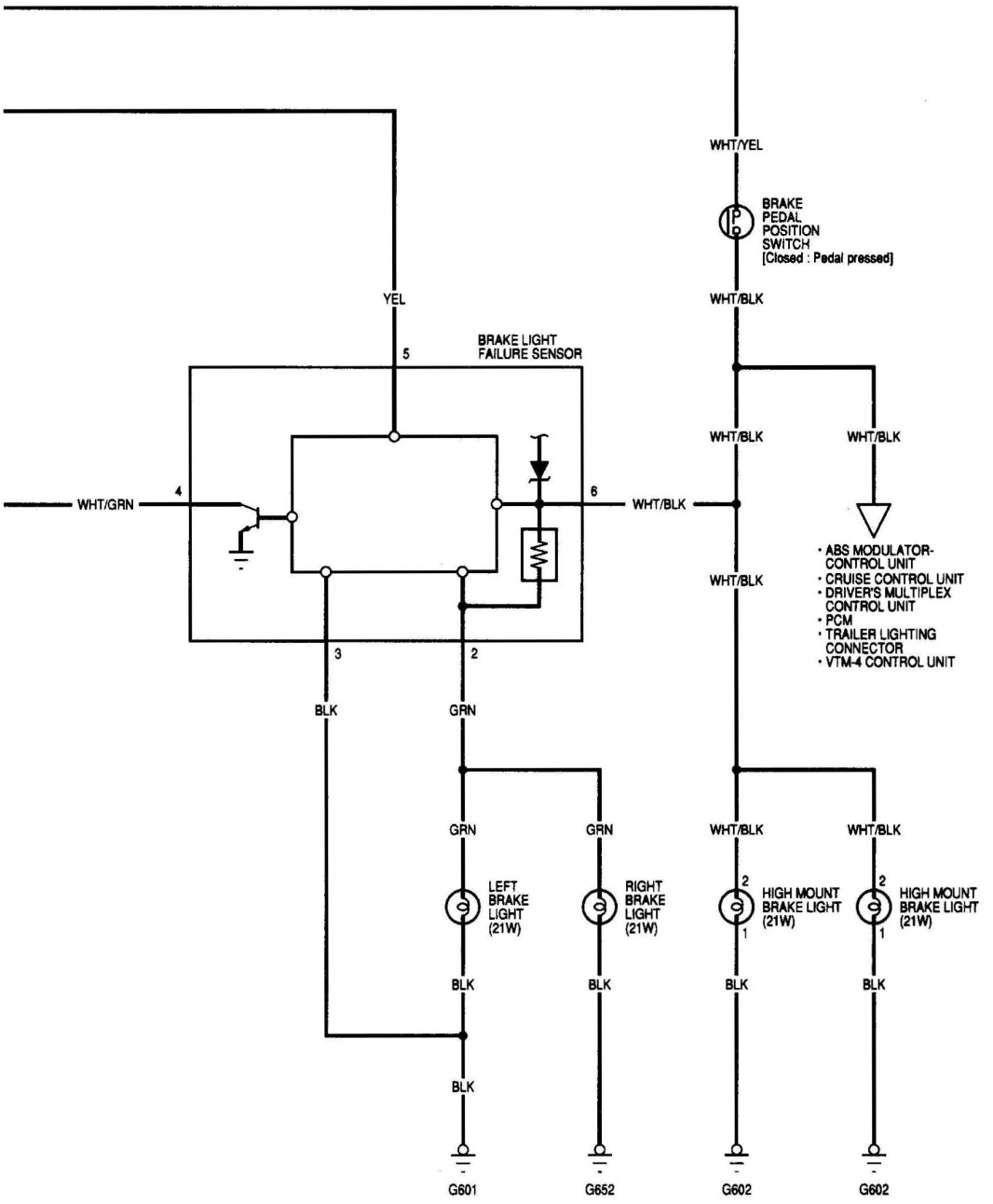
Safety Indicator System

Circuit Diagram



BACK

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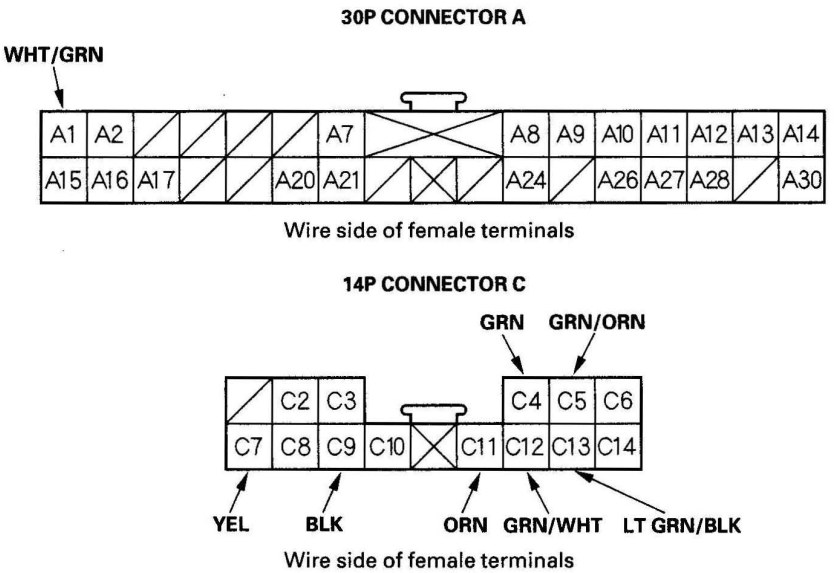


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Safety Indicator Input Test

1. Remove the gauge assembly (see page 22-80).
2. Disconnect connector A (30P) and connector C (14P) from the gauge assembly.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.



BACK

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4. Make these input tests at the connectors.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A1	WHT/GRN	Under all conditions	Check for continuity between the A1 terminal and the brake light failure sensor No. 4 terminal: There should be continuity.	• An open in the wire

5. Reconnect the connectors to the gauge assembly, and perform the following input tests at the appropriate connector.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the gauge internal circuit must be faulty.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
C9	BLK	Under all conditions	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G501) • An open in the wire
C7	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10A) fuse in the driver's under-dash fuse/relay box • An open in the wire
C4	GRN	Front passenger's door open	Check for voltage to ground: There should be less than 1 V.	• Faulty front passenger's door switch • An open in the wire
		Front passenger's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty front passenger's door switch • Short to ground in the wire
C5	GRN/ORN	Driver's door open	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door switch • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door switch • Short to ground in the wire
C11	ORN	Tailgate open	Check for voltage to ground: There should be less than 1 V.	• Faulty tailgate latch switch • An open in the wire • Poor ground (G602)
		Tailgate closed	Check for voltage to ground: There should be 5 V or more.	• Faulty tailgate latch switch • Short to ground in the wire
C12	GRN/WHT	Right rear door open	Check for voltage to ground: There should be less than 1 V.	• Faulty right rear door switch • An open in the wire
		Right rear door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty right rear door switch • Short to ground in the wire
C13	LT GRN/ BLK	Left rear door open	Check for voltage to ground: There should be less than 1 V.	• Faulty left rear door switch • An open in the wire
		Left rear door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty left rear door switch • Short to ground in the wire

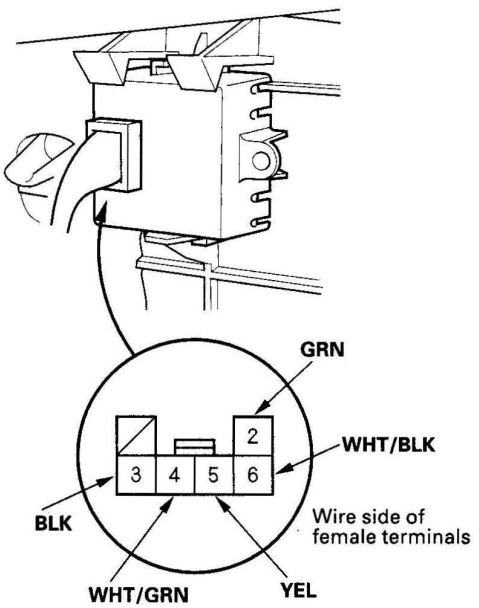
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Brake Light Failure Sensor Test

1. First make sure the brake lights come on when the brake pedal is pressed.

   - If all the brake lights come on, go to step 2.
   - If one of the brake lights does not come on, check whether the bulb is blown. If the bulb is OK, go to step 2.
   - If none of the brake lights come on, check the brake light circuit (see page 22-103).

2. Open the tailgate, and remove the left rear side trim (see page 20-57). The brake light failure sensor is mounted on the inside of the left rear side trim panel.



3. Make sure the BRAKE LAMP light in the safety indicator does not come on and stay on when the brake light failure sensor connector is disconnected and the ignition switch is turned from OFF to engine running. If the indicator light comes on and then goes out, go to step 4. If the BRAKE LAMP light in the safety indicator comes on and stays on, check for:

   - A short to ground in the WHT/GRN wire between the safety indicator and the No. 4 terminal of the failure sensors.
   - A faulty safety indicator circuit in the gauge assembly.

4. Reconnect the 6P connectors.

5. Make sure the BRAKE LAMP light in the safety indicator comes on and goes off when the No. 3 terminal of the 6P connector is grounded, the brake pedal is pressed, and the ignition switch is turned from OFF to ON (II).

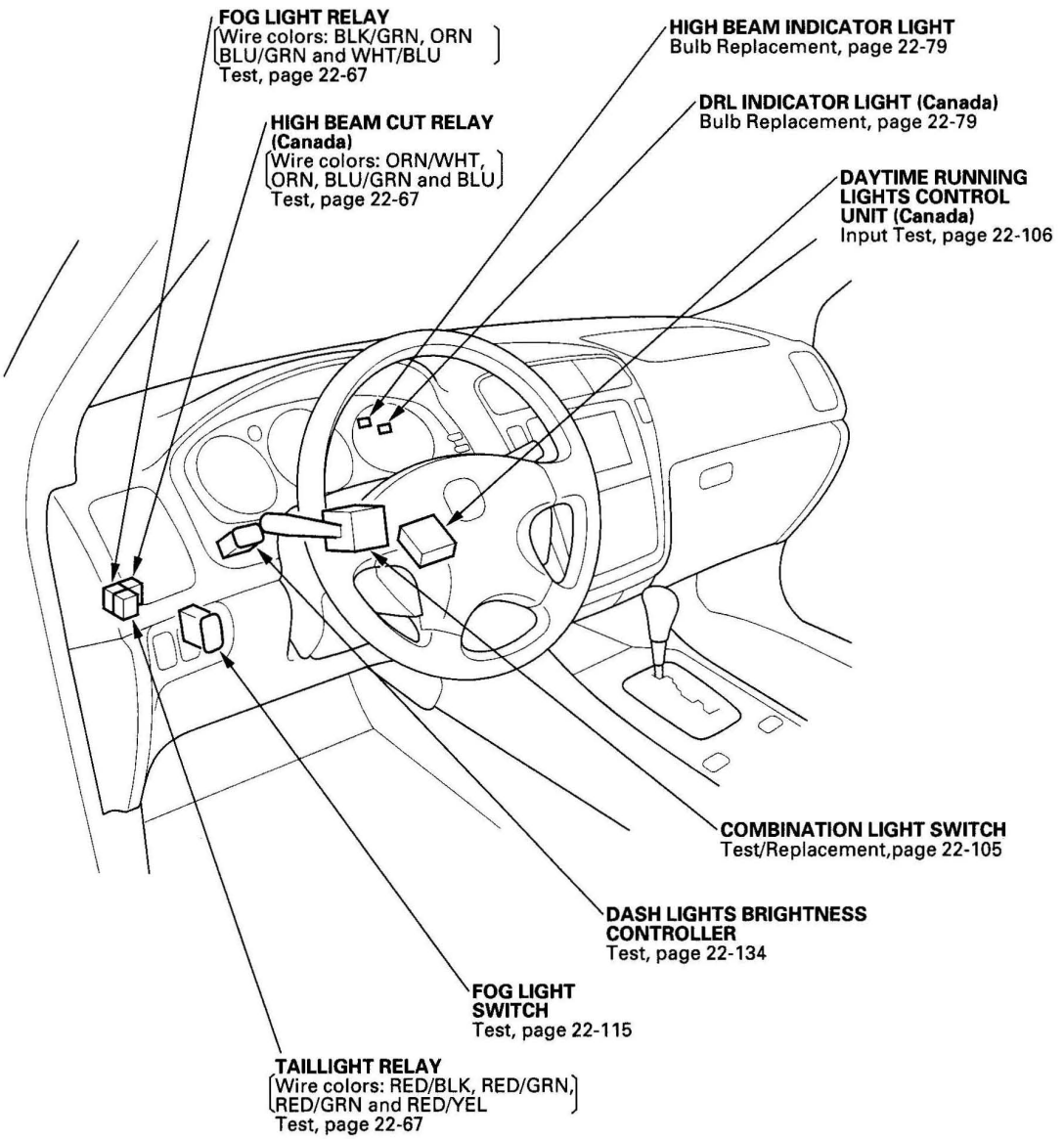
   - If the BRAKE LAMP light in the safety indicator comes on and stays on, check for a faulty sensor.

   - If the BRAKE LAMP indicator light goes off, check for:
     - A poor ground (G601).
     - An open in the WHT/GRN or BLK wire.

BACK

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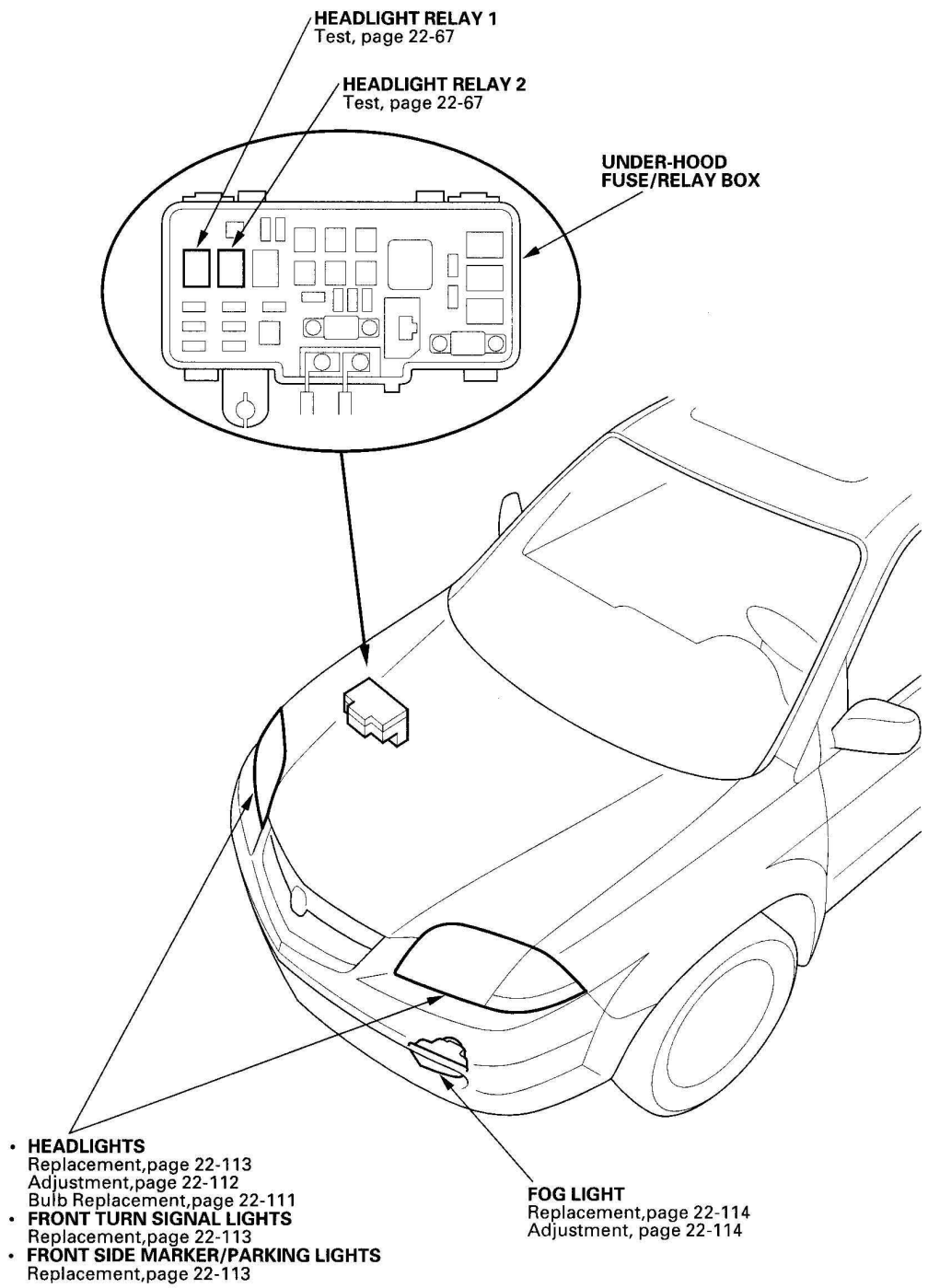
Component Location Index



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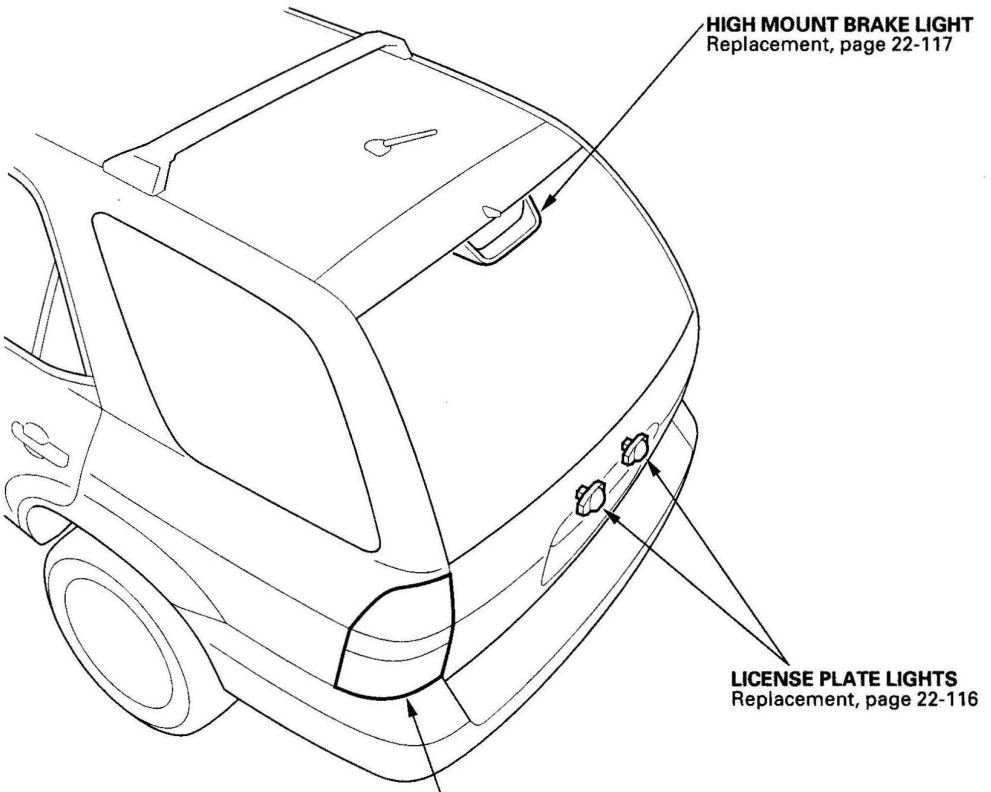
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Component Location Index (cont'd)



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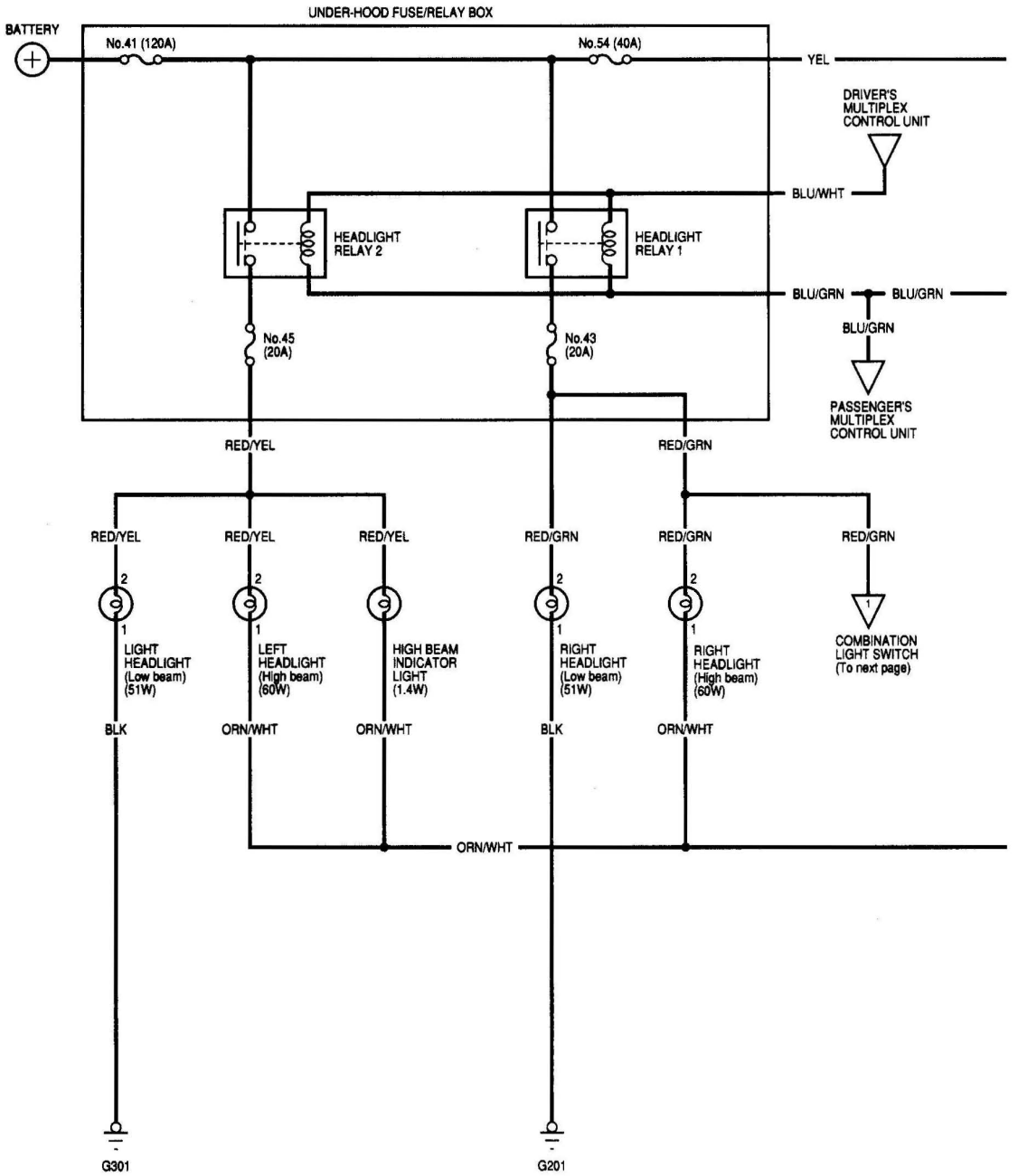


BACK

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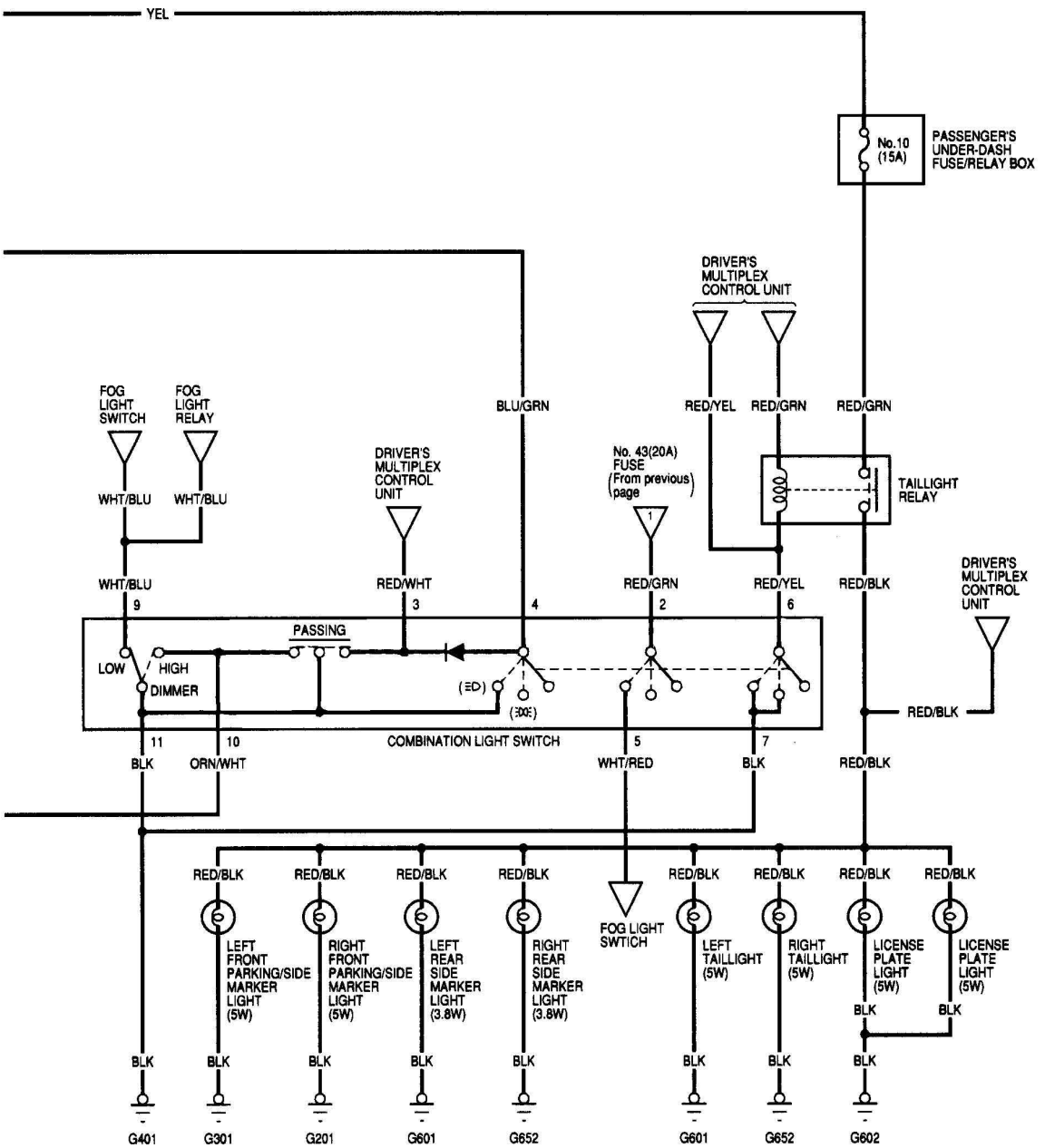
Exterior Lights

Circuit Diagram - USA



BACK

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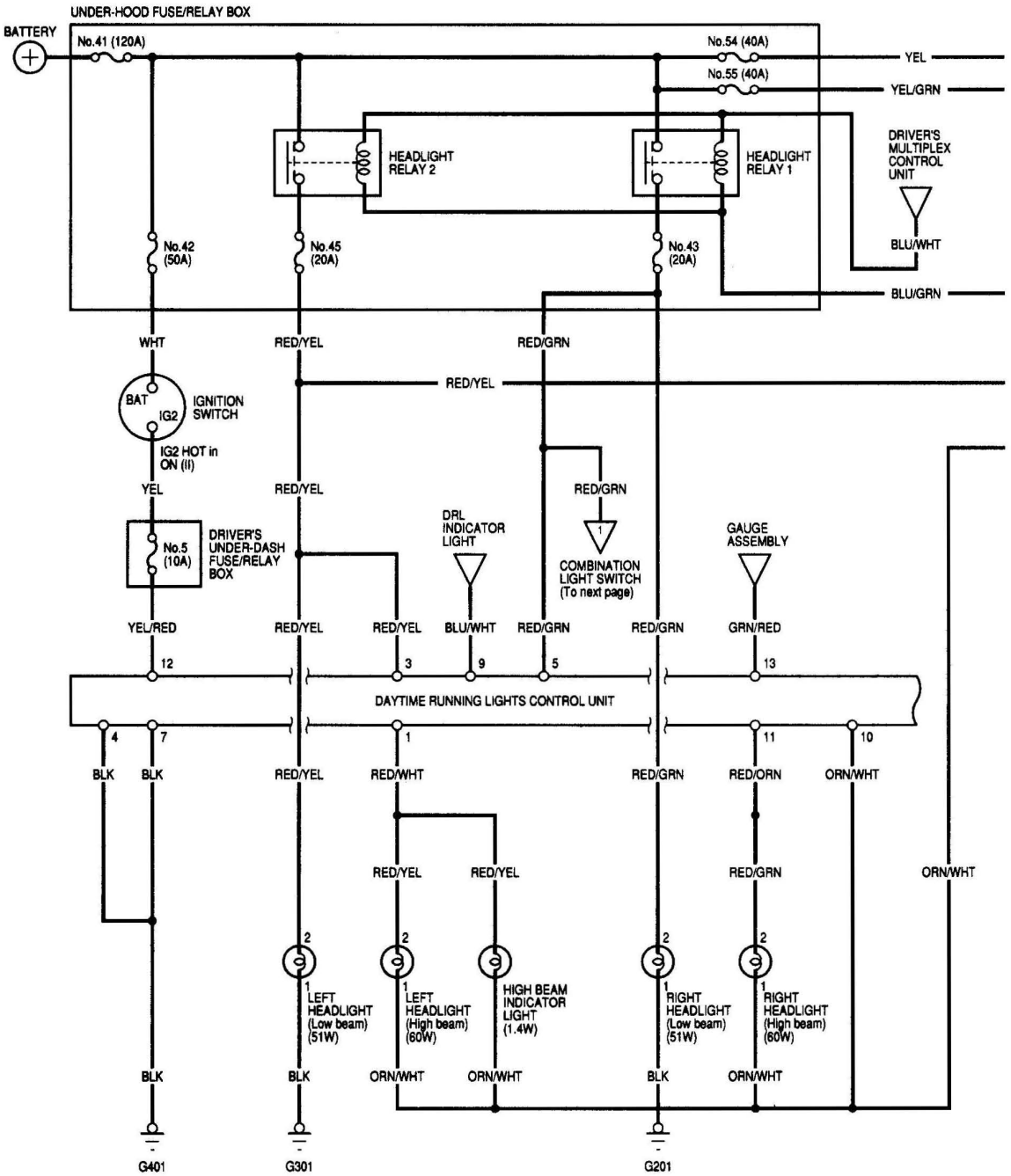


BACK

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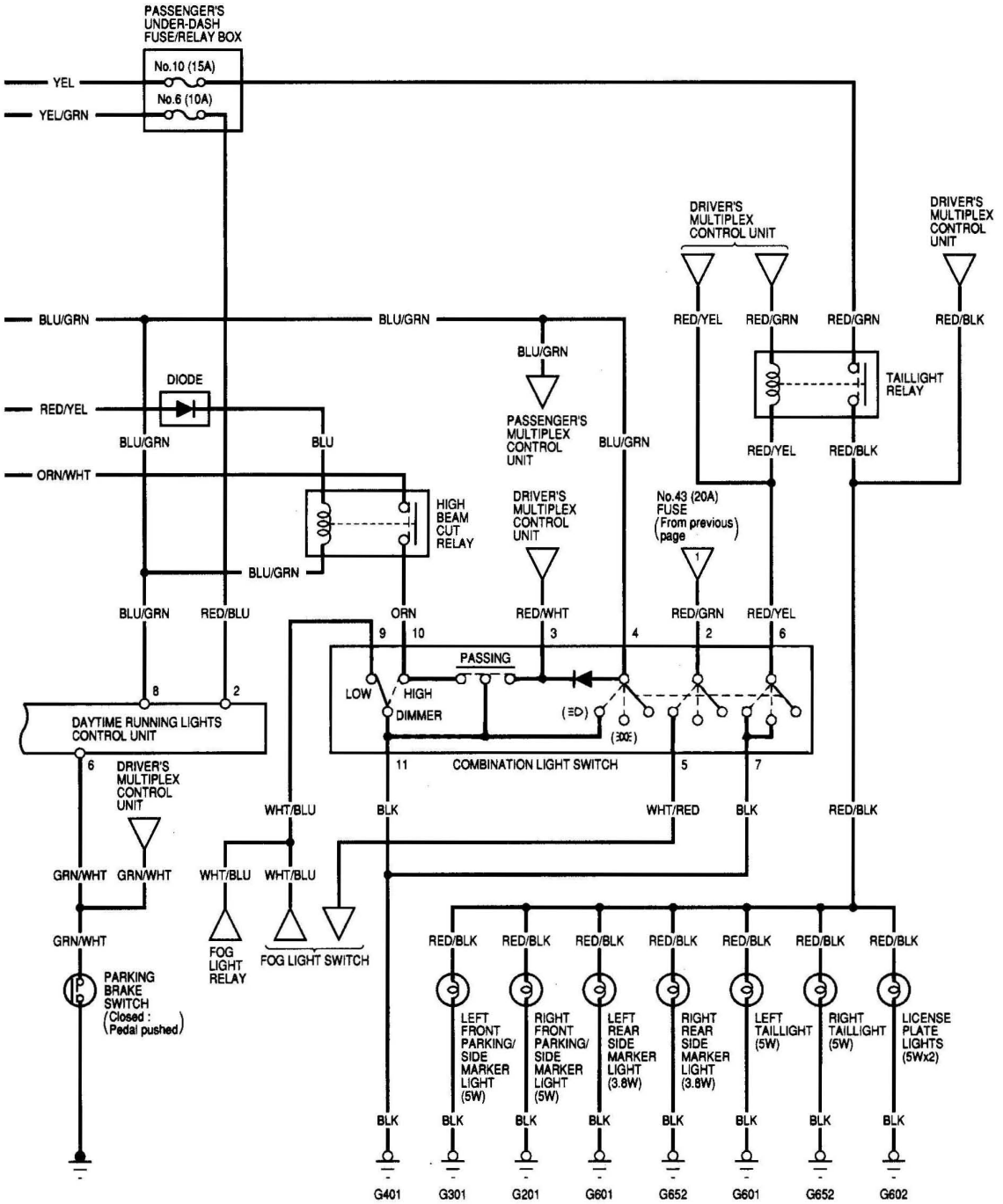
Exterior Lights

Circuit Diagram - Canada



BACK

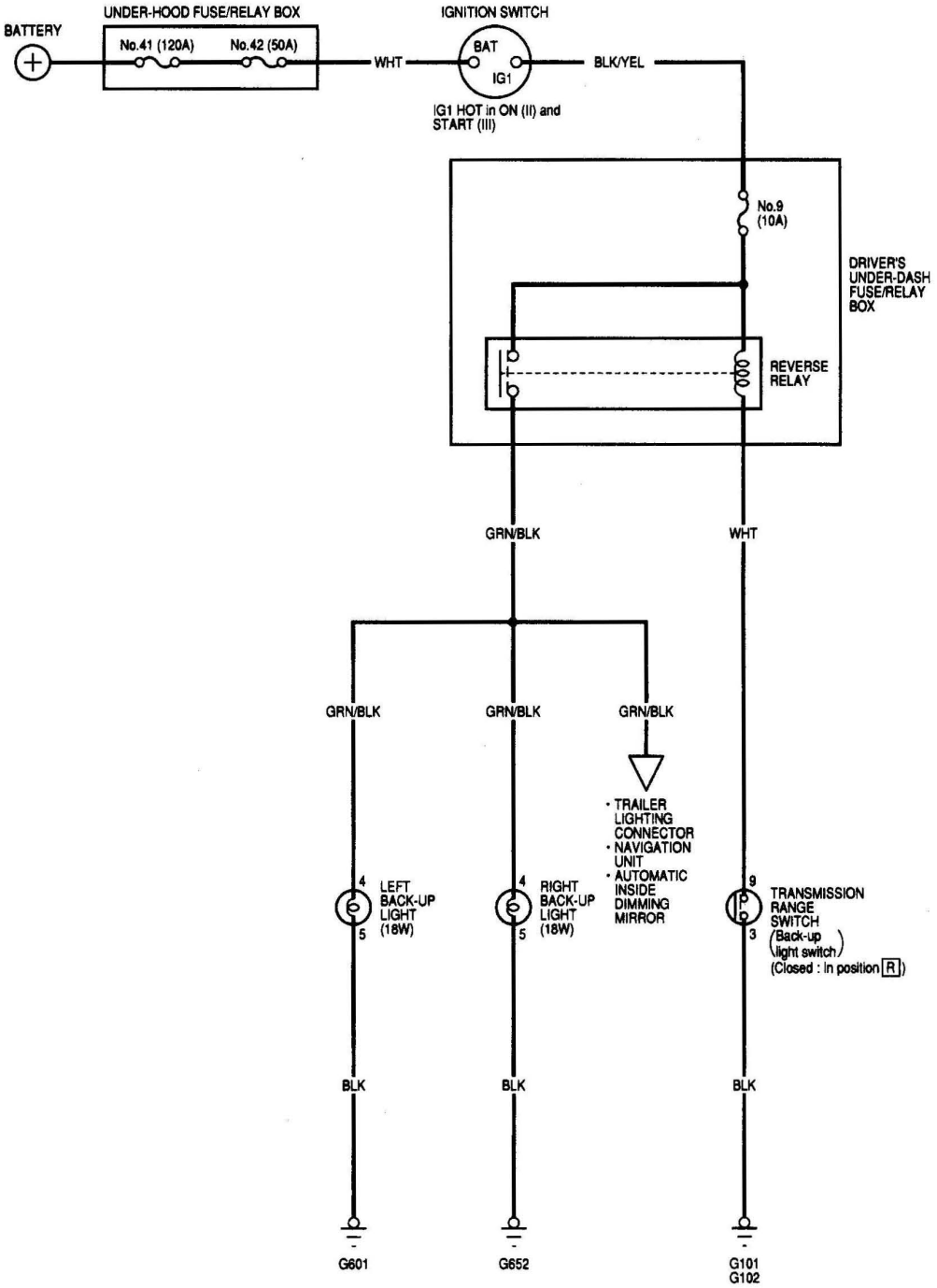
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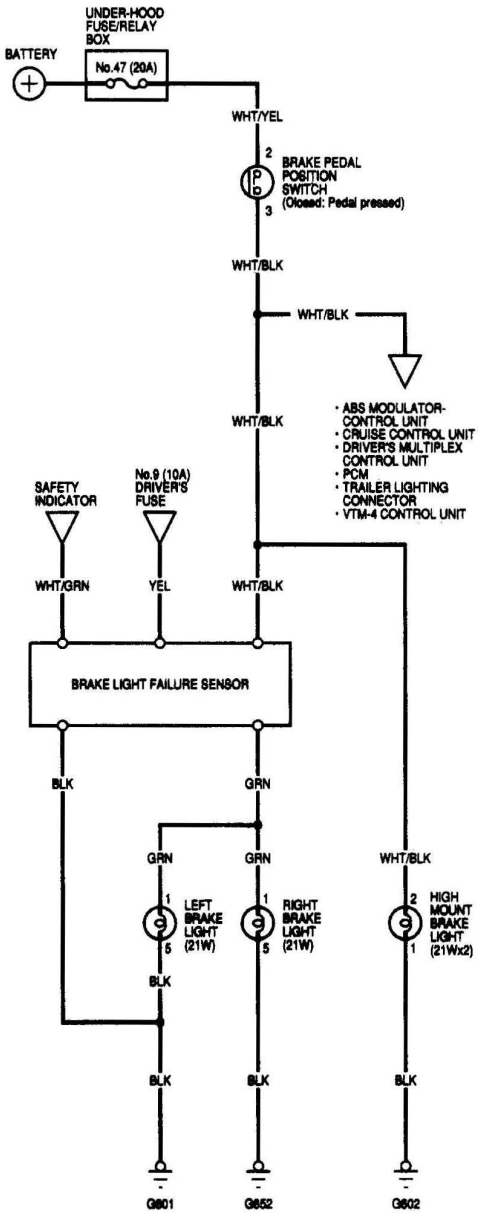
Circuit Diagram - Back-up Lights



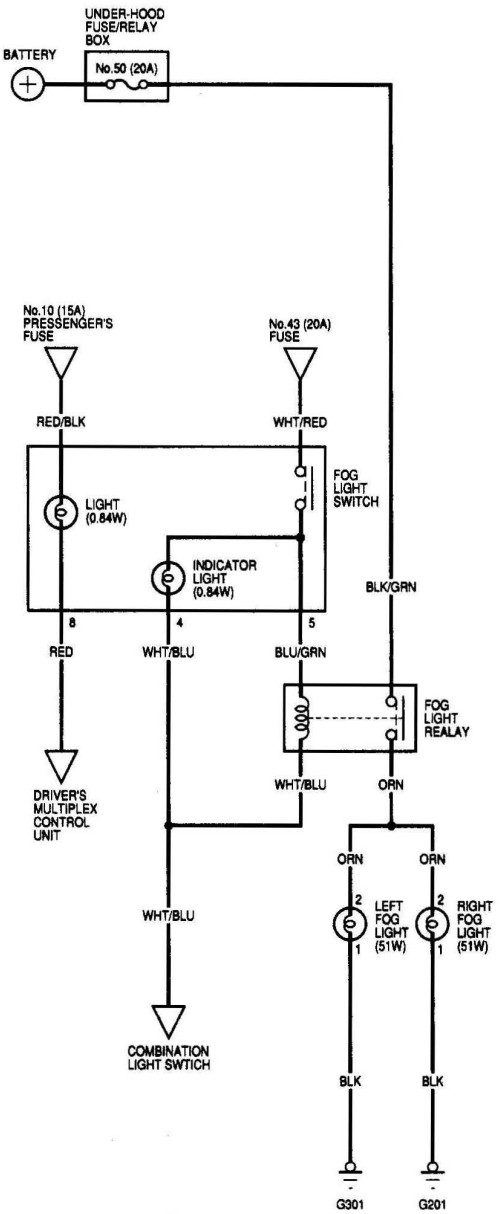
BACK

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Circuit Diagram - Brake Lights



Circuit Diagram - Fog Lights

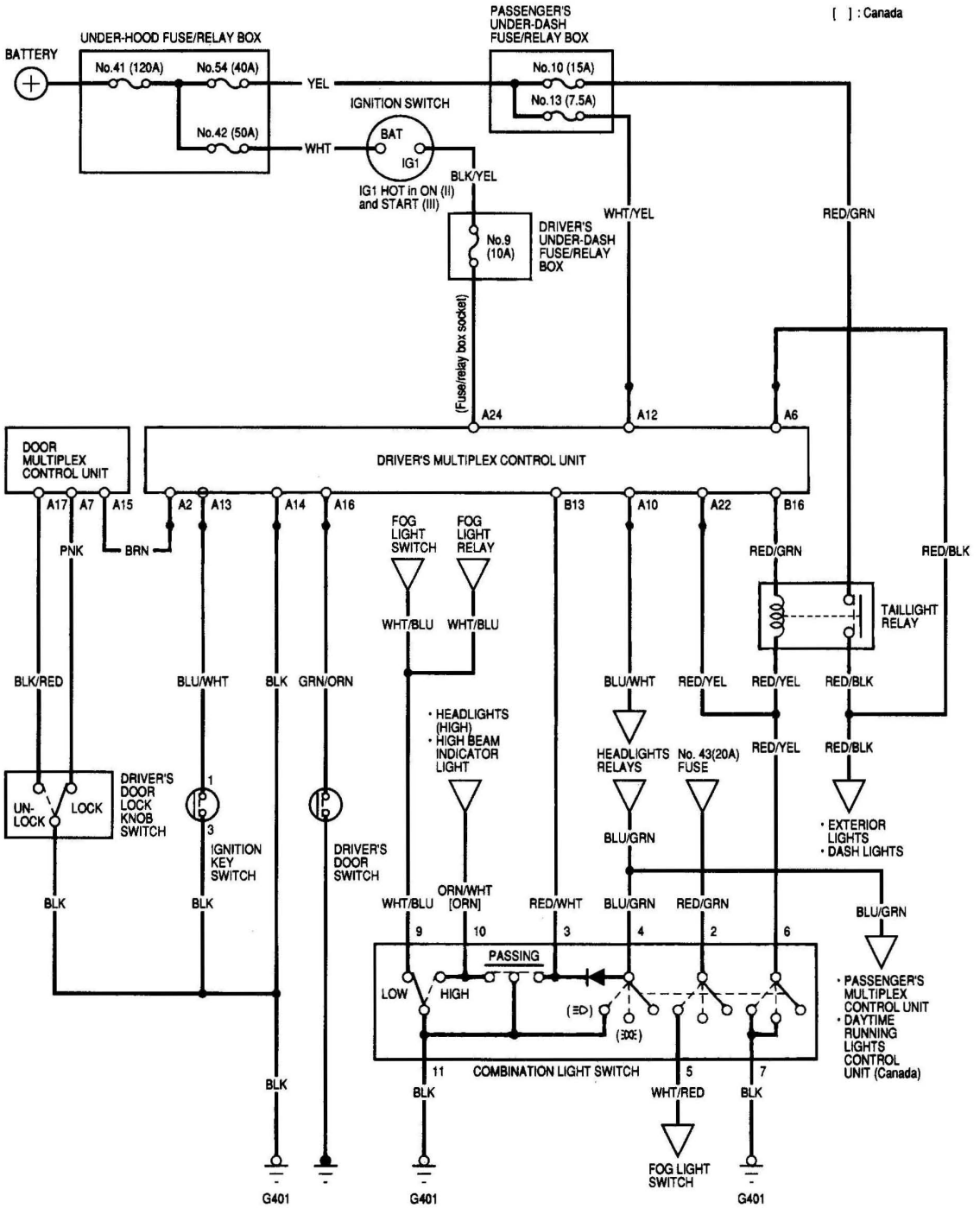


BACK

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Exterior Lights

Circuit Diagram - Auto-off Headlights

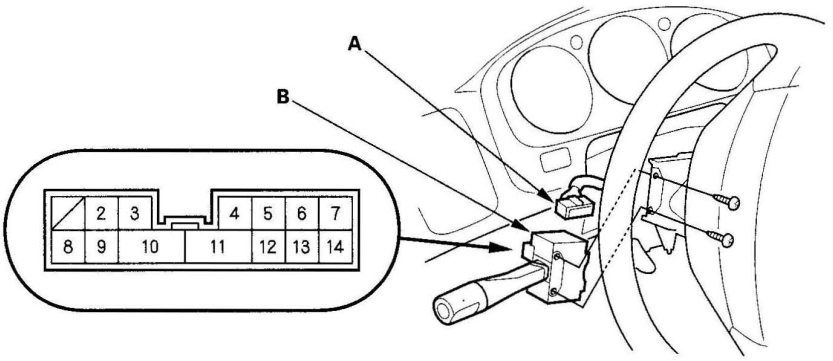


BACK

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Combination Light Switch Test/Replacement

1. Remove the driver's dashboard lower cover (see page 20-67).
2. Remove the steering column covers (see page 17-25).
3. Disconnect the 14P connector (A) from the combination light switch (B).



4. Remove the two screws, then pull out the combination light switch.
5. Inspect the connector terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, check for continuity between the terminals in each switch position according to the tables.
     - If the continuity is not as specified in the table, replace the switch.

Light switch:

Position \ Terminal		3	4	11	9	2	5	10	6	7
Headlight switch	OFF									
									○	○
	LOW	○	○	○	○	○	○		○	○
	HIGH	○	○	○	○	○	○	○	○	○
Passing switch	OFF									
	ON	○	○	○				○		

Turn signal switch:

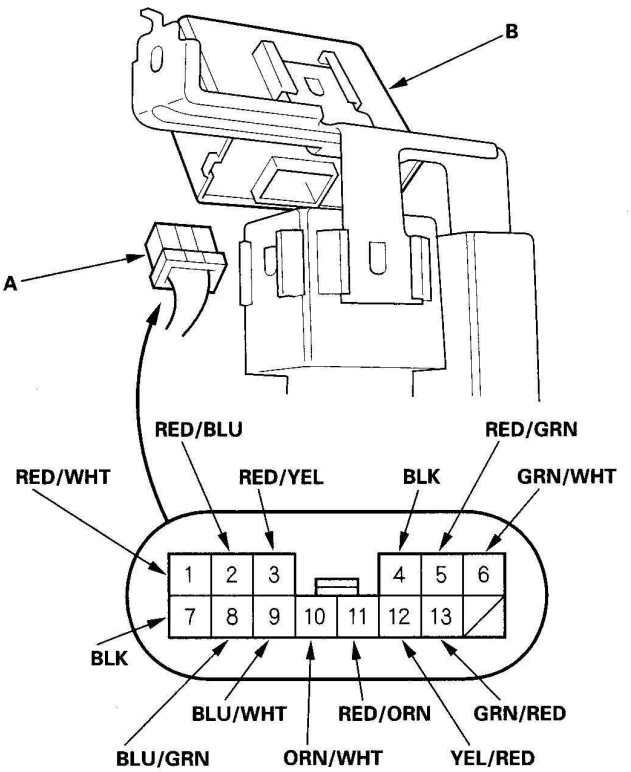
Position \ Terminal	12	13	14
LEFT	○	○	
NEUTRAL			
RIGHT		○	○

BACK

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Daytime Running Lights Control Unit Input Test (Canada)

1. Remove the driver's dashboard lower cover (see page 20-67).
2. Disconnect the 14P connector (A) from the daytime running lights control unit (B).



Wire side of female terminals

3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

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4. Make these input tests at the connector.

- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, the control unit must be faulty; replace it.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
2	RED/BLU	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 55 (40A) fuse in the under-hood fuse/relay box • Blown No. 6 (10A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
12	YEL/RED	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 5 (10A) fuse in the driver's under-dash fuse/relay box • An open in the wire
4	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire
7	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire
3	RED/YEL	Combination light switch ON (≡D)	Check for voltage to ground: There should be battery voltage.	• Blown No. 45 (20A) fuse in the under-hood fuse/relay box • Faulty headlight relay 2 • Faulty combination light switch • An open in the wire • Faulty driver's multiplex control unit
5	RED/GRN	Combination light switch ON (≡D)	Check for voltage to ground: There should be battery voltage.	• Blown No. 43 (20A) fuse in the under-hood fuse/relay box • Faulty headlight relay 1 • Faulty combination light switch • An open in the wire • Faulty driver's multiplex control unit
1	RED/WHT	Combination light switch ON (≡D), and dimmer switch in HIGH	Connect a jumper wire between No. 3 and No. 1 terminals Left headlight (HIGH) and high beam indicator light should come on.	• Blown bulb • Faulty high beam cut relay • Faulty combination light switch • Poor ground (G401) • An open in the wire
11	RED/ORN	Combination light switch ON (≡D), and dimmer switch in HIGH	Connect a jumper wire between No. 5 and No. 11 terminals. Right headlight (HIGH) should come on.	• Blown bulb • Faulty high beam cut relay • Faulty combination light switch • Poor ground (G401) • An open in the wire
10	ORN/WHT	Combination light switch ON (≡D), and dimmer switch in HIGH	Check for continuity to ground: There should be continuity.	• Faulty high beam cut relay • Faulty combination light switch • Poor ground (G401) • An open in the wire
6	GRN/WHT	Parking brake pedal pushed	Check for continuity to ground: There should be continuity.	• Faulty parking brake switch • An open in the wire
8	BLU/GRN	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Faulty headlight relays • An open in the wire • Faulty driver's multiplex control unit
9	BLU/WHT	Ignition switch ON (II)	Attach to ground: The DRL indicator light should come on.	• Blown bulb • An open in the wire
13	GRN/RED	Ignition switch ON (II)	Attach to ground: The brake system light should come on.	• Blown bulb • An open in the wire

BACK

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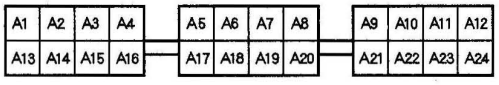
Control Unit Input Test

1. Before testing the auto-off headlights functions, troubleshoot the multiplex control system (see page 22-212).

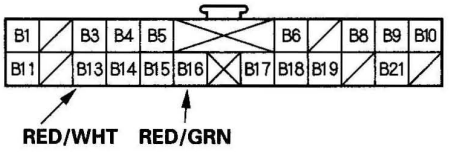
Driver's Multiplex Control Unit:

2. Remove the driver's multiplex control unit from the driver's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

DRIVER'S UNDER-DASH FUSE/RELAY BOX SOCKET

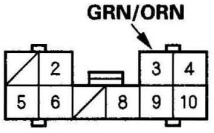


DRIVER'S MULTIPLEX CONTROL UNIT CONNECTOR B
(Plugs into multiplex control unit, driver)



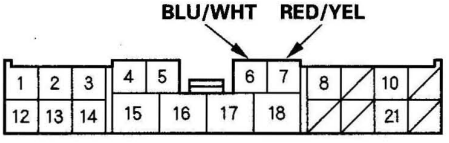
Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR E



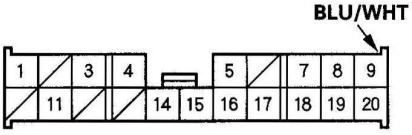
Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR I



Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR M



Wire side of female terminals

BACK

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4. With the driver's multiplex control unit still disconnected, make these input tests at the connector or driver's under-dash fuse/relay box socket.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A24	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10A) fuse in the driver's under-dash fuse/relay box • Faulty driver's under-dash fuse/relay box

5. Reconnect the driver's multiplex control unit to the driver's under-dash fuse/relay box, and perform the following input tests at the appropriate connectors on the driver's under-dash fuse/relay box. For driver's under-dash fuse/relay box connector socket location (see page 22-56).

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 6.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A12	WHT/YEL	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
E3	GRN/ORN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch. • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door switch • A short to ground
B16	RED/GRN	Under all conditions	Check for voltage to ground: There should be approximately 12 V.	• Poor ground (G401) • Faulty combination light switch • An open in the wire
B13	RED/WHT	Passing switch ON	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G401) • Faulty combination light switch • An open in the wire
L6	BLU/WHT	Combination light switch ON	Check for voltage to ground: There should be approximately 12 V.	• Poor ground (G401) • Faulty combination light switch • Faulty headlight relay • An open in the wire
L7	RED/YEL	Combination light switch ON	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G401) • Faulty combination light switch • An open in the wire
M9	BLU/WHT	Ignition key is in the ignition switch.	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G401) • Faulty ignition switch • An open in the wire
		Ignition key is out of the ignition switch.	Check for voltage to ground: There should be 5 V or more.	• Faulty ignition switch • A short to ground

(cont'd)

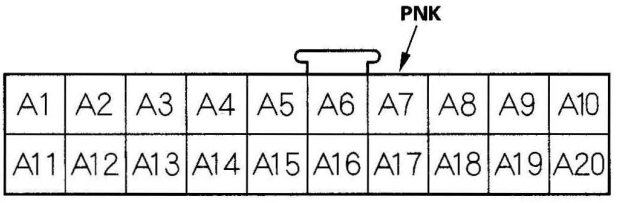
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Control Unit Input Test (cont'd)

Door Multiplex Control Unit:

6. Remove the driver's door panel, and disconnect connector A (20P) from the door multiplex control unit.
7. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 8.

DOOR MULTIPLEX CONTROL UNIT CONNECTOR A



Wire side of female terminals

8. Reconnect the connector to the door multiplex control unit, and make these input tests.
   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the control unit must be faulty; replace it.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A7	PNK	Driver's door lock knob locked	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G401) • Faulty driver's door lock actuator • An open in the wire
		Driver's door lock knob unlocked	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock actuator • Short to ground

BACK

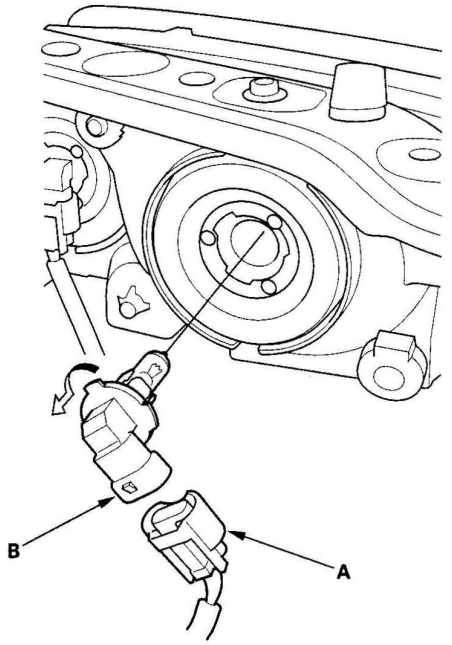
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Bulb Replacement

Headlight:

1. Disconnect the 2P connector (A) from the headlight.

HEADLIGHT (high): 60 W
HEADLIGHT (low): 51 W



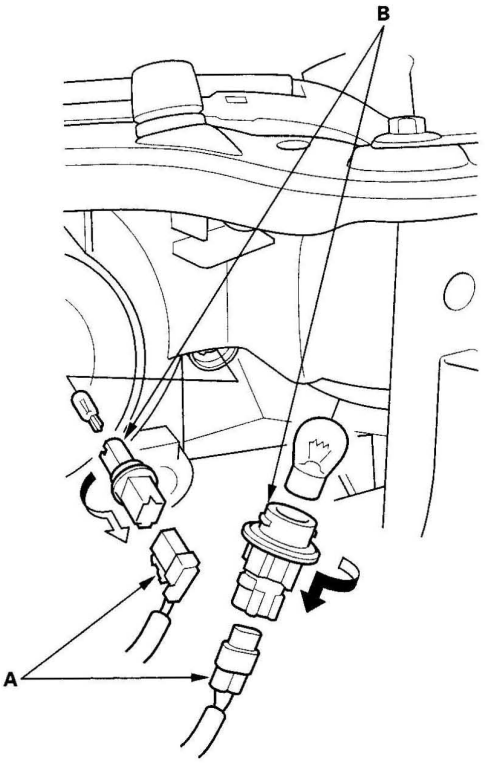
2. Turn the bulb socket (B) 45° counterclockwise to remove it from the headlight housing.

3. Install the new bulb in the reverse order of removal.

Front Turn Signal/Parking Lights: Front Side Marker Light:

1. Disconnect the connectors (A) from the lights.

FRONT TURN SIGNAL/PARKING LIGHT: 35 W
FRONT SIDE MARKER LIGHT: 5 W



2. Turn the bulb socket (B) 45° counterclockwise to remove them from the housing.

3. Install the new bulb(s) in the reverse order of removal.

BACK

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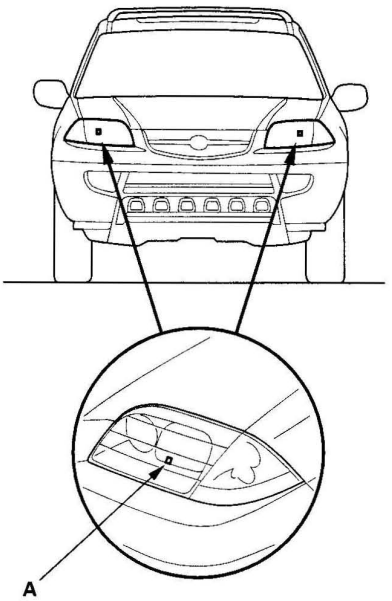
Headlight Adjustment

⚠CAUTION

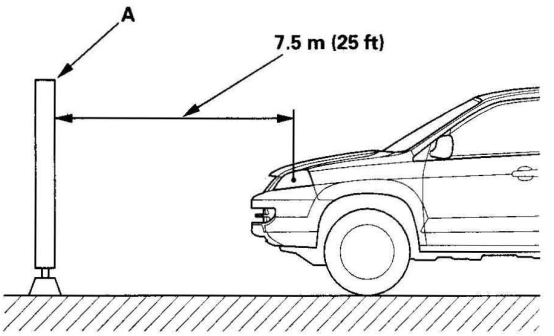
Headlights become very hot in use; do not touch them or any attaching hardware immediately after they have been turned off.

Before adjusting the headlights:
- Park the vehicle on a level surface.
- Make sure the tire pressures are correct.
- The driver or someone who weights the same should sit in the driver's seat.

1. Clean the outer lens so that you can see the center of the headlights (A).

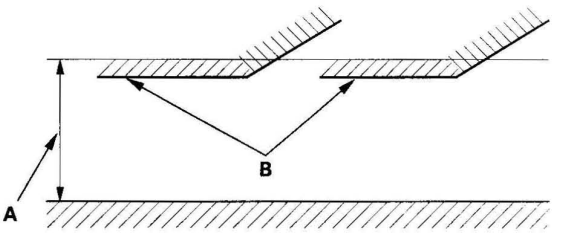


2. Park the vehicle 7.5 m (25 ft) away from a wall or a screen (A).



3. Open the hood.
4. Turn the low beams on.
5. Determine if the headlights are aimed properly.

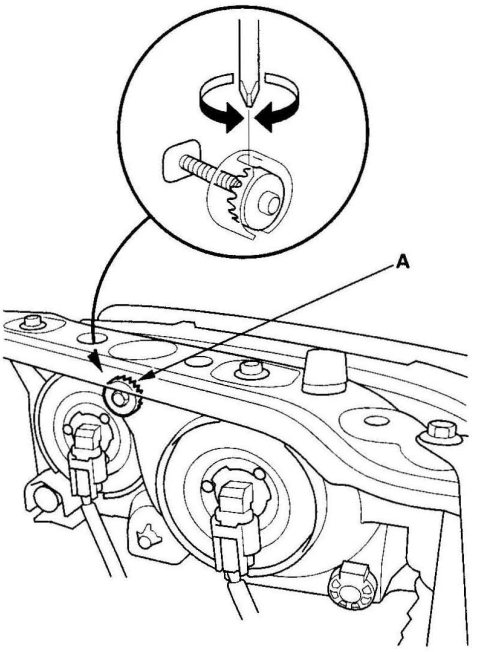
Vertical adjustment:
Measure the height of the headlights (A). The lights should reflect 52 mm (2.1 in.) below headlight height (B).



BACK

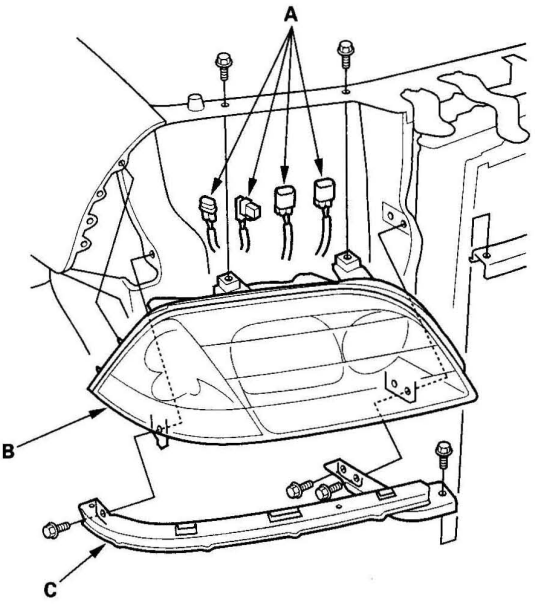
Protected by AR

6. If necessary, adjust the headlights to local requirements by turning the vertical adjuster (A).



Headlight Replacement

1. Remove the front bumper (see page 20-106).
2. Disconnect the connectors (A) from the headlight (B).

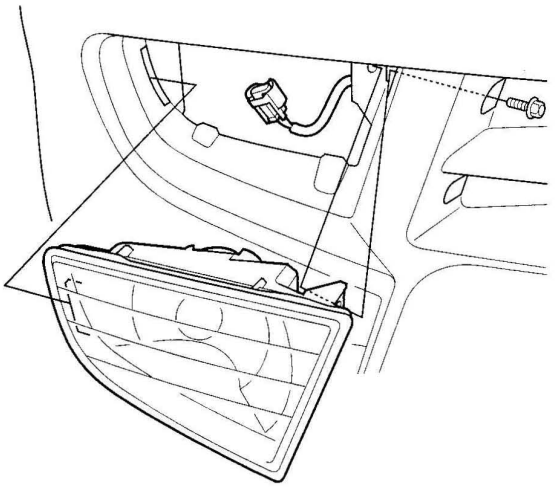


3. Remove the six mounting bolts, then remove the corner upper beam (C) and headlight assembly.
4. Install in the reverse order of removal.
5. After replacement, adjust the headlights to local requirements.

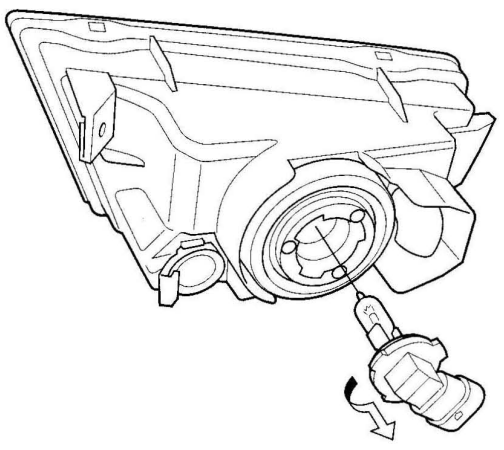
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Fog Light Replacement

1. Remove the mounting bolt from the fog light.
2. Disconnect the 2P connector from the fog light.

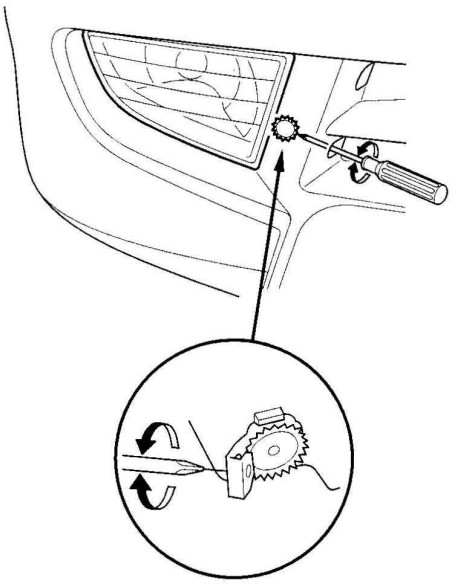


3. Turn the bulb socket 45° counterclockwise to remove it from the housing.



Fog Light Adjustment

Adjust the fog lights to local requirements by turning the adjuster.

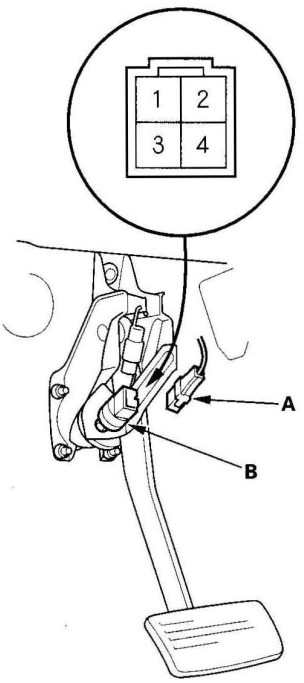


BACK

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Brake Pedal Position Switch Test

1. Disconnect the 4P connector (A) from the brake pedal position switch (B).



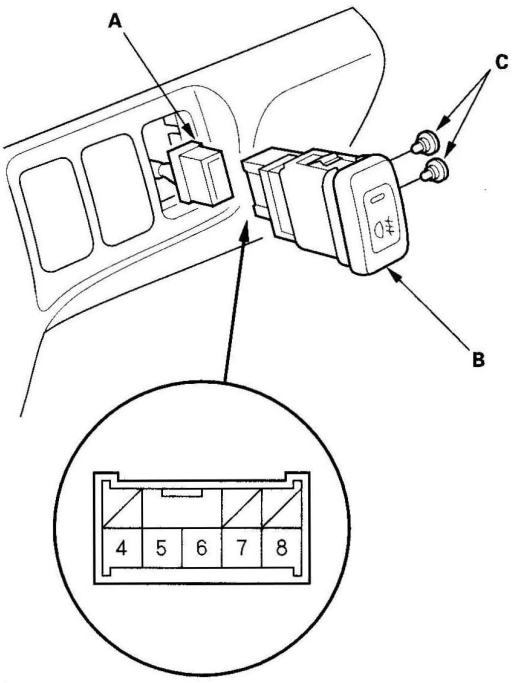
2. Check for continuity between the terminals:
   - There should be continuity between the No. 2 and No. 3 terminals when the brake pedal is pressed.
   - There should be continuity between the No. 1 and No. 4 terminals when the brake pedal is released.

3. If necessary, replace the switch or adjust the pedal height (see page 19-4).

Fog Light Switch Test

1. Remove the dashboard lower cover (see page 20-67).

2. Disconnect the 8P connector (A) from the fog light switch (B).



3. Pull the fog light switch out from the dashboard lower cover.

4. Check for continuity between the terminals:
   - There should be continuity between the No. 4 and No. 5 terminals with the fog light switch OFF.
   - There should be continuity between the No. 4, No. 5 and No. 6 terminals with the fog light switch ON.

5. If the continuity is not as specified, replace the switch.

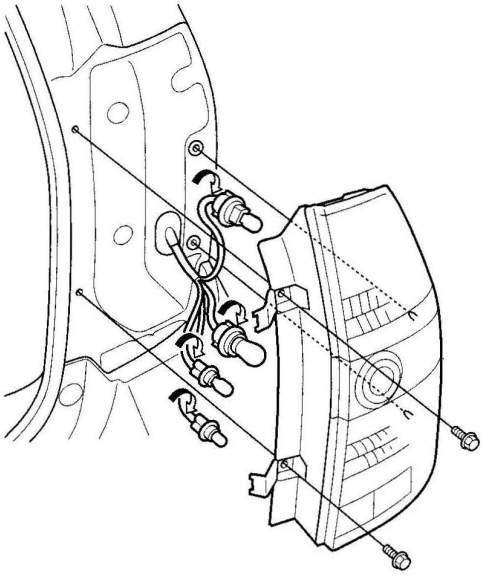
6. If necessary, check the illumination bulbs (C).

Protected by AR

Taillight Replacement

1. Open the tailgate.
2. Remove the two mounting bolts from the taillight.
3. Turn the bulb sockets 45° counterclockwise to remove it from the housing.

BRAKE/TAILLIGHT:	**27/5 W**
TURN SIGNAL LIGHT:	**27/5 W (Amber)**
BACK-UP LIGHT:	**18 W**
REAR SIDE MARKER LIGHT:	**3.8 W**

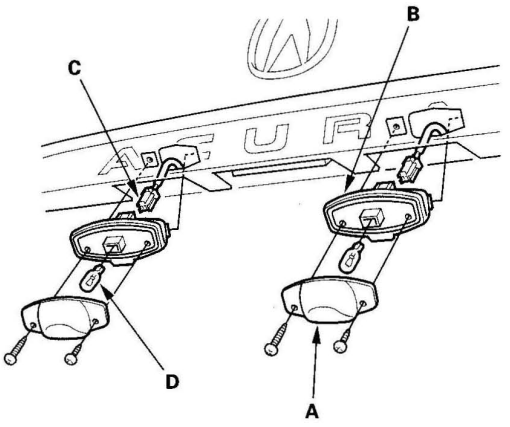


4. Install the taillight, then run water over it to make sure it does not leak.

License Plate Light Replacement

1. Remove the two screws, then remove the lens (A) from the licence plate light (B).

LICENCE PLATE LIGHT: 5 W



2. Disconnect the 2P connector (C) from the license plate light.
3. Remove the bulb (D) from the license plate light.
4. Install in the reverse order of removal.

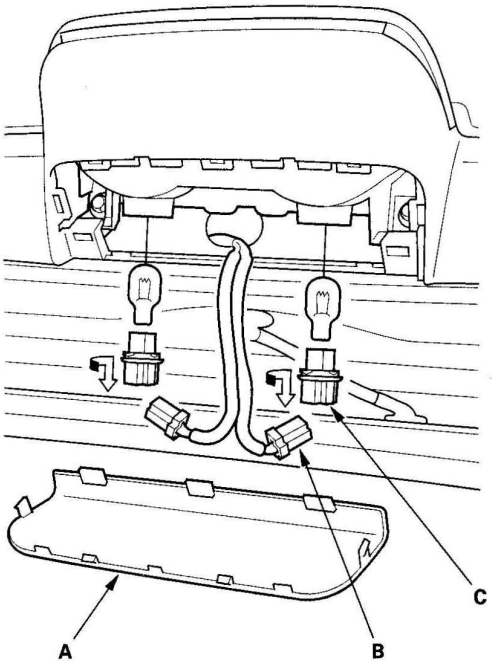
BACK

Protected by AR

High Mount Brake Light Replacement

Bulb:

1. Open the tailgate.
2. Remove the lid cover (A) from the high mount brake light.



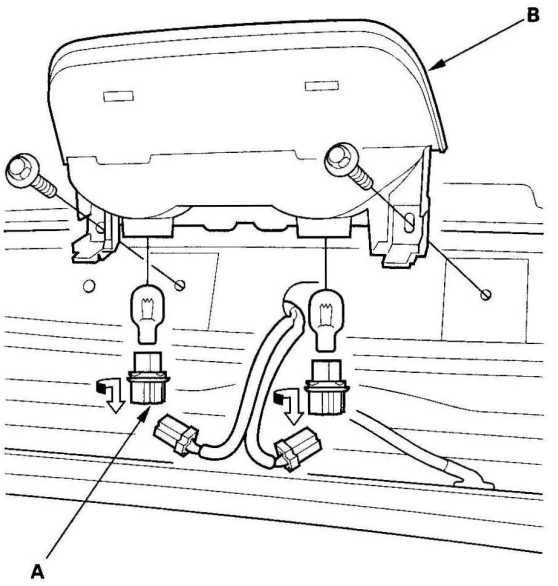
3. Disconnect the 2P connector(s) (B) from the high mount brake light.

   HIGH MOUNT BRAKE LIGHT: 21 W x 2

4. Turn the bulb socket (C) 45° counterclockwise to remove it from the housing.
5. Install the new bulb in the reverse order of removal.

Light Assembly:

1. Open the tailgate.
2. Remove the tailgate upper trim (see page 20-58).
3. Remove the bulb sockets (A) from the high mount brake light.

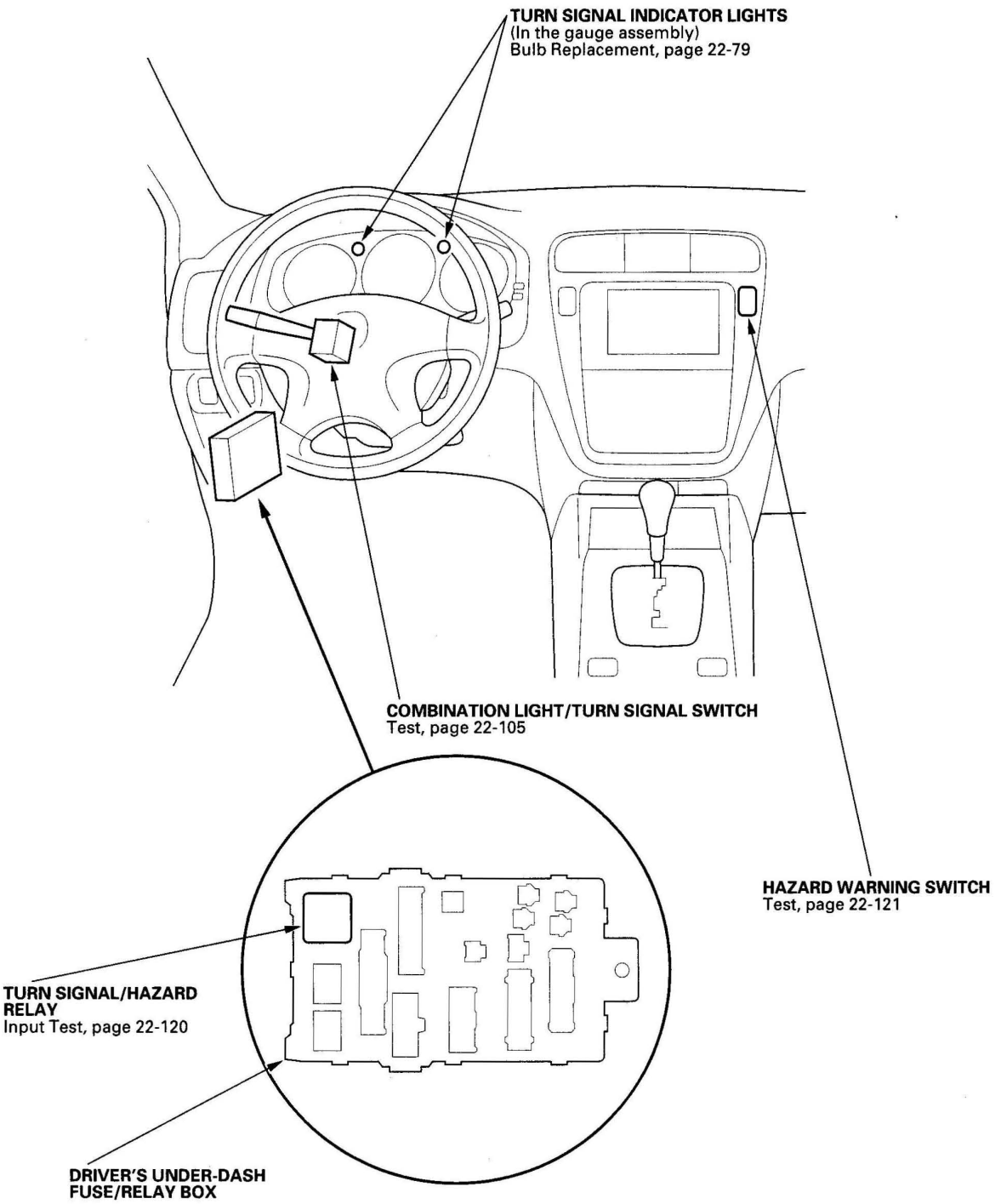


4. Remove the two mounting bolts from the high mount brake light (B).
5. Install in the reverse order of removal.

Protected by AR

Turn Signal/Hazard Flasher

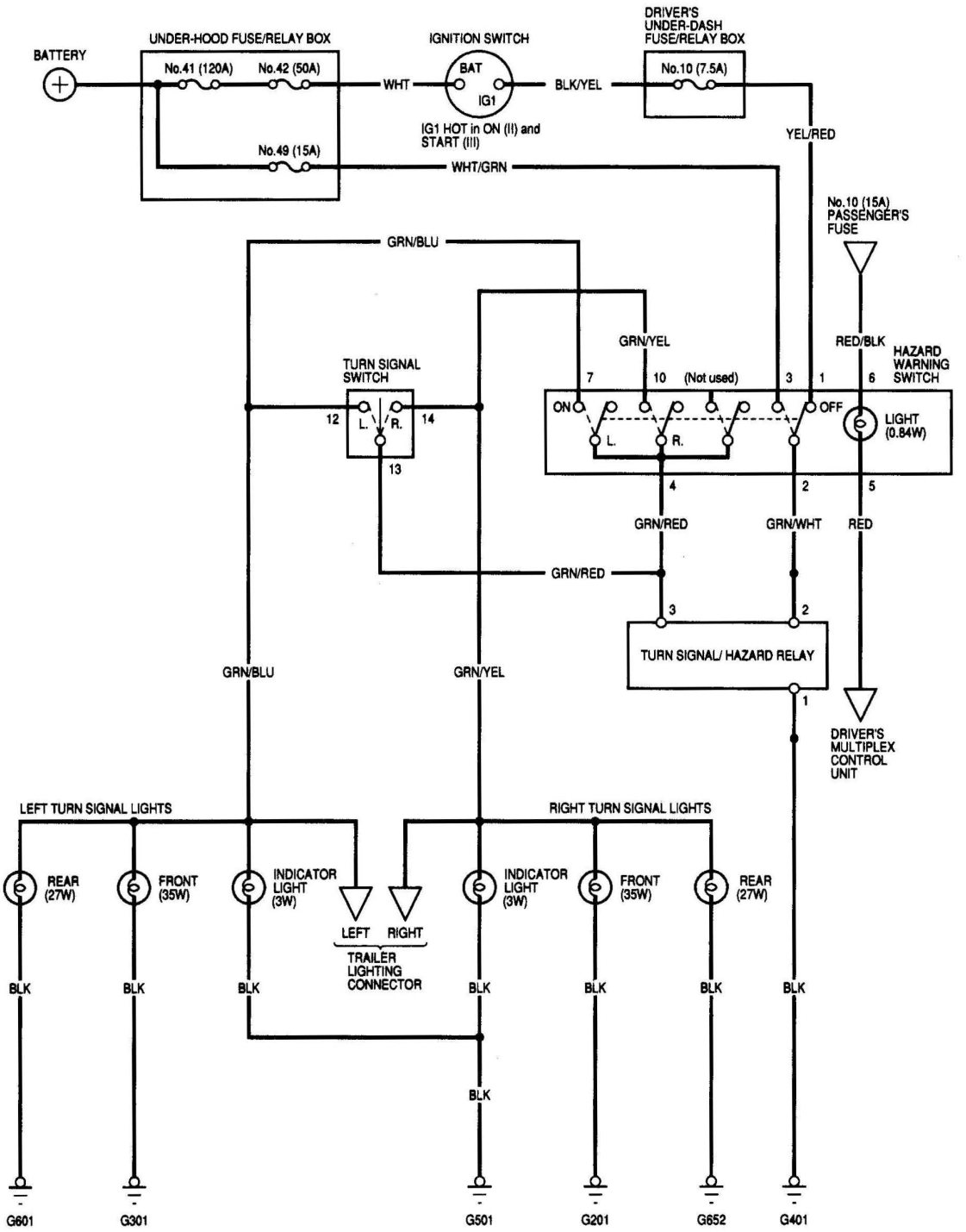
Component Location Index



BACK

Protected by AR

Circuit Diagram



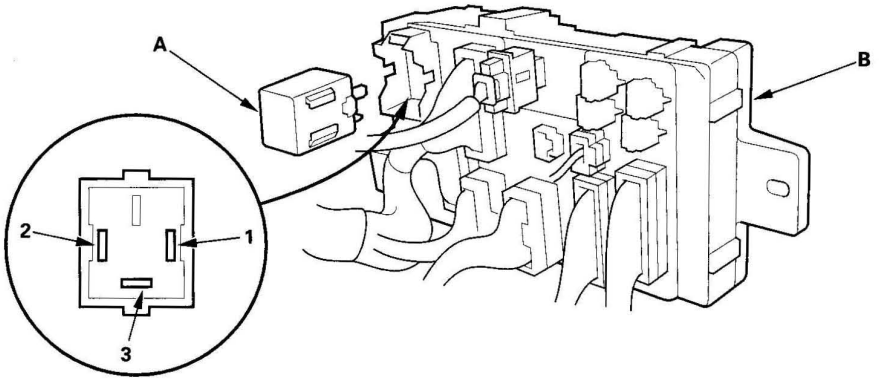
BACK

Protected by AR

Turn Signal/Hazard Flasher

Turn Signal/Hazard Relay Input Test

1. Remove the the driver's under-dash fuse/relay box (see page 22-65).
2. Remove the turn signal/hazard relay (A) from the driver's under-dash fuse/relay box (B).



3. Inspect the relay and fuse/relay box socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.
4. Make these input tests at the fuse/relay box.
   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the turn signal/hazard relay must be faulty; replace it.

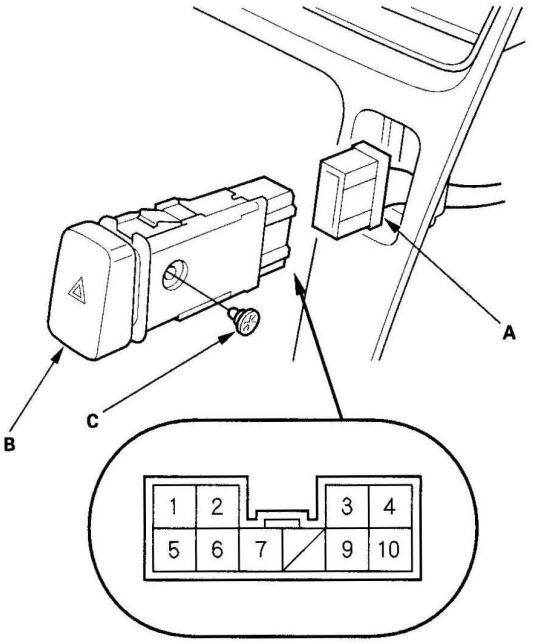
Cavity	Test condition	Test: Desired result	Possible cause if result is not obtained
1	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire
2	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 10 (7.5A) fuse in the driver's under-dash fuse/relay box • Faulty turn signal switch • An open in the wire
	Hazard warning switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 49 (15A) fuse in the under-hood fuse/relay box • Faulty hazard warning switch • An open in the wire
3	Ignition switch ON (II) and turn signal switch in Right or Left position	Connect No. 2 terminal to No. 3 terminal: Right or left turn signal lights should come on.	• Poor ground (G201, G301, G501, G601, G652) • Faulty turn signal switch • An open in the wire
	Hazard warning switch ON	Connect No. 2 terminal to No. 3 terminal: Hazard warning lights should come on.	• Poor ground (G201, G301, G501, G601, G652) • Faulty hazard warning switch • An open in the wire

BACK

Protected by AR

Hazard Warning Switch Test

1. Remove the center panel (see page 20-68).
2. Disconnect the 10P connector (A) from the hazard warning switch (B).



3. Pull the hazard warning switch out of the center panel.
4. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	5		6	1	2	3	4	7	10
OFF	○	○	○	○	○				
ON	○	○	○				○	○	○
					○	○			

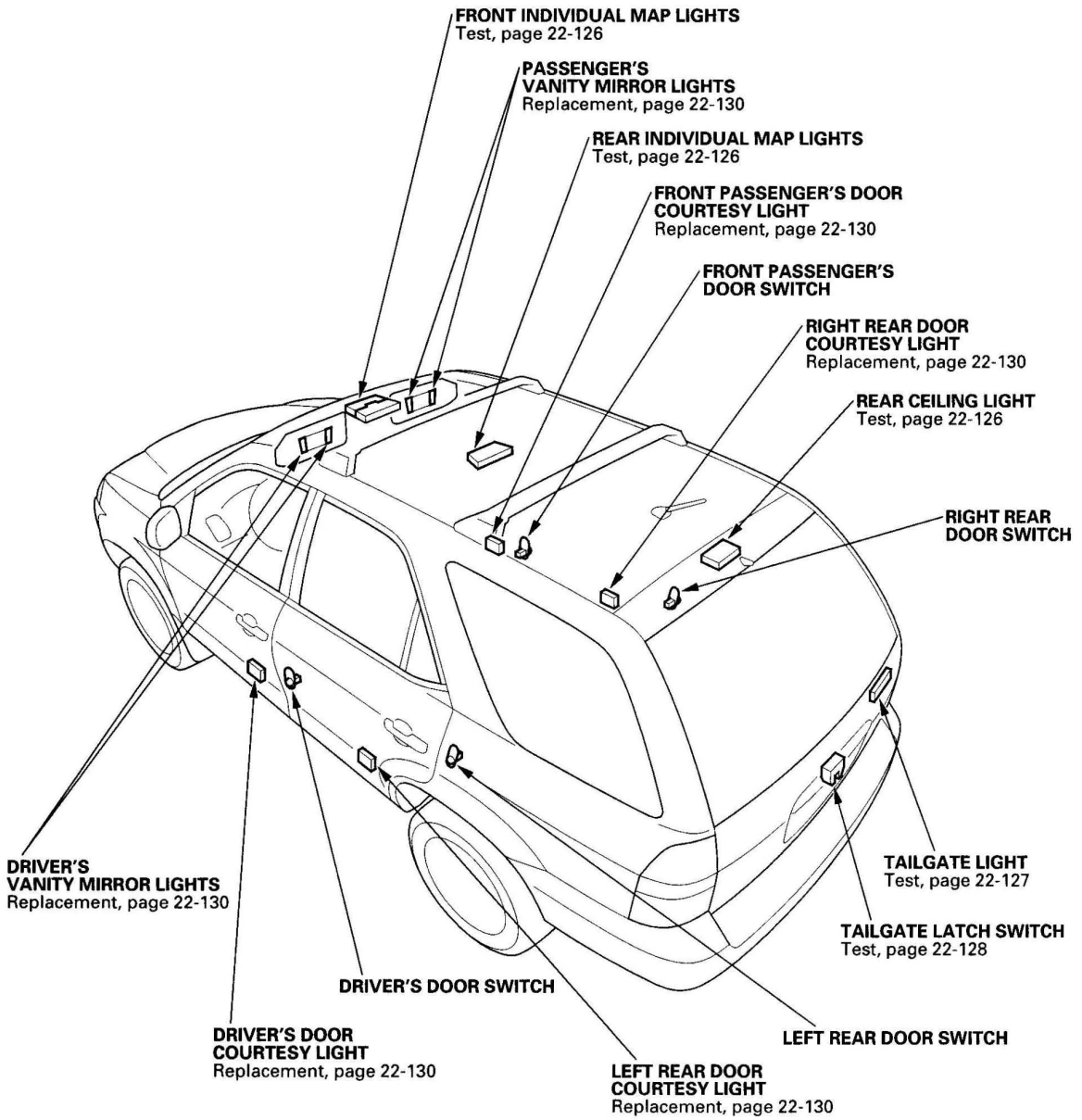
5. If the continuity is not as specified, replace the switch.
6. If necessary, check the illumination bulb (C).

BACK

Protected by AR

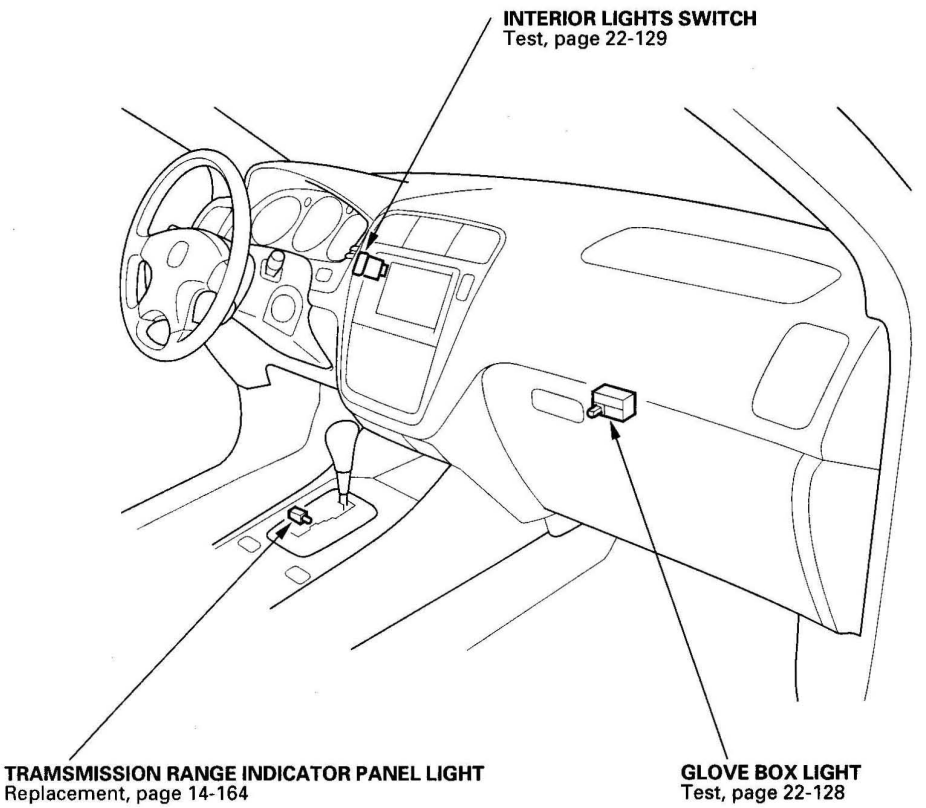
Interior Lights

Component Location Index



BACK

Protected by AR

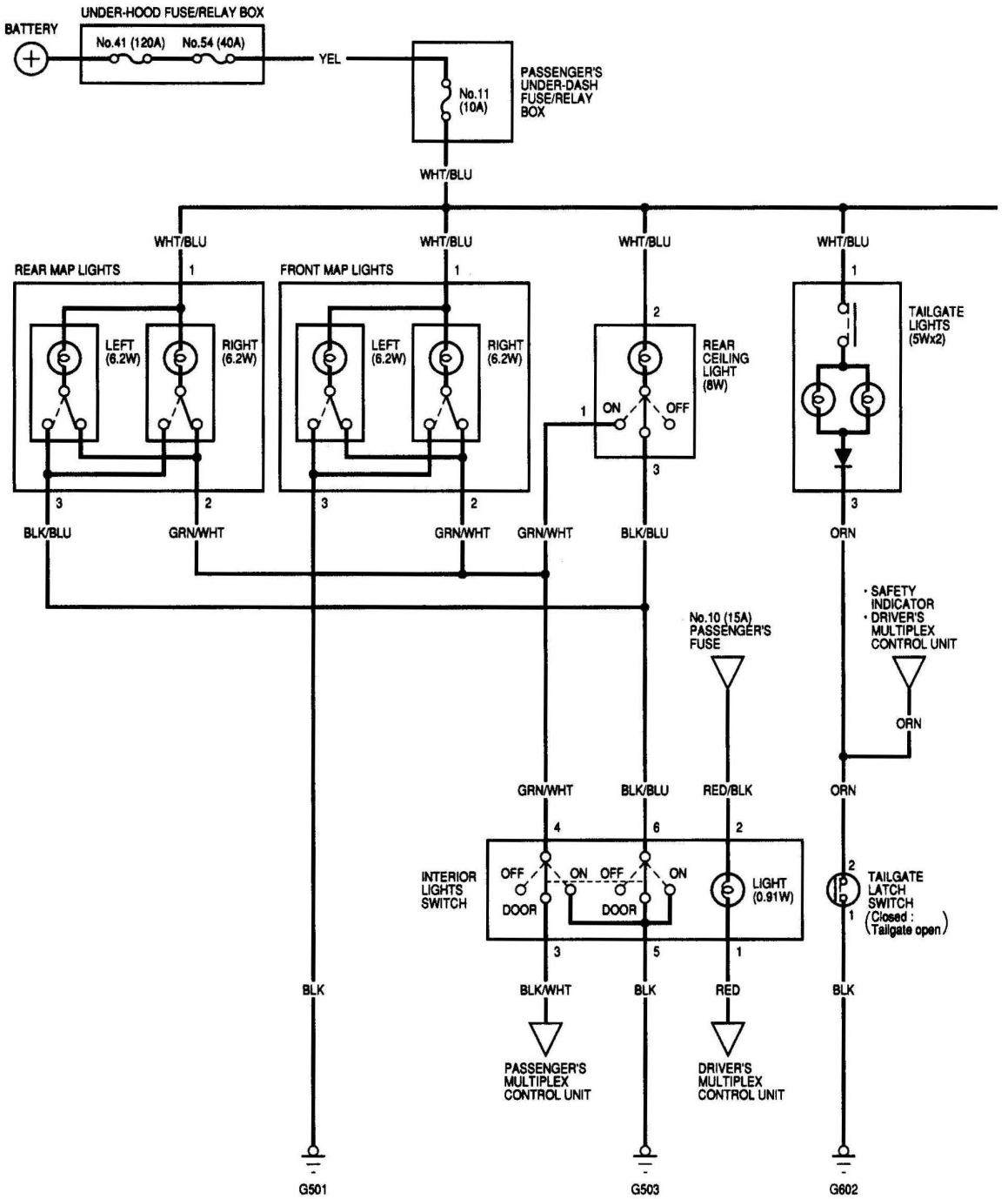


BACK

Protected by AR

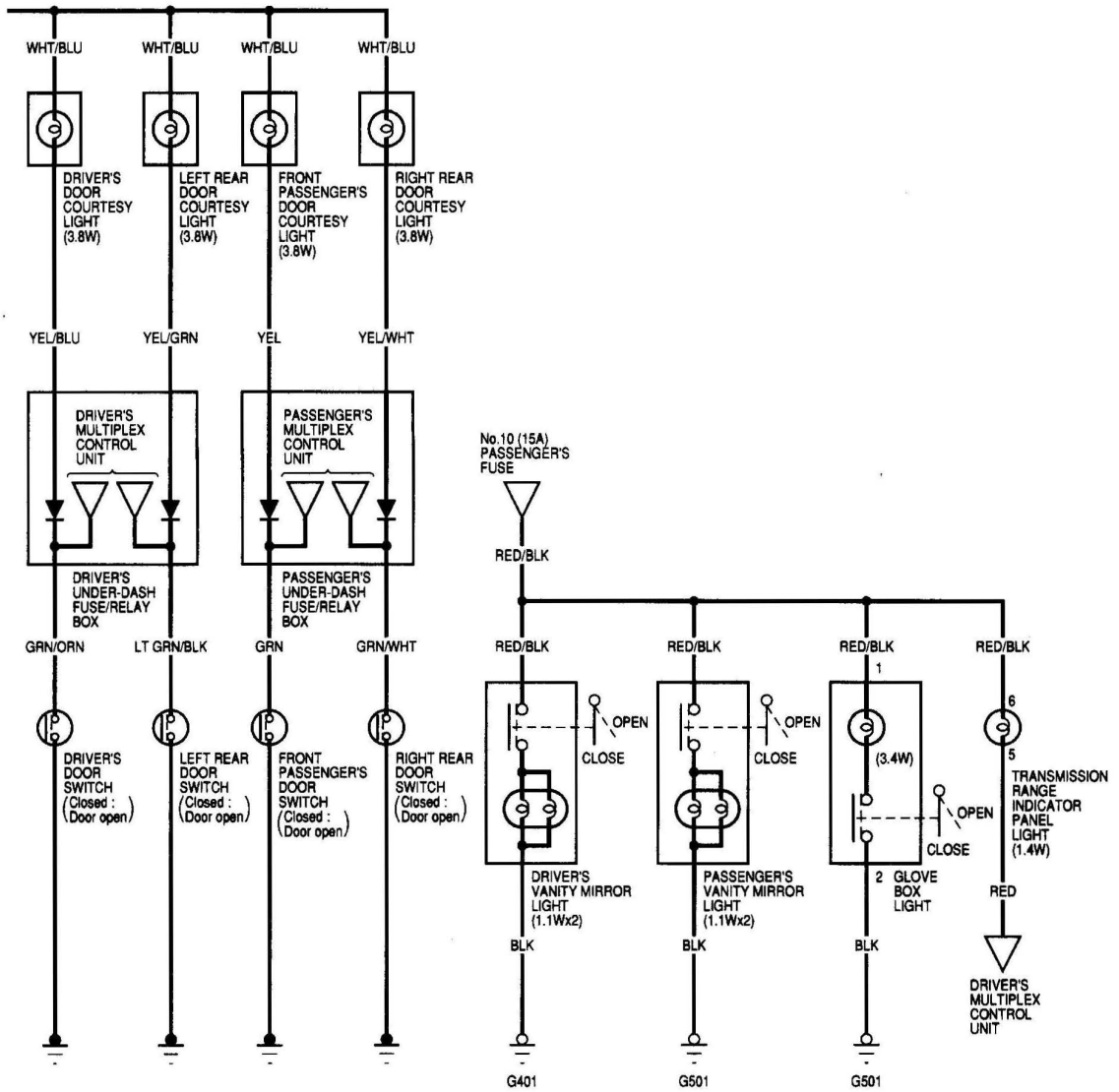
Interior Lights

Circuit Diagram



BACK

Protected by AR



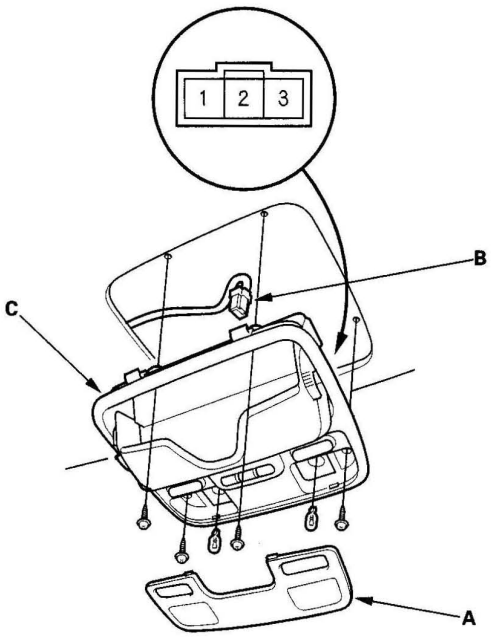
BACK

Protected by AR

Front Individual Map Lights Test

1. Turn the light switch OFF.
2. Carefully pry off the lens (A) with a small screwdriver.

   MAP LIGHT: 6.2 W

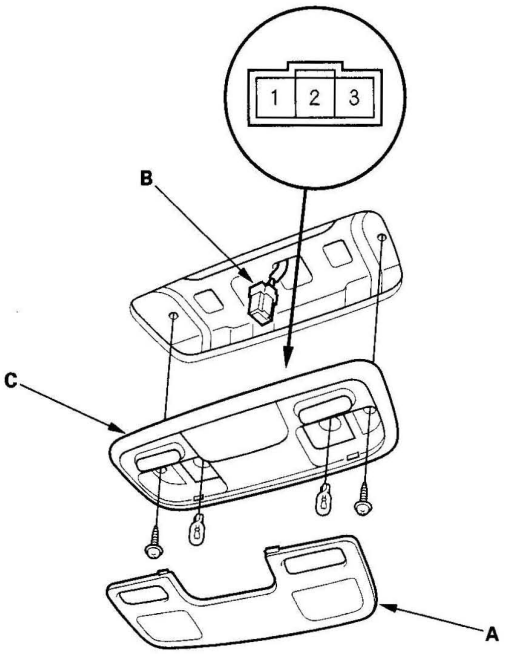


3. Remove the four mounting screws.
4. Disconnect the 3P connector (B) from the housing (C).
5. Check for continuity between the terminals.
   - There should be continuity between the No. 1 and No. 3 terminals with the left switch ON.
   - There should be continuity between the No. 1 and No. 2 terminals with the right switch ON.
6. If the continuity is not as specified, replace the light.

Rear Individual Map Lights Test

1. Turn the light switch OFF.
2. Carefully pry off the lens (A) with a small screwdriver.

   MAP LIGHT: 6.2 W



3. Remove the two mounting screws.
4. Disconnect the 3P connector (B) from the housing (C).
5. Check for continuity between the terminals.
   - There should be continuity between the No. 1 and No. 3 terminals with the left switch ON.
   - There should be continuity between the No. 1 and No. 2 terminals with the right switch ON.
6. If the continuity is not as specified, replace the light.

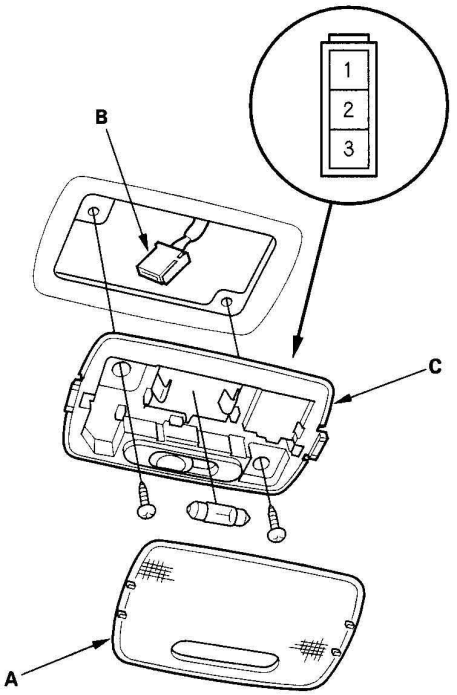
BACK

Protected by AR

Rear Ceiling Light Test

1. Turn the light switch OFF.
2. Carefully pry off the lens (A) with a small screwdriver.

CEILING LIGHT: 8 W

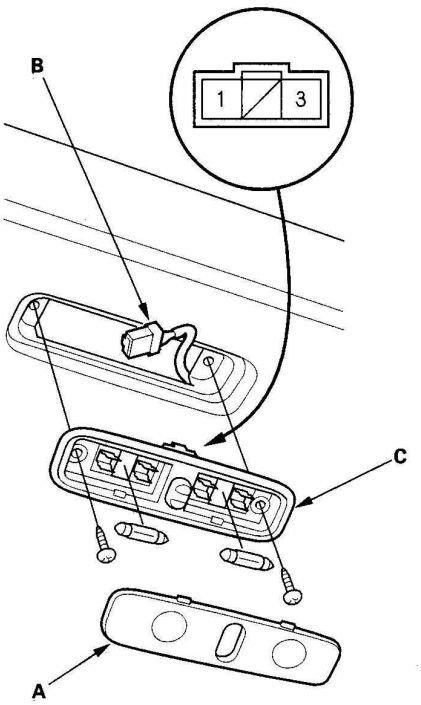


3. Remove the two mounting screws.
4. Disconnect the 3P connector (B) from the housing (C).
5. Check for continuity between the terminals in each switch position according to the table.
   - There should be continuity between the No. 2 and No. 3 terminals with the switch in the MIDDLE position.
   - There should be continuity between the No. 2 and No. 1 terminals with the switch in the ON position.
6. If the continuity is not as specified, replace the light.

Tailgate Lights Test

1. Open the tailgate.
2. Carefully pry off the lens (A) with a small screwdriver.

TAILGATE LIGHT: 5 W x 2



3. Remove the two mounting screws.
4. Disconnect the 3P connector (B) from the housing (C).
5. Check for continuity between the terminals. There should be continuity between the No. 1 and No. 3 terminals with the switch in the ON position.
6. If the continuity is not as specified, replace the light.

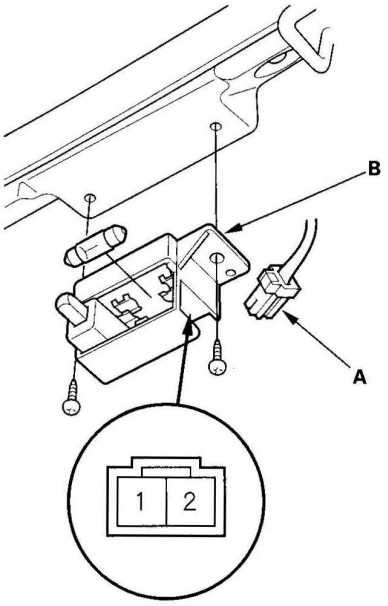
BACK

Protected by AR

Glove Box Light Test

1. Remove the glove box (see page 20-69).
2. Disconnect the 2P connector (A) from the glove box light (B).

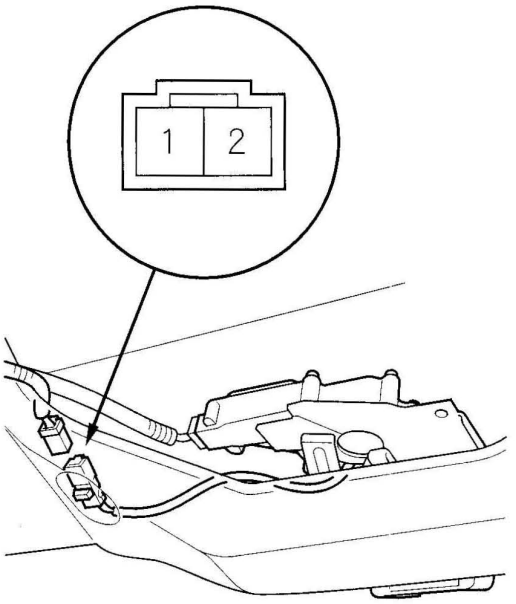
   GLOVE BOX LIGHT: 3.4 W



3. Check for continuity between the No. 1 and No. 2 terminals.
   - With the button (C) released, there should be continuity.
   - With the button pressed, there should be no continuity.
4. If the continuity is not as specified, replace the light.

Tailgate Latch Switch Test

1. Open the tailgate.
2. Remove the tailgate trim panel (see page 20-58).
3. Disconnect the 2P connector from the tailgate latch.



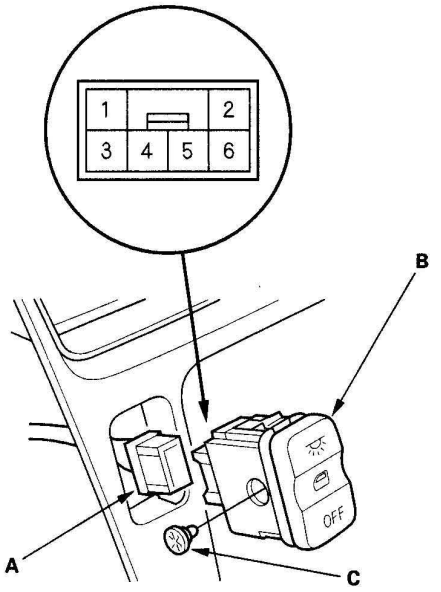
4. Check for continuity between the No. 1 and No. 2 terminals.
   - With the tailgate open, there should be continuity.
   - With the tailgate closed, there should be no continuity.
5. If the continuity is not as specified, replace the latch switch.

BACK

Protected by AR

Interior Lights Switch Test

1. Remove the center panel (see page 20-68).
2. Disconnect the 6P connector (A) from the interior lights switch (B).



3. Pull the interior lights switch out of the center panel.
4. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	1		2	3	4	5	6
OFF	○—⌀—○						
MIDDLE	○—⌀—○			○—○		○—○	
ON	○—⌀—○				○—○	○—○	

5. If the continuity is not as specified, replace the switch.
6. If necessary, check the illumination bulb (C).

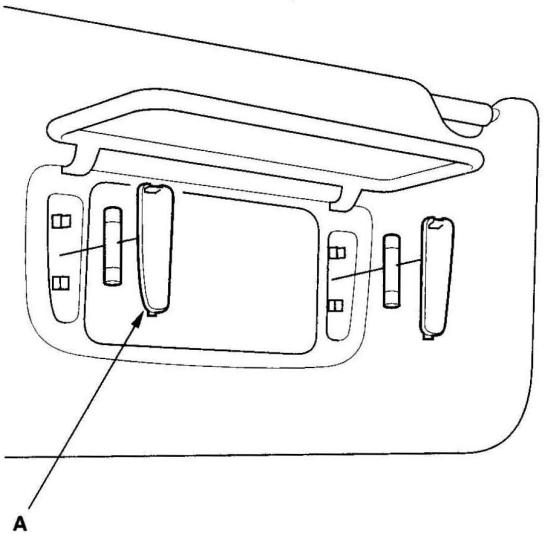
BACK

Protected by AR

Vanity Mirror Lights Replacement

1. Open the sunvisor.
2. Carefully pry off the lens (A) with a small screwdriver.

   VANITY MIRROR LIGHT: 1.1 W

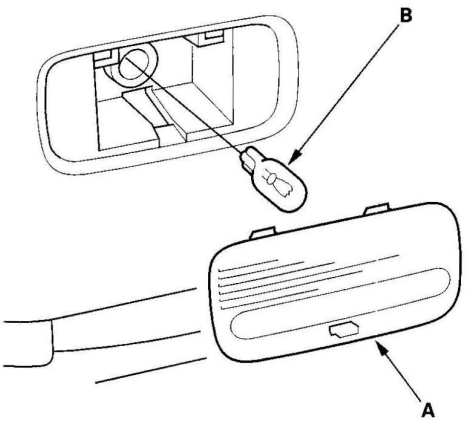


3. Remove the bulb (B) from the socket.

Courtesy Light Replacement

1. Carefully pry off the lens (A) with a small screwdriver.

   COURTESY LIGHT: 3.8 W



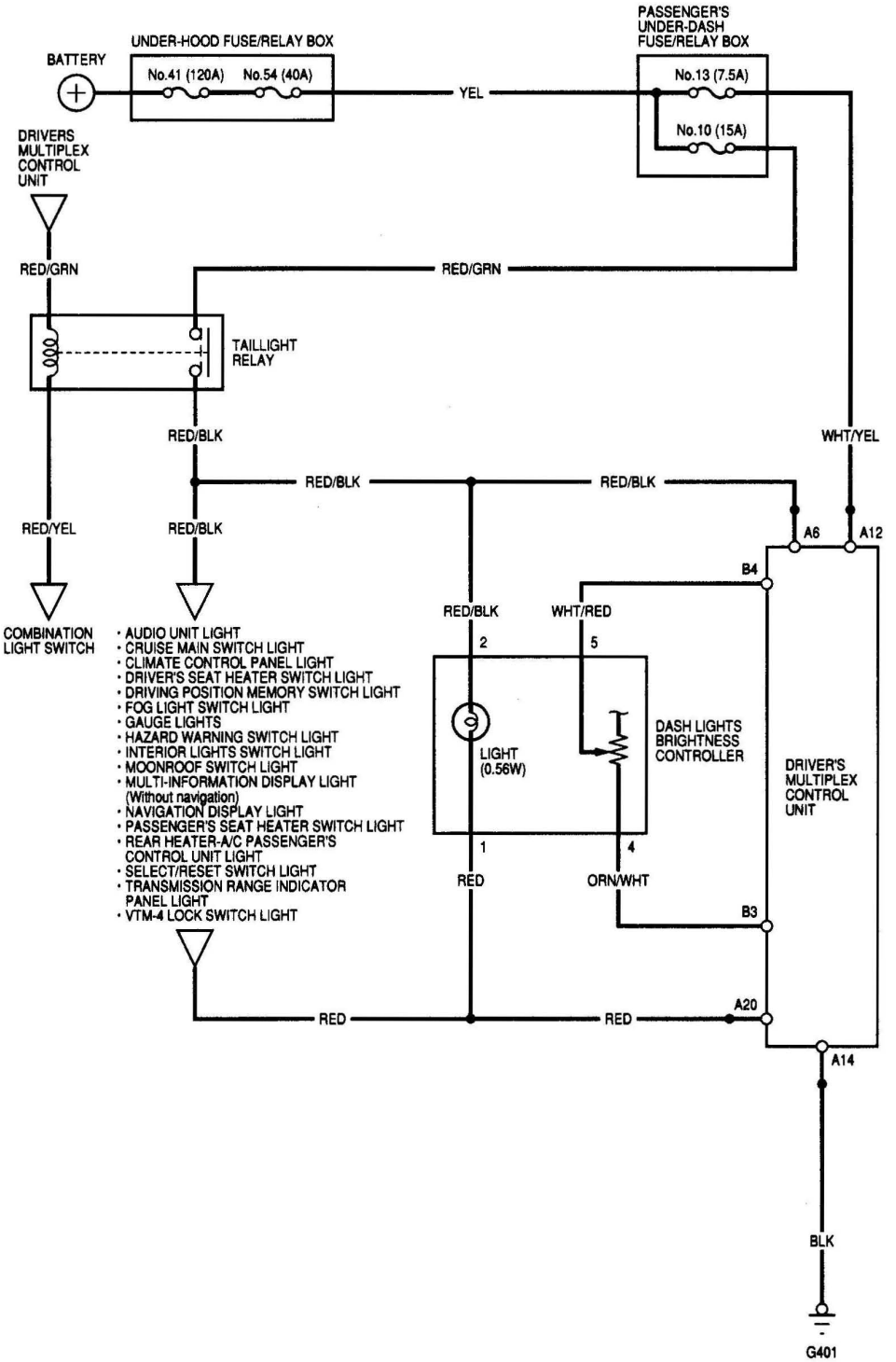
2. Remove the bulb (B) from the socket.

BACK

Protected by AR

Dash Lights Brightness Controller

Circuit Diagram



BACK

Protected by AR

Dash Lights Brightness Controller

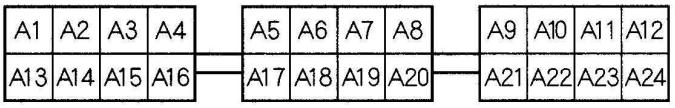
Control Unit Input Test

1. Before testing the dash lights brightness control functions, troubleshoot the multiplex control system (see page 22-212).

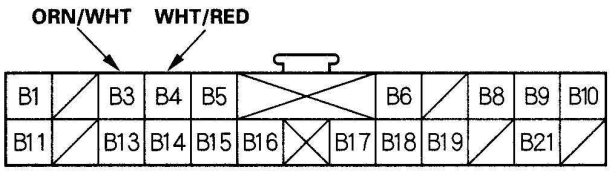
Driver's Multiplex Control Unit:

2. Remove the driver's multiplex control unit from the driver's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

DRIVER'S UNDER-DASH FUSE/RELAY BOX SOCKET

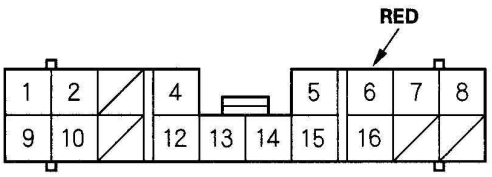


DRIVER'S MULTIPLEX CONTROL UNIT CONNECTOR B



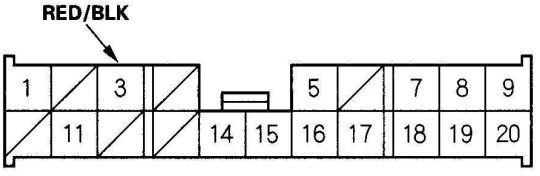
Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR J



Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR M



Wire side of female terminals

BACK

Protected by AR

4. With the driver's multiplex control unit still disconnected, make these input tests at the connector and driver's under-dash fuse/relay box socket.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • Faulty driver's under-dash fuse/relay box • An open in the wire
A14		Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • Faulty driver's under-dash fuse/relay box • An open in the wire
B3 · B4	ORN/WHT and WHT/RED	Adjusting dial rotated	Check for resistance between the B3 and B4 terminals: There should be 0-20 kΩ.	• Faulty dash lights brightness controller • An open in the wire

5. Reconnect the driver's multiplex control unit to the driver's under-dash fuse/relay box, and perform the following input tests at the appropriate connectors on the driver's under-dash fuse/relay box.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the driver's multiplex control unit must be faulty; replace it.

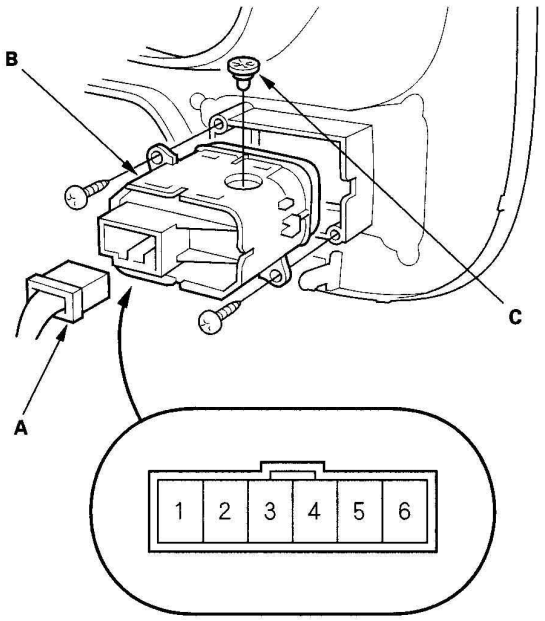
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
M3	RED/BLK	Ignition switch ON (II) and combination light switch ON (≡DC≡) or (≡D)	Check for voltage to ground: There should be battery voltage.	• Blown No. 54 (40A) fuse in the under-hood fuse/relay box • Blown No. 10 (15A) fuse in the passenger's under-dash fuse/relay box • Faulty taillight relay • Faulty combination light switch • An open in the wire
J6	RED	Ignition switch ON (II) and combination light switch ON (≡DC≡) or (≡D), set dash lights brightness controller to minimum setting	Attach to ground: Dash lights should come on full bright.	• An open in the wire

Protected by AR

Dash Lights Brightness Controller

Controller Test

1. Remove the instrument panel (see page 20-67).
2. Disconnect the 6P connector (A) from the controller (B).



3. Measure resistance between the No. 4 and No. 5 terminals while rotating the adjusting dial. Resistance should vary from 0 to 20K ohms as the dial is rotated.
4. If the resistance is not as specified, replace the controller.
5. If necessary, check the illumination bulb (C).

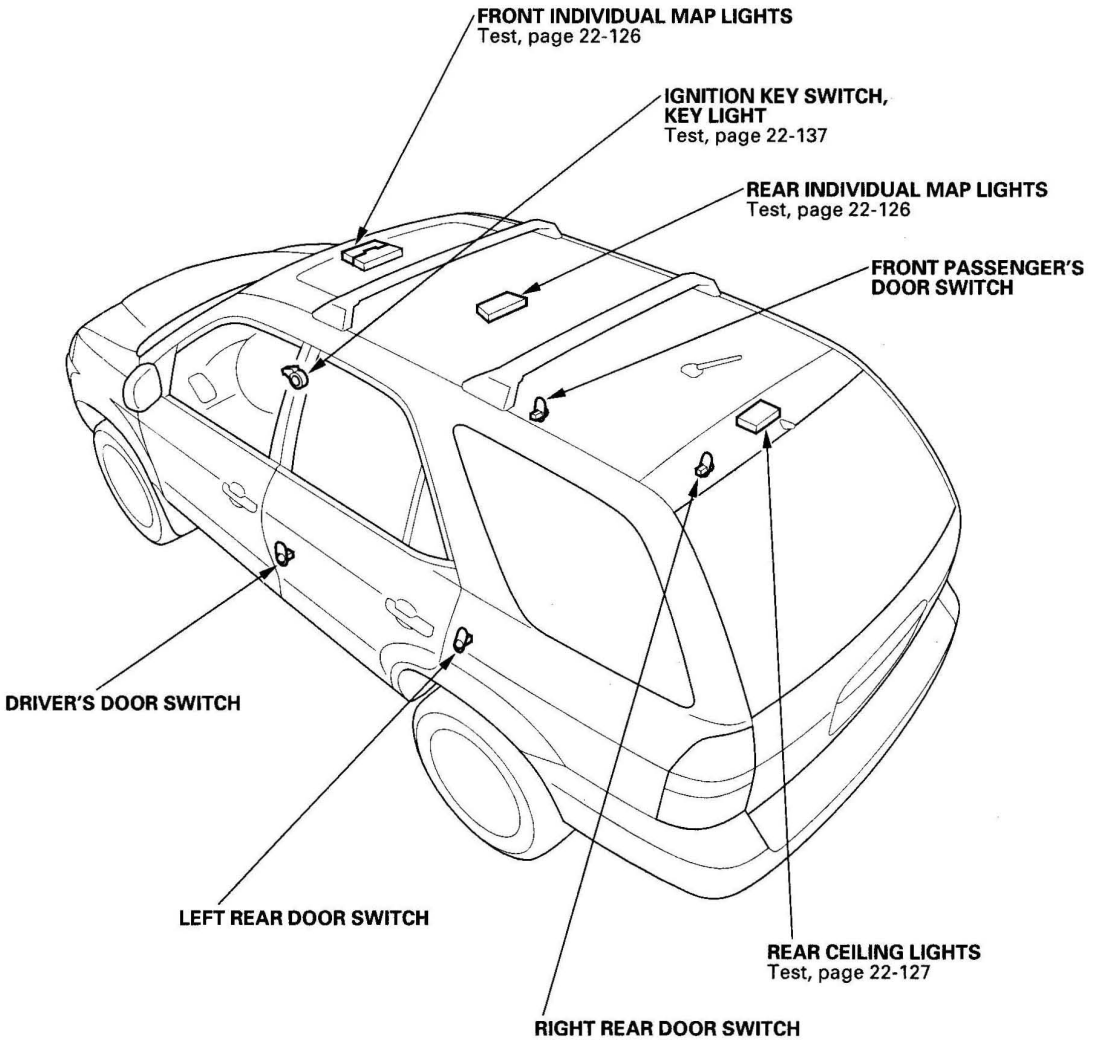
BACK

Protected by AR

Entry Light Control System

BODY

Component Location Index

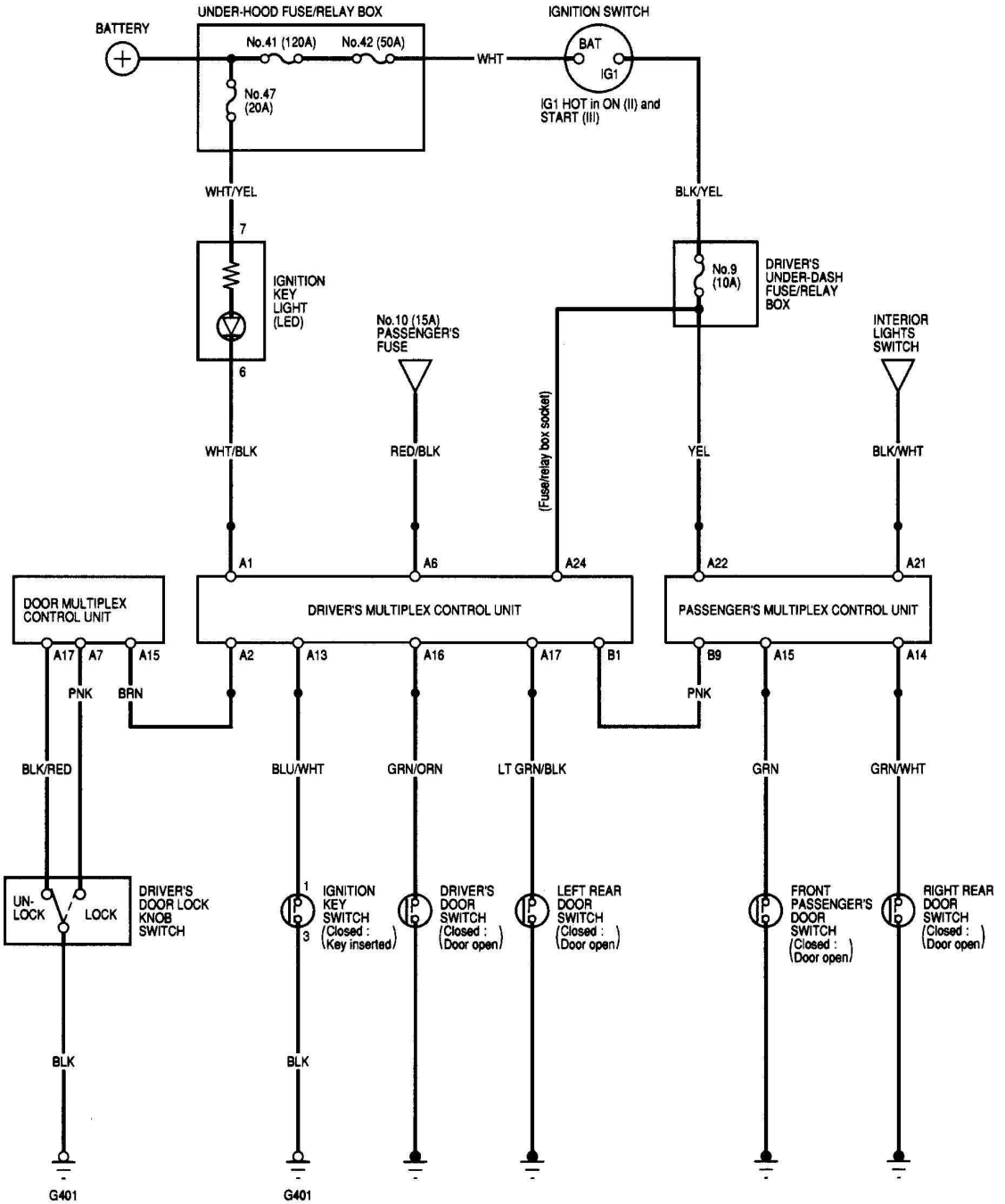


BACK

Protected by AR

Entry Light Control System

Circuit Diagram



BACK

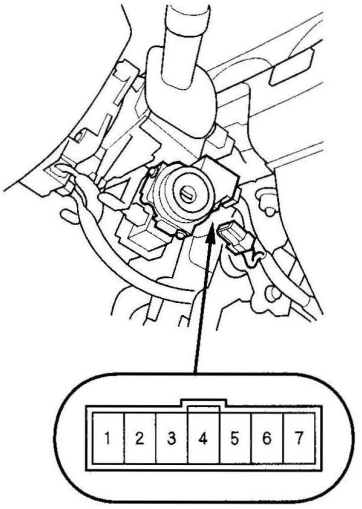
Protected by AR

Ignition Key Switch Test

NOTE: For more key-in beeper information, refer to the circuit diagram (see page 22-86) and input test (see page 22-87).

When the ignition key is in the ignition switch, the key-in beeper in the driver's multiplex control unit senses ground through the closed ignition key switch. When you open the driver's door, the beeper circuit senses ground through the closed door switch.

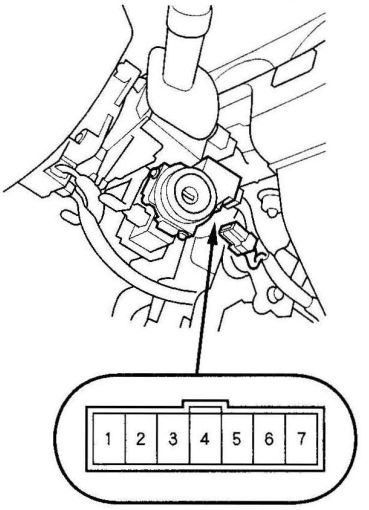
1. Remove the steering column upper and lower covers (see page 17-25).
2. Disconnect the 7P connector.



3. Check for continuity between the No. 1 and No. 3 terminals.
   - There should be continuity with the key in the ignition switch.
   - There should be no continuity with the key removed.
4. If the continuity is not as specified, replace the ignition key switch.

Ignition Key Light Test

1. Remove the steering column upper and lower covers (see page 17-25).
2. Disconnect the 7P connector.



3. The LED should come on when power is connected to the No. 7 terminal and ground is connected to No. 6 terminal.
4. If the LED does not come on, replace the ignition key switch.

Protected by AR

Entry Light Control System

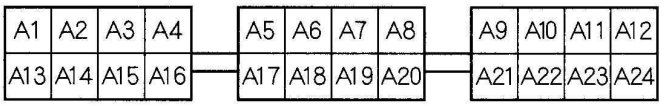
Control Unit Input Test

1. Before testing the entry light control functions, troubleshoot the multiplex control system (see page 22-212).

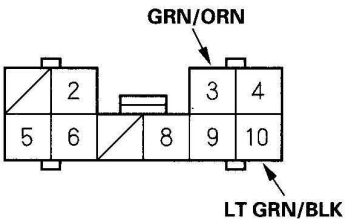
Driver's Multiplex Control Unit:

2. Remove the driver's multiplex control unit from the driver's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

DRIVER'S UNDER-DASH FUSE/RELAY BOX SOCKET

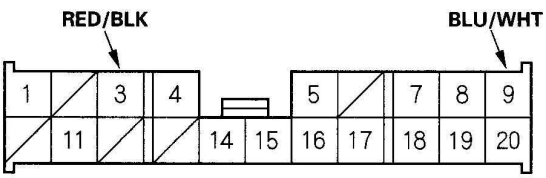


DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR E



Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR M



Wire side of female terminals

BACK

Protected by AR

4. With the driver's multiplex control unit still disconnected, make these input tests at the connector or driver's under-dash fuse/relay box socket.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A1	Fuse/relay box socket	Under all conditions	Attach to ground: The ignition key light should come on.	• Blown No. 47 (20A) fuse in the under-hood fuse/relay box • Blown LED • An open in the wire
A24		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10A) fuse in the driver's under-dash fuse/relay box • Faulty driver's under-dash fuse/relay box

5. Reconnect the driver's multiplex control unit to the driver's under-dash fuse/relay box, and perform the following input tests at the appropriate connectors on the back of the driver's under-dash fuse/relay box.
   For driver's under-dash fuse/relay box connector socket location (see page 22-56).

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 6.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
E3	GRN/ORN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch • An open in the wire • A short to ground
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	
M3	RED/BLK	Combination light switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 54 (40A) fuse in the under-hood fuse/relay box • Blown No. 10 (15A) fuse in the passenger's under-dash fuse/relay box • Faulty taillight relay • Faulty combination light switch • An open in the wire
M9	BLU/WHT	Ignition key is in the ignition switch	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G401) • Faulty ignition switch • An open in the wire • A short to ground
		Ignition key is out of the ignition switch	Check for voltage to ground: There should be 5 V or more.	
E10	LT GRN/BLK	Left rear door open	Check for voltage to ground: There should be 1 V or less.	• Faulty left rear door switch • An open in the wire • A short to ground
		Left rear door closed	Check for voltage to ground: There should be 5 V or more.	

(cont'd)

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Control Unit Input Test (cont'd)

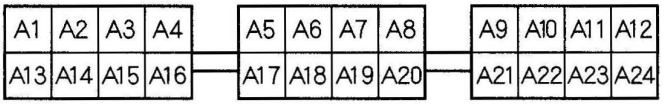
Passenger's Multiplex Control Unit:

6. Remove the passenger's multiplex control unit from the passenger's under-dash fuse/relay box, and disconnect its connector.

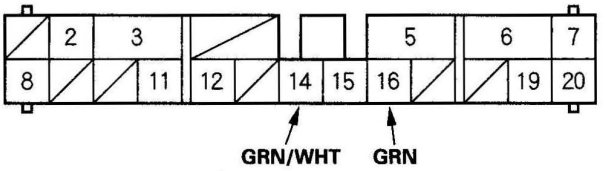
7. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 8.

PASSENGER'S UNDER-DASH FUSE/RELAY BOX SOCKET



PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR C



Wire side of female terminels

BACK

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8. With the passenger's multiplex control unit still disconnected, make these input tests at the connector and passenger's under-dash fuse/relay box socket.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 9.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A22	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5A) fuse in the driver's under-dash fuse/relay box • Faulty passenger's under-dash fuse/relay box • An open in the wire
A21		Ceiling light switches in the middle position	Attach to ground: Ceiling lights should come on.	• Blown No. 11 (10A) fuse in the passenger's under-dash fuse/ relay box • Blown No. 54 (40A) fuse in the under-hood fuse/relay box • Faulty passenger's under-dash fuse/relay box • Faulty ceiling light • Faulty interior lights switch • An open in the wire

9. Reconnect the passenger's multiplex control unit to the passenger's under-dash fuse/relay box, and perform the following input tests at the appropriate connectors on the back of the passenger's under-dash fuse/relay box.

   - If a test indicates a problem, find and correct the cause, then recheck the system.
   - If the input test proves OK, go to step 10.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
C16	GRN	Passenger's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty passenger's door switch • An open in the wire
		Passenger's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty passenger's door switch • A short to ground in the wire
C14	GRN/WHT	Right rear door open	Check for voltage to ground: There should be 1 V or less.	• Faulty right rear door switch • An open in the wire
		Right rear door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty right rear door switch • A short to ground in the wire

(cont'd)

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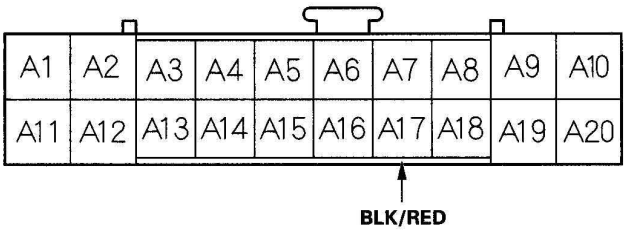
Control Unit Input Test (cont'd)

Door Multiplex Control Unit:

10. Remove the driver's door panel and disconnect the 20P connector from the door multiplex control unit.

11. Inspect the connector and socket terminals to be sure they are all making good contact.

    - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
    - If the terminals look OK, go to step 12.



Wire side of female terminels

12. Reconnect the connector to the door multiplex control unit, and make the input test at the connector.

    - If a test indicates a problem, find and correct the cause, then recheck the system.
    - If the input test proves OK, go to step 13.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A17	BLK/RED	Driver's door lock knob unlocked	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door lock actuator • Poor ground (G401) • An open in the wire
		Driver's door lock knob locked	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock actuator • Short to ground

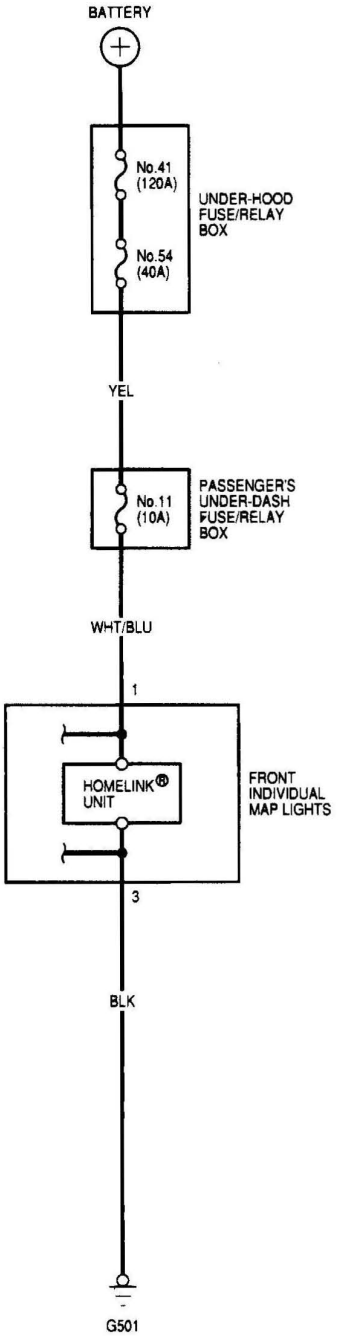
13. If all the input tests prove OK, one of the control units must be faulty. Substitute a known-good control unit for the one that is most likely at fault, then recheck the system. If the system works properly, the original control unit is faulty; replace it. If there is still a malfunction, substitute a known-good control unit for the next most likely unit to be at fault, and recheck. If the system works properly, the original unit is faulty; replace it.

BACK

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Homelink Remote Control System

Circuit Diagram



Test

Turn on the front individual map light.

- If the light comes on, the Homelink's power and ground circuits are OK. If the Homelink will not open the customer's garage door, check that the Homelink is programmed properly (see the owner's manual) or call Homelink at 800-355-3515. On the internet, go to www. homelink. jcl. com.

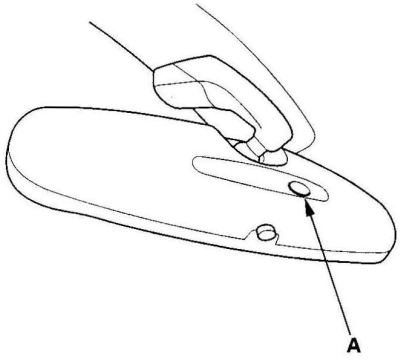
- If the light does not come on, check for these problems:
  - A blown No. 11 (10A) fuse in the passenger's under-dash fuse/relay box.
  - An open in the WHT/BLU wire between the passenger's under-dash fuse/relay box and front individual map light.
  - An open in the BLK wire between the front individual map lights and G501.

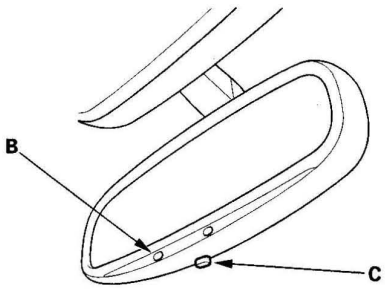
Protected by AR

Automatic Dimming Inside Mirror

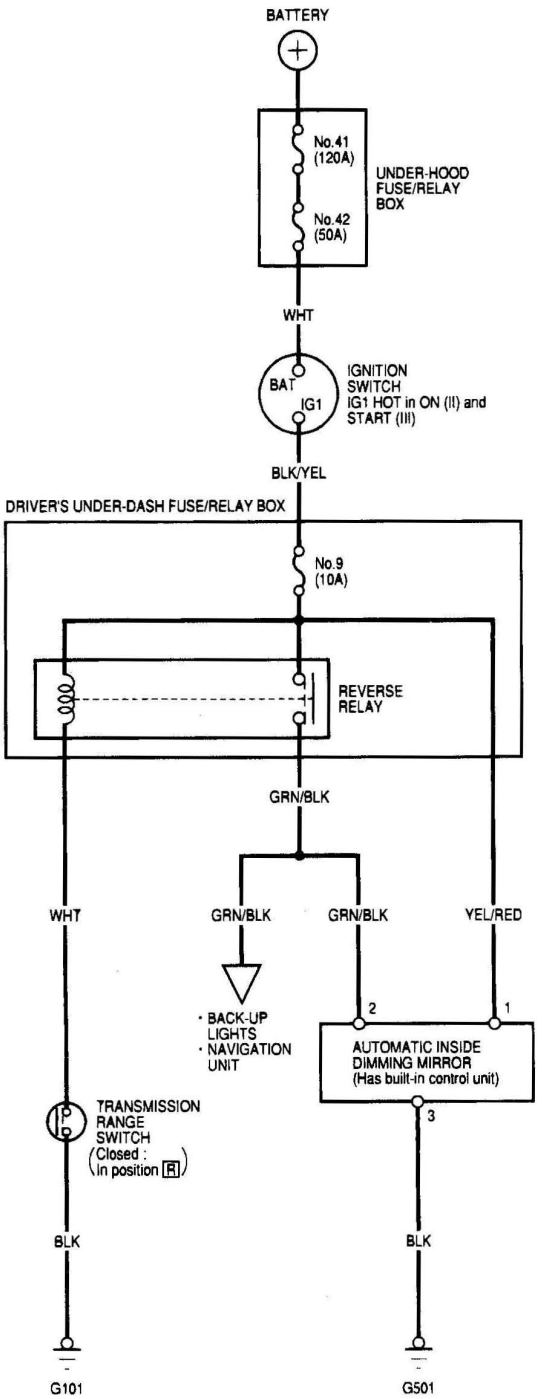
Description

The automatic dimming inside mirror has a front-facing lux level sensor (A), a rear-facing lux level sensor (B), and a control unit. The control unit receives signals from each sensor. Based on the difference between the two lux levels (the light outside the vehicle and the light from the headlights of the other vehicle, etc.), the control unit controls the electro-chromic gel to reduce the glare. This dimming function is canceled when the transmission is in reverse, or when the automatic dimming switch (C) is turned OFF.





Circuit Diagram



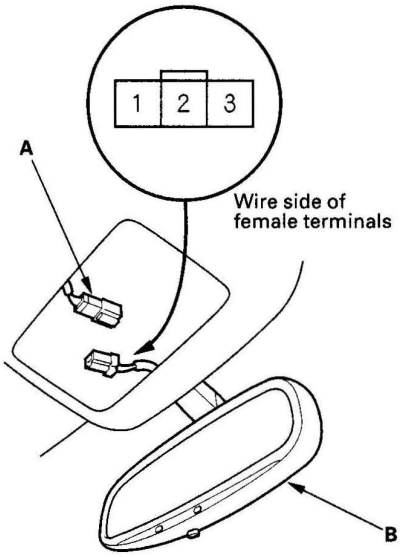
BACK

Protected by AR

Test/Replacement

1. Remove the front individual map light (see page 22-126).

2. Disconnect the 3P connector (A) from the automatic inside dimming mirror (B).



3. Check for continuity between No. 3 terminal and body ground.

   - If there is continuity, go to step 4.
   - If there is no continuity, check for:
     - an open in the wire.
     - poor ground (G501).

4. Check for voltage between No.1 terminal and body ground with the ignition switch ON (II).

   - If there is battery voltage, go to step 5.
   - If there is no voltage, check for:
     - blown No. 9 (10 A) fuse in the driver's under-dash fuse/relay box.
     - an open in the wire.

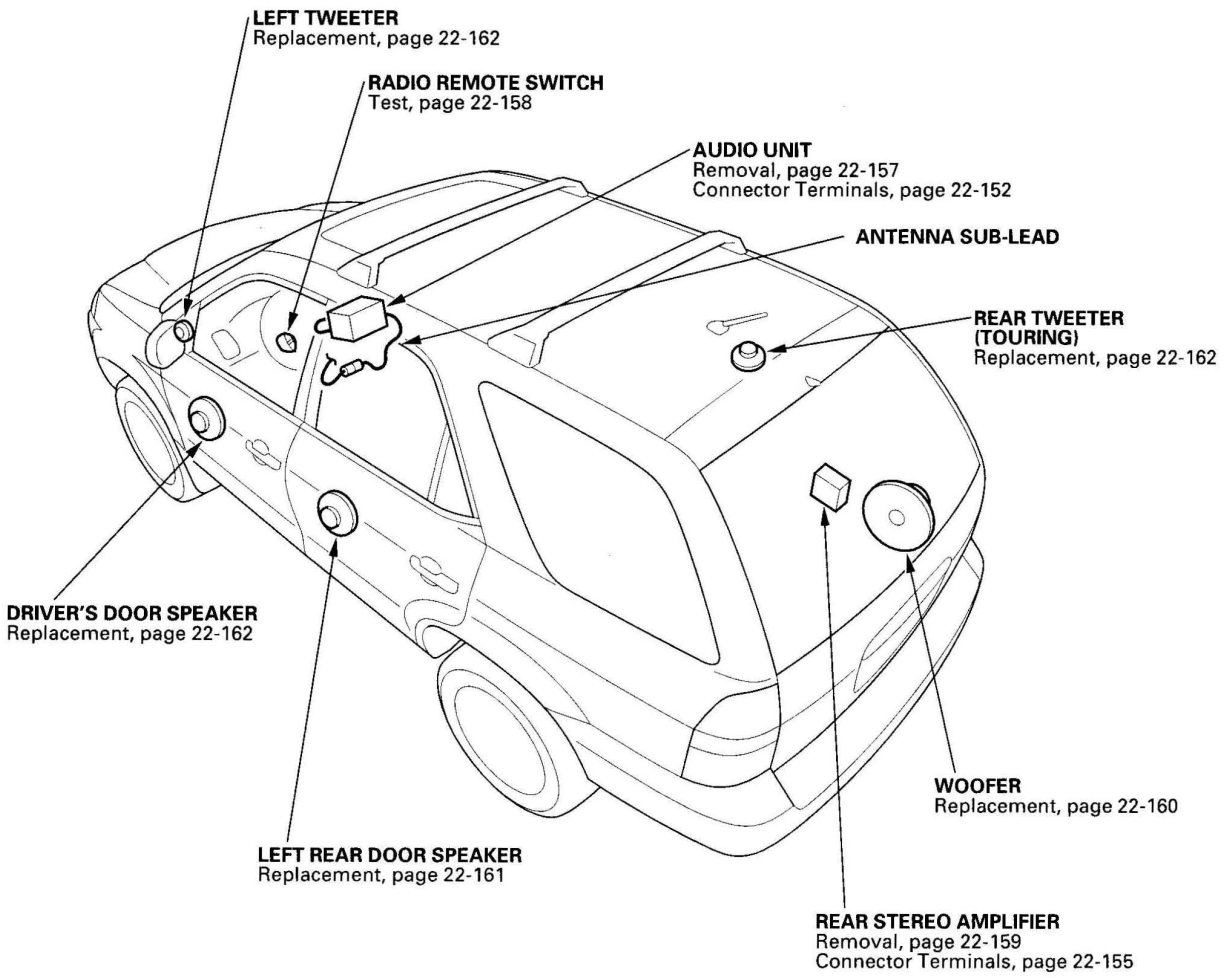
5. Check for voltage between No. 2 terminal and body ground with the ignition switch turned ON (II) and transmission range switch in [R].

   - If there is battery voltage, replace the mirror assembly.
   - If there is no voltage, check for:
     - an open in the wire.
     - faulty reverse relay.
     - faulty transmission range switch.

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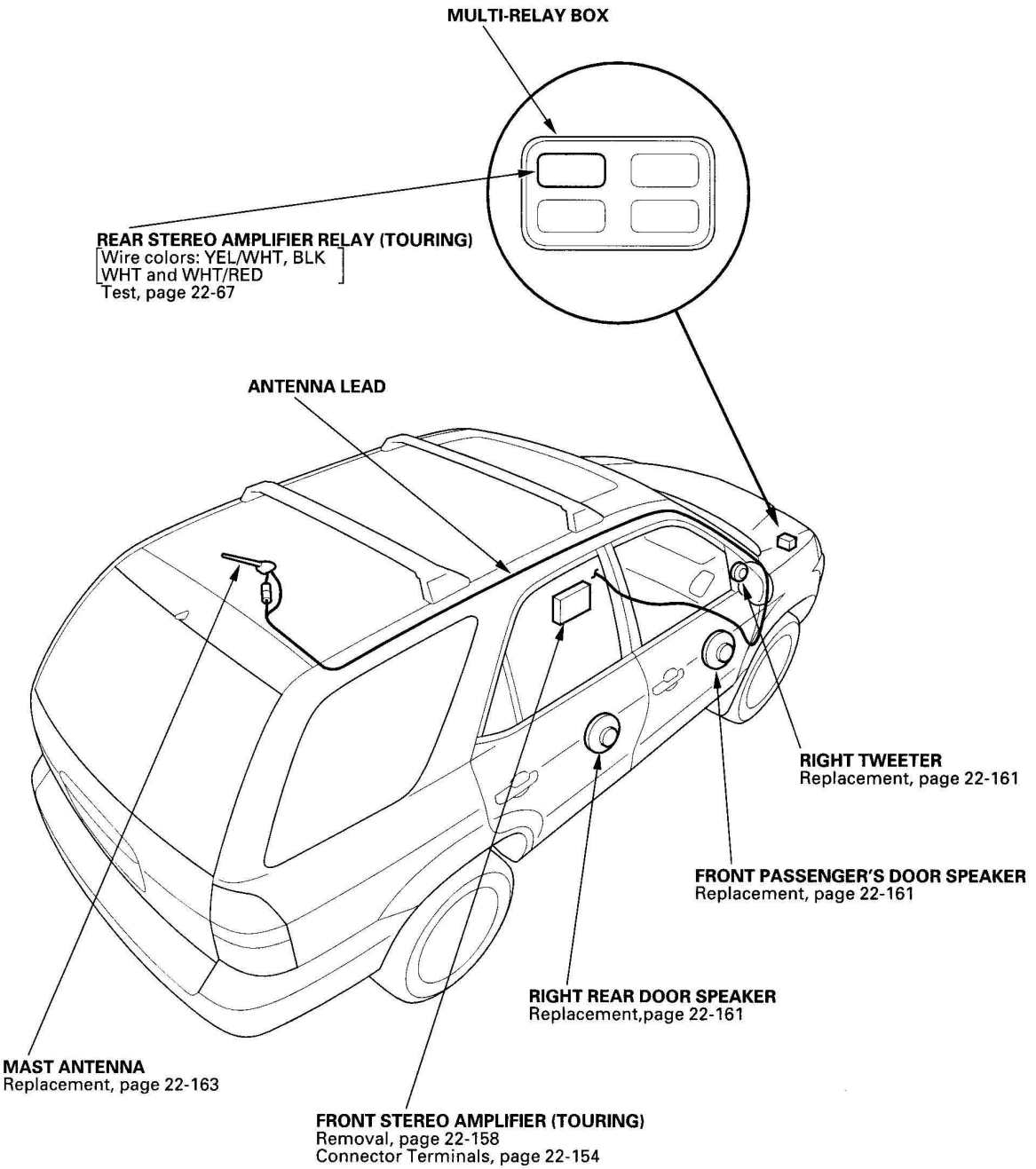
Stereo Sound System

Component Location Index



BACK

Protected by AR

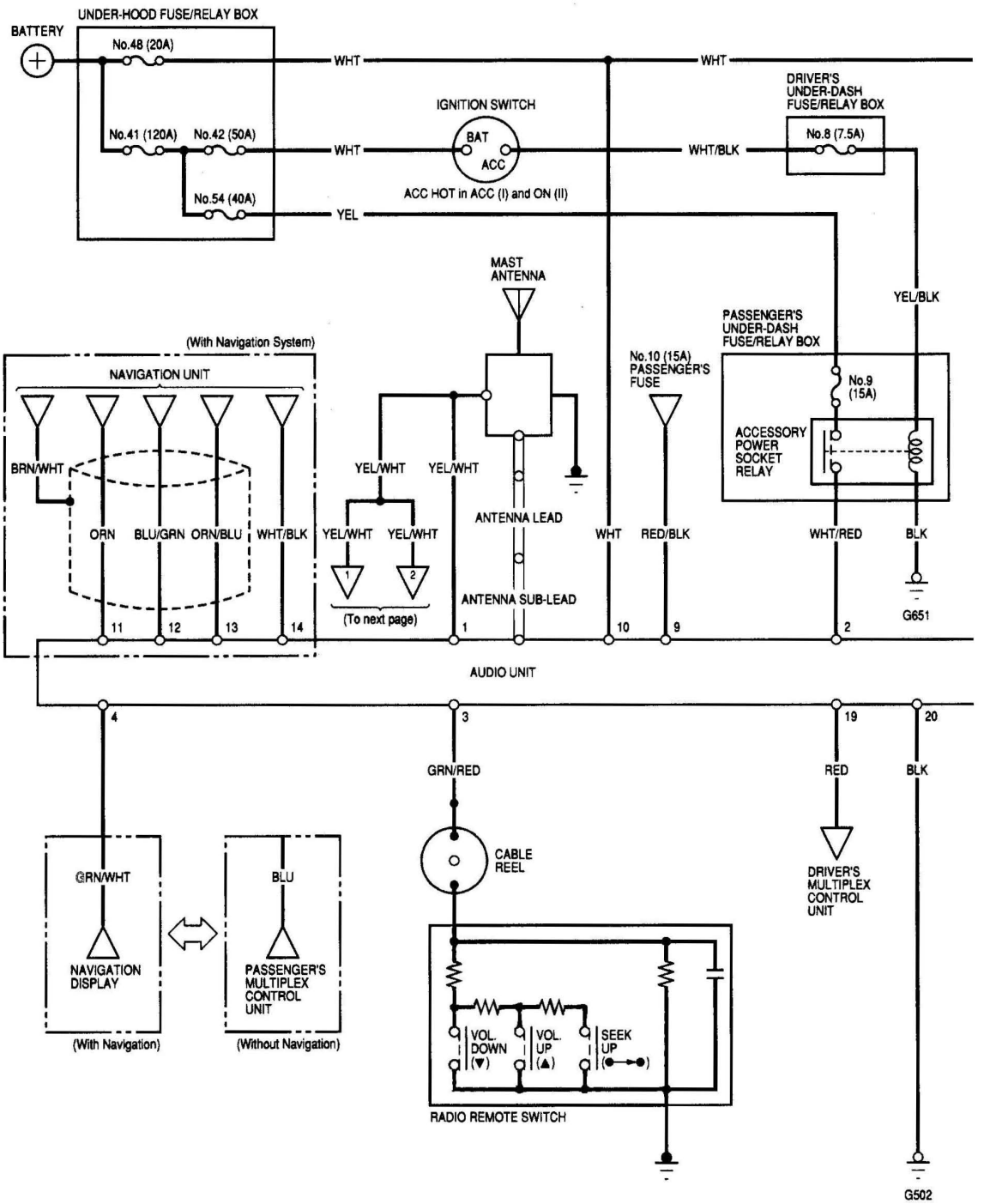


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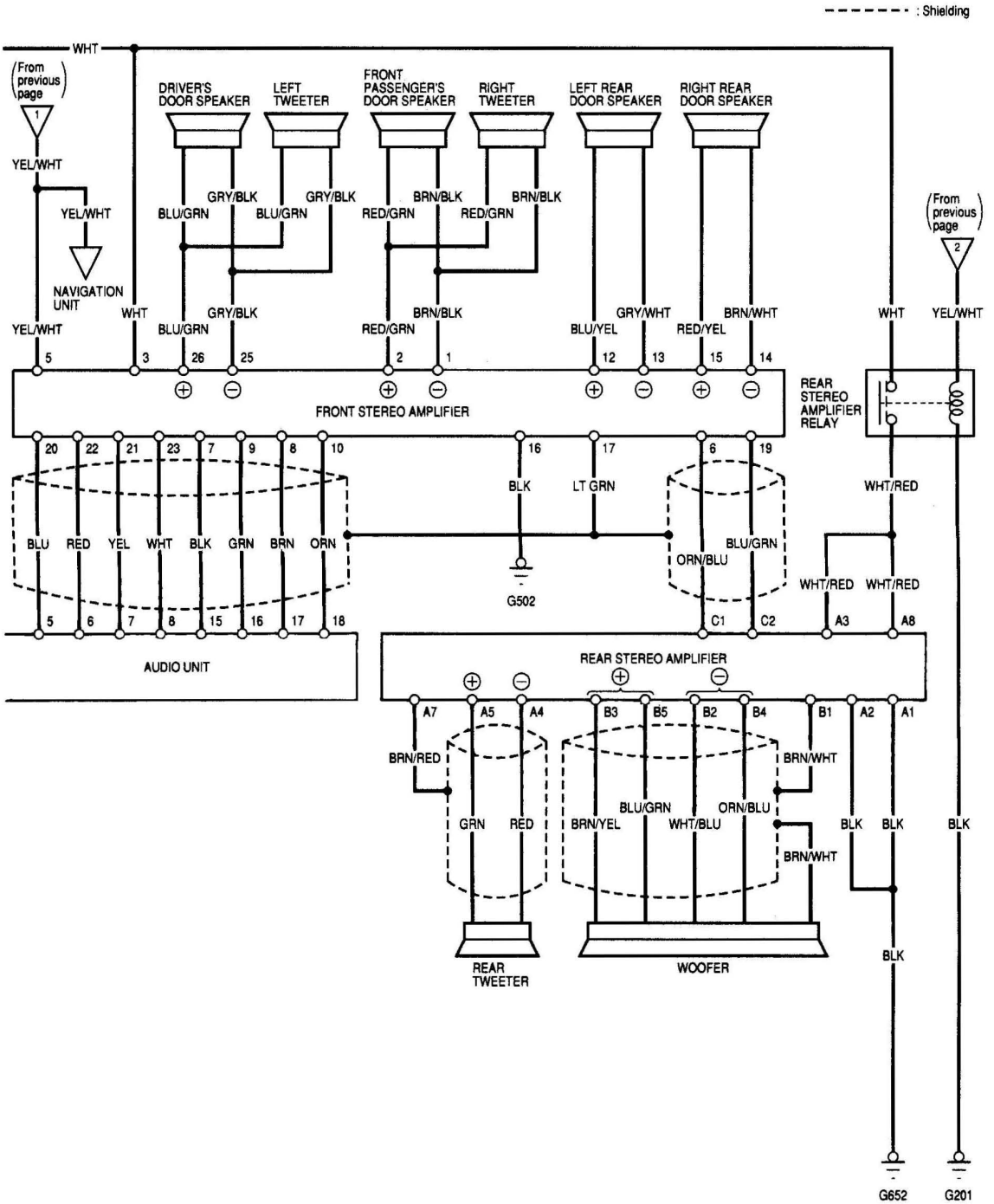
Stereo Sound System

Circuit Diagram - With BOSE Sound System



BACK

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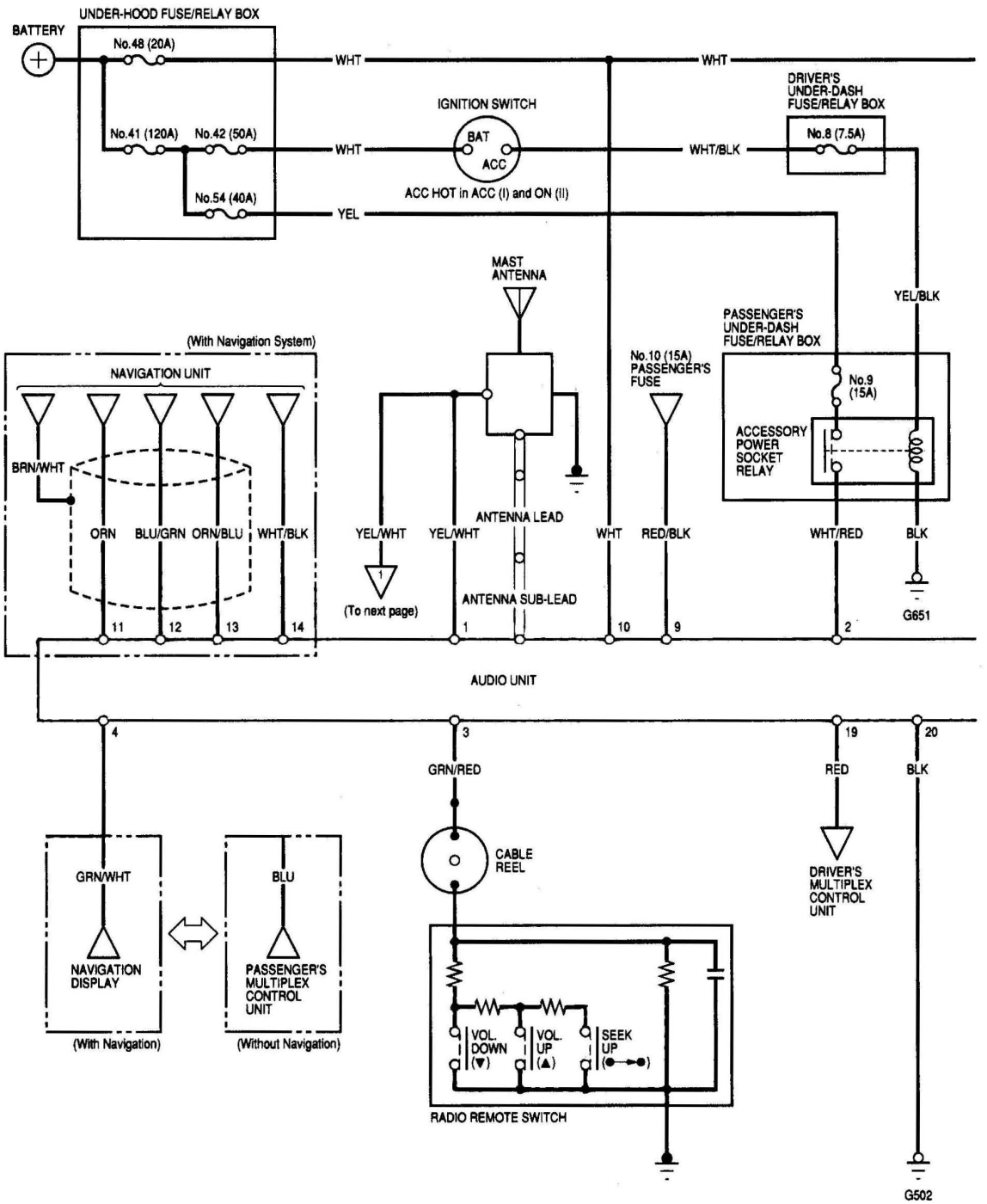


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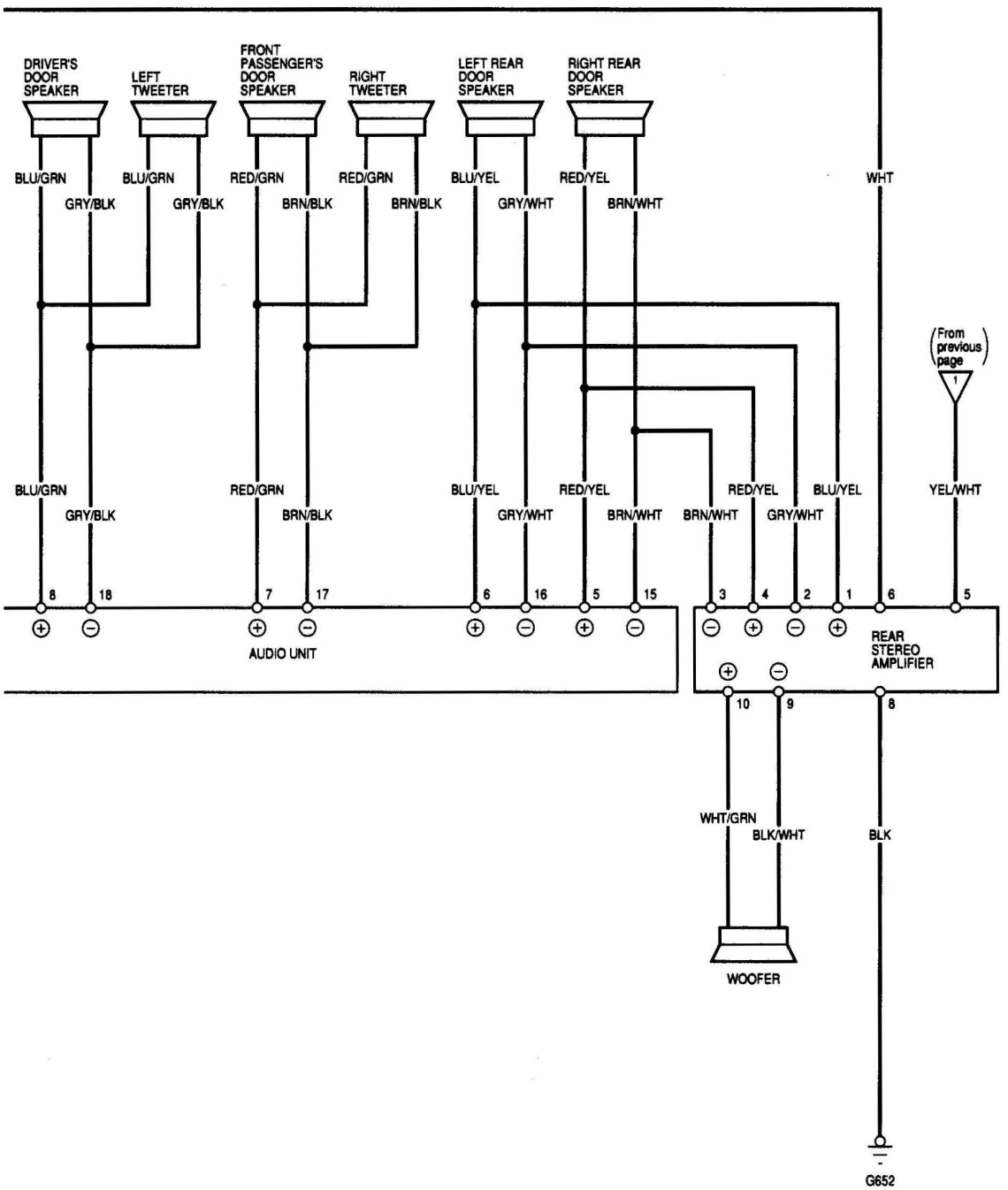
Stereo Sound System

Circuit Diagram - Without BOSE Sound System



BACK

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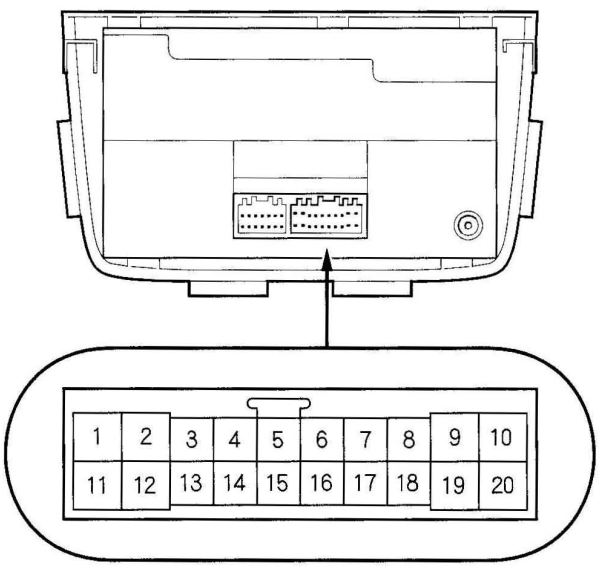
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Audio Unit Connector Replacement (With BOSE Sound System)

When replacing an audio unit connector, match the wires to the cavities as listed in the following table.

Cavity	Wire	Connects to
1	YEL/WHT	Radio switched power
2	WHT/RED	ACC (Main stereo power supply)
3	GRN/RED	Radio remote switch
4	GRN/WHT*	Security input
	BLU	
5	BLU	Front stereo amplifier-right rear (+)
6	RED	Front stereo amplifier-left rear (+)
7	YEL	Front stereo amplifier-right front (+)
8	WHT	Front stereo amplifier-left rfront (+)
9	RED/BLK	Lights-on signal
10	WHT	Constant power
11	ORN*	Navigation unit
12	BLU/GRN*	Navigation unit
13	ORN/BLU*	Navigation unit
14	WHT/BLK*	Navigation unit
15	BLK	Front stereo amplifier-right rear (−)
16	GRN	Front stereo amplifier-left rear (−)
17	BRN	Front stereo amplifier-right front (−)
18	ORN	Front stereo amplifier-left front (−)
19	RED	Dash lights brightness controller (In the driver's multiplex control unit)
20	BLK	Ground (G502)

*: With Navigation system



BACK

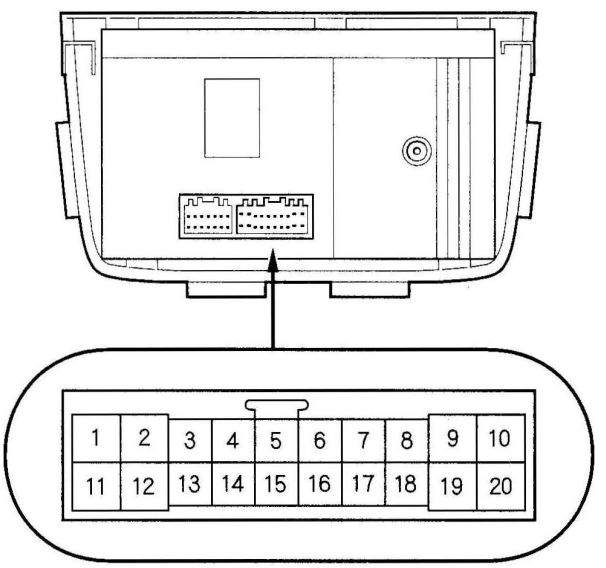
Protected by AR

Audio Unit Connector Replacement (Without BOSE Sound System)

When replacing an audio unit connector, match the wires to the cavities as listed in the following table.

Cavity	Wire	Connects to
1	YEL/WHT	Radio switched power
2	WHT/RED	ACC (Main stereo power supply)
3	GRN/RED	Radio remote switch
4	GRN/WHT*	Security input
	BLU	
5	RED/YEL	Rear stereo amplifier-right rear (+), Right rear door speaker (+)
6	BLU/YEL	Rear stereo amplifier-left rear (+), Left rear door speaker (+)
7	RED/GRN	Front passenger's door speaker (+), Right tweeter (+)
8	BLU/GRN	Driver's door speaker (+), Left tweeter (+)
9	RED/BLK	Lights-on signal
10	WHT	Constant power
11	ORN*	Navigation unit
12	BLU/GRN*	Navigation unit
13	ORN/BLU*	Navigation unit
14	WHT/BLK*	Navigation unit
15	BRN/WHT	Rear stereo amplifier-right rear (−), Right rear door speaker (−)
16	GRY/WHT	Rear stereo amplifier-left rear (−), Left rear door speaker (−)
17	BRN/BLK	Front passenger's door speaker (−), Right tweeter (−)
18	GRY/BLK	Driver's door speaker (−), Left tweeter (−)
19	RED	Dash lights brightness controller (In the driver's multiplex control unit)
20	BLK	Ground (G502)

*: With Navigation system

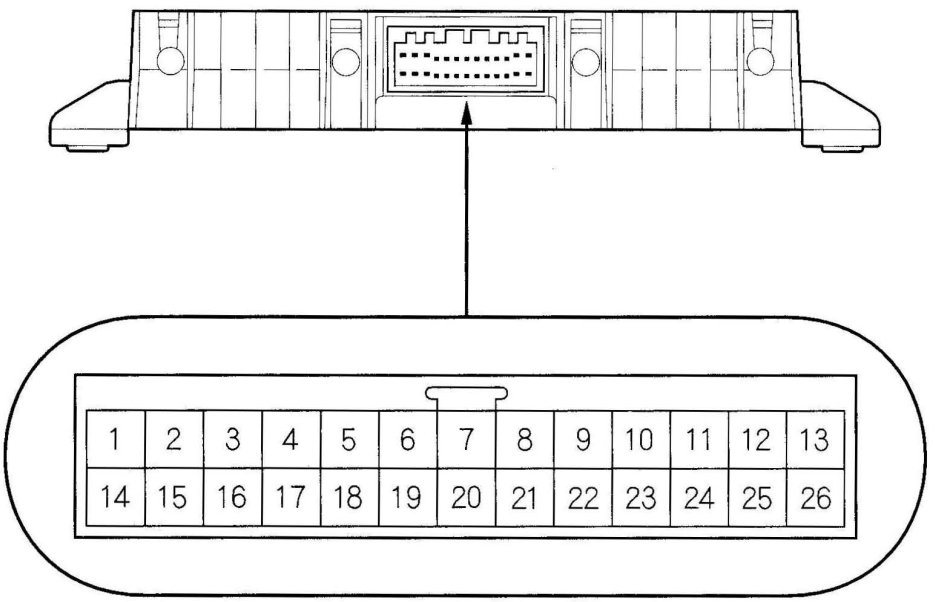


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Front Stereo Amplifier Connector Replacement (With BOSE Sound System)

When replacing a stereo amplifier connector, match the wires to the cavities as listed in the following table.

Cavity	Wire	Connects to
1	BRN/BLK	Front passenger's door speaker (−), Right tweeter (−)
2	RED/GRN	Front passenger's door speaker (+), Right tweeter (+)
3	WHT	Constant power
4	———	Not used
5	YEL/WHT	Radio switch
6	ORN/BLU	Rear stereo amplifier-bass signal (+)
7	BLK	Audio unit-right rear (−)
8	BRN	Audio unit-right front (−)
9	GRN	Audio unit-left rear (−)
10	ORN	Audio unit-left front (−)
11	———	Not used
12	BLU/YEL	Left rear door speaker (+)
13	GRY/WHT	Left rear door speaker (−)
14	BRN/WHT	Right rear door speaker (−)
15	RED/YEL	Right rear door speaker (+)
16	BLK	Ground (G502)
17	LT GRN	Shielding
18	———	Not used
19	BLU/GRN	Rear stereo amplifier-bass signal (−)
20	BLU	Audio unit-right rear (+)
21	YEL	Audio unit-right front (+)
22	RED	Audio unit-left rear (+)
23	WHT	Audio unit-left front (+)
24	———	Not used
25	GRY/BLK	Driver's door speaker (−), Left tweeter (−)
26	BLU/GRN	Driver's door speaker (+), Left tweeter (+)



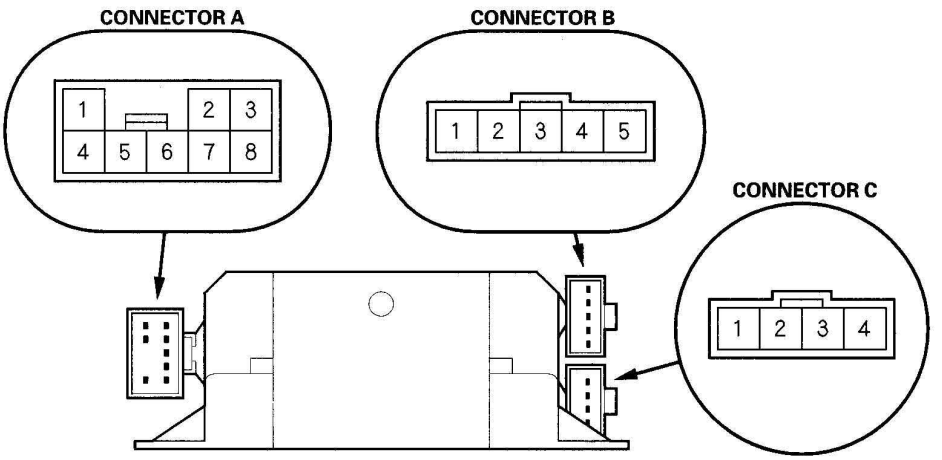
BACK

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Rear Stereo Amplifier Connector Replacement (With BOSE Sound System)

When replacing a stereo amplifier unit connector, match the wires to the cavities as listed in the following table.

Cavity	Wire	Connects to
A1	BLK	Ground (G652)
A2	BLK	Ground (G652)
A3	WHT/RED	Constant power
A4	RED	Rear tweeter (−)
A5	GRN	Rear tweeter (+)
A6	———	Not used
A7	BRN/RED	Shielding
A8	WHT/RED	Constant power
B1	BRN/WHT	Shielding
B2	WHT/BLU	Woofer (−)
B3	BLU/YEL	Woofer (+)
B4	ORN/BLU	Woofer (−)
B5	BLU/GRN	Woofer (+)
C1	ORN/BLU	Front stereo amplifier-bass signal (+)
C2	BLU/GRN	Front stereo amplifier-bass signal (−)
C3	———	Not used
C4	———	Not used

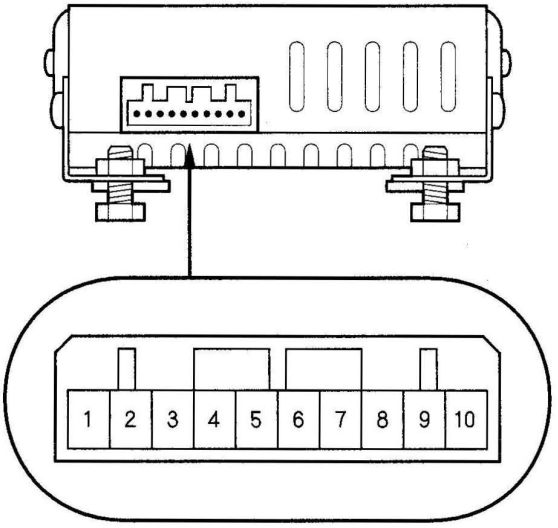


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Rear Stereo Amplifier Connector Replacement (Without BOSE Sound System)

When replacing a stereo amplifier connector, match the wires to the cavities as listed in the following table.

Cavity	Wire	Connects to
1	BLU/YEL	Audio unit-left rear (+)
2	GRY/WHT	Audio unit-left rear (−)
3	BRN/WHT	Audio unit-right rear (−)
4	RED/YEL	Audio unit-right rear (+)
5	YEL/WHT	Radio switch
6	WHT	Constant power
7	———	Not used
8	BLK	Ground (G652)
9	BRN/WHT	Woofer (−)
10	WHT/GRN	Woofer (+)



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Audio Unit Removal/Installation

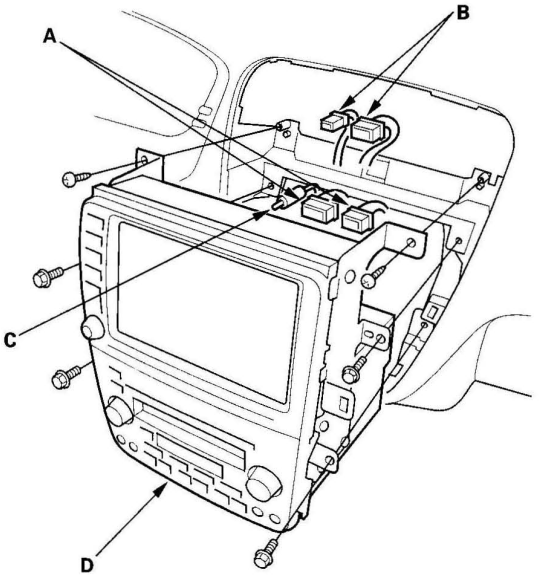
SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the dashboard and related parts.

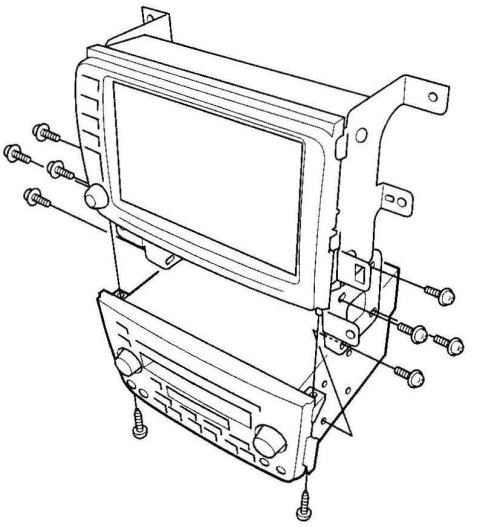
1. Make sure you have the anti-theft codes for the radio and navigation system, then write down the frequencies for the radio's preset buttons.

2. Remove the center panel (see page 20-68).

3. Remove the six mounting screws, disconnect the audio unit connectors (A), display unit connectors (B) and the antenna lead (C), then remove the audio unit (D).



4. Remove the display unit.



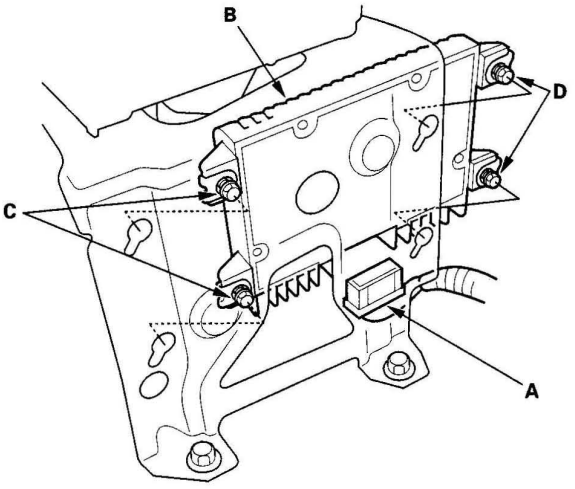
5. Install in the reverse order of removal, and note these items:

   - Make sure the audio unit and display unit connectors are plugged in properly, and the antenna lead is connected properly.
   - Enter the anti-theft codes for the radio and navigation system, then enter the customer's radio station presets.

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Front Stereo Amplifier Replacement (With BOSE Sound System)

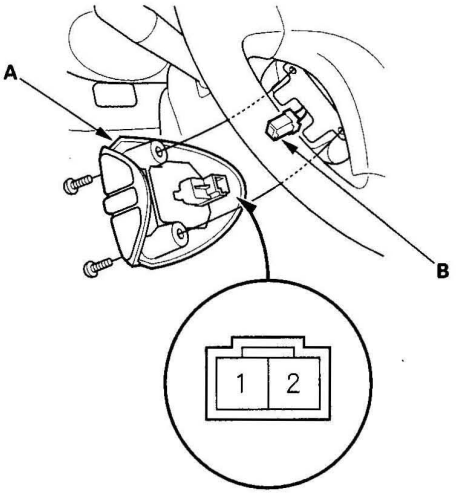
1. Remove the center console (see page 20-65).
2. Disconnect the 26P connector (A) from the front stereo amplifier (B).



3. Loosen the two front mounting bolts (C) and remove the two rear mount bolts (D), then remove the front stereo amplifier.
4. Install the amplifier in the reverse order of removal.

Radio Remote Switch Test/ Replacement

1. Remove the two screws from the radio remote switch (A).



2. Disconnect the 2P connector (B) from the radio remote switch.
3. Measure resistance between the No. 1 and No. 2 terminals in each switch position according to the table.

Position	Resistance
OFF	Approx. 3.6 kΩ
● ➡ ● (SEEK)	Approx. 990 Ω
▲ (VOL. UP)	Approx. 370 Ω
▼ (VOL. DOWN)	Approx. 100 Ω

4. If the resistance is not as specified, replace the remote switch.

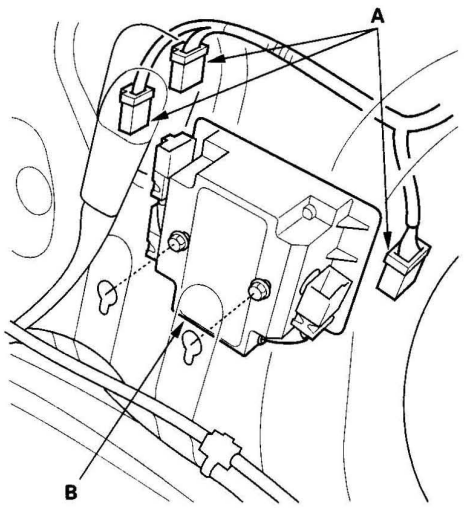
BACK

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Rear Stereo Amplifier Removal

With BOSE System:

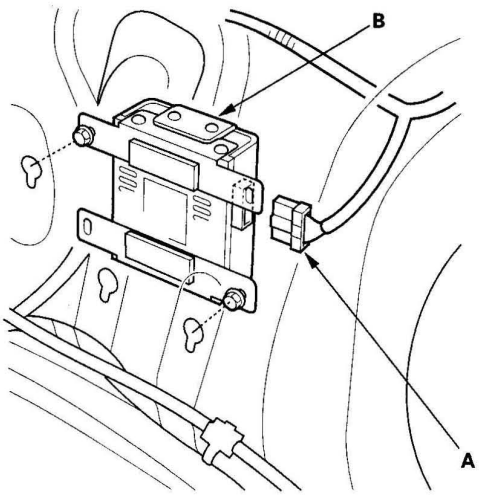
1. Remove the right rear side trim panel (see page 20-57).
2. Remove the woofer (see page 22-160).
3. Loosen the two mounting bolts and remove the rear stereo amplifier.
4. Disconnect the connectors (A) from the rear stereo amplifier (B).



5. Install the amplifier in the reverse order of removal.

Without BOSE System:

1. Remove the right rear side trim panel (see page 20-57).
2. Remove the woofer (see page 22-160).
3. Loosen the two mounting bolts and remove the rear stereo amplifier.
4. Disconnect the 10P connector (A) from the rear stereo amplifier (B).



5. Install the amplifier in the reverse order of removal.

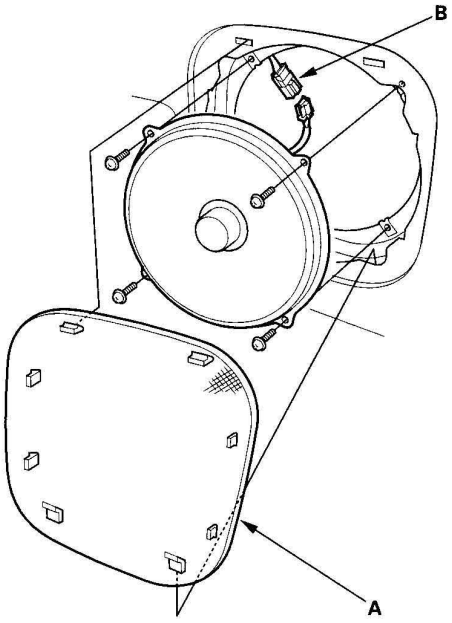
BACK

Protected by AR

Woofer Replacement

With BOSE System:

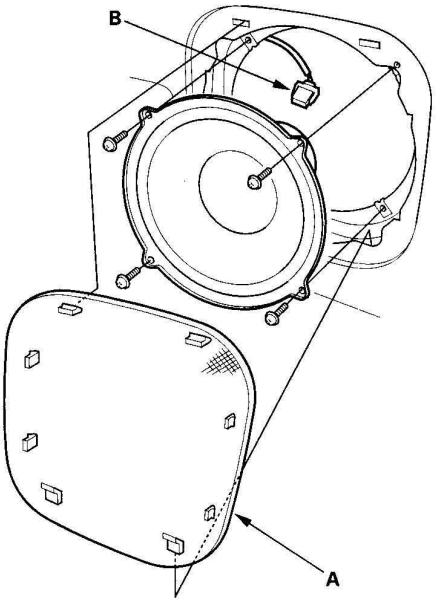
1. Remove the rear speaker grille (A).
2. Remove the four mounting screws from the woofer.



3. Disconnect the 5P connector (B), and remove the woofer.

Without BOSE System:

1. Remove the rear speaker grille (A).
2. Remove the four mounting screws from the woofer.



3. Disconnect the 2P connector (B), and remove the woofer.

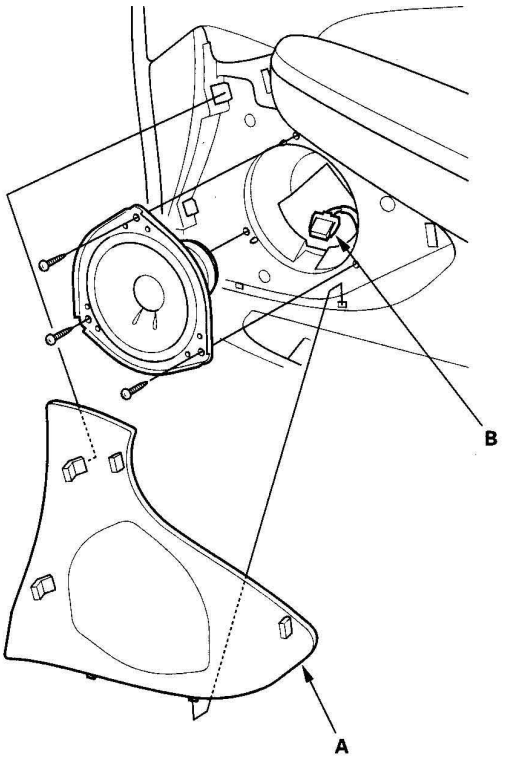
BACK

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Speaker Replacement

Front Speaker:

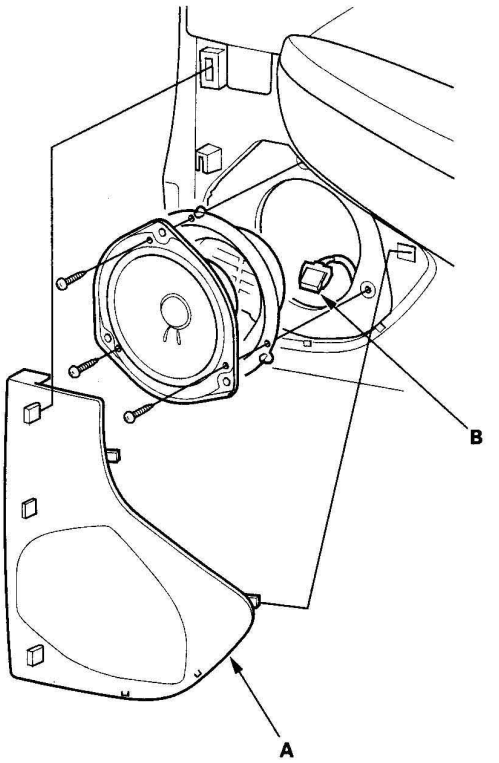
1. Remove the front door speaker grille (A).
2. Remove the three mounting screws from the front speaker.



3. Disconnect the 2P connector (B), and remove the speaker.

Rear Speaker:

1. Remove the rear door speaker grille (A).
2. Remove the three mounting screws from the rear speaker.



3. Disconnect the 2P connector (B), and remove the speaker.

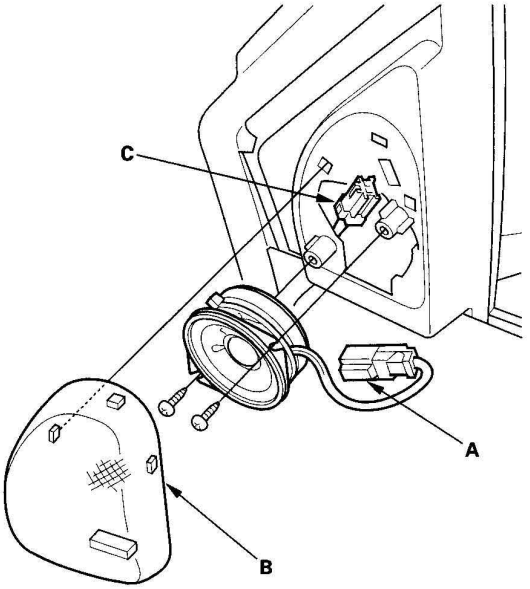
(cont'd)

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Speaker Replacement (cont'd)

Front Tweeter:

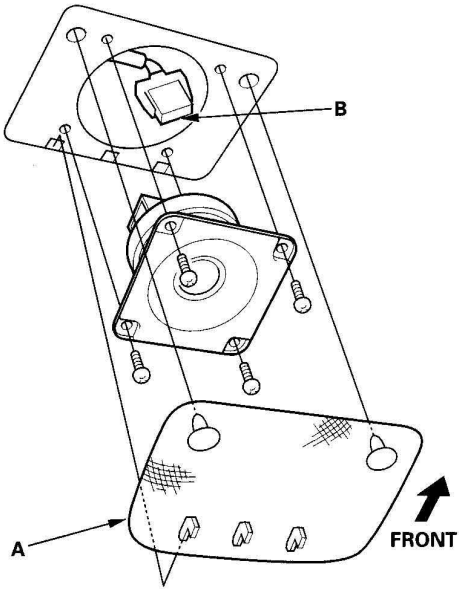
1. Remove the front door panel (see page 20-6).
2. Remove the harness clip (A).



3. Remove the front tweeter speaker grille (B).
4. Remove the two mounting screws and the tweeter.
5. Disconnect the 2P connector (C) from the tweeter.

Rear Tweeter (With BOSE System):

1. Remove the rear ceiling speaker grille (A).



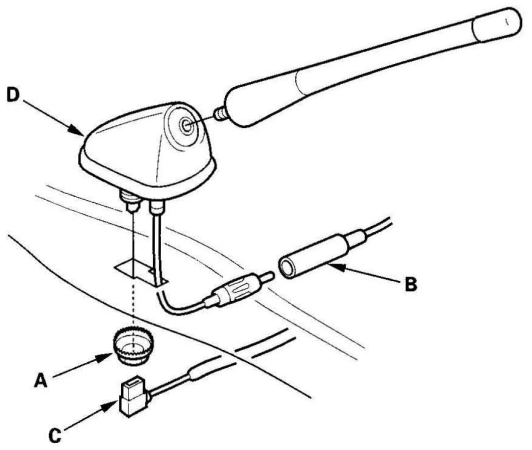
2. Remove the four mounting screws and remove tweeter from the ceiling.
3. Disconnect the 2P connector (B) from the tweeter.

BACK

Protected by AR

Antenna Mast Replacement

1. Carefully pull the rear of the headliner down to access the antenna mounting nut (A) and antenna lead (B).



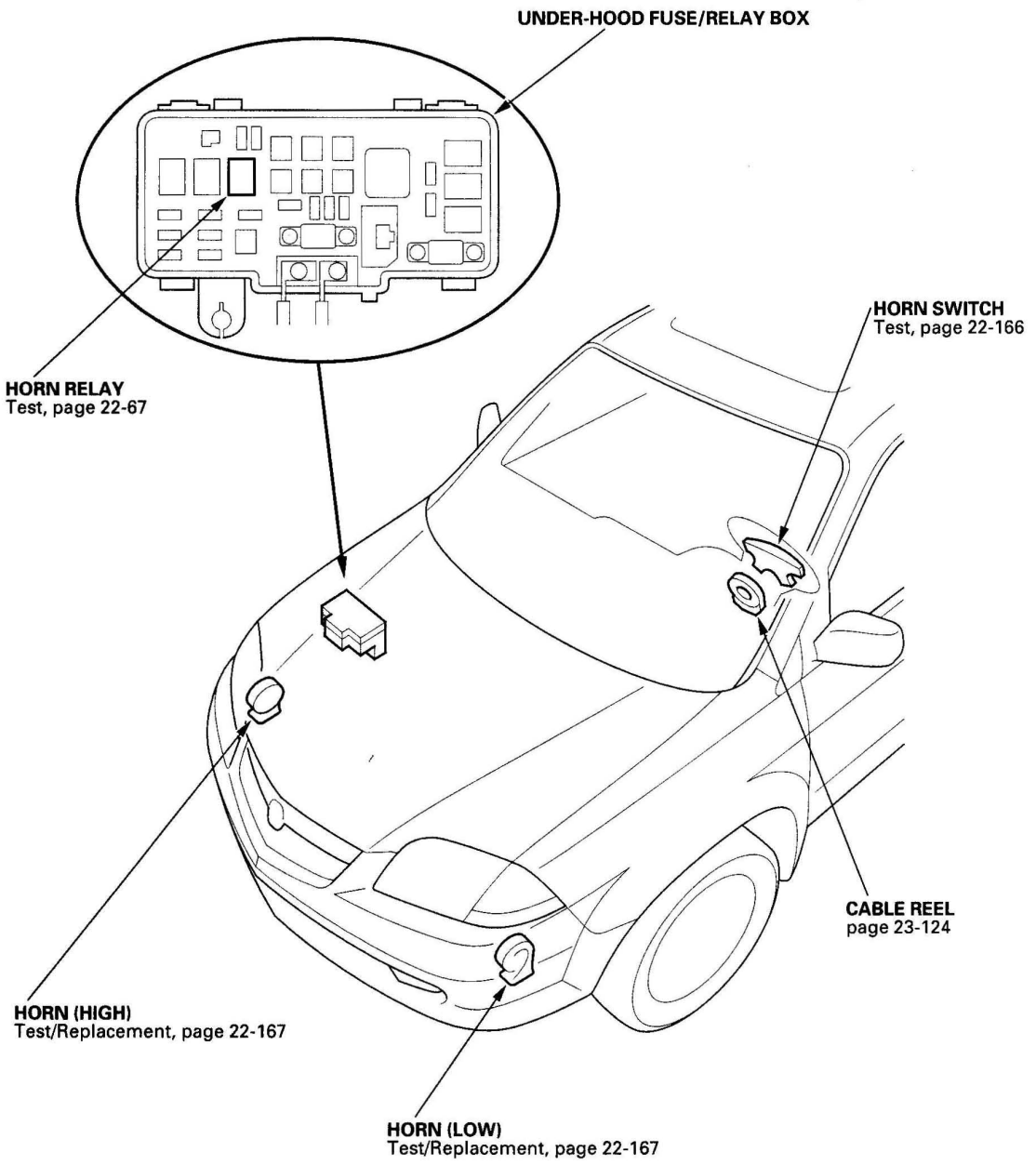
2. Disconnect the antenna lead and connector (C).
3. Remove the mounting nut, then remove the antenna mount (D).

BACK

Protected by AR

Horns

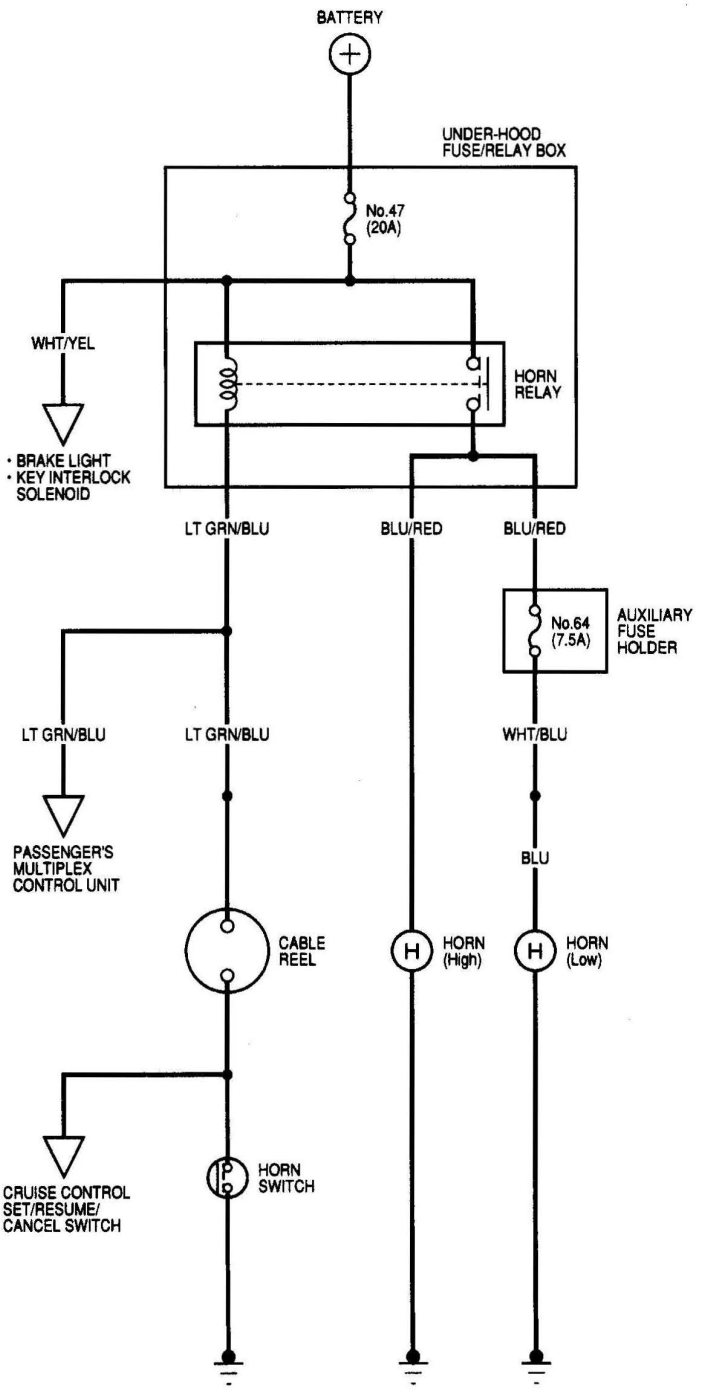
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Circuit Diagram

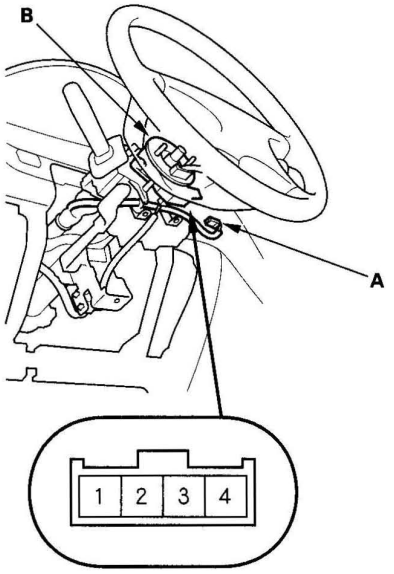


BACK

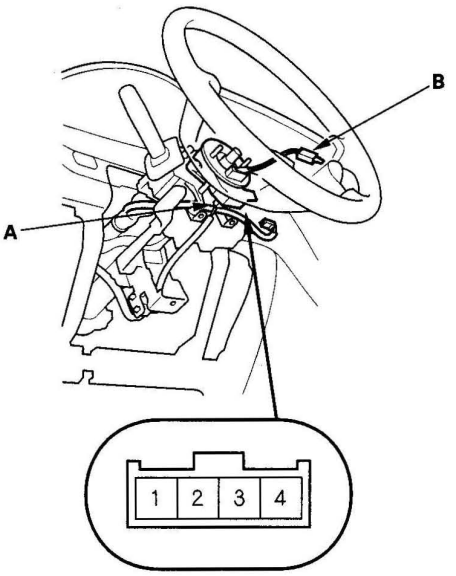
Protected by AR

Horn Switch Test

1. Remove the dashboard lower cover (see page 20-67).
2. Remove the steering column covers (see page 17-25).
3. Disconnect the dashboard wire harness B 4P connector (A) from the cable reel (B).



4. Connect terminal No. 2 of the dashboard wire harness B 4P connector to ground. The horn should sound.
   - If the horn does not sound, inspect the horn relay circuit.
   - If the horn sounds, go to step 5.
5. Check for continuity between the cable reel No. 2 terminal and body ground with the horn switch pushed.
   - If there is continuity, the switch is OK.
   - If there is no continuity, go to step 6.
6. Remove the driver's airbag assembly (see page 23-116).
7. Check for continuity between the cable reel No. 2 terminal (A) and the horn switch positive terminal (B).
   - If there is no continuity, replace the cable reel (see page 23-124) and check for proper operation.
   - If there is continuity, go to step 8.



8. Check for continuity between the center of the steering column and ground.
   - If there is continuity, replace the airbag.
   - If there is no continuity, replace the steering column.

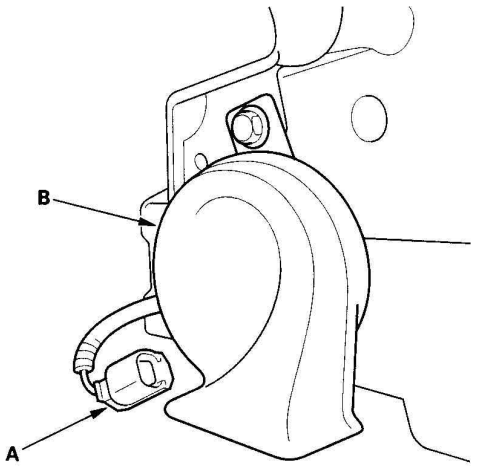
BACK

Protected by AR

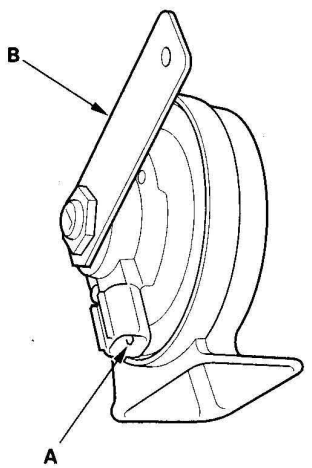
Horn Test/Replacement

Low Horn:

1. Remove the left inner fender (see page 20-121).
2. Disconnect the 1P connector (A) from the horn (B).



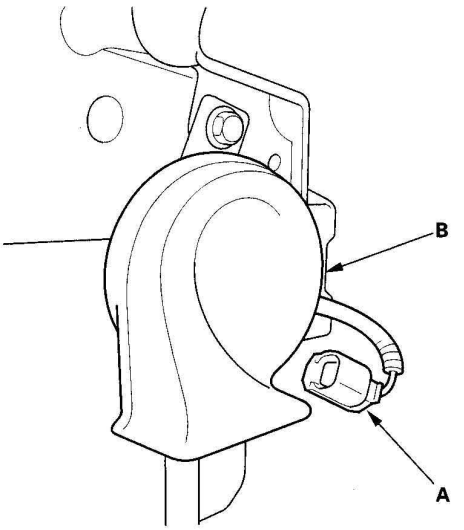
3. Remove the mounting bolt and the horn.
4. Test the horn by connecting battery power to the terminal (A) and grounding to the bracket (B). The horn should sound.



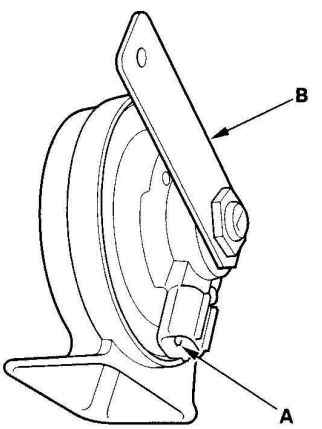
5. If it fails to sound, replace it.

High Horn:

1. Remove the right inner fender (see page 20-121).
2. Disconnect the 1P connector (A) from the horn (B).



3. Remove the mounting bolt and the horn.
4. Test the horn by connecting battery power to the terminal (A) and grounding to the bracket (B). The horn should sound.



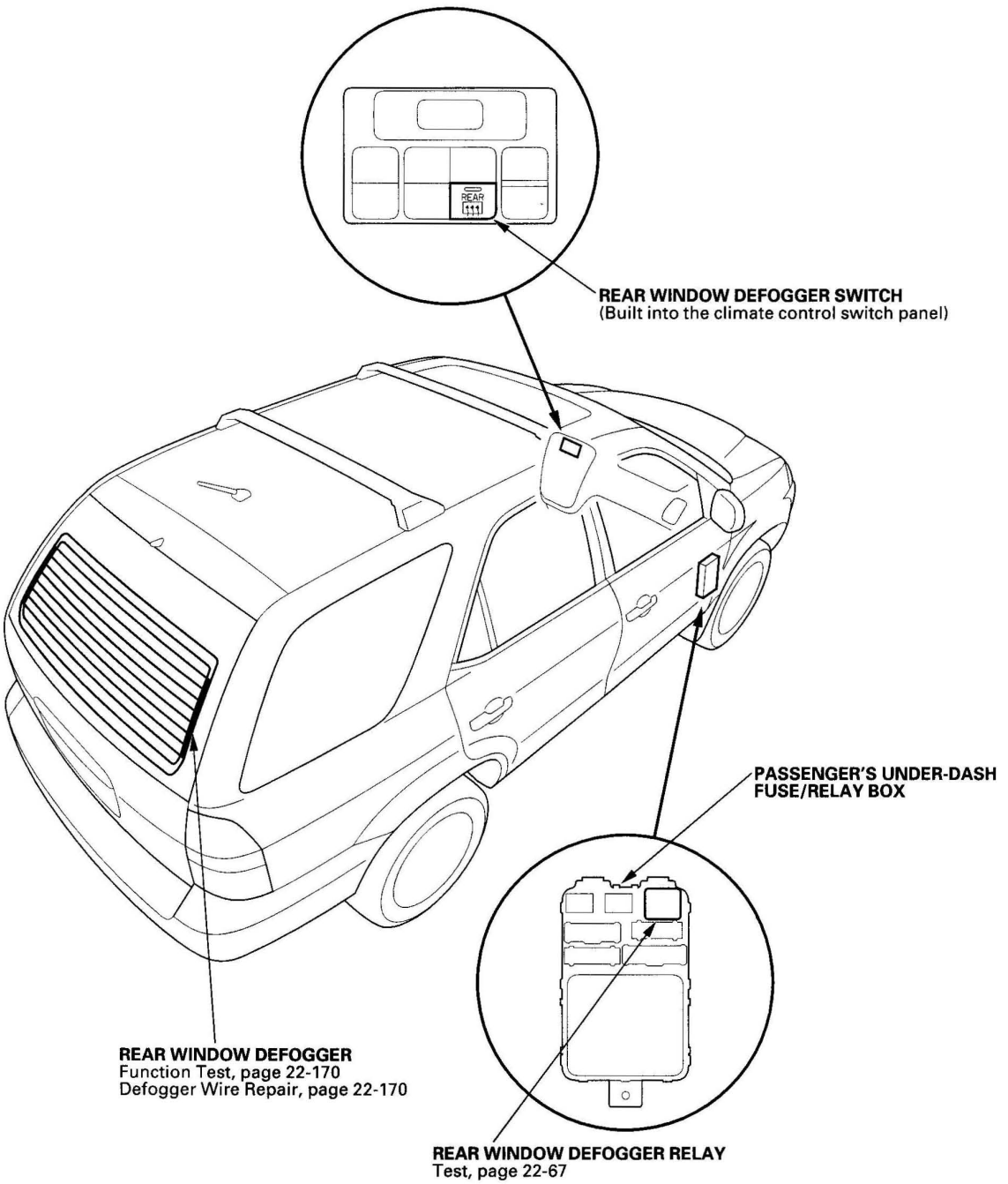
5. If it fails to sound, replace it.

BACK

Protected by AR

Rear Window Defogger

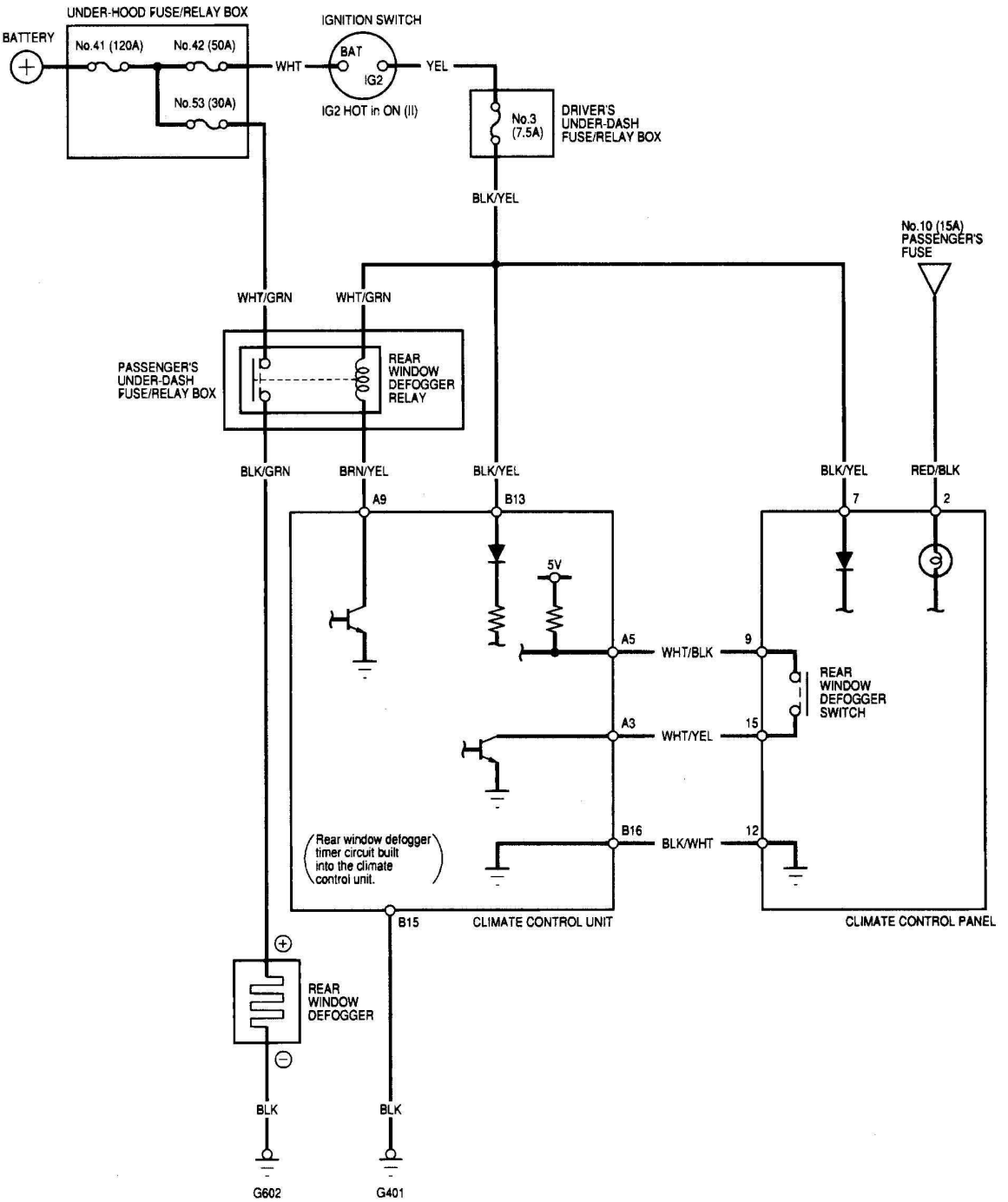
Component Location Index



BACK

Protected by AR

Circuit Diagram



BACK

Protected by AR

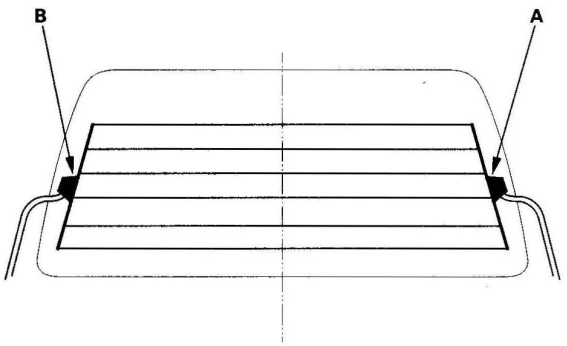
Rear Window Defogger

Function Test

NOTE:
- Be careful not to scratch or damage the defogger wires with the tester probe.
- Before testing, check the No. 53 (30A) fuse in the under-hood fuse/relay box and No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

1. Check for voltage between the positive terminal (A) and body ground with the ignition switch and defogger switch ON.
   There should be battery voltage.

   - If there is no voltage, check for:
     - faulty defogger relay.
     - an open in the BLK/GRN wire.
     - faulty climate control panel and unit.
   - If there is battery voltage, go to step 2.



2. Check for continuity between the negative terminal (B) and body ground.
   If there is no continuity, check for:

   - an open in the BLK wire.
   - Poor ground (G602).

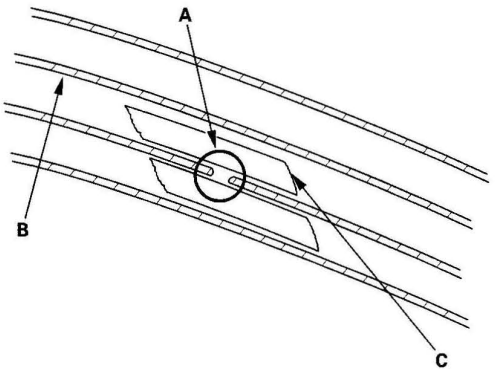
3. Touch the voltmeter positive probe to the halfway point of each defogger wire, and the negative probe to the negative terminal.
   There should be about 6 V with the ignition switch and the defogger switch ON.

   - If the voltage is as specified, the defogger wire is OK.
   - If the voltage is not as specified, repair the defogger wire.
     - If it is more than 6 V, there is a break in the negative half of the wire.
     - If it is less than 6 V, there is a break in the positive half of the wire.

Defogger Wire Repair

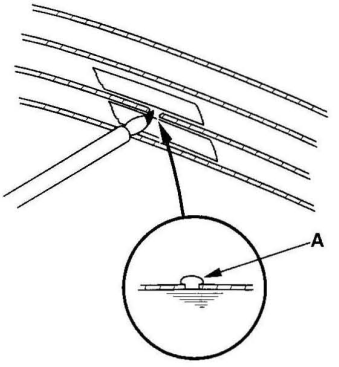
NOTE: To make an effective repair, the broken section must be no longer than one inch.

1. Lightly rub the area around the broken section (A) with fine steel wool, then clean it with alcohol.



2. Carefully mask above and below the broken portion of the defogger wire (B) with cellophane tape (C).

3. Mix the silver conductive paint thoroughly. Using a small brush, apply a heavy coat of paint extending about 1/8″ on both sides of the break. Allow 25 minutes to dry.



4. Check for continuity in the repaired wire.

5. Apply a second coat of paint in the same way. Let it dry 3 hours before removing the tape.

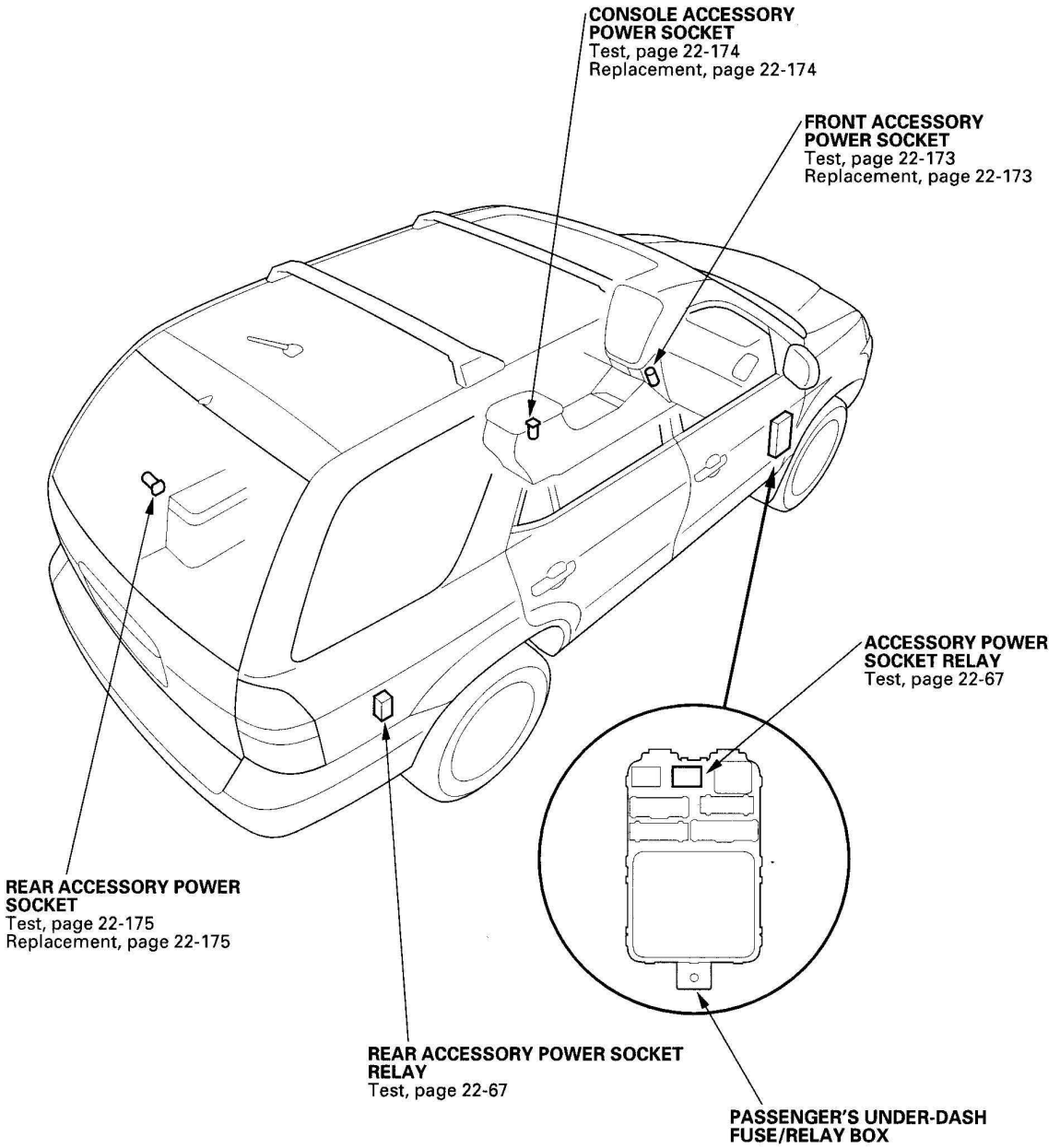
BACK

Protected by AR

Accessory Power Sockets

BODY

Component Location Index

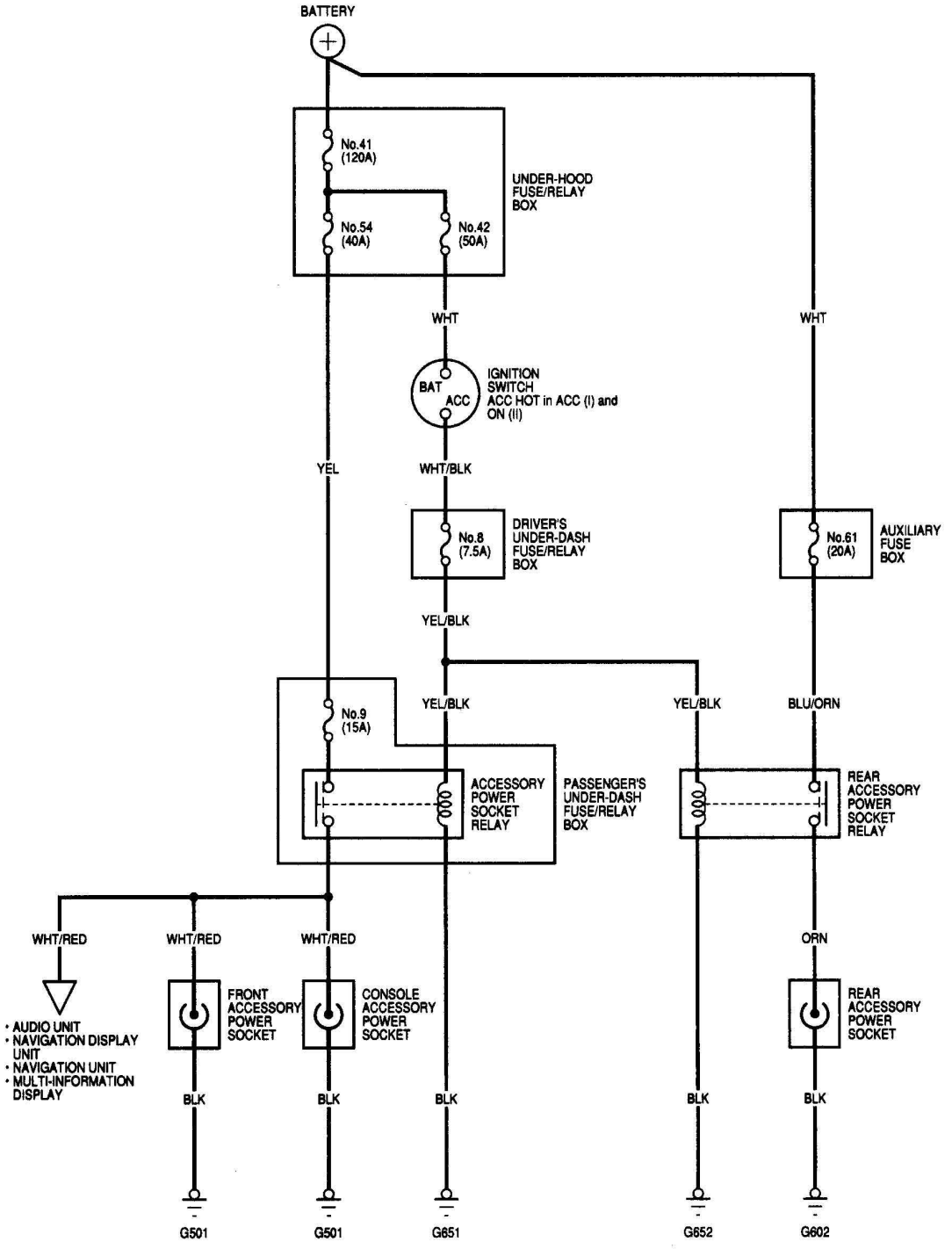


BACK

Protected by AR

Accessory Power Sockets

Circuit Diagram



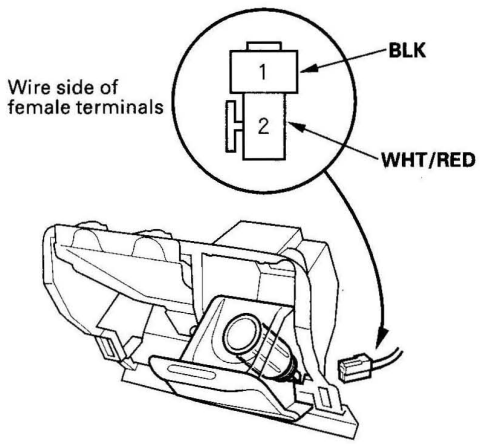
BACK

Protected by AR

Front Accessory Power Socket Test/Replacement

1. Remove the center lower cover (see page 20-70).

2. Disconnect the 2P connector from the front accessory power socket.



3. Inspect the connector terminals to be sure they are all making good contact.

   - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

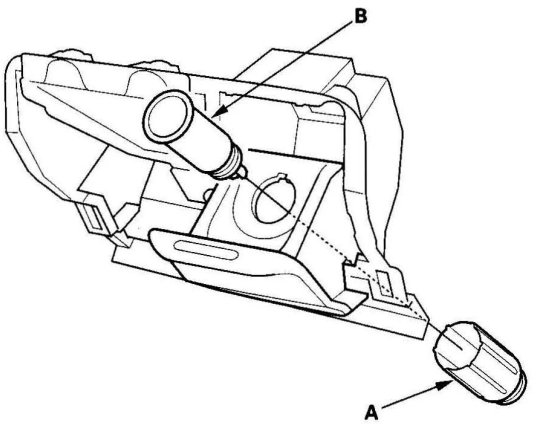
4. Turn the ignition switch to ACC (I), and check for voltage between the No. 2 terminal and body ground. There should be battery voltage.

   - If there is battery voltage, go to step 5.
   - If there is no battery voltage, check for:
     - Blown No. 8 (7.5A) fuse in the driver's under-dash fuse/relay box.
     - Blown No. 9 (15A) fuse in the passenger's under-dash fuse/relay box.
     - Faulty accessory power socket relay.
     - Poor ground (G501, G651).
     - An open in the wire.

5. Check for continuity between the No. 1 terminal and body ground. There should be continuity.

   - If there is continuity, go to step 6.
   - If there is no continuity, check for:
     - Poor ground (G501).
     - An open in the wire.

6. Remove the housing (A) and socket (B).



7. Install the power socket in the reverse order of removal.

BACK

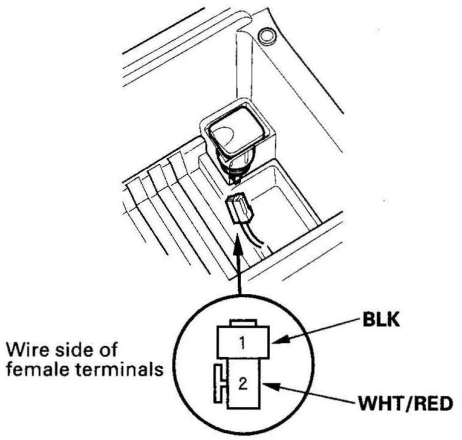
Protected by AR

Accessory Power Sockets

Console Accessory Power Socket Test/Replacement

1. Remove the center console (see page 20-65).

2. Disconnect the 2P connector from the console accessory power socket.



3. Inspect the connector terminals to be sure they are all making good contact.

   - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

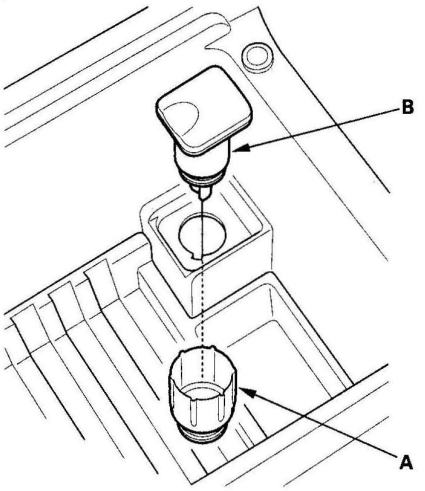
4. Turn the ignition switch to ACC (I), and check for voltage between the No. 2 terminal and body ground. There should be battery voltage.

   - If there is battery voltage, go to step 5.
   - If there is no battery voltage, check for:
     - Blown No. 8 (7.5A) fuse in the driver's under-dash fuse/relay box.
     - Blown No. 9 (15A) fuse in the passenger's under-dash fuse/relay box.
     - Faulty accessory power socket relay.
     - Poor ground (G501, G651).
     - An open in the wire.

5. Check for continuity between the No. 1 terminal and body ground. There should be continuity.

   - If there is continuity, go to step 6.
   - If there is no continuity, check for:
     - Poor ground (G501).
     - An open in the wire.

6. Remove the housing (A) and socket (B).



7. Install the power socket in the reverse order of removal.

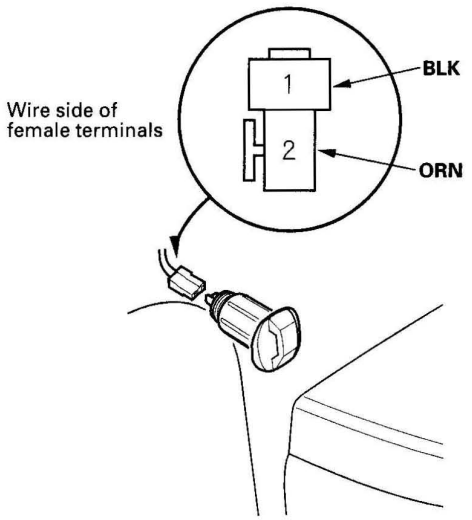
BACK

Protected by AR

Rear Accessory Power Socket Test/Replacement

1. Remove the left rear side trim panel (see page 20-57).

2. Disconnect the 2P connector from the rear accessory power socket.



3. Inspect the connector terminals to be sure they are all making good contact.

   - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
   - If the terminals looks OK, go to step 4.

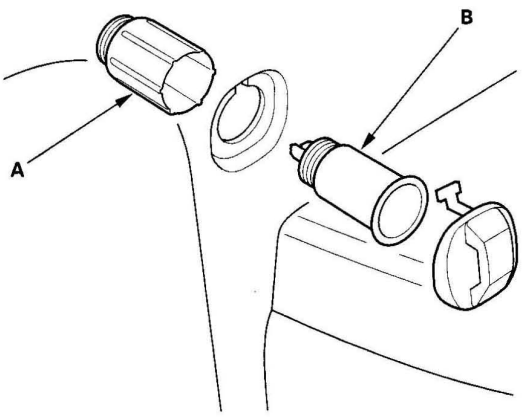
4. Turn the ingition switch to ACC (I), and check for voltage between the No. 2 terminal and body ground. There should be battery voltage.

   - If there is battery voltage, go to step 5.
   - If there is no battery voltage, check for:
     - Blown No. 61 (20A) fuse in the auxiliary fuse holder.
     - Blown No. 8 (7.5A) fuse in the driver's under-dash fuse/relay box.
     - Faulty rear accessory power socket relay.
     - Poor ground (G652).
     - An open in the wire.

5. Check for continuity between the No. 1 terminal and body ground. There should be continuity.

   - If there is continuity, go to step 6.
   - If there is no continuity, check for:
     - Poor ground (G602).
     - An open in the wire.

6. Remove the housing (A) and socket (B).



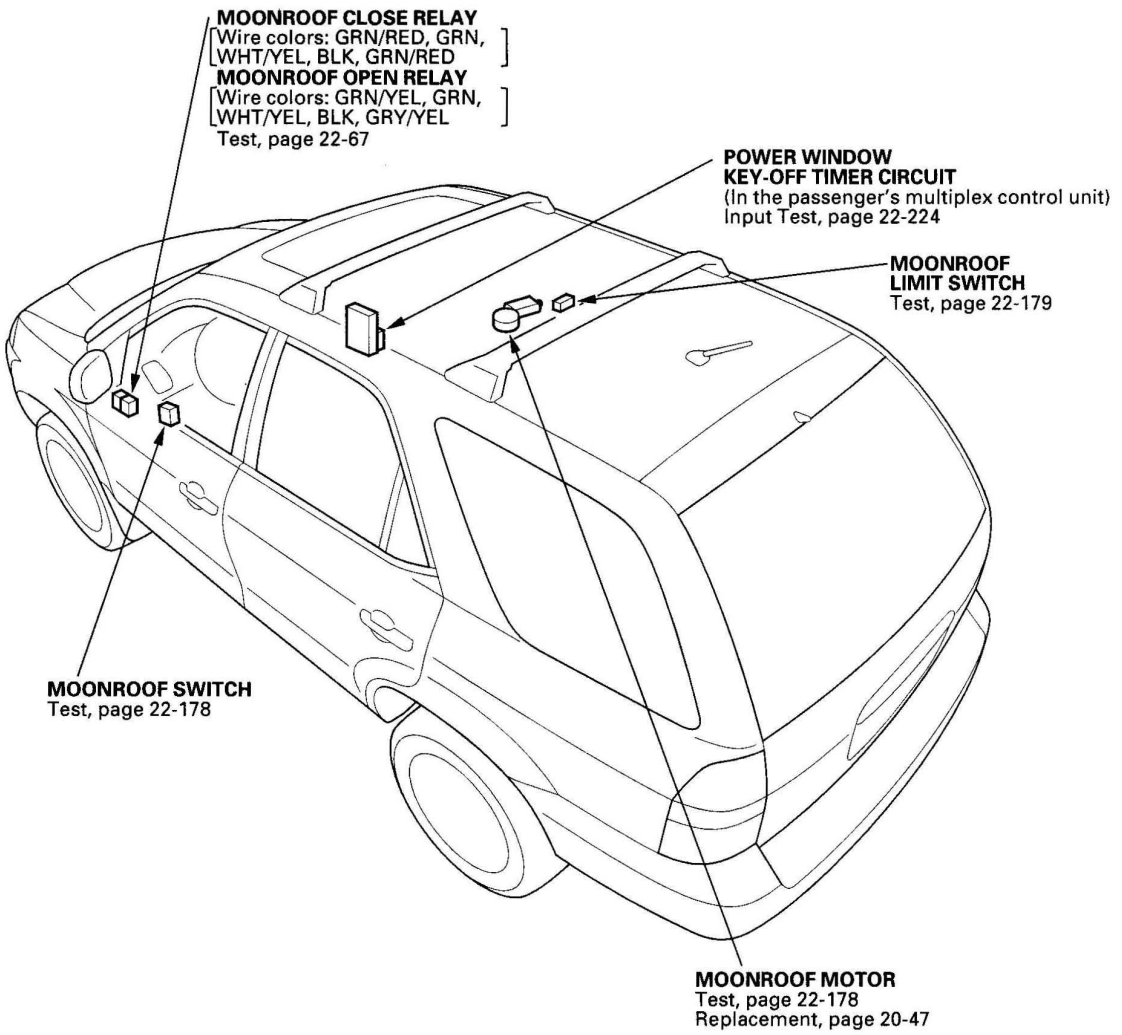
7. Install the power socket in the reverse order of removal.

BACK

Protected by AR

Moonroof

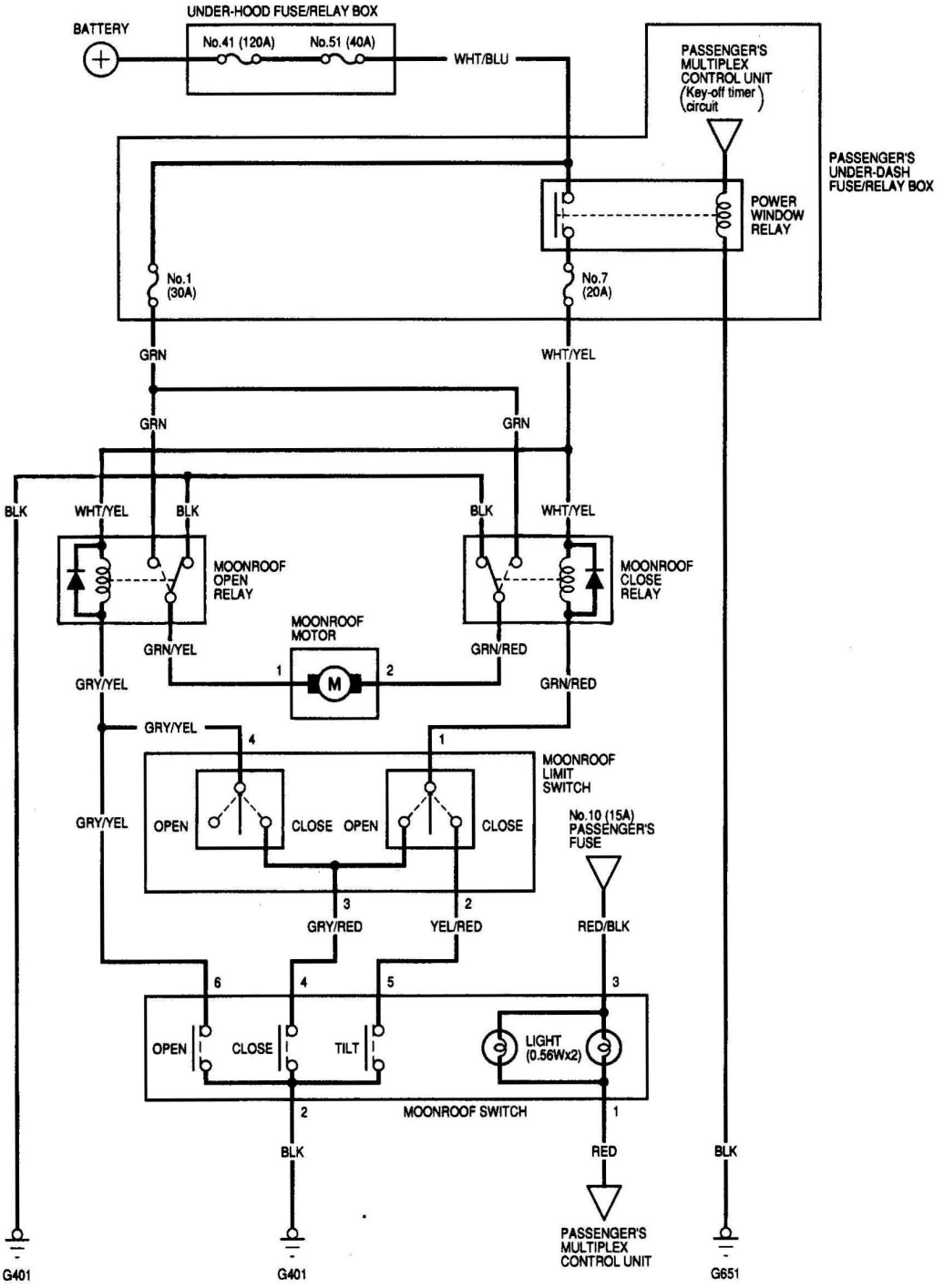
Component Location Index



BACK

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Circuit Diagram



BACK

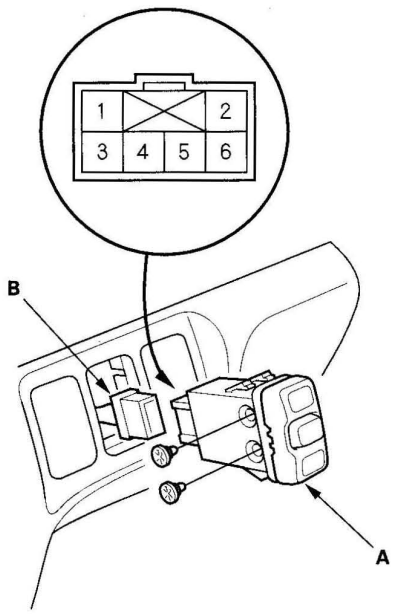
Protected by AR

Moonroof

Switch Test

NOTE: The moonroof can still be operated for about 10 minutes after the ignition switch is turned from the "II" to the "I" or "O" positions, as long as none of the doors have been opened. This provides a convenience to parked occupants while offering a degree of security against unwanted or accidental moonroof operation.

1. If the continuity is not as specified, replace the switch.
2. Carefully push out the moonroof switch (A) from behind the dashboard, then disconnect the 6P connector (B) from the switch.



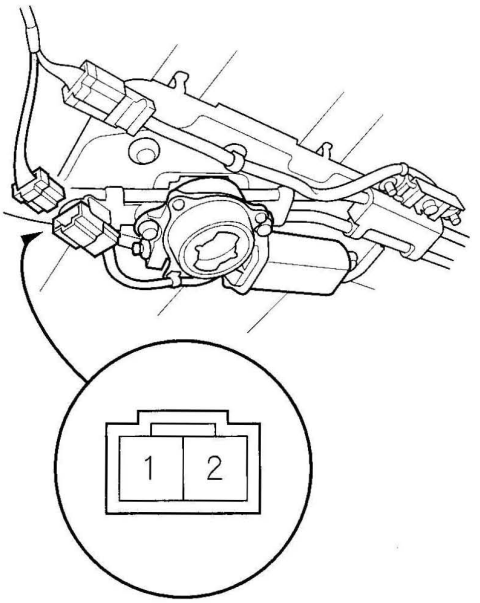
3. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	1		3	2	4	5	6
CLOSE							
TILT							
OPEN							

4. If the continuity is not as specified, replace the switch.

Motor Test

1. Remove the headliner (see page 20-59).
2. Disconnect the 2P connector from the moonroof motor.



3. Check the motor by connecting power and ground according to the table.

Terminal / Position	1	2
OPEN	⊕	⊖
CLOSE	⊖	⊕

4. If the motor does not run, replace it.

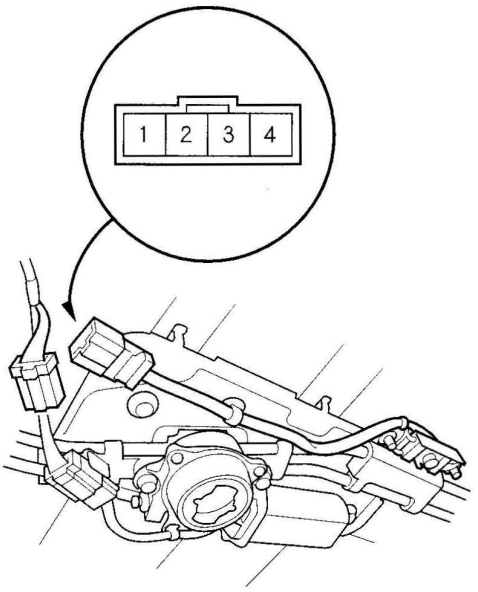
NOTE: See closing force check (see page 20-53) for motor clutch test.

BACK

Protected by AR

Limit Switch Test

1. Remove the headliner (see page 20-59).
2. Disconnect the 4P connector from the moonroof limit switch.



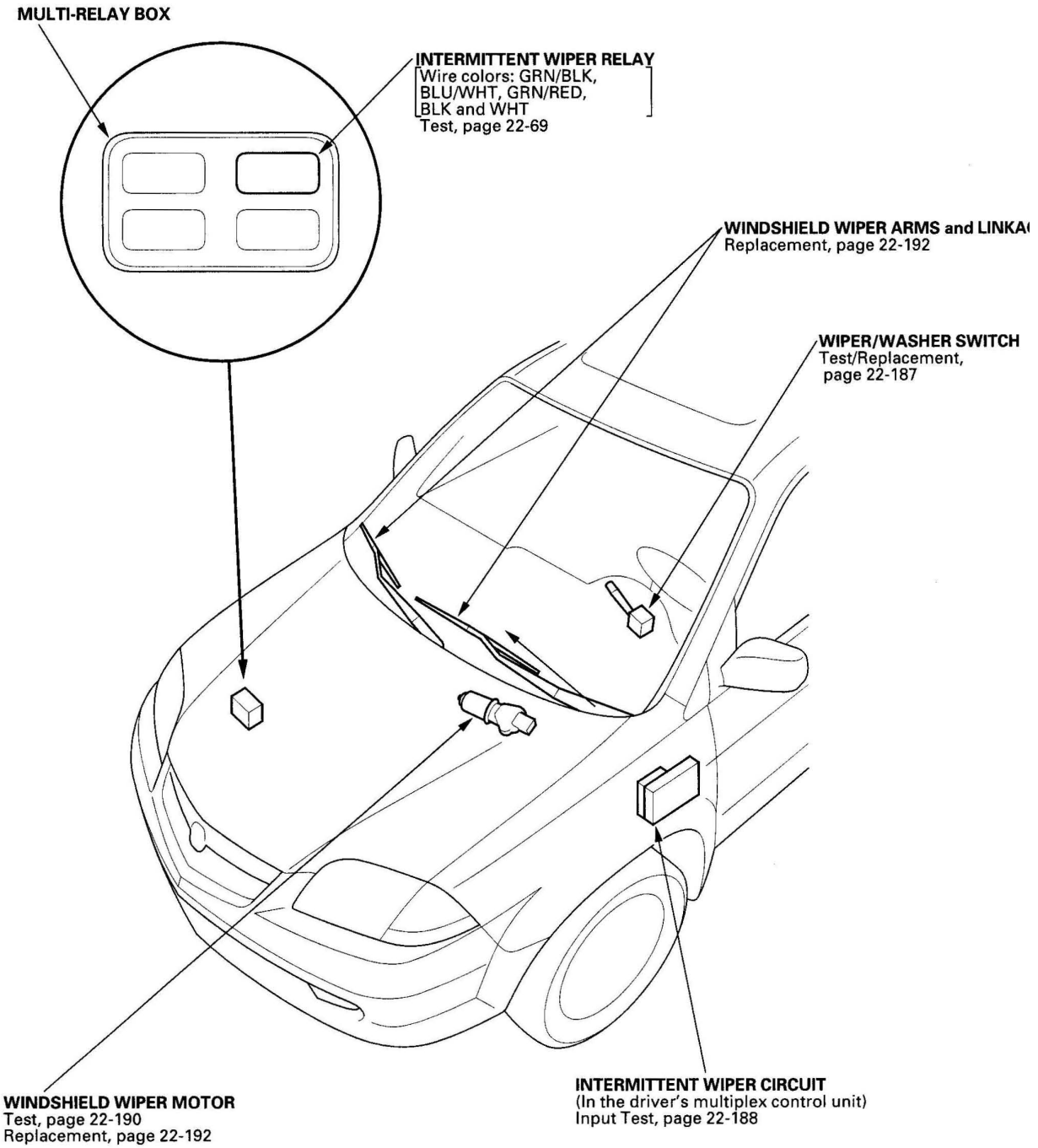
3. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	1	2	3	4
TILT	○	○	○	○
OPEN	○		○	
CLOSE	○	○	○	○

4. If there is no continuity, replace the motor.

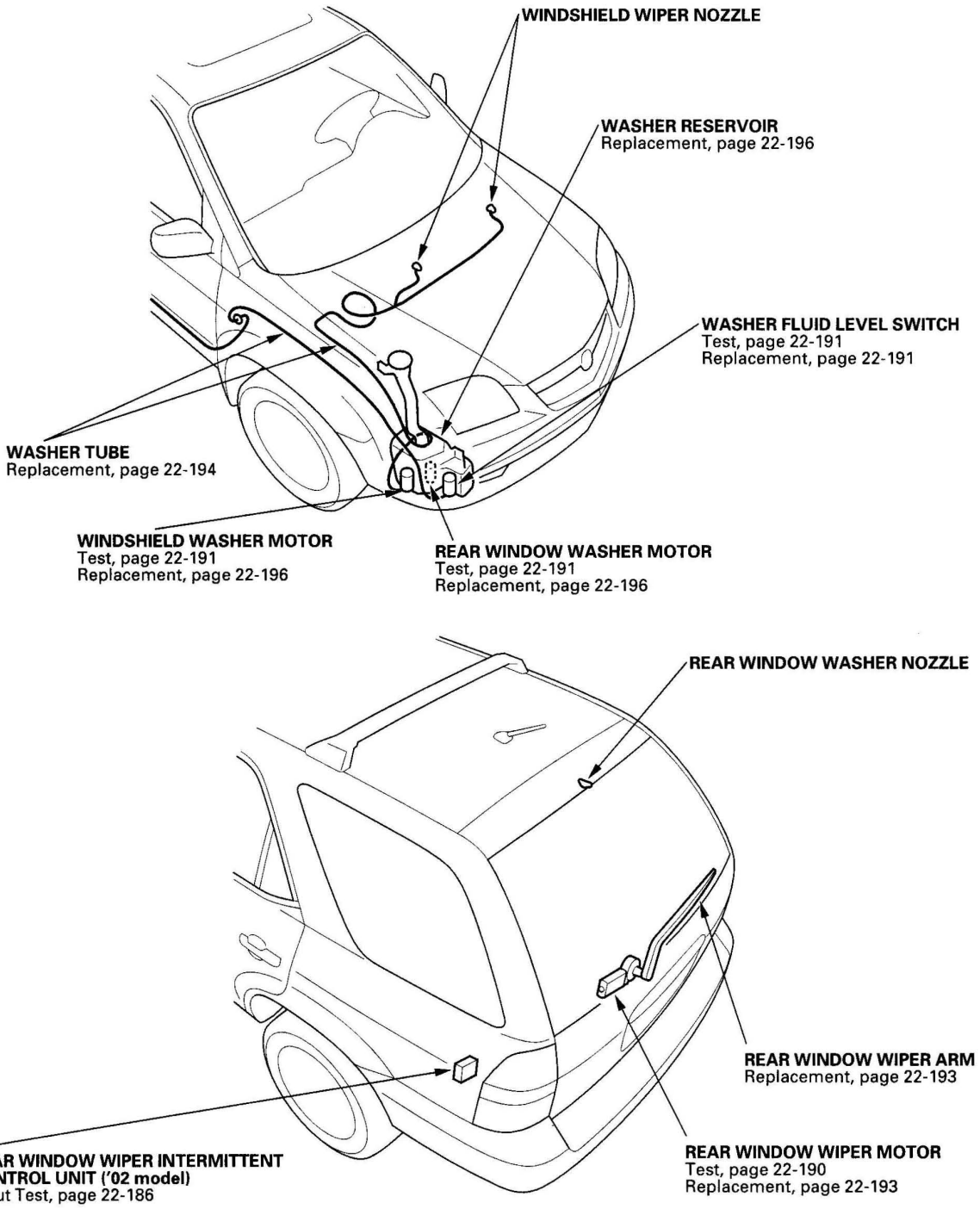
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Component Location Index



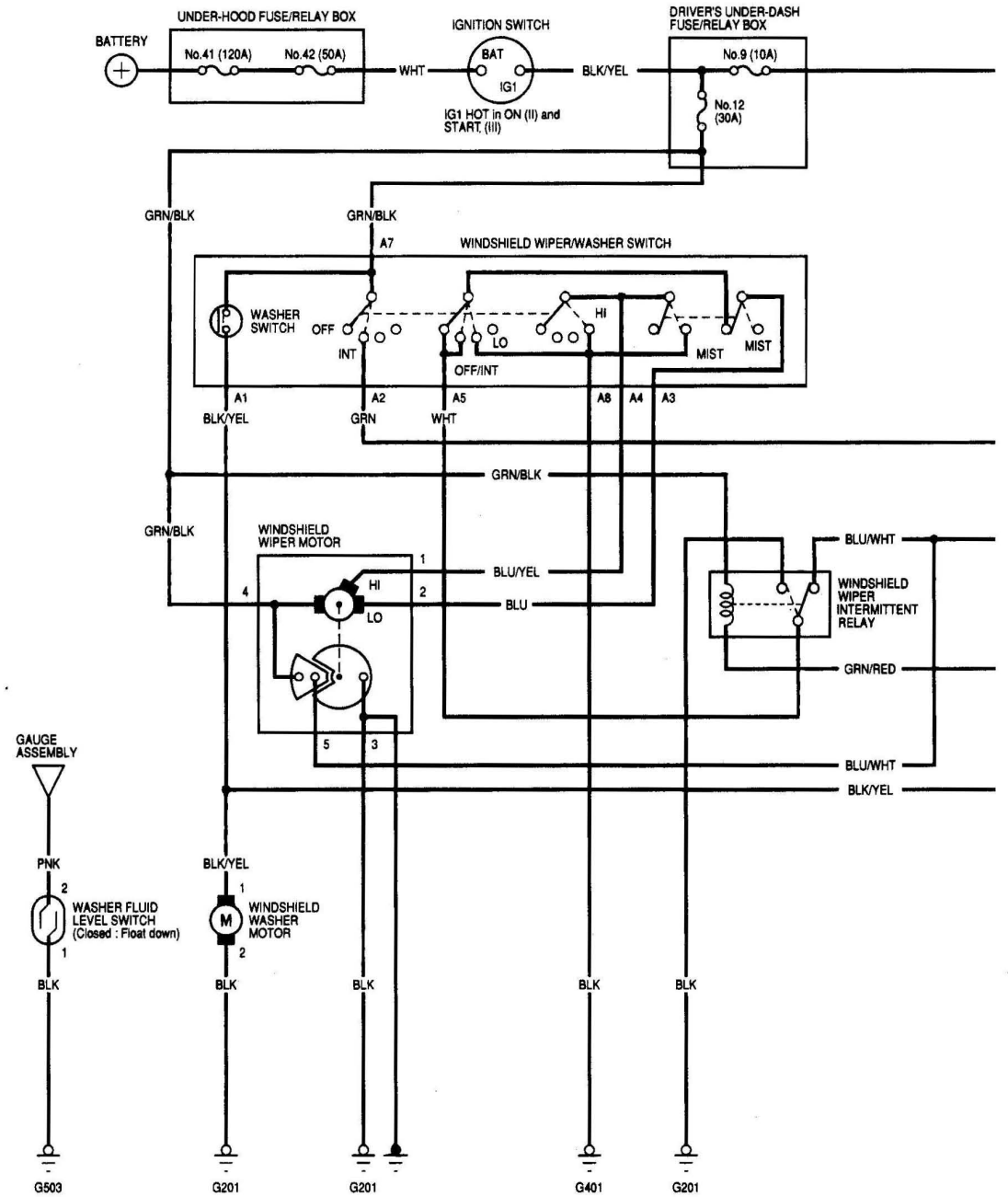
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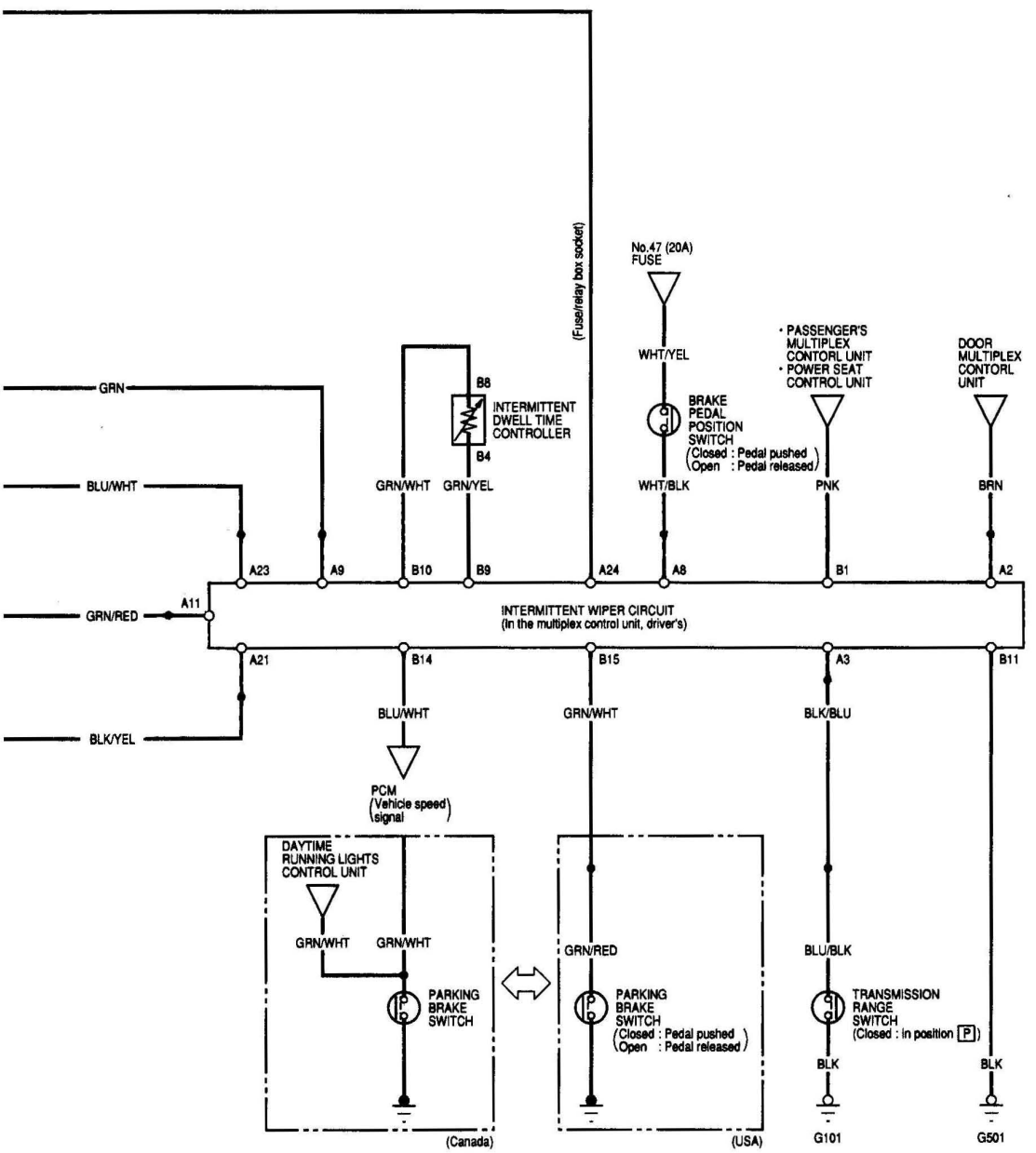
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Circuit Diagram - Windshield



BACK

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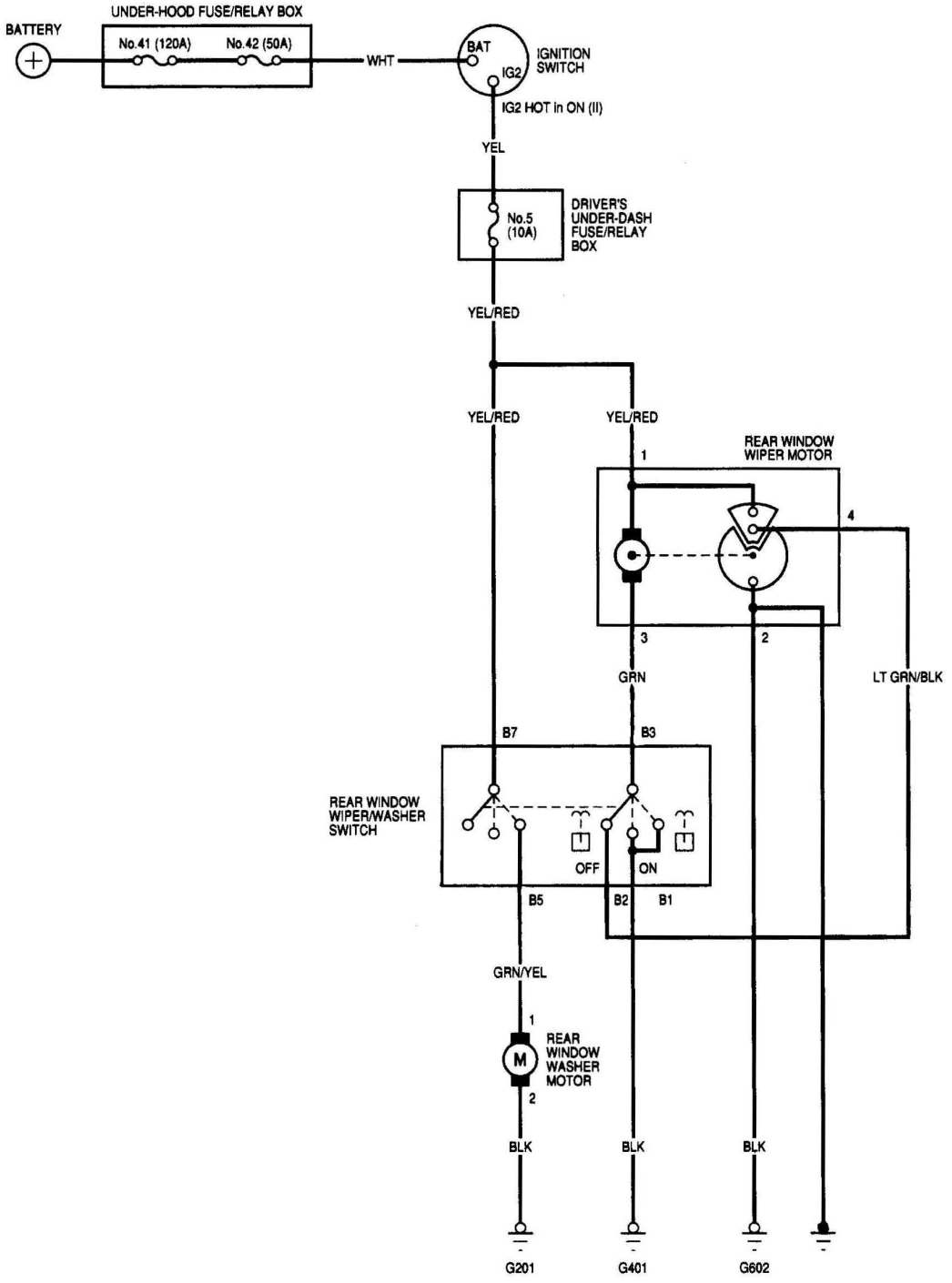


BACK

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Circuit Diagram - Rear Window

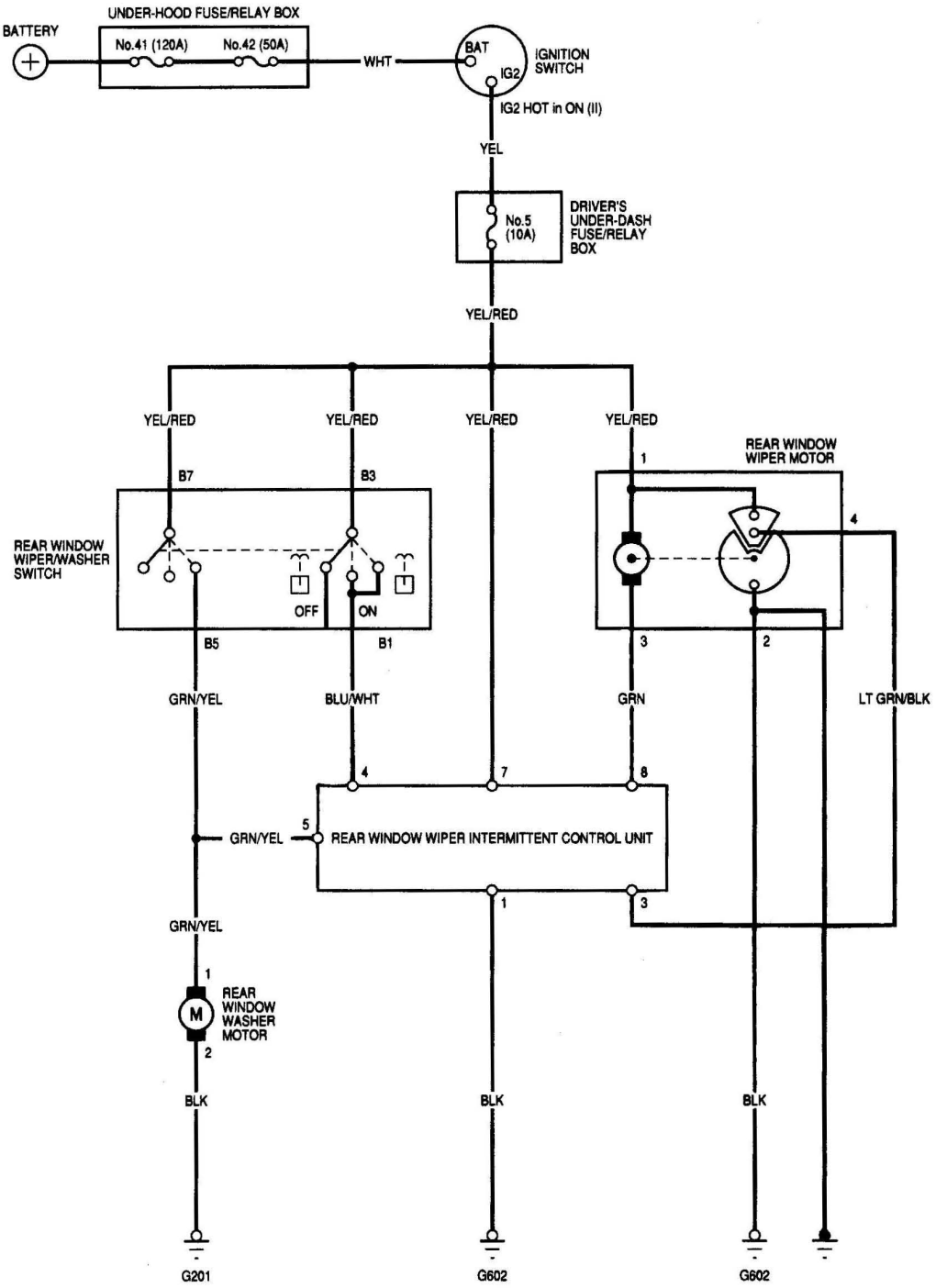
'01 model



BACK

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'02 model



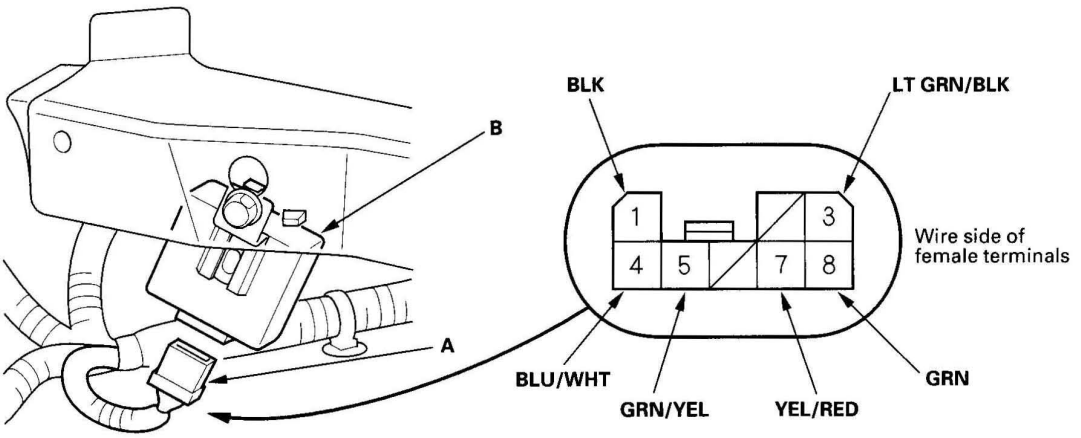
BACK

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Rear Window Wiper Intermittent Control Unit Input Test

'02 model

1. Remove the left rear side trim panel (see page 20-57).
2. Disconnect the 8P connector (A) from the rear window wiper intermittent control unit (B).



3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.
4. With the connector reconnected, make these input tests at the connectors.
   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all there input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G602) • An open in the wire
3	LT GRN/BLK	Ignition switch ON (II) and rear wiper in parked position.	Check for voltage to ground: There should be battery voltage.	• Blown No. 5 (10A) fuse in the driver's under-dash fuse/relay box • Faulty rear window wiper motor • An open in the wire
4	BLU/WHT	Ignition switch ON (II) and rear window wiper switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 5 (10A) fuse in the driver's under-dash fuse/relay box • Faulty wiper/washer switch • An open in the wire
5	GRN/YEL	Ignition switch ON (II) and rear window washer switch ON	Check for voltage to ground: There should be battery voltage.	
7	YEL/RED	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 5 (10A) fuse in the driver's under-dash fuse/relay box • An open in the wire

5. Disconnect the 8P connector, and make this test at the connector.
   - If the test indicates a problem, find and correct the cause, then recheck the system.
   - If the input test proves OK, the control unit must be faulty replace it.

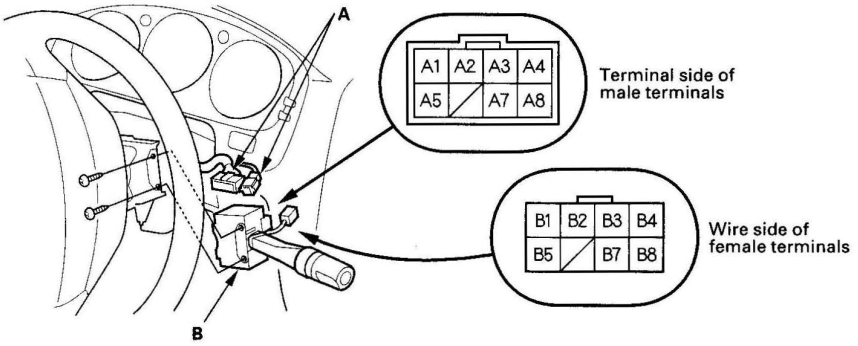
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
8	GRN	Ignition switch ON (II)	Attach to ground: The rear window wiper motor should run.	• Blown No. 5 (10A) fuse in the driver's under-dash fuse/relay box • Faulty rear window wiper motor • An open in the wire

BACK

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Wiper/Washer Switch Test/Replacement

1. Remove the dashboard lower cover (see page 20-67).
2. Remove the steering column covers (see page 17-25).
3. Disconnect the 8P connectors (A) from the wiper/washer switch (B), then remove the two screws and the switch.



4. Check for continuity between the terminals in each switch position according to the table. If the switch fails any continuity check, replace the switch.

Windshield:

Position \ Terminal	A1	A2	A3	A4	A5	A7	A8	B4		B8
OFF			○		○					
INT		○				○				
			○		○					
LO			○				○			
HI				○			○			
Mist switch ON				○			○			
Washer switch ON	○					○				
Intermittent dwell time controller turned								○	0—30 kΩ	○

Rear Window:

Position \ Terminal	B1	B2	B3	B5	B7
OFF		○	○		
ON	○		○		
Wiper and Washer switch ON	○		○	○	○

BACK

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Control Unit Input Test

1. Before testing the wiper/washer control functions, troubleshoot the multiplex control system (see page 22-212).

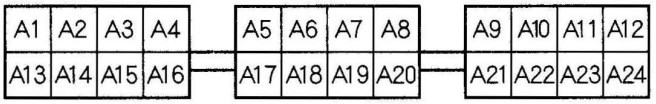
Driver's Multiplex Control Unit:

2. Remove the driver's multiplex control unit from the driver's under-dash fuse/relay box, and disconnect its connector.

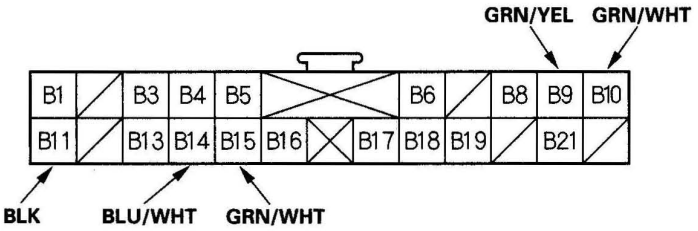
3. Inspect all connector and socket terminals to be sure they are making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

DRIVER'S UNDER-DASH FUSE/RELAY BOX SOCKET



DRIVER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

BACK

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4. With the driver's multiplex control unit still disconnected, make these input tests at the connector and driver's under-dash fuse/relay box sockets.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, driver's multiplex control unit must be faulty; replace it.

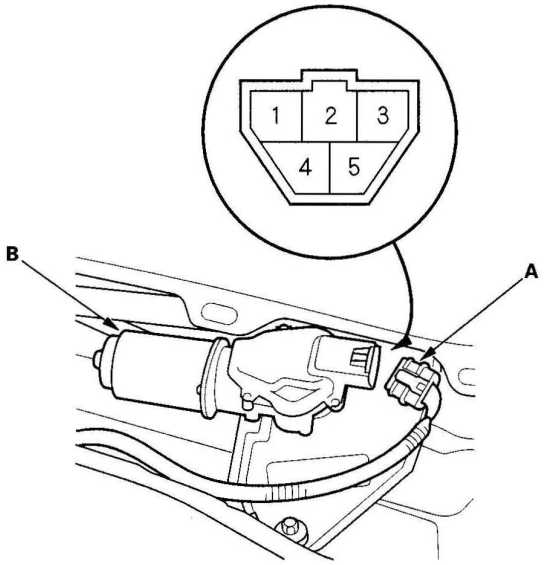
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B11	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire
A24	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10A) fuse in the driver's under-dash fuse/relay box • Faulty driver's under-dash fuse/relay box
A3		Shift lever in P	Check for continuity to ground: There should be continuity.	• Faulty transmission range switch • An open in the wire
A8		Brake pedal pressed	Check for voltage to ground: There should be battery voltage.	• Blown No. 47 (20A) fuse in the under-hood fuse/relay box • Faulty brake pedal position switch • An open in the wire
B14	BLU/WHT	Under all conditions	Check for continuity between the B14 terminal and No. 9 terminal of the PCM 32P connector A: There should be continuity.	• An open in the wire
B15	GRN/WHT	Parking brake pedal pressed	Check for continuity to ground: There should be continuity.	• Faulty parking brake switch • An open in the wire
B9 B10	GRN/YEL GRN/WHT	Intermittent dwell time control ring turned	Check resistance between the terminals: It should vary from 0 to approx. 30 kΩ as the ring is turned.	• Faulty intermittent dwell time controller • An open in the wire
A9	Fuse/relay box socket	Ignition switch ON (II) and wiper switch at INT	Check for voltage to ground: There should be battery voltage.	• Blown No. 12 (30A) fuse in the driver's under-dash fuse/relay box • Faulty wiper switch • Faulty driver's under-dash fuse/relay box • An open in the wire
A11		Ignition switch ON (II) and INT switch OFF	Check for voltage to ground: There should be battery voltage.	• Blown No. 12 (30A) fuse in the driver's under-dash fuse/relay box • Faulty intermittent wiper relay • Faulty driver's under-dash fuse/relay box • An open in the wire
A21		Ignition switch ON (II) and washer switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 12 (30A) fuse in the driver's under-dash fuse/relay box • Faulty washer switch • Faulty driver's under-dash fuse/relay box • An open in the wire
A23		Ignition switch ON (II) and wiper switch OFF	Check for voltage to ground: There should be battery voltage.	• Blown No. 12 (30A) fuse in the driver's under-dash fuse/relay box • Faulty wiper motor • Faulty driver's under-dash fuse/relay box • An open in the wire

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Wiper Motor Test

Windshield:

1. Remove the cowl cover (see page 22-192).
2. Disconnect the wiper motor connector (A) from the wiper motor (B).



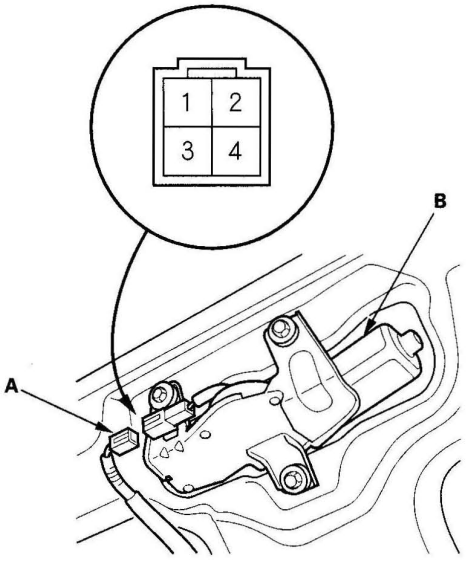
3. Test the motor by connecting battery power and ground according to the table.
   If the motor does not run or fails to run smoothly, replace it.

Terminal / Position	1	2	4
LOW SPEED		⊖	⊕
HIGH SPEED	⊖		⊕

4. Connect an analog voltmeter between the No. 5 (+) and No. 3 (−) terminals, and run the motor at low or high speed. The voltmeter should indicate 0 V and 4 V or less alternately.
   - If the motor does not run replace the motor.

Rear Window:

1. Remove the tailgate trim panel (see page 20-58).
2. Disconnect the 4P connector (A) from the rear window wiper motor (B).



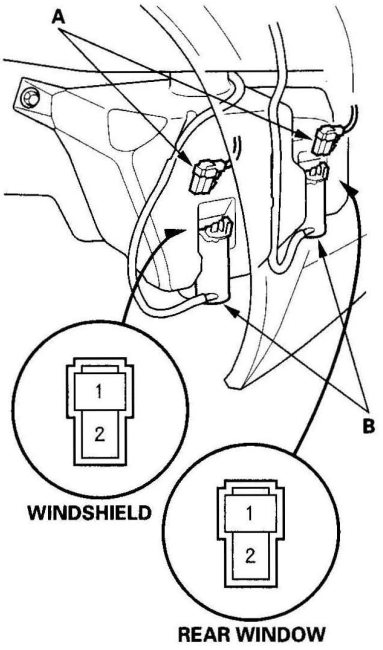
3. Test the motor by connecting battery power to the wiper motor 4P connector No. 1 terminal and grounding the No. 3 terminal. The motor should run. If the motor does not run or fails to run smoothly, replace the motor.
4. Connect an analog voltmeter between the No. 4 (+) and No. 2 (−) terminals, and run the motor. The voltmeter should indicate 0 V and 4 V or less alternately.
   - If the motor does not run replace the motor.

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Washer Motor Test

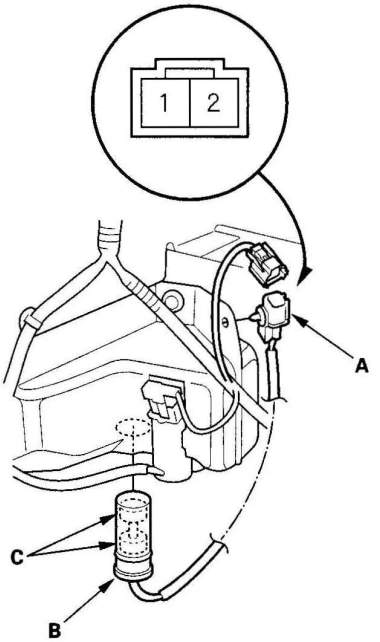
1. Remove the right inner fender (see page 20-121).
2. Disconnect the 2P connectors (A) from the washer motors (B).



3. Test the washer motor by connecting battery power to the No. 1 terminal and grounding to the No. 2 terminal. If the motor does not run or fails to run smoothly, replace it.

Washer Fluid Level Switch Test/ Replacement

1. Remove the right inner fender (see page 20-121).
2. Disconnect the 2P connector (A) from the washer fluid level switch (B).



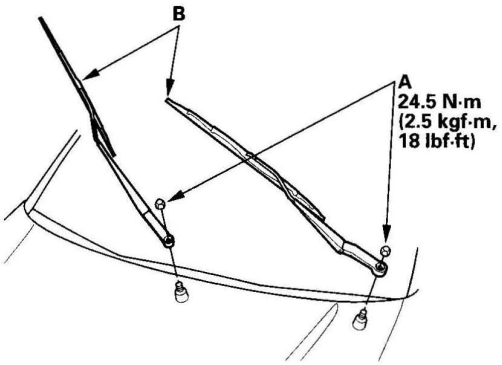
3. Check for continuity between the No. 1 and No. 2 terminals in each float switch position (C).
   - There should be continuity when the float is down.
   - There should be no continuity when the float is up.
4. If the continuity is not as specified, pull the switch out of the reservoir and replace it.

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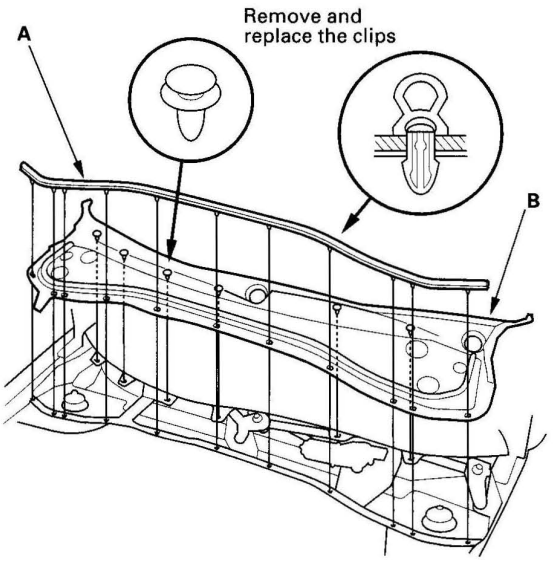
Wiper Motor Replacement

Windshield:

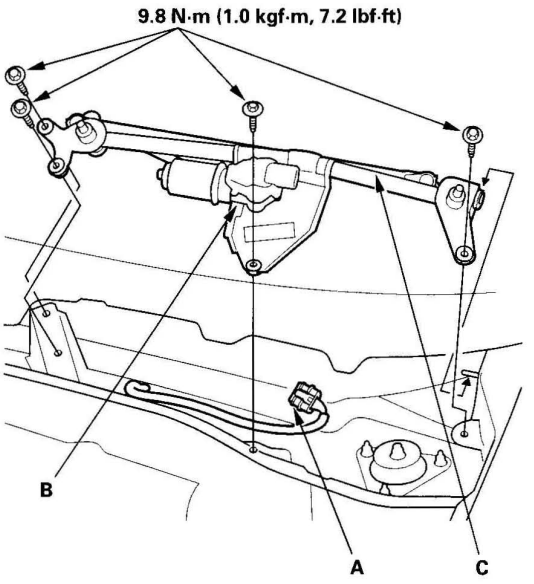
1. Remove the nuts (A) and the windshield wiper arms (B).



2. Remove the hood seal (A) and cowl cover (B).



3. Disconnect the 5P connector (A) from the windshield wiper motor (B).

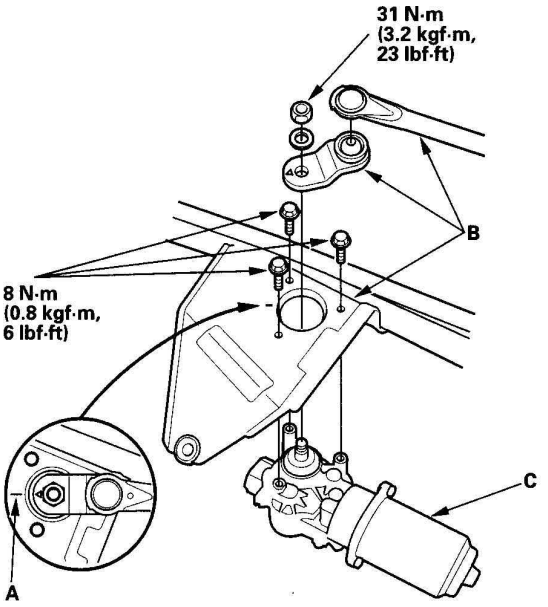


4. Remove the mounting bolts and the wiper linkage assembly (C).

BACK

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5. Scribe a line (A) across the link and windshield wiper linkage to show the original adjustment. Separate the windshield wiper linkage (B) from the wiper motor (C).

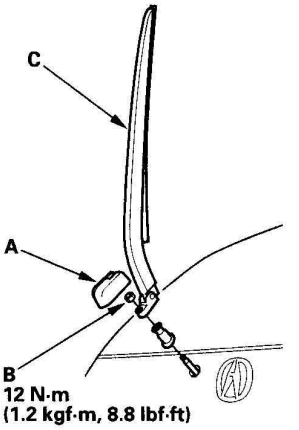


6. Install in the reverse order of removal, and note these items:

   - Grease the moving parts.
   - Before reinstalling the wiper arms, turn the wiper switch ON, then OFF to return the wiper shafts to the park position.
   - If necessary, replace any damaged clips.
   - Make sure the wiper motor operates properly.

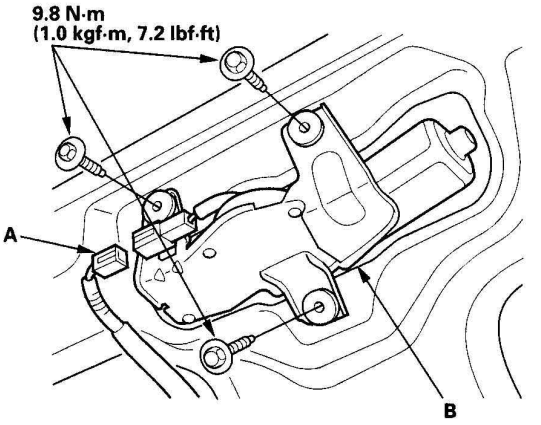
Rear Window:

1. Remove the cap (A), mounting nut (B) and rear window wiper arm (C).



2. Open the tailgate and remove the tailgate lower trim panel (see page 20-58).

3. Disconnect the 4P connector (A) from the rear window wiper motor (B).



4. Remove the mounting bolts and the wiper motor.

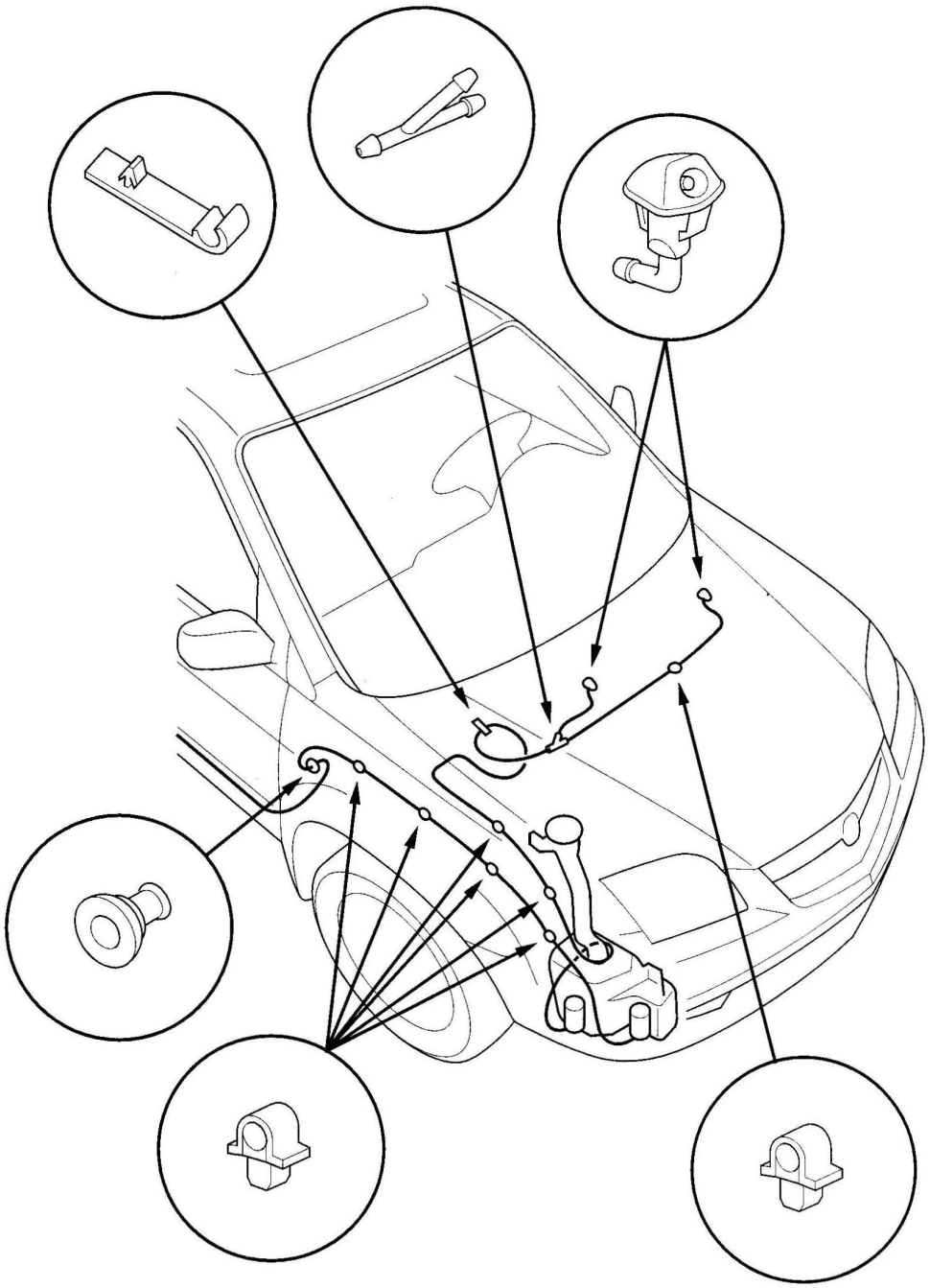
5. Install in the reverse order of removal.

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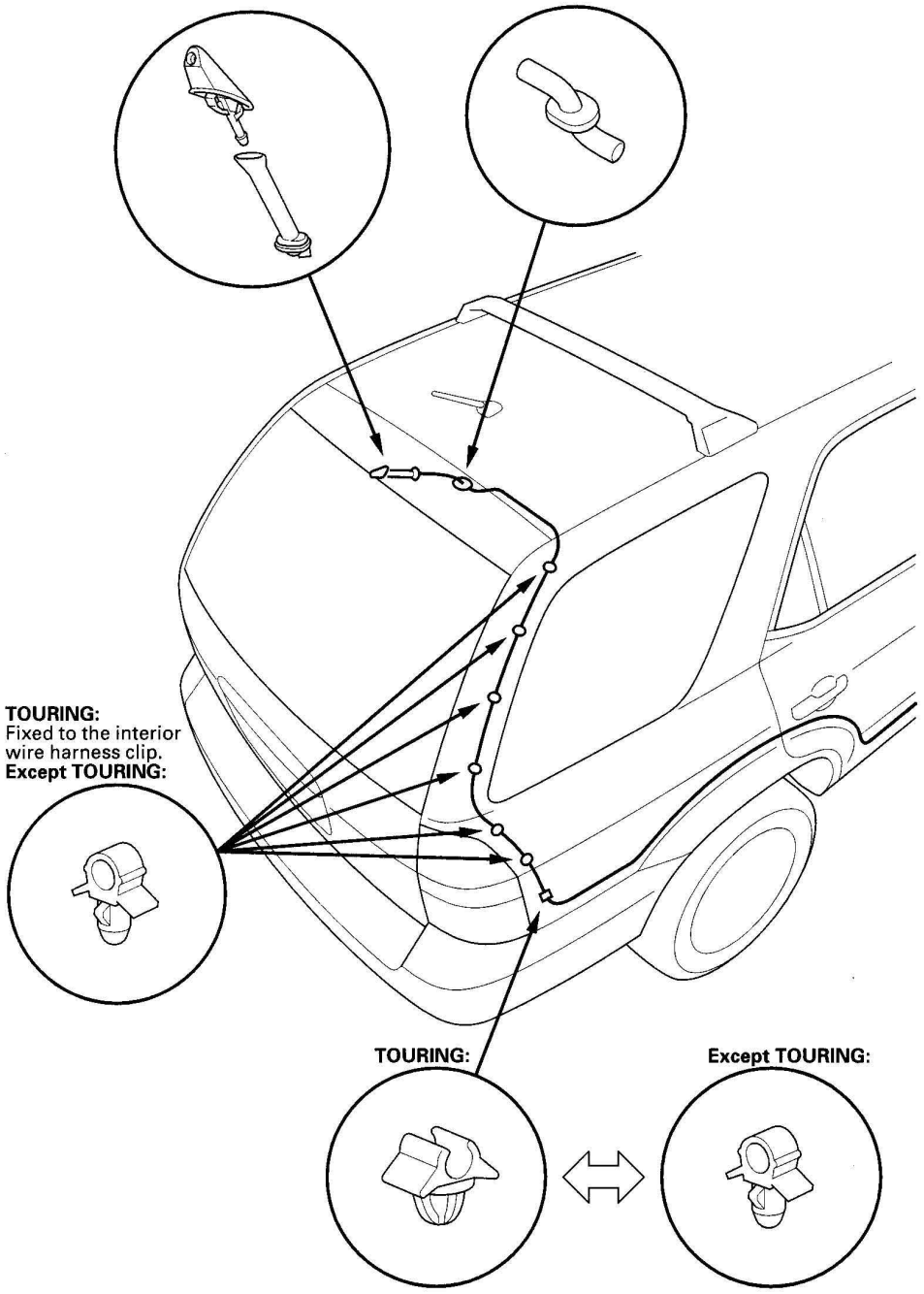
Washer Tubes Replacement

1. Remove the right inner fender (see page 20-121).
2. Remove the windshield washer nozzles and clips, then remove the tube.



BACK

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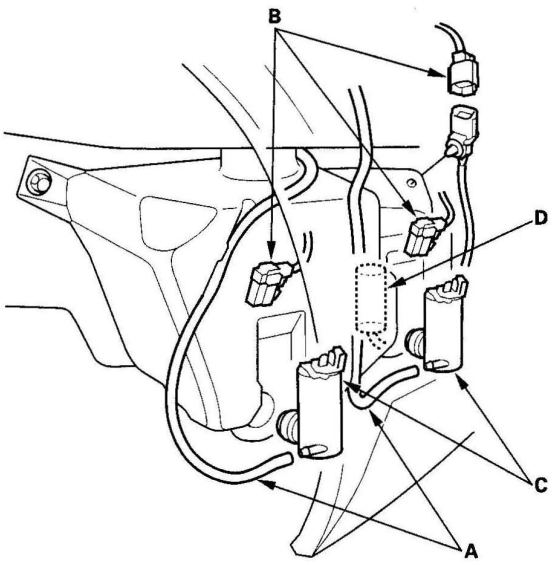
3. Install in the reverse order of removal. Take care not to pinch the washer tube. Check the washers operation.

BACK

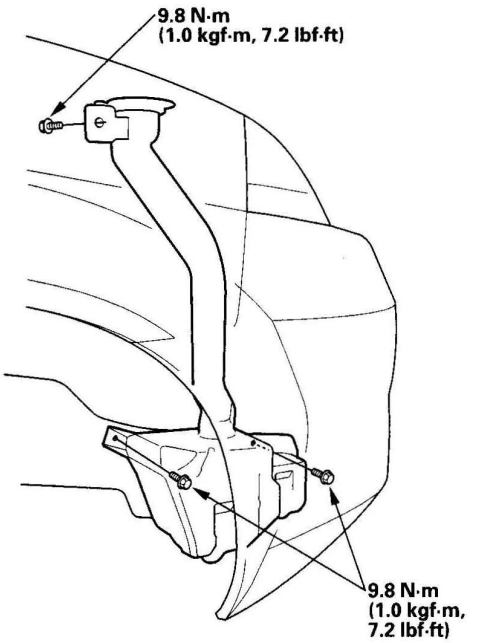
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Washer Reservoir Replacement

1. Remove the right inner fender (see page 20-121).
2. Disconnect the washer tubes (A).



3. Disconnect the 2P connectors (B) from the washer motors (C) and the washer fluid level switch (D).
4. Remove the three mounting bolts and washer reservoir.



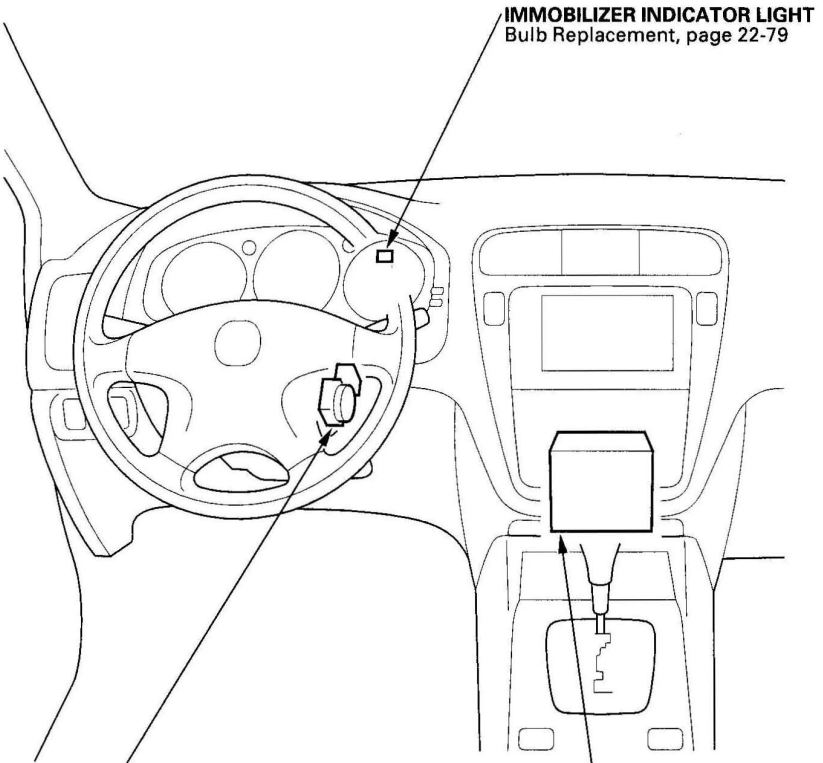
5. Install in the reverse order of removal. Make sure the washer motors operates properly.

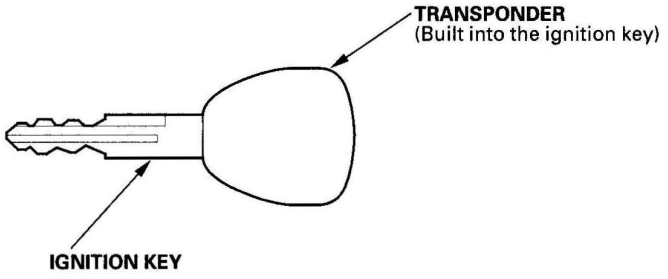
BACK

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Immobilizer System

Component Location Index





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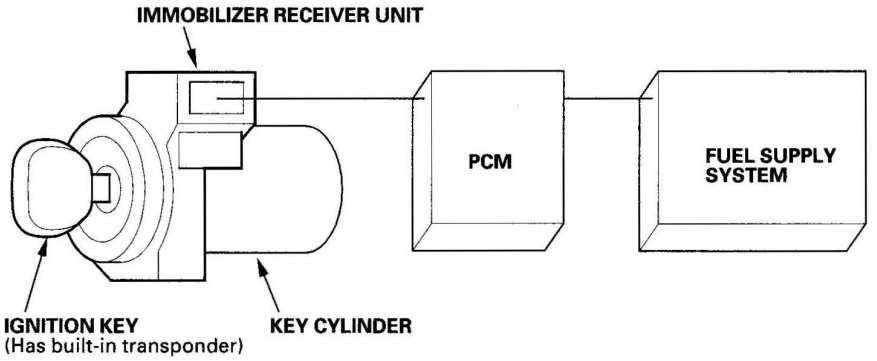
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Immobilizer System

System Description

The vehicle is equipped with an immobilizer system that will disable the vehicle unless the proper ignition key is used. This system consists of a transponder located in the ignition key, an immobilizer receiver unit, an indicator light, and the PCM.

When the key is inserted in the ignition switch and turned to the (II) position, the immobilizer receiver unit sends power to the transponder in the ignition key. The transponder then sends a coded signal back through the immobilizer receiver unit to the PCM.



- If the proper key has been used, the immobilizer indicator light will come on for about two seconds, then go off.
- If the wrong key has been used whose code was not received or recognized by the unit, the indicator light will come on for about 2 seconds, then it will blink until the ignition switch is turned OFF.
- If the ignition switch is turned OFF, the indicator will blink for about 5 seconds to signal that the unit has been set correctly, then the indicator will go off.
- If the customer has lost his key, and cannot start the engine, contact Acura Customer Relations.

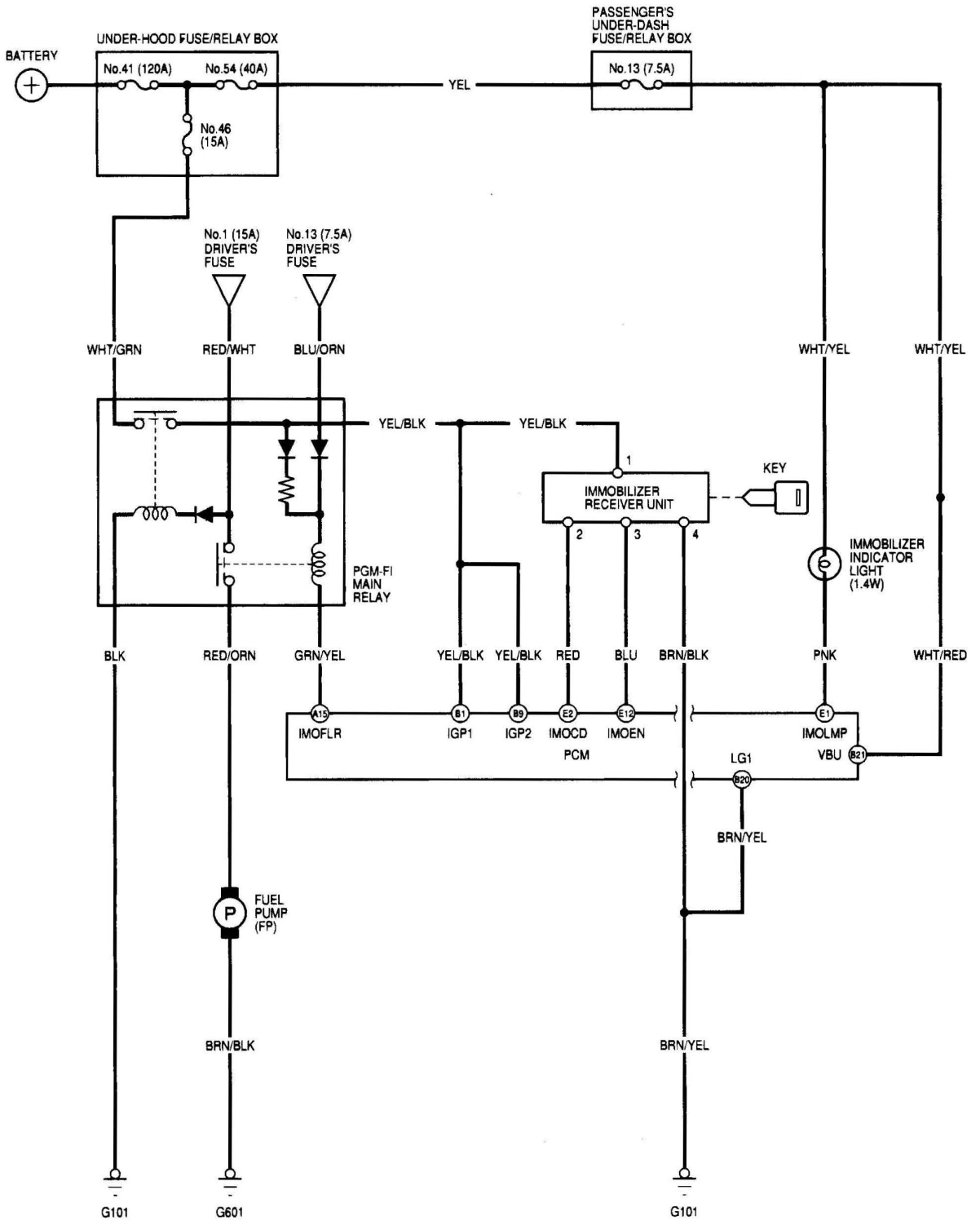
IMMOBILIZER INDICATOR LIGHT BLINKING PATTERN:

IGNITION SWITCH		ON / OFF
PROPER KEY INSERTED	INDICATOR LIGHT	ON / OFF (2 sec, 5 sec, 1 Hz)
WRONG KEY INSERTED	INDICATOR LIGHT	ON / OFF (1 Hz)

BACK

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Circuit Diagram



BACK

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Troubleshooting

Follow this procedure if the vehicle does not start after rewriting the PCM with the Honda PGM Tester.

Note these items before troubleshooting:

- Due to the action of the immobilizer system, the engine takes slightly more time to start than engines of vehicle without an immobilizer system.
- When the system is normal, and the proper key is inserted, the indicator light comes on for 2 seconds, then it will go off.
- If the indicator starts to blink after 2 seconds, or if the engine does not start, turn the ignition switch OFF (0) and repeat the starting procedure.
  If the engine still does not start, continue with this procedure.

1. Using a scan tool, check for a Diagnostic Trouble Code (DTC) P1607 (see page 11-3).

   Is DTC P1607 indicated?

   YES – Substitute the PCM with a known-good PCM and retest (see page 11-5). ■

   NO – Go to step 2.

2. Turn the ignition switch ON (II) with the proper key.

3. Check to see if the immobilizer indicator light comes on.

   Does the indicator light blink?

   YES – Go to step 4.

   NO – Check for these problems: ■

   - An open in the PNK wire between the gauge assembly and PCM.
   - A faulty immobilizer indicator light.
   - A blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box.
   - A faulty PGM-FI main relay.
   - A blown No. 46 (15A) fuse in the under-hood fuse/relay box.
   - A blown No. 1 (15A) fuse in the driver's under-dash fuse/relay box.

4. Remove the steering column covers (see page 17-25).

5. Check for voltage between the No.1 terminal and body ground with the ignition switch turned ON (II).

   Is there battery voltage?

   YES – Go to step 6.

   NO – Check for these problems: ■

   - An open in the YEL/BLK wire between the PGM-FI main relay and the immobilizer receiver unit.

BACK

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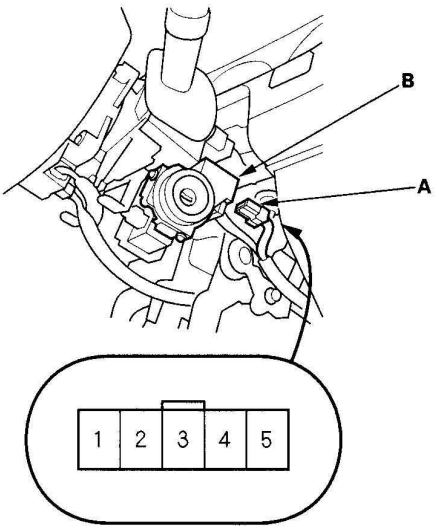
6. Check for voltage between the No. 4 terminal and body ground.

   Is there less than 1 V?

   YES – Go to step 8.

   NO – Repair open in the BRN/BLK (BRN/YEL) wire between the immobilizer receiver unit and G101. ■

7. Disconnect the 5P connector (A) from the immobilizer receiver unit (B).



Wire side of female terminals

8. Check for continuity between the No. 2 terminal and PCM connector terminal E2.

   Is there continuity?

   YES – Go to step 9.

   NO – Repair open in the RED wire between the immobilizer receiver unit and PCM. ■

9. Check for continuity between the No. 3 terminal and PCM connector terminal E12.

   Is there continuity?

   YES – Replace the immobilizer receiver unit. ■

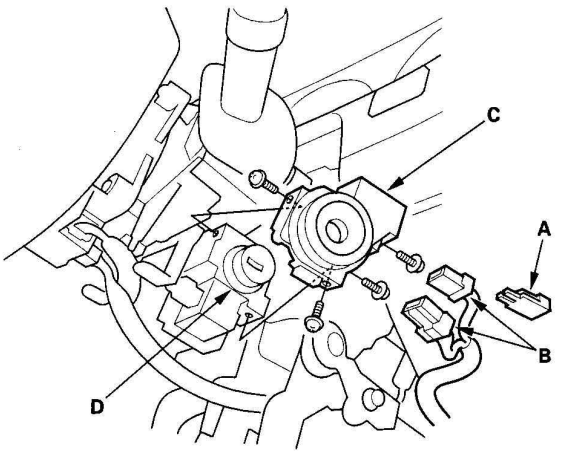
   NO – Repair open in the BLU wire between the immobilizer receiver unit and PCM. ■

Immobilizer Receiver Unit Replacement

1. Remove the driver's dashboard lower cover (see page 20-67).

2. Remove the steering column covers (see page 17-25).

3. Remove the gray connector lock (A) from the 5P connector.



4. Disconnect the 5P and 7P connectors (B) from the immobilizer receiver unit (C).

5. Remove the screws and the immobilizer receiver unit from the ignition key cylinder (D).

6. Install in the reverse order of removal.

7. After replacement, check the immobilizer system.

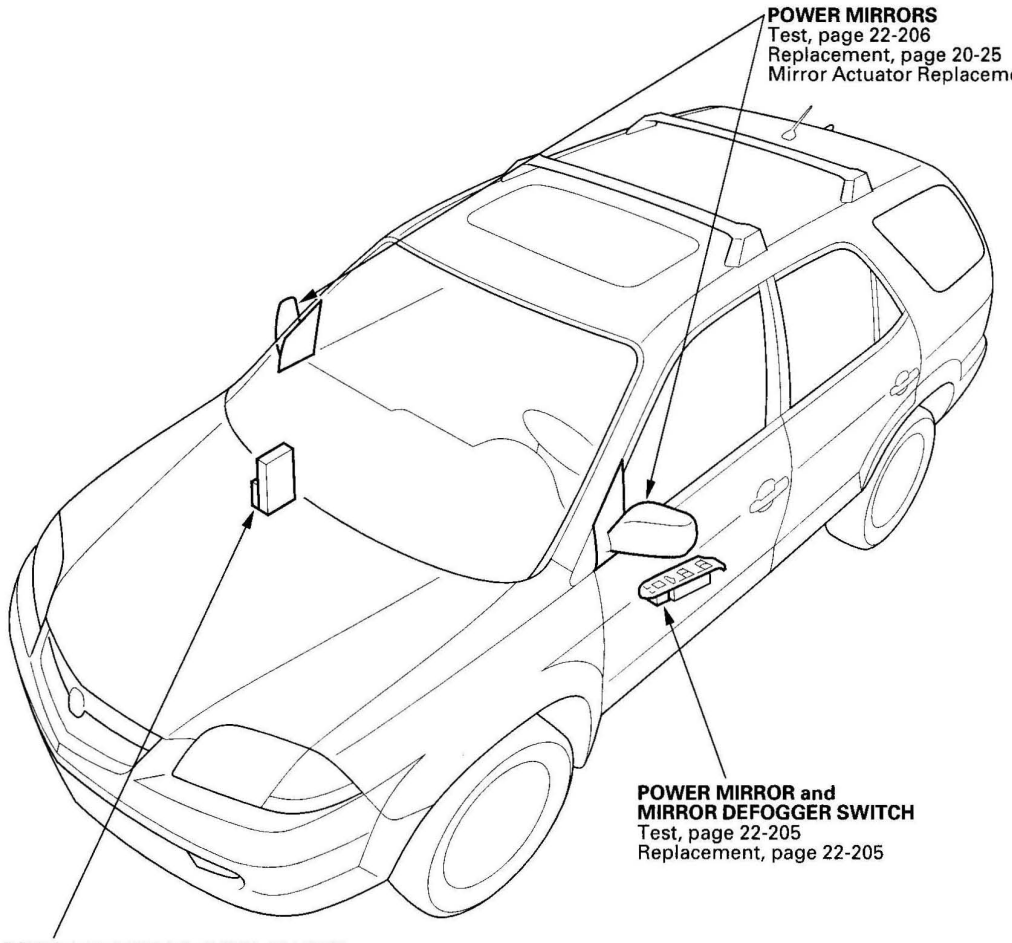
BACK

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Power Mirrors

Component Location Index

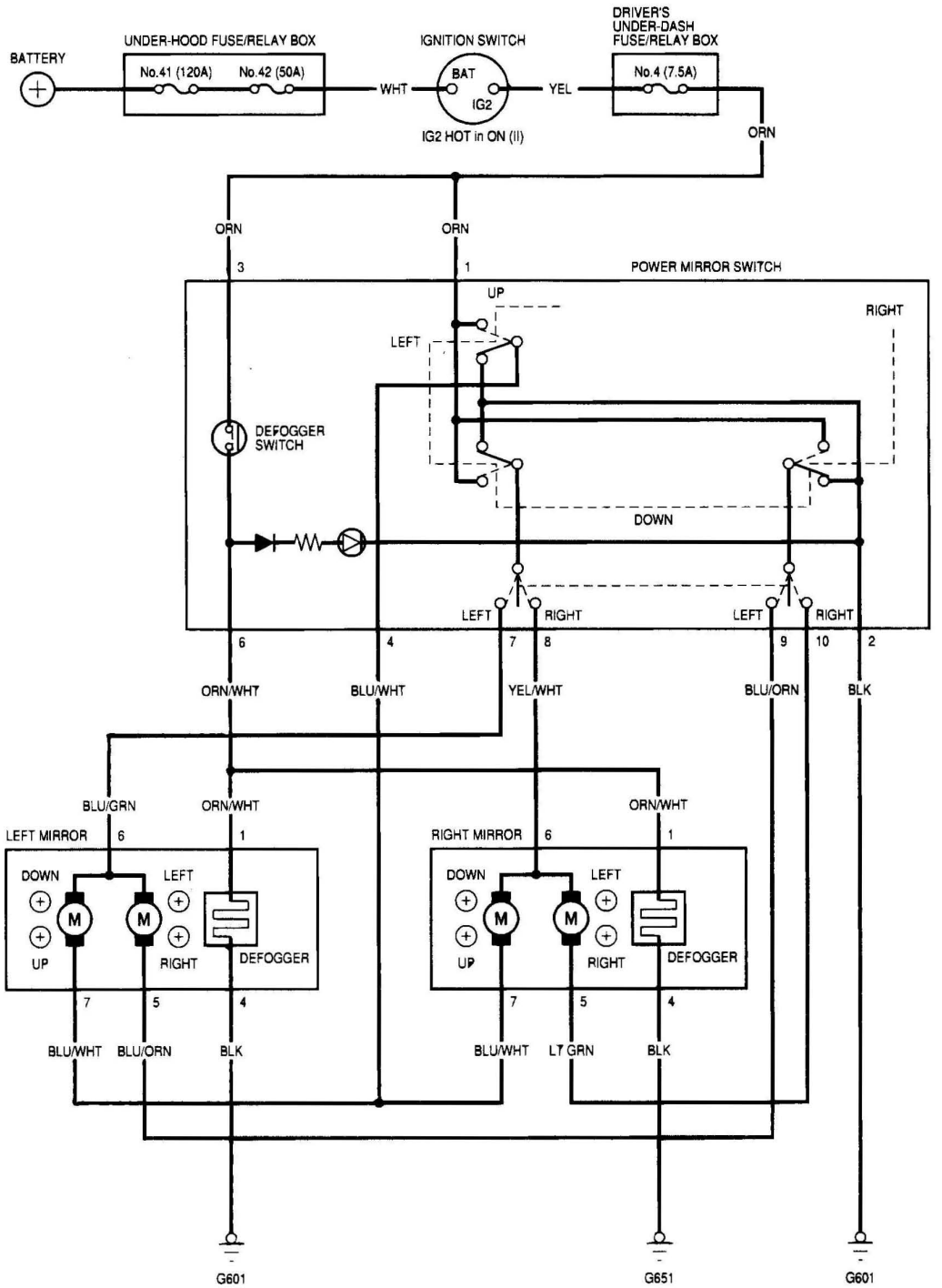
NOTE: For the power mirror with DPMS circuit diagram and input tests, refer to the Driving Position Memory System (DPMS) (page 22-266).



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Circuit Diagram - Without DPMS

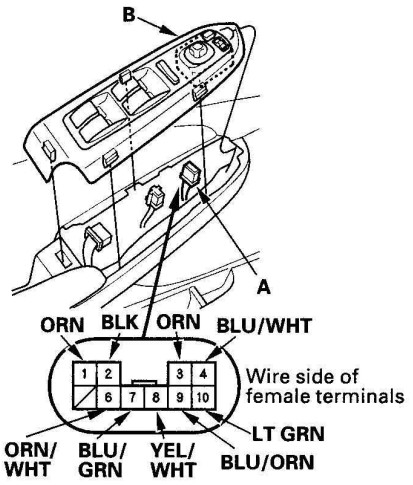


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Function Test - Without DPMS

1. Remove the driver's door switch trim (see page 20-6).



2. Disconnect the 10P connector (A) from the power mirror switch (B), and inspect the terminals. If OK, go to step 3.

3. Choose the appropriate test based on the symptom:
   - Both mirrors don't work, go to step 4.
   - Left mirror doesn't work, go to step 6.
   - Right mirror doesn't work, go to step 7.
   - Defoggers don't work , go to step 8.

Both mirrors

4. Reconnect the power mirror switch connector, and check for voltage between the No. 1 terminal and body ground with the ignition switch ON (II) while operating the power mirror switch.
   There should be battery voltage.
   - If there is no battery voltage, check for:
     - blown No. 4 (7.5A) fuse in the driver's under-dash fuse/relay box.
     - an open in the ORN wire.
   - If there is battery voltage, go to step 5.

5. Check for voltage between the No. 2 terminal and body ground while operating the power mirror switch.
   There should be less than 1 V.
   - If there is more than 1 V, check for:
     - an open in the BLK wire.
     - poor ground (G601).
   - If there is less than 1 V, check both mirrors individually as described in step 6 and 7.

Left mirror

6. Connect the No. 1 terminal to the No. 7 terminal, and the No. 4 (or No. 9) terminal to body ground with jumper wires. The left mirror should tilt down (or swing left) with the ignition switch ON (II).
   - If the mirror does not tilt down (or does not swing left), check for an open in the BLU/WHT (or BLU/ORN) wire between the left mirror and the 10P connector. If the wire is OK, check the left mirror actuator.
   - If the mirror neither tilts down nor swings left, check for an open in the BLU/GRN wire.
   - If the mirror works properly, check the mirror switch.

Right mirror

7. Connect the No. 1 terminal to the No. 8 terminal, and the No. 4 (or No. 10) terminal to body ground with jumper wires. The right mirror should tilt down (or swing left) with the ignition switch ON (II).
   - If the mirror does not tilt down (or does not swing left), check for an open in the BLU/WHT (or LT GRN) wire between the right mirror and the 10P connector.
     If the wire is OK, check the right mirror actuator.
   - If the mirror neither tilts down nor swings left, check for an open in the YEL/WHT wire.
   - If the mirror works properly, check the mirror switch.

Defogger

8. Connect the No. 3 and No. 6 terminals with a jumper wire, and check for voltage between the No. 3 terminal and body ground. There should be battery voltage and both mirrors should warm up with the ignition switch ON (II).
   - If there is no voltage or neither warms up, check for:
     - an open in the ORN and ORN/WHT wires.
     - blown No. 4 (7.5A) fuse in the driver's under-dash fuse/relay box.
     - poor ground (G601, G651).
   - If only one fails to warm up, check its defogger.
   - If both warm up, check the defogger switch.

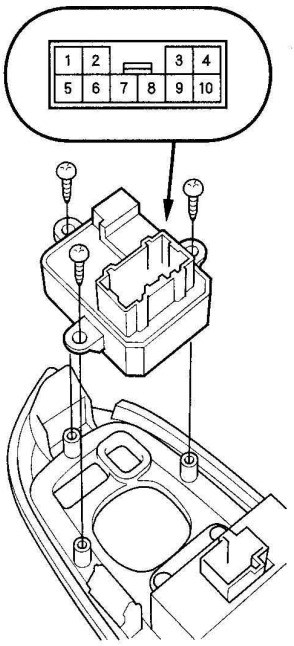
BACK

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Power Mirror and Mirror Defogger Switch Test

1. Remove the driver's door switch trim (see page 20-6).

2. Disconnect the 10P connector from the power mirror switch.



3. Remove the three screws and the power mirror switch.

4. Check for continuity between the terminals in each switch position according to the table.

Mirror Switch:

	Terminal / Position	1	2	4	7	8	9	10
L	UP	○		○				
			○		○			
	DOWN	○			○			
			○	○				
	LEFT	○			○			
			○				○	
	RIGHT	○					○	
			○		○			
R	UP	○		○				
			○			○		
	DOWN	○				○		
			○	○				
	LEFT	○				○		
			○					○
	RIGHT	○						○
			○			○		

Defogger Switch:

Terminal / Position	3	6
ON	○	○
OFF		

5. If the continuity is not as specified, replace the switch.

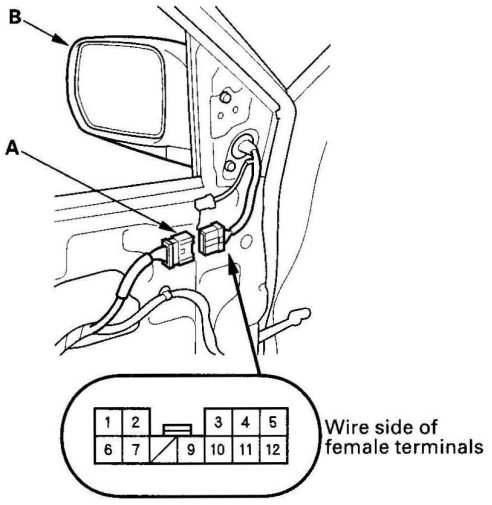
BACK

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Power Mirror Actuator Test

With DPMS:

1. Remove the door panel (see page 20-6).
2. Disconnect the 12P connector (A) from the power mirror actuator (B).



3. Check actuator operation by connecting power and ground according to the table.

Terminal / Position	9	10	11
TILT UP	⊕	⊖	
TILT DOWN	⊖	⊕	
SWING LEFT		⊕	⊖
SWING RIGHT		⊖	⊕

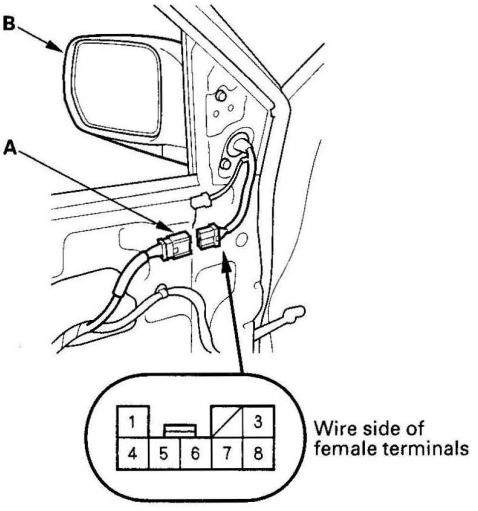
4. If the mirror fails to work properly, replace the mirror actuator.

Defogger Test

5. Check for continuity between the No. 6 and No. 7 terminals of the 12P connector. There should be continuity.
   - If there is no continuity, replace the mirror holder (see page 20-26).

Without DPMS:

1. Remove the door panel (see page 20-6).
2. Disconnect the 8P connector (A) from the power mirror actuator (B).



3. Check actuator operation by connecting power and ground according to the table.

Terminal / Position	5	6	7
TILT UP		⊖	⊕
TILT DOWN		⊕	⊖
SWING LEFT	⊖	⊕	
SWING RIGHT	⊕	⊖	

4. If the mirror fails to work properly, replace the mirror actuator.

Defogger Test

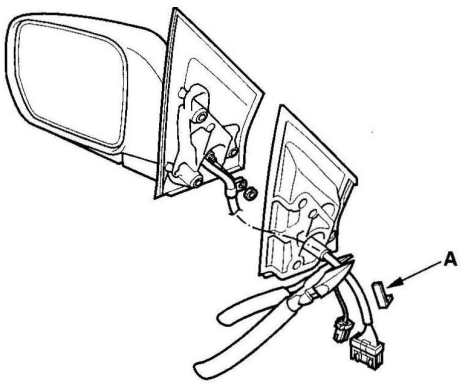
5. Check for continuity between the No. 1 and No. 4 terminals of the 8P connector. There should be continuity.
   - If there is no continuity, replace the mirror holder (see page 20-26).

BACK

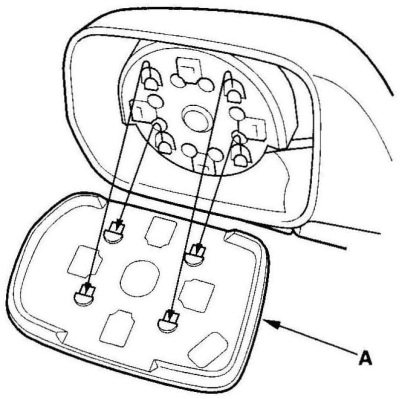
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Power Mirror Actuator/Tweeter Harness Replacement

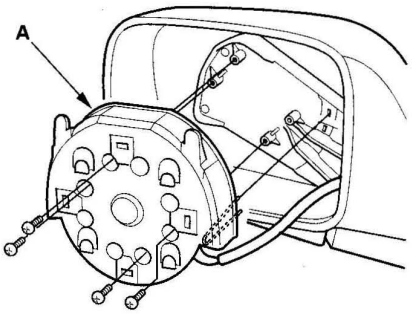
1. Remove the power mirror (see page 20-25).
2. Disconnect the connector(s).
3. Record the terminal locations and wire colors.
4. Remove the wire harness clip (A) from the harness, then cut the harness with wire cutters.



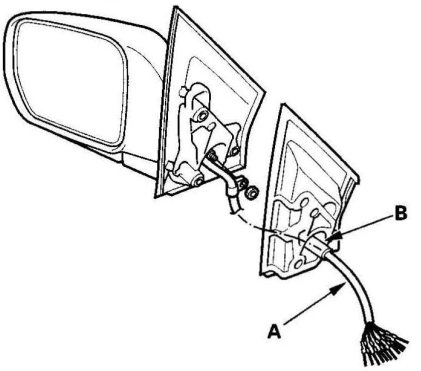
5. Slide the mirror holder (A) up and remove it.



6. Remove the four screws, then remove the actuator (A).



7. Route the wire harness (A) of the new actuator through the hole in the bracket (B).



(cont'd)

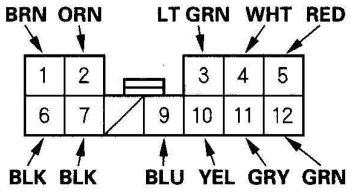
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Power Mirror Actuator/Tweeter Harness Replacement (cont'd)

8. Insert the terminals into the connector as shown below:

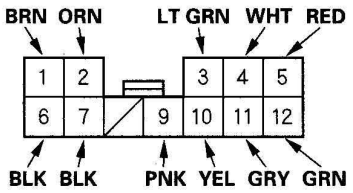
With DPMS (Terminals No. 5 and No. 12 are for tweeter)

LEFT MIRROR CONNECTORS



Wire side of female terminals

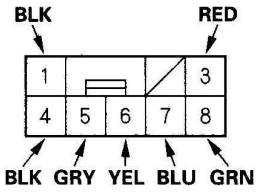
RIGHT MIRROR CONNECTORS



Wire side of female terminals

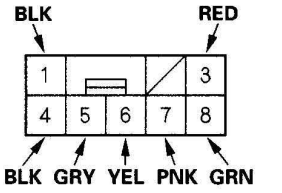
Without DPMS (Terminals No. 3 and No. 8 are for tweeter)

LEFT MIRROR CONNECTORS



Wire side of female terminals

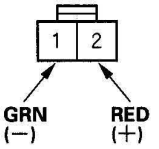
RIGHT MIRROR CONNECTORS



Wire side of female terminals

9. Insert the terminals of tweeter side into the new tweeter 2P connector as shown below:

TWEETER CONNECTORS



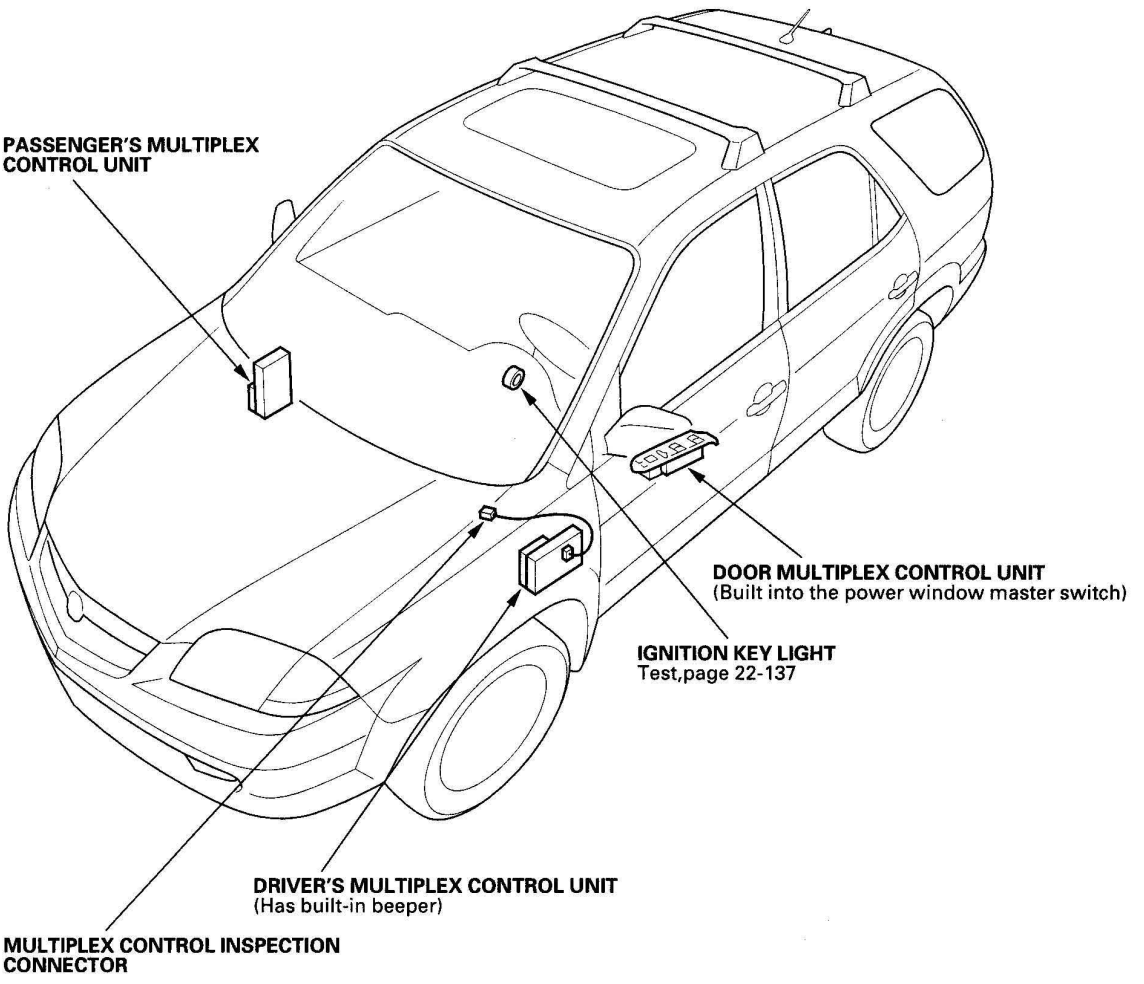
Wire side of female terminals

10. Reattach the wire harness clip to the harness with tape in its original position.
11. Seal the intersection of wire harness with tape.
12. Reassemble in the reverse order of disassembly. Be careful not to break the mirror holder when reinstalling it to the actuator.
13. Reinstall the mirror assembly to the door.
14. Operate the power mirror to ensure smooth operation.

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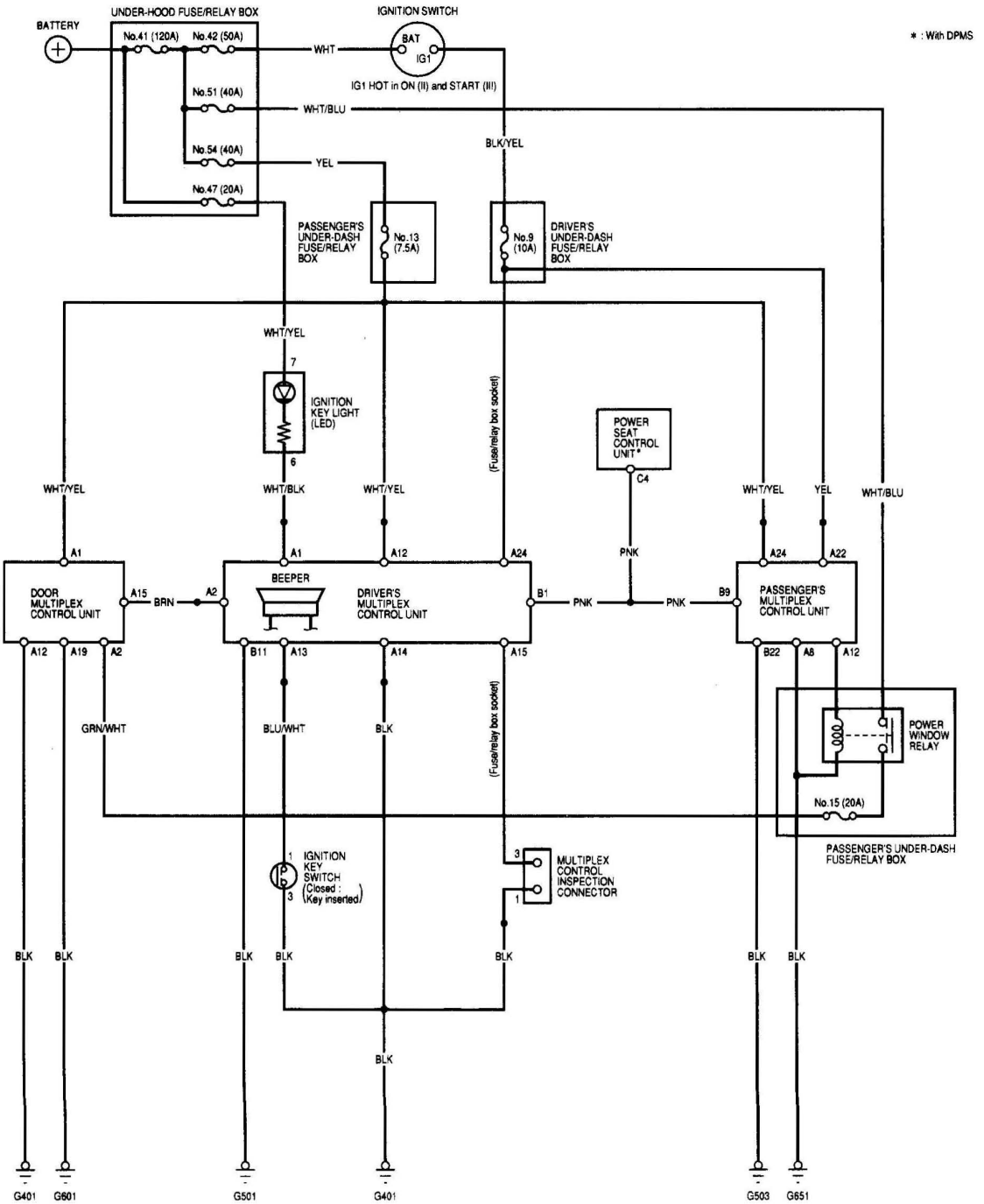
Component Location Index



Protected by AR

Multiplex Control System

Circuit Diagram (Power, Ground, Communication Lines)



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System Description

The Multiplex Control System has four internal functions:
- Multiplexing (send multiple signals over shared wires)
- Wake up/sleep modes (runs at full power only on demand to reduce battery draw)
- Fail-safe (fixes or ignores faulty signals)
- Self-diagnosis (Mode 1 for the system, Mode 2 for input lines)

The system controls the function of the following circuits
- Engine Oil Pressure Indicator
- Seat Belt Reminder
- Lights-on Reminder
- Key-in Reminder
- Key Light Timer
- Dash Lights Brightness Control
- Entry Light Control
- Automatic Lights-off
- Power Door Locks
- Power Window and Moonroof (including key-off timer operation)
- Windshield Wiper/Washer (including speed sensitive intermittent wiper)
- Security Alarm
- Interlock
- Memory Seat and Mirror Control

Multiplex Communication

To reduce the number of wire harnesses, digital signals are sent via shared multiplex communication lines rather than sending normal electrical signals through individual wires.
- The input signals from each switch are converted to digital signals at the central processing unit (CPU). The digital signals are sent from the transmitter unit to the receiver unit as serial signals.
- The transmitted signal is converted to a switch signal at the receiver unit, and it operates the related component.
- There are exclusive communication lines between each of the multiplex control units:
  - Door ↔ Driver's (between the door and the driver's multiplex control units) Wire color: BRN
  - Driver's and Driver's Power Seat Control Unit ↔ Passenger's (between the driver's and the passenger's multiplex control units) Wire color: PNK

The control units always communicate via these lines when the system is operating, and they stop communicating when the system is OFF.

Wake-up and Sleep

The multiplex control system has "wake-up" and "sleep" functions to decrease parasitic draw on the battery when the ignition switch is OFF.
- In the sleep mode, the multiplex control unit stops the functions (communication and CPU control) when it is not necessary for the system to operate.
- As soon as any operation is requested (for example, door is unlocked), the related control unit in the sleep mode immediately wakes up and begins to function. This control unit also sends a wake-up signal to the other control units via the communication lines.
- When the ignition switch is turned OFF, and the driver's or front passenger's door is opened, there is about a 10 second delay before the control units go from the wake-up mode to the sleep mode.
- If any door is open, the sleep mode will not function.
- If the key is in the ignition switch, the sleep mode will not function.
- When in the sleep mode, the current draw is reduced from 70−80 mA to less than 20 mA.

Fail-safe

To prevent improper operation, the multiplex control system has a fail-safe function. In the fail-safe mode, the output signal is fixed when any part of the system malfunctions (for example, a faulty control unit or communication line).
Each control unit has a hardware fail-safe function that fixes the output signal when there is any CPU malfunction, and a software fail-safe function that ignores the signal from the malfunctioning control unit and allows the rest of the system to operate normally.

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Troubleshooting

Special Tools Required
SCS Service Connector 07WAZ-001010A

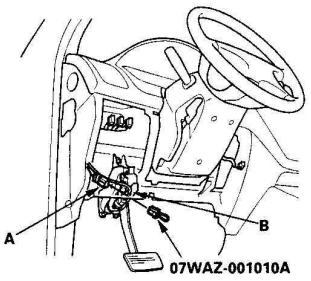
1. Check the No. 9 (10A) fuse in the driver's under-dash fuse/relay box, and the No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box.

   Are the fuses OK?

   YES – Go to step 2.

   NO – Find and repair the cause of the blown fuse. ■

2. Connect the special tool to the multiplex control inspection connector (A).

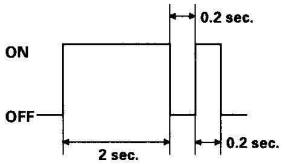


3. Turn the ignition switch ON (II).
   If the driver's seat belt is unbuckled, the seat belt reminder will beep five times.

4. Check self-diagnosis function Mode 1 for a diagnostic trouble code (DTC). After about 5 seconds, the ignition key light should come on and the beeper should beep for 2 seconds, go off for 0.2 seconds, then blink and beep for 0.2 seconds. This means that you are in Mode 1 of the self-diagnosis function.

   - If the system enters Mode 1, go to step 5.
   - If the system does not enter Mode 1, see if the SCS circuit is working properly. Go to step 6.

MODE 1: IGNITION KEY LIGHT and BEEPER



5. About 1 second after you go into self-diagnosis Mode 1, the ignition key light and beeper indicate the DTC, and repeat it every 3 seconds. If there is a code, it will blink/beep, pause, then repeat the code as long as the ignition switch is ON (II). If there is more than one DTC, the system will indicate them in ascending order, beginning with the DTC with the lowest numerical value.

   Does the ignition key light blink and the beeper beep?

   YES – There is a DTC. Count the blinks/beeps to find your DTC in the table, then go to step 9 and check the communication lines.

DTC	Cause
1	The driver's unit is not able to receive signals from the door unit.
2	The driver's unit is not able to receive signals from the passenger's unit.
3	Malfunction in the driver's unit.
4	Signals from each unit do not match (LX and EX control units are not interchangable)
5	The passenger's unit is not able to receive signals from the other units.
6	The door unit is not able to receive signals from the other units.

   NO – If the system goes into Mode 1 as described in step 4, and there is no repeating DTC. Go to step 11.

6. Remove the special tool from the SCS connector.

7. Check for continuity between the No. 1 terminal of the inspection connector and the A15 terminal in the driver's multiplex control unit.

   Is there continuity?

   YES – Go to step 8.

   NO – Replace the driver's under-dash fuse/relay box, and recheck for DTC's. ■

8. Check for continuity between the No. 3 terminal of the inspection connector and body ground G401.

   Is there continuity?

   YES – If there is still no Mode 1 confirmation, replace the driver's multiplex control unit and try again. After replacing the driver's multiplex control unit the system confirms Mode 1 and there are no codes, go to step 12.

   NO – Repair open in the wire, and recheck for DTC's. ■

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9. With the ignition switch OFF, check for continuity according to the table.

Communication Line	Wire	Continuity
Door unit to Driver's unit	BRN	YES
Driver's unit to Passenger's unit	PNK	YES

Is there continuity?

YES – Go to step 10.

NO – Check for an open in the wire.■

10. Turn the ignition switch ON (II), and check for voltage between the communication line and ground.

Communication Line	Wire	Voltage
Door unit to Driver's unit	BRN	3.5 – 9.5
Driver's unit to Passenger's unit	PNK	3.0 – 10.0

Does the voltage match the table?

YES – Communication lines are OK. Go to step 11.

NO – Repair the line according to the following.■

- If the voltage is too high:
  - Check for a short to another wire with voltage.
  - Check for poor contact in the connectors at each control unit connector to the wire.
- If the voltage is too low:
  - Check for a short to ground or to another wire.
  - Check for poor connections at each control unit connector to the wire.
  - Faulty circuit in one of the multiplex control units connected to the wire.
- If any one or all the control units are completely inoperative, perform the multiplex control unit input test (see page 22-216).

11. Shift to the sleep mode:
    - Turn the ignition switch OFF, and remove the key.
    - Remove the special tool from the SCS connector.
    - Cancel the key-off operation timer in the power window system by opening and closing one of the doors.
    - Make sure the exterior lights are off. If you do not operate any switches related to the multiplex control units within 1 minute after meeting the above conditions, the system function shifts to the sleep mode. (All of the switches must be turned OFF except door lock knob switches). Go to step 12.

12. Confirm the sleep mode:
    - Check for voltage to ground on the BRN wire and PNK wire. There should be battery voltage in the sleep mode.
    - Check the parasltic draw at the battery while shifting to sleep mode. Amperage should change from about 70 to 80 mA to less than 20 mA.
    - If the vehicle does not go into the sleep mode, carefully perform Mode 2 test (see step 14), and check for faulty input for example a key cylinder switch keeping the system awake.

13. Confirm the wake up mode:
    - When any switch in the multiplex system is turned on, it wakes up its related control unit which, in turns wakes up, wakes up the other units. After one minuite it will return to sleep mode again if the switch is returned to the original position.
    - When the ignition switch is turned to ON (II), all of the multiplex control units wake up at the same time without "talking" to each other through the communication lines.

    If the wake up mode is confirmed on the first switch tested, and there is no problem with any other switch operation, the system is working correctly. Go to step 14.

    After confirming a problem in sleep mode, look in the following tables for the switch most closely related to the problem you may be having. Operate that switch and see if its control units wake up. Also use Mode 2 step 14 to confirm switch imputs.

    NOTE: If any control unit is faulty and will not wake up, several functions (locks, windows, etc.) of the system will malfunction at the same time.

    In each table below, the control unit is followed by a list of the switches and input signals that can wake it up.

(cont'd)

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Troubleshooting (cont'd)

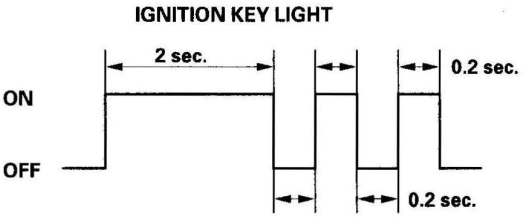
Passenger's Multiplex Control Unit No. 9 (10A) driver's fuse No. 13 (7.5A) passenger's fuse
Communication lines (BRN, PNK)
Front passenger's door lock knob switch (LOCK) Front passenger's door lock knob switch (UNLOCK) Front passenger's door lock switch (LOCK/UNLOCK) Front passenger's door switch (OPEN) Passenger's rear door switch (OPEN) Right rear door lock knob switch (UNLOCK) Keyless transmitter (LOCK) Keyless transmitter (UNLOCK) Keyless transmitter (TRUNK) Security input for the radio or navigation system. Test by disconnecting and reconnecting the radio or navigation system connector. When testing the passenger's door lock knobs, be sure all other passenger lock knobs are in the locked position.

Driver's Multiplex Control Unit No. 9 (10A) driver's fuse No. 13 (7.5A) passenger's fuse
Communication lines (BRN, PNK)
Combination switch (ON) Driver's door switch (OPEN) Left rear door switch (OPEN) Tailgate latch switch (OPEN) Hood switch (OPEN)

Door Multiplex Control Unit No. 9 (10A) driver's fuse No. 13 (7.5A) passenger's fuse
Communication lines (BRN, PNK)
Driver's door lock knob switch (LOCK/UNLOCK) Driver's door key cylinder switch (LOCK/UNLOCK) Driver's door lock knob switch (LOCK/UNLOCK) Power window master switch Driving position memory switch (memo position 1 and 2)

14. With the system in Mode 1, and the ignition switch still in the ON (II) position, disconnect the special tool from the multiplx control inspection connecter for about 5 to 10 seconds, then reconnect it. The ignition key light should come on and the beeper should beep for 2 seconds, then blink and beep twice more at 0.2 seconds intervals. This means the system has gone from Mode 1 to Mode 2. Go to step 15.

MODE 2:



NOTE: To cancel Mode 2, disconnect the SCS service connector from the multiplex control inspection connector for 10 seconds or more, or turn the ignition switch OFF.

BACK

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15. Look in the following tables for the switch most closely related to the problem. Test all the switches in the following order, otherwise the test results maybe inaccurate. While still in the Mode 2 operate that switch to test the wire, switch, and it's control unit input. If the circuit is OK, the ignition key light should blink once and the beeper should beep once. If the circuit is faulty, there will be no indication.

    Does the ignition key light blink and the beeper beep?

    YES — The circuit is OK. Test the other switches.

    NO — Go to step 16.

In each of the following tables, the control unit is followed by a list of circuits that it can check in Mode 2.

A second key is necessary to test the key cylinder switches. If only one key is available, cut a second key from a non-immobilizer type key blank for the test.

Passenger's Multiplex Control Unit
Test all the switches in the following order, otherwise the test results maybe inaccurate:
Front passenger's door lock knob switch(LOCK)
Front passenger's key cylinder switch(LOCK)
Front passenger's door lock knob switch(UNLOCK)
Front passenger's key cylinder switch(UNLOCK)*
Front passenger's door lock switch(LOCK/UNLOCK)
Front passenger's door switch(OPEN)
Right rear door switch(OPEN)
Power mirror switch(with DPMS)
Security input for the radio or navigation system. Test by disconnecting and reconnecting the radio or navigation system connector.
*When testing the passenger's door lock knobs, be sure all other passenger lock knobs are in the locked position.

NOTE: When testing the door lock knob switches, make sure all three passenger doors are locked. After unlocking the door, make sure to return the door lock knob switch to the lock position, otherwise the test results will be inaccurate.

Driver's Multiplex Control Unit
Dash lights brightness controller(ROTATE)
Driver's door switch(OPEN)
Left rear door switch(OPEN)
Left rear door lock knob switch(UNLOCK)
Tailgate latch switch(OPEN)
Driver's seat belt switch(BUCKLED)
Windshield wiper/washer switch(except MIST switch)
Brake pedal position switch(Brake switch)(PRESSED)
Parking brake switch(ON)
Hood switch(OPEN)
Headlight or combination switch(ON)

Door Multiplex Control Unit
Test all the switches in the following order, otherwise the test results maybe inaccurate;
Driver's door lock knob switch (LOCK)
Driver's key cylinder switch (LOCK)
Driver's door lock knob switch (UNLOCK)
Driver's key cylinder switch (UNLOCK)
Driver's door lock switch (LOCK/UNLOCK)
Power window master switch (not the passenger's switches)
Driving position memory switch (memo position 1 and 2)

Driver's Power Seat Control Uint
Recliner limit switch
Driver's power seat adjustment switch (front up/down,rear up/down,side forward/backward,recline forward/backward)

The key cylinder switches shoud only beep/flash when turned to LOCK or UNLOCK. If they beep/flash when returning to the center position, the switch is defective or misaligned. Adjust or replace the affected key cylinder switch.

16. Check 2 or 3 more circuits listed for that control unit. *Does the ignition key light blink and the beeper beep for each additional circuit?*

    YES — The additional circuits are OK. Repair the short or open in the circuit that failed the test in the proceeding step. Refer to the test(s) for that individual system.■

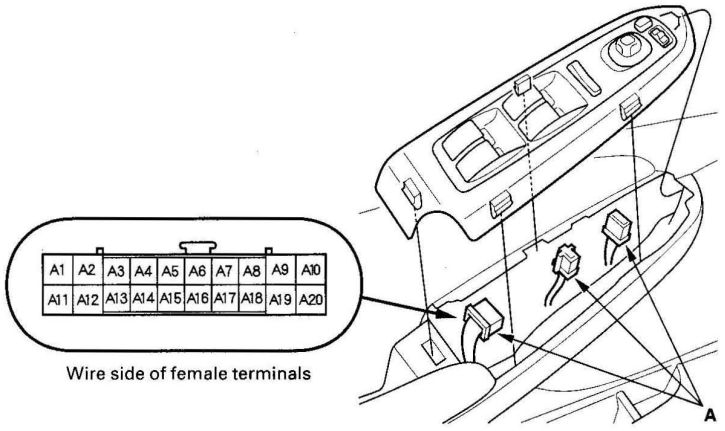
    NO — Multiple failed circuits can mean that the control unit has failed, but without triggering a DTC. Test a few more circuits. If they also fail, substitute a known-good control unit, then recheck. If the system works propely, the original control unit is faulty; replace it. If there is still a malfunction, substitute a known-good control unit for the next most likely faulty control unit, then recheck. If the system works propery, that control unit is faulty; replace it.■

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Multiplex Control Unit Input Test

Door Unit:

1. Carefully pry off the driver's door switch trim (see page 20-6).
2. Disconnect the connectors (A).
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.



4. Make the following input tests at connector A (20P).
   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A1	WHT/YEL	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • Blown No. 54 (40A) fuse in the under-hood fuse/relay box • An open in the wire
A2	GRN/WHT	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 51 (40A) fuse in the under-hood fuse/relay box. • Blown No. 15 (20A) fuse in the passenger's under-dash fuse/relay box • Faulty power window relay • An open in the wire
A12	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire
A19	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G601) • An open in the wire

BACK

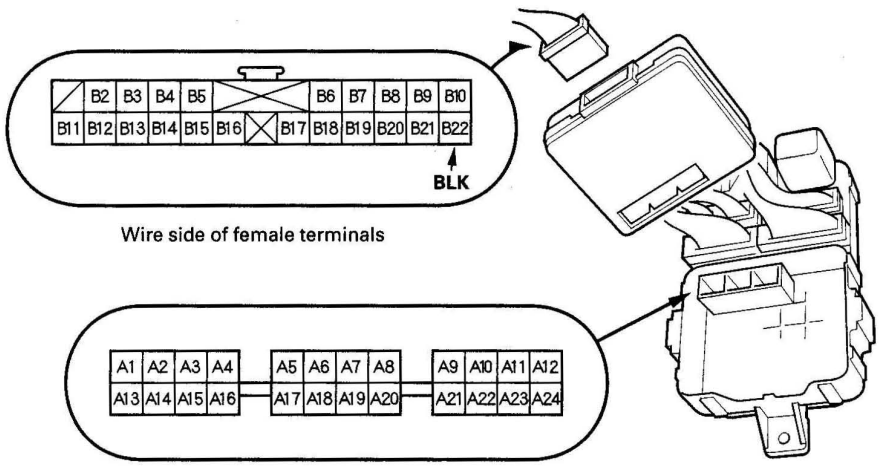
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Passenger's Unit

5. Remove the passenger's multiplex control unit from the passenger's under-dash fuse/relay box.

6. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 7.



7. Make the following input tests at 22P connector B and the passenger's under-dash fuse/relay box socket.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 8.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A24	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/ relay box • Blown No. 54 (40A) fuse in the under-hood fuse/relay box • Faulty passenger's under-dash fuse/relay box
A8		Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G651) • An open in the wire
A22		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10A) fuse in the driver's under-dash fuse/relay box • An open in the wire
A12		Under all conditions	Check for continuity to ground: There should be continuity	• Poor ground (G651) • Faulty passenger's fuse box • Faulty power window relay • An open in the wire
B22	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G503) • An open in the wire

(cont'd)

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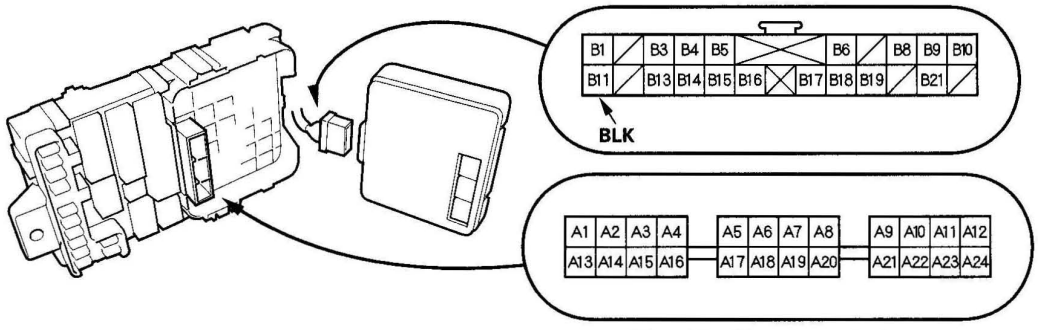
Multiplex Control Unit Input Test (cont'd)

Driver's Unit:

8. Remove the driver's multiplex control unit from the driver's under-dash fuse/relay box.

9. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 10.



Wire side of female terminals

10. Make the following input tests at 22P connector B and the driver's under-dash fuse/relay box socket.

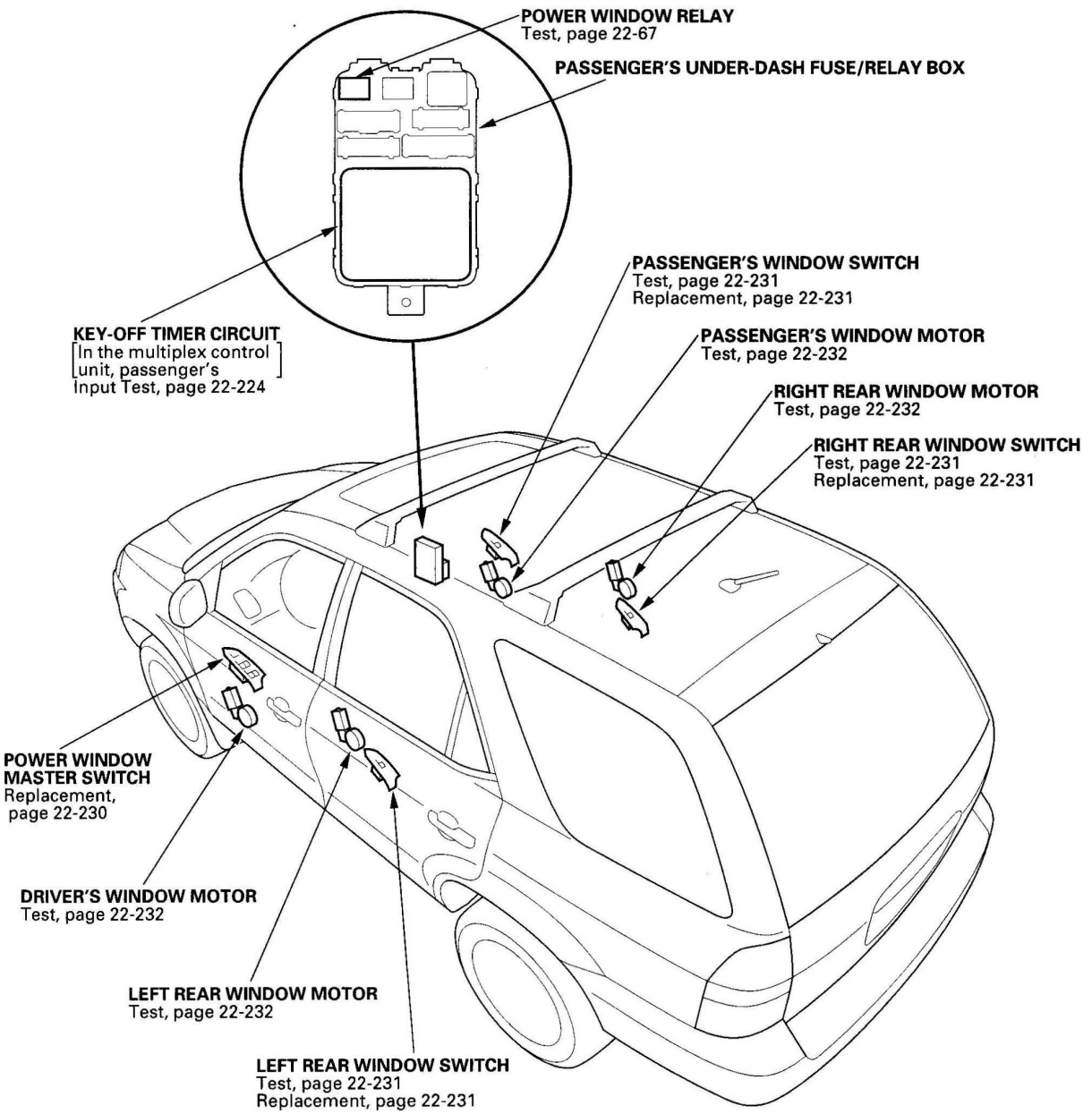
    - If any test indicates a problem, find and correct the cause, then recheck the system.
    - If all the input tests prove OK, troubleshoot the Multiplex Control System (see page 22-212).

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • Blown No. 54 (40A) fuse in the under-hood fuse/relay box • An open in the wire
A14		Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire
A24		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10A) fuse in the driver's under-dash fuse/relay box • An open in the wire
A13		Ignition key is inserted into the ignition switch	Check for continuity to ground: There should be continuity.	• Faulty ignition key switch • An open in the wire • Poor ground (G401)
A1		Under all conditions	Attach to ground: Ignition key light should come on.	• Blown No. 47 (20A) fuse in the under-hood fuse/relay box • Blown LED • An open in the wire
A15		Short the multiplex control inspection connector terminals.	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • Faulty driver's fuse/relay box • An open in the wire
B11	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire

BACK

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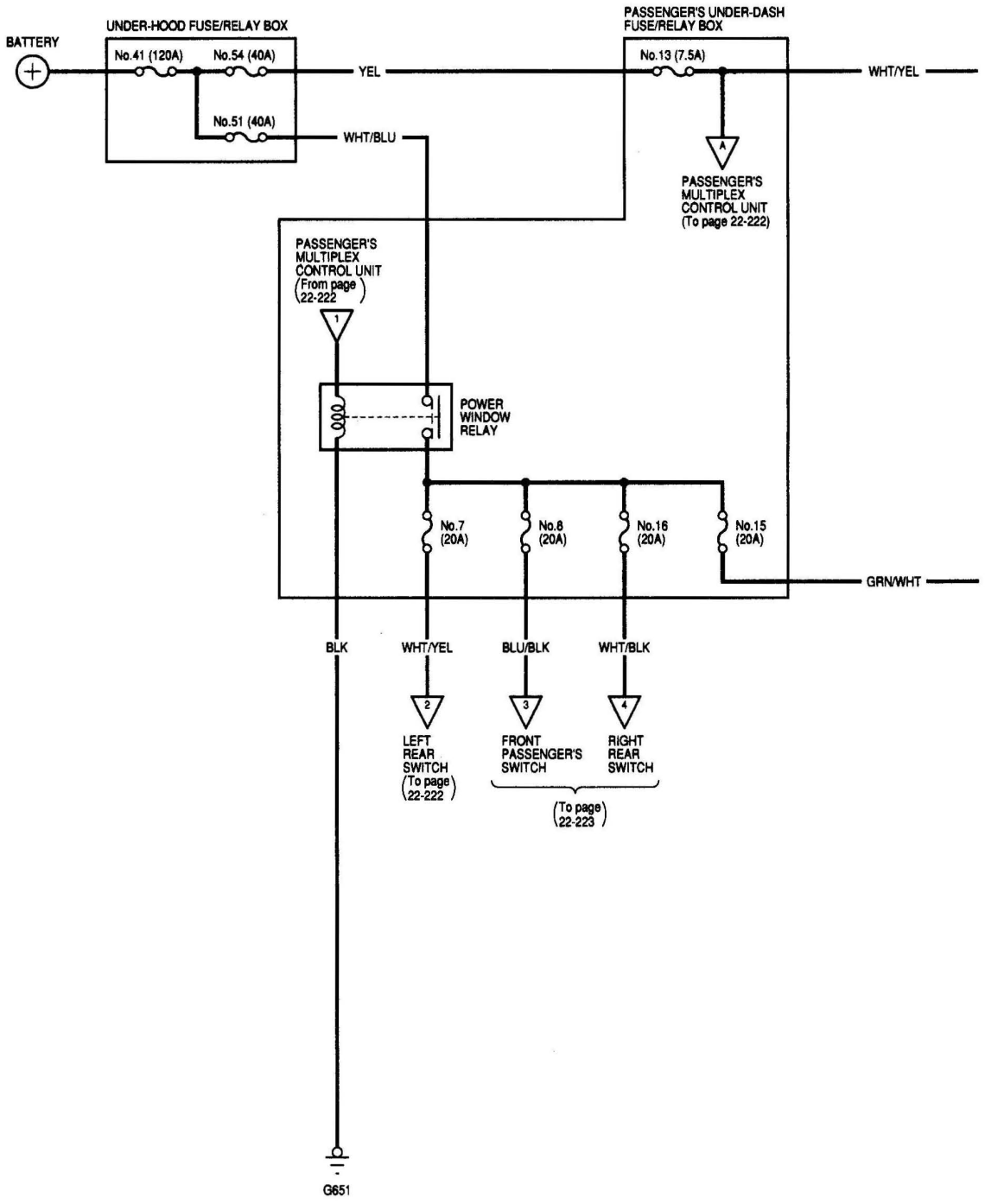
Component Location Index



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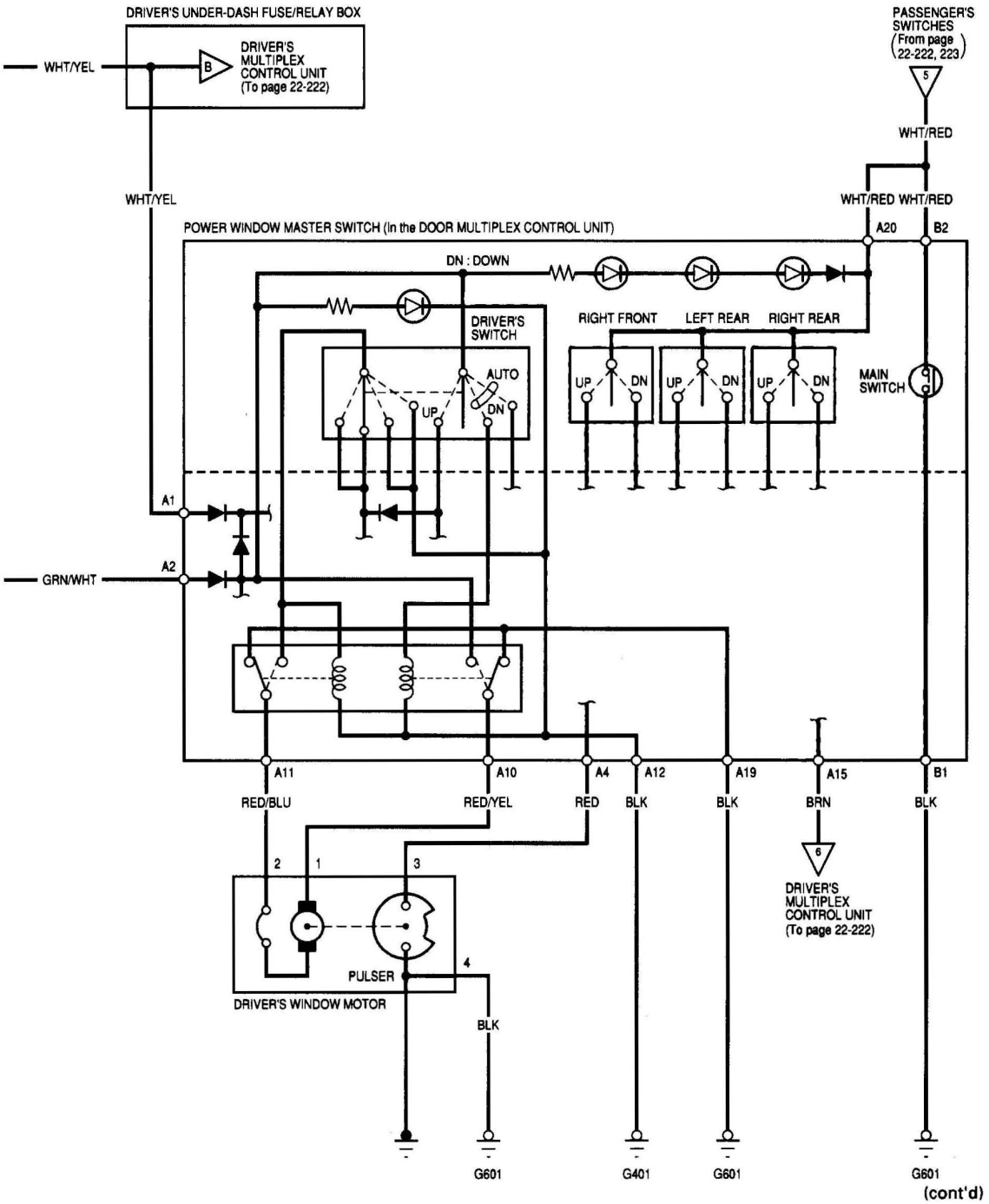
Power Windows

Circuit Diagram



BACK

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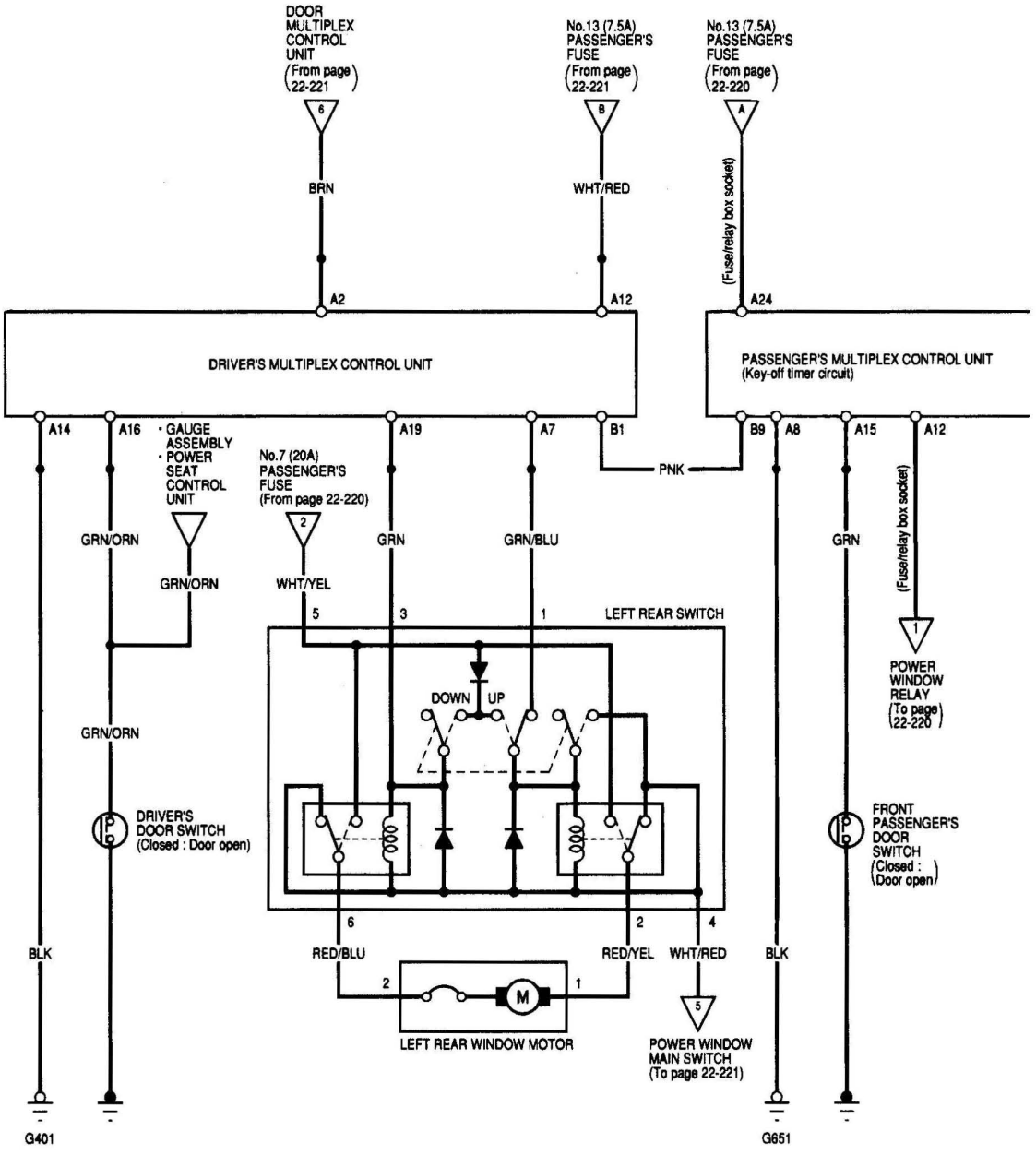
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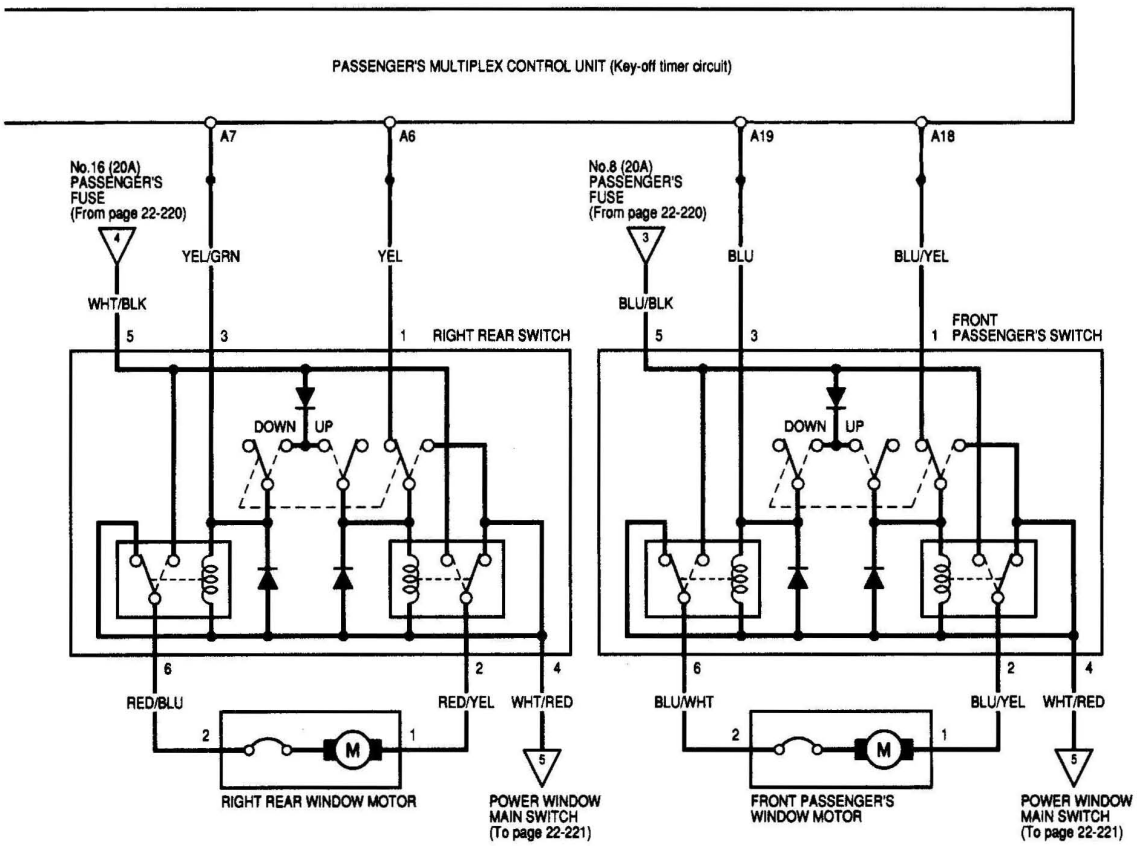
Power Windows

Circuit Diagram (cont'd)



BACK

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BACK

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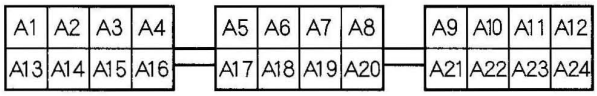
Control Unit Input Test

1. Before testing the power window control functions, troubleshoot the multiplex control system (see page 22-212).

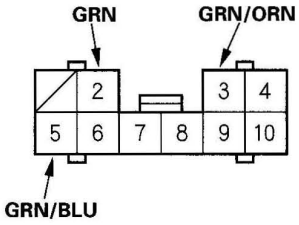
Driver's Unit:

2. Remove the driver's multiplex control unit from the driver's under-dash fuse/relay box.
3. Inspect all connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

DRIVER'S UNDER-DASH FUSE/RELAY BOX SOCKET (DRIVER'S MULTIPLEX CONTROL UNIT CONNECTOR A)



DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR E



Wire side of female terminals

4. With the driver's multiplex control unit still disconnected, make these input tests at the driver's under-dash fuse/relay box socket.
   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
A14			Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire

BACK

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5. Reconnect the driver's multiplex control unit to the driver's under-dash fuse/relay box, turn the ignition switch ON (II), and perform the following input tests at the appropriate connectors on the back of the driver's under-dash fuse /relay box.
   For driver's under-dash fuse/relay box connector socket location (see page 22-56).

   - If any test indicates a problem, find and correct the cause then recheck the system.
   - If all the input tests prove OK, go to step 6.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
E2	GRN	Jump E2 to battery voltage	Check the left rear window motor operation: The window should go down.	• Poor ground (G601) • Blown No. 7 (20A) fuse in the passenger's under-dash fuse/relay box • Faulty window switch • Faulty power window master switch • An open in the wire
E3	GRN/ORN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door switch • Short to ground in the wire
E5	GRN/BLU	Jump E5 to battery voltage	Check the left rear window motor operation: The window should go up.	• Poor ground (G601) • Blown No. 7 (20A) fuse in the passenger's under-dash fuse/relay box • Faulty window switch • Faulty power window master switch • An open in the wire

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Control Unit Input Test (cont'd)

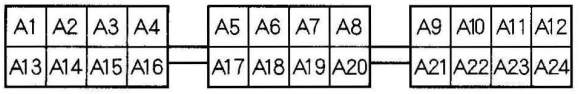
Passenger's Unit:

6. Remove the passenger's multiplex control unit from the passenger's under-dash fuse/relay box, and disconnect its connector.

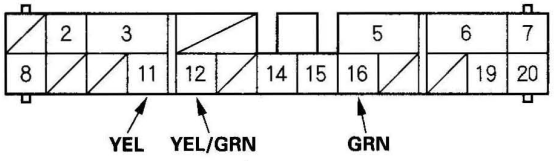
7. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 8.

PASSENGER'S UNDER-DASH FUSE/RELAY BOX SOCKET (PASSENGER'S MULTIPLEX CONTROL UNIT CONNECTOR A)

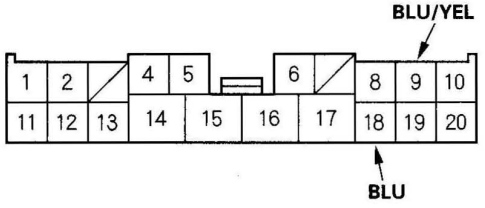


PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR C



Wire side of female terminals

PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR E



Wire side of female terminals

8. With the passenger's multiplex control unit still disconnected, make these input tests at the passenger's under-dash fuse/relay box socket.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 9.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A24	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • Faulty passenger's under-dash fuse/relay box
A12	Fuse/relay box socket	Under all conditions	Check for continuity to ground: There should be continuity.	• Faulty power window relay Poor ground (G651) • An open in the wire
A8	Fuse/relay box socket	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G651) • An open in the wire

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9. Reconnect the passenger's multiplex control unit to the passenger's under-dash fuse/relay box, and perform the following input tests at the appropriate connectors on the passenger's under-dash fuse/relay box.
For passenger's under-dash fuse/relay box connector socket location (see page 22-57).

- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 10.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
C16	GRN	Front passenger's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty passenger's door switch • An open in the wire • A short to ground
		Front passenger's door closed	Check for voltage to ground: There should be 5 V or more.	
E18	BLU	Jump E18 to battery voltage	Check the front passenger's window motor operation: The window should go down.	• Poor ground (G601) • Blown No. 8 (20A) fuse in the passenger's under-dash fuse/relay box • Faulty power window master switch • Faulty right rear switch • Faulty window motor • An open in the wire
E9	BLU/YEL	Jump E9 to battery voltage	Check the front passenger's window motor operation: The window should go up.	• Poor ground (G601) • Blown No. 8 (20A) fuse in the passenger's under-dash fuse/relay box • Faulty power window master switch • Faulty front passenger's switch • Faulty window motor • An open in the wire
C12	YEL/GRN	Jump C12 to battery voltage	Check the right rear window motor operation: The window should go down.	• Poor ground (G601) • Blown No. 16 (20A) fuse in the passenger's under-dash fuse/relay box • Faulty power window master switch • Faulty right rear switch • Faulty window motor • An open in the wire
C11	YEL	Jump C11 to battery voltage	Check the right rear window motor operation: The window should go up.	• Poor ground (G601) • Blown No. 16 (20A) fuse in the passenger's under-dash fuse/relay box • Faulty power window master switch • Faulty right rear switch • Faulty window motor • An open in the wire

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Control Unit Input Test (cont'd)

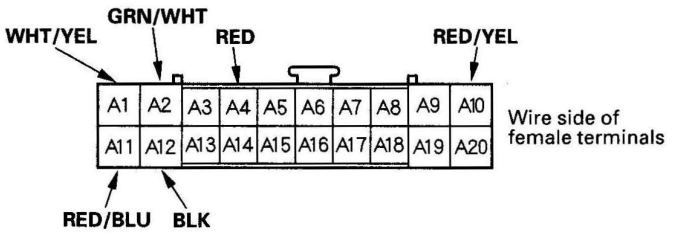
Door Unit:

10. Remove the door multiplex control unit from the driver's door, and disconnect its connectors.

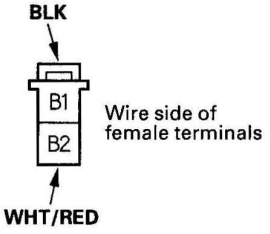
11. Inspect the connector and socket terminals to be sure they are all making good contact.

    - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
    - If the terminals look OK, go to step 12.

DOOR MULTIPLEX CONTROL UNIT CONNECTOR A



DOOR MULTIPLEX CONTROL UNIT CONNECTOR B



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12. Reconnect the door multiplex control unit and perform the following input test.

- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 13.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A1	WHT/YEL	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • Faulty passenger's fuse/relay box • An open in the wire
A2	GRN/WHT	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 15 (20A) fuse in the passenger's under-dash fuse/relay box • Faulty power window relay • Faulty passenger's multiplex control unit • Poor ground (G651) • An open in the wire
A12 A19 B1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401, G601) • An open in the wire
A4	RED	While operating the driver's window switch with the ignition switch ON (II)	Check for voltage on the A4 and A12 terminals: About 6 V should be indicated as the driver's window motor runs.	• Faulty pulser • Faulty driver's window motor • An open in the wire • A short to ground in the wire
B2	WHT/RED	Ignition switch ON (II) main switch on	Check for voltage to ground: Should be 1 V or less.	• Poor ground (G401, G601) • Faulty passenger's multiplex control unit • Faulty passenger's switch • An open in the wire
		Ignition switch ON (II) main switch off	Check for voltage to ground: There should be 5 V or more.	• Faulty passenger's switch • Faulty passenger's multiplex control unit • Short to ground in the wire • An open in the wire

13. Disconnect the door multiplex control unit and make these input tests at the connectors.

- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 14.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A10 A11	RED/YEL RED/BLU	Connect the A10 terminal to the A 12 terminal, and the A11 terminal to the A1 terminal.	Check the driver's window motor operation: The window should go up. NOTE: If the window is up, jump A11 to A12, and A10 to A1; the window should go down.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • Faulty driver's window motor • An open in the wire • Faulty passenger's fuse/relay box

14. If all the input tests prove OK, one of the control units must be faulty. Substitute a known-good control unit for the one that is most likely at fault, then check the system. If the system works properly, the original control unit is faulty; replace it. If there is still a malfunction, substitute a known-good control unit for the next most likely unit to be at fault, and recheck. If the system works properly, the original unit is faulty; replace it.

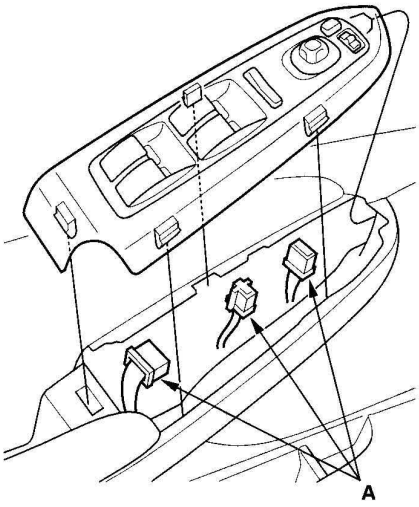
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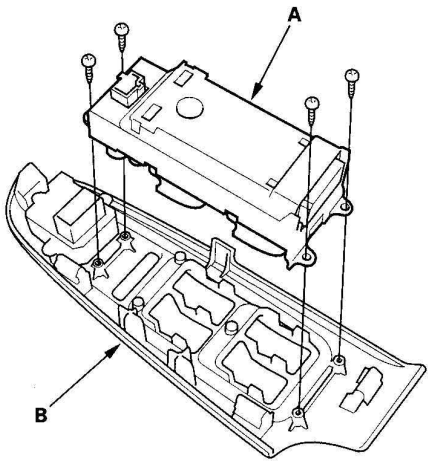
Master Switch Replacement

1. Carefully pry off the driver's door switch trim (see page 20-6).

2. Disconnect the power mirror and power window switch connectors (A).



3. Remove the four mounting screws, then remove the master switch (A) from the panel (B).



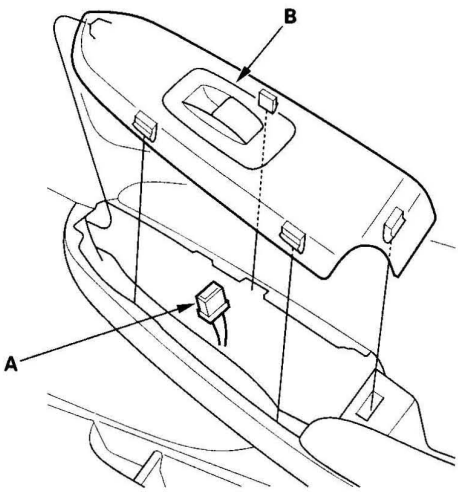
BACK

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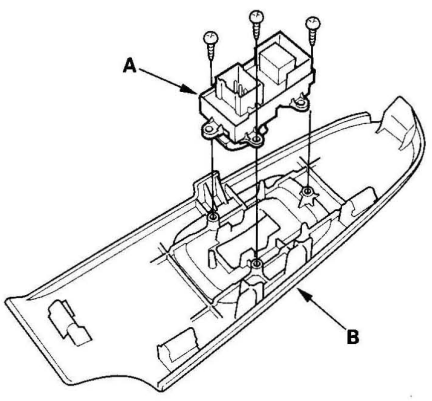
Passenger's Window Switch Test/Replacement

1. Carefully pry off the door switch trim (see page 20-6).

2. Disconnect the 6P connector (A) from the power window switch (B).



3. Remove the three mounting screws, then remove the power window switch (A) from the switch trim (B).



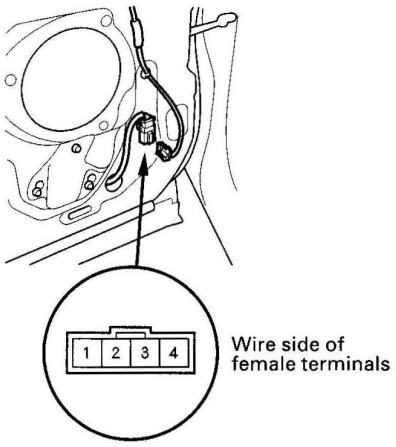
4. Swap the window switch with another known-good switch and test.
   If the original window switch is faulty, replace it.

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Driver's Window Motor Test

Motor Test:

1. Remove the driver's door panel (see page 20-6).
2. Disconnect the 4P connector from the window motor.



3. Test the motor in each direction by connecting battery power and ground according to the table. When the motor stops running, disconnect one lead immediately.

Terminal / Direction	1	2
UP	⊖	⊕
DOWN	⊕	⊖

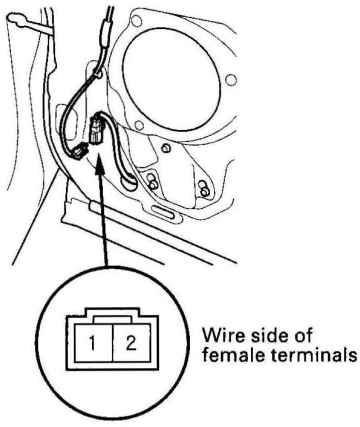
4. If the motor does not run or fails to run smoothly, replace it.

Pulser Test:

5. Connect the test leads of an analog ohmmeter to the No. 3 and No. 4 terminals.
6. Run the motor by connecting power and ground to the No. 1 and No. 2 terminals. The ohmmeter needle should move back and forth alternately.

Passenger's Window Motor Test

1. Remove the passenger's door panel (see page 20-6).
2. Disconnect the 2P connector from the window motor.



3. Test the motor by connecting battery power and ground according to the table. When the motor stops running, disconnect one lead immediately.

Terminal / Direction	1	2
UP	⊕	⊖
DOWN	⊖	⊕

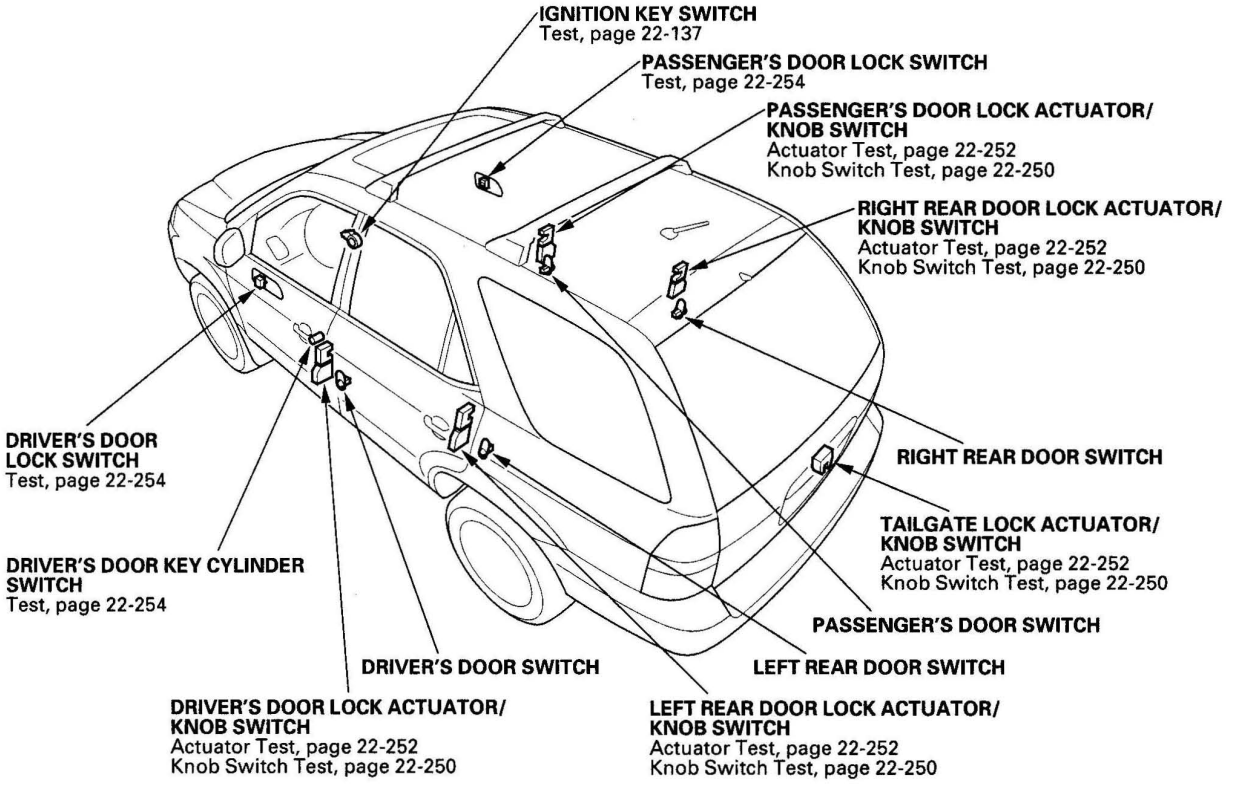
4. If the motor does not run or fails to run smoothly, replace it.

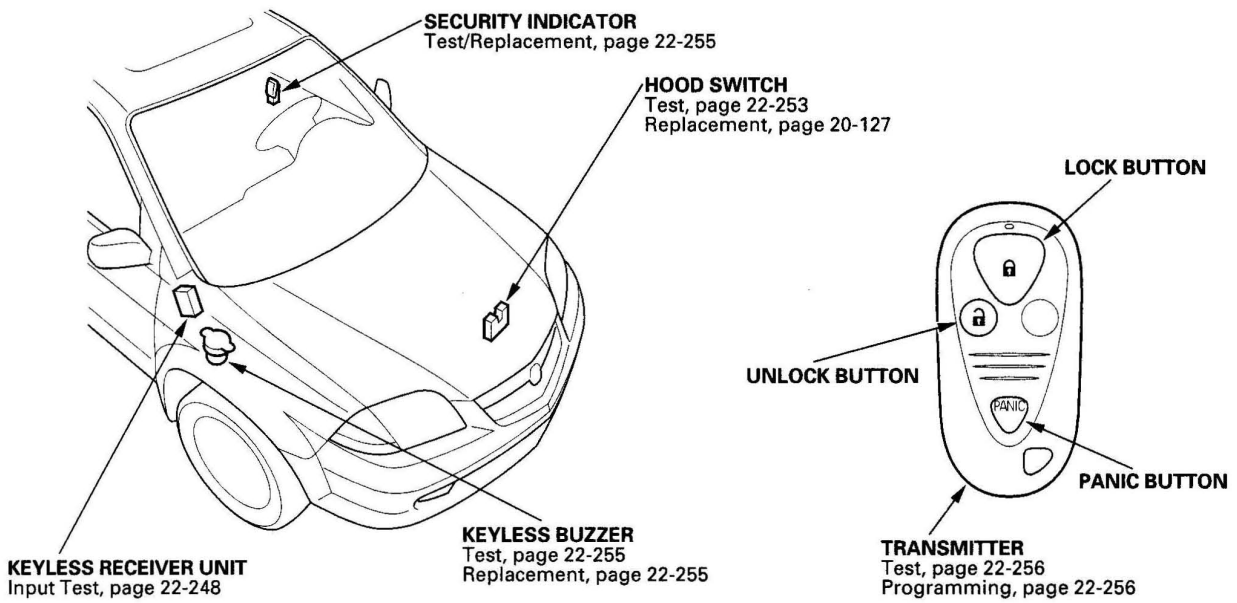
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Keyless Entry/Security Alarm System

Component Location Index





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Keyless Entry/Security Alarm System

System Description

Security Alarm System

The security alarm system is armed automatically after the doors, hood, and tailgate are closed and locked. For the system to arm, the ignition switch must be off, the key must be removed, and the security control unit must receive signals that the doors, hood, and tailgate are closed and locked. The alarm can be disarmed at any time by unlocking either door with the key or the remote transmitter.

When everything is closed and locked, the only control unit inputs that are grounded, and have 0 volts, are the driver's door lock knob switch, the audio unit, and the navigation display. In other words, all of the other switches are open, including the key cylinder switches, and they have about 10 volts. Ten seconds after the doors are locked with the key or the lock knob (with the door open), or immediatcly after the doors are locked with the LOCK button on the remote transmitter, the security system arms, and security indicator on the door panel flashes. If the security indicator does not flash, the system is not arming. Check the doors, hood, and tailgate to see if they are closed. A beep to confirm the security alarm system is armed will sound if the LOCK button is pressed a second time within 5 seconds.

If one of the switches is misadjusted or there is a short in the system, the system will not arm. As long as the control unit continues to receive a ground signal, it senses that the vehicle is not closed and locked, and the system will not arm. Conversely, a switch that is slightly misadjusted can sound an alarm for no apparent reason. In this case a significant change in outside temperature, the vibration of a passing truck, or someone bumping into the vehicle could cause the alarm to sound.

If anything is opened or improperly unlocked after the system is armed, the control unit receives a ground signal from that switch, and the 10 volts reference drops to 0 volts. If the radio or navigation display is disconnected, the input loses its ground, and the input voltage goes to 10 volts. The system sounds the alarm when any of these things occur:

- A door is forced open
- A door is unlocked without using the key or remote transmitter
- The hood is opened
- The tailgate is opened without using the transmitter
- The audio unit or navigation display is disconnected
- The remote panic is operated

When the system sounds the alarm, the security horn sounds and the exterior lights flash for 2 minutes. The alarm can be stopped at any time by unlocking either door with the key or by pushing any button on the remote transmitter.

Panic Mode

The panic mode allows the security system to sound the alarm with the remote transmitter in order to attract attention. When the PANIC button is pressed and hold for 2 seconds, the alarm will sound and the exterior lights will flash for about 30 seconds.

The panic mode can be canceled at anytime by pressing any button on the remote transmitter or by turning the ignition switch ON (II). The panic mode will not function if the ignition switch is ON (II).

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Keyless Entry System

The security alarm system receives lock (arm), unlock (disarm) and panic signals from the keyless entry control unit. The keyless entry system allows you to lock and unlock the vehicle with the remote transmitter. When you push the LOCK button, all doors lock. When you push the UNLOCK button once, only the driver's door unlocks. The passenger's doors and tailgate will unlock when you push the button a second time.

When the switch for the ceiling light, is in the center position, if will come on when you press the UNLOCK button. If you do not open a door, the light will go off in about 30 seconds, the doors will automatically relock, and the security system will rearm. If you relock the doors with the remote transmitter within 30 seconds, the light will go off immediately.

You cannot lock the doors with the remote transmitter if a door or the tailgate is not fully closed, or if the key is in the ignition switch. If the hood or tailgate are not closed, the doors will lock and unlock, but the security system will not be armed until the hood and tailgate are closed.

The system will signal you when the doors lock and unlock by flashing the parking lights, side marker lights, and taillights: once when they lock, and twice when they unlock. If the light don't flash, make sure the doors, the hood, and the tailgate are closed and locked. Check that the security indicator blinks. If the security alarm system does not arm, refer to the multiplex mode or security input tests.

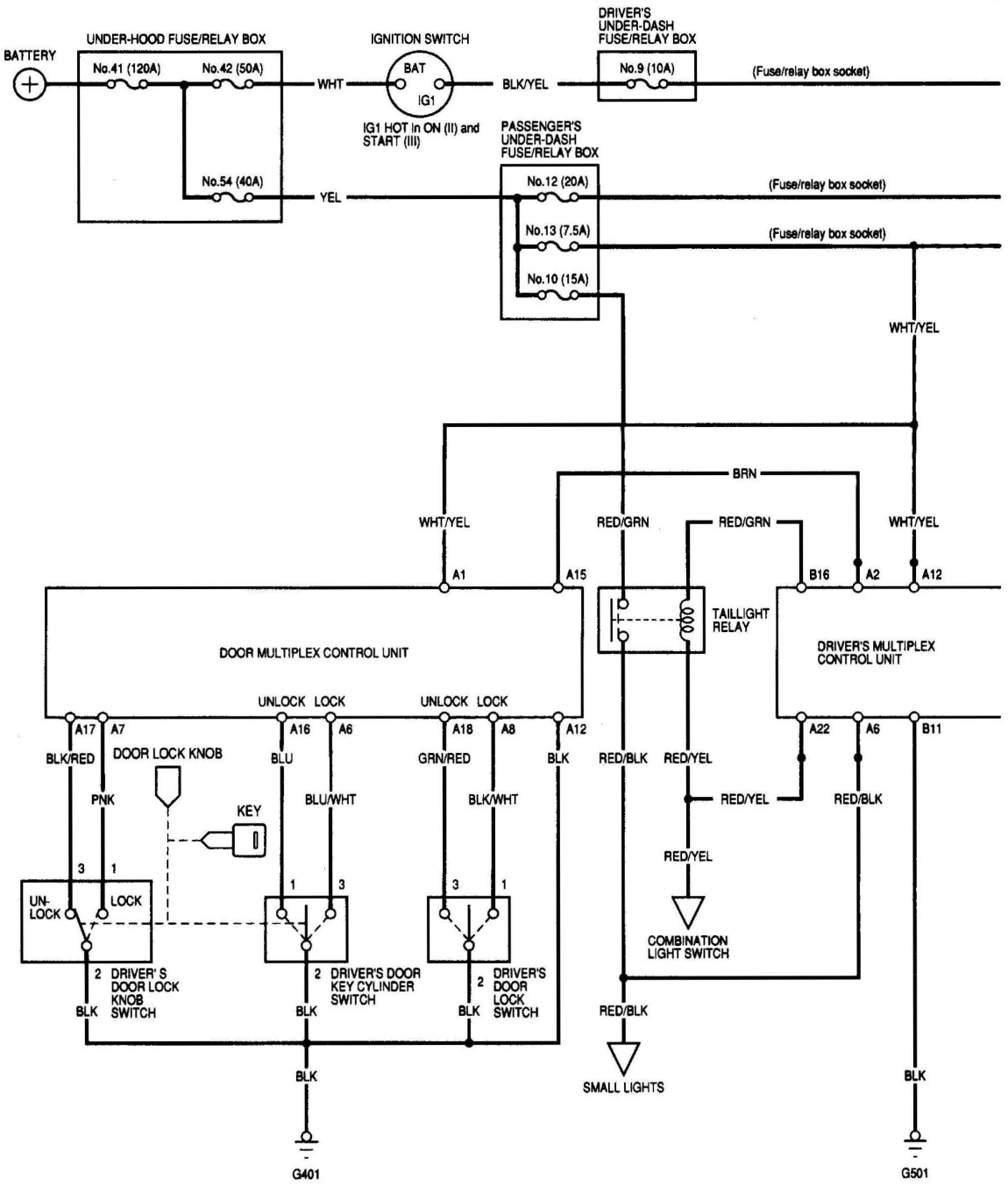
Touring model only: Recalling a Memorized Driving Position

The transmitter has a function to recall a memorized driving position. There are two kinds of transmitters. One is for the driving position memory switch 1, the other is for driving position memory switch 2. When the driver's door is opened after unlocking the door with the transmitter, the beeper sounds once, and the driver's seat and mirror move to the memorized driving position. When the movement is complete, the beeper sounds twice. If the driving position is already set to the memorized position the beeper sounds three times ('01 model) or makes no sound ('02 model) when the door is opened. The instructions for turning ON and OFF this feature are on the back of the keyless transmitter or (see page 22-256).

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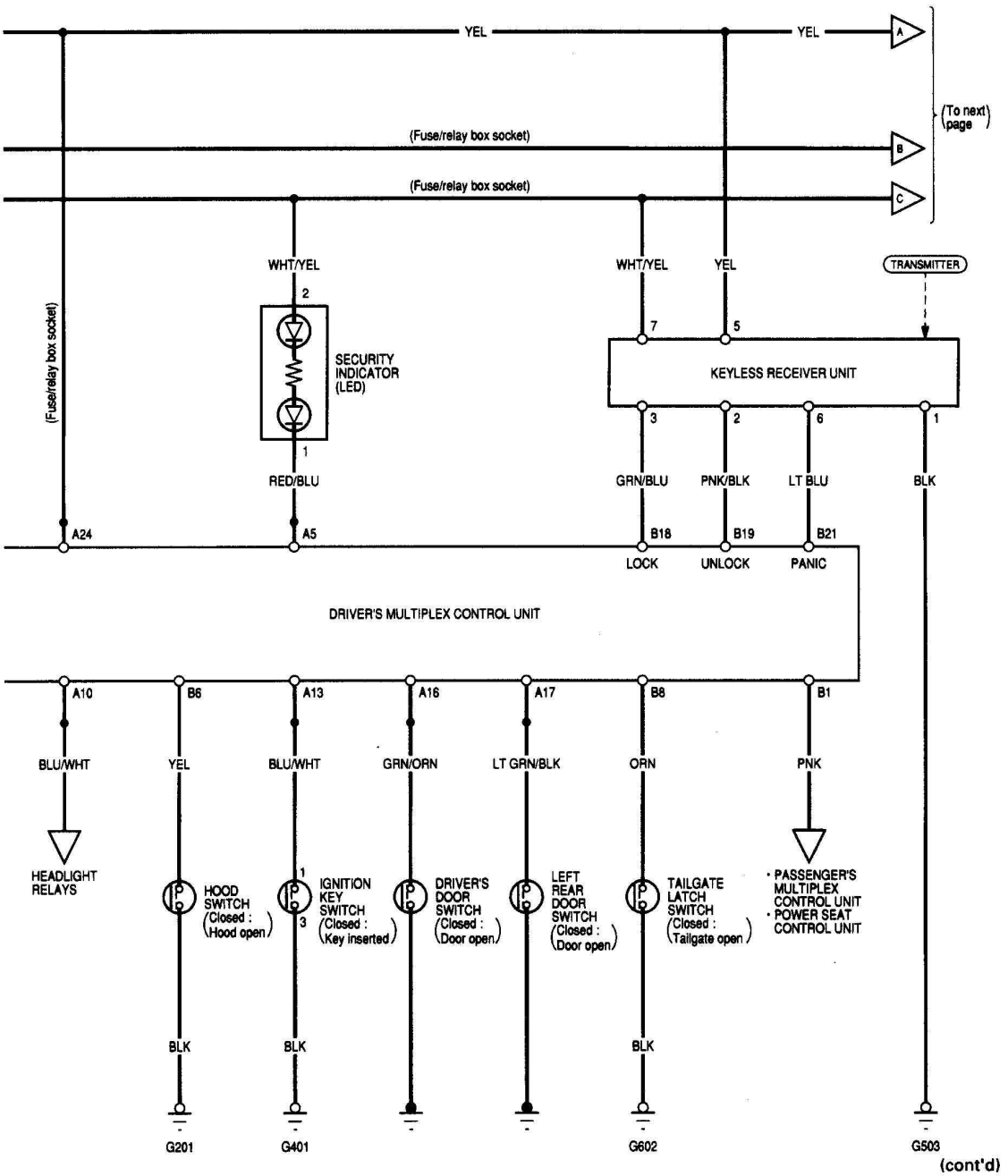
Keyless Entry/Security Alarm System

Circuit Diagram



BACK

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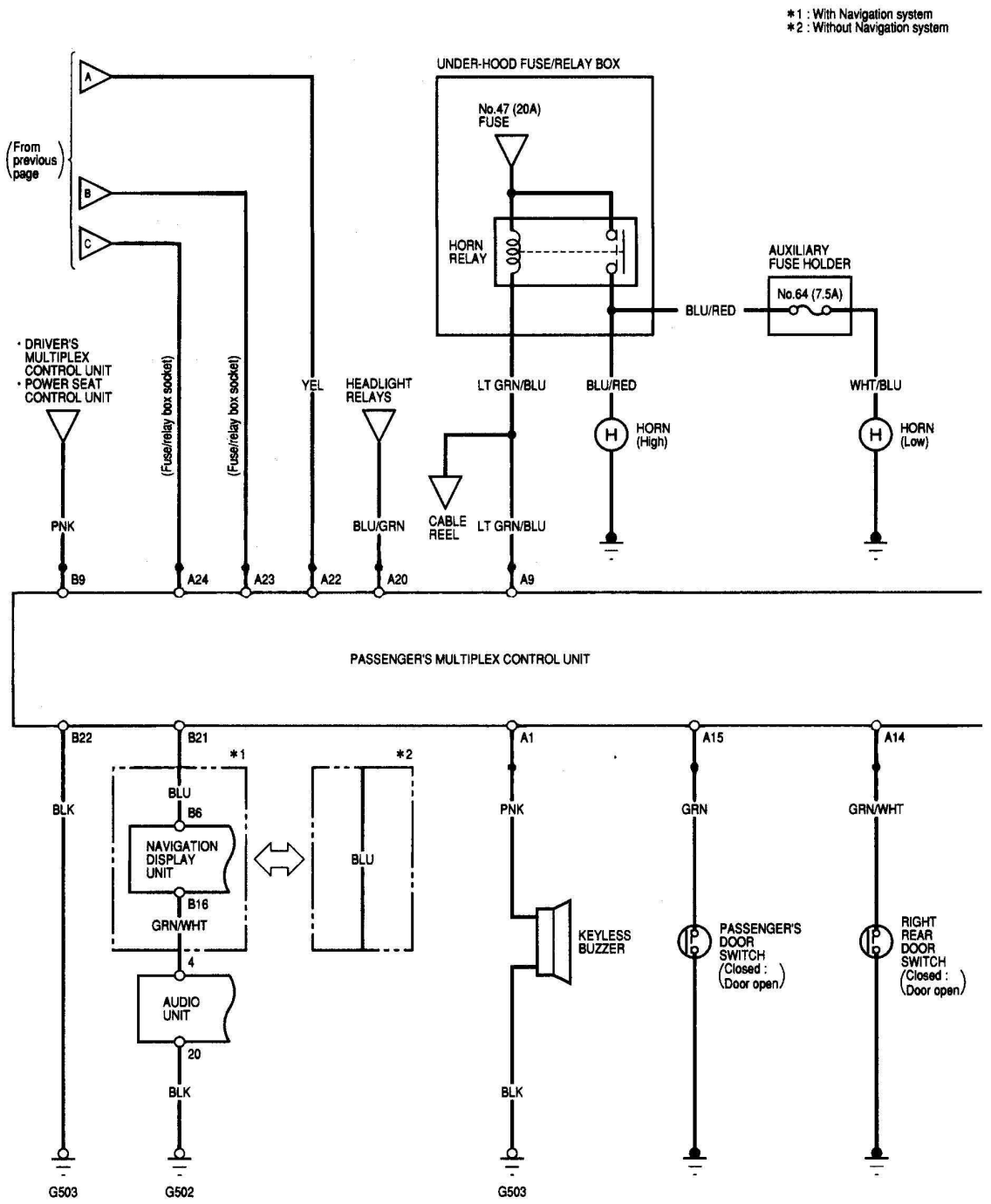
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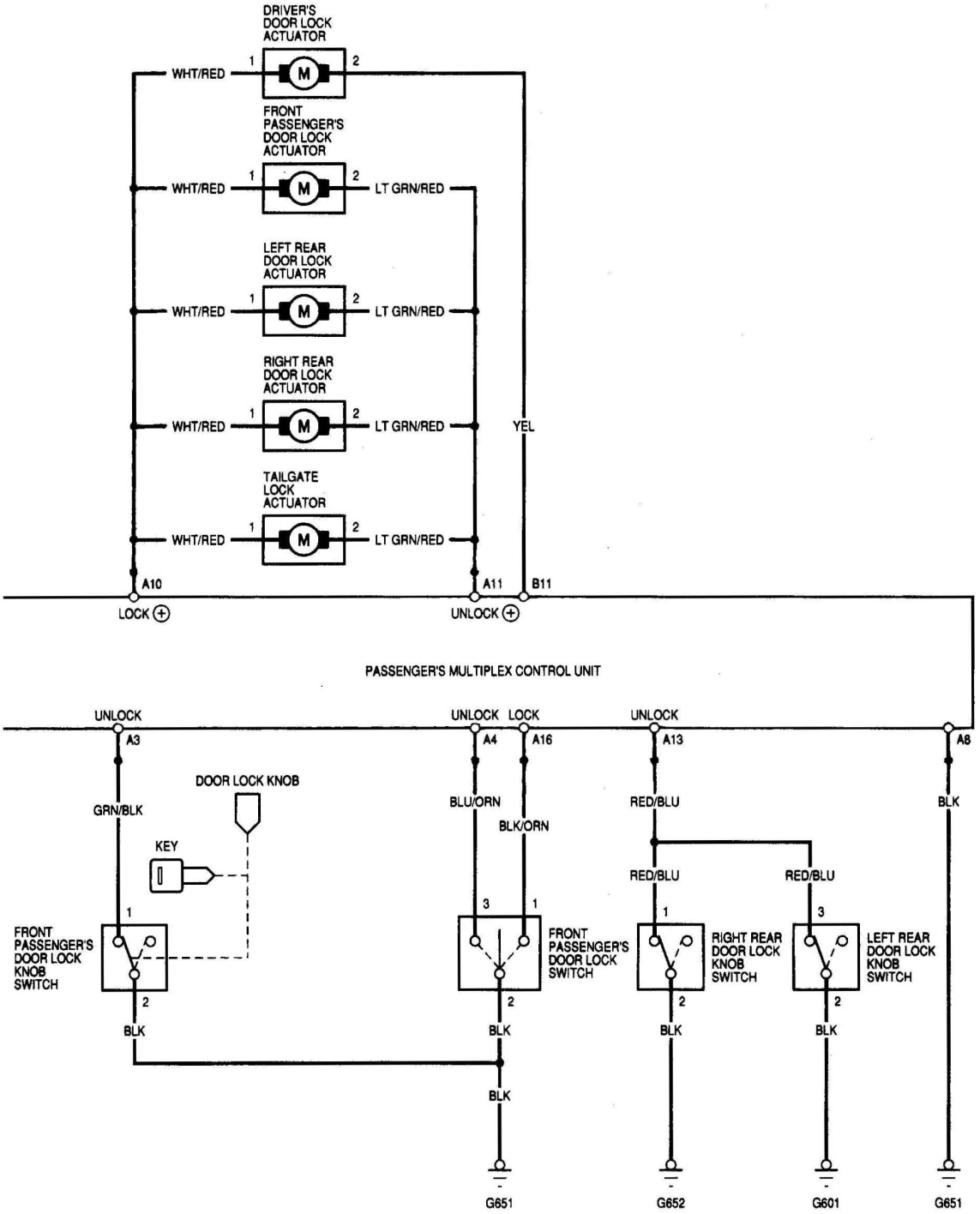
Keyless Entry/Security Alarm System

Circuit Diagram (cont'd)



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BACK

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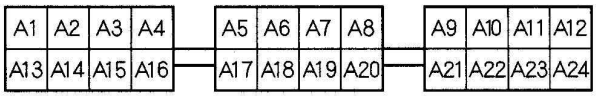
Control Unit Input Test

1. Before testing the keyless entry/security control functions, troubleshoot the multiplex control system (see page 22-212).

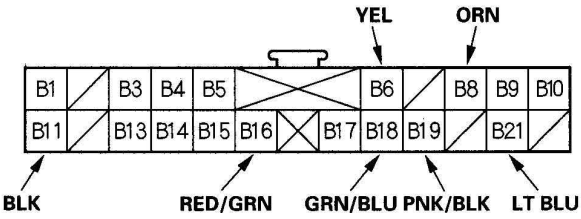
Driver's Unit:

2. Remove the driver's multiplex control unit from the driver's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

DRIVER'S UNDER-DASH FUSE/RELAY BOX SOCKET (DRIVER'S MULTIPLEX CONTROL UNIT CONNECTOR A)

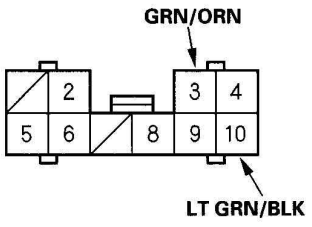


DRIVER'S MULTIPLEX CONTROL UNIT CONNECTOR B



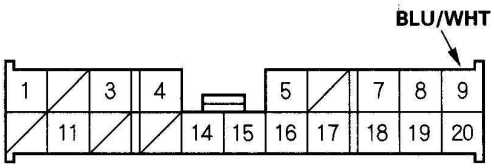
Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR E



Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR M



Wire side of female terminals

BACK

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4. With the driver's multiplex control unit still disconnected, make these input tests at the connector and driver's under-dash fuse/relay box sockets.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B11	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • Faulty driver's fuse/relay box • An open in the wire
A24		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10A) fuse in the driver's under-dash fuse/relay box • Faulty driver's fuse/relay box
A10		Headlight switch ON (≣D) and jump A10 to battery voltage	The headlights should come on.	• Poor ground (G401) • Faulty headlight relay 1 or 2 • Faulty combination light switch • Faulty driver's fuse/relay box • An open in the wire
A5		Under all conditions	Attach to ground: The security indicator should come on.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • Faulty security indicator • Faulty driver's fuse/relay box • An open in the wire
A22		Connect B16 to battery voltage and A22 to ground	The parking lights and dash lights should come on.	• Poor ground (G401) • Faulty combination light switch • Faulty driver's fuse/relay box • Faulty taillight relay • An open in the wire
A6			Check for voltage to ground: There should be battery voltage.	• Blown No. 10 (15A) fuse in the passenger's under-dash fuse/relay box • Faulty taillight relay • Faulty driver's fuse/relay box • An open in the wire
B16	RED/GRN	Combination light switch OFF	Check for continuity to ground: There should be no continuity.	• Faulty taillight relay • Faulty combination light switch • Faulty driver's fuse/relay box • An open in the wire • A short to ground in the wire
		Combination light switch ON and jump B16 to battery voltage	The parking lights and dash lights should come on.	• Faulty taillight relay • Faulty combination light switch • Faulty driver's fuse/relay box • An open in the wire

(cont'd)

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Control Unit Input Test (cont'd)

5. Reconnect the driver's multiplex control unit to the driver's under-dash fuse/relay box, and perform the following input tests at the appropriate connectors on the back of the driver's under-dash fuse/relay box.
   For driver's under-dash fuse/relay box connector socket location (see page 22-56).

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 6.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
E3	GRN/ORN	Driver's door open	Check for voltage to ground: There shoul be 1 V or less.	• Faulty driver's door switch • An open in the wire • Short to ground
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	
E10	LT GRN/ BLK	Left rear door open	Check for voltage to ground: There should be 1 V or less.	• Faulty left rear door switch • An open in the wire • Short to ground
		Left rear door closed	Check for voltage to ground: There should be 5 V or more.	
B6	YEL	Hood open	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G201) • Faulty hood switch • An open in the wire • Short to ground
		Hood closed	Check for voltage to ground: There should be 5 V or more.	
B8	ORN	Tailgate open	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G602) • Faulty tailgate latch switch • An open in the wire • Short to ground
		Tailgate closed	Check for voltage to ground: There should be 5 V or more.	
M9	BLU/WHT	Ignition key is in the ignition switch	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G401) • Faulty ignition key switch • An open in the wire • Short to ground
		Ignition key is out of the ignition switch	Check for voltage to ground: There should be 5 V or more.	

BACK

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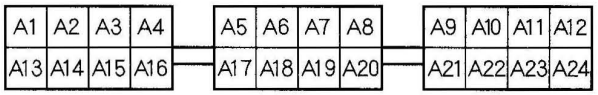
Passenger's Unit:

6. Remove the passenger's multiplex control unit from the passenger's under-dash fuse/relay box, and disconnect its connector.

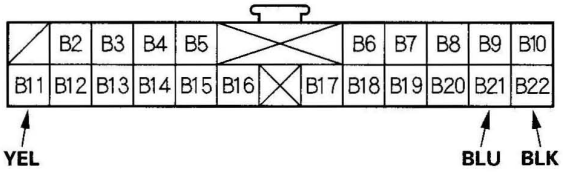
7. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 8.

PASSENGER'S UNDER-DASH FUSE/RELAY BOX SOCKET

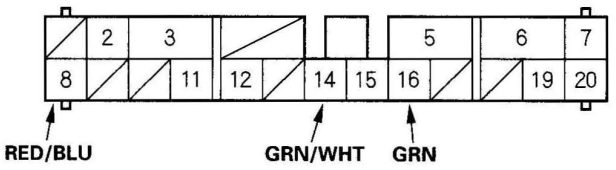


DRIVER'S MULTIPLEX CONTROL UNIT CONNECTOR B



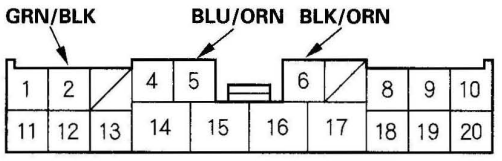
Wire side of female terminals

PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR C



Wire side of female terminals

PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR E



Wire side of female terminals

(cont'd)

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Control Unit Input Test (cont'd)

8. With the passenger's multiplex control unit still disconnected, make these input tests at the connectors and the passenger's under-dash fuse/relay box sockets.

   - If any test indicates a problem, find and corredt the cause, then recheck the system.
   - If all the input tests prove OK, go to step 9.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B22	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G503) • Faulty passenger's fuse/relay box • An open in the wire
A8	Fuse/relay box socket	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G651) • Faulty passenger's fuse/relay box • An open in the wire
A9		Under all conditions	Attach to ground: Horns should sound.	• Blown No. 47 (20A) fuse in the under-hood fuse/relay box • Faulty passenger's fuse/relay box • Faulty horn relay • Faulty horn • An open in the wire
A20		Under all conditions	Attach to ground: Headlights should come on.	• Faulty headlight relay 1 or 2 • Faulty passenger's fuse/relay box • An open in the wire
A22		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10A) fuse in the driver's under-dash fuse/relay box • Faulty driver's fuse/relay box • Faulty passenger's fuse/relay box • An open in the wire
A23		Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 12 (20A) fuse in the passenger's under-dash fuse/relay box • Faulty passenger's fuse/relay box
A24		Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • Faulty passenger's fuse/relay box
A10	Fuse/relay box socket	Jump A10 to battery voltage and B11 to body ground.	Check driver's door lock operation: The door should lock.	• Faulty driver's door lock actuator • Faulty passenger's fuse/relay box • An open in the wire
B11	YEL			
A10	Fuse/relay box socket	Jump A10 to battery voltage and A11 to body ground.	Check passenger's doors lock operation: The door should lock.	• Faulty passenger's door lock actuator • Faulty passenger's fuse/relay box • An open in the wire
A11			Check tailgate lock operation: The tailgate should lock.	• Faulty tailgate lock actuator • Faulty passenger's fuse/relay box • An open in the wire
A1	PNK	Connect A1 terminal to A24 terminal momentarily.	Check keyless buzzer operation: The buzzer should click.	• Poor ground (G501) • Faulty keyless buzzer • Faulty passenger's fuse/relay box • An open in the wire
B21	BLU	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G502) • Faulty connections at the audio unit or navigation display unit • Faulty audio unit or navigation display unit • Faulty passenger's fuse/relay box • An open in the wire

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9. Reconnect the passenger's multiplex control unit to the passenger's under-dash fuse/relay box, and perform the following input tests at the appropriate connectors on the passenger's under-dash fuse/relay box.
For passenger's under-dash fuse/relay box connector socket location (see page 22-57).

NOTE: When testing passenger's door lock knob switches, begin with all doors locked, then test one at a time.
- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 10.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
C16	GRN	Passenger's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty passenger's door switch • An open in the wire • Short to ground
		Passenger's door closed	Check for voltage to ground: There should be 5 V or more.	
C14	GRN/WHT	Right rear door open	Check for voltage to ground: There should be 1 V or less.	• Faulty right rear door switch • An open in the wire • Short to ground
		Right rear door closed	Check for voltage to ground: There should be 5 V or more.	
C8	RED/BLU	Wake up the multiplex system by locking all doors with the power door lock switch; Left rear door lock knob switch unlocked	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G601) • Faulty left rear door lock actuator • An open in the wire • Short to ground
		Wake up the multiplex system by locking all doors with the power door lock switch; Left rear door lock knob switch locked	Check for voltage to ground: There should be 5 V or more.	
		Wake up the multiplex system by locking all doors with the power door lock switch; Right rear door lock knob switch unlocked	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G652) • Faulty right rear door lock actuator • An open in the wire • Short to ground
		Wake up the multiplex system by locking all doors with the power door lock switch; Right rear door lock knob switch locked	Check for voltage to ground: There should be 5 V or more.	
E2	GRN/BLK	Wake up the multiplex system by locking all doors with the power door lock switch; Passenger's door lock knob switch unlocked	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G581) • Faulty passenger's door lock actuator • An open in the wire • Short to ground
		Wake up the multiplex system by locking all doors with the power door lock switch; Passenger's door lock knob switch locked	Check for voltage to ground: There should be 5 V or more.	
E5	BLU/ORN	Passenger's door lock switch in UNLOCK	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G581) • Faulty passenger's door lock switch • An open in the wire • Short to ground
		Passenger's door lock switch in neutral position	Check for voltage to ground: There should be 5 V or more.	
E6	BLK/ORN	Passenger's door lock switch in LOCK	Check for voltage to ground: There should be 1 V or less.	
		Passenger's door lock switch in neutral position	Check for voltage to ground: There should be 5 V or more.	
B21	BLU	Under all conditions	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G502) • Poor connection at audio unit or navigation display unit • Faulty audio unit or navigation display unit. • An open in the wire

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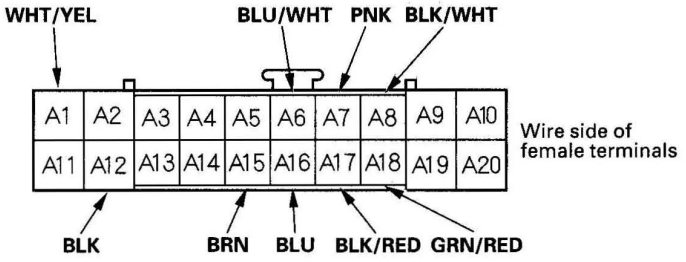
Control Unit Input Test (cont'd)

Door Unit:

10. Remove the door multiplex control unit, and disconnect its connector.

11. Inspect the connector and socket terminals to be sure they are making good contact

    - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
    - If the terminals look OK, go to step 12.



12. Reconnect the connector to the door multiplex control unit, make these input tests at the connector.

    - If any test indicates a problem, find and correct the cause, then recheck the system.
    - If all the input tests prove OK, go to step 13.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A1	WHT/YEL	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/ relay box • An open in the wire
A12	BLK	Under all conditions	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G401) • An open in the wire

BACK

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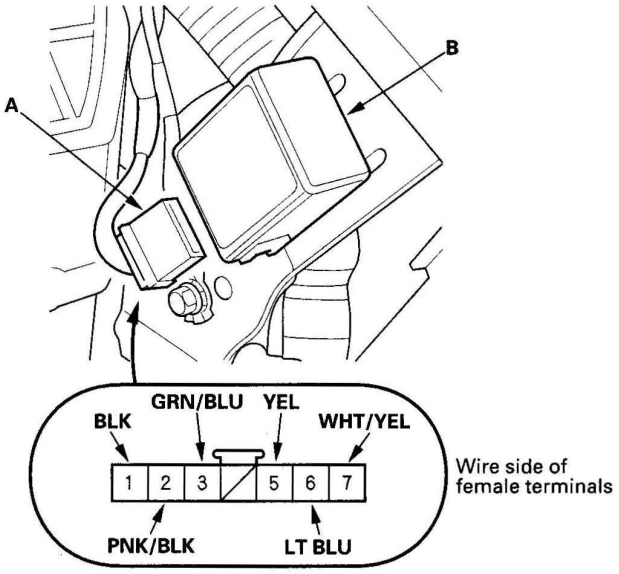
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A6	BLU/WHT	Driver's door key cylinder switch in LOCK	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door key cylinder switch • Poor ground (G401) • An open in the wire • Short to ground
		Driver's door key cylinder switch in the neutral position	Check for voltage to ground: There should be 5 V or more.	
		Driver's door key cylinder switch in UNLOCK	Check for voltage to ground: There should be 5 V or more.	
A16	BLU	Driver's door key cylinder switch in UNLOCK	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door key cylinder switch • Poor ground (G401) • An open in the wire • Short to ground
		Driver's door key cylinder switch in the neutral position	Check for voltage to ground: There should be 5 V or more.	
		Driver's door key cylinder switch in LOCK	Check for voltage to ground: There should be 5 V or more.	
A7	PNK	Driver's door lock knob locked	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door lock actuator • Poor ground (G401) • An open in the wire
		Driver's door lock knob unlocked	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock actuator • Short to ground in the wire
A17	BLK/RED	Driver's door lock knob unlocked	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door lock actuator • Poor ground (G401) • An open in the wire
		Driver's door lock knob locked	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock actuator • Short to ground in the wire
A8	BLK/WHT	Driver's door lock switch in LOCK	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door lock switch • Poor ground (G401) • An open in the wire
		Driver's door lock switch in the neutral position	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock switch • Short to ground in the wire
A18	GRN/RED	Driver's door lock switch in UNLOCK	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door lock switch • Poor ground (G401) • An open in the wire
		Driver's door lock switch in the neutral position	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock switch • Short to ground in the wire

13. If all the input tests prove OK, one of the control units must be faulty, Substitute a known-good control unit for the one that is most likely at fault, then recheck the system. If the system works properly, the original control unit is faulty; replace it. If there is still a malfunction, substitute a known-good control unit for the next most likely unit to be at fault, and recheck. If the system works properly, the original unit is faulty; replace it.

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Keyless Receiver Unit Input Test

1. Remove the glove box and glove box cover (see page 20-69).
2. Disconnect the 7P connector (A) from the keyless receiver unit (B).



3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals are OK, go to step 4.

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4. With the connector still disconnected, make these input tests at the connector.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
2	PNK/BLK	Under all conditions	Check for continuity between the No. 2 terminal and driver's multiplex control unit B19 terminal. There should be continuity.	• An open in the wire
3	GRN/BLU	Under all conditions	Check for continuity between the No. 3 terminal and driver's multiplex control unit B18 terminal. There should be continuity.	• An open in the wire
6	LT BLU	Under all conditions	Check for continuity between the No. 6 terminal and driver's multiplex control unit B21 terminal. There should be continuity.	• An open in the wire

5. With the connector connected, make these input tests at the connector.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, replace the keyless receiver unit.

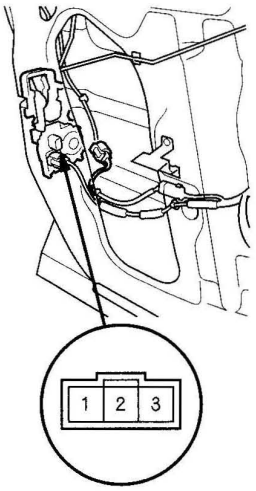
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G503) • An open in the wire
5	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10A) fuse in the driver's under-dash fuse/relay box • An open in the wire
7	WHT/YEL	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • An open in the wire

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Door Lock Knob Switch Test

Driver's Door:

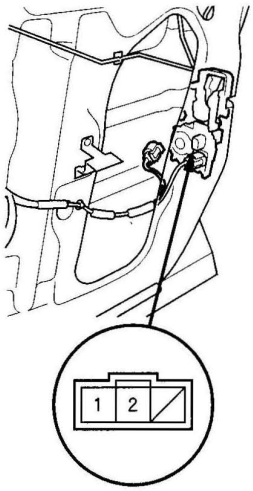
1. Remove the driver's door panel (see page 20-6).
2. Disconnect the 3P connector from the actuator.



3. Check for continuity between the terminals.
   - There should be continuity between the No. 1 and No. 2 terminals when the door lock knob switch is in the LOCK position.
   - There should be continuity between the No. 2 and No. 3 terminals when the door lock knob switch is in the UNLOCK position.
4. If the continuity is not as specified, replace the door lock actuator.

Front Passenger's Door:

1. Remove the front passenger's door panel (see page 20-6).
2. Disconnect the 3P connector from the actuator.



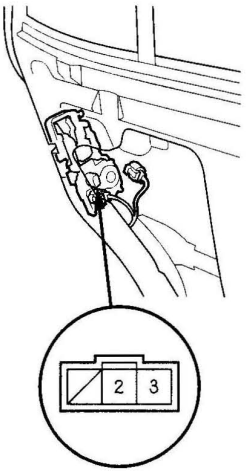
3. Check for continuity between the terminals.
   - There should be continuity between the No. 1 and No. 2 terminals when the door lock knob switch is in the UNLOCK position.
4. If the continuity is not as specified, replace the door lock actuator.

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Left Rear Door:

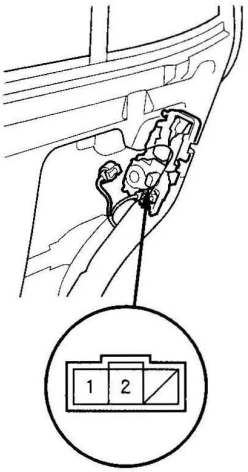
1. Remove the left rear door panel (see page 20-6).
2. Disconnect the 3P connector from the actuator.



3. Check for continuity between the terminals.
   - There should be continuity between the No. 2 and No. 3 terminals when the door lock knob switch is in the UNLOCK position.
4. If the continuity is not as specified, replace the door lock actuator.

Right Rear Door:

1. Remove the right rear door panel (see page 20-14).
2. Disconnect the 3P connector from the actuator.



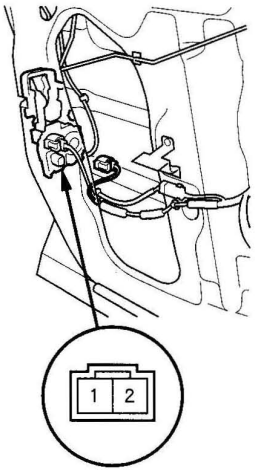
3. Check for continuity between the terminals.
   - There should be continuity between the No. 1 and No. 2 terminals when the door lock knob switch is in the UNLOCK position.
4. If the continuity is not as specified, replace the door lock actuator.

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Door Lock Actuator Test

Driver's Door:

1. Remove the driver's door panel (see page 20-6).
2. Disconnect the 2P connector from the actuator.



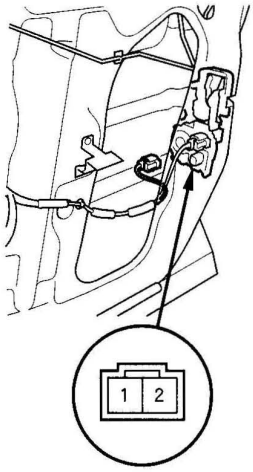
3. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

Terminal / Position	1	2
LOCK	⊕	⊖
UNLOCK	⊖	⊕

4. If the actuator does not operate as specified, replace it.

Passenger's Door:

1. Remove the passenger's door panel (see page 20-6).
2. Disconnect the 2P connector from the actuator.



3. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

Terminal / Position	1	2
LOCK	⊕	⊖
UNLOCK	⊖	⊕

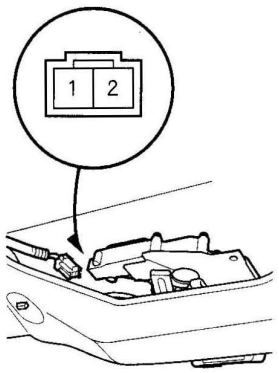
4. If the actuator does not operate as specified, replace it.

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Tailgate:

1. Remove the tailgate lining (see page 20-58).
2. Disconnect the 2P connector from the actuator.



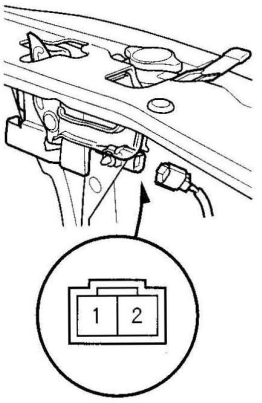
3. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

Terminal / Position	1	2
LOCK	⊕	⊖
UNLOCK	⊖	⊕

4. If the actuator does not operate as specified, replace it.

Hood Switch Test

1. Open the hood.
2. Disconnect the 2P connector from the hood switch.

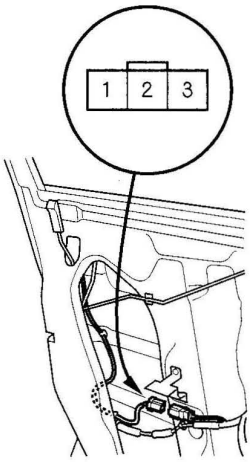


3. Check for continuity between the terminals.
   - There should be continuity between the No. 1 and No. 2 terminals when the hood is opened (lever released)
   - There should be no continuity between the No. 1 and No. 2 terminals when the hood is closed (lever pushed down)
4. If the continuity is not as specified, replace the switch.

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Door Key Cylinder Switch Test

1. Remove the driver's door panel (see page 20-6).
2. Disconnect the 3P connector from the key cylinder switch.

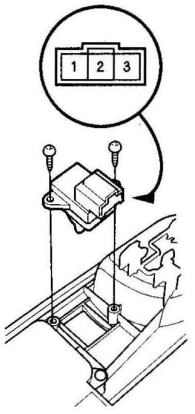


3. Check for continuity between the terminals.
   - There should be continuity between the No. 2 and No. 3 terminals when the door key cylinder switch is in the LOCK position.
   - There should be no continuity between the No. 2 and No. 3 terminals when the door key cylinder switch is in the neutral position.
   - There should be continuity between the No. 1 and No. 2 terminals when the door key cylinder switch is in the UNLOCK position.
   - There should be no continuity between the No. 1 and No. 2 terminals when the door key cylinder switch is in the neutral position.
4. If the continuity is not as specified, replace the switch.

   NOTE: Make sure the slot in the switch is properly aligned with the tab on the key cylinder.

Door Lock Switch Test

1. Remove the door panel (see page 20-6).
2. Remove the two screws, then remove the door lock switch.



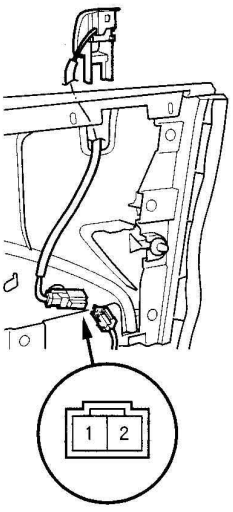
3. Check for continuity between the terminals.
   - There should be continuity between the No. 1 and No. 2 terminals when the door lock switch is in the LOCK position.
   - There should be no continuity between the No. 1 and No. 2 terminals when the door lock switch is in the neutral position.
   - There should be continuity between the No. 2 and No. 3 terminals when the door lock switch is in the UNLOCK position.
   - There should be no continuity between the No. 2 and No. 3 terminals when the door lock switch is in the neutral position.
4. If the continuity is not as specified, replace the switch.

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Security Indicator Test

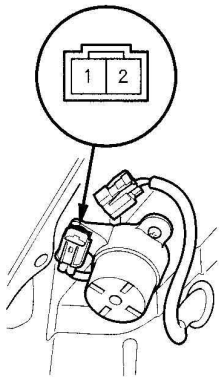
1. Remove the driver's door panel (see page 20-6).
2. Disconnect the 2P connector from the security indicator.



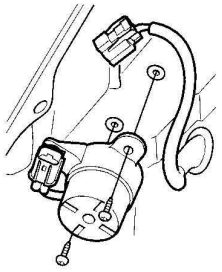
3. Test the indicator by connecting battery power to the No. 2 terminal and grounding the No. 1 terminal. The LED should come on.
4. If the LED does not come on, replace the security indicator.

Keyless Buzzer Test/Replacement

1. Remove the right inner fender (see page 20-121).
2. Disconnect the 2P connector (A) from the keyless buzzer (B).



3. Test the buzzer by connecting battery power to the No. 2 terminal and grounding the No. 1 terminal. You should hear a slight chirp.
4. If the buzzer fails to sound, remove the two mounting screws, and replace the buzzer.

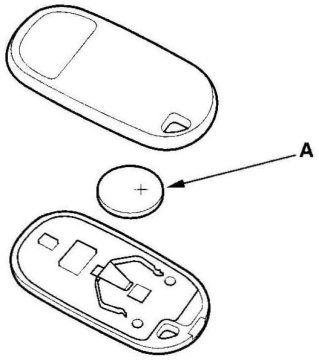


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Transmitter Test

NOTE:
- If the doors unlock or lock with the transmitter, but the LED on the transmitter does not come on, the LED is faulty; replace the transmitter.
- If any door is open, you cannot lock the door with the transmitter.
- If you unlocked the doors with the transmitter, but do not open any of the doors within 30 seconds, the doors relock automatically.
- The doors do not lock or unlock with the transmitter if the ignition key is inserted in the ignition switch.

1. Press the lock or unlock button five or six times to reset the transmitter.
   - If the locks work, the transmitter is OK.
   - If the locks don't work, go to step 2.
2. Open the transmitter and check for water damage.
   - If you find any water damage, replace the transmitter.
   - If there is no water damage, go to step 3.
3. Replace the transmitter battery (A) with a new one, and try to lock and unlock the doors with the transmitter by pressing the lock or unlock button five or six times.
   - If the doors lock and unlock, the transmitter is OK.
   - If the doors don't lock and unlock, go to step 4.



4. Reprogram and register the transmitter, then try to lock and unlock the doors.
   - If the doors lock and unlock, the transmitter is OK.
   - If the doors don't lock and unlock, replace the transmitter.

Transmitter Programming

Storing transmitter codes:
The codes of up to three transmitters can be read into the keyless receiver unit memory. (If a fourth code is stored, the code which was input first will be erased.)

NOTE: It is important to maintain the time limits between the steps. Make sure the doors, hood and tailgate are closed.

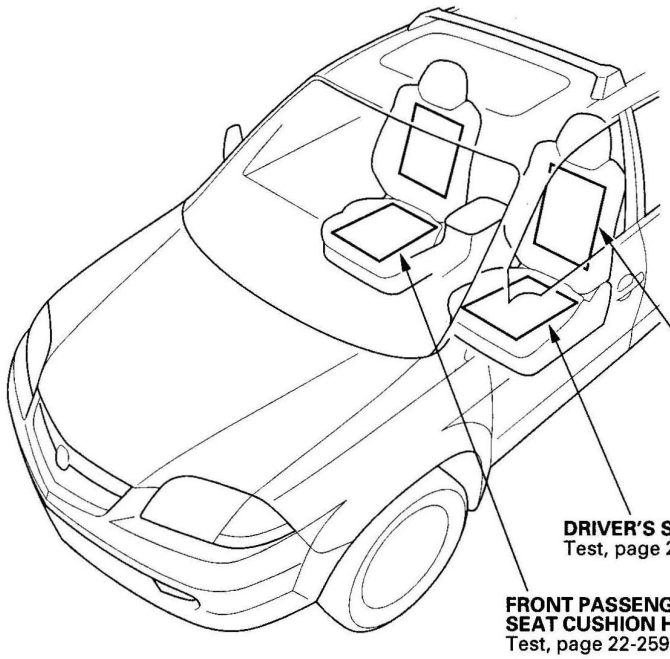
1. Turn the ignition switch ON (II).
2. Within 1 to 4 sec., push the transmitter lock or unlock button with the transmitter aimed at the keyless receiver unit by the steering column.
3. Within 1 to 4 sec., turn the ignition switch OFF.
4. Within 1 to 4 sec., turn the ignition switch ON (II).
5. Within 1 to 4 sec., push the transmitter lock or unlock button with the transmitter aimed at the keyless receiver unit by the steering column.
6. Within 1 to 4 sec., turn the ignition switch OFF.
7. Within 4 sec., turn the ignition switch ON (II).
8. Within 1 to 4 sec., push the transmitter lock or unlock button with the transmitter aimed at the keyless receiver unit by the steering column.
9. Within 1 to 4 sec., turn the ignition switch OFF.
10. Within 4 sec., turn the ignition switch ON (II).
11. Within 1 to 4 sec., push the transmitter lock or unlock button with the transmitter aimed at the keyless receiver unit by the steering column.
12. Confirm you can hear the sound of the door lock actuators. Within 1 to 4 sec., push the transmitter lock or unlock button again.
13. Within 10 sec., aim the transmitters (up to two additional ones) whose codes you want to store at the keyless receiver unit, and press the transmitter lock or unlock buttons.
    Confirm that you can hear the sound of the door lock actuators after each transmitter code is stored.
14. Turn the ignition switch OFF, and pull out the key.
15. Confirm proper operation with the new codes(s).
    To turn the remote DPMS feature ON or OFF, press and hold the LOCK and UNLOCK buttons of the transmitter. The transmitter LED will blink once for remote DPMS ON, and blink twice for remote DPMS OFF.

BACK

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Seat Heaters

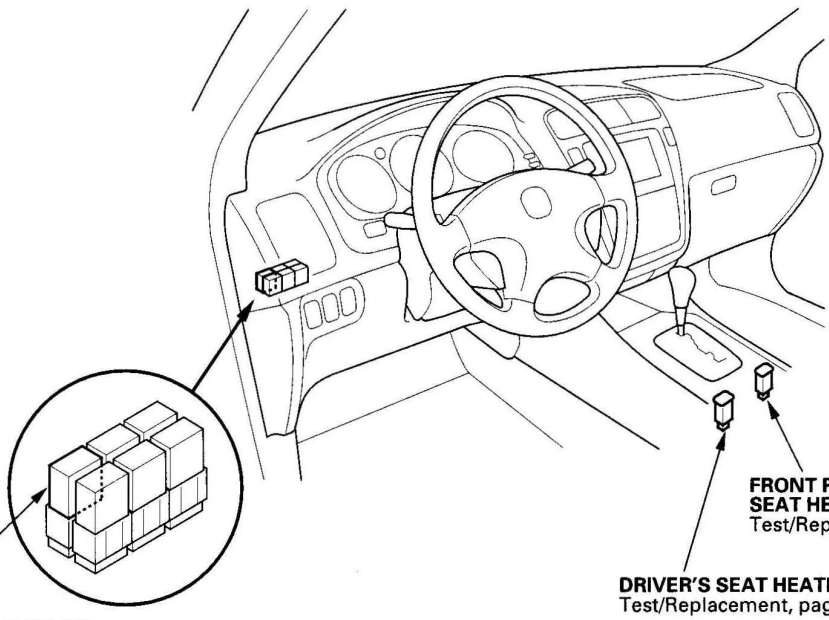
Component Location Index



DRIVER'S SEAT-BACK HEATER
Test, page 22-259

DRIVER'S SEAT CUSHION HEATER
Test, page 22-259

FRONT PASSENGER'S SEAT CUSHION HEATER
Test, page 22-259



FRONT PASSENGER'S SEAT HEATER SWITCH
Test/Replacement, page 22-260

DRIVER'S SEAT HEATER SWITCH
Test/Replacement, page 22-260

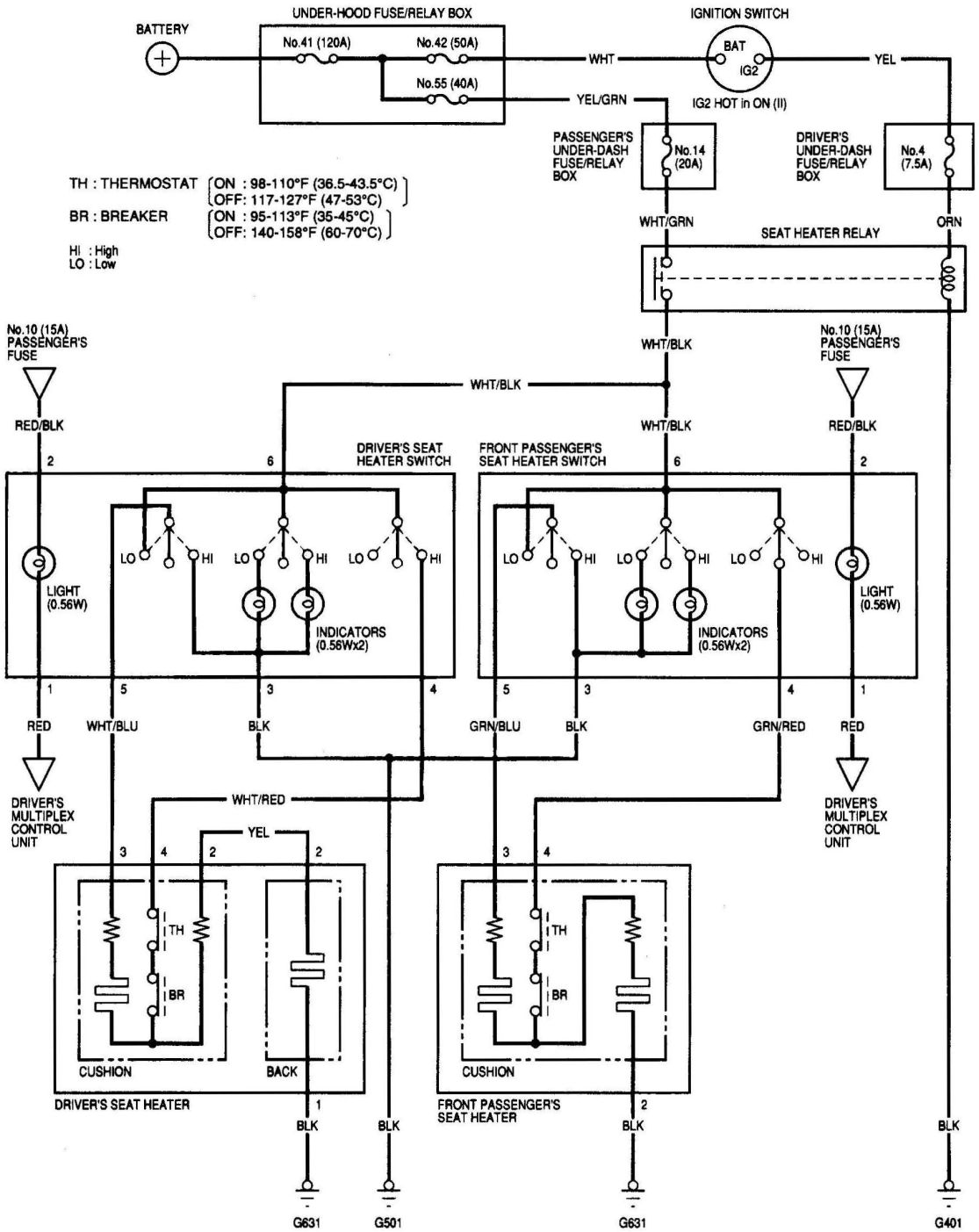
SEAT HEATER RELAY
[Wire colors: WHT/GRN, WHT/BLK, BLK and ORN]
Test, page 22-67

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Seat Heaters

Circuit Diagram



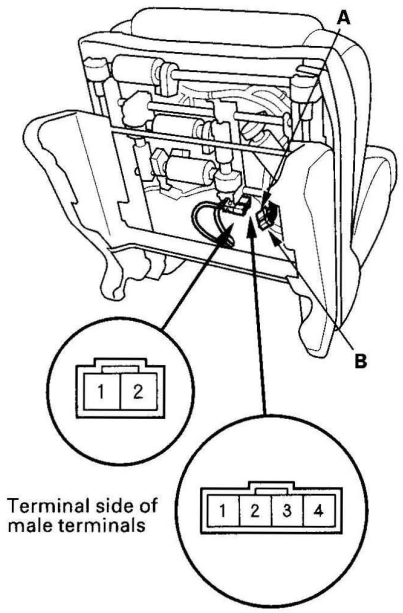
BACK

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Seat Heater Test

Driver's Seat:

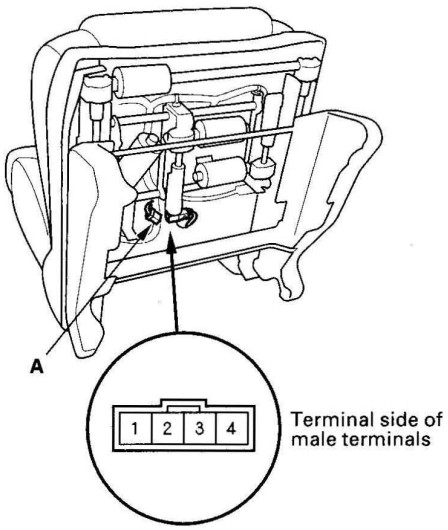
1. Remove the driver's seat (see page 20-77).
2. Disconnect the 4P connector (A) and 2P connector (B) from the seat heater.



3. Seat Cushion Heater:
   Check for continuity between the No. 2 and No. 3 terminals, and No. 3 and No. 4 terminals of the 4P connector. There should be continuity.
4. Seat-back Heater:
   Check for continuity between the No. 1 and No. 2 terminals of the 2P connector. There should be continuity.
5. If the continuity is not as specified, replace the seat heater.

Front Passenger's Seat:

1. Remove the passenger's seat (see page 20-77).
2. Disconnect the 4P connector (A) from the seat heater.



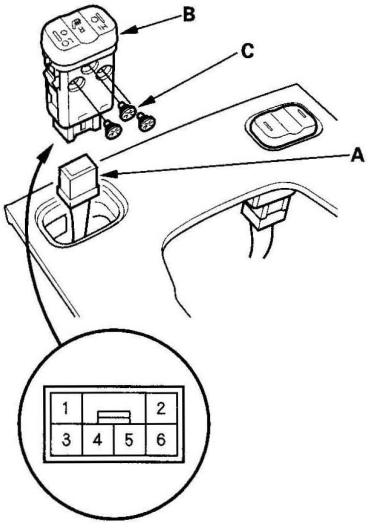
3. Check for continuity between the No. 2 and No. 3 terminals, and No. 3 and No. 4 terminals of the 4P connector. There should be continuity.
4. If the continuity is not as specified, replace the seat heater.

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Seat Heaters

Switch Test

1. Remove the center console (see page 20-65).
2. Disconnect the 6P connector (A) from the seat heater switch (B), and remove the switch.



3. Check for continuity between the terminal in each switch position according the table.

Position \ Terminal		1		2	3		6	4	5
ON	HIGH	○	○	○	○	○	○	○	○
	LOW	○	○	○	○	○	○		○
OFF		○	○	○					

4. If the continuity is not as specified, replace the switch.
5. If necessary, check the illumination bulbs (C).

BACK

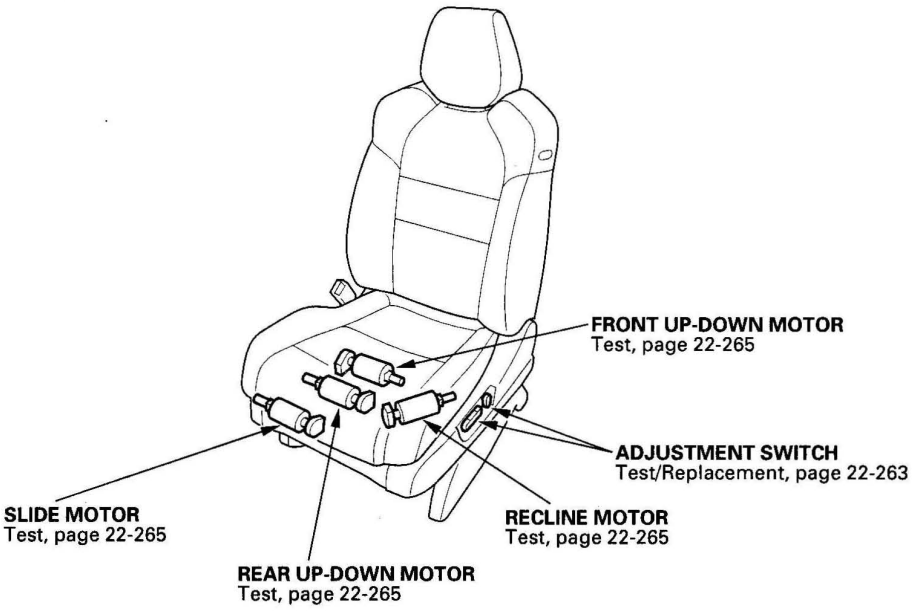
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Power Seats

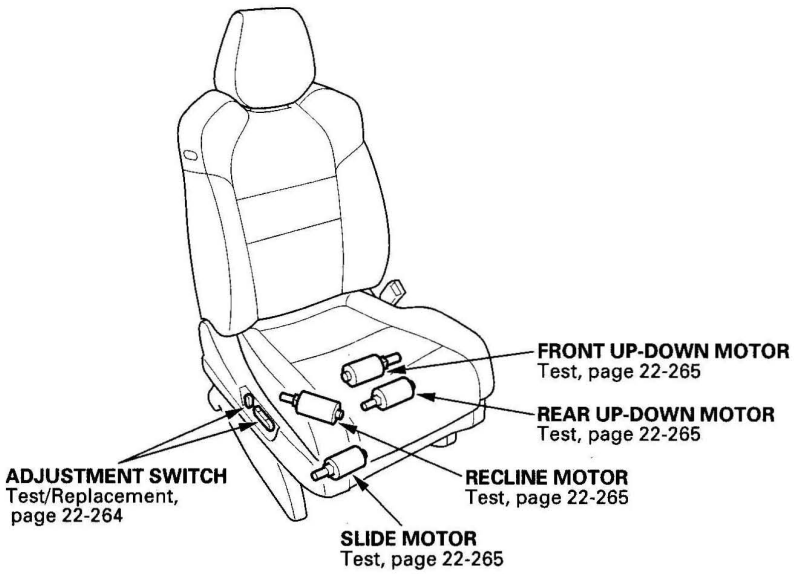
Component Location Index

)TE: For the Driving Position Memory System (DPMS), refer to page 22-266.

Driver's Power Seat (8-way Adjustable)(Without Memory):



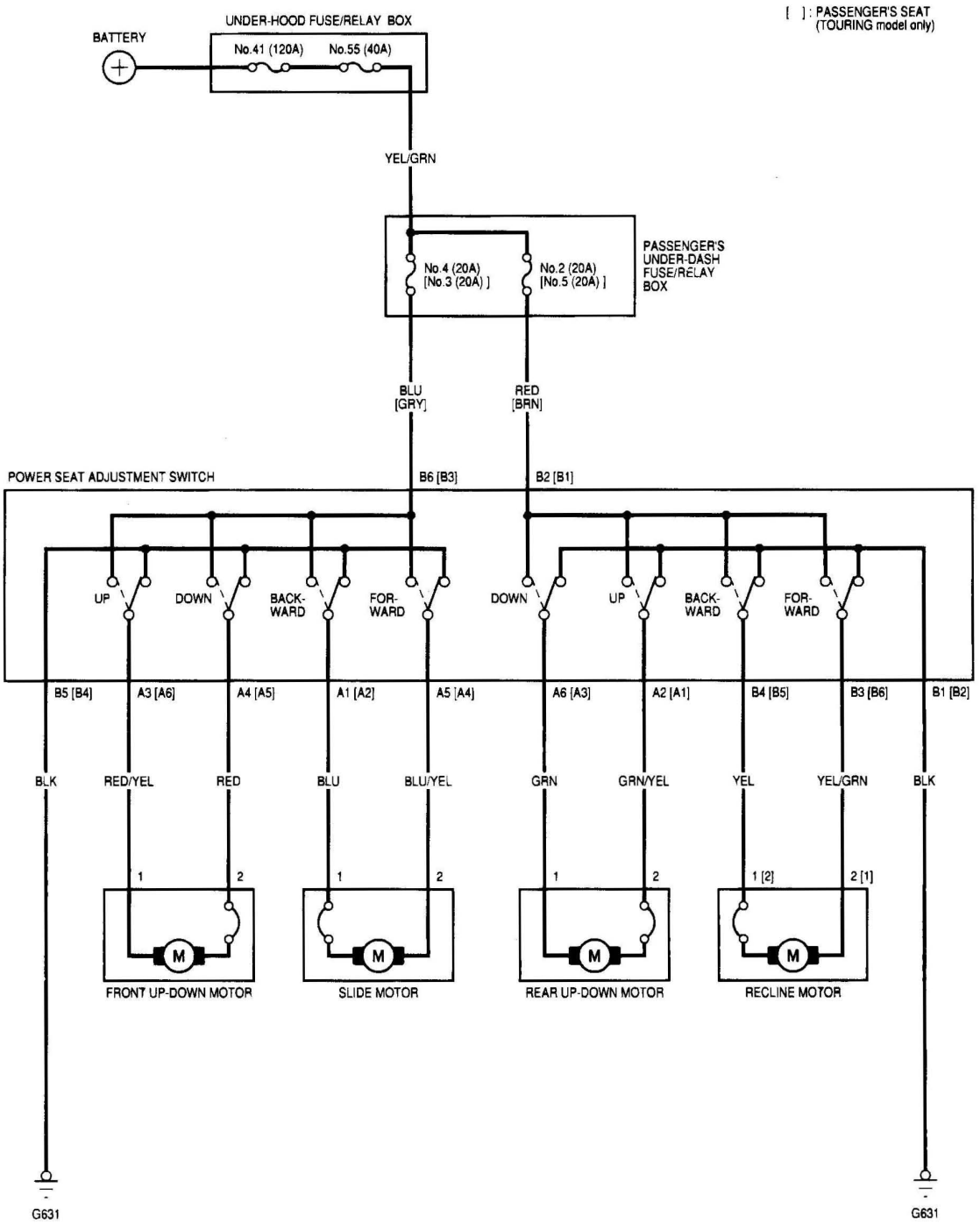
Passenger's Power Seat (8-way Adjustable):
(TOURING model only)



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Power Seats

Circuit Diagram - Power Seat without DPMS



BACK

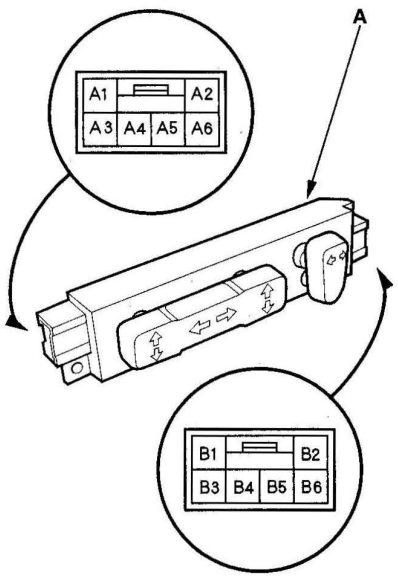
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Switch Test/Replacement

Driver's Switch:

1. Remove the power seat adjustment switch knob and recline cover from the driver's seat, then remove the power seat switch (see page 20-79).

2. Disconnect the 6P connectors from the power seat adjustment switch (A).



3. Reinstall the adjustment switch knob to the switch.

4. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal		A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6
SLIDE SWITCH	Forward	○				○						○	○
	Backward	○				○						○	○
RECLINE SWITCH	Forward							○	○	○	○		
	Backward							○	○	○	○		
FRONT UP-DOWN SWITCH	UP			○	○							○	○
	DOWN			○	○							○	○
REAR UP-DOWN SWITCH	UP		○				○	○	○				
	DOWN		○				○	○	○				

5. If the continuity is not as specified, replace the switch.

(cont'd)

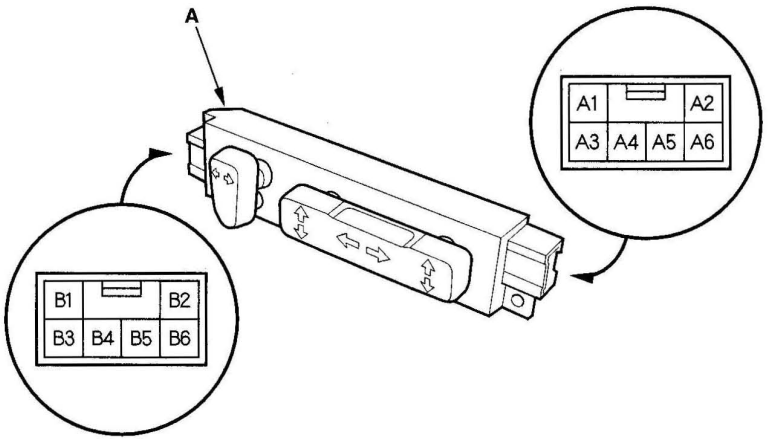
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Switch Test/Replacement (cont'd)

Passenger's Switch:

1. Remove the power seat adjustment switch knob and recline cover from the passenger's seat, then remove the power seat switch (see page 20-79).

2. Disconnect the 6P connectors from the power seat adjustment switch (A).



3. Reinstall the adjustment switch knobs to the switch.

4. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal		A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6
SLIDE SWITCH	Forward		○		○	—	—	—	—	○	○		
	Backward		○		○	—	—	—	—	○	○		
RECLINE SWITCH	Forward							○	○	—	—	○	
	Backward							○	○	—	—	○	
FRONT UP-DOWN SWITCH	UP					○	○	—	—	○	○		
	DOWN					○	○	—	—	○	○		
REAR UP-DOWN SWITCH	UP	○		○	—	—	—	○	○				
	DOWN	○		○	—	—	—	○	○				

5. If the continuity is not as specified, replace the switch.

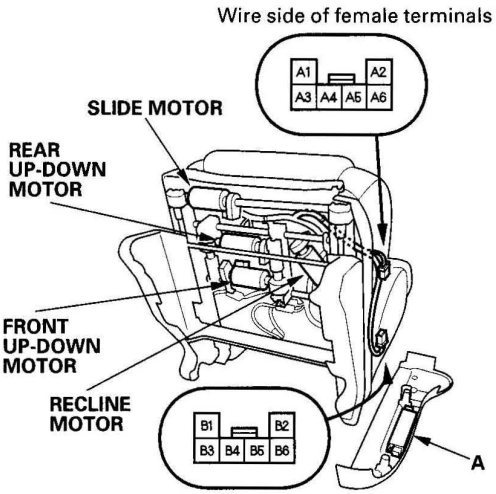
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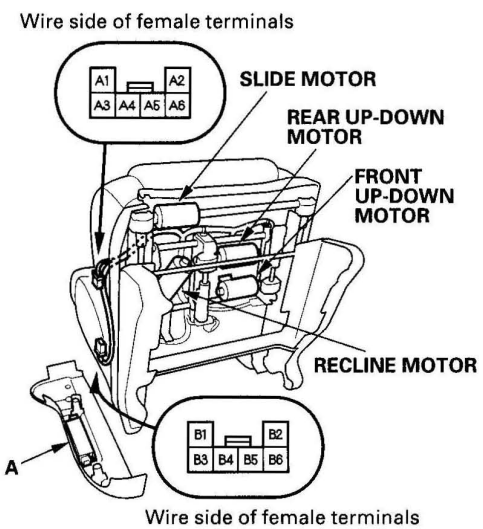
Motor Test

1. Remove the seat (see page 20-77).
2. Disconnect the 6P connectors from the adjustment switch (A).

Driver's Seat:



Passenger's Seat:



3. Test each motor by applying battery voltage and body ground to the terminals.

Slide motor:

Terminal / Position	A1 [A2]	A5 [A4]
Forward	⊖	⊕
Backward	⊕	⊖

Recline motor:

Terminal / Position	B3 [B6]	B4 [B5]
Forward	⊕	⊖
Backward	⊖	⊕

Front up-down motor:

Terminal / Position	A3 [A6]	A4 [A5]
UP	⊕	⊖
DOWN	⊖	⊕

Rear up-down motor:

Terminal / Position	A2 [A1]	A6 [A3]
UP	⊕	⊖
DOWN	⊖	⊕

[ ] : **Passenger's seat**

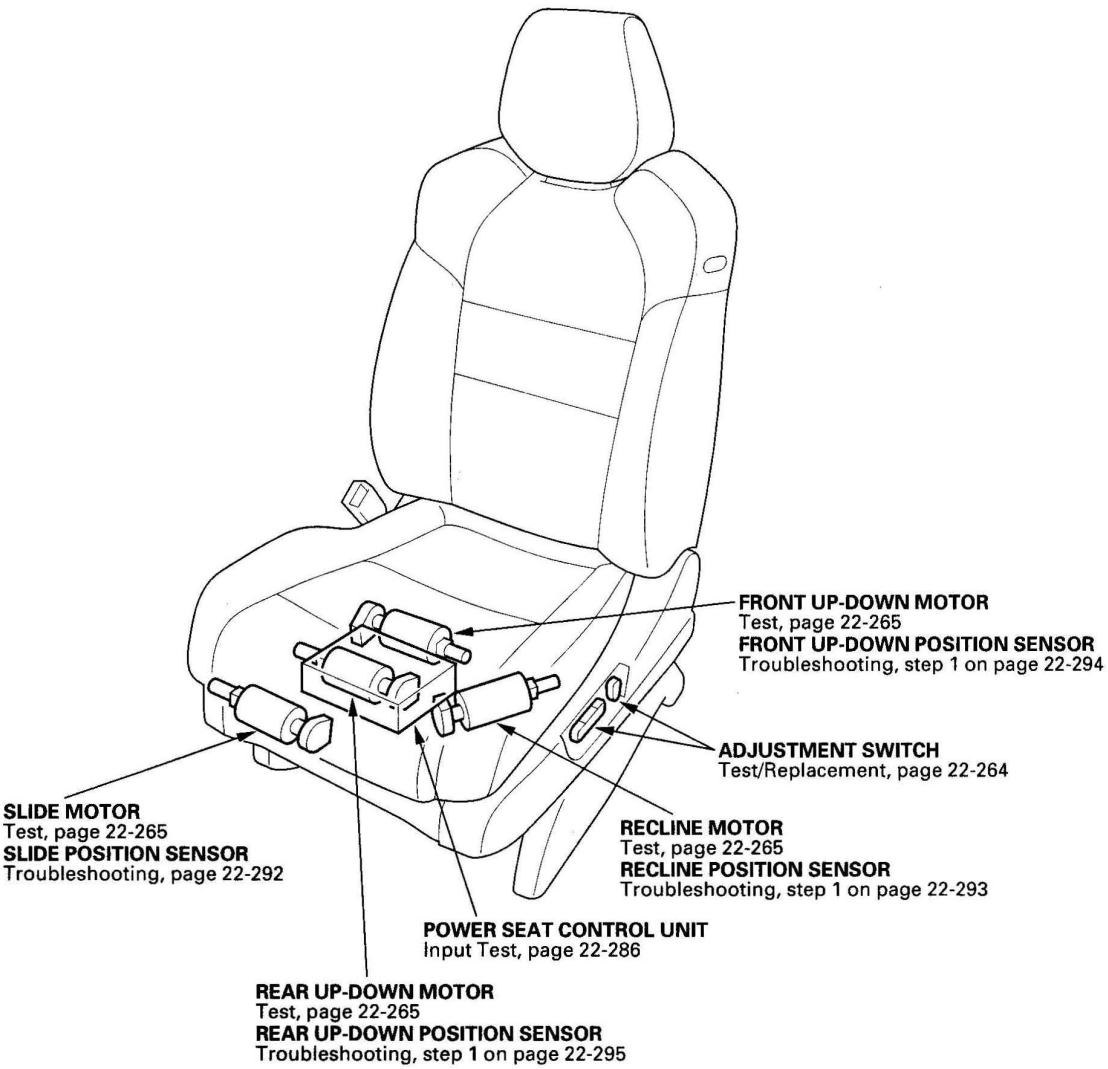
4. If the motor does not run or fails to run smoothly, check for an open in the power seat wire harness between the 6P connector and the 2P power seat motor. If the harness is OK, replace the motor (see page 20-82).

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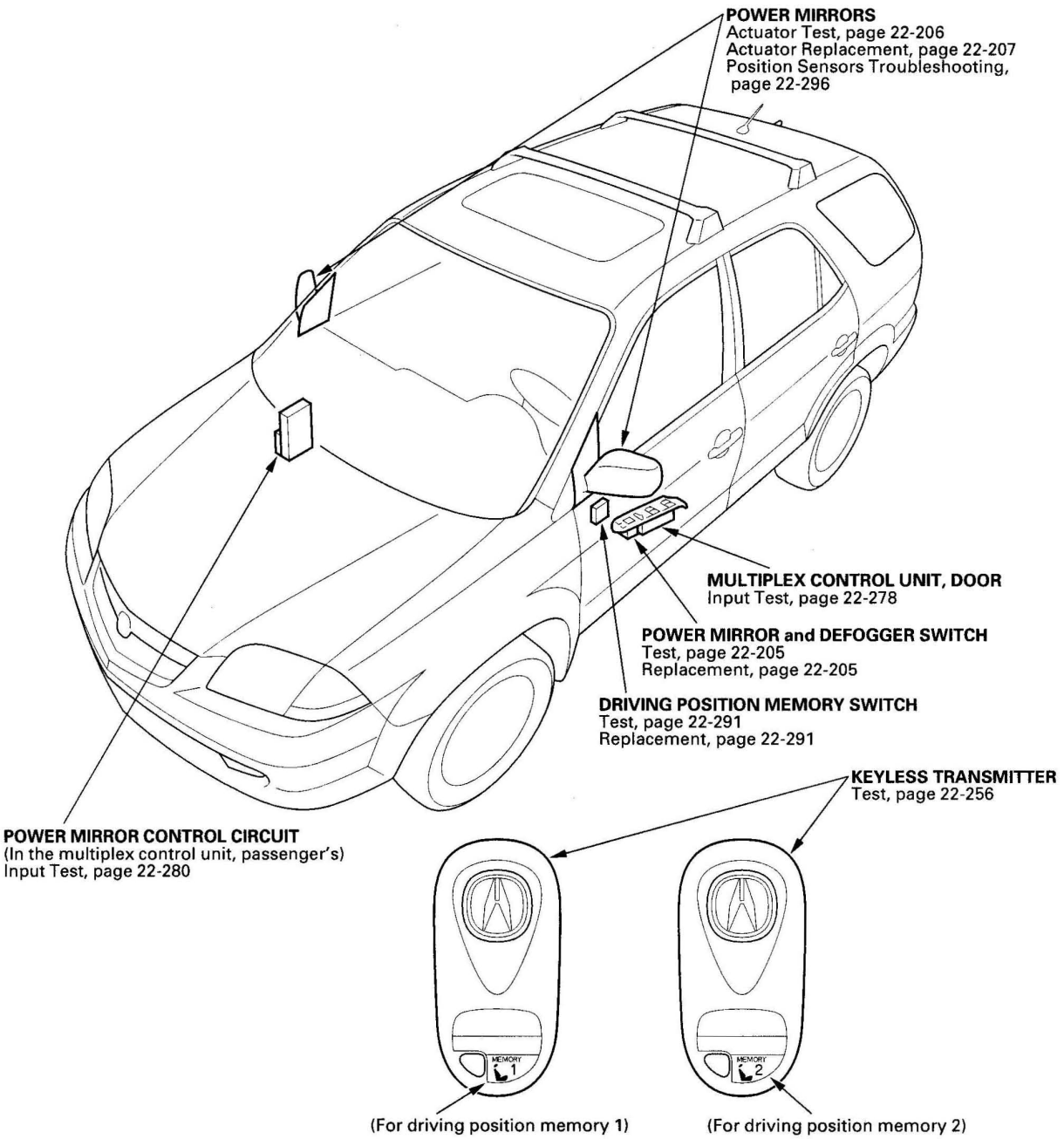
Driving Position Memory System (DPMS)

Component Location Index



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Driving Position Memory System (DPMS)

System Descriptions

The driver's seat and the power mirrors have a memory feature. The seat and mirror adjustments can be regulated separately. All the adjustments can be memorized by pressing the MEMO button on the driving position memory switch, and then pressing one of two position buttons within 5 seconds. Pressing the appropriate position button will move the seat and the mirrors to the position memorized positions.
This system is related with the Multiplex control system, and has also Wake-up and Sleep mode. All digital signals are sent via shared multiplex communication line. For more information about Communication line and Wake-up/Sleep mode, refer to the Multiplex Control System Description (see page 22-211).
Disconnecting the battery will cancel the memorized positions.
To turn remote DPMS feature ON or OFF, refer to Keyless Entry/Security Alarm System transmitter programming (see page 22-256).

Memory Retrieve:
When one of the two buttons on the driving position memory switch is pressed with the vehicle parked (shift lever in P) and the driver's door closed, the seat and the mirrors move to the memorized positions.

Power Seat Position Sensors:
Each motor has a reed switch sensor which detects motor rotation and sends a pulse to the power seat control unit when the motor rotates. The control unit stores the number of pulses in its memory, and the seat position is memorized.

Power Mirror Position Sensors:
By means of a Hall-effect type tilt position sensor and swing position sensor, the power mirror control circuit in the passenger's multiplex control unit detects the voltage changes caused by the movements of the mirrors. These voltage changes are stored in memory, and the power mirror positions are memorized.

Reverse Mirror Control:
When the vehicle is shifted to Reverse (shift lever in R), the passenger's side mirror tilts down automatically to help the driver's view. The passenger's side mirror will return to previous position by memory when the shift lever is shifted out of R. The mirror switch must be in the center position for the reverse mirror control to operate.

BACK

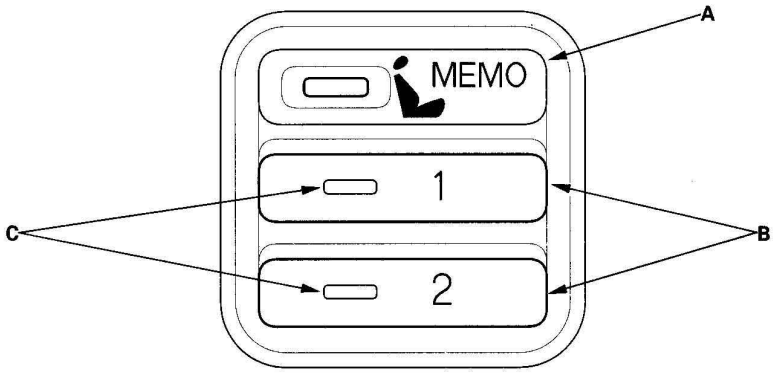
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General Troubleshooting Infomation

The self-diagnostic function of the driving position memory system detects system problems. This information can be retrieved by displaying diagnostic trouble code.

Displaying the Diagnostic Trouble Code (DTC)

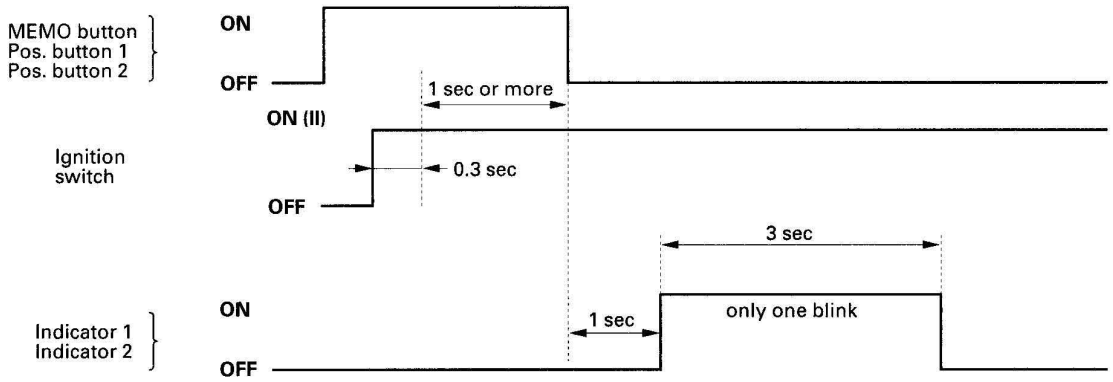
1. Turn the ignition switch OFF, and move the seat to a non-memorized position.
2. Press and hold the MEMO button (A) and both position buttons (B) at the same time.



3. Turn the ignition switch ON (II), and wait at least 1 second, then release the three buttons.
4. After 1 second, the position button indicators (C) will blink to show the DTC.

DTC Indications
No System Problem Pattern:

If there is no DTC stored, the indicators blink only once (3 seconds).



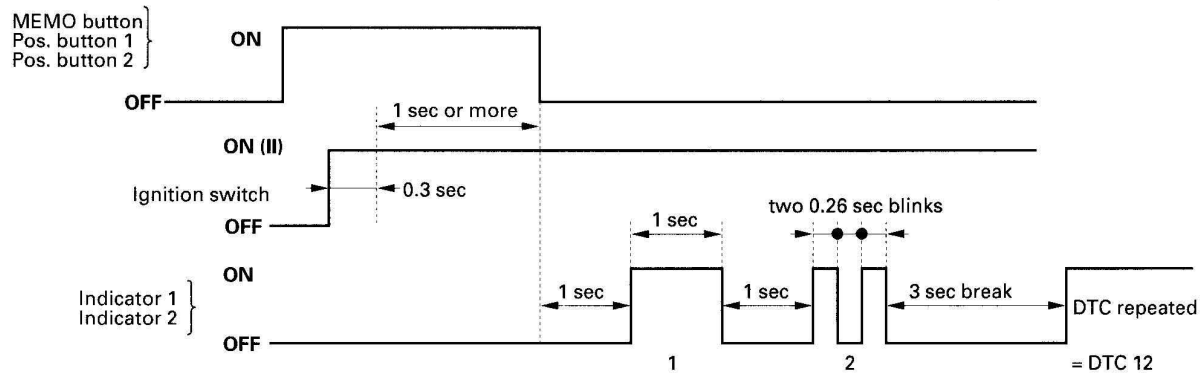
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General Troubleshooting Infomation (cont'd)

System Problem Pattern:

If a system problem occurs and a DTC is stored, the indicators will show the DTC. The first digit is indicated by the number of long (1 second) blinks, and the second digit is indicated by the number of short (0.26 second) blinks. There is a 3 second break between each DTC when there are multiple DTCs.



Canceling the DTC Indication

- Turn the ignition switch OFF or
- Press the MEMO button, or position button 1, or position button 2, or
- Press one of the driving position adjustment switches.

Erasing the DTC from Memory

Make sure you have the anti-theft code for the radio and the navigation system, then write down the frequencies for the radio's preset button. Disconnect the battery negative cable for at least 30 seconds. After reconnecting the battery, enter the anti-theft codes for the radio and the navigation system, then enter the customer's radio station presets. Reset the clock.

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Diagnostic Trouble Code (DTC) Index

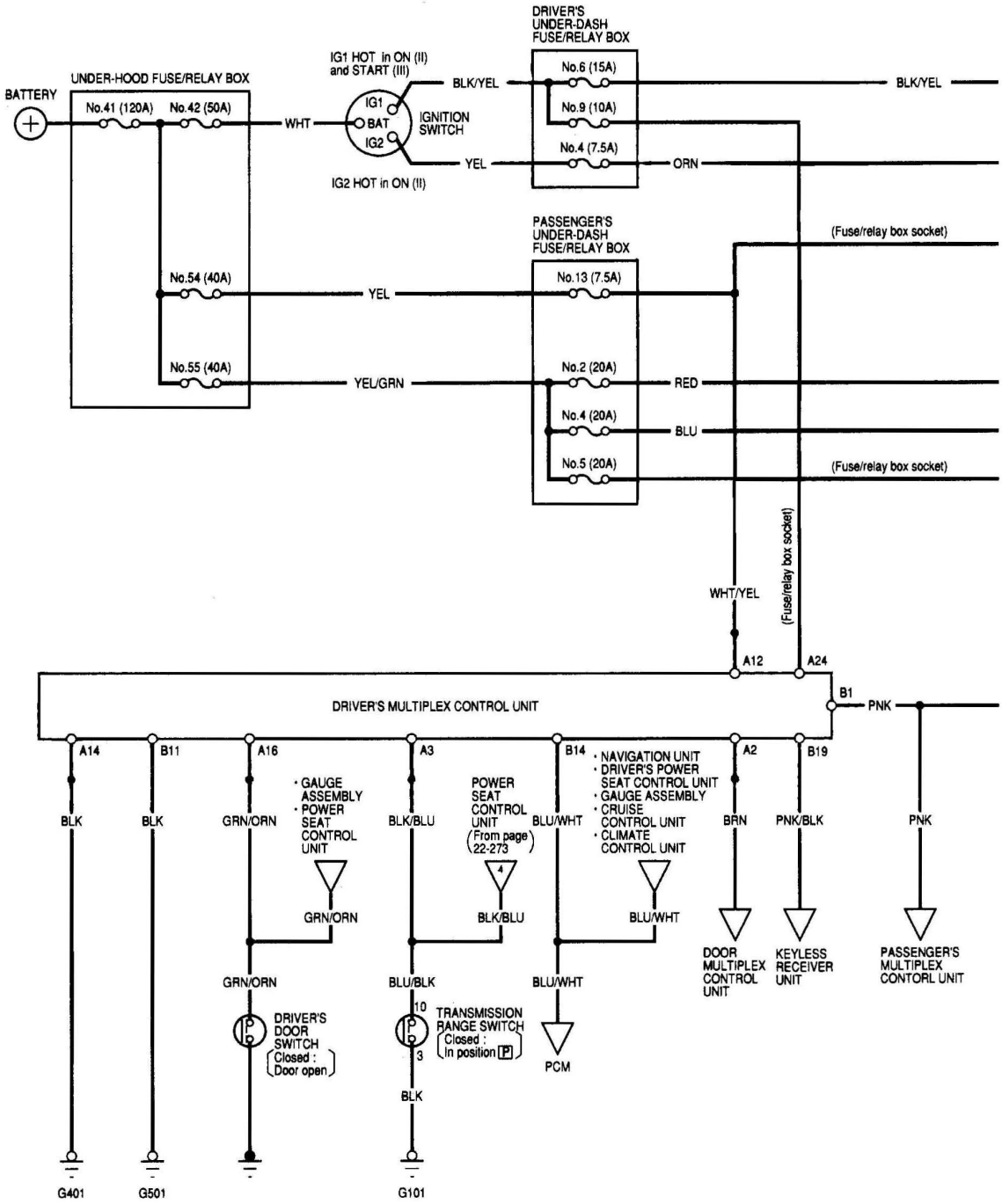
DTC	Symptom	Possible Cause	Page
31	Seat can't be adjusted at all	Faulty power seat adjustment switch, or power seat control unit	(see page 22-286) for power seat control unit input test (see page 22-278) for power seat adjustment switch test
32	Positions can't be stored or retrieved with the driving position memory switch (failure to write or read in the driver's power seat control unit)	Faulty driver's position memory switch, power seat control unit or door multiplex control unit	(see page 22-286) for power seat control unit input test (see page 22-278) for multiplex control unit input troubleshooting (see page 22-291) for driving position memory switch test
33	Positions can't be stored or retrieved with the driving position memory switch (failure to write or read in the passenger's multiplex control unit)	Faulty driver's position memory switch, or passenger's multiplex control unit	(see page 22-286) for power seat control unit input test (see page 22-278) for multiplex control unit input troubleshooting (see page 22-291) for driving position memory switch test
37	Seat can't be adjusted or can be adjusted even when the vehicle moving	Faulty transmission range switch, or vehicle speed sensor circuit	(see page 14-175) for transmission range switch test (see page 14-127) for countershaft speed sensor test (see page 22-84) for vehicle speed sensor circuit troubleshooting

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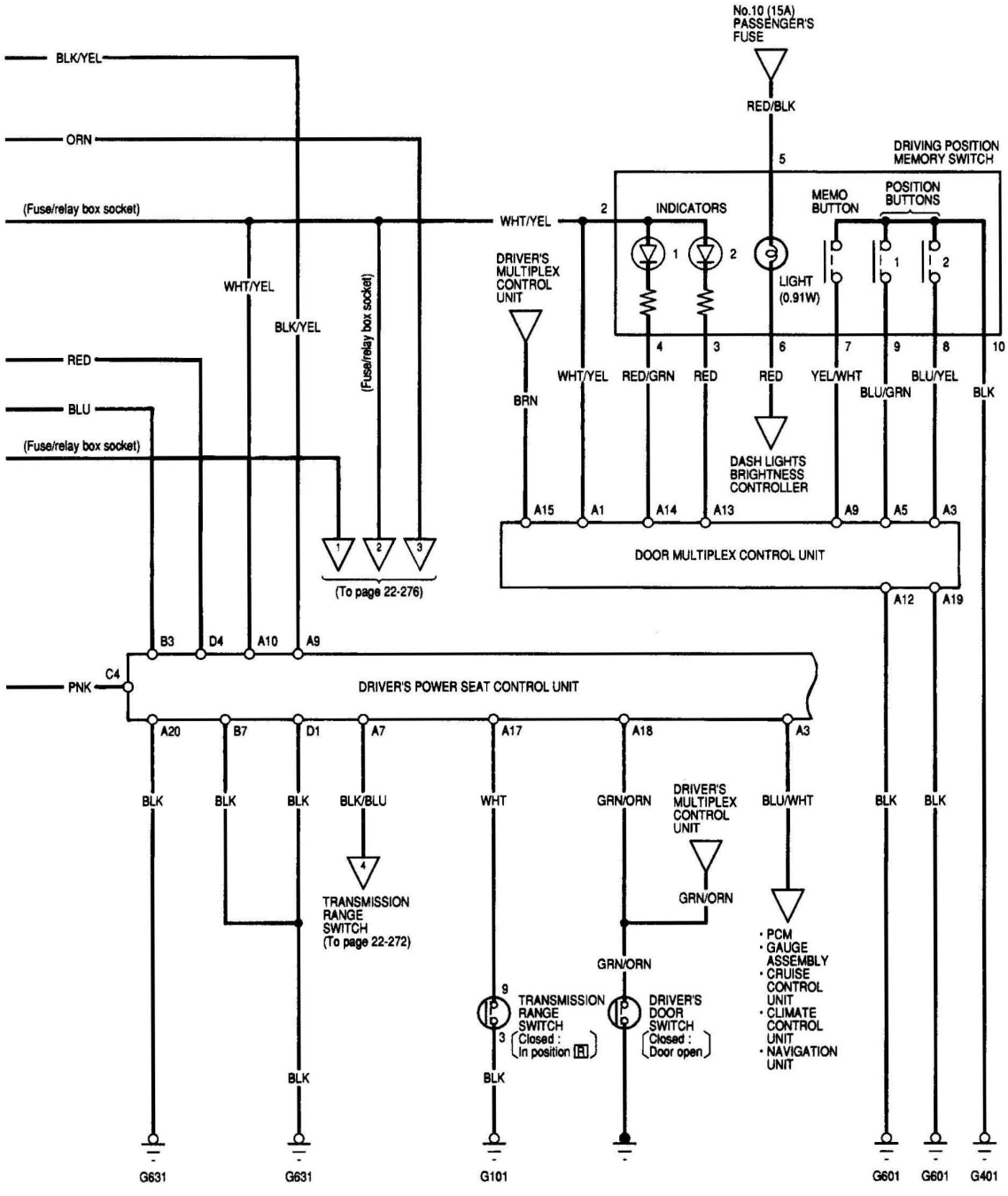
Driving Position Memory System (DPMS)

Circuit Diagram



BACK

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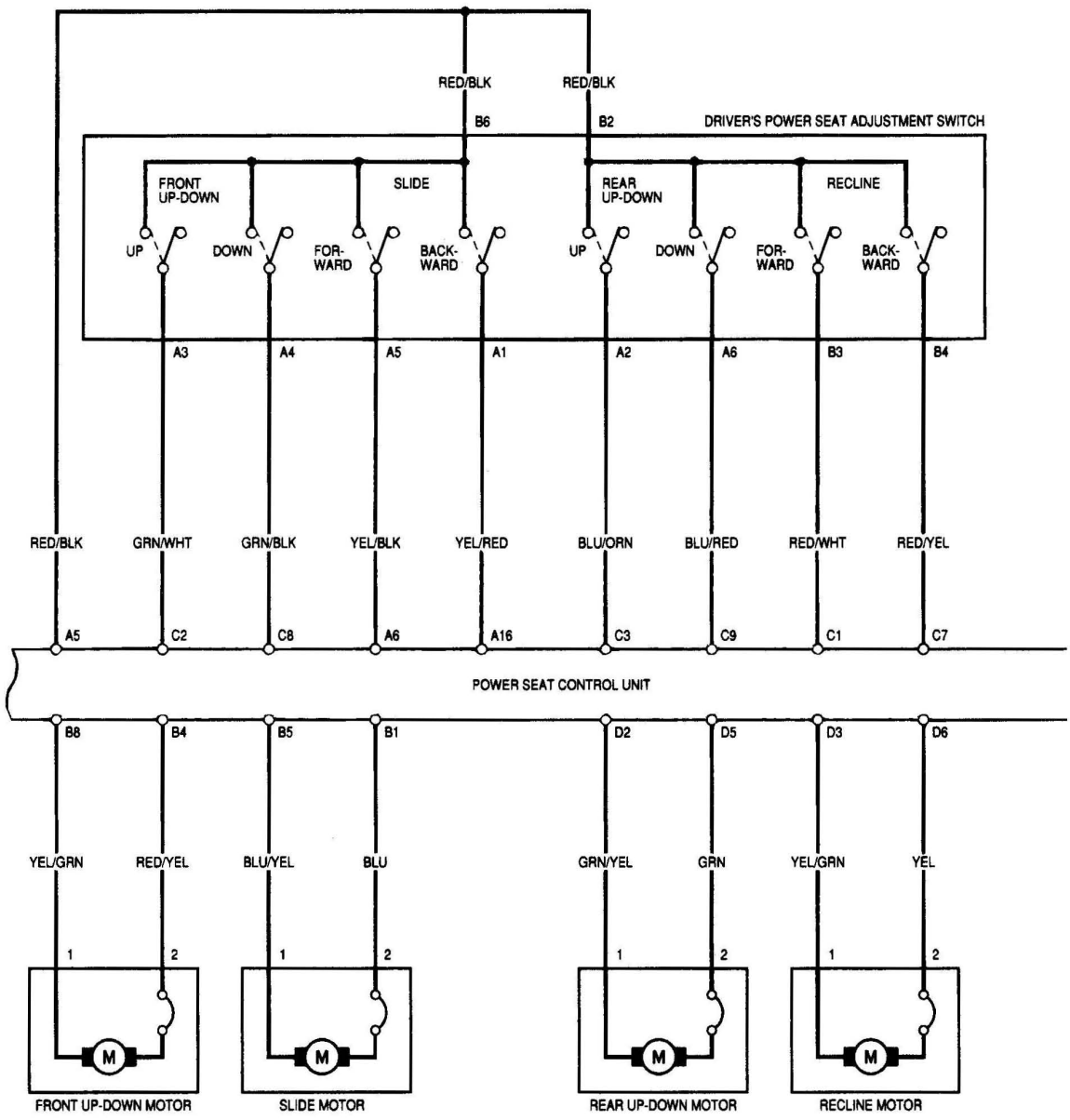
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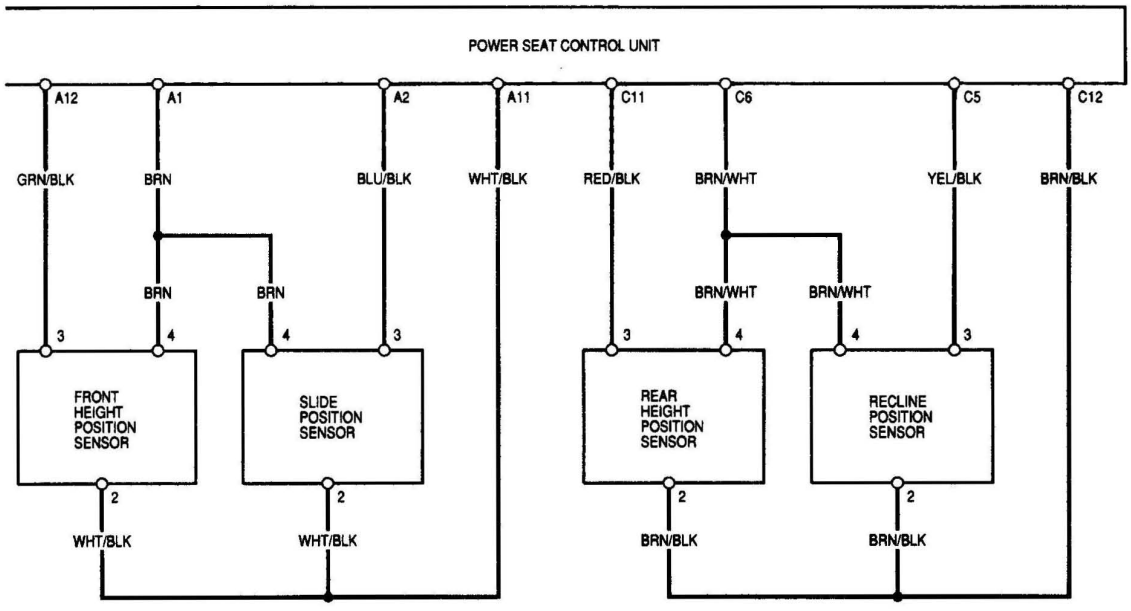
Driving Position Memory System (DPMS)

Circuit Diagram (cont'd)



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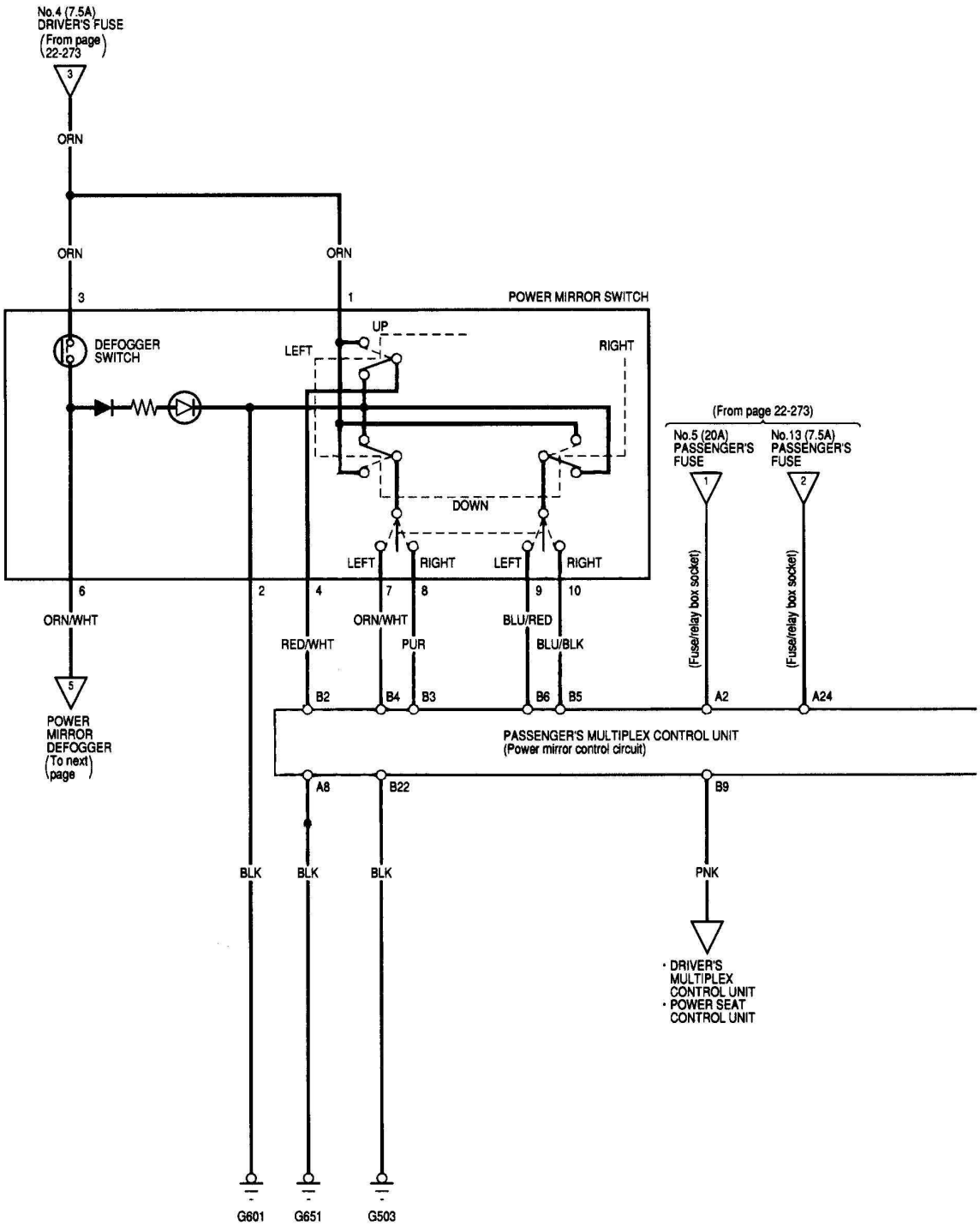
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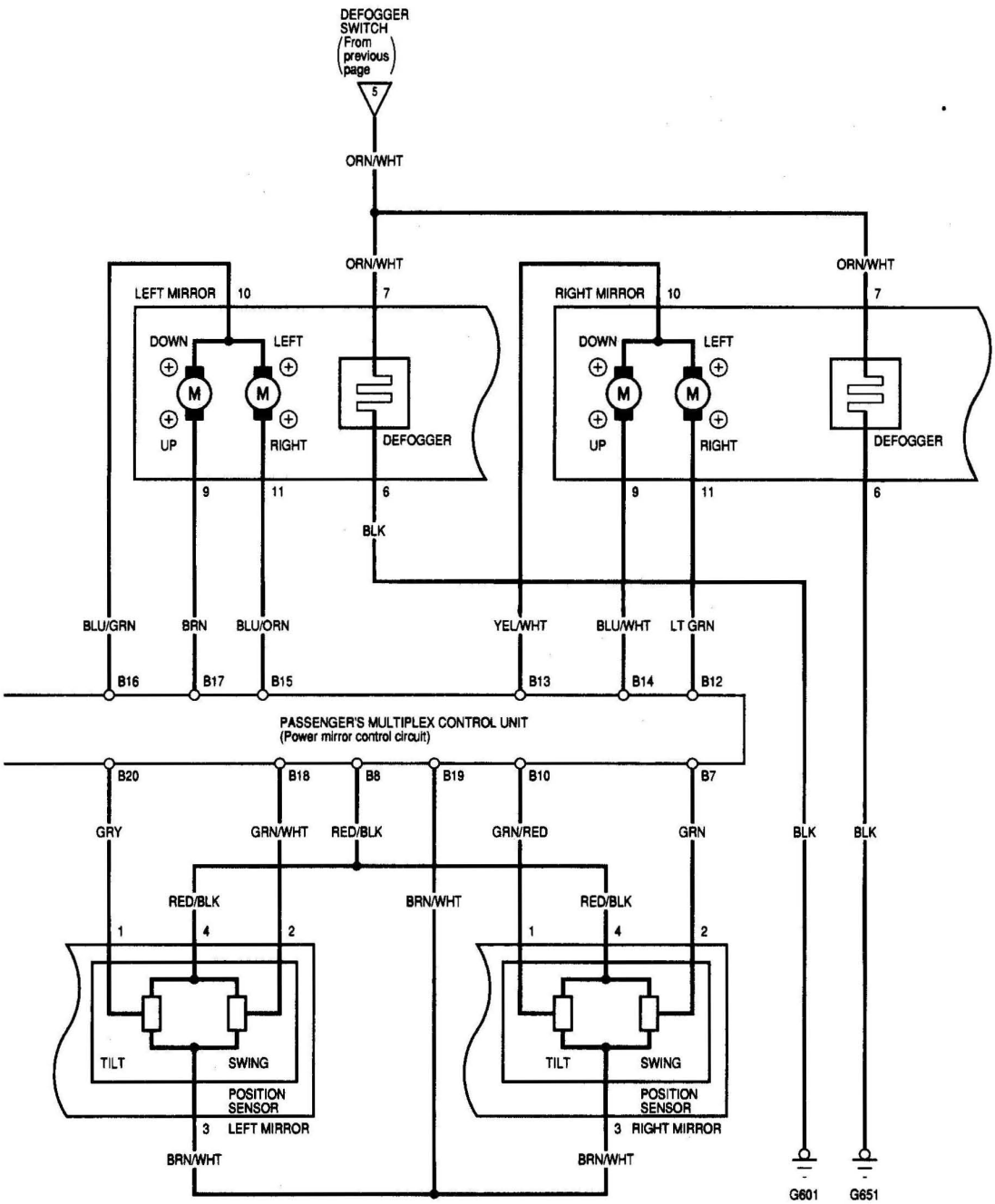
Driving Position Memory System (DPMS)

Circuit Diagram (cont'd)



BACK

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BACK

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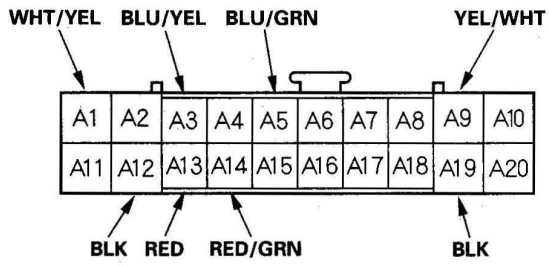
Control Unit Input Test

1. Before testing the driving position memory control functions, troubleshoot the multiplex control system (see page 22-212).

Door Unit:

2. Remove the driver's door panel (see page 20-6).
3. Disconnect the connectors from the door multiplex control unit.
4. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 5.

DOOR MULTIPLEX CONTROL UNIT CONNECTOR A



Wire side of female terminals

BACK

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5. With the door multiplex control unit reconnected, make these input tests at the connectors.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 6.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A1	WHT/YEL	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/ relay box • An open in the wire
A12	BLK	Under all conditions	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G601) • An open in the wire
A19	BLK	Under all conditions	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G601) • An open in the wire
A3	BLU/YEL	Push position button 2	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G401) • Faulty driving position memory switch • An open in the wire
		Release position button 2	Check for voltage to ground: There should be 5 V or more.	• Faulty driving position memory switch • Short to ground
A5	BLU/GRN	Push position button 1	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • Faulty driving position memory switch • An open in the wire
		Release position button 1	Check for voltage to ground: There should be 5 V or more.	• Faulty driving position memory switch • Short to ground
A9	YEL/WHT	Push the MEMO button	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • Faulty driving position memory switch • An open in the wire
		Release the MEMO button	Check for voltage to ground: There should be 5 V or more.	• Faulty driving position memory switch • Short to ground
A13	RED	Ignition switch ON (II)	Attach to ground: Indicator 2 should come on.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/ relay box • Faulty driving position memory switch indicator • An open in the wire
A14	RED/GRN	Ignition switch ON (II)	Attach to ground: Indicator 1 should come on.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/ relay box • Faulty driving position memory switch indicator • An open in the wire

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Driving Position Memory System (DPMS)

Control Unit Input Test (cont'd)

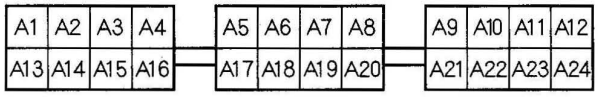
Passenger's Unit:

6. Remove the passenger's multiplex control unit from the passenger's under-dash fuse/relay box, and disconnect its connector.

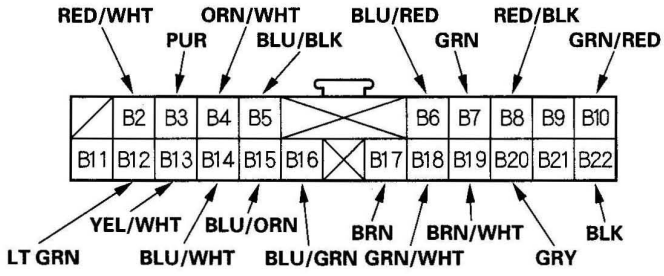
7. Inspect all connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 8.

PASSENGER'S UNDER-DASH FUSE/RELAY BOX SOCKET (PASSENGER'S MULUTIPLEX UNIT CONNECTOR A)

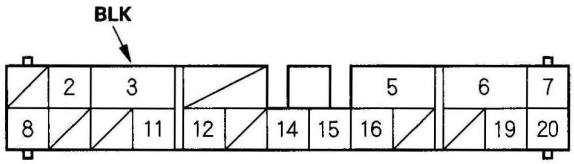


PASSENGER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR C



Wire side of female terminals

BACK

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8. With the connectors still disconnected, make these input tests at the connectors.

- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 9.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A8	Fuse/relay box socket	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G651) • Faulty passenger's fuse/relay box • An open in the wire
B22	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G503) • An open in the wire
A2	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No.55 (40A) fuse in the under-hood fuse/relay box • Blown No.5 (20A) fuse in the passenger's under-dash fuse/relay box • Faulty passenger's fuse/relay box
A22	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No.9 (10A) fuse in the driver's under-dash fuse/relay box • An open in the wire
A24	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No.54 (40A) fuse in the under-hood fuse/relay box • Blown No.13 (7.5A) fuse in the passenger's under-dash fuse/relay box • Faulty passenger's fuse/relay box

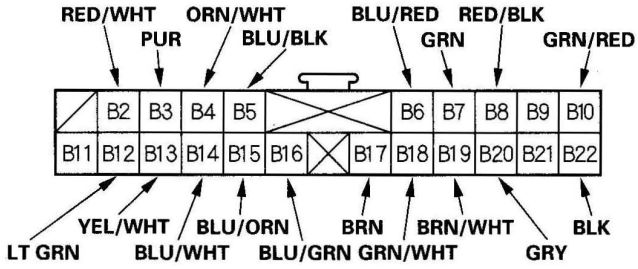
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Control Unit Input Test (cont'd)

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B13 · B12	YEL/WHT · LT GRN	Connect battery power to B13 terminal and B12 terminal to B22 terminal momentarily	Check right power mirror actuator operation: The mirror should swing left.	• Faulty right power mirror actuator • An open in the wire
B13 · B14	YEL/WHT · BLU/WHT	Connect battery power to B13 terminal and B14 terminal to B22 terminal momentarily.	Check right power mirror actuator operation: The mirror should tilt down.	• Faulty right power mirror actuator • An open in the wire
B16 · B15	BLU/GRN · BLU/ORN	Connect battery power to B16 terminal and B15 terminal to B22 terminal momentarily.	Check left power mirror actuator operation: The mirror should swing left.	• Faulty left power mirror actuator • An open in the wire
B16 · B17	BLU/GRN · BRN	Connect battery power to B16 terminal and B17 terminal to B22 terminal momentarily.	Check left power mirror actuator operation: the mirror should tilt down.	• Faulty left power mirror actuator • An open in the wire

PASSENGER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

BACK

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9. Reconnect the passenger's multiplex control unit to the passenger's under-dash fuse/relay box, and make these input tests at the appropriate connectors on the passenger's under-dash fuse/relay box.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 10.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B5	BLU/BLK	Ignition switch ON (II) and power mirror selector switch to right mirror, then press the power mirror switch "Right".	Check for voltage to ground: There should be battery voltage.	• Blown No.4 (7.5A) fuse in the driver's under-dash fuse/relay box • Faulty power mirror switch • An open in the wire
B3	PUR	Ignition switch ON (II) and power mirror selector switch to right mirror, then press the power mirror switch "Left" or "Down".	Check for voltage to ground: There should be battery voltage.	• Blown No.4 (7.5A) fuse in the driver's under-dash fuse/relay box • Faulty power mirror switch • An open in the wire
B2	RED/WHT	Ignition switch ON (II) and power mirror selector switch to right or left mirror switch "UP".	Check for voltage to ground: There should be battery voltage.	• Blown No.4 (7.5A) fuse in the driver's under-dash fuse/relay box • Faulty power mirror switch • An open in the wire
B6	BLU/RED	Ignition switch ON (II) and power mirror selector switch to left mirror, then press the power mirror switch "Right".	Check for voltage to ground: There should be battery voltage.	• Blown No.4 (7.5A) fuse in the driver's under-dash fuse/relay box • Faulty power mirror switch • An open in the wire
B4	ORN/WHT	Ignition switch ON (II) and power mirror selector switch to left mirror, then press the power mirror switch "Left" or "Down".	Check for voltage to ground: There should be battery voltage.	• Blown No.4 (7.5A) fuse in the driver's under-dash fuse/relay box • Faulty power mirror switch • An open in the wire
B8 . B19	RED/BLK . BRN/WHT	Ignition switch ON (II)	Check for voltage between the terminals: There should be about 5 V.	• Faulty power mirror position sensor • A short to ground
B7 . B19	GRN . BRN/WHT	Ignition switch ON (II)	Check for voltage between the terminals: The voltage should change from about 1 V to 3 V when the right mirror swings from left to right.	• Faulty right power mirror position sensor • An open in the wire
B10 . B19	GRN/RED . BRN/WHT	Ignition switch ON (II)	Check for voltage between the terminals: The voltage should change from about 1 V to 3 V when the right mirror tilts from up to down.	• Faulty right power mirror position sensor • An open in the wire
B18 . B19	GRN/WHT . BRN/WHT	Ignition switch ON (II)	Check for voltage between the terminals: The voltage should change from about 1 V to 3 V when the left mirror swings from left to right.	• Faulty left power mirror position sensor • An open in the wire
B20 . B19	GRY . BRN/WHT	Ignition switch ON (II)	Check for voltage between the terminals: The voltage should change from about 1 V to 3 V when the left mirror tilts from up to down.	• Faulty left power mirror position sensor • An open in the wire

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Control Unit Input Test (cont'd)

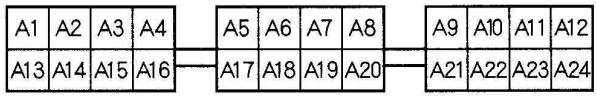
Driver's Unit:

10. Remove the driver's unit from the driver's under-dash fuse/relay box, and disconnect its connector.

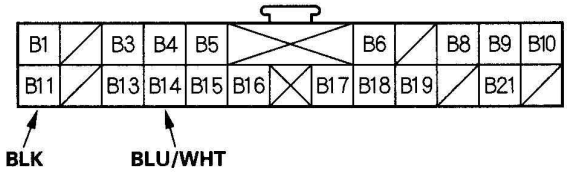
11. Inspect all connector and socket terminals to be sure they are all making good contact.

    - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
    - If the terminals look OK, go to step 12.

DRIVER'S UNDER-DASH FUSE/RELAY BOX SOCKET (DRIVER'S MULUTIPLEX CONTROL UNIT CONNECTOR A)

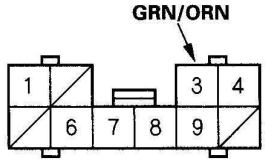


DRIVER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR E



Wire side of female terminals

BACK

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12. With the driver's multiplex control unit still disconnected, make these input tests at the connectors.

- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 13.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A14	Fuse/relay box socket	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • Faulty driver's fuse/relay box • An open in the wire
B11	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • Faulty driver's fuse/relay box • An open in the wire
A24	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10A) fuse in the driver's under-dash fuse/relay box • Faulty driver's fuse/relay box
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 54 (40A) fuse in the under-hood fuse/relay box • Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
A3	Fuse/relay box socket	Shift lever in P	Check for continuity to ground: There should be continuity.	• Poor ground (G101) • Faulty transmission range switch • Faulty driver's fuse/relay box • An open in the wire
B14	BLU/WHT	Under all conditions	Check for continuity between the B14 terminal and the No.9 terminal of the PCM 32P connector A (disconnected): There should be continuity.	• An open in the wire
			Check for continuity between the B14 terminal and body ground: There should be no continuity.	• Short in the wire

13. Reconnect the driver's multiplex control unit to the driver's under-dash fuse/relay box, and make these input tests at the appropriate connectors on the driver's under-dash fuse/relay box.

- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 14.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
E3	GRN/ORN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door switch • Short to ground in the wire

14. If all the input tests prove OK, one of the control units must be faulty, Substitute a known-good control unit for the one that is most likely at fault, then recheck the system. If the system works properly, the original control unit is faulty; replace it. If there is still a malfunction, substitute a known-good control unit for the next most likely unit to be at fault, and recheck. If the system works properly, the original unit is faulty; replace it.

BACK

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Driving Position Memory System (DPMS)

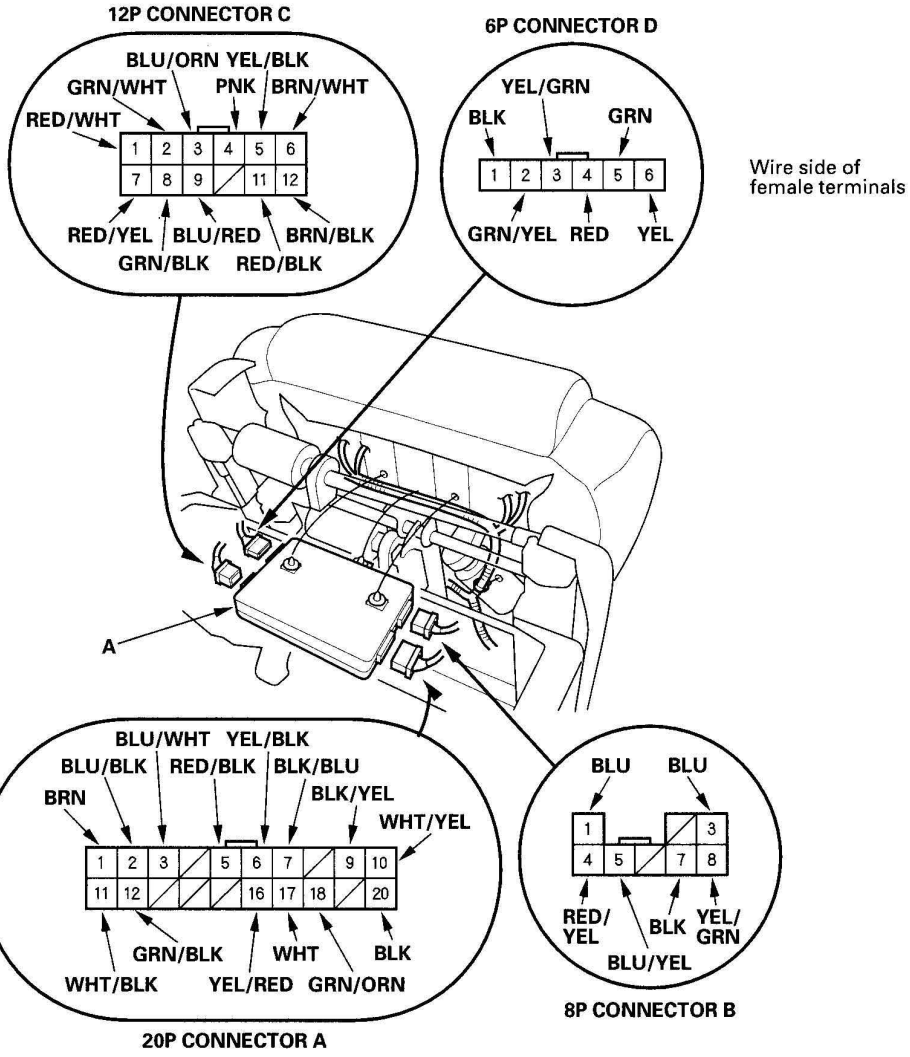
Driver's Power Seat Control Unit Input Test

1. Remove the driver's power seat mounting bolts (see page 20-77).

   NOTE: Be careful not to scratch the interior trim.

2. Disconnect the connectors from the driver's power seat control unit (A).

   NOTE: Turning the ignition switch ON (II) when the power seat connectors are disconnected may set SRS codes.



3. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary and recheck the system.
   - If the terminals look OK, go to step 4.

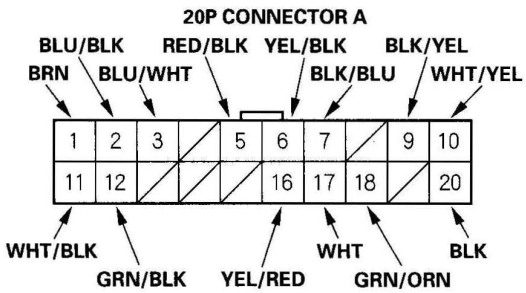
BACK

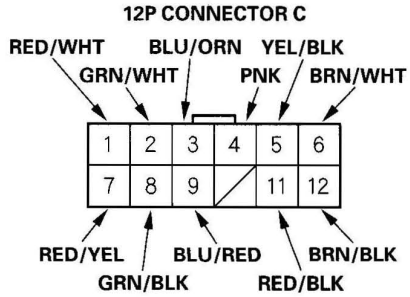
Protected by AR

4. Reconnect the connectors to the driver's power seat control unit, and make these input tests at the connectors.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the control unit must be faulty; replace it.

   NOTE: All connector views are from wire side of female terminals.





Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A9	BLK/YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 6 (15A) fuse in the driver's under-dash fuse/relay box • Faulty under-hood fuse/relay box • An open in the wire
A10	WHT/YEL	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 54 (40A) fuse in the under-hood fuse/relay box • Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • Faulty under-hood fuse/relay box • An open in the wire
A7	BLK/BLU	Shift lever in P, Ignition switch ON (II)	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G101) • Faulty transmission range switch • An open in the wire
A17	WHT	Shift lever in R, Ignition switch ON (II)	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G101) • Faulty transmission range switch • An open in the wire
A18	GRN/ORN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch • An open in the wire • Short to ground
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	
A2	BLU/BLK	While slide motor running	Check for voltage to ground: There should be 0 V to about 5 V alternately.	• Faulty slide position sensor • An open in the BLU/BLK, BRN or WHT/BLK wires • Short to ground
A12	GRN/BLK	While front up-down motor running	Check for voltage to ground: There should be 0 V to about 5 V alternately.	• Faulty front up-down position sensor • An open in the GRN/BLK, BRN or WHT/BLK wires • Short to ground
C5	YEL/BLK	While recline motor running	Check for voltage to ground: There should be 0 V to about 5 V alternately.	• Faulty recline position sensor • An open in the YEL/BLK, BRN/WHT or BRN /BLK wires • Short to ground
C11	RED/BLK	While rear up-down motor running	Check for voltage to ground: There should be 0 V to about 5 V alternately.	• Faulty rear up-down position sensor • An open in the RED/BLK, BRN/WHT or BRN /BLK wires • Short to ground

(cont'd)

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Driving Position Memory System (DPMS)

Driver's Power Seat Control Unit Input Test (cont'd)

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A5 · A6	RED/BLK · YEL/BLK	Slide switch in "FORWARD"	Check for voltage between the A5 and A6 terminals: There should be less than 1 V.	• Faulty adjustment switch • An open in the wire
		Slide switch is in the neutral position.	Check for voltage between the A5 and A6 terminals: There should be more than 5 V.	• Faulty adjustment switch
A5 · A16	RED/BLK · YEL/RED	Slide switch in "BACKWARD"	Check for voltage between the A5 and A16 terminals: There should be less than 1 V.	• Faulty adjustment switch • An open in the wire
		Slide switch is in the neutral position.	Check for voltage between the A5 and A16 terminals: There should be more than 5 V.	• Faulty adjustment switch
A5 · C1	RED/BLK · RED/WHT	Recline switch in "FORWARD"	Check for voltage between the A5 and C1 terminals: There should be less than 1 V.	• Faulty adjustment switch • An open in the wire
		Recline switch is in the neutral position.	Check for voltage between the A5 and C1 terminals: There should be more than 5 V.	• Faulty adjustment switch
A5 · C7	RED/BLK · RED/YEL	Recline switch in "BACKWARD"	Check for voltage between the A5 and C7 terminals: There should be less than 1 V.	• Faulty adjustment switch • An open in the wire
		Recline switch is in the neutral position.	Check for voltage between the A5 and C7 terminals: There should be more than 5 V.	• Faulty adjustment switch
A5 · C8	RED/BLK · GRN/BLK	Front up-down switch in "DOWN"	Check for voltage between the A5 and C8 terminals: There should be less than 1 V.	• Faulty adjustment switch • An open in the wire
		Front up-down switch is in the neutral position.	Check for voltage between the A5 and C8 terminals: There should be more than 5 V.	• Faulty adjustment switch
A5 · C2	RED/BLK · GRN/WHT	Front up-down switch in "UP"	Check for voltage between the A5 and C2 terminals: There should be less than 1 V.	• Faulty adjustment switch • An open in the wire
		Recline switch is in the neutral position.	Check for voltage between the A5 and C2 terminals: There should be more than 5 V.	• Faulty adjustment switch
A5 · C3	RED/BLK · BLU/ORN	Rear up-down switch in "UP"	Check for voltage between the A5 and C3 terminals: There should be less than 1 V.	• Faulty adjustment switch • An open in the wire
		Rear up-down switch is in the neutral position.	Check for voltage between the A5 and C3 terminals: There should be more than 5 V.	• Faulty adjustment switch
A5 · C9	RED/BLK · BLU/RED	Rear up-down switch in "DOWN"	Check for voltage between the A5 and C9 terminals: There should be less than 1 V.	• Faulty adjustment switch • An open in the wire
		Rear up-down switch is in the neutral position.	Check for voltage between the A5 and C9 terminals: There should be more than 5 V.	• Faulty adjustment switch
B3	BLU	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 55 (40A) fuse in the under-hood fuse/relay box • Blown No. 4 (20A) fuse in the passenger's under-dash fuse/relay box • Faulty under-hood fuse/relay box • An open in the wire
D4	RED	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 55 (40A) fuse in the under-hood fuse/relay box • Blown No. 2 (20A) fuse in the passenger's under-dash fuse/relay box • Faulty under-hood fuse/relay box • An open in the wire
A20 B7 D1	BLK	Ignition switch ON (II)	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G631) • An open in the wire

BACK

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5. With the power seat control unit still disconnected, make these input tests at the connectors.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A3	BLU/WHT	Under all conditions	Check for continuity between the A3 terminal and No. 9 terminal of the PCM 32P connector A (disconnected): There should be continuity.	An open in the wire
			Check for continuity between the A3 terminal and body ground: There should be no continuity.	Short to ground

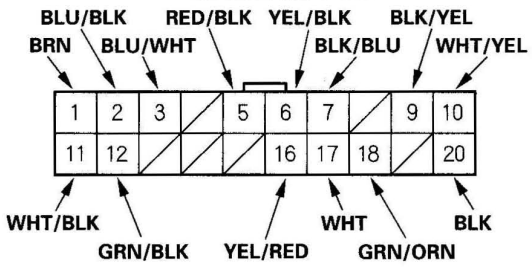
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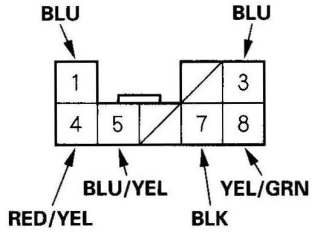
Driver's Power Seat Control Unit Input Test (cont'd)

NOTE: All connector view are from wire side of female terminals

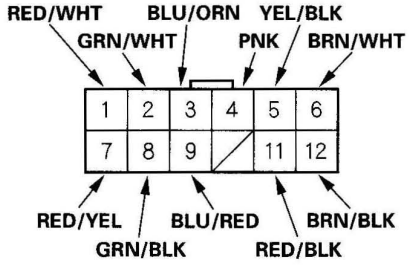
20P CONNECTOR A



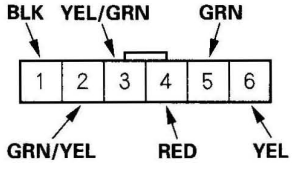
8P CONNECTOR B



12P CONNECTOR C



6P CONNECTOR D



Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B1 · B5	BLU · BLU/YEL	Jump B3 terminal to B1 terminal, and B5 terminal to B7 terminal. Reverse the connections to operate the motor in the other direction.	Check slide motor operation: There motor should run.	• Faulty slide motor • An open in the wire
B4 · B8	RED/YEL · YEL/GRN	Jump B3 terminal to B4 terminal, and B8 terminal to B7 terminal. Reverse the connections to operate the motor in the other direction.	Check front up-down motor operation: There motor should run.	• Faulty front up-down motor • An open in the wire
D2 · D5	GRN/YEL · GRN	Jump B3 terminal to D2 terminal, and D5 terminal to B7 terminal. Reverse the connections to operate the motor in the other direction.	Check rear up-down motor operation: There motor should run.	• Faulty rear up-down motor • An open in the wire
D3 · D6	YEL/GRN · YEL	Jump B3 terminal to D3 terminal, and D6 terminal to B7 terminal. Reverse the connections to operate the motor in the other direction.	Check recline motor operation: There motor should run.	• Faulty recline motor • An open in the wire

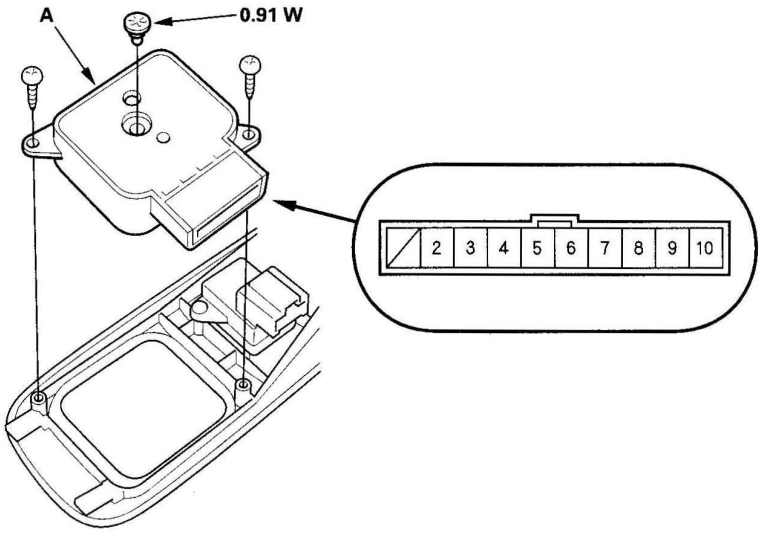
BACK

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Driving Position Memory Switch Test/Replacement

1. Remove the driver's door panel (see page 20-6).

2. Disconnect the 10P connector from the memory switch (A).



3. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal		2		3	4	7	8	9	10	5		6
MEMO button	OFF											
	ON					○			○			
Position 1 button	OFF											
	ON							○	○	○	○	○
Position 2 button	OFF											
	ON						○		○			
Indicator 1		○	▷|	○								
Indicator 2		○	▷|	○								

4. If the continuity is not as specified, replace the switch.

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Power Seat Position Sensor Troubleshooting

Slide Position Sensor:

1. Raise the driver's power seat up with the power seat up-down switch, then remove the power seat (see page 20-77).

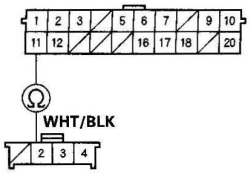
   NOTE: Be careful no to scratch the interior trim.

2. Disconnect the power seat control unit connectors (see page 22-286).

3. Disconnect the 4P connector from the slide position sensor.

4. Check for continuity between the No. 2 terminal of the slide position sensor and A11 terminal of the power seat control unit.

POWER SEAT CONTROL UNIT 20P CONNECTOR A
Wire side of female terminals



SLIDE POSITION SENSOR 4P CONNECTOR
Wire side of female terminals

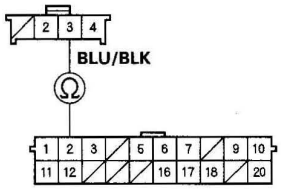
Is there continuity?

YES – Go to step 5.

NO – Repair open in the WHT/BLK wire. ■

5. Check for continuity between the No. 3 terminal of the slide position sensor and A2 terminal of the power seat control unit.

SLIDE POSITION SENSOR 4P CONNECTOR
Wire side of female terminals



POWER SEAT CONTROL UNIT 20P CONNECTOR A
Wire side of female terminals

Is there continuity?

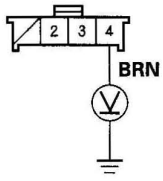
YES – Go to step 6.

NO – Repair open in the BLU/BLK wire. ■

6. Reconnect all connectors to run the seat motors.

7. Check for voltage between the No. 4 terminal of the slide position sensor and body ground.

SLIDE POSITION SENSOR 4P CONNECTOR



Wire side of female terminals

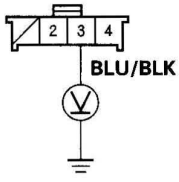
Is there about 5 V?

YES – Go to step 8.

NO – Repair open or short in the BRN wire. ■

8. Check for voltage pulse between the No. 3 terminal of the slide position sensor and body ground when the slide switch moves forward or backward.

SLIDE POSITION SENSOR 4P CONNECTOR



Wire side of female terminals

Does voltage pulse from 0 to about 5 V alternately?

YES – Replace the power seat control unit. ■

NO – Check for a short in the wire. If the wire is OK, the slide position sensor is faulty; replace the slide motor assembly. ■

BACK

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Recline Position Sensor:

1. Raise the driver's power seat up with the power seat up-down switch, then remove the power seat (see page 20-77).

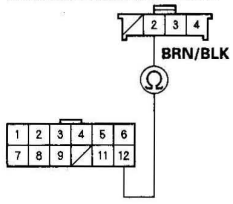
   NOTE: Be careful not to scratch the interior trim.

2. Disconnect the power seat control unit connectors (see page 22-286).

3. Disconnect the 4P connector from the recline position sensor.

4. Check for continuity between the No. 2 terminal of the recline position sensor and C12 terminal of the power seat control unit.

RECLINE POSITION SENSOR 4P CONNECTOR
Wire side of female terminals



POWER SEAT CONTROL UNIT 12P CONNECTOR C
Wire side of female terminals

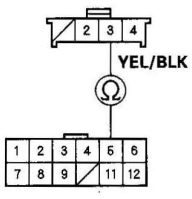
Is there continuity?

YES – Go to step 5.

NO – Repair open in the BRN/BLK wire. ■

5. Check for continuity between the No. 3 terminal of the recline position sensor and C5 terminal of the power seat control unit.

RECLINE POSITION SENSOR 4P CONNECTOR
Wire side of female terminals



POWER SEAT CONTROL UNIT 12P CONNECTOR C
Wire side of female terminals

Is there continuity?

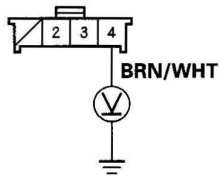
YES – Go to step 6.

NO – Repair open in the YEL/BLK wire. ■

6. Reconnect all connectors to run the seat motors.

7. Check for voltage between the No. 4 terminal of the recline position sensor and body ground.

RECLINE POSITION SENSOR 4P CONNECTOR



Wire side of female terminals

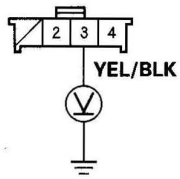
Is there about 5 V?

YES – Go to step 8.

NO – Repair open or short in the BRN/WHT wire. ■

8. Check for voltage pulse between the No. 3 terminal of the recline position sensor and body ground when the recline switch moves forward or backward.

RECLINE POSITION SENSOR 4P CONNECTOR



Wire side of female terminals

Does voltage pulse from 0 to about 5 V alternately?

YES – Replace the power seat control unit. ■

NO – Check for a short in the wire. If the wire is OK, the recline position sensor is faulty; replace the recline motor assembly. ■

(cont'd)

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Power Seat Position Sensor Troubleshooting (cont'd)

Front Up-Down Position Sensor:

1. Raise the driver's power seat up with the power seat up-down switch, then remove the power seat (see page 20-77).

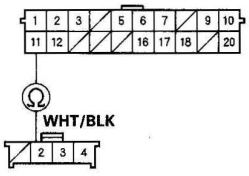
   NOTE: Be careful not to scratch the indicator trim.

2. Disconnect the power seat control unit connectors (see page 22-286).

3. Disconnect the 4P connector from the front up-down position sensor.

4. Check for continuity between the No. 2 terminal of the front up-down position sensor and A11 terminal of the power seat control unit.

POWER SEAT CONTROL UNIT 20P CONNECTOR A
Wire side of female terminals



FRONT UP-DOWN POSITION SENSOR 4P CONNECTOR
Wire side of female terminals

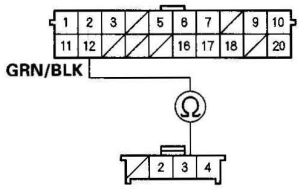
Is there continuity?

YES – Go to step 5.

NO – Repair open in the WHT/BLK wire. ■

5. Check for continuity between the No. 3 terminal of the front up-down position sensor and A12 terminal of the power seat control unit.

POWER SEAT CONTROL UNIT 20P CONNECTOR A
Wire side of female terminals



FRONT UP-DOWN POSITION SENSOR 4P CONNECTOR
Wire side of female terminals

Is there continuity?

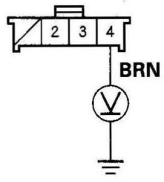
YES – Go to step 6.

NO – Repair open in the GRN/BLK wire. ■

6. Reconnect all connectors to run the seat motors.

7. Check for voltage between the No. 4 terminal of the front up-down position sensor and body ground.

FRONT UP-DOWN POSITION SENSOR 4P CONNECTOR



Wire side of female terminals

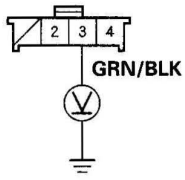
Is there about 5 V?

YES – Go to step 8.

NO – Repair the open or short in the BRN wire. ■

8. Check for voltage pulse between the No. 3 terminal of the front up-down position sensor and body ground when the front up-down switch moves up and down.

FRONT UP-DOWN POSITION SENSOR 4P CONNECTOR



Wire side of female terminals

Does voltage pulse from 0 to about 5 V alternately?

YES – Replace the power seat control unit. ■

NO – Check for a short in the wire. If the wire is OK, the front up-down position sensor is faulty; replace the front up-down motor assembly. ■

BACK

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Rear Up-Down Position Sensor:

1. Raise the driver's power seat up with the power seat up-down switch, then remove the power seat (see page 20-77).

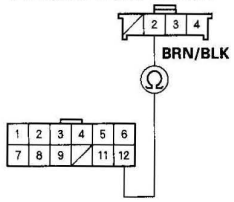
   NOTE: Be careful not to scratch the interior trim.

2. Disconnect the power seat control unit connectors (see page 22-286).

3. Disconnect the 4P connector from the rear up-down position sensor.

4. Check for continuity between the No. 2 terminal of the rear up-down position sensor and C12 terminal of the power seat control unit.

REAR UP-DOWN POSITION SENSOR 4P CONNECTOR
Wire side of female terminals



POWER SEAT CONTROL UNIT 12P CONNECTOR C
Wire side of female terminals

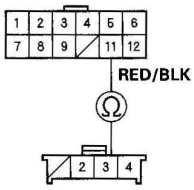
Is there continuity?

YES – Go to step 5.

NO – Repair open in the BRN/BLK wire. ■

5. Check for continuity between the No. 3 terminal of the rear up-down position sensor and C11 terminal of the power seat control unit.

POWER SEAT CONTROL UNIT 12P CONNECTOR C
Wire side of female terminals



REAR UP-DOWN POSITION SENSOR 4P CONNECTOR
Wire side of female terminals

Is there continuity?

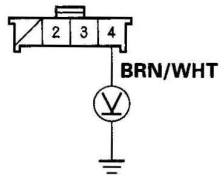
YES – Go to step 6.

NO – Repair open in the RED/BLK wire. ■

6. Reconnect all connectors to run the seat motors.

7. Check for voltage between the No. 4 terminal of the rear up-down position sensor and body ground.

REAR UP-DOWN POSITION SENSOR 4P CONNECTOR



Wire side of female terminals

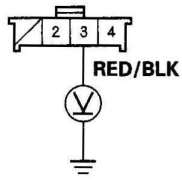
Is there about 5 V?

YES – Go to step 8.

NO – Repair the open or short in the BRN/WHT wire. ■

8. Check for voltage pulse between the No. 3 terminal of the rear up-down position sensor and body ground when the rear up-down switch moves up and down.

REAR UP-DOWN POSITION SENSOR 4P CONNECTOR



Wire side of female terminals

Does voltage pulse from 0 to about 5 V alternately?

YES – Replace the power seat control unit. ■

NO – Check for a short in the wire. If the wire is OK, the rear up-down position sensor is faulty; replace the rear up-down motor assembly. ■

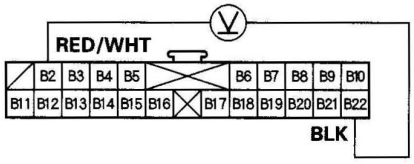
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Power Mirror Position Sensor Troubleshooting

NOTE: Before troubleshooting, check the No.4 (7.5A) fuse in the driver's under-dash fuse/relay box and test the power mirrors (see page 22-205).

1. Turn the ignition switch ON (II).
2. Check for voltage between the B2 and B22 terminals of the passenger's multiplex control unit with the power mirror switch pressed UP or Left.

PASSENGER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

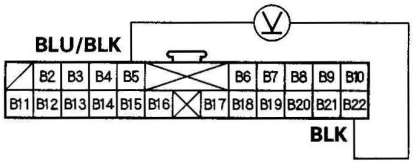
Is there battery voltage?

YES – Go to step 3.

NO – Repair open in the RED/WHT or BLK wire. ■

3. Move the selector switch to Right.
4. Check for voltage between the B5 and B22 terminals with the power mirror switch pressed to the Right or Down.

PASSENGER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

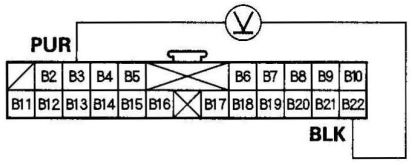
Is there battery voltage?

YES – Go to step 5.

NO – Repair open in the BLU/BLK wire. ■

5. Check for voltage between the B3 and B22 terminals with the power mirror switch pressed to the Left or Down.

PASSENGER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

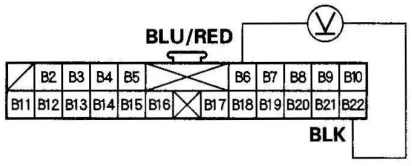
Is there battery voltage?

YES – Go to step 6.

NO – Repair open in the PUR wire. ■

6. Move the selector switch to the Left.
7. Check for voltage between the B6 and B22 terminals with the power mirror switch pressed to the Right or Down.

PASSEGER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

Is there battery voltage?

YES – Go to step 8.

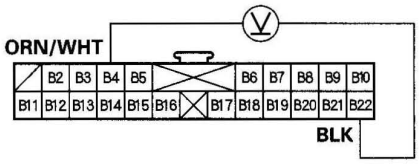
NO – Repair open in the BLU/RED wire. ■

BACK

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8. Check for voltage between the B4 and B22 terminals with the power mirror switch pressed to the Left or Down.

PASSENGER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

Is there battery voltage?

YES – Go to step 9.

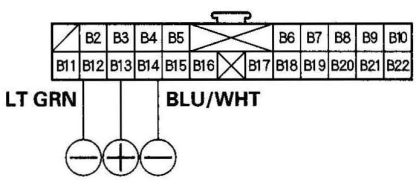
NO – Repair open in the ORN/WHT wire. ■

9. Turn the ignition switch OFF.

10. Disconnect passenger's multiplex control unit 22P connector B.

11. Apply battery power to the B13 terminal and ground the B12 [or B14] terminal.

PASSENGER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

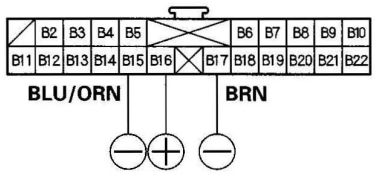
Does right mirror swing left [or tilt down] ?

YES – Go to step 12.

NO – Check the power mirror actuator (see page 22-206). If the mirror is OK, repair the open in the LT GRN or YEL/WHT [or BLU/WHT] wires. ■

12. Apply battery power to the B16 terminal and ground the B15 [or B17] terminal.

PASSENGER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

Does left mirror swing left [or tilt down] ?

YES – Go to step 13.

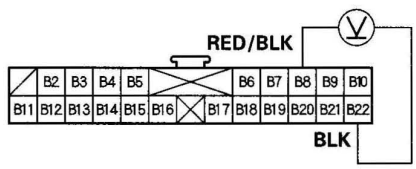
NO – Check the power mirror actuator (see page 22-206). If the mirror is OK, repair the open in the BLU/ORN or BLU/GRN [or BRN] wires. ■

13. Reconnect the 22P connector B to the passenger's multiplex control unit.

14. Turn the ignition switch ON (II)

15. Check for voltage between the B8 and B22 terminals.

PASSENGER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

Is there about 5 V?

YES – Go to step 16.

NO – Repair open or short in the RED/BLK wire. If the wire is OK, replace the passenger's multiplex control unit. ■

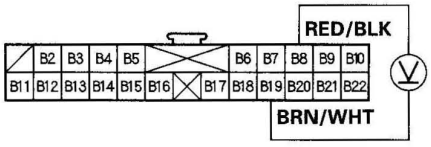
(cont'd)

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Power Mirror Position Sensor Troubleshooting (cont'd)

16. Check for voltage between the B8 and B19 terminals.

PASSENGER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

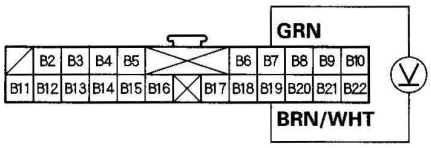
Is there about 5 V?

YES – Go to step 17.

NO – Repair open or short in the BRN/WHT wire. If the wire is OK, the power mirror position sensor is faulty; replace the power mirror actuator. ■

17. Check for voltage between the B7 and B19 terminals while moving the passenger's mirror from right to left.

PASSENGER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

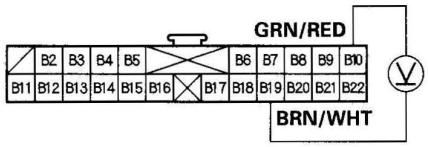
Does the voltage change from about 3 V to 1 V?

YES – Go to step 18.

NO – Repair open or short in the GRN wire. If the wire is OK, the right power mirror position sensor is faulty; replace the right power mirror actuator. ■

18. Check for voltage between the B10 and B19 terminals while moving the passenger's mirror from up to down.

PASSENGER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

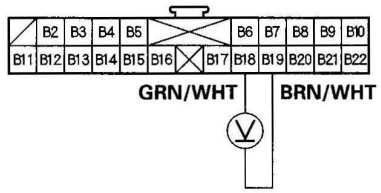
Does the voltage change from about 1 V to 3 V?

YES – Go to step 19.

NO – Repair open or short in the GRN/RED wire. If the wire is OK, the right power mirror position sensor is faulty; replace the right power mirror actuator. ■

19. Check for voltage between the B18 and B19 terminals while moving the driver's mirror from left to right.

PASSENGER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

Does the voltage change from about 3 V to 1 V?

YES – Go to step 20.

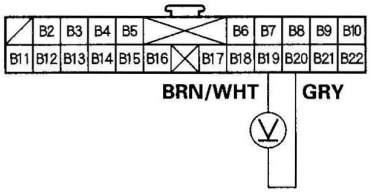
NO – Repair open or short in the GRN/WHT wire. If the wire is OK, the left power mirror position sensor is faulty; replace the left power mirror actuator. ■

BACK

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20. Check for voltage between the B20 and B19 terminals while moving the driver's mirror from up to down.

PASSENGER'S MULTIPLEX CONTROL UNIT CONNECTOR B



Wire side of female terminals

Does the voltage change from about 1 V to 3 V?

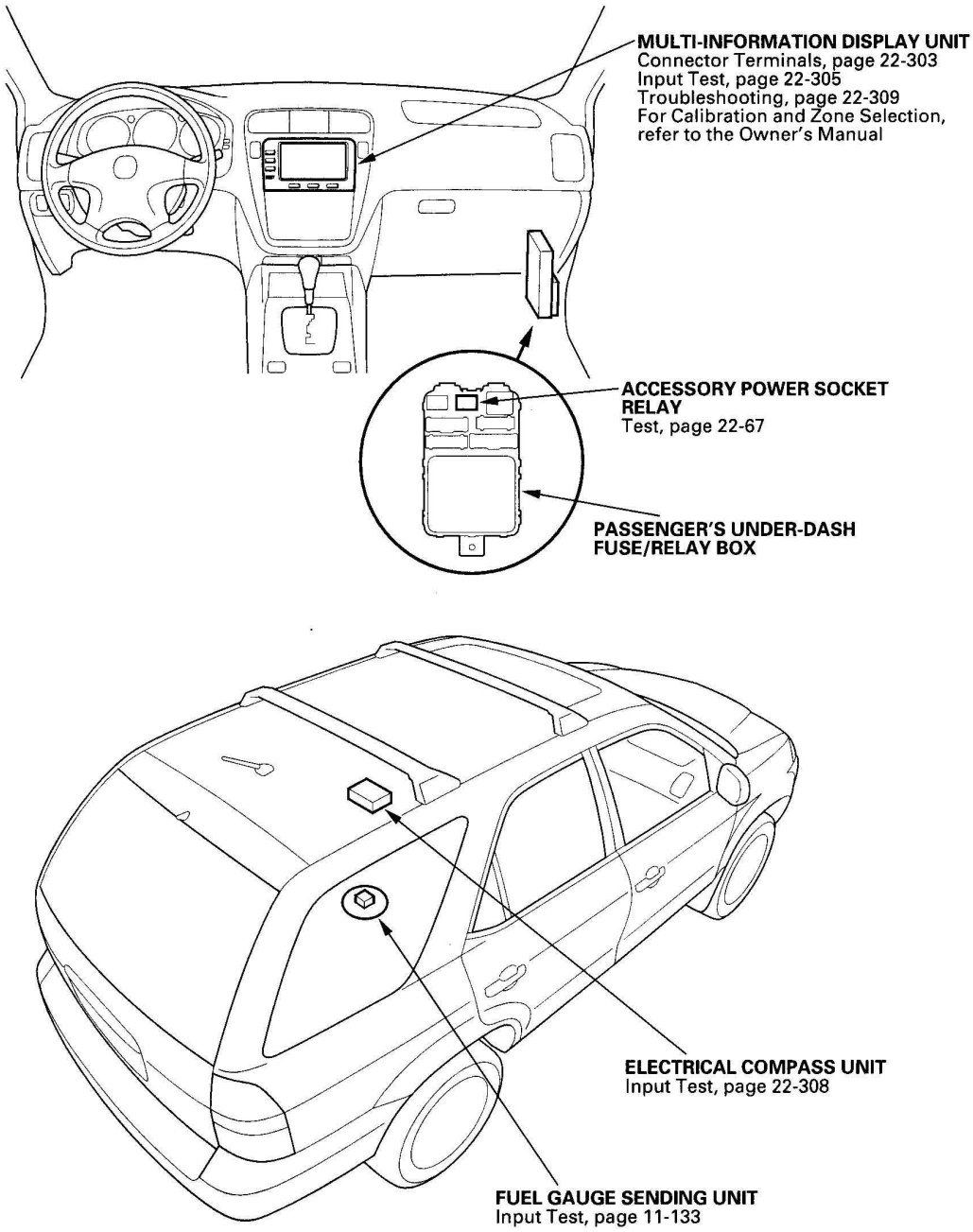
YES – Substitute a known good passenger's multiplex control unit, and recheck. If the systems now work OK, replace the original passenger's unit. ■

NO – Repair open or short in the GRY wire. If the wire is OK, the left power mirror position sensor is faulty; replace the left power mirror actuator. ■

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Multi-information System (Without Navigation)

Component Location Index



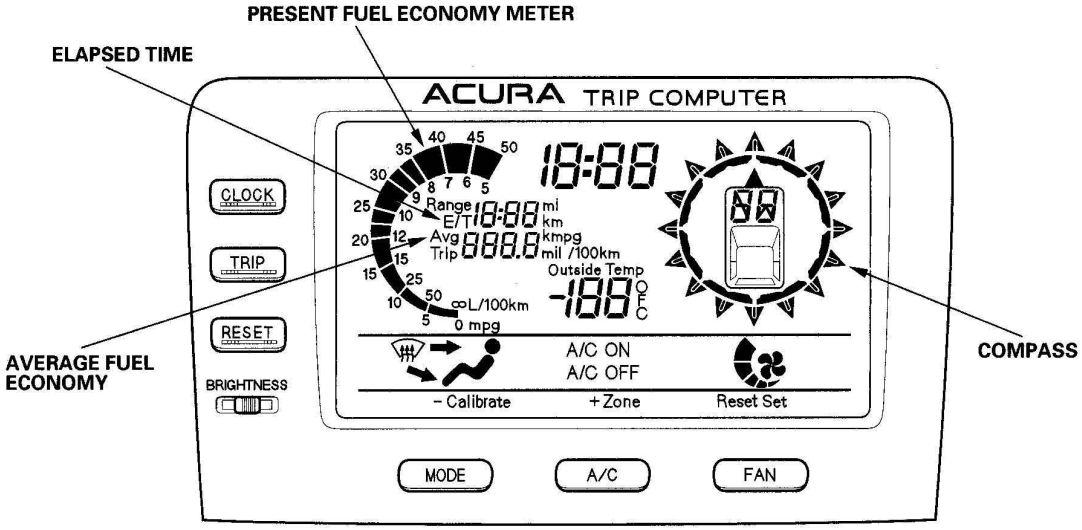
BACK

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Description

The Multi-information system displays the information listed below when the appropriate buttons are pressed.

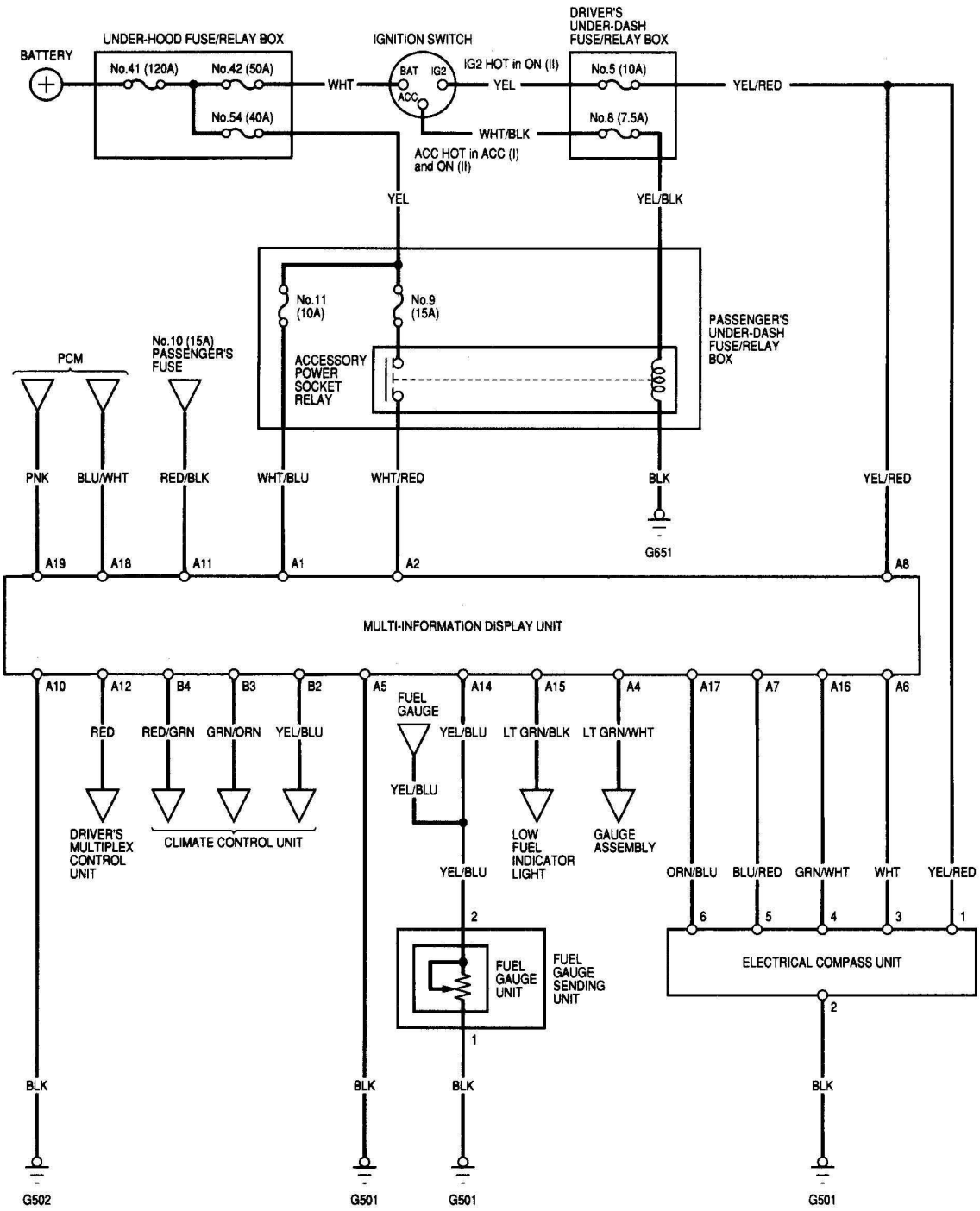
- Present status of the air conditioning system when it is manually controlled.
- Clock
- Present fuel economy and average fuel economy (provided by the PCM based on the injection pulse signal and vehicle speed signal).
- Range: the distance you can drive with the fuel remaining.
- Trip meter.
- Outside temperature, (provided by the climate control unit based on the temperature sensor data).
- Compass: the direction of the vehicle is heading based on the data from the electrical compass unit.



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Multi-information System (Without Navigation)

Circuit Diagram

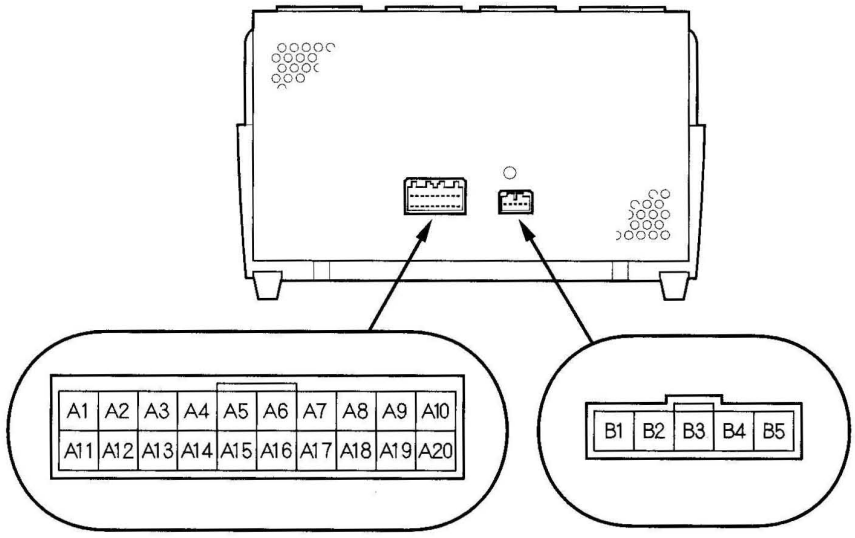


BACK

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Display Unit Connector Replacement

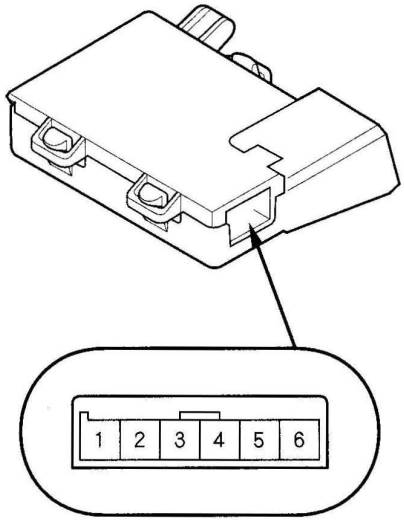
Cavity	Wire	Connects to
A1	WHT/BLU	Constant power
A2	WHT/RED	ACC (power source for accessory)
A3	———	Not used
A4	LT GRN/ WHT	Gauge assembly (Fuel V ref)
A5	BLK	Ground (G501)
A6	WHT	Electrical compass unit (RX +)
A7	BLU/RED	Electrical compass unit (TX +)
A8	YEL/RED	IG2 (power source for ignition switch)
A9	———	Not used
A10	BLK	Ground (G502)
A11	RED/BLK	Lights-on signal
A12	RED	Dash lights brightness controller
A13	———	Not used
A14	YEL/BLU	Fuel gauge unit (Fuel level V meas)
A15	LT GRN/BLK	Low fuel indicator light
A16	GRN/WHT	Electrical compass unit (RX −)
A17	ORN/BLU	Electrical compass unit (TX −)
A18	BLU/WHT	PCM (Vehicle speed signal)
A19	PNK	PCM (FUP output signal)
A20	———	Not used
B1	———	Not used
B2	YEL/BLU	Climate control unit (A/C Clock, synchronizes climate control unit and display unit.)
B3	GRN/ORN	Climate control unit (A/C SI)
B4	RED/GRN	Climate control unit (A/C SO)
B5	———	Not used



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Electrical Compass Unit Connector Replacement

Cavity	Wire	Connects to
1	YEL/RED	IG2 (power source for ignition switch)
2	BLK	Ground (G501)
3	WHT	Display unit (RX +)
4	GRN/WHT	Display unit (RX −)
5	BLU/RED	Display unit (TX +)
6	ORN/BLU	Display unit (TX −)



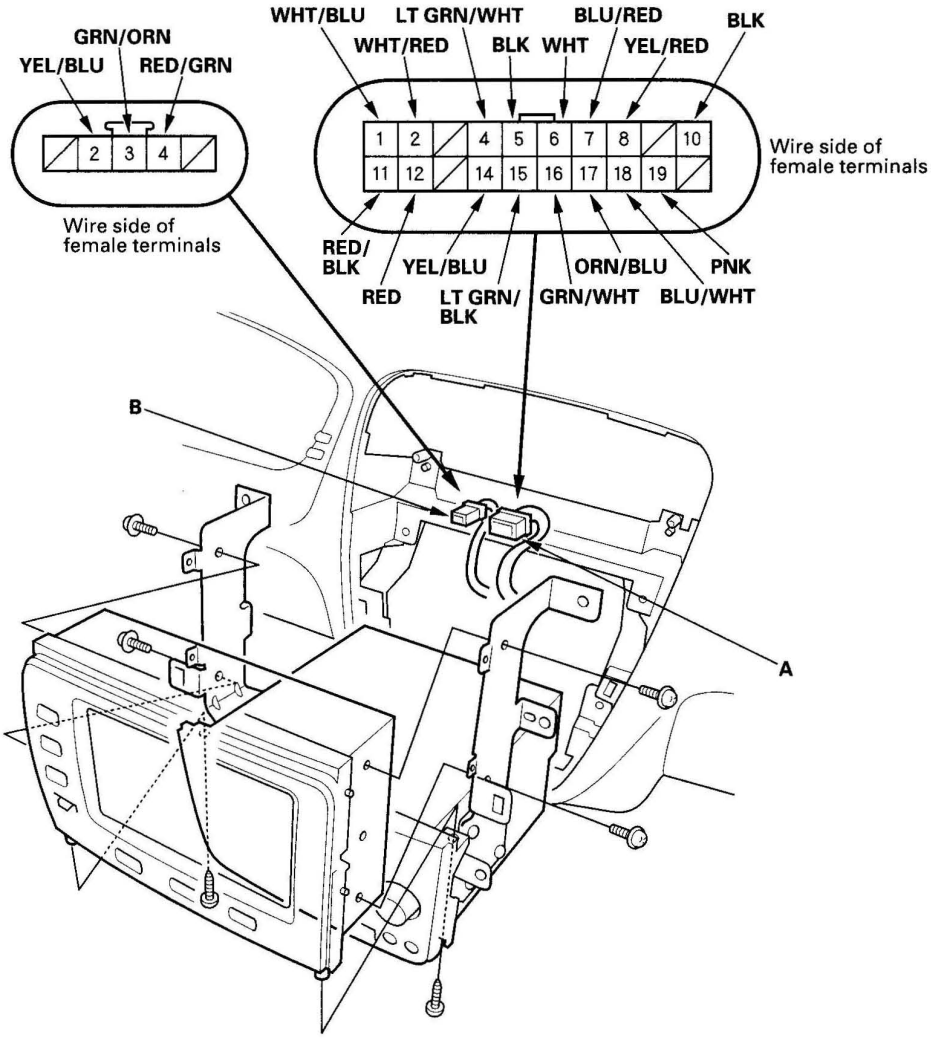
BACK

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Multi-information Display Unit Input Test

1. Remove the audio unit (see page 22-157).

2. Disconnect connector A (20P) and connector B (5P) from the display unit.



3. Inspect all of the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

(cont'd)

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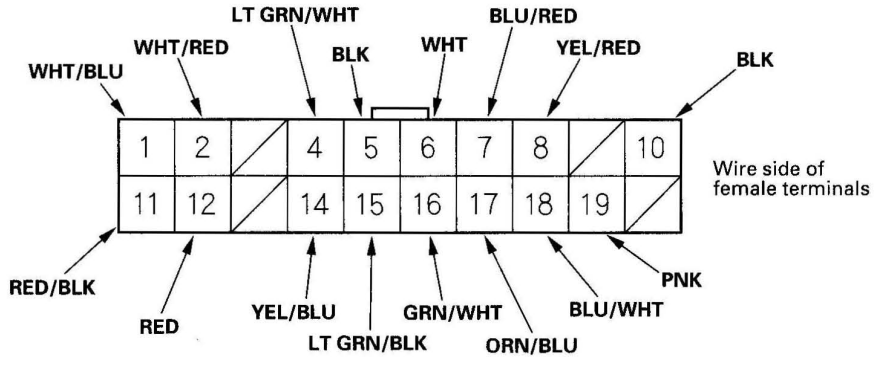
Multi-information System (Without Navigation)

Multi-information Display Unit Input Test (cont'd)

4. With the display unit still disconnected, make these input tests at the connector by back probing each terminal.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test Condition	Test: Desired result	Possible cause if result is not obtained
A1	WHT/BLU	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 54 (40A) fuse in the under-hood fuse/relay box • Blown No. 11 (10A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
A2	WHT/RED	Ignition switch ON (I)	Check for voltage to ground: There should be battery voltage.	• Blown No. 54 (40A) fuse in the under-hood fuse/relay box • Blown No. 9 (15A) fuse in the passenger's under-dash fuse/relay box • Blown No. 8 (7.5A) fuse in the driver's under-dash fuse/relay box • Faulty accessory power socket relay • Poor ground (G651) • An open in the wire
A8	YEL/RED	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 5 (10A) fuse in the driver's under-dash fuse/relay box • Faulty ignition switch • An open in the wire
A5	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire
A10	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G502) • An open in the wire
A11	RED/BLK	Combination light switch ON (≡DO≡) or (≣D)	Check for voltage to ground: There should be battery voltage.	• Blown No. 10 (15A) fuse in the passenger's under-dash fuse/relay box • Faulty taillight relay • Faulty combination light switch • An open in the wire
A12	RED	Combination light switch ON (≡DO≡) or (≣D)	Attach to ground: Dash lights should come on full bright	• An open in the wire
A18	BLU/WHT	Under all conditions	Check for continuity batween the A18 terminal and No. 9 terminal of the PCM connector A (32P): There should be continuity.	• An open in the wire
A19	PNK	Ignition switch ON (II)	Check for voltage to ground: There should be less than 1 V.	• An open in the wire



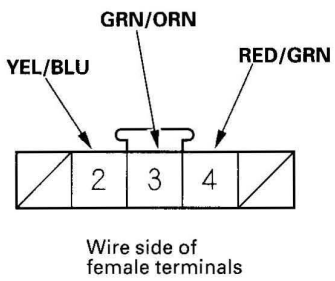
BACK

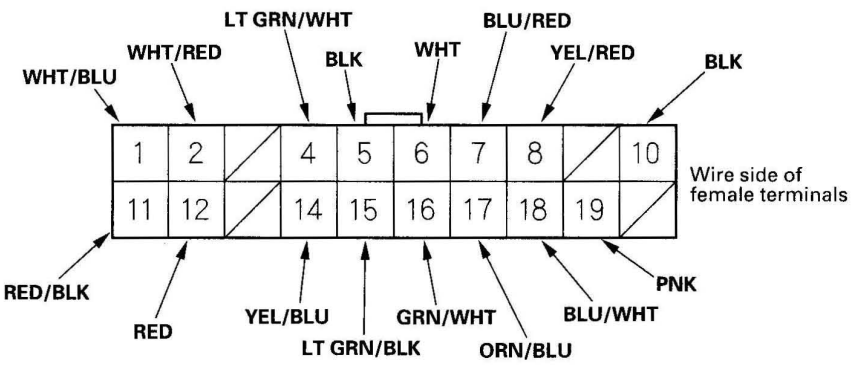
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5. Reconnect the connector to the display unit, and perform the following input tests at the connectors.

- If any test indicatets a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, the display unit must be faulty; replace it.

Cavity	Wire	Test Condition	Test: Desired result	Possible cause if result is not obtained
A4	LT GRN/WHT	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Faulty gauge assembly • An open in the wire
A14	YEL/BLU	Ignition switch ON (II) with the fuel gauge sending unit float at EMPTY position	Check for voltage to ground: There should be 5 V or more.	• Faulty gauge assembly • Faulty fuel gauge sending unit • Poor ground (G501) • An open in the wire • A short to ground in the wire
A17	ORN/BLU	Ignition switch ON (II)	Check for voltage to ground: There should be about 4 V.	• Faulty electrical compass unit • An open in the wire • A short to ground in the wire
A7	BLU/RED	Ignition switch ON (II)	Check for voltage to ground: There should be about 4 V.	• Faulty electrical compass unit • An open in the wire • A short to ground in the wire
A16	GRN/WHT	Ignition switch ON (II)	Check for voltage to ground: There should be about 4 V.	• Faulty electrical compass unit • An open in the wire • A short to ground in the wire
A6	WHT	Ignition switch ON (II)	Check for voltage to ground: There should be about 4 V.	• Faulty electrical compass unit • An open in the wire
B2	YEL/BLU	Ignition switch ON (II)	Check for voltage to ground: There should be about 5 V.	• Faulty climate control unit • A short in the wire • An open in the wire
B3	GRN/ORN	Ignition switch ON (II)	Check for voltage to ground: There should be about 5 V.	• Faulty climate control unit • A short in the wire • An open in the wire
B4	RED/GRN	Ignition switch ON (II)	Check for voltage to ground: There should be about 5 V.	• Faulty climate control unit • A short in the wire • An open in the wire

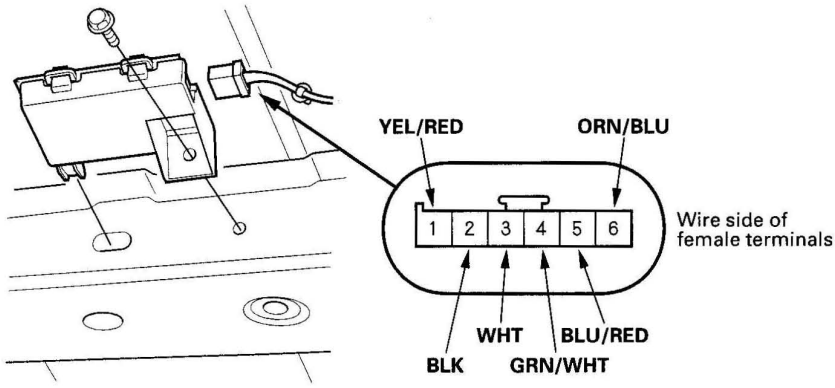




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Electrical Compass Unit Input Test

1. Remove the headliner (see page 20-59).
2. Disconnect the 6P connector from the electrical compass unit.
3. Inspect the all connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.



4. With the electrical compass unit still disconnected, make these input tests at the connector.
   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test Condition	Test: Desired result	Possible cause if result is not obtained
2	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire
1	YEL/RED	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 5 (10A) fuse in the driver's under-dash fuse/relay box • An open in the wire

5. Reconnect the connector to the electrical compass unit, and perform the following input tests at the connectors.
   - If any test indicates a problem, find and correct the cause, them recheck the system.
   - If all input tests OK, the electrical compass unit must be faulty; replace it.

Cavity	Wire	Test Condition	Test: Desired result	Possible cause if result is not obtained
3	WHT	Under all conditions	Check for voltage to ground: There should be about 4 V.	• Faulty display unit • An open in the wire • A short to ground in the wire
4	GRN/WHT	Under all conditions	Check for voltage to ground: There should be about 4 V.	• Faulty display unit • An open in the wire • A short to ground in the wire
5	BLU/RED	Under all conditions	Check for voltage to ground: There should be about 4 V.	• Faulty display unit • An open in the wire • A short to ground in the wire
6	ORN/BLU	Under all conditions	Check for voltage to ground: There should be about 4 V.	• Faulty display unit • An open in the wire • A short to ground in the wire

BACK

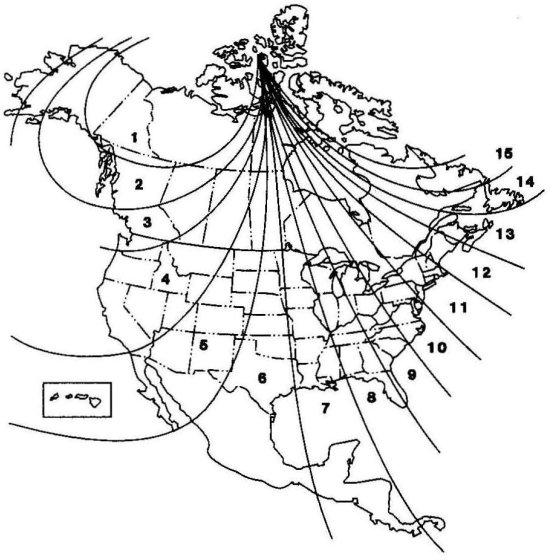
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Troubleshooting

Compass shows wrong direction

NOTE: You should do this procedure in an open area away from buildings, power lines, and other vehicles.

1. Check the No. 5 (10A) and No. 8 (7.5A) fuses in the driver's under-dash fuse/relay box, and the No. 9 (15A) and No. 11 (10A) fuses in the passenger's under-dash fuse/relay box.
2. Press and hold the CLOCK and TRIP buttons until the display changes (about 1 second).
3. Press the Calibrate (MODE) button.
4. Press the Set (FAN) button. Calibrate will start blinking, and the direction display will change to "— —".
5. Drive the vehicle slowly in 2 complete circles.
6. Press the ZONE (A/C) button to display the current zone setting.
7. Compare the zone setting displayed to the map. If the zone is incorrect, use the MODE or A/C buttons to select the proper zone.



8. Lock in the select zone by pressing the SET button.
9. Press the CLOCK, TRIP, or RESET button to complete the calibration and return to the normal display.

No picture is shown on the display

NOTE: Check the dimmer switch position for the display.

1. Check the No. 11 (10A) fuse in the passenger's under-dash fuse/relay box, and reinstall the fuse if it is OK.

   Is the fuse OK?

   YES — Go to step 2.

   NO — Replace the fuse and recheck. ■

2. Check the No. 9 (15A) fuse in the passenger's under-dash fuse/relay box, and reinstall the fuse if it is OK.

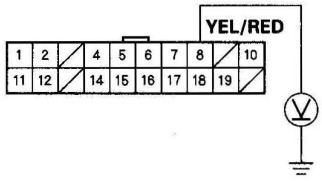
   Is the fuse OK?

   YES — Go to step 3.

   NO — Replace the fuse and recheck. ■

3. Disconnect display unit connector A.
4. Turn the ignition switch ON (II).
5. Measure voltage between body ground and display unit connector A terminal No. 8.

DISPLAY UNIT CONNECTOR A



Wire side of female terminals

Is there battery voltage?

YES — Go to step 6.

NO — Check the No. 5 (10A) fuse in the driver's under-dash fuse/relay box and recheck. If the fuse is OK, check for an open in the YEL/RED wire. ■

6. Turn the ignition switch OFF.

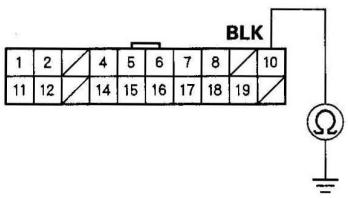
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Troubleshooting (cont'd)

7. Check for continuity between display unit connector A terminal No. 10 and body ground.

DISPLAY UNIT CONNECTOR A



Wire side of female terminals

Is there continuity?

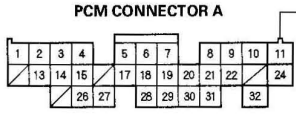
YES – Replace the display unit.■

NO – Go to the display unit input test (see page 22-305).

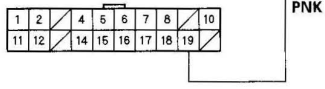
Fuel consumption displays does not work

1. Disconnect PCM connector A and display unit connector A.
2. Check for continuity between PCM connector A terminal No. 11 and display unit connector A terminal No. 19.

PCM CONNECTOR A



DISPLAY UNIT CONNECTOR A



Wire side of female terminals

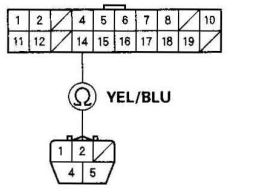
Is there continuity?

YES – Go to step 3.

NO – Check for an open in the wire between PCM connector A terminal No. 11 and display unit connector A terminal No. 19.■

3. Disconnect the fuel gauge sending unit connector.
4. Check for continuity between the display unit connector A terminal No. 14 and fuel gauge sending unit connector terminal No. 2.

DISPLAY UNIT CONNECTOR A



FUEL GAUGE SENDING UNIT CONNECTOR

Wire side of female terminals

Is there continuity?

YES – Go to step 5.

NO – Check for these problems:■

- A faulty fuel gauge sending unit.
- An open in the wire between fuel gauge sending unit connector terminal No. 2 and display unit connector A terminal No. 14.

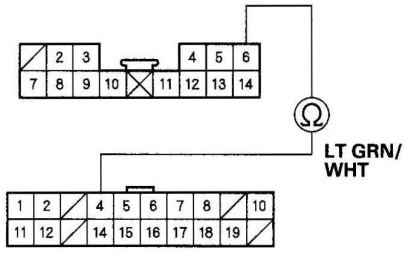
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5. Disconnect gauge assembly connector C.

6. Check for continuity between display unit connector A terminal No. 4 and gauge assembly connector C terminal No. 6.

GAUGE ASSEMBLY CONNECTOR C



DISPLAY UNIT CONNECTOR A
Wire side of female terminals

Is there continuity?

YES—Check for these problems:■

- A short to ground in the LT GRN/WHT wire.
- A short to ground in the YEL/BLU wire.
- A short to ground in the PNK wire.

If the wires are OK, replace the display unit.

NO—Repair open in the wire between gauge assembly connector C terminal No. 6 and display unit connector A terminal No. 4.■

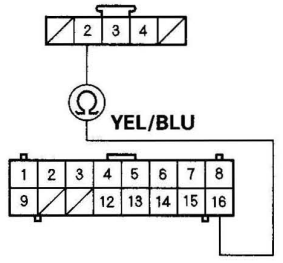
A/C and outside temperature display do not work

1. Check for climate control unit DTCs. If you find any, repair the problem, and clear the DTC before continuing.

2. Disconnect climate control unit connector A and display unit connector B.

3. Check for continuity between display unit connector B terminal No. 2 and climate control unit connector A terminal No. 16.

DISPLAY UNIT CONNECTOR B



CLIMATE CONTROL UNIT CONNECTOR A
Wire side of female terminals

Is there continuity?

YES—Go to step 4.

NO—Repair open in the wire between climate control unit connector A terminal No. 16 and display connector B terminal No. 2.■

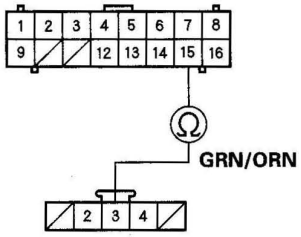
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Troubleshooting (cont'd)

4. Check for continuity between display unit connector B terminal No. 3 and climate control unit connector A terminal No. 15.

CLIMATE CONTROL UNIT CONNECTOR A



DISPLAY UNIT CONNECTOR B

Wire side of female terminals

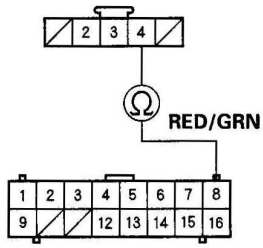
Is there continuity?

YES – Go to step 5.

NO – Repair open in the wire between climate control unit connector A terminal No. 15 and display unit connector B terminal No. 3.■

5. Check for continuity between display unit connector B terminal No. 4 and climate control unit connector A terminal No. 8.

DISPLAY UNIT CONNECTOR B



CLIMATE CONTROL UNIT CONNECTOR A

Wire side of female terminals

Is there continuity?

YES – Check for these problems:■

- A short to ground in the RED/GRN wire.
- A short to ground in the GRN/ORN wire.
- A short to ground in the YEL/BLU wire.

If the wires are OK, replace the display unit.

NO – Check for these problems:■

- A faulty outside air temperature sensor input to the climate control unit.
- A faulty climate control unit.
- A faulty outside air temperature sensor.

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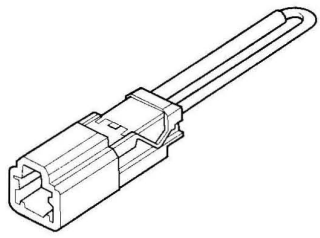
Navigation System

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Special Tools

Ref.No.	Tool Number	Description	Qty
①	07PAZ-0010100	SCS Service Connector	1

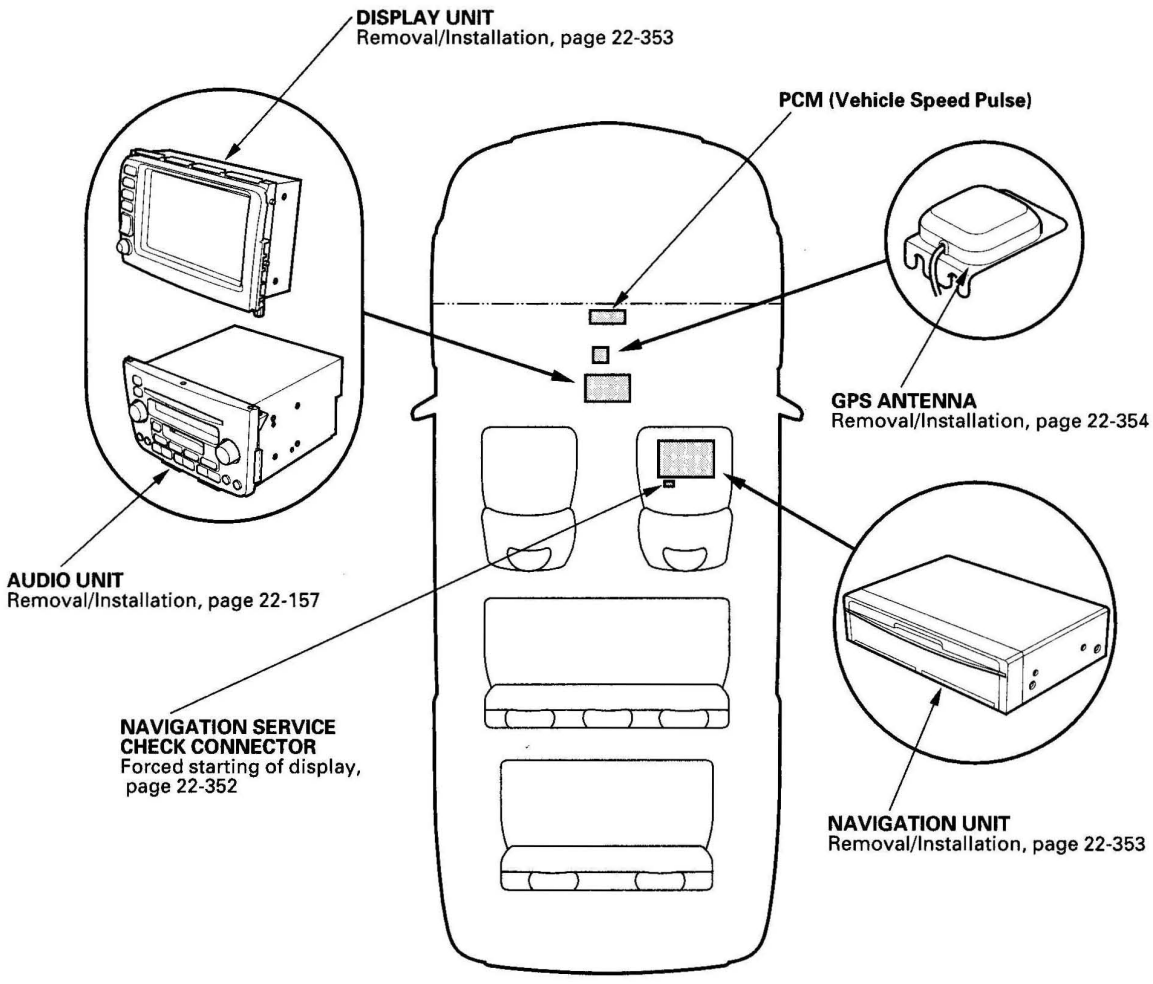


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Component Location Index



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General Troubleshooting Information

General Operation

Refer to the Acura Navigation System Owner's manual, P/N 31S3V800 ('01model), 31S3V810 ('02model), for the navigation system operating procedures.

Anti-theft Feature

The navigation system has a coded theft protection circuit. Be sure to get the customer's 4-digit security code number before;

- disconnecting the battery
- disconnecting the navigation unit 8P connector
- removing the NAVIGATION (10 A) fuse from the passenger's under-dash fuse/relay box

After service, reconnect power to the navigation unit, and turn the ignition switch ON (II). Enter the 4-digit security code, then select "Done".

When replacing the navigation unit, be sure to give the customer the new anti-theft security code.

Symptom Diagnosis

Certain circumstances and system limitations will result in occasional vehicle positioning errors. Some customers may think this indicates a problem with the navigation system when, in fact, the system is normal. Keep the following items in mind when interviewing customers about navigation system symptoms.

Self-Inertial Navigation Limitations

The limitations of the self-inertial portion of the navigation system (the yaw rate sensor and the vehicle speed signal) can cause some discripancies between the vehicle's actual position and the indicated vehicle position (GPS vehicle position). However, if GPS signals cannot be received, you must tune the vehicle position manually.

The following circumstances may cause vehicle positioning errors:

- Moving the vehicle with the engine stopped, such as by ferry or tow truck, or if the vehicle is spun on a turn table
- Tire slippage, changes in tire rolling diameters, and some driving situations may cause discrepancies in travel distances. Examples of this include:
  - Continuous tire slippage on a slippery surface
  - Driving with snow chains mounted
  - Abnormal tire pressure
  - Incorrect tire size
  - Frequent lane changes across a wide highway
  - Continuous driving on a straight or gently curving highway
- Tolerances in the system and map inaccuracies sometimes limit how precisely the vehicle position is indicated. Examples of this include:
  - Driving on roads not shown on the map (map matching is not possible)
  - Driving on a road that winds in one direction, such as a loop bridge, an interchange, or a spiral parking garage
  - Driving on a road with a series of sharp hair-pin turns
  - Driving on one of two close parallel roads
  - After making many 90 degree turns

Global Positioning System (GPS) Limitations

The GPS cannot detect the vehicle's position during the following instances:

- For the first 5 to 10 minutes after reconnecting the battery
- When the satellite signals are blocked by tall building, mountains, tunnels, large trees, or large trucks
- When the GPS antenna is blocked by something on the dashboard
- When there is no satellite signal output (Signal output is sometimes stopped for satellite servicing)
- When the satellite signals are blocked by the operation of some electronic aftermarket accessories including, but not limited to non-DEM in-dash entertainment units (radio, CD players/changers)

The accuracy of GPS is reduced during these instances:

- When only two satellite signals can be received (Three satellite signals are required for accurate positioning)
- When the satellite control centers are experiencing problems

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LCD Display Unit Limitations

- In cold temperatures, the display may stay dark for the first 2 or 3 minutes until it warms up.
- When the display is too hot because of direct summer sunlight, it will remain dark until the temperature drops.
- When the humidity is high and the interior temperature is low, the display may appear cloudy. The display will clear up after some use.
- Fingerprints on the touch panel may sometimes be noticeable because of the panel's low-reflection coating. When cleaning the panel, wipe it gently with a soft cloth. To avoid scratching the panel, do not rub too hard.
- The touch panel is an infrared system, so there is no need to press hard. If a touch switch does not function immediately, shift your finger slightly on the switch, and touch it again.

Note: Input may be affected by direct sunlight.

Symptom Duplication

- When the symptom can be duplicated, follow the self-diagnostic procedures (picture diagnosis mode) and the appropriate troubleshooting procedures.
- When the symptom does not reappear or only reappears intermittently, ask the customer about the conditions when the symptom occured.
  - Try to establish if outside interference may have been the cause.
  - Try to duplicate the symptom under the same conditions the customer was experiencing.
  - Vibration, temperature extremes, and moisture (dew, humidity) are factors that are difficult to duplicate.
  - Inspect the vehicle for after-market electronic devices (vehicle locators, amps,etc) that may be hidden.

Service Precautions

- Before disconnecting the battery, make sure you have the anti-theft codes for the radio and the navigation system, and write down the frequencies for the radio's preset buttons.
- When the battery is disconnected, the clock is reset to "0:00". The clock will reset to the correct time after the system receives the GPS satellite signals.
- After reconnecting the battery, you have to wait to get the initial signal from the satellite. It will take about 10 minutes.

After Servicing-Map Matching

- Park the vehicle in an area where the GPS satellite signals will be unobstructed, and check the satellite mark on the display.
- Drive the vehicle 1 mile before entering a destination and confirm the road being used is displayed at the bottom of the screen (map matched).
- Enter the dealer address and confirm the system routes and performs normally.

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Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
No picture is shown on the display	Troubleshooting (see page 22-334)	
The picture is missing a color or tone	Troubleshooting (see page 22-335)	
Display unit buttons do not work	Troubleshooting (see page 22-336)	
Satellite mark in the GPS mark is not indicated	Troubleshooting (see page 22-337)	Electronic aftermarket accessories
Audio driving instructions cannot be heard	Troubleshooting (see page 22-338)	"Vehicle position does not move on the map"
Vehicle position does not move on the map	Troubleshooting (see page 22-341)	
Present fuel economy meter is MAX level when the vehicle speed is more than 0 mph (0 km/h)	Troubleshooting (see page 22-342)	
Range shows "---"	Troubleshooting (see page 22-343)	

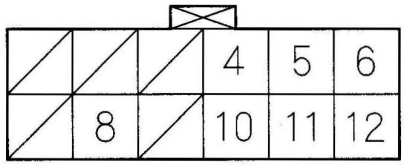
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System Description

Navigation Unit Inputs and Outputs for Connector A (12P)

NAVIGATION UNIT CONNECTOR A (12P)



Wire side of female terminals

Terminal number	Wire color	Terminal	Terminal name	Description
4	WHT	R SIG	Red signal	Red color signal
5	RED	G SIG	Green signal	Green color signal
6	BRN/BLK	SH SIG	Shield signal	Shield for terminal No. 4, 5, 10, 11, 12
8	YEL/WHT	AMP SW +B	Amplifier switch +B	Power source signal of amplifier
10	YEL	B SIG	Blue signal	Blue color signal
11	GRN	C SIG	Composite signal	Composite video (vertical/ horizontal) synchronizing signal
12	BLU	GND SIG	Ground signal	Ground for color signal

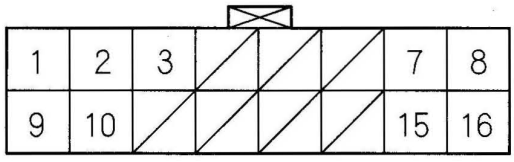
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System Description (cont'd)

Navigation Unit Inputs and Outputs for Connector B (16P)

NAVIGATION UNIT CONNECTOR B (16P)



Wire side of female terminals

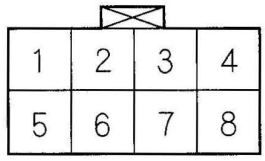
Terminal number	Wire color	Terminal	Terminal name	Description
1	BLU/GRN	RG R+	Route guidance right positive	Right audio signal of voice guidance
2	BRN/WHT	SH RG	Shield route guidance	Shield for terminal No. 1, 9, 10
3	WHT/BLK	MUTE	Mute	Audio mute signal
7	BLU/GRN	DISP BUS (+)	Display bus positive	Data bus (+)
8	RED/BLK	ILL+	Illumination positive	Parking light ON signal
9	ORN/BLU	RG L+	Route guidance left positive	Left audio signal of voice guidance
10	ORN	GND RG	Ground route guidance	Ground for voice guidance signal
15	ORN/BLU	DISP BUS (−)	Display bus negative	Data bus (−)
16	LT BLU	SH DISP BUS	Shield display bus	Shield for terminal No. 7, 15

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Navigation Unit Inputs and Outputs for Connector C (8P)

NAVIGATION UNIT CONNECTOR C (8P)



Wire side of female terminals

Terminal number	Wire color	Terminal	Terminal name	Description
1	WHT/BLU	+B	+B power source	Countinuous power source
2	WHT/RED	ACC	Accessory	Power source for accessory
3	WHT/BLU	CHG	Charge	Engine ON signal
4	BLK	GND	Ground	Ground for navigation unit
5	GRN/BLK	BACK LT	Back light	Reverse signal of select lever
6	BLU/WHT	VSP	Vehicle speed pulse	Vehicle speed pulse signal
7	GRN/RED	DIAG P	Diagnosis positive	Service check signal for navigation system
8	BLU/GRN	DIAG N	Diagnosis negative	Ground for service check signal

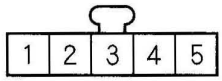
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System Description (cont'd)

Navigation Unit Inputs Outputs for Connector D (5P)

NAVIGATION UNIT CONNECTOR D (5P)



Wire side of female terminals

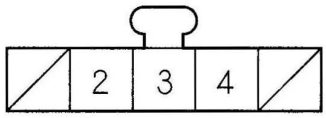
Terminal number	Wire color	Terminal	Terminal name	Description
1	PNK	FUP	Fuel pulse	Pulse signal of fuel injector
2	BLK	GND FU	Ground fuel	Ground for FU circuit
3	LT GRN/ WHT	FU VREF	Fuel voltage reference	Reference signal for FU circuit
4	YEL/BLU	FU VME	Fuel voltage measure	Fuel quantity signal
5	LT GRN/ BLK	FU LOW	Fuel low	Low fuel signal

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Display Unit Inputs and Outputs for Connector A (5P)

DISPLAY UNIT CONNECTOR A (5P)



Wire side of female terminals

Terminal number	Wire color	Terminal	Terminal name	Description
2	YEL/BLU	CLK2	Clock 2	Air conditioning control unit synchronizing signal
3	GRN/ORN	ACI	Air conditioner in	Communication circuit with climate control unit
4	RED/GRN	ACO	Air conditioner out	

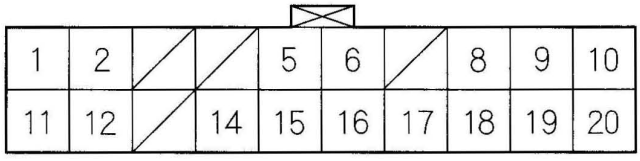
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System Description (cont'd)

Display Unit Inputs and Outputs for Connector B (20P)

DISPLAY UNIT CONNECTOR B (20P)



Wire side of female terminals

Terminal number	Wire color	Terminal	Terminal name	Description
1	WHT/BLU	+B	+B power source	Continuous power source
2	WHT/RED	ACC	Accessory	Power source for accessory
5	BLU/GRN	DISP BUS (+)	Display bus positive	Data bus (+)
6	BLU	SCTY 1	Security 1	Security signal
8	WHT	R SIG	Red signal	Red color signal
9	RED	G SIG	Green signal	Green color signal
10	BLK	GND	Ground	Ground for display unit
11	RED/BLK	ILL+	Illumination positive	Parking light ON signal
12	RED	ILL−	Illumination negative	Parking light ON signal
14	LT BLU	SH DISP BUS	Shield display bus	Shield for display bus
15	ORN/BLU	DISP BUS (−)	Display bus negative	Data bus (−)
16	GRN/WHT	SCTY 2	Security 2	Security signal
17	BLU	GND SIG	Ground signal	Ground for color signal
18	YEL	B SIG	Blue signal	Blue color signal
19	GRN	C SIG	Composite signal	Composite video (vertical/ horizontal) synchronizing signal
20	BRN/BLK	SH SIG	Shield signal	Shield for terminal No. 8, 9, 17, 18, 19

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Overview

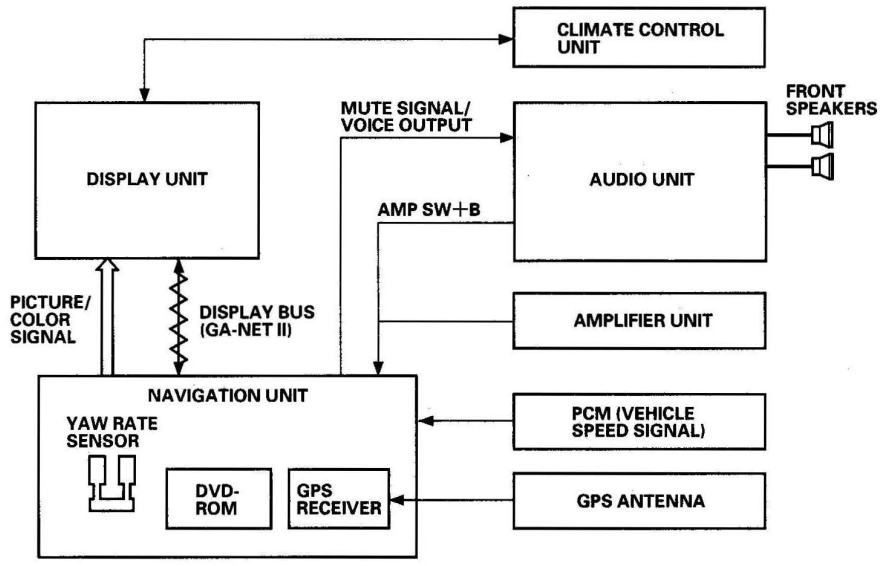
The Acura Navigation System is a highly-sophisticated, hybrid locating system that uses satellites and a map database to show you where you are and to help guide you to a desired destination.

The navigation system receives signals from the Global Positioning System (GPS), a network of 24 satellites in orbit around the earth. By receiving signals from serveral of these satellites, the navigation system can determine the latitude and longitude of the vehicle. In addition, signals from the system's yaw rate sensor and the PCM (vehicle speed signal) enable the system to keep track of the vehicle's direction and speed of travel.

This hybrid system has advantages over a system that is either entirely self-contained or one that relies totally on the GPS. For example, the self-contained portion of the system can keep track of vehicle position even when satellite signals cannot be received. When the navigation system is on, the GPS can keep track of the vehicle position even when the vehicle is transported by ferry.

The navigation system applies all this location, direction, and speed information to the maps and calculates a route to the destination entered. As you drive to that destination, the system provides both visual and audio guidance.

System Diagram



(cont'd)

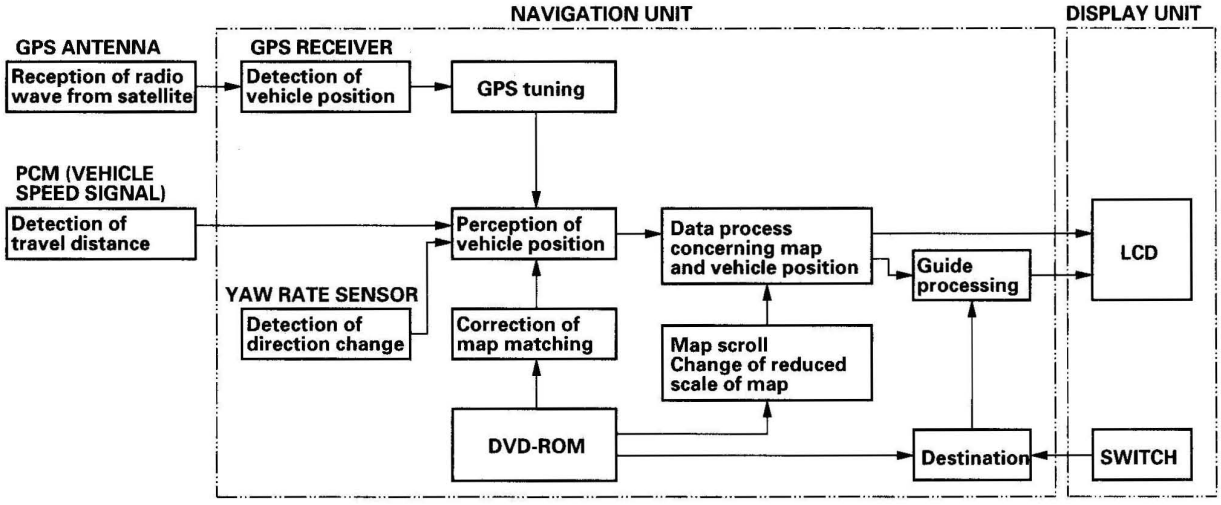
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System Description (cont'd)

Navigation Function

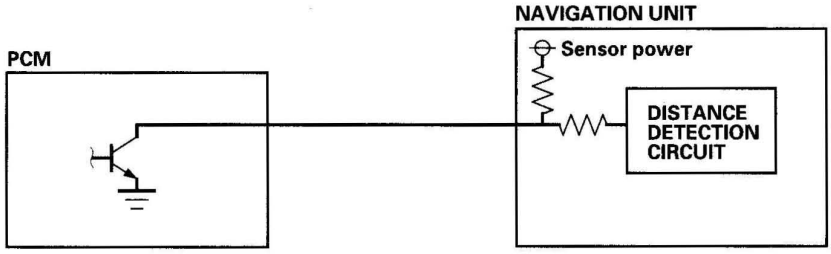
The navigation system is composed of the navigation unit, the PCM (vehicle speed signal), the GPS antenna, and the display unit.

Function Diagram



Vehicle Speed Signal

The vehicle speed signal is outputted by the PCM. The PCM recieves the signal from the countershaft speed sensor, then the PCM processes the signal and transmits it to the speedometer and other systems.



BACK

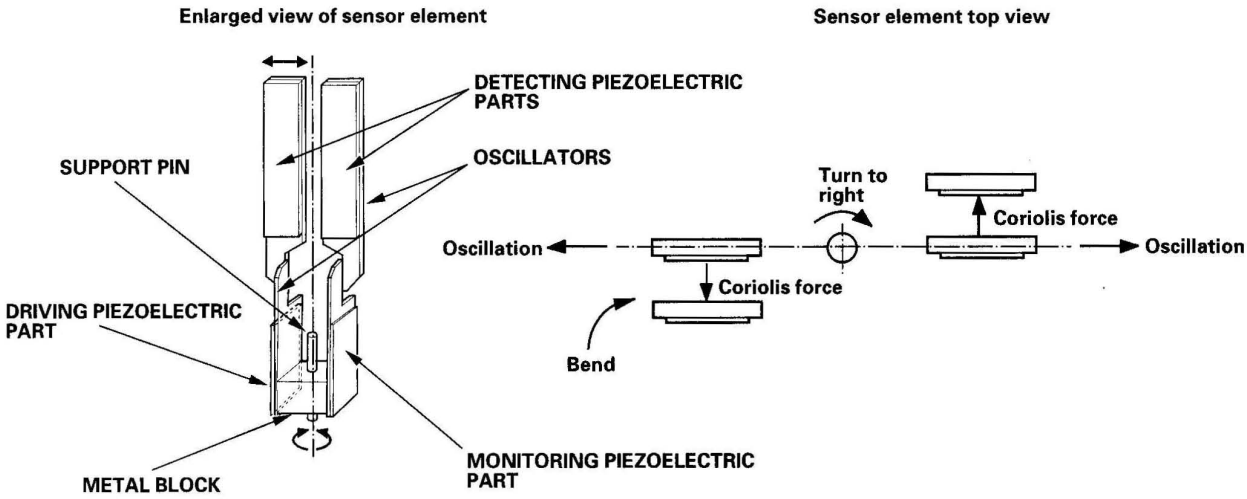
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Yaw Rate Sensor
The yaw rate sensor detects the direction change (angular speed) of the vehicle. The sensor is an oscillation gyro built into the navigation unit.

Sensor Element Structure
The sensor element is shaped like a tuning fork, and it consists of the piezoelectric parts, the metal block, and the support pin. There are four piezoelectric parts: one to drive the oscillators, one to monitor and maintain the oscillation at a regular frequency, and two to detect angular velocity. The two oscillators, which have a 90-degree twist in the center, are connected at the bottom by the metal block and supported by the support pin. A detection piezoelectric part is attached to the top of each oscillator. The driving piezoelectric part is attached to the bottom of one oscillator, and the monitoring piezoelectric part is attached to the bottom of the other oscillator.

Oscillation Gyro Principles
The piezoelectric parts have "electric/mechanical transfer characteristics." They bend vertically when voltage is applied to both sides of the parts, and voltage is generated between both sides of the piezoelectoric parts when they are bent by an external force. The oscillation gyro functions by utilizing this characteristic of the piezoelectric parts and "Coriolis force." (Coriolis force deflects moving objects as a result of the earth's rotation.) In the oscillation gyro, this force moves the sensor element when angular velocity is applied.

Operation
1. The driving piezoelectric part oscillates the oscillator by repeatedly bending and returning when an AC voltage of 6 kHz is applied to the part, The monitoring-side oscillator resonates because it is connected to the driving-side oscillator by the metal block.
2. The monitoring piezoelectric part bends in proportion to the oscillation and outputs voltage (the monitor signal). The navigation unit control circuit controls the drive signal to stabilize the monitor signal.
3. When the vehicle is stopped, the detecting piezoelectric parts oscillate right and left with the oscillators, but no signal is output because the parts are not bent (no angular force)
4. When the vehicle turns to the right, the sensor element moves in a circular motion with the right oscillator bending forward and the left oscillator bending rearward. The amount of forward/rearward bend varies according to the angular velocity of the vehicle.
5. The detecting piezoelectric parts output voltage (the yaw rate signal) according to the amount of bend. The amount of vehicle direction change is determined by measuring this voltage.



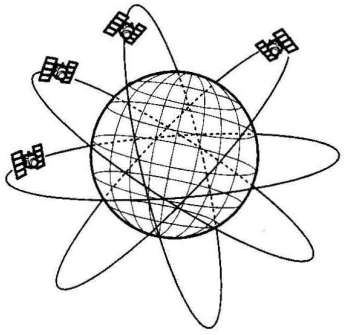
(cont'd)

Protected by AR

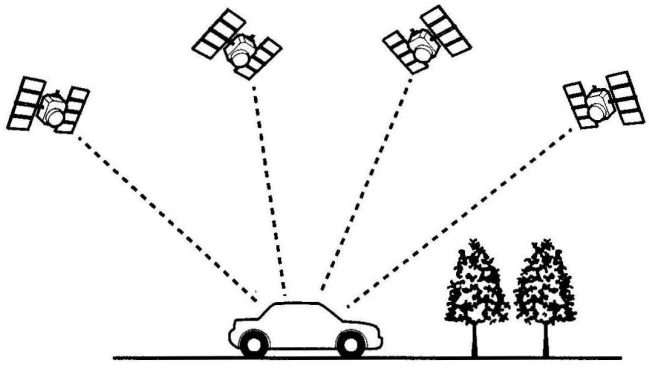
System Description (cont'd)

Global Positioning System (GPS)
The Global Positioning System (GPS) enables the navigation system to determine the current position of the vehicle by utilizing the electric waves transmitted from the satellites in orbit around the earth. The satellites transmit the satellite identification signal, orbit information, transmission time signal, and other information. When the GPS receiver receives the electric waves from three or more satellites simultaneously, it calculates the current position of the vehicle based on the distance to each satellite and the satellite positions on their respective orbits.

Position detection Image with GPS satellite



NOTE: Four satellites on each of 6 orbits.



Precision of GPS
The precision of the GPS varies according to the number of satellites from which electric waves are received and the control condition. The precision is indicated by the GPS mark shown on the upper left of the display.

GPS MARK	No.of SATELLITES	CONDITION	DISCRIPTION
No satellite mark → 	2 or less	Impossible to detect vehicle position	GPS funtion is normal. The satellite electric waves received by the GPS are too few to detect the vehicle position.
Yellow satellite mark → 	3	Vehicle position detectable in 2 demensions	The longitude and latitude of the vehicle position can be detected. (Less precise than detection in three dimensions)
Green satellite mark → 	4 or more	Vehicle position detectable in 3 dimensions	The longitude, latitude and the altitude of the vehicle position can be detected. (More precise than detection in two dimensions)
Not indicate	——	Faulty	The GPS can't be utilzed due to a faulty GPS receiver, open in the wire, or other fault.

GPS Antenna
The GPS antenna amplifies and transmits the electronic waves received from the satellites to the GPS receiver.

GPS Receiver
The GPS receiver is built in the navigation unit. It calculates the vehicle position by receiving the signal from the GPS antenna. The vehicle position and signal reception condition is transmitted from the GPS receiver to the navigation control unit to adjust vehicle position.

BACK

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Navigation Unit
The navigation unit calculates the vehicle position and guides you to the destination. The unit performs map matching correction, GPS correction, and distance tuning. It also controls the menu functions and the DVD-ROM drive. With control of all these items, the navigation unit makes the navigation picture signal, then it transmits the signal to the display unit and audio driving instructions to the audio unit.

Calculation of Vehicle Position
The navigation unit calculates the vehicle position (the driving direction and the current position) by receiving the directional change signals from the yaw rate sensor and the travel distance signals from the vehicle speed pulse (VSP) sensor.

Map Matching Tuning
The map matching tuning is accomplished by indicating the vehicle position on the roads on the map. The map data transmitted from the DVD-ROM is checked against the vehicle position data, and the vehicle position is indicated on the nearest road. Map matching tuning does not occur when the vehicle travels on a road not shown on the map, or when the vehicle position is far away from a road on the map.

GPS Tuning
The GPS tuning is accomplished by indicating the vehicle position as the GPS's vehicle position. The navigation unit compares its calculated vehicle position data with the GPS vehicle position data. If there is large difference between the two, the indicated vehicle position is adjusted to the GPS vehicle position.

Distance Tuning
The distance tuning reduces the difference between the travel distance signal from the VSP and the distance data on the map. The navigation unit compares its calculated vehicle position data with the GPS vehicle position data. The navigation unit then decreases the tuning value when the vehicle position is always ahead of the GPS vehicle position, and it increases the tuning value when the vehicle position is always behind the GPS vehicle position.

Route Guidance
The navigation unit can calculate different routes to a selected destination. You have four options:
- Direct Route — Calculate a route that is the most direct and will take the least time.
- Easy Route — Calcute a route that minimizes the number of turns needed.
- Minimize Freeways — Calculate a route that avoids freeway travel. If that is not possible, keep the amount of freeway travel to a minimum.
- Mimimize Toll Roads — Calculate a route that avoids, or minimizes travel on toll roads

Audio Guidance
The navigation unit transmits audio driving instructions before entering an intersection or passing a junction. The audio instructions come through the audio unit and the front speakers.

DVD-ROM
The map data (including all scale rates) is stored in the DVD-ROM. The map data includes:
- Road distances, road widths, speed limits, traffic regulations, passing time at junction, distances to junctions, and the driving instructions for audio guidance.
- Latitude and longitude GPS.

(cont'd)

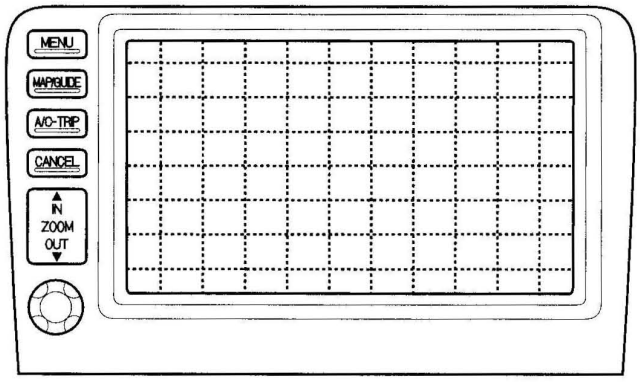
Protected by AR

System Description (cont'd)

Audio Unit
The audio unit receives the audio driving instructions from the navigation unit and transmits the instructions through the front speakers even when the audio system is in use.

Display Unit
The display unit uses liquid crystal display (LCD). The LCD is a 7-inch-wide, thin film transistor (TFT), stripe type with 280,800 picture elements, The color film and fluorescent light are laid out on the back of the liquid crystal film. The touch sensor on the front of the LCD is an infrared type with 10 vertical and 7 horizontal infrared rays to produce 70 sensing points. The display unit transmits the signal from each operation key and the touch switches to the navigation unit.

Infrared rays



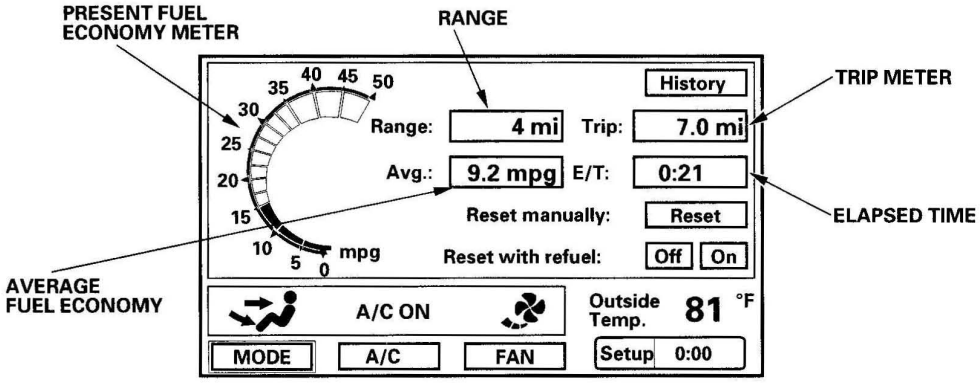
·····:Infrared for touch switch

BACK

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Trip Information Function

The navigation unit indicates trip information together with A/C control screen, outside temperature, and current time on the display.



Trip information shows:

- Present fuel economy meter
  This meter shows the present fuel consumption. The navigation unit calculates the fuel consumption from the vehicle speed signal and the fuel injector signal.

- Range
  This reading shows the distance you can drive with the fuel remaining. The navigation unit calculates the range from the average fuel economy and the remaining fuel.

- Average fuel economy
  This reading shows the average fuel consumption since the last reset.

- Trip meter
  This meter shows the number of miles driven since the last reset.

- Elapsed time
  This reading shows you the elapsed time since the last reset.

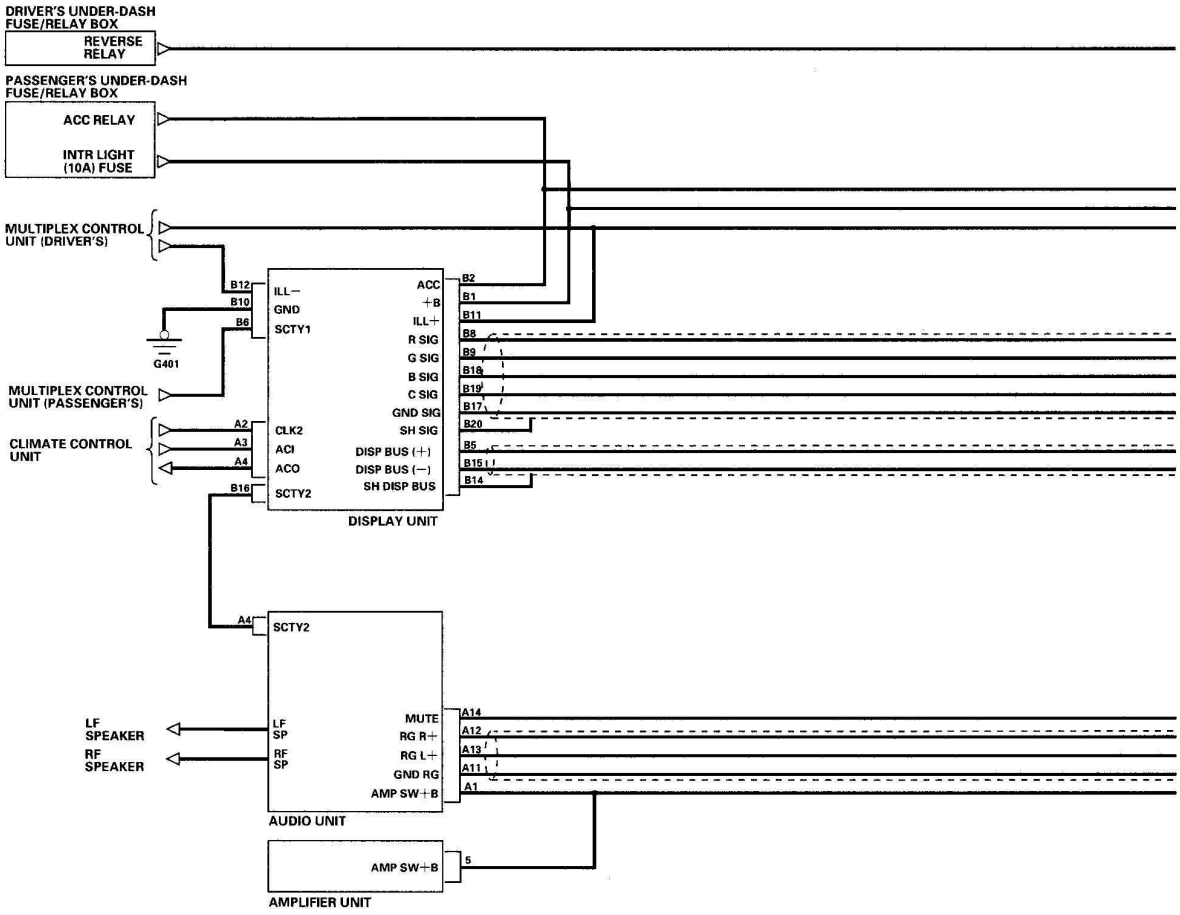
- Reset manually
  Touch the reset icon to reset all trip information.

- Reset with refuel
  ON-All trip information will automatically reset each time the fuel tank is filled.
  OFF-No trip information will change when the fuel tank is filled.

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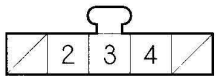
Navigation System

Circuit Diagram

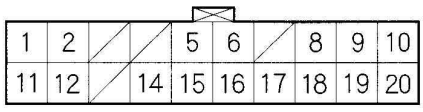


DISPLAY UNIT CONNECTORS

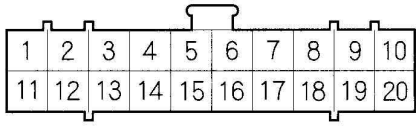
CONNECTOR A (5P)



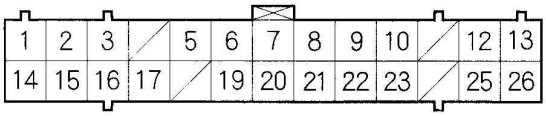
CONNECTOR B (20P)



AUDIO UNIT CONNECTOR A (20P)



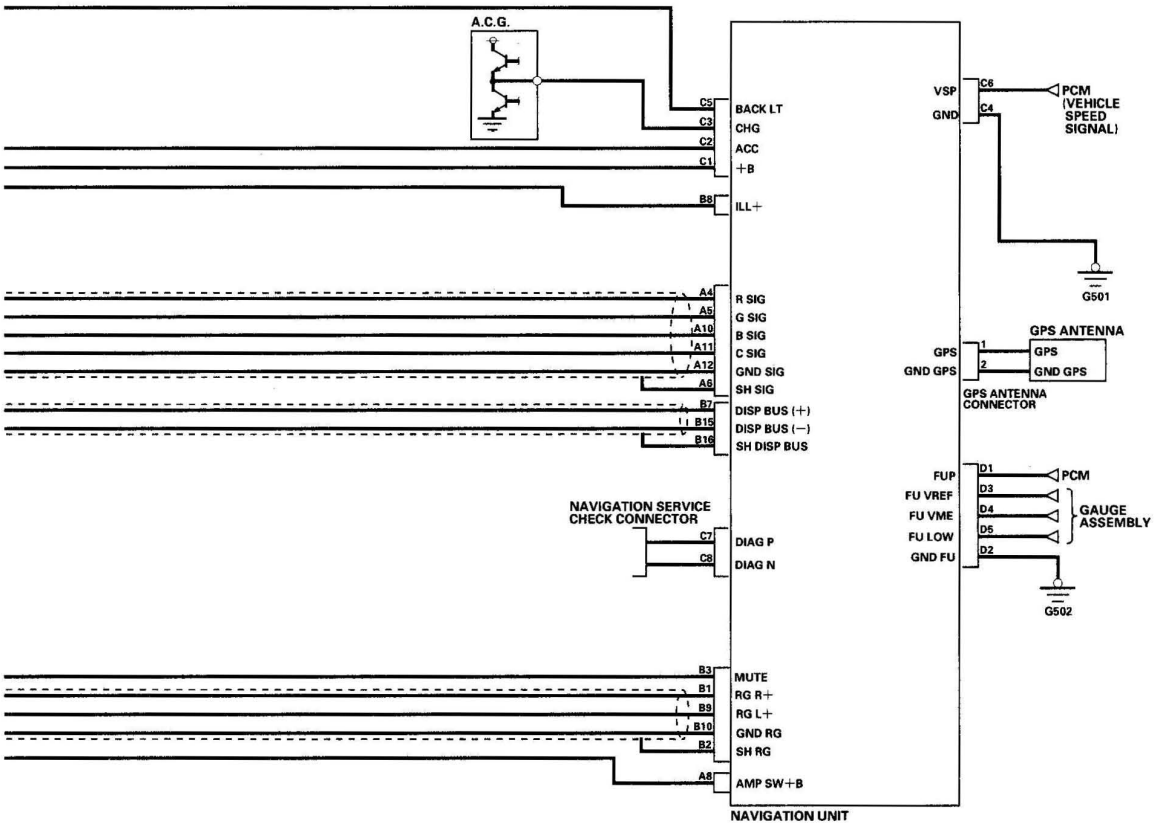
AMPLIFIER UNIT 26P CONNECTOR



Wire side of female terminals

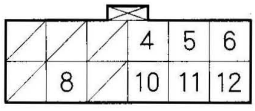
BACK

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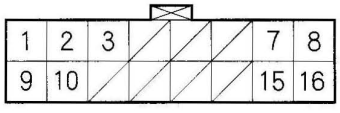


NAVIGATION UNIT CONNECTORS

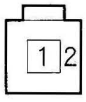
CONNECTOR A (12P)



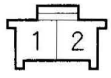
CONNECTOR B (16P)



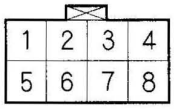
GPS ANTENNA CONNECTOR



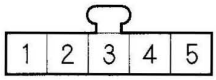
NAVIGATION SERVICE CHECK CONNECTOR



CONNECTOR C (16P)



CONNECTOR D (5P)



Wire side of female terminals

BACK

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Symptom Troubleshooting

No picture is shown on the display

1. Check the INTR LIGHT (10 A) fuse in the passenger's under-dash fuse relay box, and reinstall the fuse if it is OK.

   Is the fuse OK?

   YES – Go to step 2.

   NO – Replace the fuse and recheck. ■

2. Turn the ignition switch to ACC (I).

3. Operate the radio and listen to the audio.

   Can audio be heard?

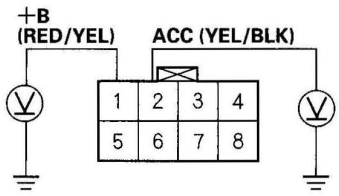
   YES – Go to step 4.

   NO – Check the ACC circuit. ■

4. Turn the ignition switch ON (II).

5. Measure the voltage between body ground and navigation unit connector C (8P) terminals No. 1 and No. 2 individually.

   NAVIGATION UNIT CONNECTOR C (8P)



   Wire side of female terminals

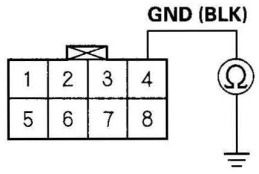
   Is there battery voltage?

   YES – Go to step 6.

   NO – If the +B wire does not have voltage, repair open in the wire between the passenger's under-dash fuse relay box and the navigation unit.
   If the ACC wire does not have voltage, repair open in the wire between the driver's under-dash fuse relay box and the navigation unit. ■

6. Check for continuity between navigation unit connector C (8P) terminal No. 4 and body ground.

   NAVIGATION UNIT CONNECTOR C (8P)



   Wire side of female terminals

   Is there continuity?

   YES – Go to step 7.

   NO – Repair open in the wire between the navigation unit and body ground (G501). ■

7. Turn the ignition switch OFF.

8. Perform the forced starting of the display (see page 22-352).

   Is the diagnosis menu of the picture diagnosis displayed?

   YES – Perform the System Links Test in the System Diagnosis Test menu (see page 22-346). ■

   NO – Go to step 9.

9. Shield the display unit from the sun with your hand, and check that the display is black (only back light is ON.)

   Can you see the back light?

   YES – Replace the navigation unit (see page 22-353). ■

   NO – Replace the display unit (see page 22-353). ■

BACK

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The picture is missing a Red, Green or Blue color or tone

1. Perform the start-up procedure (see page 22-346). Press the Monitor Check button then press the RGB Color button (see page 22-348).

   Are the Red, Green, and Blue colored circles shown?

   YES – Push the return button. Push the Color Change button, and then press the Default button to restore the standard color settings. ■

   NO – Go to step 2.

2. Turn the ignition switch OFF. Disconnect navigation unit connector A (12P) from the navigation unit, and display unit connector B (20P) from the display unit.

3. Check for loose terminals at navigation unit connector A (12P) and display unit connector B (20 P).

   Are there loose terminals?

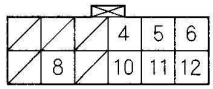
   YES – Repair the terminal. ■

   NO – Go to step 4.

4. Check for continuity between the appropriate terminals of navigation unit connector A (12P) to display unit connector B (20P) based on the missing color(s).

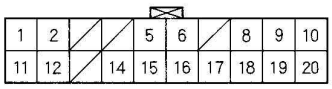
Missing color	Navigation unit connector A (12P)	Display unit connector B (20P)	Wire color
Blue	A10	B18	YEL
Green	A5	B9	RED
Red	A4	B8	WHT

NAVIGATION UNIT CONNECTOR A (12P)



Wire side of female terminals

DISPLAY UNIT CONNECTOR B (20P)



Wire side of female terminals

Is there continuity?

YES – Go to step 5.

NO – There is an open in the circuit between the display unit and the navigation unit. Replace the affected shielded harness. ■

5. Check for continuity between the appropriate terminals of navigation unit connector A (12P) and display unit connector B (20P) based on the missing color(s).

Missing color	Navigation unit connector A (12P)	Display unit connector B (20P)
Blue	A10	B10, B20
Green	A5	B10, B20
Red	A4	B10, B20

Is there continuity?

YES – There is a short to body ground in the circuit between the display unit and the navigation unit. Replace the affected shielded harness. ■

NO – Replace the navigation unit.
If the problem is still unresolved, replace the display unit. ■

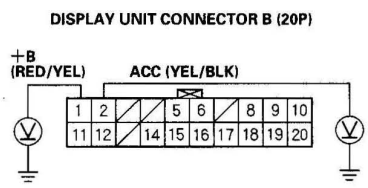
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Symptom Troubleshooting (cont'd)

Display unit buttons do not work

NOTE: Always check all of the connectors for loose terminals.

1. Turn the ignition switch to ACC (I).
2. Measure the voltage between body ground and display unit connector B (20P) terminals No. 1 and No. 2 individually.



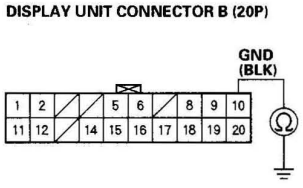
Wire side of female terminals

Is there battery voltage?

YES – Go to step 3.

NO – If the +B wire does not have voltage, repair the open in the wire between the passenger's under-dash fuse/relay box and the display unit. If the ACC wire does not have voltage, repair the open in the wire between the driver's under-dash fuse/relay box and the display unit. ■

3. Check for continuity between display unit connector B (20P) terminal No. 10 and body ground.



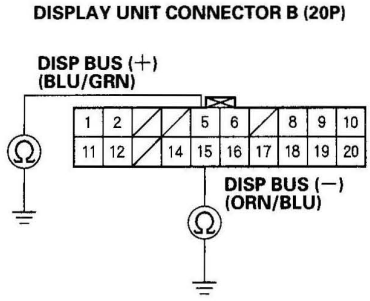
Wire side of female terminals

Is there continuity?

YES – Go to step 4.

NO – Repair the open in the wire between the display unit and body ground (G401). ■

4. Turn the ignition switch OFF.
5. Disconnect the navigation unit and display unit connectors.
6. Check for continuity between body ground and display unit connector B (20P) terminals No. 5 and No. 15 individually.



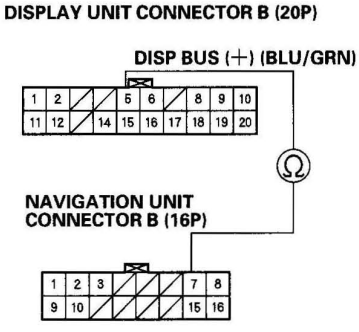
Wire side of female terminals

Is there continuity?

YES – There is a short to body ground in the circuit between the display unit and the navigation unit. Replace the affected shielded harness. ■

NO – Go to step 7.

7. Check for continuity between display unit connector B (20P) terminal No. 5 and navigation unit connector B (16P) terminal No. 7.



Wire side of female terminals

Is there continuity?

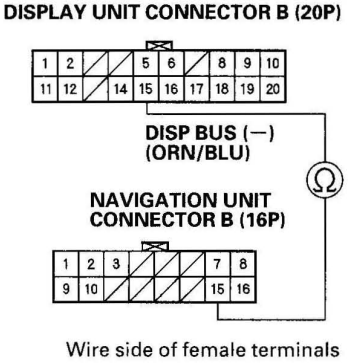
YES – Go to step 8.

NO – There is an open in the circuit between the display unit and the navigation unit. Replace the affected shielded harness. ■

BACK

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8. Check for continuity between display unit connector B (20P) terminal No. 15 and navigation unit 16P connector B (16P) terminal No. 15.



Wire side of female terminals

Is there continuity?

YES – Replace the display unit (see page 22-353). ■

NO – There is an open in the circuit between the display unit and the navigation unit. Replace the affected shielded harness. ■

Satellite mark is not indicated

1. Check for electronic aftermarket accessories (possibly hidden) mounted near the GPS antenna or the navigation unit.

   Are there any electronic accessories?

   YES – Disable the accessories and recheck. ■

   NO – Go to step 2.

2. Perform the "System Link" check under picture diagnosis (see page 22-346).

   Is "NG" indicated?

   YES – Repair as indicated by the system link check. ■

   NO – Check that nothing is blocking the GPS antenna located under the dashboard and recheck. If "NG" is still indicated, substitude a known-good GPS antenna. ■

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Symptom Troubleshooting (cont'd)

Audio driving instructions cannot be heard

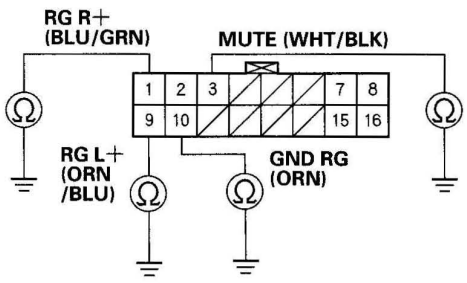
1. Push the display unit MENU key, and select "set-up".
2. Check the audio driving instructions volume setting.

   Is it set to OFF?

   YES—Set the volume to an audible level.■

   NO—Go to step 3.
3. Turn the ignition switch OFF.
4. Disconnect the navigation unit 16P and the audio unit 20P connectors.
5. Check for continuity between body ground and navigation unit connector B (16P) terminals No. 1, No. 3, No. 9, and No. 10 individually.

NAVIGATION UNIT CONNECTOR B (20P)



Wire side of female terminals

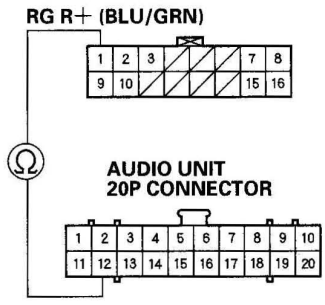
Is there continuity?

YES—If terminal No. 3 has continuity to ground, repair the short to body ground in the MUTE wire. If terminal No. 1, No. 9 or No. 10 have continuity to ground, replace the affected shielded harness.■

NO—Go to step 6.

6. Check for continuity between navigation unit connector B (16P) terminal No. 1 and the audio unit 20P connector terminal No. 12.

NAVIGATION UNIT CONNECTOR B (16P)



Wire side of female terminals

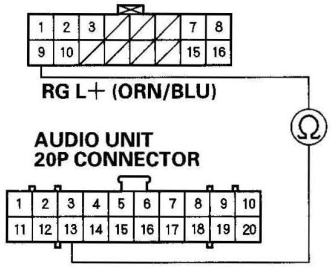
Is there continuity?

YES—Go to step 7.

NO—There is an open in the circuit between the navigation unit and the audio unit. Replace the affected shielded harness.■

7. Check for continuity between navigation unit connector B (16P) terminal No. 9 and the audio unit 20P connector terminal No. 13.

NAVIGATION UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there continuity?

YES—Go to step 8.

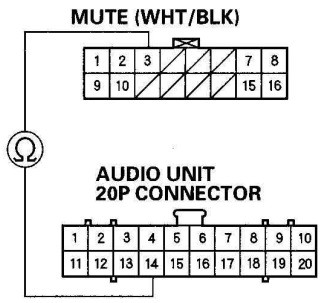
NO—There is as open in the circuit between the navigation unit and the audio unit. Replace the affected shielded harness.■

BACK

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8. Check for continuity between navigation unit connector B (16P) terminal No. 3 and the audio unit 20P connector terminal No. 14.

NAVIGATION UNIT CONNECTOR B (16P)



Wire side of female terminals

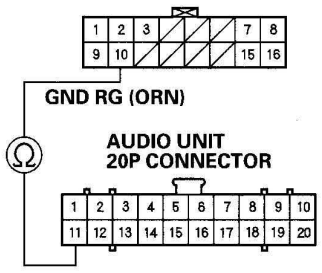
Is there continuity?

YES – Go to step 9.

NO – Repair open in the wire between the navigation unit and the audio unit. ■

9. Check for continuity between navigation unit connector B (16P) terminal No. 10 and the audio unit 20P connector terminal No. 11.

NAVIGATION UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there continuity?

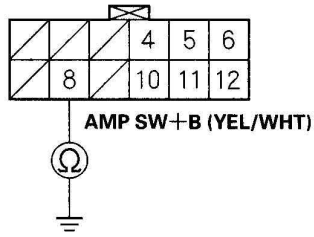
YES – For vehicles with touring package, go to step 10. For vehicles without touring package, go to step 14.

NO – There is an open in the circuit between the navigation unit and the audio unit. Replace the affected shielded harness. ■

10. Disconnect the navigation unit 12P and the front amplifier unit 26P connector.

11. Check for continuity between body ground and navigation unit connector A (12P) terminal No. 8.

NAVIGATION UNIT CONNECTOR A (12P)



Wire side of female terminals

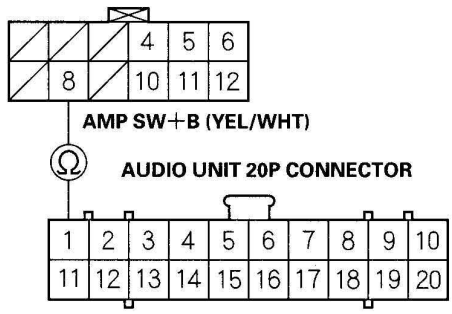
Is there continuity?

YES – Repair short to body ground in the wire between the navigation unit, the audio unit, and the front amplifier unit. ■

NO – Go to step 12.

12. Check for continuity between navigation unit connector A (12P) terminal No. 8 and the audio unit 20P connector terminal No. 1.

NAVIGATION UNIT CONNECTOR A (12P)



Wire side of female terminals

Is there continuity?

YES – Go to step 13.

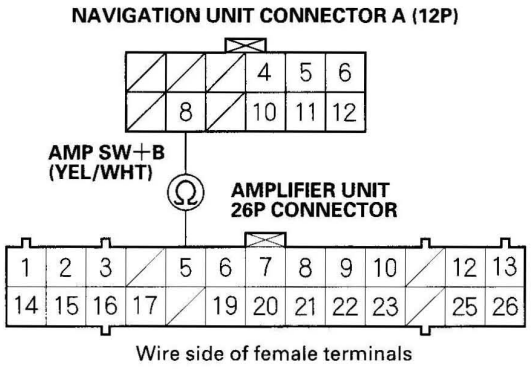
NO – Repair open in the wire between the navigation unit and the audio unit. ■

(cont'd)

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Symptom Troubleshooting (cont'd)

13. Check for continuity between navigation unit connector A (12P) terminal No. 8 and the amplifier unit 26P connector terminal No. 5.



Is there continuity?

YES—Go to step 14.

NO—Repair open in the wire between the navigation unit and the amplifier unit.■

14. Substitute a known-good audio unit and recheck.

Is the system OK?

YES—Replace the audio unit (see page 22-157).■

NO—For vehicles with touring package, go to step 15. For vehicles without touring package, replace the navigation unit (see page 22-353).■

15. Substitute a known-good amplifier unit and recheck.

Is the system OK?

YES—Replace the amplifier unit (see page 22-158).■

NO—Replace the navigation unit (see page 22-353).■

BACK

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Vehicle position does not move on the map

1. Test drive the vehicle.

   Does the speedometer operate correctly?

   YES – Go to step 2.

   NO – Do the vehicle speed signal circuit troubleshooting (see page 22-84). ■

2. Stop the vehicle with the engine running.
3. Perform the Car Status Test in the Picture Diagnosis Test menu (see page 22-346).

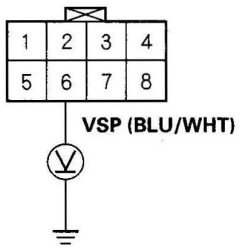
   Is the VSP indicator ON when the vehicle is moving?

   YES – Replace the navigation unit (see page 22-353). ■

   NO – Go to step 4.

4. Turn the ignition switch OFF.
5. Raise the vehicle, and make sure it is securely supported.
6. Disconnect the navigation unit connector C (8P).
7. Check for a loose No.6 terminal at navigation unit connector C (8P).
8. Reconnect navigation unit connector C (8P).
9. Turn the ignition switch ON (II) and shift into neutral.
10. Connect a voltmeter to body ground and back probe navigation unit connector C (8P) terminal No. 6.

NAVIGATION UNIT CONNECTOR C (8P)



Wire side of female terminals

11. Slowly rotate one wheel with the other wheel blocked.

    Does voltage pulse from 0 V to about 5 V or more?

    YES – Replace the navigation unit (see page 22-353). ■

    NO – Repair open or short in the wire between the PCM and the navigation unit. ■

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Symptom Troubleshooting (cont'd)

Present fuel economy meter is MAX level when the vehicle speed is more than 0 mph (0 Km/h)

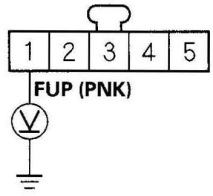
1. Check that navigation unit connector D (5P) is connected to the navigation unit.
2. Start the vehicle and push "OK" on the disclaimer screen.
3. Do the Start-up procedure in the Picture Diagnosis Test (see page 22-346), then select Trip Diag.

   Is the FUP Count 5—6 at cold idle and 2—3 at warm idle?

   YES—Replace the navigation unit (see page 22-353).■

   NO—Go to step 4.
4. Turn the ignition switch OFF.
5. Disconnect PCM connector A (32P) and navigation unit connector D (5P).
6. Turn the ignition switch ON (II).
7. Measure the voltage between navigation unit connector D (5P) terminal No. 1 and body ground.

NAVIGATION UNIT CONNECTOR D (5P)



Wire side of female terminals

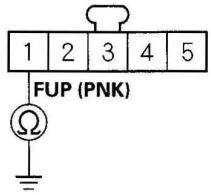
Is there voltage?

YES—Repair short to power in the wire between the navigation unit and the PCM.■

NO—Go to step 8.

8. Turn the ignition switch OFF.
9. Check for continuity between navigation unit connector D (5P) terminal No. 1 and body ground.

NAVIGATION UNIT CONNECTOR D (5P)



Wire side of female terminals

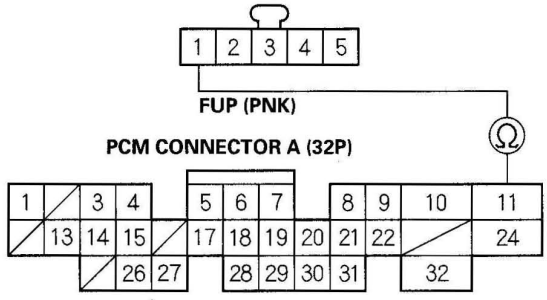
Is there continuity?

YES—Repair short to body ground in the wire between the navigation unit and PCM.■

NO—Go to step 10.

10. Check for continuity between navigation unit connector D (5P) terminal No. 1 and PCM connector A (32P) terminal No. 11.

NAVIGATION UNIT CONNECTOR D (5P)



Wire side of female terminals

Is there continuity?

YES—Go to step 11.

NO—Repair open in the wire between the navigation unit and the PCM.■

BACK

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11. Substitute a known-good navigation unit and recheck.

Is the system OK?

YES—Replace the navigation unit (see page 22-353). ■

NO—Replace the PCM (see page 11-4). ■

Range shows"———"

NOTE: Check for loose terminals.

1. Check that navigation unit connector D (5P) is connected to the navigation unit.
2. Start the vehicle and push "OK" on the disclaimer screen.
3. Do the Start-up procedure in the Picture Diagnosis Test (see page 22-346), then select Trip Diag.

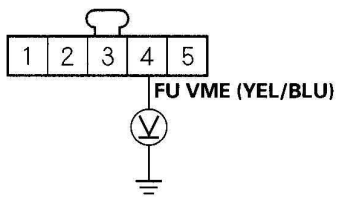
Is the Fuel Vref A/D between 745—1000, and is the Fuel Vmeas A/D between 80—580?

YES—Replace the navigation unit (see page 22-353). ■

NO—Go to step 4.

4. Turn the ignition switch OFF.
5. Disconnect gauge assembly connector A (30P) and navigation unit connector D (5P).
6. Turn the ignition switch ON (II).
7. Measure the voltage between navigation unit connector D (5P) terminal No. 4 and body ground.

NAVIGATION UNIT CONNECTOR D (5P)



Wire side of female terminals

Is there voltage?

YES—Repair short to power in the wire between the navigation unit and the gauge assembly. ■

NO—Go to step 8.

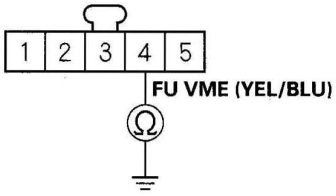
(cont'd)

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Symptom Troubleshooting (cont'd)

8. Turn the ignition switch OFF.
9. Check for continuity between navigation unit connector D (5P) terminal No. 4 and body ground.

NAVIGATION UNIT CONNECTOR D (5P)



Wire side of female terminals

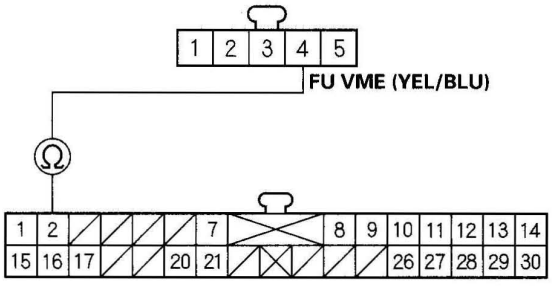
Is there continuity?

YES — Repair short to body ground in the wire between the navigation unit and the gauge assembly. ■

NO — Go to step 10.

10. Check for continuity between navigation unit connector D (5P) terminal No. 4 and gauge assembly connector A (30P) terminal No. 2.

NAVIGATION UNIT CONNECTOR D (5P)



Wire side of female terminals

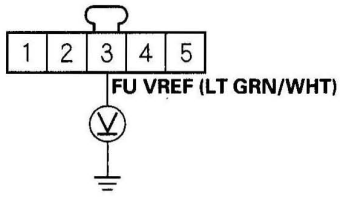
Is there continuity?

YES — Go to step 11.

NO — Repair open in the wire between the navigation unit and the gauge assembly. ■

11. Disconnect gauge assembly connector C (14P).
12. Turn the ignition switch ON (II).
13. Measure the voltage between navigation unit connector D (5P) terminal No. 3 and body ground.

NAVIGATION UNIT CONNECTOR D (5P)



Wire side of female terminals

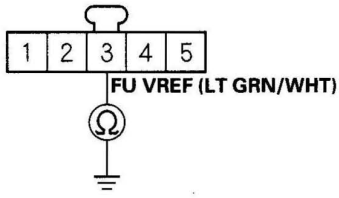
Is there voltage?

YES — Repair short to power in the wire between the navigation unit and gauge assembly. ■

NO — Go to step 14.

14. Turn the ignition switch OFF.
15. Check for continuity between navigation unit connector D (5P) terminal No. 3 and body ground.

NAVIGATION UNIT CONNECTOR D (5P)



Wire side of female terminals

Is there continuity?

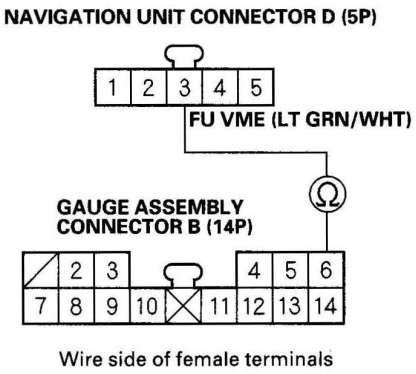
YES — Repair short to body ground in the wire between the navigation unit and the gauge assembly. ■

NO — Go to step 16.

BACK

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16. Check for continuity between navigation unit connector D (5P) terminal No. 3 and gauge assembly connector B (14P) terminal No. 6.



Wire side of female terminals

Is there continuity?

YES – Go to step 17.

NO – Repair open in the wire between the navigation unit and the gauge assembly. ■

17. Substitute a known-good navigation unit and recheck.

Does the system work properly?

YES – Replace the navigation unit (see page 22-353). ■

NO – Replace the gauge assembly (see page 22-80). ■

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System Diagnosis Test

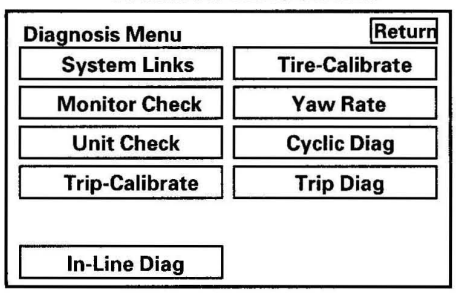
Start-up procedure and Diagnosis Menu

1. Turn the ignition switch ON (II), press "OK" on the disclaimer screen, then press and hold the keys in this order: (1) MENU Key. (2) MAP/GUIDE Key, (3) CANCEL Key, and keep them pressed simultaneously for 5 seconds.

2. After the display changes to the diagnosis menu screen, touch the item you want to check, and the check will start. To return to the previous screen, touch the "RETURN" switch on the diagnosis screen.

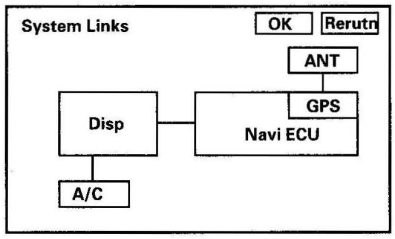
   - System Links.
   - Tire Calibrate.
   - Monitor Check.
   - Yaw Rate.
   - Unit Check.
   - Cyclic Diag.
   - Trip-Calibrate.
   - Trip Diag.
   - In-line Diag.

DIAGNOSIS MENU SCREEN



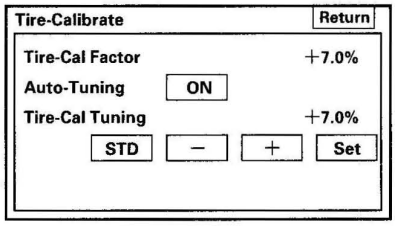
System Links

- During diagnosis, all of the communication lines connecting the components are shown in yellow.
- If the system is OK, all of the communication lines connecting the components will change to green, the screen will indicate "OK", and a tone will sound.
- If there is a problem in the system, the faulty communication line will change to red, the screen will indicate "NG", and a tone will sound.
- The indication on the screen will not change until the ignition switch is cycled. After repairing the system, turn the ignition switch OFF to reset the system, then return to the Diagnosis Menu screen, and run system Links again.



Tire Calibrate

- The "AUTO TUNING" is factory-set to "ON", and it should remain on. If you find it has been turned OFF, turn it back ON.
- The "TIRE-CAL TUNING" should not be used. The AUTO TUNING function keeps the system in better tune.



BACK

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Yaw Rate

"Offset" is a reference voltage or standard within the yaw rate sensor. It should indicate 1.500 to 3.500 V with the vehicle stopped.

"Sensor" indicates the voltage output from the yaw rate sensor. It should indicate 1.500 to 3.500 V with the vehicle stopped.

A "Sensor" output voltage HIGHER than that of the "Offset" voltage indicates the vehicle is turning to the RIGHT.

A "Sensor" output voltage LOWER than that of the "Offset" voltage indicates the vehicle is turning to the LEFT.

With the vehicle stopped, sitting still, with the engine idling both the "Offset" and "Sensor" voltages should be within 0.01 V ± of each other.

If not replace the Navigation unit.

Example:

NOTE: The vehicle is stopped, sitting still, with the engine idling.

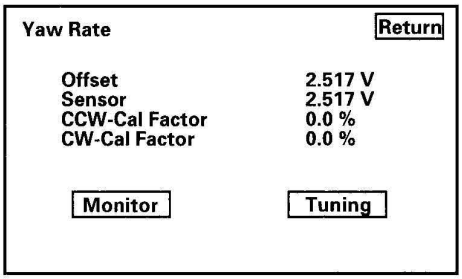
Good

Offset	**2.517 V**
Sensor	**2.517 V (0.010 V ±)**

Bad

Offset	**2.517 V**
Sensor	**2.823 V**

NOTE: Do not try to tune the yaw rate sensor unless instructed by American Honda.



Cyclic Diag

This test, checks the following items repeatedly:

- Navigation unit check
- Monitor check (except switch test)

To exit this test, press the CANCEL key

In—Line Diag

This test, checks the following items:

- System links
- Car status
- Yaw rate

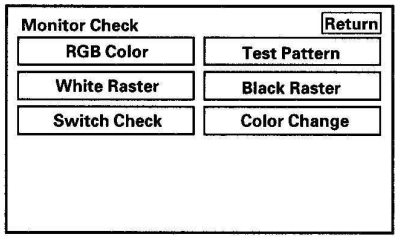
(cont'd)

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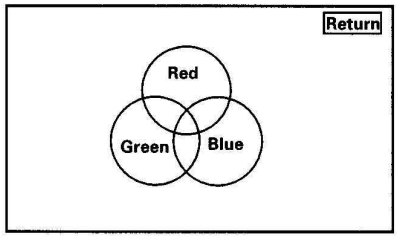
System Diagnosis Test (cont'd)

Monitor Check

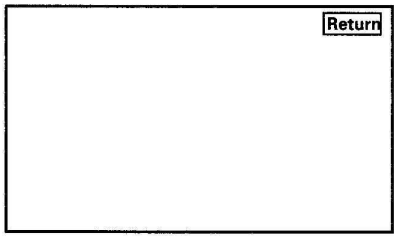
Touch the item you want to check, and the check starts.



RGB COLOR
The three primary colors of red, green and blue must be shown.
If any color(s) are missing, troubleshoot for the missing color (see page 22-335).

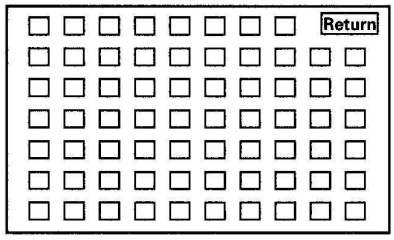


WHITE RASTER
The entire display must be shown in white.

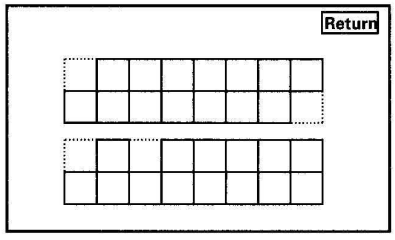


Switch Check
Each switch must be shown on the display and each switch must reverse and sound, when touched.

NOTE: The test may be affected if done in direct sunlight.



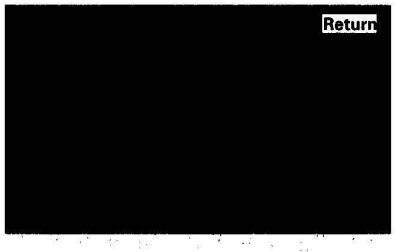
Test Pattern
All 32 colors including black must be indicated (including the back ground color).



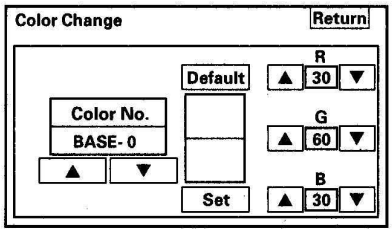
BACK

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Black Raster
The entire display must be shown in black.

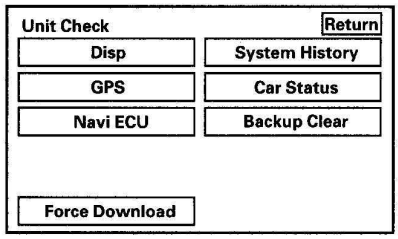


Color Change
This screen is for the manufacturer's use only.



Unit Check

Touch the item you want to check, and the check starts.

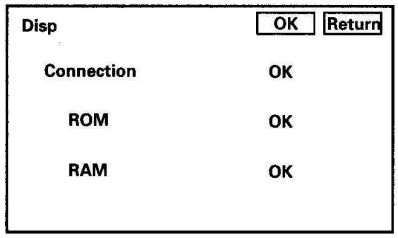


NOTE: Do not use "Force Download", This command is for the manufacturer's use only.

Disp

When the connection is NG.
First check for loose terminals at the navigation unit and the display unit connectors.
Next check for an open or short in the communication line between the navigation unit and the display unit. If the line is OK, replace the display unit. If the line is found to have an open or short, replace the affected shielded harness.

When the ROM or RAM is NG.
Replace the display unit.



(cont'd)

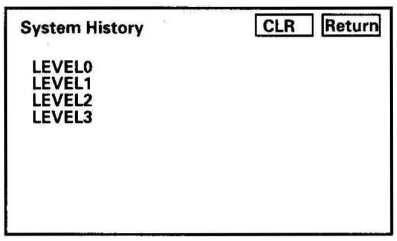
Protected by AR

System Diagnosis Test (cont'd)

System History

This screen is for the manufacturer's use only.

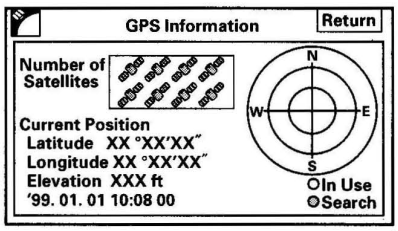
NOTE: Do not touch the CLR switch. Touching CLR will clear the system history.



GPS Information

This screen shows the condition of the GPS reception and the vehicle position.

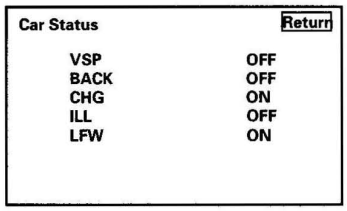
The vehicle should be parked out side away from building, tall trees, high tension lines for 10 minutes with motor running.
The number of satellites box should contain at least three yellow sateilite icons. If not, troubleshoot for satellite mark not indicated (see page 22-337).



Car Status

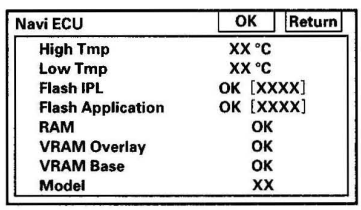
Use the car status screen to check each signal.
If the indication does not match the actual vehicle status, check the applicable signal line.

- VSP (vehicle speed pulse indication)
  - OFF when vehicle is not moving
  - ON when vehicle is moving
- BACK (reverse indication)
  - OFF when shift lever is in any position other than reverse
  - ON when shift lever is in reverse
- CHG (charging indication)
  - ON when engine is running and alternator is charging
  - OFF when engine is off or alternator is not charging
- ILL (illumination indication)
  - OFF when parking lights or headlights are off
  - ON when parking lights or headlights are on
- LFW (low fuel warning indication)
  - OFF when low fuel indicator is off
  - ON when low fuel indicator is on



Navi ECU

When any item is NG, replace the navigation unit.

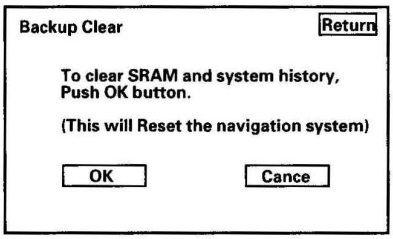


BACK

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Back-up Clear

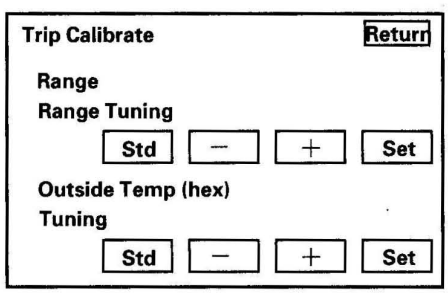
This screen is for manufacture's use only.



Trip Calibrate

- Range Tuning
  When the tripmeter range display reads "0", and the range tuning is at the factory setting (STD), the vehicle will have enough fuel to travel approximately 20 miles. Touch "+" or "−" calibrate the range tuning.
- Outside Temp (hex)
  Touch "+" or "−" to calibrate the outside temperature display.

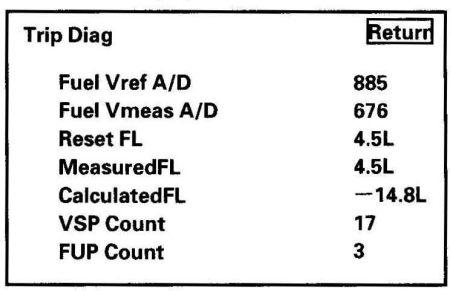
NOTE: Setting the range offset too low (+ 10) could result in the vehicle running out of fuel before the display reads "0". Make changes slowly when changing the calibration.



Trip Diag

NOTE: The engine must be runnig to use the trip diag screen for troubleshooting.

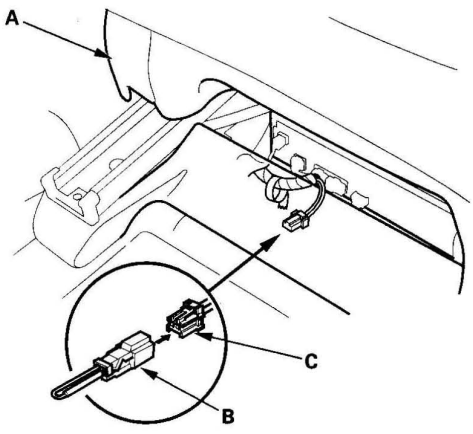
- Fuel Vref A/D
  Correct value: 745−1000
- Fuel Vmeas A/D
  Correct value: 80−580
- Reset FL
  Not used: Valve will vary for AHM use.
- Measured FL
  Not used: Valve will vary for AHM use.
- Calculated FL
  Not used: Valve will vary for AHM use.
- VSP Count
  Correct value:
  When the vehicle is stopped: 0
  When the vehicle speed is 30 mph (48 Km/h): 34
  When the vehicle speed is 60 mph (96 Km/h): 68
- FUP Count
  Correct value:
  When cold idling: 5−6
  When warm idling: 2−3



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Forced Starting of Display

1. Slide the passenger's seat (A) forward.

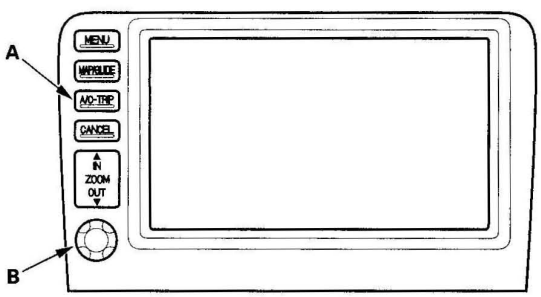


2. Connect the SCS service connector (B) to the navigation service check connector (C) located behind the navigation unit.

3. Check that the diagnosis menu for the picture diagnosis start 5 up, and then changes to the system link menu.

4. If the display does not turn on, turn the ignition switch OFF, press and hold the A/C -TRIP button (A), press and hold the joystick (B) up, then turn ignition switch to ACC (I).

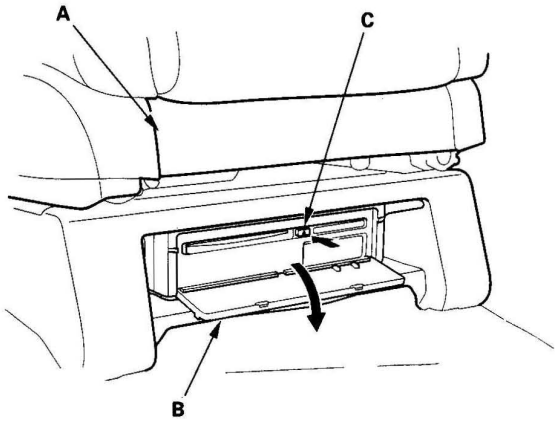
   NOTE: If the display fails to light or the system link screen is not displayed, refer to No picture is shown on the display (see page 22-334).



DVD-ROM Replacement

NOTE: When the DVD-ROM is re-inserted or replaced, a map match must be done (see page 22-317).

1. Slide the passenger's seat (A) to the rear.



2. Turn the ignition switch ON (II).

3. Open the front cover (B) of the navigation unit.

4. Press the EJECT button (C).

5. Remove the DVD-ROM.

6. Insert the new DVD-ROM.

7. Close the front cover.
   - Do not turn the ignition switch OFF, until data is down loaded to navigation unit.

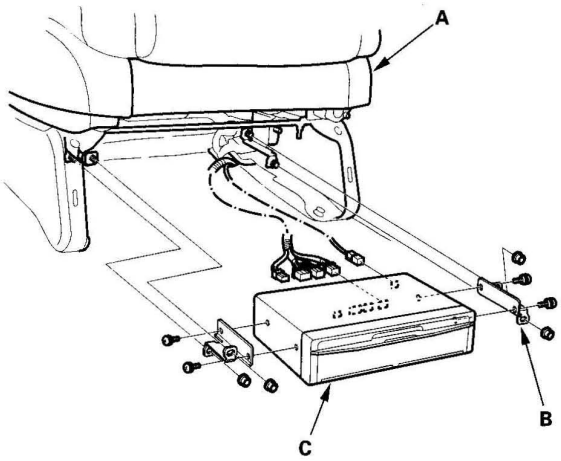
   NOTE: After servicing, the front cover must be closed. If you start up the navigation system with the front cover open, the display will indicate. "Navigation unit door is open or No DVD Disk installed. Please check system".

BACK

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Navigation Unit Removal/Installation

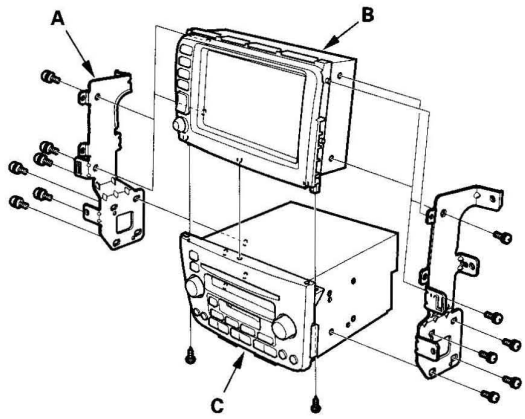
1. Slide the passenger's seat (A) to the rear.



2. Remove the navigation unit bracket (B) from the passenger's seat.
3. Remove the bracket from the navigation unit (C).
4. Install the parts in the reverse order of removal.

Display Unit Removal/Installation

1. Remove the center panel (see page 20-68).
2. Remove the display unit/audio unit (see page 22-157).
3. Remove the bracket (A), then remove the display unit (B) from the audio unit (C).

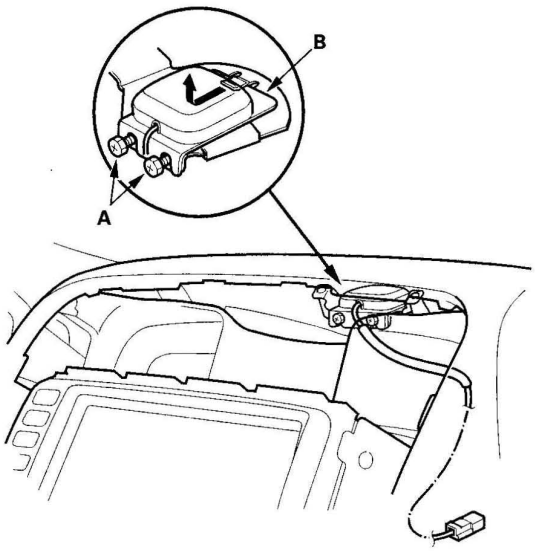


4. Install the parts in the reverse order of removal.

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GPS Antenna Removal/Installation

1. Remove the center panel (see page 20-68).
2. Loosen the two screw-bolts (A).



3. Pull and pry up the GPS antenna (B), then remove the GPS antenna.
4. Install the parts in the reverse order of removal.

Clock Display Size and Location Adjustment

1. Tum the ignition switch ON (II).
2. When the disclaimer is shown on the navigation display unit, touch "OK."
3. When the "Enter destination by:" screen is shown, touch "Setup."
4. When the "Setup Screen" is shown, touch Display "Off."
5. Touch the numbers of the clock to change the clock size and location.
   - If the clock is small and in the lower right hand corner of the screen, if will increase in size and move to the center of the screen.
   - If the clock is large and in the center of the screen, it will decrease in size and move to the lower right hand comer of the screen.
6. Push the MENU button to return to the "Enter destination by:" screen. The clock display settings will be saved.

BACK

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Restraints

Restraints

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Inspection 23-12
Third Row Child Seat Tether Anchor Replacement 23-13

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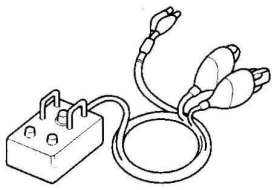


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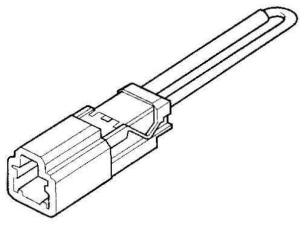
Special Tools

Ref.No.	Tool Number	Description	Qty
①*1	07HAZ-SG00500	Deployment Tool	1
②	07PAZ-0010100	SCS Service Connector	1
③	07SAZ-TB4011A	SRS Inflator Simulator	1
④	07TAZ-SZ5011A	SRS Simulator Lead C	1
⑤*2	07TAZ-001020A	Backprobe Adapter, 17 mm	2
⑥	07XAZ-S1A0200	SRS Simulator Lead E	1
⑦	07XAZ-SZ30100	SRS Simulator Lead F	1
⑧	07YAZ-S3AA100	SRS Simulator Lead H	1

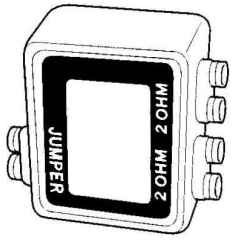
*1: Included in SRS Tool Set 07MAZ-SM5000B
*2: Use with the stacking patch cords from T/N 07SAZ-001000A, Backprobe Set.



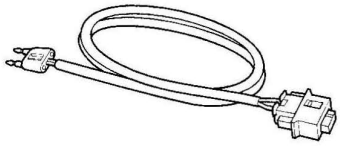
①



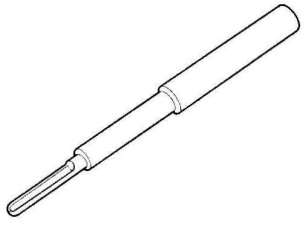
②



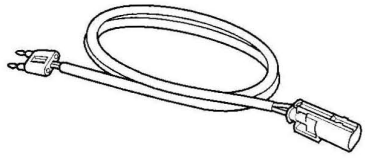
③



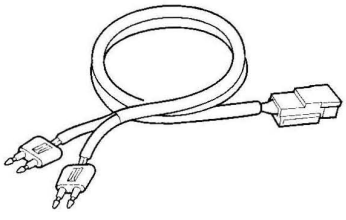
④



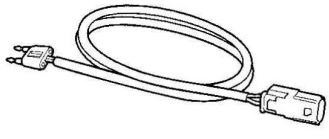
⑤



⑥



⑦

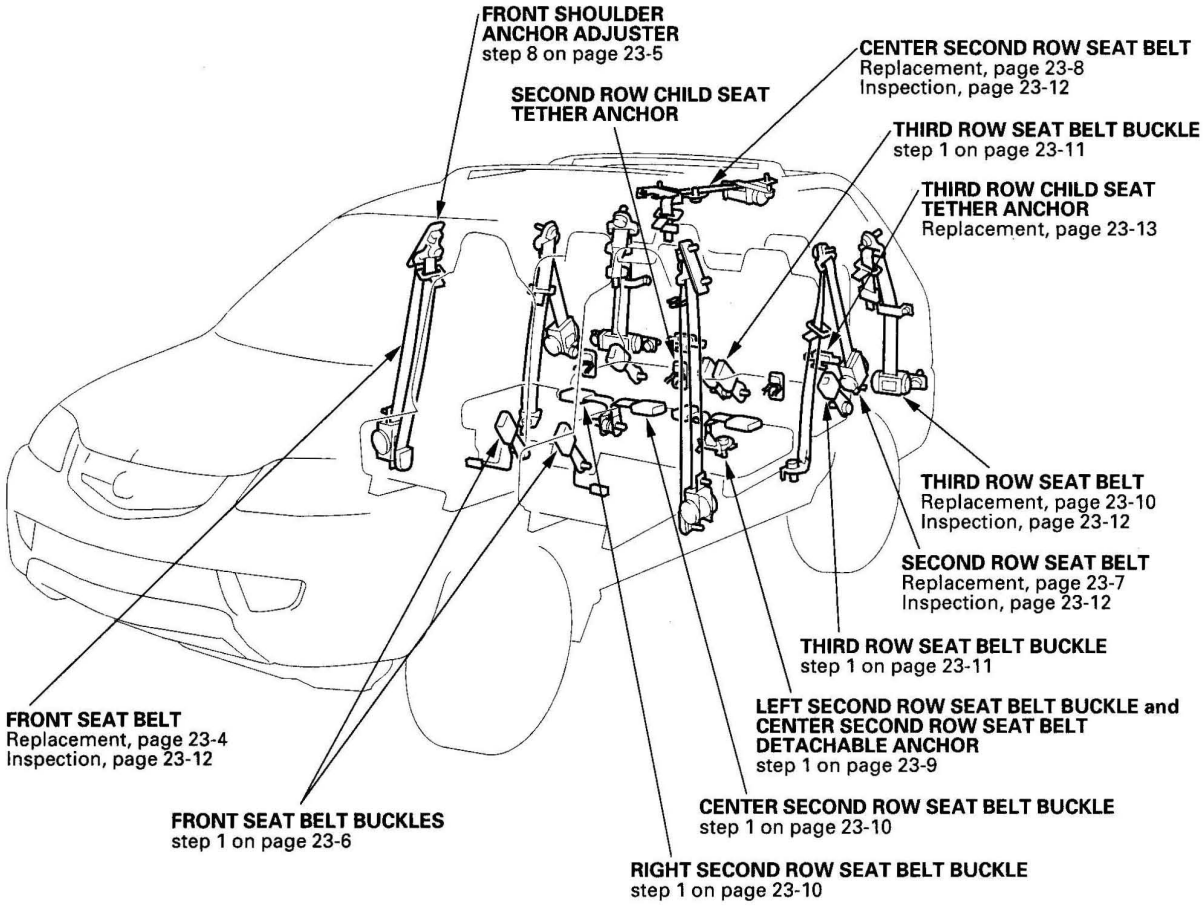


⑧

BACK

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Component Location Index



BACK

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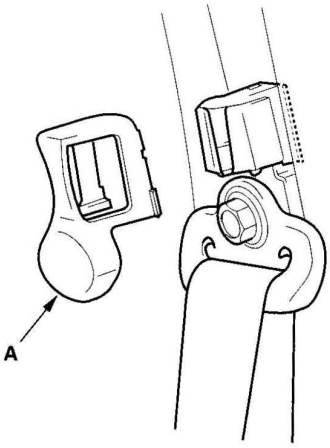
Front Seat Belt Replacement

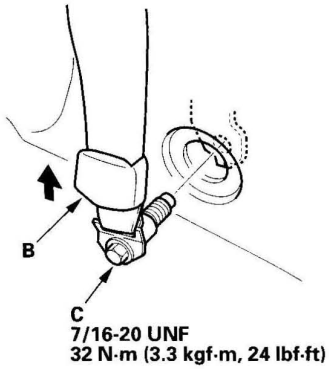
SRS components are located in this area. Review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before preforming repairs or service.

NOTE: Check the front seat belts for damage, and replace them if necessary. Be careful not to damage them during removal and installation.

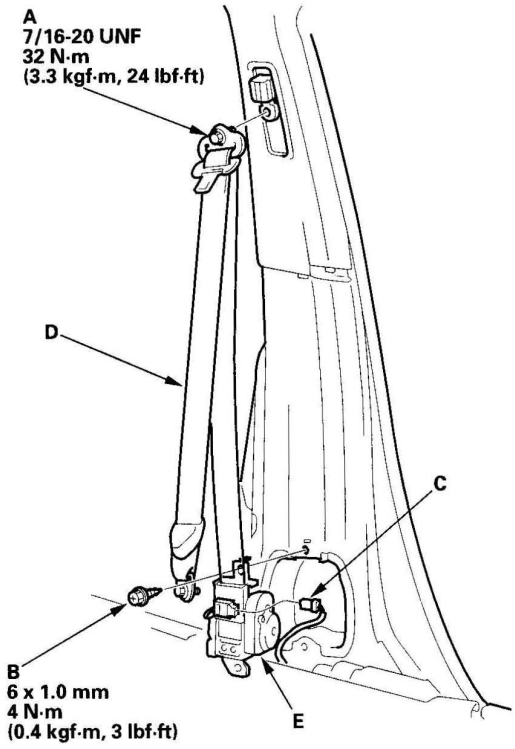
Front Seat Belt

1. Make sure you have the anti-theft code for the radio and the navigation system, then write down the frequencies for the preset buttons.
2. Slide the front seat forward fully.
3. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
4. Remove the upper anchor cover (A), pull the lower anchor cover (B) back, and remove the lower anchor bolt (C).





5. Remove the B-pillar lower trim panel (see page 20-55).
6. Remove the upper anchor bolt (A) and the retractor mounting ET screw (B). Disconnect the seat belt tensioner connector (C), and remove the front seat belt (D) and retractor (E).

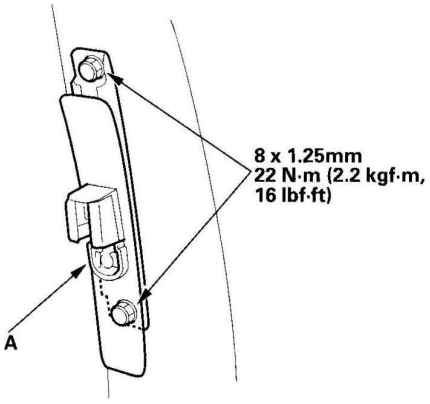


BACK

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7. Remove the B-pillar upper trim (see page 20-55).

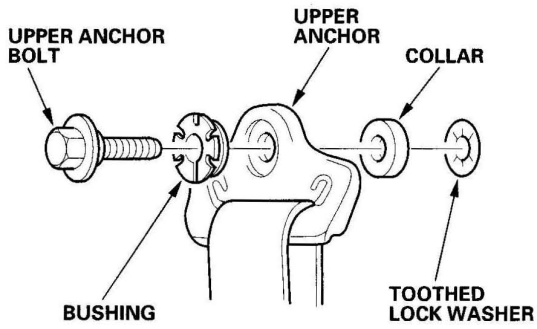
8. Remove the shoulder anchor adjuster (A).



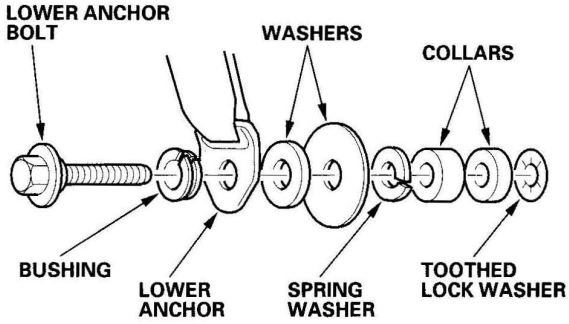
9. Install the front seat belt and retractor in the reverse order of removal, and note these items:

- Apply liquid thread lock to the upper anchor bolt before reinstallation.
- Check that the retractor locking mechanism functions (see page 23-12).
- Assemble the washers, collar and bushing on the upper and lower anchor bolts as shown.
- Before installing the anchor bolts, make sure there are no twists or kinks in the front seat belt.
- Make sure the seat belt tensioner connector is plugged in properly.
- Reconnect the negative cable to the battery.
- Enter the anti-theft code for the radio and for the navigation system, then enter the customer's radio station presets.

Upper anchor bolt construction:



Lower anchor bolt construction:



(cont'd)

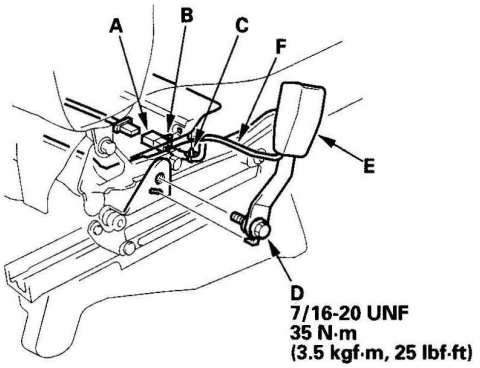
Protected by AR

Front Seat Belt Replacement (cont'd)

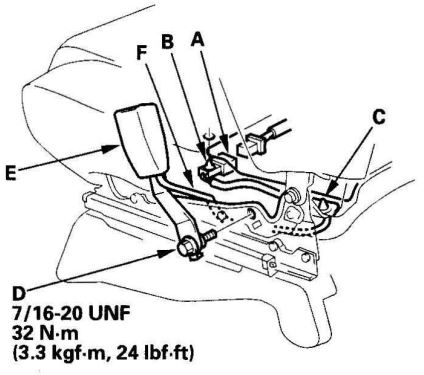
Seat Belt Buckle

1. Remove the front seat (see page 20-77).
2. Remove the center cover, driver's 8-way power seat (see page 20-79), passenger's 8-way power seat (see page 20-80) manual seat (see page 20-81).
3. Disconnect the seat belt switch connector (A), then detach the connector clip (B) and harness clip (C).

8-way power seat:

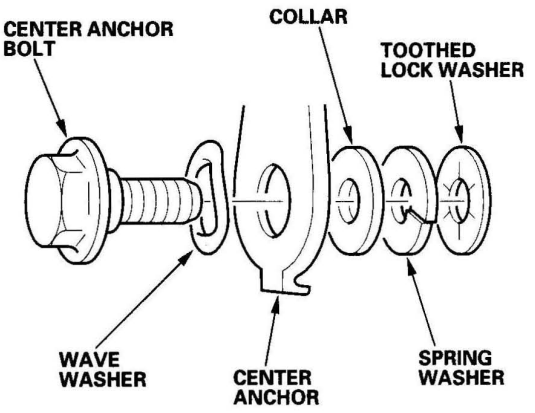


Manual seat:



4. Remove the center anchor bolt (D), and remove the seat belt buckle (E).
5. Remove the seat belt switch harness (F) from under the seat cushion.
6. Install the buckle in the reverse order of removal. Assemble the washers on the center anchor bolt as shown. Move the seat up and down to make sure the buckle harness is not pinched.

Center anchor bolt construction:



BACK

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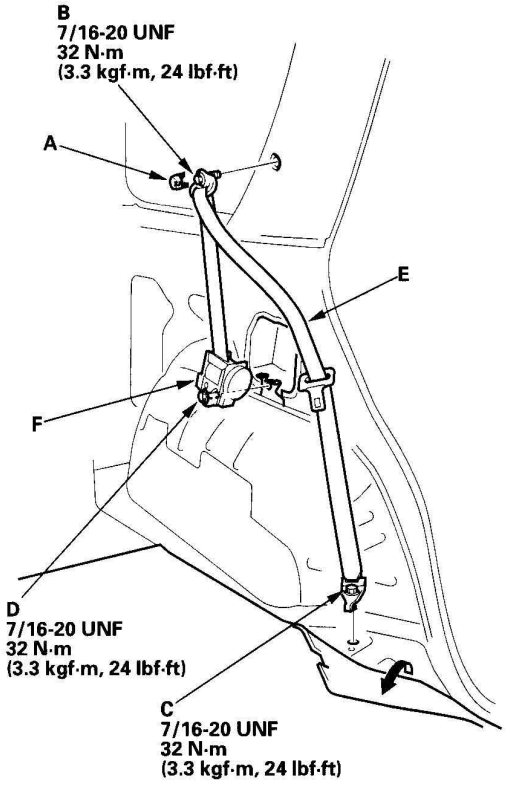
Second Row Seat Belt Replacement

NOTE: Check the second row seat belts for damage, and replace them if necessary. Be careful not to damage them during removal and installation.

Second Row Seat Belt

1. Remove the rear side trim panel (see page 20-57).

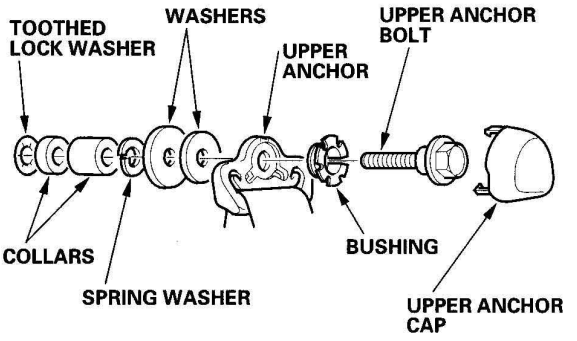
2. Remove the upper anchor cap (A), the upper anchor bolt (B), the lower anchor bolt (C), the retractor bolt (D), then remove the second row seat belt (E) and retractor (F).



3. Install the second row seat belt and retractor in the reverse order of removal, and note these items:

   - Apply liquid thread lock to the upper anchor bolt before reinstallation.
   - Check that the retractor locking mechanism functions (see page 23-12).
   - Assemble the washers, collar and bushing on the upper anchor bolt as shown.
   - Before installing the anchor bolts, make sure there are no twists or kinks in the second row seat belt.

Upper anchor bolt construction:



(cont'd)

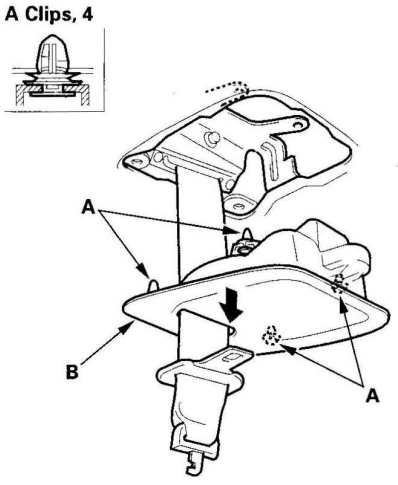
BACK

Protected by AR

Second Row Seat Belt Replacement (cont'd)

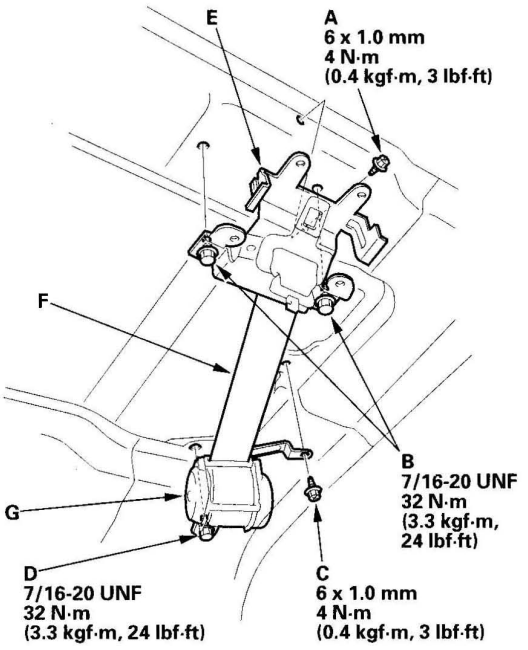
Center Second Row Seat Belt

1. Detach the clips (A) and remove the seat belt cover (B).



2. Remove the headliner (see page 20-59).

3. Remove the upper anchor mounting ET screw (A), the upper anchor bolts (B), the retractor mounting ET screw (C), the retractor bolt (D), then remove the upper anchor (E), center seat belt (F) and retractor (G).



4. Install the center second row seat belt and retractor in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - Check that the retractor locking mechanism functions (see page 23-12).
   - Before installing the upper anchor bolt, make sure there are no twists or kinks in the center seat belt.

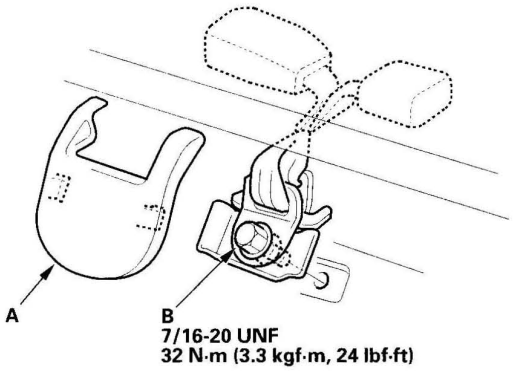
BACK

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Left Seat Belt Buckle and Center Seat Belt Detachable Anchor

NOTE: Take care not to tear the seams or damage the seat covers.

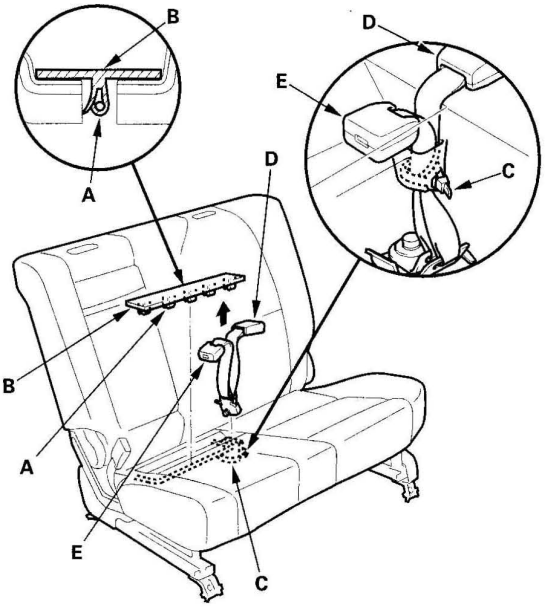
1. Remove the anchor cover (A) and center anchor bolt (B).



2. Remove the left second row seat (see page 20-86).

3. Remove the left seat belt buckle from the elastic strap.

4. Release the hooks (A), then remove the seat belt buckle pocket (B).



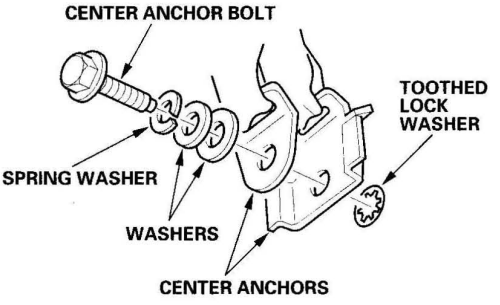
5. Cut the zip tie (C), and remove it from under the seat cushion.

6. Remove the left second row seat belt buckle (D) and center second row seat belt detatchable anchor (E) complete.

7. Install the buckle and the detachable anchor in the reverse order of removal, and note these items:

   - Replace the zip tie with a new one.
   - Assemble the washers on the center anchor bolt as shown.

Center anchor bolt construction:



(cont'd)

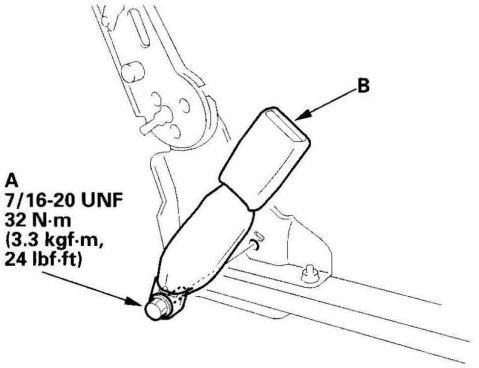
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Second Row Seat Belt Replacement (cont'd)

Center Seat Belt Buckle/Right Seat Belt Buckle

NOTE: The center seat belt buckle is shown, and the right seat belt buckle is symmetrical.

1. Remove the second row seat (see page 20-86).
2. Remove the buckle from the elastic strap.
3. Remove the pivot bolt cover, and using a Torx T30 bit, remove the pivot bolt from both sides, left second row seat on '01 model (see page 20-87), left second row seat on '02 model (see page 20-88), right second row seat on '01 model (see page 20-89), right second row seat on '02 model (see page 20-90).
4. Lift the seat cushion up, and remove the inner slide cover, left second row seat on '01 model (see page 20-87), left second row seat on '02 model (see page 20-88), right second row seat on '01 model (see page 20-89), right second row seat on '02 model (see page 20-90).
5. Remove the center anchor bolt (A), and remove the seat belt buckle (B).



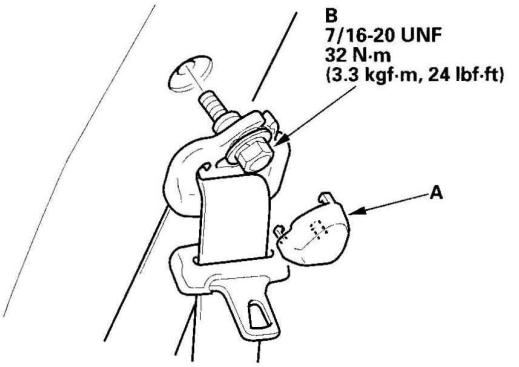
6. Install the buckle in the reverse order of removal.

Third Row Seat Belt Replacement

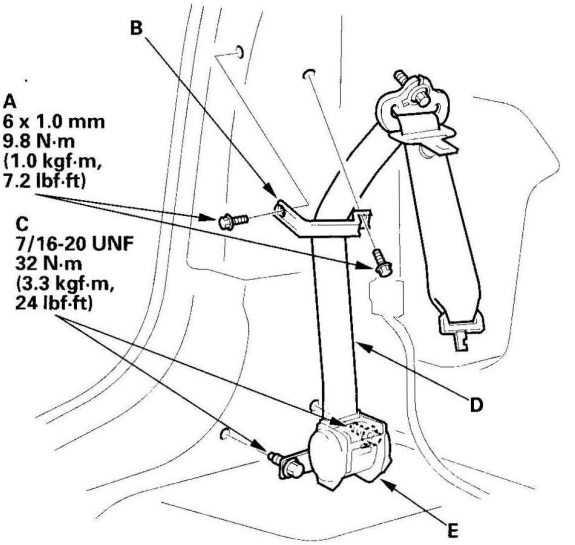
NOTE: Check the third row seat belts for damage, and replace them if necessary. Be careful not to damage them during removal and installation.

Third Row Seat Belt

1. Remove the upper anchor cap (A) and the upper anchor bolt (B).



2. Remove the rear side trim panel (see page 20-57).
3. Remove the bolts (A) and remove the seat belt guide (B).



4. Remove the retractor bolts (C), then remove the third row seat belt (D) and retractor (E).

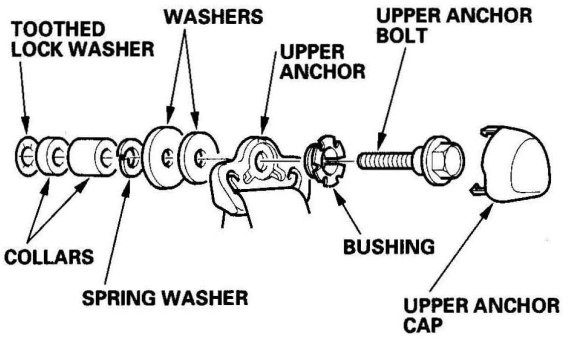
BACK

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5. Install the third row seat belt and retractor in the reverse order of removal, and note these items:

   - Apply liquid thread lock to the upper anchor bolt before reinstallation.
   - Check that the retractor locking mechanism functions (see page 23-12).
   - Assemble the washers, collar and bushing on the upper anchor bolt as shown.
   - Before installing the anchor bolts, make sure there are no twists or kinks in the third row seat belt.

Upper anchor bolt construction:

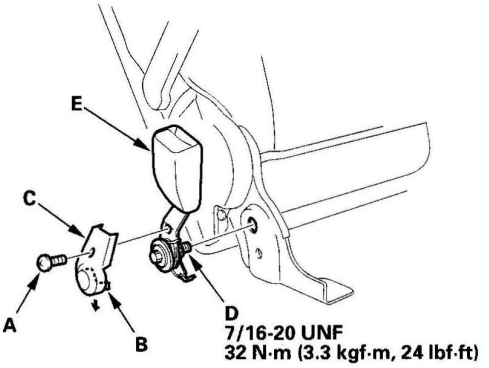


Seat Belt Buckle/Seat Belt Detachable Anchor

NOTE: The seat belt buckle is shown, and the seat belt detachable anchor is similar.

1. Remove the third row seat (see page 20-101).

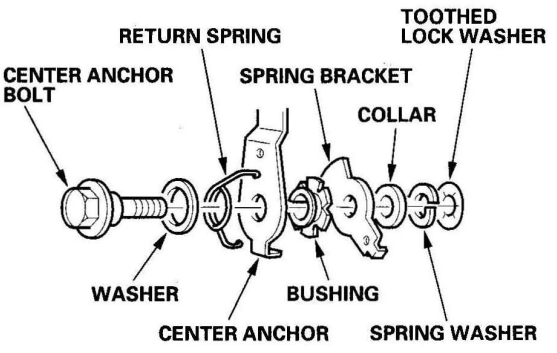
2. Remove the screw (A) and release the hook (B), then remove the bracket cover (C).



3. Remove the center anchor bolt (D), then remove the seat belt buckle (E).

4. Install the buckle in the reverse order of removal. Assemble the washers, spring, and bracket on the center anchor bolt as shown.

Center anchor bolt construction:



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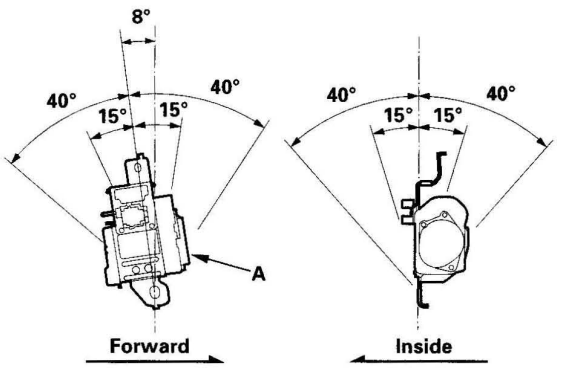
Inspection

For front seat belt retractor with seat belt tensioner, review the SRS component locations (see page 23-15), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

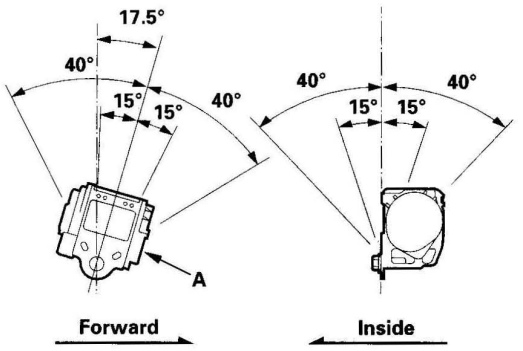
Retractor

1. Before installing the retractor, check that the seat belt can be pulled out freely.
2. Make sure that the seat belt does not lock when the retractor (A) is leaned slowly up to 15° from the mounted position. The seat belt should lock when the retractor is leaned over 40°. Do not attempt to disassemble the retractor.

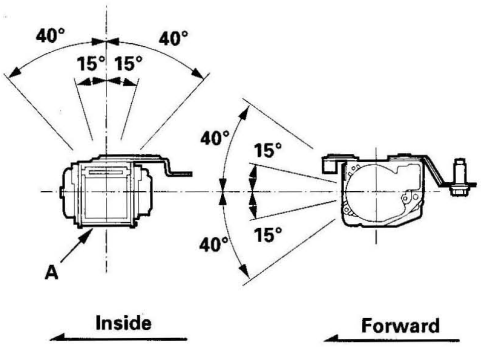
Front:



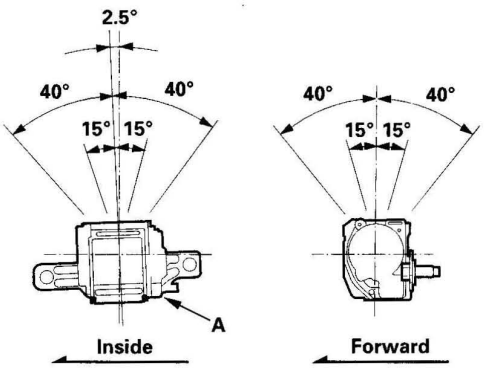
Second row:



Center second row:



Third row:



3. Replace the seat belt with a new assembly if there is any abnormality. Do not disassemble any part of the seat belt for any reason.

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In-vehicle

1. Check that the seat belt is not twisted or caught on anything.
2. After installing the anchors, check for free movement on the anchor bolts. If necessary, remove the anchor bolts and check that the washers and other parts are not damaged or improperly installed.
3. Check the seat belts for damage or discoloration. Clean with a shop towel if necessary. Use only soap and water to clean.

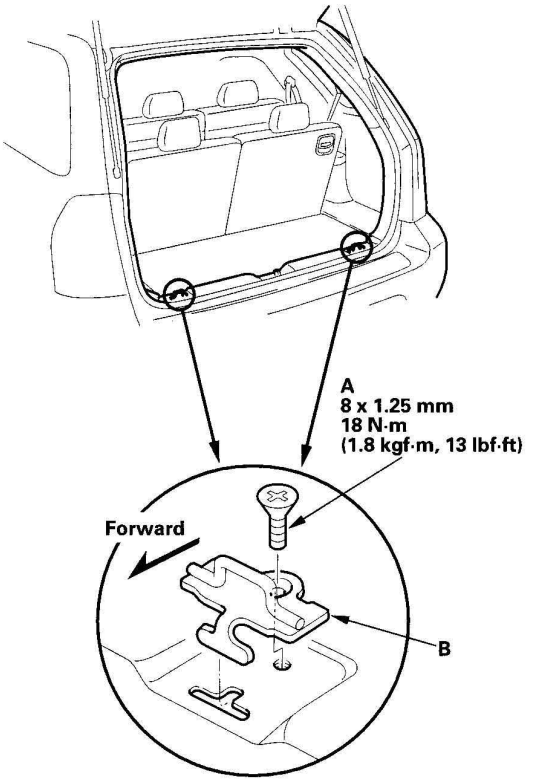
   NOTE: Dirt build-up in the metal loops of the upper anchors can cause the seat belts to retract slowly. Wipe the inside of the loops with a clean cloth dampened in isopropyl alcohol.
4. Check that the seat belt does not lock when pulled out slowly. The seat belt is designed to lock only during a sudden stop or impact.
5. Make sure that the seat belt will retract automatically when released.
6. For each passenger's seat belt, check the seat belt retractor locking mechanism ALR (automatic locking retractor). This function is for securing child seats.

   – 1 Pull the seat belt all the way out to engage the ALR. The seat belt should retract with a ratcheting sound, but not extend. This is normal.

   – 2 To disengage the ALR, release the seat belt and allow it to fully retract, then pull the seat belt out part-way. The seat belt should retract and extend normally.
7. Replace the seat belt with a new assembly if there is any abnormality. Do not disassemble any part of the seat belt for any reason.

Third Row Child Seat Tether Anchor Replacement

1. Remove the rear trim panel (see page 20-57).
2. Remove the screw (A) and remove the third row child seat tether anchor (B).



3. Install the anchor in the reverse order of removal.

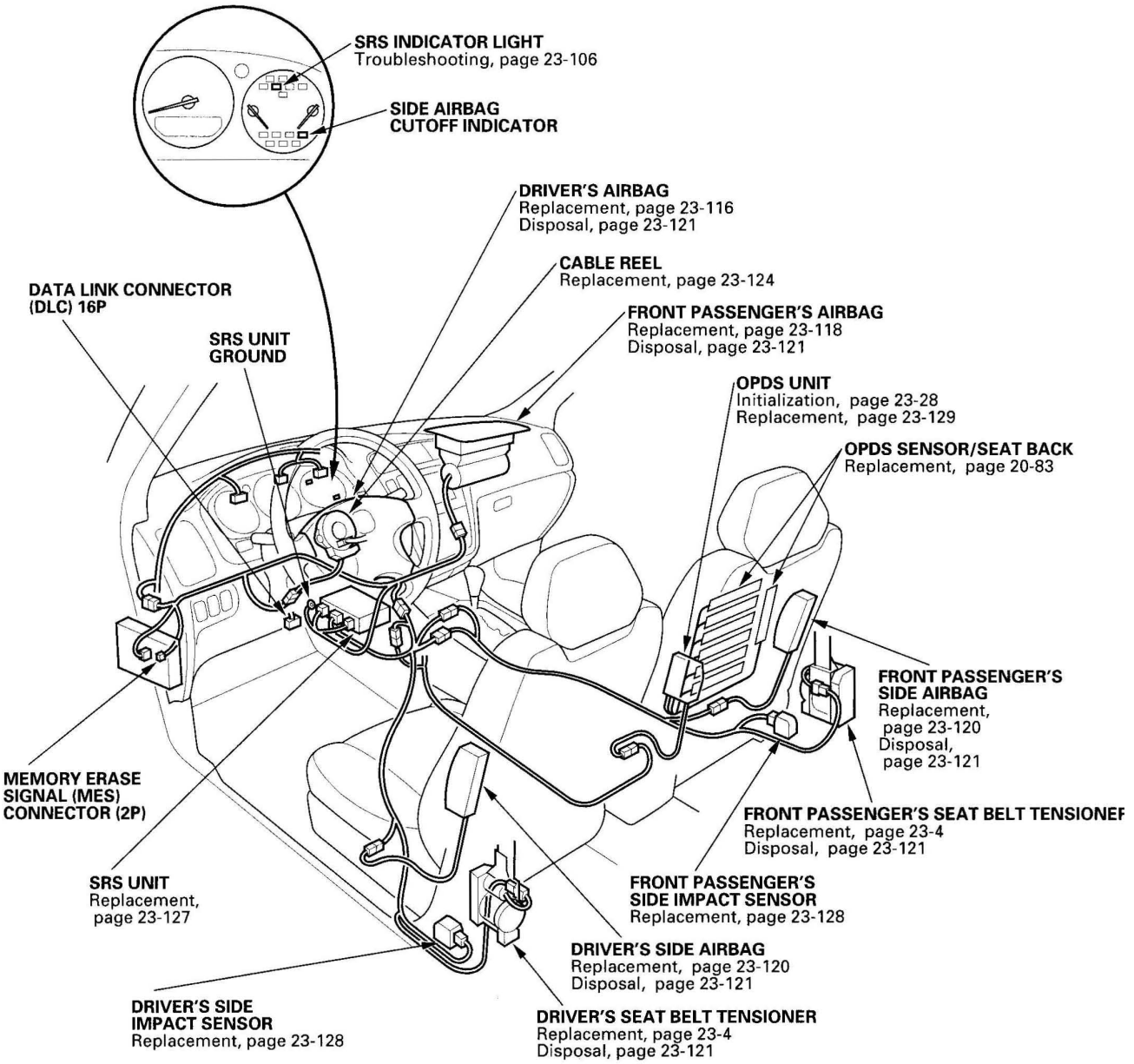
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Component Location Index



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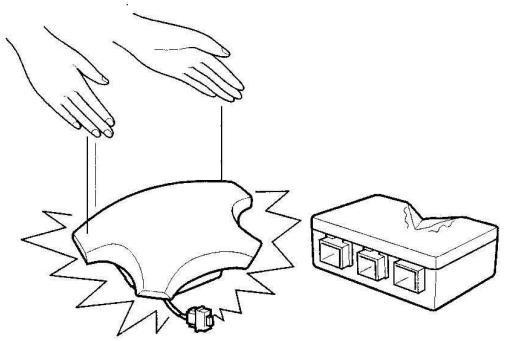
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Precautions and Procedures

General Precautions

Please read the following precautions carefully before performing airbag system service. Observe the instructions described in this manual, or the airbags could accidentally deploy and cause damage or injuries.

- Except when performing electrical inspections, always turn the ignition switch OFF, disconnect the negative cable from the battery, and wait at least 3 minutes before beginning work.
  NOTE: The memory is not erased even if the ignition switch is turned OFF or the battery cables are disconnected from the battery.
- Use replacement parts which are manufactured to the same standards and quality as the original parts. Do not install used SRS parts from another vehicle. Use only new parts when making SRS repairs.
- Carefully inspect any SRS part before you install it. Do not install any part that shows signs of being dropped or improperly handled, such as dents, cracks, or deformation.



- Before removing any SRS parts (including the disconnection of connectors), always disconnect the SRS connector.
- Use only a digital multimeter to check the system. If it is not a Honda multimeter, make sure its output is 10 mA (0.01A) or less when switched to the lowest value in the ohmmeter range. A tester with a higher output could cause accidental deployment and possible injury.
- Do not put objects on the front passenger's airbag.
- The original radio and navigation system have coded theft protection circuits. Be sure to get the customer's radio and navigation system codes, and write down the frequencies for the radio's preset stations before disconnecting the battery cable.
- Before returning the vehicle to the customer, enter the navigation code, enter the radio code, then enter the customer's radio station presets, and set the clock.

Steering-related Precautions

Cable Reel Alignment

- Misalignment of the cable reel could cause an open in the wiring, making the SRS system and the horns inoperative. Center the cable reel whenever the following is performed (see step 6 on page 23-126).

  – Installation of the steering wheel
  – Installation of the cable reel
  – Installation of the steering column
  – Other steering-related adjustment or installation

- Do not disassemble the cable reel.

- Do not apply grease to the cable reel.

- If the cable reel shows any signs of damage, replace it with a new one. For example, it does not rotate smoothly.

BACK

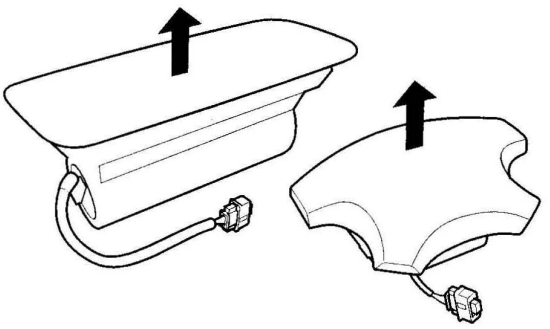
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Airbag Handling and Storage

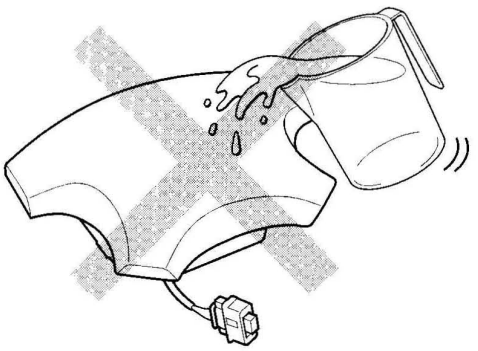
Do not disassemble an airbag. It has no serviceable parts. Once an airbag has been deployed, it cannot be repaired or reused.

For temporary storage of the airbag during service, please observe the following precautions.

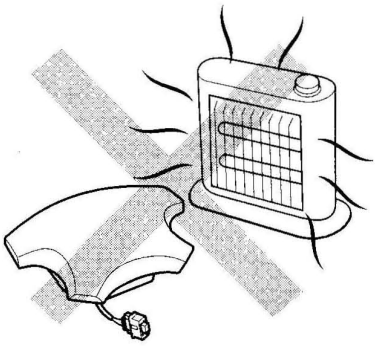
- Store the removed airbag with the pad surface up. Never put anything on the airbag.



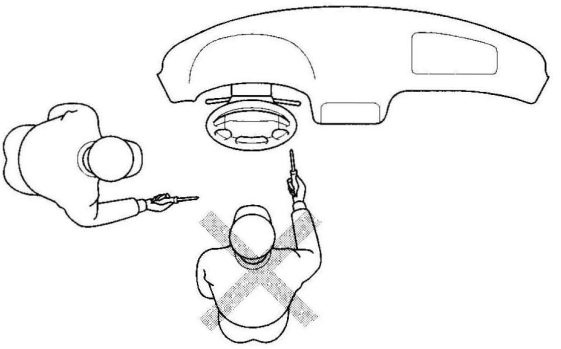
- Keep free from any oil, grease, detergent, or water to prevent damage to the airbag assembly.



- Store the removed airbag on a secure, flat surface away from any high heat source (exceeding 200° F/ 93° C).



- Never perform electrical inspections to the airbags, such as measuring resistance.
- Do not position yourself in front of the airbag assembly during removal, inspection, or replacement.



- Refer to the scrapping procedures for disposal of the damaged airbag.

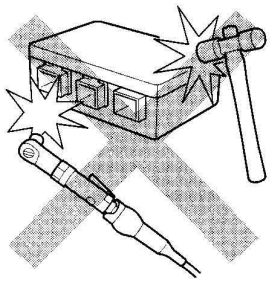
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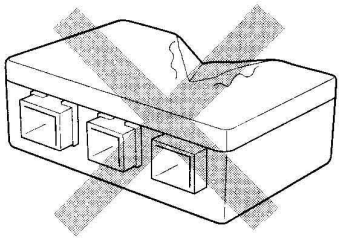
Precautions and Procedures (cont'd)

SRS Unit and Side Impact Sensors

- Be careful not to bump or impact the SRS unit or the side impact sensors whenever the ignition switch is ON (II), or for at least 3 minutes after the ignition switch is turned OFF.
- During installation or replacement, be careful not to bump (by impact wrench, hammer, etc.) the area around the SRS unit and the side impact sensor. The airbags could accidentally deploy and cause damage or injury.



- After a collision in which any airbags or seat belt tensioners were deployed, replace the SRS unit and other related components (see page 23-115). After a collision in which a side airbag was deployed, replace the side impact sensor on the deployed side and the SRS unit. After a collision in which the airbags or the side airbags did not deploy, inspect for any damage or any deformation on the SRS unit and the side impact sensors . If there is any damage, replace the SRS unit and/or the side impact sensors.



- Do not disassemble the SRS unit or the side impact sensors.
- Turn the ignition switch OFF, disconnect the battery negative cable, and wait at least 3 minutes before beginning installation or replacement of the SRS unit, or disconnecting the connectors from the SRS unit.
- Be sure the SRS unit and side impact sensors are installed securely, with the mounting bolts torqued to 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft).
- Do not spill water or oil on the SRS unit or the side impact sensors, and keep them away from dust.
- Store the SRS unit and the side impact sensors in a cool (less than 104° F/40° C) and dry (less than 80% relative humidity, no moisture) area.

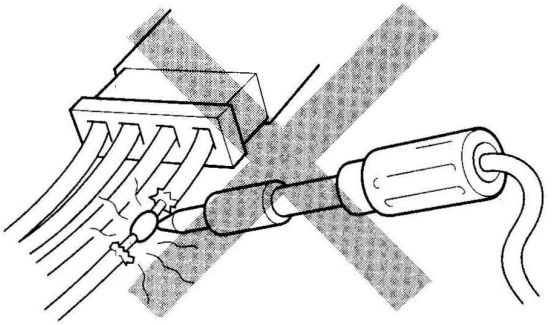
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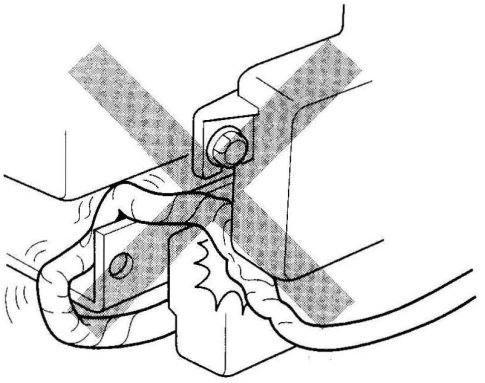
Wiring Precautions

SRS wiring can be identified by special yellow outer covering (except the SRS indicator light circuit). Observe the instructions described in this section.

- Never attempt to modify, splice, or repair SRS wiring. If there is an open or damage in SRS wiring, replace the harness.



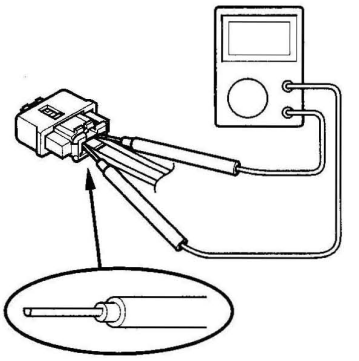
- Be sure to install the harness wires so they do not get pinched or interfere with other parts.



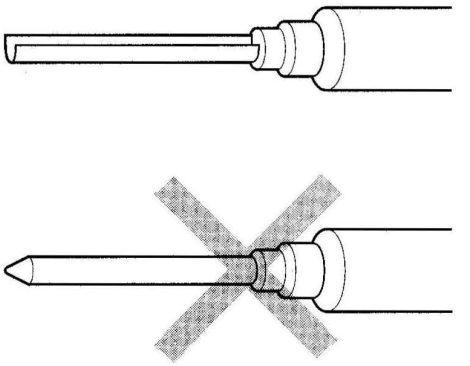
- Make sure all SRS ground locations are clean, and grounds are securely fastened for optimum metal-to-metal contact. Poor grounding can cause intermittent problems that are difficult to diagnose.

Precautions for Electrical Inspections

- When using electrical test equipment, insert the probe of the tester into the wire side of the connector. Do not insert the probe of the tester into the terminal side of the connector, and do not tamper with the connector.



- Use a U-shaped probe. Do not insert the probe forcibly.



- Use specified service connectors in troubleshooting. Using improper tools could cause an error in inspection due to poor metal-to-metal contact.

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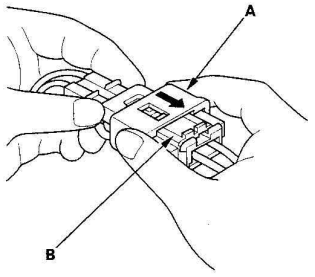
Precautions and Procedures (cont'd)

Spring-loaded Lock Connector

Some SRS system connectors have a spring-loaded lock.

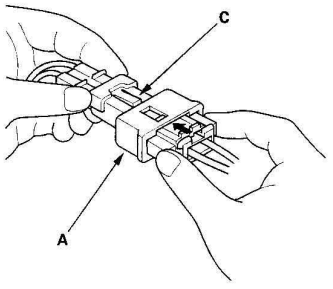
Front Airbag Connectors:

Disconnecting
To release the lock, pull the spring-loaded sleeve (A) toward the stop (B) while holding the opposite half of the connector. Then pull the connector halves apart. Be sure to pull on the sleeve and not on the connector half.

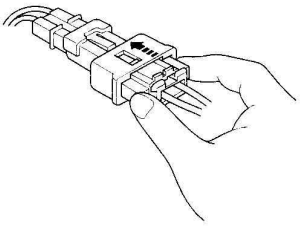


Connecting

1. To reconnect, hold the pawl-side connector half, and press on the back of the sleeve-side connector half in the direction shown. As the two connector halves are pressed together, the sleeve (A) is pushed back by the pawl (C). Do not touch the sleeve.

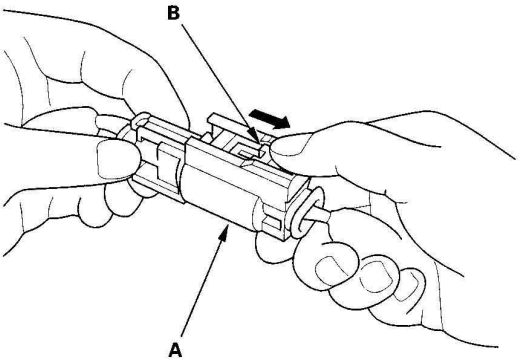


2. When the connector halves are completely connected, the pawl is released, and the spring-loaded sleeve locks the connector.

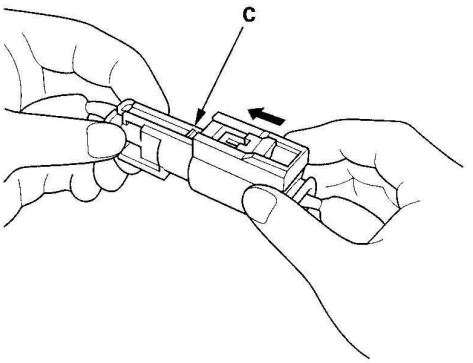


Side Airbag Connector:

Disconnecting
To release the lock, pull the spring-loaded sleeve (A) and the slider (B) while holding the opposite half of the connector. Then pull the connector halves apart. Be sure to pull on the sleeve and not on the connector half.



Connecting
Hold both connector halves, and press them firmly together until the projection (C) of the sleeve-side connector clicks.



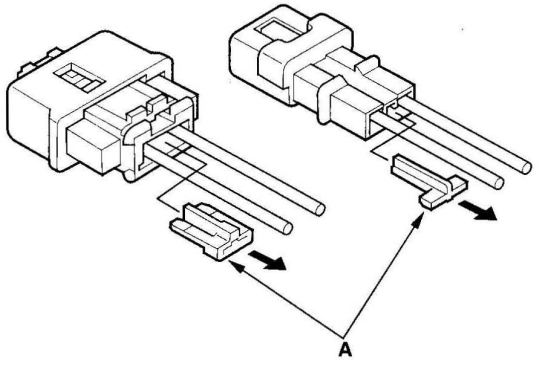
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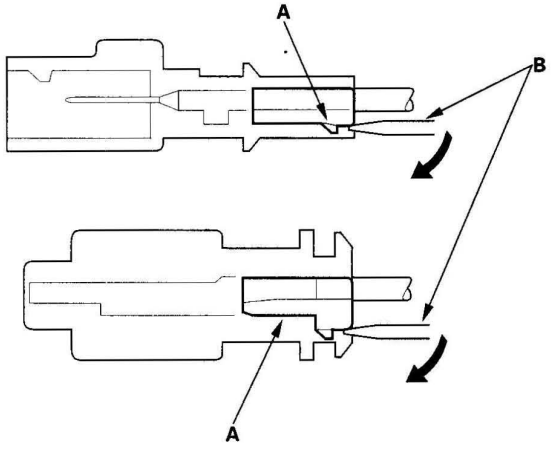
Backprobing Spring-loaded Lock Connectors

When checking voltage or resistance on this type of connector the first time, you must remove the retainer to insert the tester probe from the wire side.

NOTE: It is not necessary to reinstall the removed retainer; the terminals will stay locked in the connector housing.

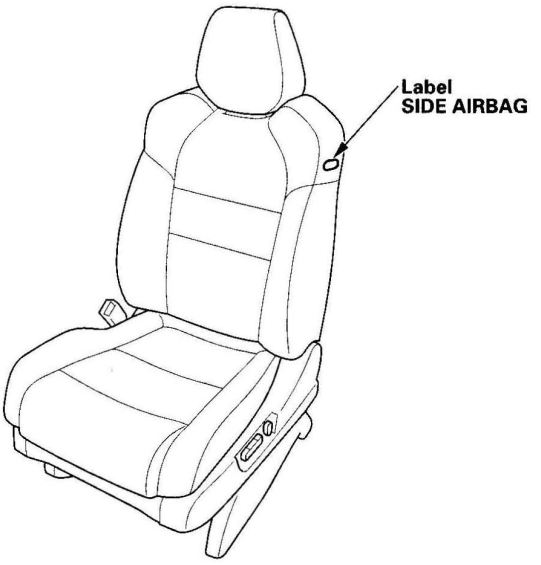


To remove the retainer (A), insert a flat-tip screwdriver (B) between the connector body and the retainer, then carefully pry out the retainer. Take care not to break the connector.



Seats with Side Airbags

Seats with side airbags have a "SIDE AIRBAG" label on the seat-back. Because the component parts (seat-back cover, cushion, etc.) of seats with and without airbags are different, make sure you install only the correct replacement parts.



- When cleaning, do not saturate the seat with liquid, and do not spray steam on the seat.
- Do not repair a torn or frayed seat-back cover. Replace the seat-back cover.
- After a collision in which the side airbag was deployed, replace the seat-back cover and the side airbag with new parts. If the seat-back cushion is split, it must be replaced. If the seat-back frame is deformed, it must be replaced.
- Never put aftermarket accessories on the seat (covers, pads, seat heaters, lights, etc.).

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Precautions and Procedures (cont'd)

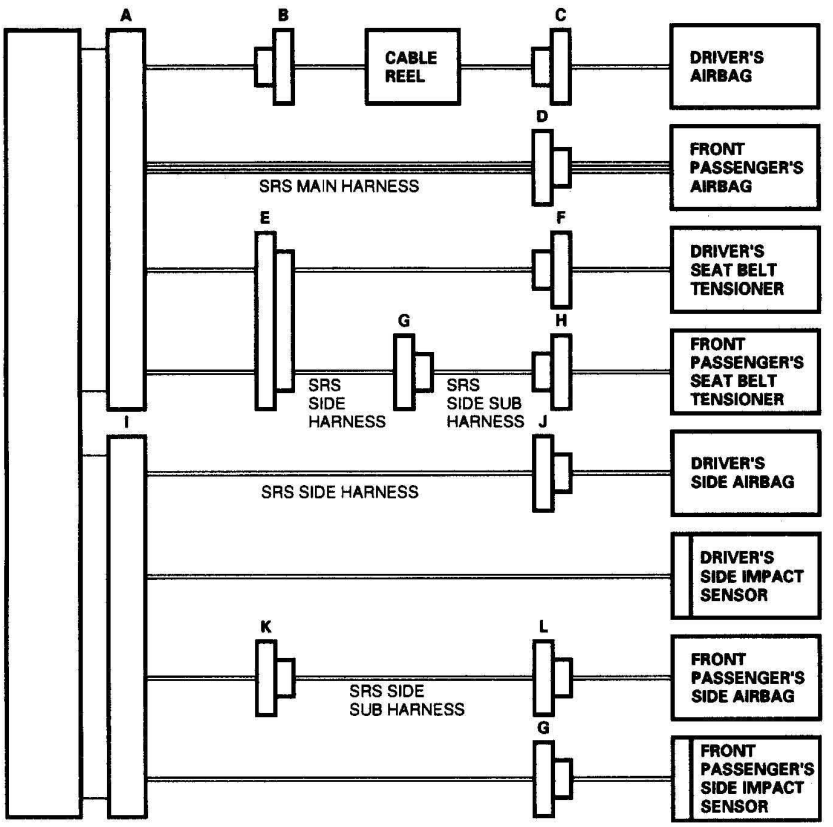
Disconnecting the Airbag Connectors, Side Airbag Connectors, and Seat Belt Tensioner Connectors

Before removing a front airbag, side airbag, or other SRS related devices (the SRS unit, the cable reel, the side impact sensors, and the seat belt tensioner connector), disconnecting connectors from related devices, or removing the dashboard or the steering column, disconnect the airbag connectors or the side airbag connectors to prevent accidental deployment.
Turn the ignition switch OFF, disconnect the negative cable from the battery, and wait at least 3 minutes before beginning the following procedures.

- Before disconnecting SRS unit connector A (18P) (A) from the SRS unit, disconnect the driver's airbag 2P connector (C), the front passenger's airbag 4P connector (D), the driver's seat belt tensioner 2P connector (F), and the front passenger's seat belt tensioner 2P connector (H).

- Before disconnecting SRS unit connector B (14P) (I) from the SRS unit, disconnect both side airbag 2P connectors (J, L).

- Before disconnecting the cable reel 2P connector (B), disconnect the driver's airbag 2P connector (C).
- Before disconnecting the SRS main harness 4P connector (E), disconnect the driver's seat belt tensioner 2P connector (F), and front passenger's seat belt tensioner 2P connector (H).
- Before disconnecting the SRS side harness 2P connector (K), disconnect the front passenger's side airbag 2P connector (L).



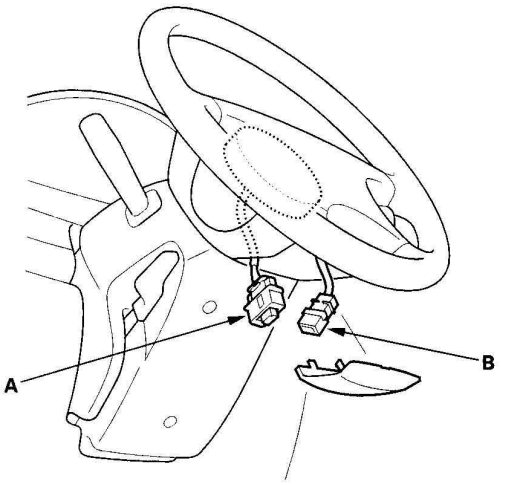
BACK

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1. Disconnect the battery negative cable, and wait at least 3 minutes.

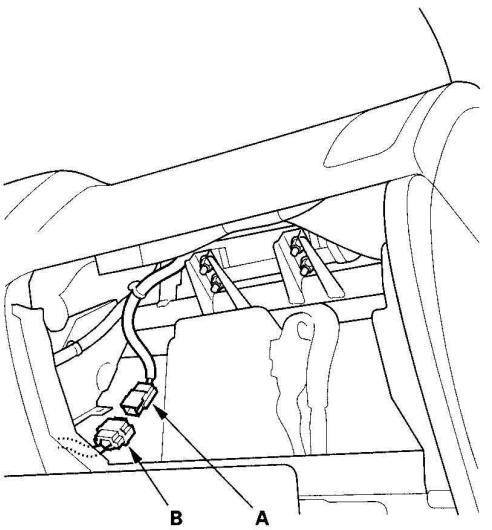
Driver's Airbag

2. Remove the access panel from the steering wheel, then disconnect the driver's airbag 2P connector (A) from the cable reel 2P connector (B).



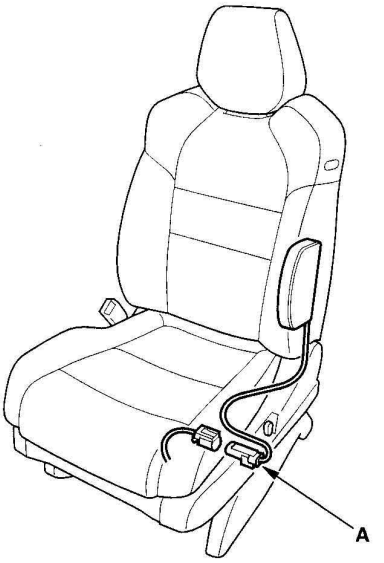
Front Passenger's Airbag

3. Remove the glove box, then disconnect the front passenger's airbag 4P connector (A) from the SRS main harness 4P connector (B).



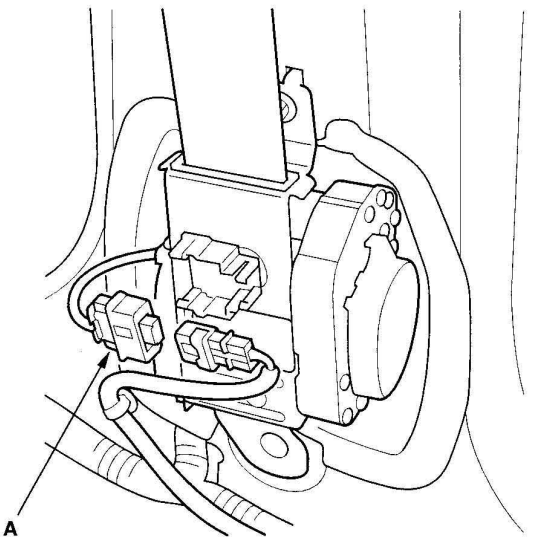
Side Airbag

4. Disconnect both side airbag 2P connectors (A).



Seat Belt Tensioner

5. Disconnect both seat belt tensioner 2P connectors (A).



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General Troubleshooting Information

DTC (Diagnostic Trouble Codes)

The self-diagnostic function of the SRS allows it to locate the causes of system problems and then store this information in memory. For easier troubleshooting, this data can be retrieved via a data link circuit.

- When you turn the ignition switch ON (II), the SRS indicator will come on. If it goes off after 6 seconds, the system is normal.
- If there is an abnormality, the system locates and defines the problem, stores this information in memory, and turns the SRS indicator light on. The data will remain in the memory even when the ignition switch is turned off or if the battery is disconnected.
- When you connect the Honda PGM Tester to the 16P data link connector (DLC) to short the SCS terminal, and turn the ignition switch ON (II), the SRS indicator light will indicate the diagnostic trouble code (DTC) by the number of blinks.
- After reading and recording the DTC, proceed with the troubleshooting procedure for this code.

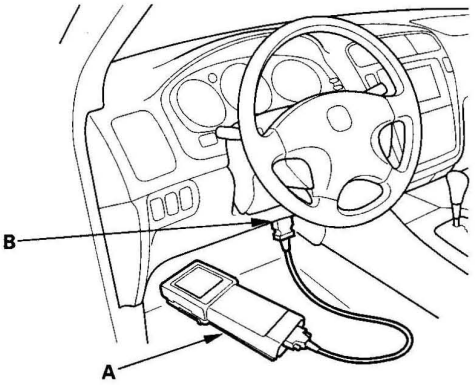
Precautions

- Use only a digital multimeter to check the system. If its not a Honda multimeter, make sure its output is 10 mA (0.01 A) or less when switched to the smallest value in the ohmmeter range. A tester with a higher output could damage the airbag circuit or cause accidental airbag deployment and possible injury.
- Whenever the ignition switch is ON (II), or has been turned OFF for less than 3 minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.
- Before you remove the SRS main harness, disconnect the driver's airbag connector, the front passenger's airbag connector, both side airbag connectors, and both seat belt tensioner connectors.
- Make sure the battery is sufficiently charged. If the battery is dead or low, measuring values won't be correct.
- Do not touch a tester probe to the terminals in the SRS unit or harness connectors, and do not connect the terminals with a jumper wire. Use only the backprobe set and the Honda PGM Tester. Backprobe spring-loaded lock type connectors correctly.

Reading the DTC

When the SRS indicator light is on, read the DTC using either of the following methods:

Honda PGM Tester "SRS" Menu Method:
Connect the Honda PGM Tester (A) to the 16P Data Link Connector (DLC) (B), and follow the Tester's prompts in the "SRS" menu. If the Tester indicates no DTC, DTC 9-1, or DTC 9-2, double-check by selecting "SCS" on the display, and watching the SRS indicator light.



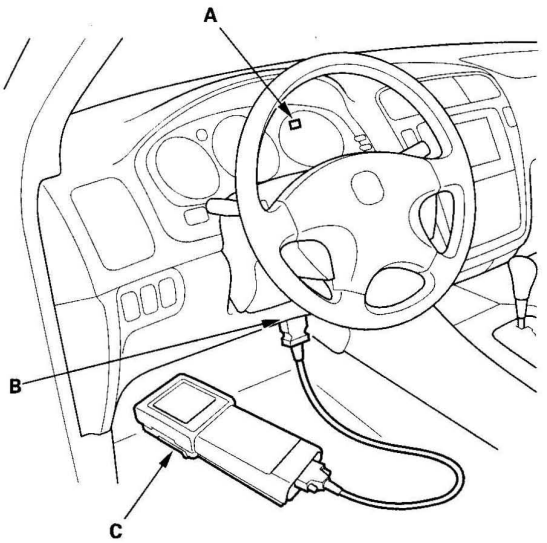
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Honda PGM Tester "SCS" Menu Method (retrieving the flash codes):

The SRS indicator light (A) indicates the DTC by the number of blinks when the Honda PGM Tester (C) is connected to the DLC (data link connector) (16P) (B).

1. Make sure the ignition switch is OFF.
2. Connect the Honda PGM Tester (C) to the DLC (B), and follow the Tester's prompts in the "SCS" menu (see the Honda PGM Tester Operator's Manual).

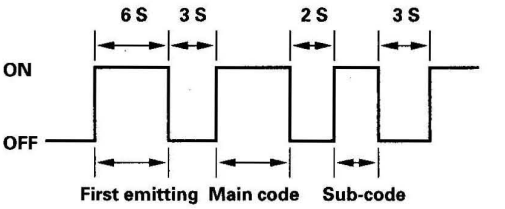


3. Turn the ignition switch ON (II). The SRS indicator light (A) comes on for about 6 seconds, and then goes off. Then it will blink to indicate the DTCs (see the table below).
4. Read the DTC.
5. Turn the ignition switch OFF, and wait for 10 seconds.
6. Disconnect the Honda PGM Tester (C) from the DLC (B).
7. Proceed with the troubleshooting procedure for this DTC.

Patterns of DTC Indications:

The DTC consists of a main code and sub-code.

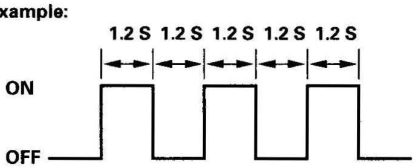
S: Second



Reading the main code:

In case of 1~10
Count the number of blinks.

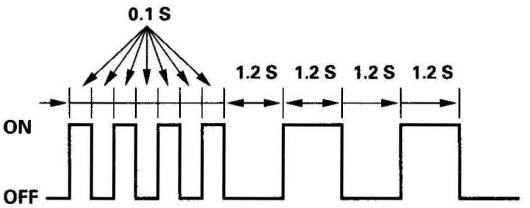
Example:



Main code= 1 + 1 + 1 = 3

In case of 11~15
Four continuous blink count as ten.
Add any further blinks together as shown.

Example:

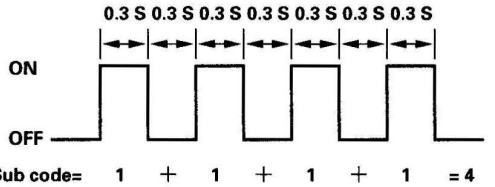


Main code= 10 + 1 + 1 = 12

Reading the sub code:

Count the number of blinks.

Example:



Sub code= 1 + 1 + 1 + 1 = 4

If the main code is '3', and the sub code is '4', record a DTC 3-4.

(cont'd)

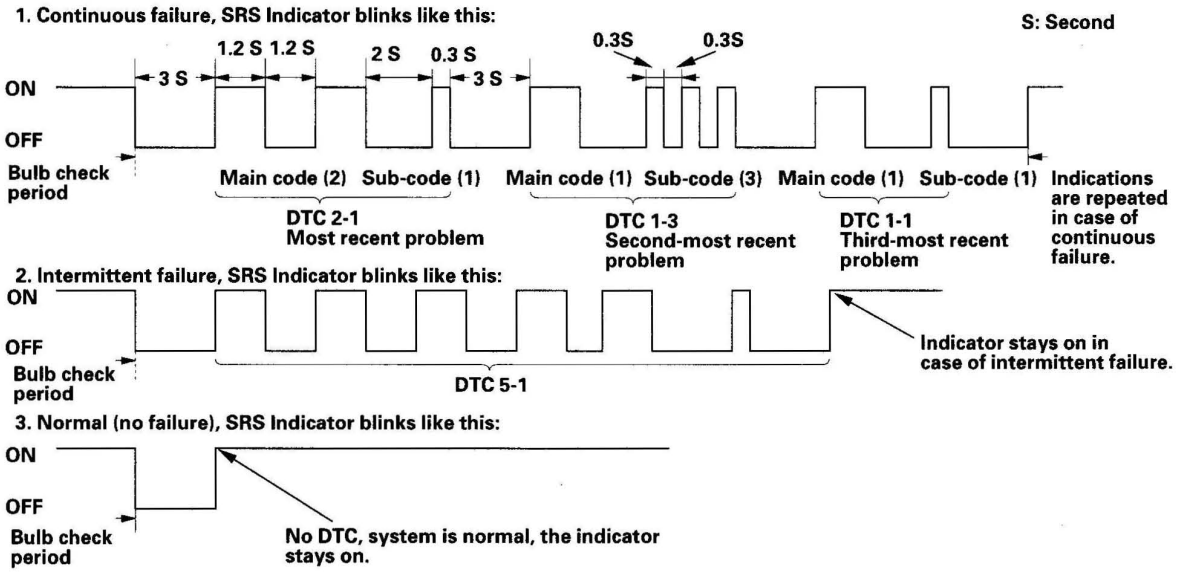
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General Troubleshooting Information (cont'd)

- Including the most recent problem, up to three different malfunctions can be indicated (see example 1 below).
- In case of a continuous failure, the DTC will be indicated repeatedly (see example 1 below).
- In case of an intermittent failure, the SRS indicator light will indicate the DTCs one time, then it will stay on (see example 2 below).
- If both a continuous and an intermittent failure occur, both DTCs will be indicated as continuous failures.
- When the system is normal (no DTCs), the SRS indicator light will stay on (see example 3).
- If the SRS indicator light comes on continuously without a DTC, there may be a problem with the system.
- If the SRS indicator light does not come on as indicated above, always check for an open or a short to ground in the SCS circuit before troubleshooting the system.

Example of DTC Indications:



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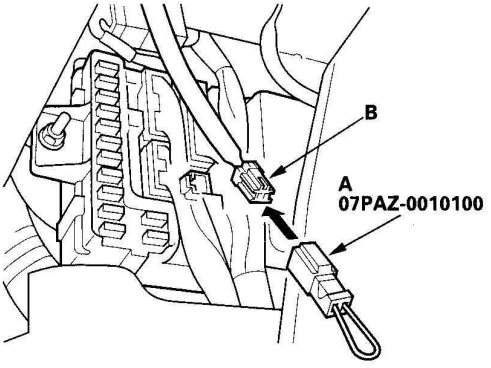
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Erasing the DTC Memory

Special Tools Required
SCS Service Connector 07PAZ-0010100

To erase the DTC(s) from the SRS unit, use a Honda PGM Tester (see the Honda PGM Tester SRS Vehicle System Supplement) or the following procedure.

1. Make sure the ignition switch is OFF.
2. Connect the SCS service connector (A) to the MES connector (2P)(B). Do not use a jumper wire.



3. Turn the ignition switch ON (II).
4. The SRS indicator light will come on for about 6 seconds, and then go off. Remove the SCS service connector from the MES connector within 4 seconds after the light goes off.
5. The SRS indicator light will come on again. Reconnect the SCS service connector to the MES connector within 4 seconds after the light comes on.
6. When the SRS indicator light goes off, remove the SCS service connector from the MES connector within 4 seconds.
7. The SRS indicator light will blink two times indicating that the memory has been erased.
8. Turn the ignition switch OFF, and wait for 10 seconds.
9. Turn the ignition switch ON (II) again. The SRS is OK if the SRS indicator light comes on for 6 seconds and then goes off.

Troubleshooting Intermittent Failures

If there was a malfunction, but it doesn't recur, it will be stored in the memory as an intermittent failure, and the SRS indicator light will come on.

After checking the DTC, troubleshoot as follows:

1. Read the DTC (see "Reading the DTC").
2. Erase the DTC memory (see "Erasing the DTC Memory").
3. With the shift lever in Park or neutral, start the engine, and let it idle.
4. The SRS indicator light will come on for about 6 seconds and then go off.
5. Shake the wire harness and the connectors, take a test drive (quick acceleration, quick braking, cornering), turn the steering wheel fully left and right, and hold it there for 5 to 10 seconds. If the problem recurs, the SRS indicator light will come on.
6. If you can't duplicate the intermittent failure, the system is OK at this time.

(cont'd)

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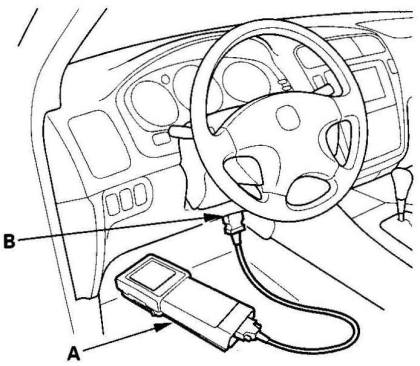
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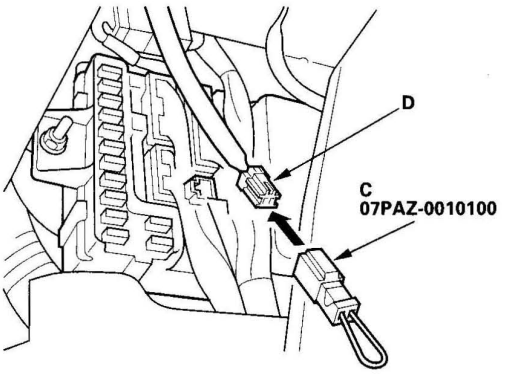
General Troubleshooting Information (cont'd)

Initializing the OPDS (Occupant Position Detection System) Unit

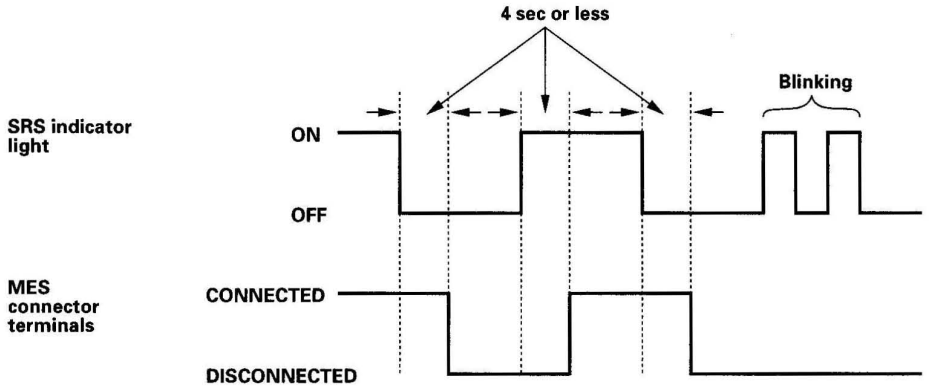
When a seat-back cover, seat-back cushion, and/or OPDS unit is replaced, initialize the OPDS by following the procedure below.

1. Set the seat-back in the normal position, and make sure there is nothing on the front passenger's seat.
2. Make sure the front passenger's seat is dry. If it is not dry, start the engine, and turn on the air conditioning system for 30 minutes to dry any moisture from it.
3. Turn the ignition switch OFF.
4. Connect the Honda PGM Tester (A) to the DLC (16P) (B), and follow the Tester's prompts in the "SCS" menu (see the Honda PGM Tester Operator's Manual).
5. Connect the SCS service connector (C) to the MES connector (2P) (D). Do not use a jumper wire.





6. Turn the ignition switch ON (II).
7. The SRS indicator light comes on for about 6 seconds and goes off. Remove the SCS service connector from the MES connector within 4 seconds after the SRS indicator light went off.
8. The SRS indicator light comes on again. Reconnect the SCS service connector to the MES connector within 4 seconds after the SRS indicator light comes on.
9. The SRS indicator light goes off. Remove the SCS service connector from the MES connector within 4 seconds.
10. Watch the SRS indicator.
    - If the indicator blinks two times and then stays on, the OPDS is initialized, but the DTCs need to be erased. Go to step 11, then erase the DTCs.
    - If the indicator blinks two times and then goes off, the OPDS unit is initialized. Go to step 11.
    - If the indicator stays on without first blinking, the OPDS is not initialized. Read the DTC, and go to the appropriate page in the DTC Troubleshooting Index.
11. Turn the ignition switch off, and disconnect the Honda PGM Tester.



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DTC Troubleshooting Index

DTC	Detection Item	Notes
1-1	Open or increased resistance in driver's airbag inflator	(see page 23-36)
1-3	Short to another wire or decreased resistance in driver's airbag inflator	(see page 23-38)
1-4	Short to power in driver's airbag inflator	(see page 23-40)
1-5	Short to ground in driver's airbag inflator	(see page 23-42)
2-1	Open or increased resistance in front passenger's airbag inflator	(see page 23-44)
2-3	Short to another wire or decreased resistance in front passenger's airbag inflator	(see page 23-45)
2-4	Short to power in front passenger's airbag inflator	(see page 23-47)
2-5	Short to ground in front passenger's airbag inflator	(see page 23-48)
3-1	Open or increased resistance in driver's seat belt tensioner	(see page 23-50)
3-3	Short to another wire or decreased resistance in driver's seat belt tensioner	(see page 23-52)
3-4	Short to power in driver's seat belt tensioner	(see page 23-54)
3-5	Short to ground in driver's seat belt tensioner	(see page 23-56)
4-1	Open or increased resistance in front passenger's seat belt tensioner	(see page 23-58)
4-3	Short to another wire or decreased resistance in front passenger's seat belt tensioner	(see page 23-60)
4-4	Short to power in front passenger's seat belt tensioner	(see page 23-63)
4-5	Short to ground in front passenger's seat belt tensioner	(see page 23-65)
5-1	Internal failure of SRS unit NOTE: Before troubleshooting DTCs 5-1 through 8-8, check battery/system voltage. If the voltage is low, repair the charging system before troubleshooting the SRS.	(see page 23-68)
5-2		
5-4		
5-8		
6-3		
6-4		
6-7		
6-8		
7-1		
7-2		
7-3		
8-1		
8-2		
8-3		
8-4		
8-5		
8-6		
8-7		
8-8		

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DTC Troubleshooting Index (cont'd)

DTC	Detection Item	Notes
9-1	Internal failure of the SRS unit. If intermittent, it could mean internal failure of the unit or a faulty indicator light circuit. Refer to Troubleshooting Intermittent Failures (see page 23-27).	(see page 23-68)
9-2	Internal failure of the SRS unit. If intermittent, it could mean internal failure of the power supply (VB line). Refer to Troubleshooting Intermittent Failures (see page 23-27).	
9-3	Faulty driver's seat belt buckle switch	(see page 23-70)
9-4	Faulty front passenger's seat belt buckle switch	(see page 23-74)
10-1	Seat belt tensioners (and airbag(s)) deployed	(see page 23-68)
10-2	Driver's side airbag deployed	
10-3	Seat belt tensioners (and airbag(s)) and driver's side airbag deployed	
10-4	Front passenger's side airbag deployed	
10-5	Seat belt tensioners (and airbag(s)) and front passnger's side airbag deployed	
10-6	Driver's and front passenger's side airbags deployed	
10-7	Seat belt tensioners (and airbag(s)) and driver's and front passenger's side airbags deployed	
11-1	Open or increased resistance in driver's side airbag inflator	(see page 23-78)
11-3	Short to another wire or decreased resistance in driver's side airbag inflator	(see page 23-79)
11-4	Short to power in driver's side airbag inflator	(see page 23-81)
11-5	Short to ground in driver's side airbag inflator	(see page 23-82)
12-1	Open or increased resistance in front passenger's side airbag inflator	(see page 23-84)
12-3	Short to another wire or decreased resistance in front passenger's side airbag inflator	(see page 23-85)
12-4	Short to power in front passenger's side airbag inflator	(see page 23-87)
12-5	Short to ground in front passenger's side airbag inflator	(see page 23-88)
13-1	Faulty driver's side impact sensor	(see page 23-69)
13-2		
13-3	No signal from the driver's side impact sensor	(see page 23-90)
13-4	Faulty power supply to the driver's side impact sensor	(see page 23-91)
14-1	Faulty front passenger's side impact sensor	(see page 23-69)
14-2		
14-3	No signal from the front passenger's side impact sensor	(see page 23-93)
14-4	Faulty power supply to the front passenger's side impact sensor	(see page 23-94)
15-1	Faulty OPDS unit or OPDS system not initialized	(see page 23-96)
15-2	Faulty side airbag cutoff indicator circuit	(see page 23-100)
15-3	Faulty OPDS sensor	(see page 23-105)

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Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
SRS indicator light doesn't come on	SRS Indicator Light Troubleshooting (see page 23-106)	
SRS indicator light stays on when in "SCS" menu method	SRS Indicator Light Troubleshooting (see step 1 on page 23-109)	Inability to retrieve DTCs with the Honda PGM Tester. Retrieve the flash codes using the SCS menu method (see page 23-25).
Side airbag cutoff indicator stays on after bulb check	• Make sure nothing is on the front passenger's seat. • Make sure the front passenger's seat isn't wet. If the seat is wet, start the engine, and turn on the air conditioning system for 30 minutes to dry any moisture from the seat. • If the side airbag cutoff indicator stays on after the ignition switch is turned ON (II), initialize the ODPS unit (see page 23-28) – If the side airbag cutoff indicator operates normally, the system is OK. – If the side airbag cutoff indicator stays on, replace the OPDS sensor (see section 20). The sensor is part of the seatback pad.	

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System Description

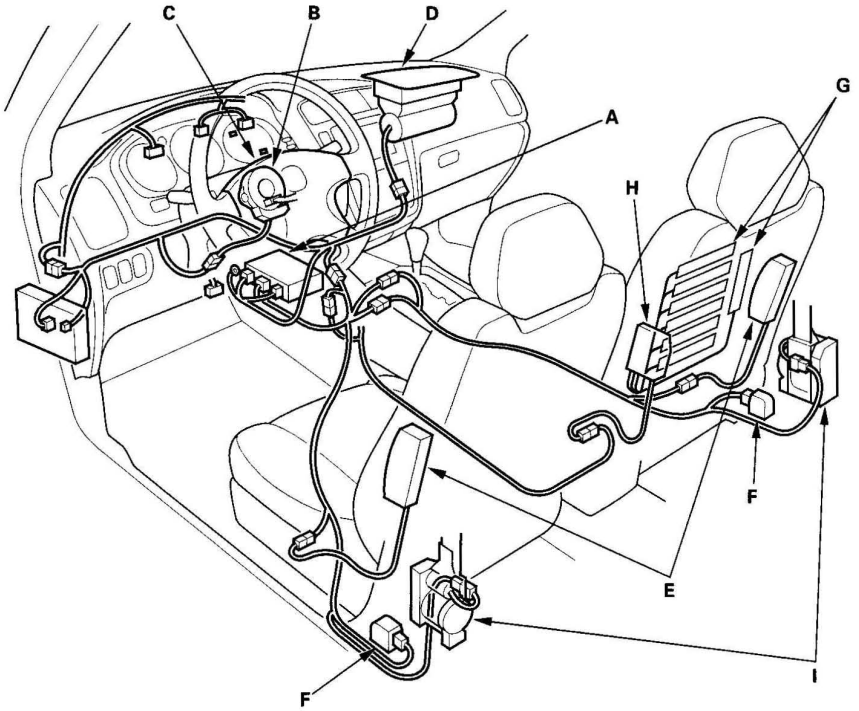
SRS Components

Airbags
The SRS is a safety device which, when used with the seat belt, is designed to help protect the driver and front passenger in a frontal impact exceeding a certain set limit. The system consists of the SRS unit, including safing sensor and impact sensor (A), the cable reel (B), the driver's airbag (C), the front passenger's airbag (D), side airbags (E), and seat belt tensioners (I).

Side Airbags
The side airbags (E) are in each front seat-back. They help protect the upper torso of the driver or front seat passenger during a moderate to severe side impact. Side impact sensors (F) in each door sill and in the SRS unit detect such an impact and instantly inflate the driver's or the passenger's side airbag. Only one side airbag will deploy during a side impact. If the impact is on the passenger's side, the passenger's side airbag will deploy even if there is no passenger.

Seat Belt Tensioner
The seat belt tensioners (I) are linked with the SRS airbags to further increase the effectiveness of the seat belt. In a front-end collision, the tensioners instantly retract the belt firmly to secure the occupants in their seats.

OPDS
The side airbag system also includes an Occupant Position Detection System (OPDS). This system consists of sensors (G) and an OPDS unit (H) in the front passenger's seat-back. The OPDS unit sends occupant height and position data to the SRS unit. If the SRS unit determines that the front passenger is of small stature (for example, a child) and the front passenger is leaning into the side airbag deployment path, it will automatically disable the airbag. The SRS unit will also disable the airbag when the OPDS detects certain objects on the seat. When the side airbag is disabled, the Side Airbag Cutoff indicator on the instrument panel alerts the driver that the passenger's side airbag will not deploy in a side impact. When the object is removed, or the passenger sits upright, the Side Airbag Cutoff indicator will go off, alerting the driver that the side airbag will deploy in a side impact.



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SRS Operation

The main circuit in the SRS unit senses and judges the force of impact and, if necessary, ignites the inflator charges. If battery voltage is too low or power is disconnected due to the impact, the voltage regulator and the back-up power circuit, respectively, will keep voltage at a constant level.

For the SRS to operate:

Seat belt Tensioners

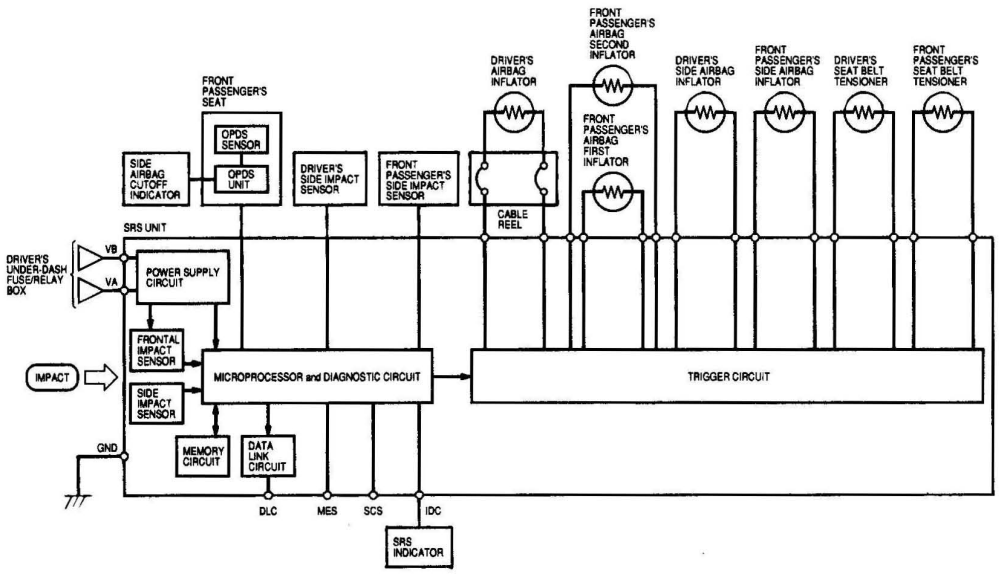
(1) The frontal impact sensor must activate, and send electronic signals to the microprocessor.
(2) The microprocessor must compute the signals, and send them to the seat belt tensioners.
(3) The inflators must ignite and activate the tensioners.

Driver's and Front passenger's Airbag(s)

(1) The frontal impact sensor must activate, and send electric signals to the microprocessor.
(2) The microprocessor must compute the signals, and depending on the severity of the collision and whether the seat belt buckle switch is ON or OFF, it sends the appropriate signals to the airbag inflator(s).
(3) The inflators that received signals must ignite and deploy the airbags.

Side Airbag(s)

(1) The side impact sensors must activate, and send electric signals to the microprocessor.
(2) The microprocessor must compute the signals and send them to the side airbag inflator(s). However, the microprocessor cuts off the signals to the front passenger's side airbag if the SRS unit determines that the front passenger's head is in the deployment path of the side airbag.
(3) The inflator that received the signal must ignite and deploy the side airbag.



Self-diagnosis System

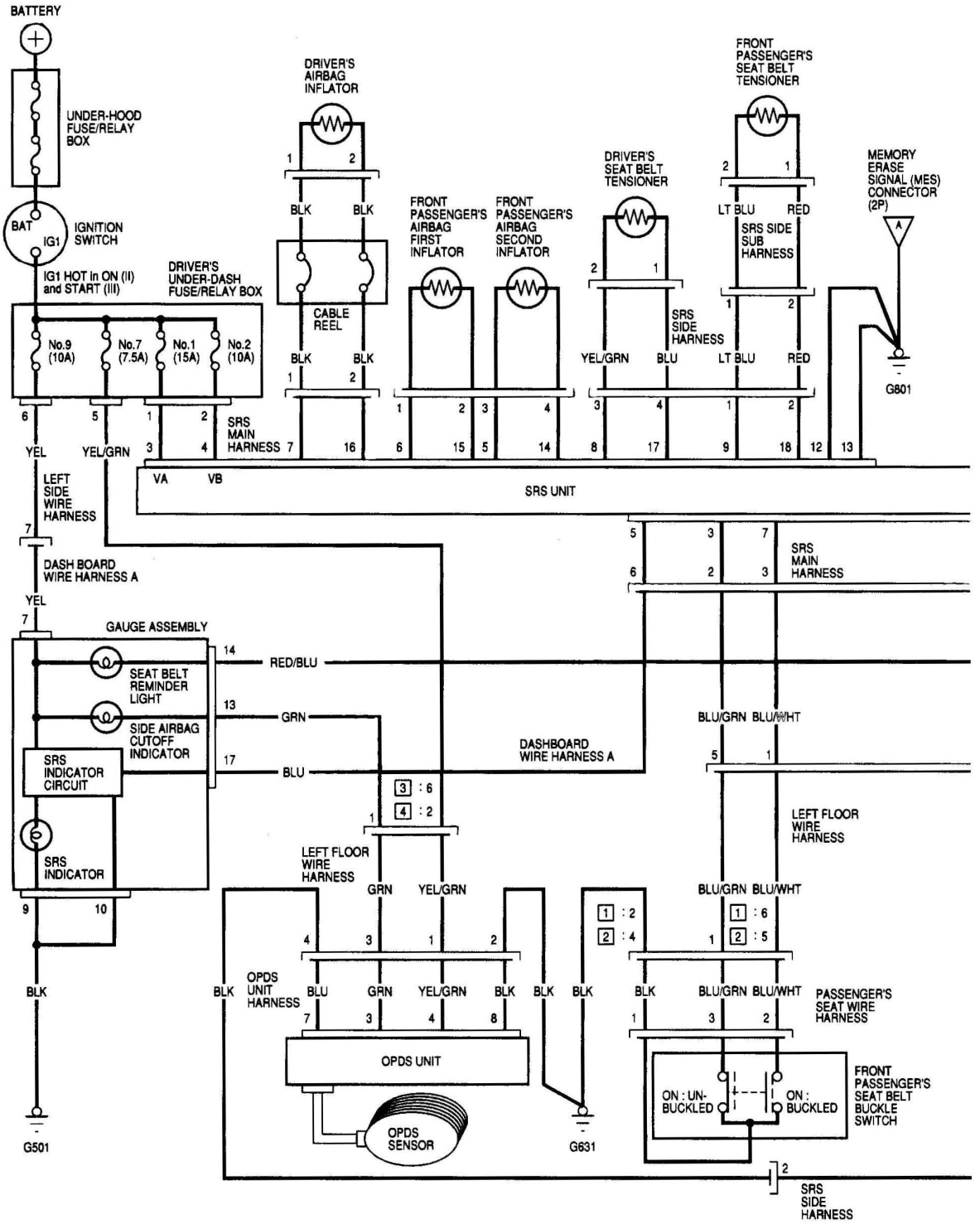
A self-diagnosis circuit is built into the SRS unit; when the ignition switch is turned ON (II), the SRS indicator light comes on and goes off after about 6 seconds if the system is operating normally.
If the indicator does not come on, or does not go off after 6 seconds, or if it comes on while driving, it indicates an abnormality in the system. The system must be inspected and repaired as soon as possible.

For better serviceability, the SRS unit memory stores a DTC that relates to the cause of the malfunction, and the unit is connected to the data link circuit. This information can be read with the Honda PGM Tester when it is connected to the data link connector (DLC).

BACK

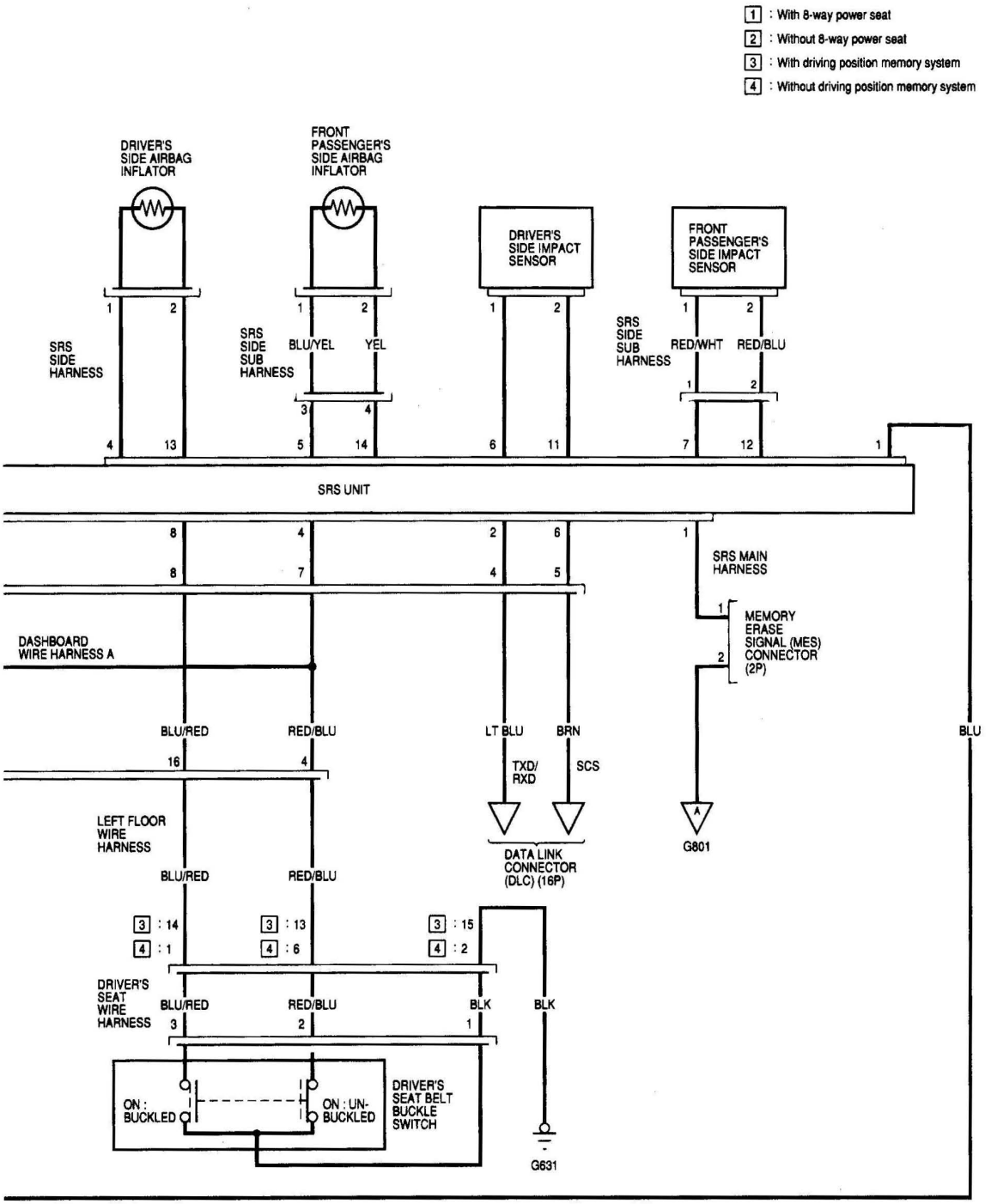
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Circuit Diagram



BACK

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BACK

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DTC Troubleshooting

DTC 1-1: Open or Increased Resistance in Driver's Airbag Inflator

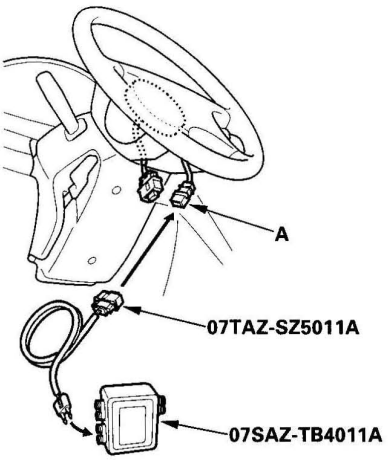
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 2P connector from the cable reel 2P connector (A).

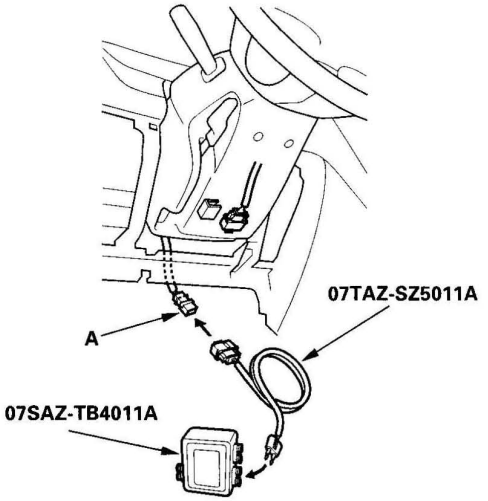


5. Connect the special tool (2 Ω connector) to the cable reel 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-1 indicated?

   YES – Go to step 9.

   NO – Open or increased resistance in the driver's airbag inflator; replace the driver's airbag (see page 23-116). ■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the cable reel 2P connector from the SRS main harness 2P connector (A).



11. Connect the special tool (2 Ω connector) to the SRS main harness 2P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

BACK

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14. Read the DTC.

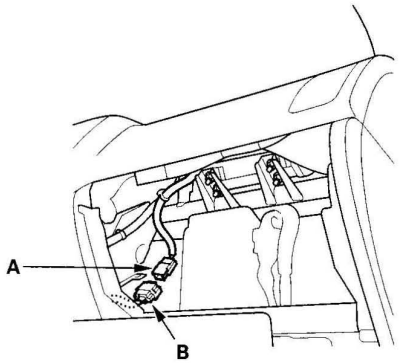
Is DTC 1-1 indicated?

YES – Go to step 15.

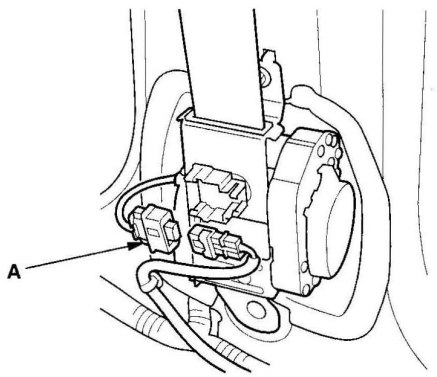
NO – Open or increased resistance in the cable reel; replace the cable reel (see page 23-124). ■

15. Disconnect the battery negative cable, and wait for 3 minutes.

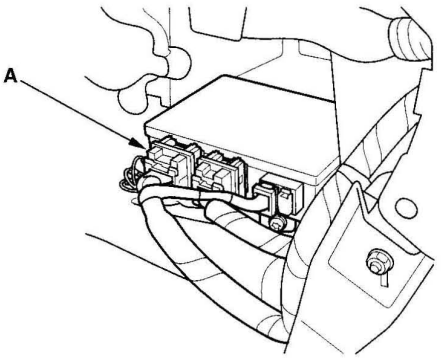
16. Disconnect the front passenger's airbag 4P connector (A) from the SRS main harness 4P connector (B).



17. Disconnect both seat belt tensioner 2P connectors (A).

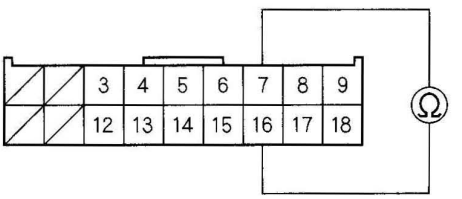


18. Disconnect SRS unit connector A (18P) from the SRS unit.



19. Check resistance between the No. 7 terminal and the No. 16 terminal of SRS unit connector A (18P). There should be 2.0 – 3.0 Ω.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit or poor contact at SRS unit connector A (18P) and the SRS unit. Check the connection between SRS unit connector A (18P) and the SRS unit. If the connection is OK, replace the SRS unit (see page 23-127). ■

NO – Open or increased resistance in the SRS main harness; replace the SRS main harness. ■

BACK

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DTC Troubleshooting (cont'd)

DTC 1-3: Short to Another Wire or Decreased Resistance in Driver's Airbag Inflator

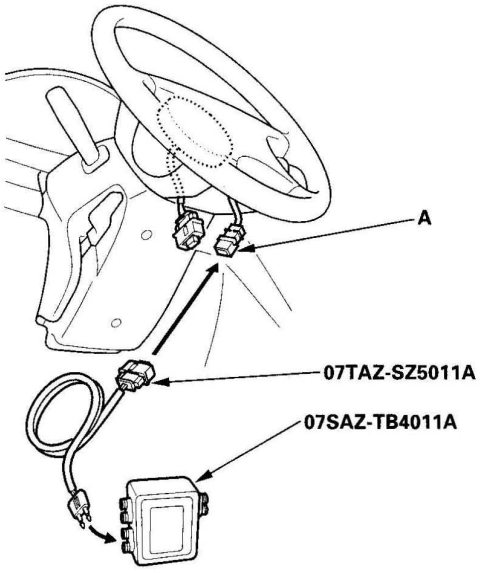
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 2P connector from the cable reel 2P connector (A).

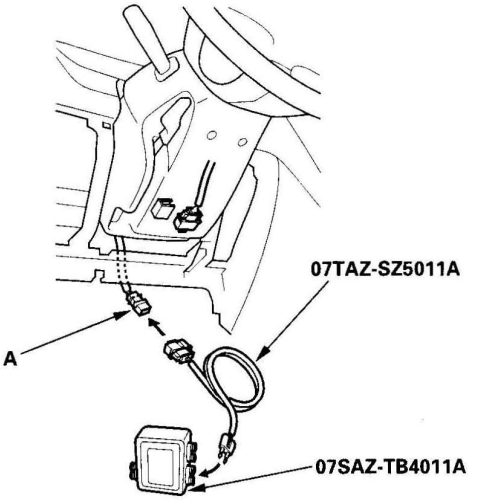


5. Connect the special tool (2 Ω connector) to the cable reel 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-3 indicated?

   YES – Go to step 9.

   NO – Short in the driver's airbag; replace the driver's airbag (see page 23-116).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the cable reel 2P connector from the SRS main harness 2P connector (A).



11. Connect the special tool (2 Ω connector) to the SRS main harness 2P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 1-3 indicated?

    YES – Go to step 15.

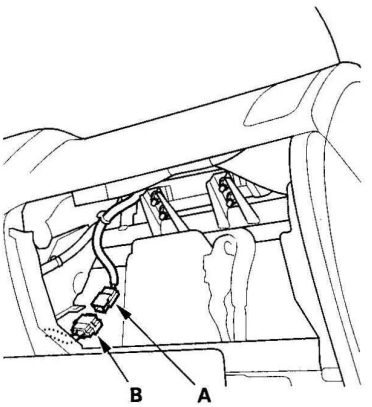
    NO – Short in the cable reel; replace the cable reel (see page 23-124).■

BACK

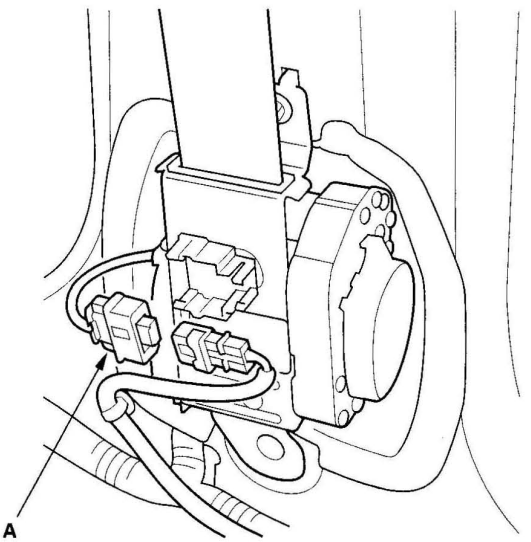
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15. Disconnect the battery negative cable, and wait for 3 minutes.

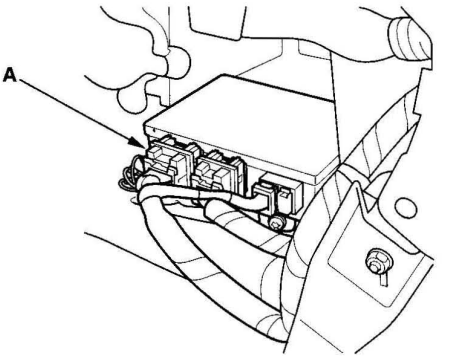
16. Disconnect the front passenger's airbag 4P connector (A) from the SRS main harness 4P connector (B).



17. Disconnect both seat belt tensioner 2P connectors (A).



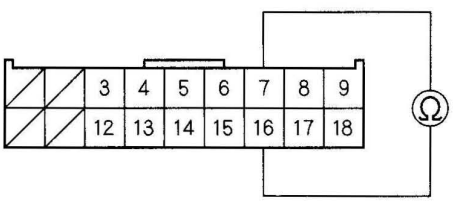
18. Disconnect SRS unit connector A (18P) from the SRS unit.



19. Disconnect the special tool from the SRS main harness 2P connector.

20. Check resistance between the No. 7 terminal and the No. 16 terminal of SRS unit connector A (18P). There should be 1 MΩ or more.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES — Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO — Short in the SRS main harness; replace the SRS main harness. ■

BACK

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DTC Troubleshooting (cont'd)

DTC 1-4: Short to Power in Driver's Airbag Inflator

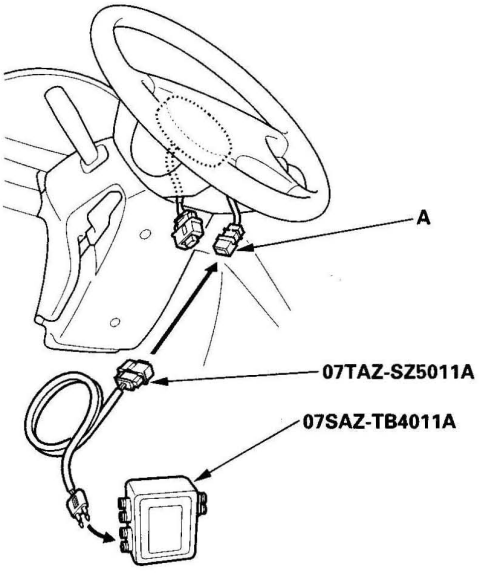
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 2P connector from the cable reel 2P connector (A).

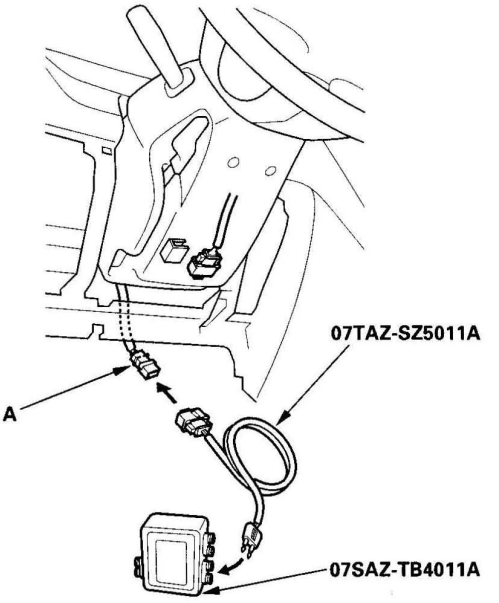


5. Connect the special tool (2 Ω connector) to the cable reel 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-4 indicated?

   YES – Go to step 9.

   NO – Short to power in the driver's airbag; replace the driver's airbag (see page 23-116). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the cable reel 2P connector from the SRS main harness 2P connector (A).



11. Connect the special tool (2 Ω connector) to the SRS main harness 2P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

BACK

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14. Read the DTC.

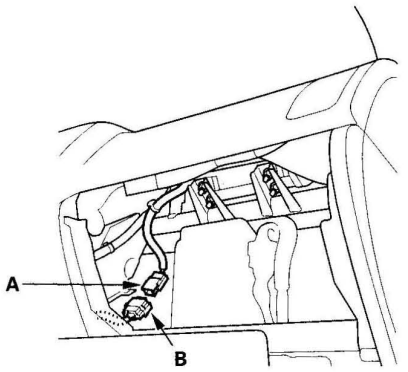
    Is DTC 1-4 indicated?

    YES – Go to step 15.

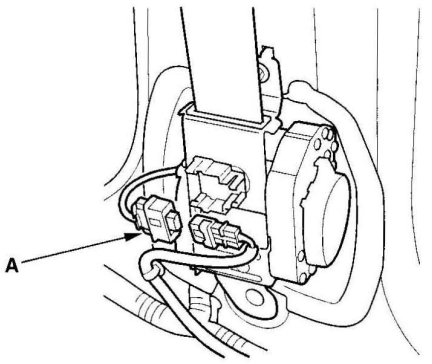
    NO – Short to power in the cable reel; replace the cable reel (see page 23-127).■

15. Disconnect the battery negative cable, and wait for 3 minutes.

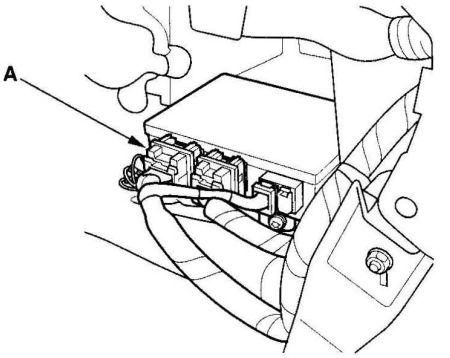
16. Disconnect the front passenger's airbag 4P connector (A) from the SRS main harness 4P connector (B).



17. Disconnect both seat belt tensioner 2P connectors (A).



18. Disconnect SRS unit connector A (18P) from the SRS unit.



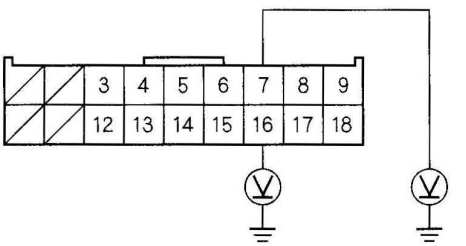
19. Disconnect the special tool from the SRS main harness 2P connector.

20. Reconnect the battery negative cable.

21. Turn the ignition switch ON (II).

22. Check for voltage between the No. 7 terminal of SRS unit connector A (18P) and body ground, and the No. 16 terminal and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the voltage as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-127).■

NO – Short to power in the SRS main harness; replace the SRS main harness.■

BACK

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DTC Troubleshooting (cont'd)

DTC 1-5: Short to Ground in Driver's Airbag Inflator

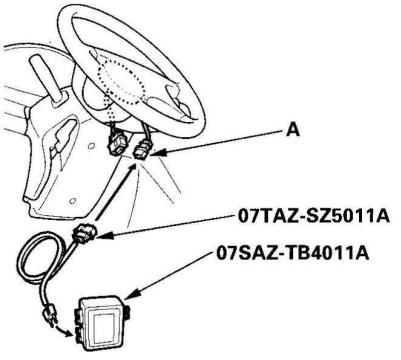
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 2P connector from the cable reel 2P connector (A).

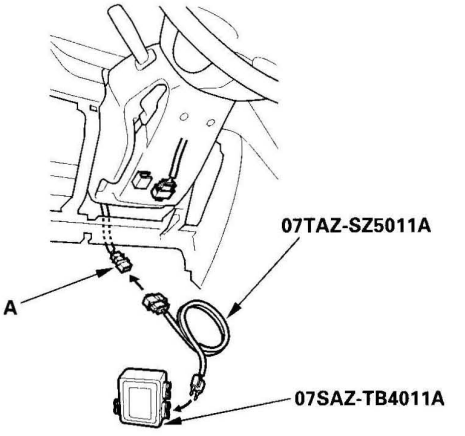


5. Connect the special tool (2 Ω connector) to the cable reel 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-5 indicated?

   YES – Go to step 9.

   NO – Short to ground in the driver's airbag inflator; replace the driver's airbag (see page 23-116). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS main harness 2P connector from the cable reel 2P connector (A).



11. Connect the special tool (2 Ω connector) to the SRS main harness 2P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

BACK

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14. Read the DTC.

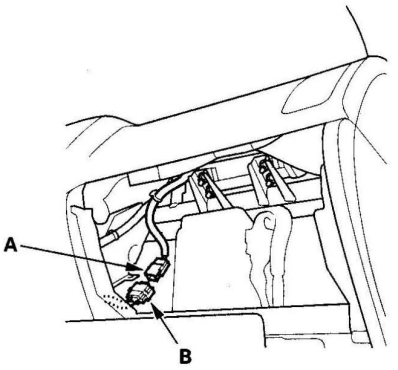
Is DTC 1-5 indicated?

YES – Go to step 15.

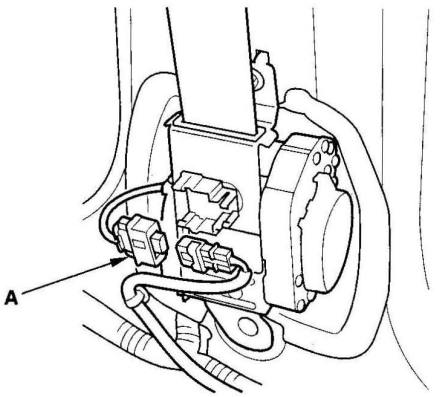
NO – Short to ground in the cable reel; replace the cable reel (see page 23-124). ■

15. Disconnect the battery negative cable, and wait for 3 minutes.

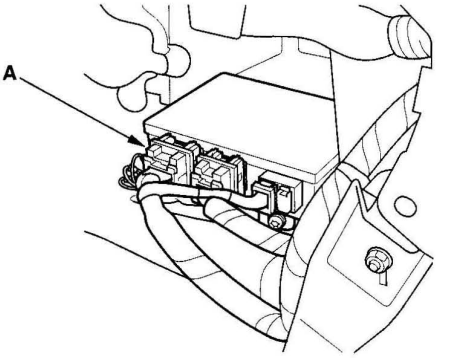
16. Disconnect the front passenger's airbag 4P connector (A) from the SRS main harness 4P connector (B).



17. Disconnect both seat belt tensioner 2P connectors (A).



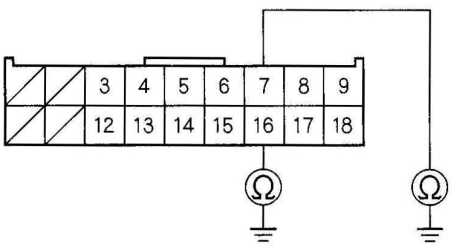
18. Disconnect SRS unit connector A (18P) from the SRS unit.



19. Disconnect the special tool from the SRS main harness 2P connector.

20. Check resistance between the No. 7 terminal of SRS unit connector A (18P) and body ground, and the No. 16 terminal and body ground. There should be 1 MΩ or more.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO – Short to ground in the SRS main harness; replace the SRS main harness. ■

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DTC Troubleshooting (cont'd)

DTC 2-1: Open or Increased Resistance in Front Passenger's Airbag Inflator

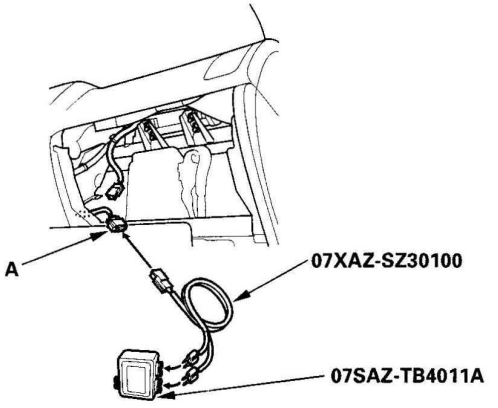
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's airbag 4P connector from the SRS main harness 4P connector (A).

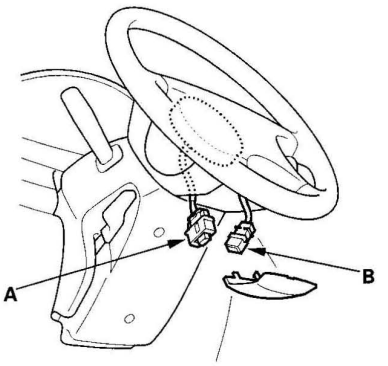


5. Connect the special tool (2 Ω connector) to the SRS main harness 4P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

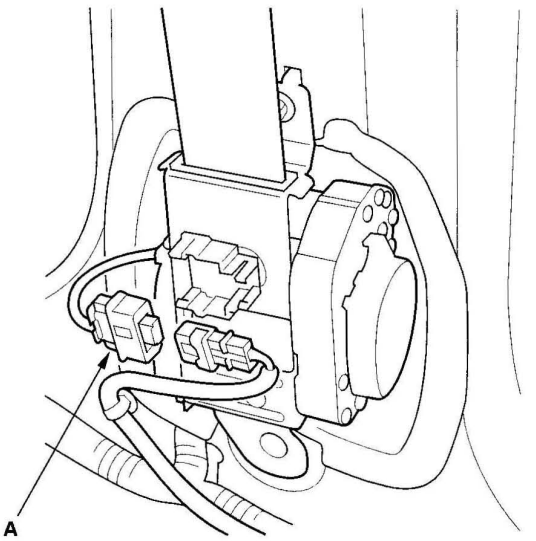
   Is DTC 2-1 indicated?

   YES – Go to step 9.

   NO – Open or increased resistance in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-118). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the driver's airbag 2P connector (A) from the cable reel 2P connector (B).



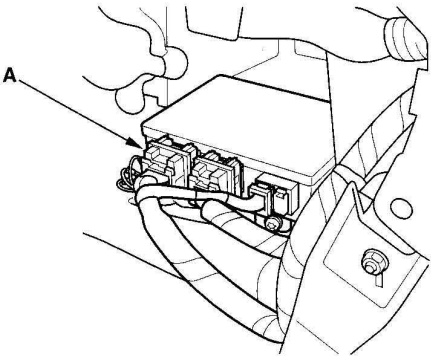
11. Disconnect both seat belt tensioner 2P connectors (A).



BACK

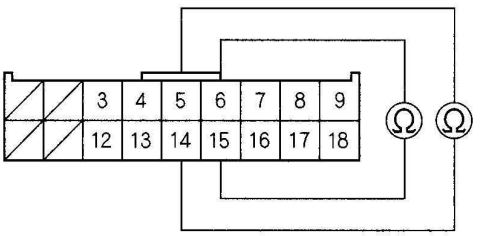
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12. Disconnect SRS unit connector A (18P) from the SRS unit.



13. Check resistance between the No. 6 and No. 15 terminals and between the No. 5 and No. 14 terminals of SRS unit connector A (18P). There should be 2.0—3.0 Ω.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at the SRS unit connector. Check the connection. If the connector is OK, replace the SRS unit (see page 23-127).■

NO—Open or increased resistance in the SRS main harness; replace the SRS main harness.■

DTC 2-3: Short to Another Wire or Decreased Resistance in Front Passenger's Airbag Inflator

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-27).

2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

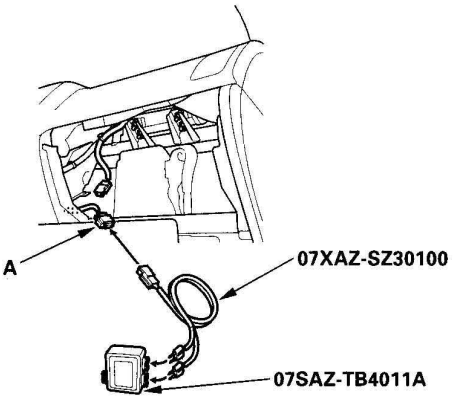
   Does the SRS indicator light stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the front passenger's airbag 4P connector from the SRS main harness 4P connector (A).



5. Connect the special tool (2 Ω connector) to the SRS main harness 4P connector.

6. Reconnect the battery negative cable.

7. Erase the DTC memory.

(cont'd)

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DTC Troubleshooting (cont'd)

8. Read the DTC.

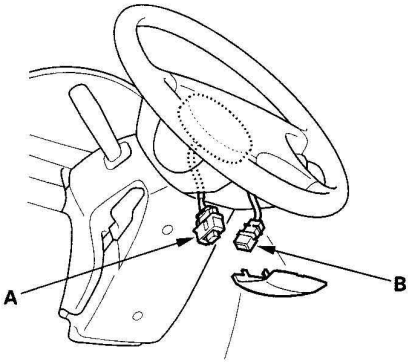
   Is DTC 2-3 indicated?

   YES – Go to step 9.

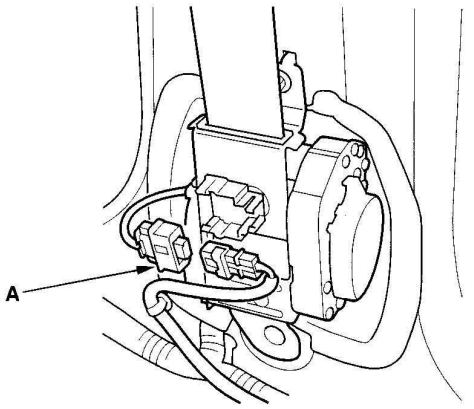
   NO – Short in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-118). ■

9. Disconnect the battery negative cable, and wait for 3 minutes.

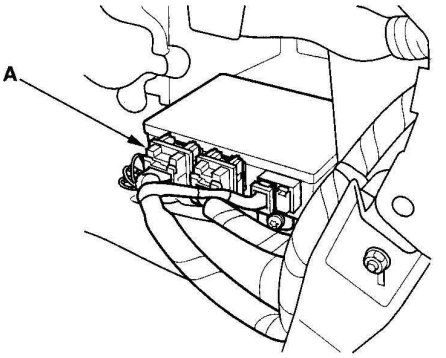
10. Disconnect the driver's airbag 2P connector (A) from the cable reel 2P connector (B).



11. Disconnect both seat belt tensioner 2P connectors (A).



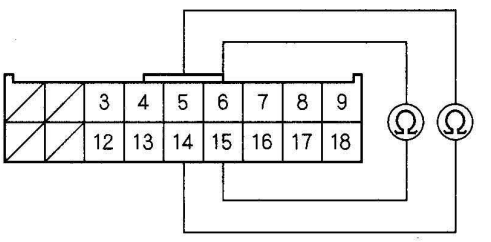
12. Disconnect SRS unit connector A (18P) from the SRS unit.



13. Disconnect the special tool from the SRS main harness 4P connector.

14. Check resistance between the No. 6 and No. 15 terminals and between the No. 5 and No. 14 terminals of SRS unit connector A (18P). There should be 1 MΩ or more.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO – Short in the SRS main harness; replace the SRS main harness. ■

BACK

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DTC 2-4: Short to Power in Front Passenger's Airbag Inflator

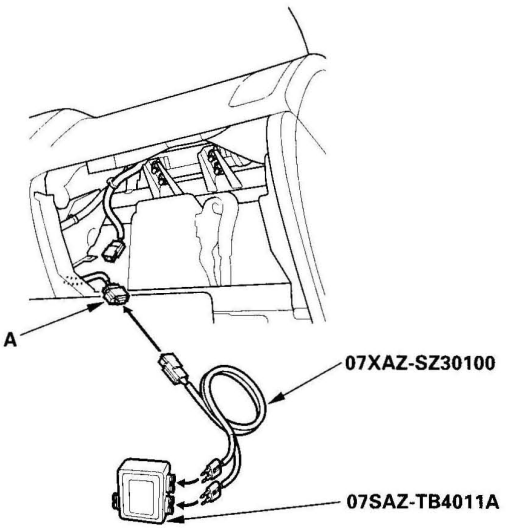
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's airbag 4P connector from the SRS main harness 4P connector (A).

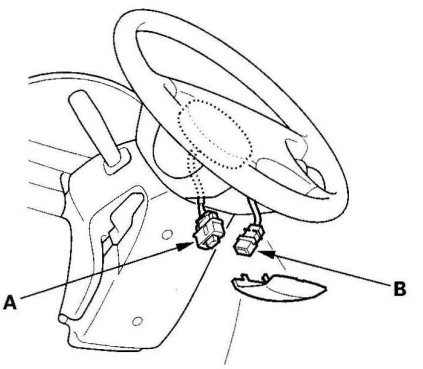


5. Connect the special tool (2 Ω connectors) to the SRS main harness 4P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

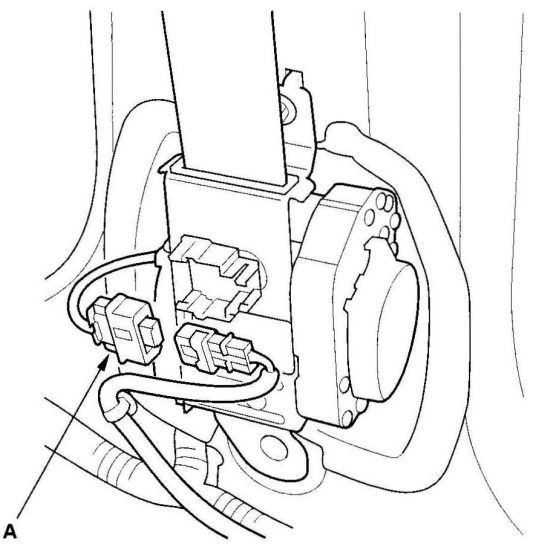
   Is DTC 2-4 indicated?

   YES – Go to step 9.

   NO – Short to power in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-118). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the driver's airbag 2P connector (A) from the cable reel 2P connector (B).



11. Disconnect both seat belt tensioner 2P connectors (A).



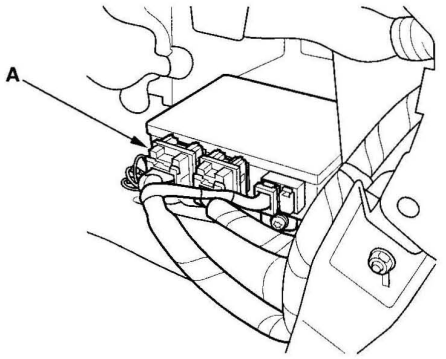
(cont'd)

BACK

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DTC Troubleshooting (cont'd)

12. Disconnect SRS unit 18P connector A (18P) from the SRS unit.



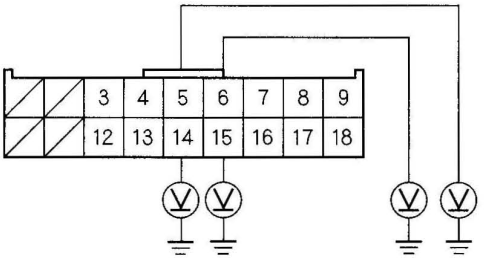
13. Disconnect the special tool from the SRS main harness 4P connector.

14. Reconnect the battery negative cable.

15. Turn the ignition switch ON (II).

16. Check for voltage between the No. 6 terminal of SRS unit connector A (18P) and body ground, the No. 15 terminal and body ground, the No. 5 terminal and body ground, and the No. 14 terminal and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the voltage as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO – Short to power in the SRS main harness; replace the SRS main harness. ■

DTC 2-5: Short to Ground in Front Passenger's Airbag Inflator

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-27).

2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

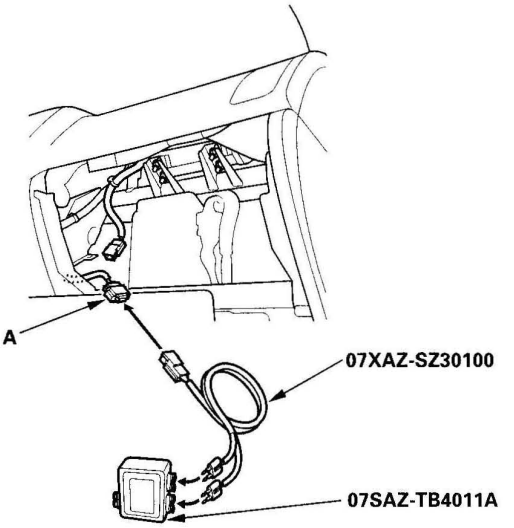
   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the front passenger's airbag 4P connector from the SRS main harness 4P connector (A).



5. Connect the special tool (2 Ω connectors) to the SRS main harness 4P connector.

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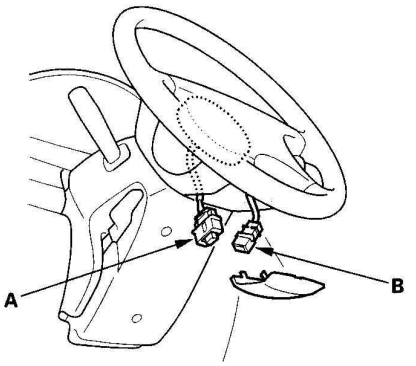
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 2-5 indicated?

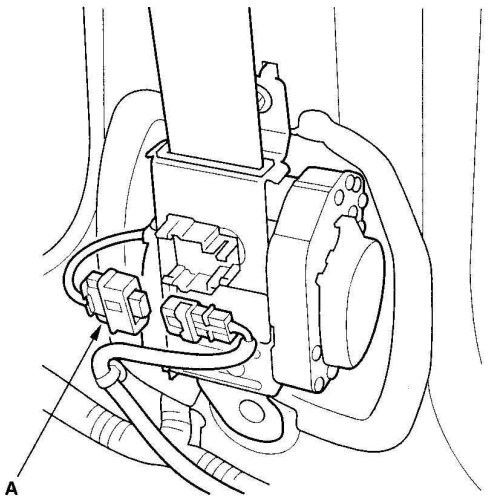
   YES – Go to step 9.

   NO – Short to ground in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-118). ■

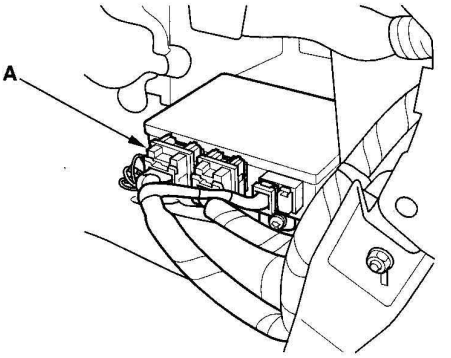
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the driver's airbag 2P connector (A) from the cable reel 2P connector (B).



11. Disconnect both seat belt tensioner 2P connectors (A).

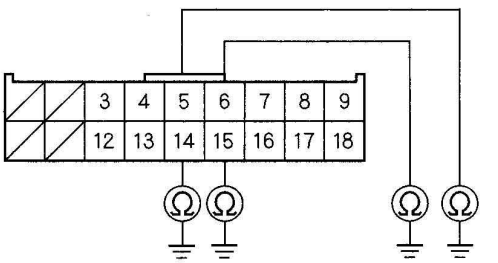


12. Disconnect SRS unit connector A (18P) from the SRS unit.



13. Disconnect the special tool from the SRS main harness 4P connector.
14. Check resistance between the No. 6 terminal of SRS unit connector A (18P) and body ground, the No. 15 terminal and body ground, the No. 5 terminal and body ground, and the No. 14 terminal and body ground. There should be 1 MΩ or more.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO – Short to ground in the SRS main harness; replace the SRS main harness. ■

BACK

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DTC Troubleshooting (cont'd)

DTC 3-1: Open or Increased Resistance in Driver's Seat Belt Tensioner

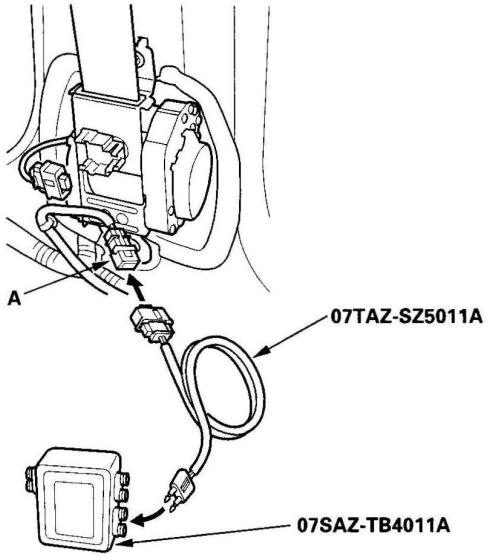
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's seat belt tensioner 2P connector from the SRS side harness 2P connector (A).

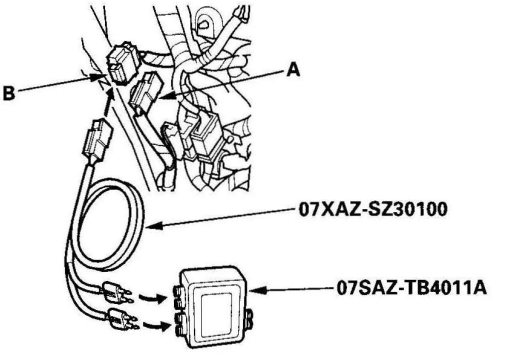


5. Connect the special tool (2 Ω connector) to the SRS side harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 3-1 indicated?

   YES – Go to step 9.

   NO – Open or increased resistance in the driver's seat belt tensioner; replace the driver's seat belt (see page 23-4). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS side harness 4P connector C802 (A) (located under the center console, between the SRS unit and the rear blower motor, clipped to the dashboard support) from the SRS main harness 4P connector (B).



11. Connect the special tool (2 Ω connectors) to the SRS main harness 4P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 3-1 indicated?

    YES – Go to step 15.

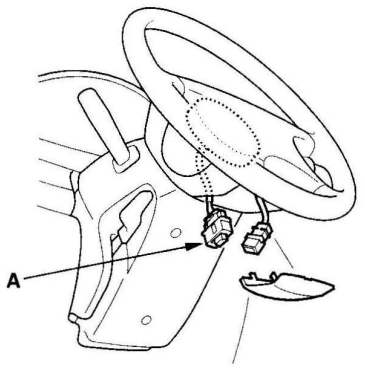
    NO – Open or increased resistance in the SRS side harness; replace the SRS side harness. ■

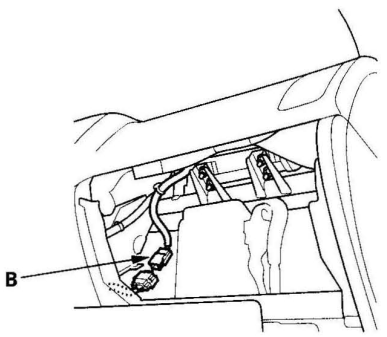
BACK

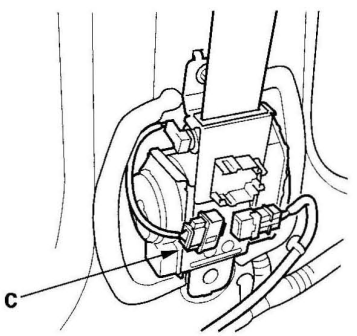
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15. Disconnect the battery negative cable, and wait for 3 minutes.

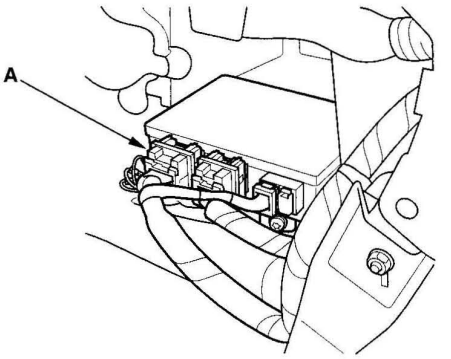
16. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and front passenger's seat belt tensioner connector (C).





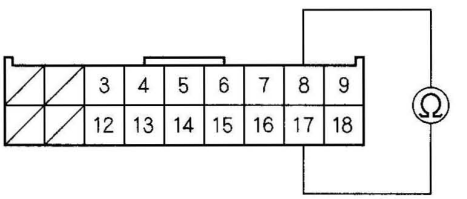


17. Disconnect SRS unit connector A (18P) from the SRS unit.



18. Check resistance between the No. 8 terminal and the No. 17 terminal of SRS unit connector A (18P). There should be 2.0—3.0 Ω.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at SRS unit connector A (18P) and at the SRS unit. Check the connection between SRS unit connector A (18P) and the SRS unit. If the connection is OK, replace the SRS unit (see page 23-127).■

NO—Open or increased resistance in the SRS main harness; replace the SRS main harness.■

BACK

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DTC Troubleshooting (cont'd)

DTC 3-3: Short to Another Wire or Decreased Resistance in Driver's Seat Belt Tensioner

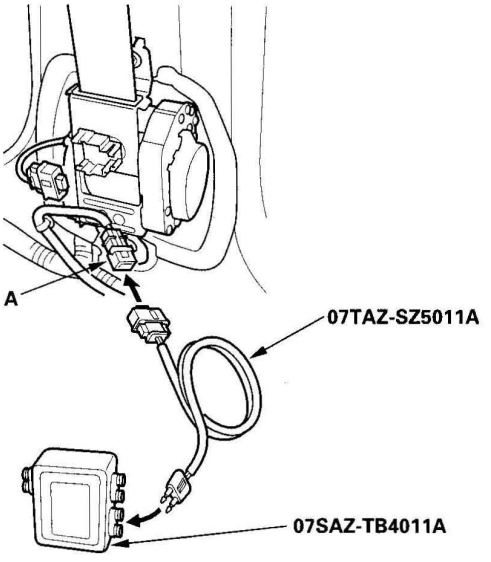
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's seat belt tensioner 2P connector from the SRS side harness 2P connector (A).

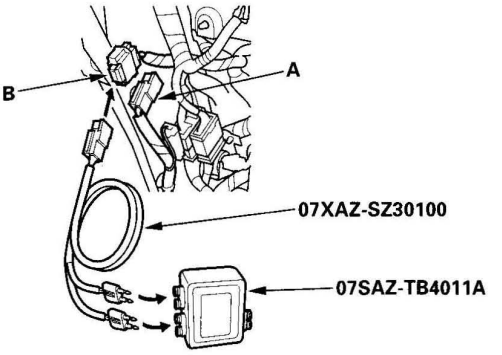


5. Connect the special tool (2 Ω connector) to the SRS side harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 3-3 indicated?

   YES – Go to step 9.

   NO – Short in the driver's seat belt tensioner; replace the driver's seat belt (see page 23-4). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS side harness 4P connector C802 (A) (located under the center console, between the SRS unit and the rear blower motor, clipped to the dashboard support) from the SRS main harness 4P connector (B).



11. Connect the special tool (2 Ω connectors) to the SRS main harness 4P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 3-3 indicated?

    YES – Go to step 15.

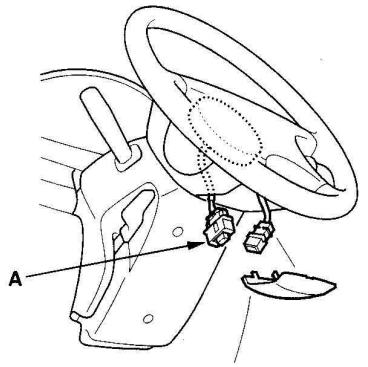
    NO – Short in the SRS side harness; replace the SRS side harness. ■

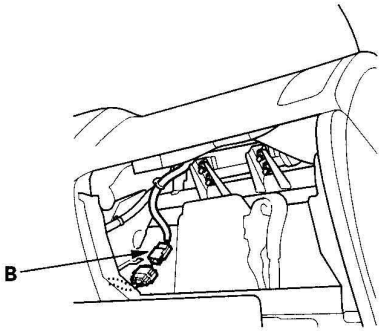
BACK

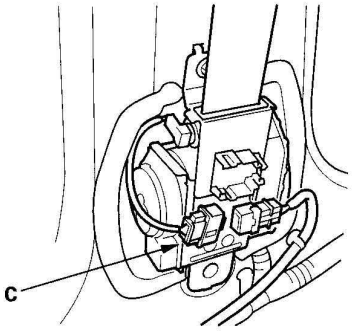
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15. Disconnect the battery negative cable, and wait for 3 minutes.

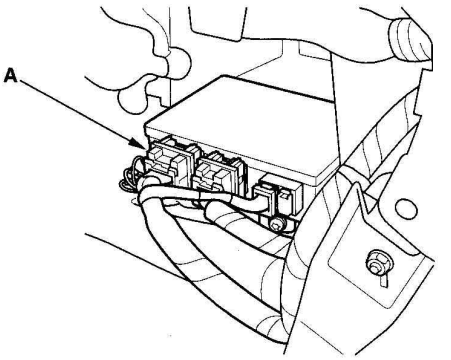
16. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and front passenger's seat belt tensioner connector (C).







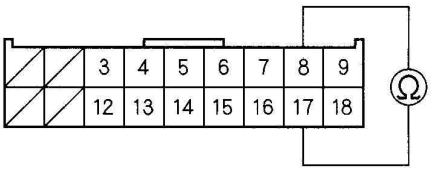
17. Disconnect SRS unit connector A (18P) from the SRS unit.



18. Disconnect the special tool from the SRS main harness 4P connector.

19. Check resistance between the No. 8 terminal and the No. 17 terminal of SRS unit connector A (18P). There should be 1 M Ω or more.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127).■

NO—Short in the SRS main harness; replace the SRS main harness.■

BACK

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DTC Troubleshooting (cont'd)

DTC 3-4: Short to Power in Driver's Seat Belt Tensioner

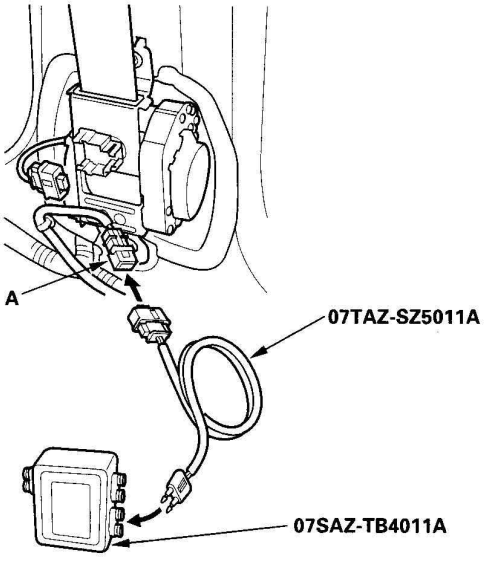
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's seat belt tensioner 2P connector from the SRS side harness 2P connector (A).

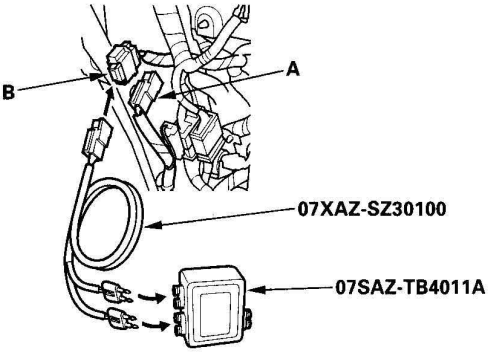


5. Connect the special tool (2 Ω connector) to the SRS side harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 3-4 indicated?

   YES – Go to step 9.

   NO – Short to power in the driver's seat belt tensioner; replace the driver's seat belt (see page 23-4).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS side harness 4P connector C802 (A) (located under the center console, between the SRS unit and the rear blower motor, clipped to the dashboard support) from the SRS main harness 4P connector (B).



11. Connect the special tool (2 Ω connectors) to the SRS main harness 4P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 3-4 indicated?

    YES – Go to step 15.

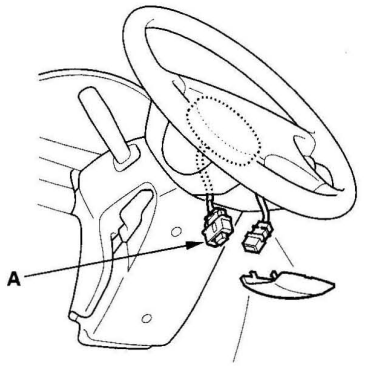
    NO – Short to power in the SRS side harness; replace the SRS side harness.■

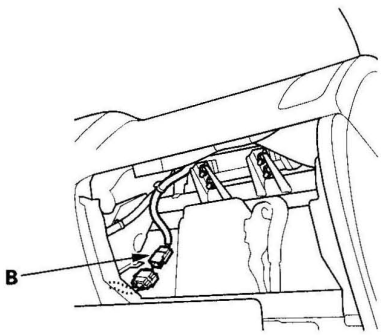
BACK

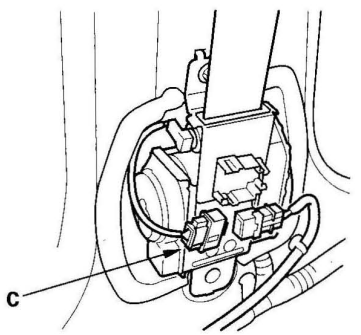
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15. Disconnect the battery negative cable, and wait for 3 minutes.

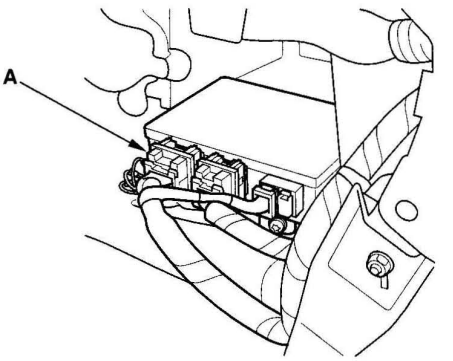
16. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and front passenger's seat belt tensioner connector (C).







17. Disconnect SRS unit connector A (18P) from the SRS unit.



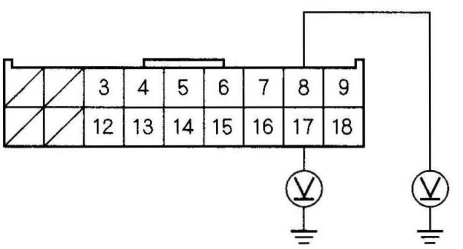
18. Disconnect the special tool from the SRS main harness 4P connector.

19. Reconnect the battery negative cable.

20. Turn the ignition switch ON (II).

21. Check for voltage between the No. 8 terminal of SRS unit connector A (18P) and body ground, and the No. 17 terminal and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the voltage as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO – Short to power in the SRS main harness; replace the SRS main harness. ■

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DTC Troubleshooting (cont'd)

DTC 3-5: Short to Ground in Driver's Seat Belt Tensioner

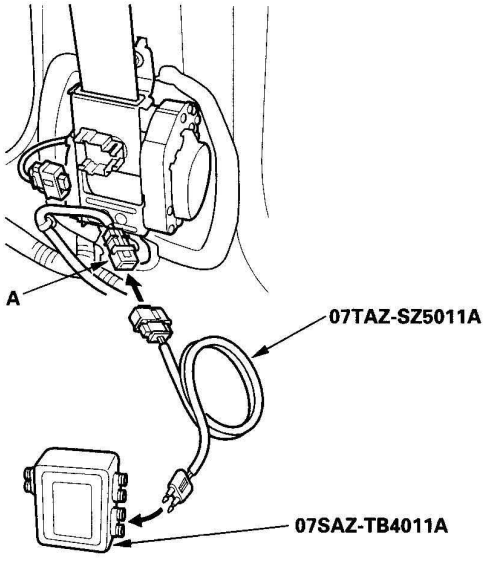
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's seat belt tensioner 2P connector from the SRS side harness 2P connector (A).

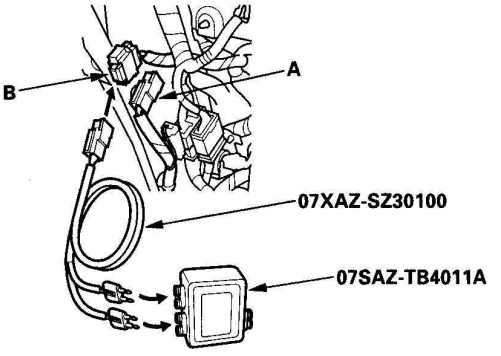


5. Connect the special tool (2 Ω connector) to the SRS side harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 3-5 indicated?

   YES – Go to step 9.

   NO – Short to ground in the driver's seat belt tensioner; replace the driver's seat belt (see page 23-4). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS side harness 4P connector C802 (A) (located under the center console, between the SRS unit and the rear blower motor, clipped to the dashboard support) from the SRS main harness 4P connector (B).



11. Connect the special tool (2 Ω connectors) to the SRS main harness 4P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 3-5 indicated?

    YES – Go to step 15.

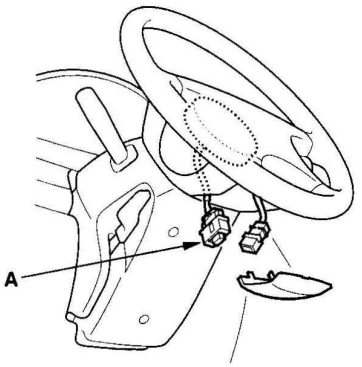
    NO – Short to ground in the SRS side harness; replace the SRS side harness. ■

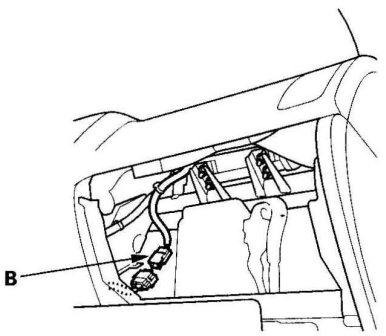
BACK

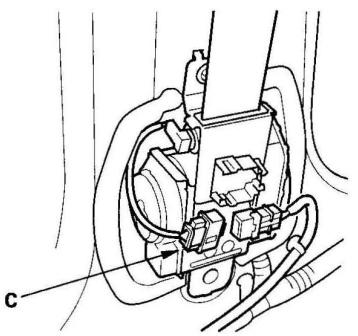
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15. Disconnect the battery negative cable, and wait for 3 minutes.

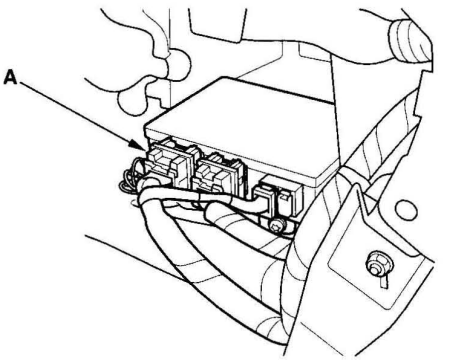
16. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and front passenger's seat belt tensioner connector (C).







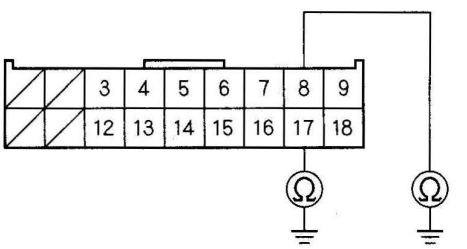
17. Disconnect SRS unit connector A (18P) from the SRS unit.



18. Disconnect the special tool from the SRS main harness 4P connector.

19. Check resistance between the No. 8 terminal of SRS unit connector A (18P) and body ground, and the No. 17 terminal and body ground. There should be 1 M Ω or more.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO – Short to ground in the SRS main harness; replace the SRS main harness. ■

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DTC Troubleshooting (cont'd)

DTC 4-1: Open or Increased Resistance in Front Passenger's Seat Belt Tensioner

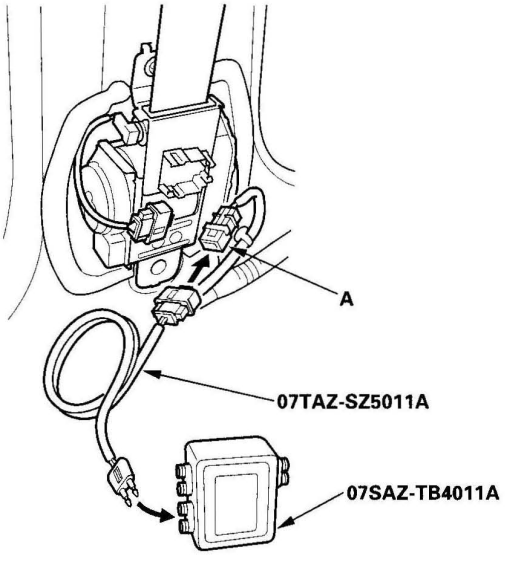
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's seat belt tensioner 2P connector from the SRS side sub harness 2P connector (A).

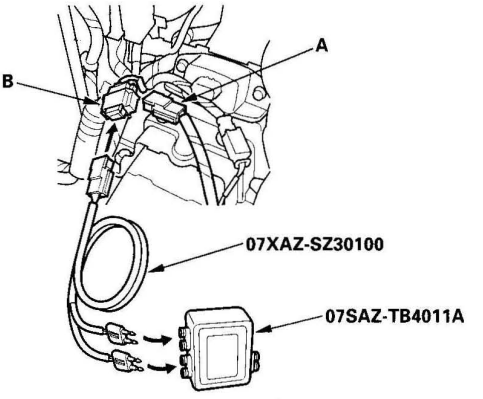


5. Connect the special tool (2 Ω connector) to the SRS side sub harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 4-1 indicated?

   YES – Go to step 9.

   NO – Open or increased resistance in the front passenger's seat belt tensioner; replace the front passenger's seat belt (see page 23-4). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS side sub harness 4P connector C804 (A) (located under the center console, between the SRS unit and the rear blower motor, clipped to the floor bracket) from the SRS side harness 4P connector (B).



11. Connect the special tool (2 Ω connectors) to the SRS side harness 4P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 4-1 indicated?

    YES – Go to step 15.

    NO – Open or increased resistance in the SRS side sub harness; replace the SRS side sub harness. ■

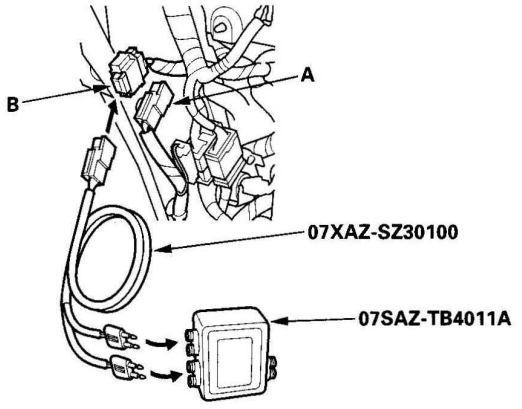
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15. Disconnect the battery negative cable, and wait for 3 minutes.

16. Disconnect the special tool from the SRS side harness 4P connector.

17. Disconnect the SRS side harness 4P connector C802 (A) (clipped to the dashboard support) from the SRS main harness 4P connector (B).



18. Connect the special tool (2 Ω connectors) to the SRS main harness 4P connector.

19. Reconnect the battery negative cable.

20. Erase the DTC memory.

21. Read the DTC.

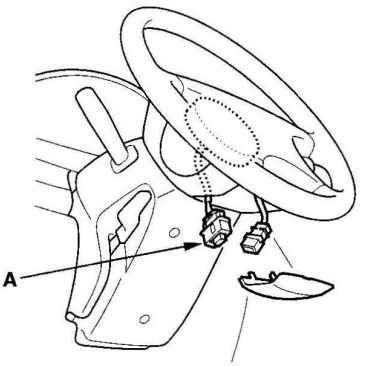
Is DTC 4-1 indicated?

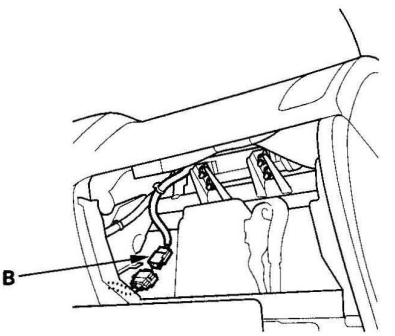
YES – Go to step 22.

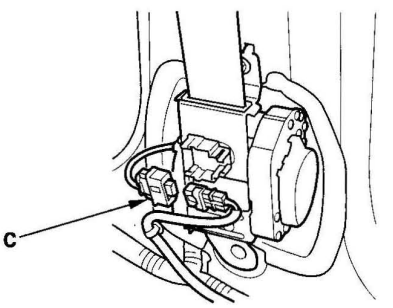
NO – Open or increased resistance in the SRS side harness; replace the SRS side harness. ■

22. Disconnect the battery negative cable, and wait for 3 minutes.

23. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and driver's seat belt tensioner connector (C).





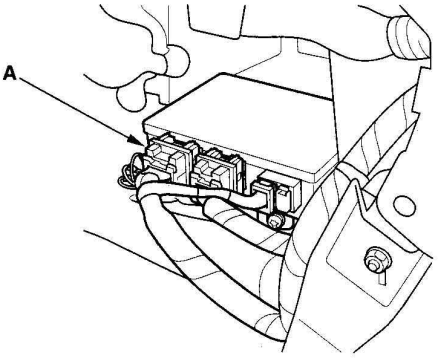


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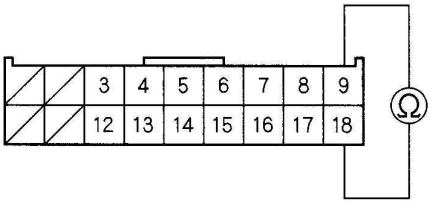
DTC Troubleshooting (cont'd)

24. Disconnect SRS unit connector A (18P) from the SRS unit.



25. Check resistance between the No. 9 terminal and the No. 18 terminal of SRS unit connector A (18P). There should be 2.0—3.0 Ω.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at SRS unit connector A (18P) and the SRS unit. Check the connection between SRS unit connector A (18P) and the SRS unit. If the connection is OK, replace the SRS unit (see page 23-127). ■

NO—Open or increased resistance in the SRS main harness; replace the SRS main harness. ■

DTC 4-3: Short to Another Wire or Decreased Resistance in Front Passenger's Seat Belt Tensioner

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-27).

2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

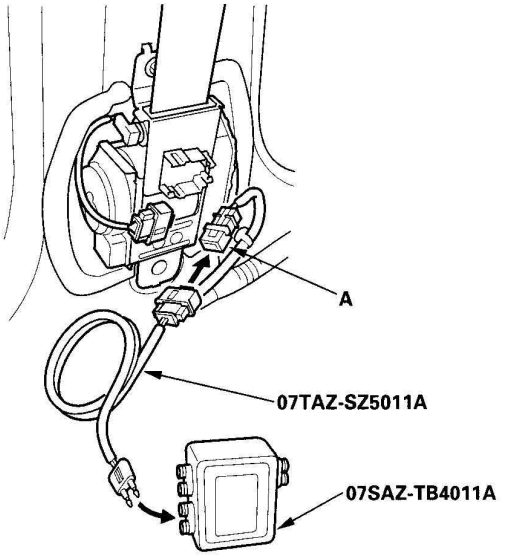
   Does the SRS indicator light stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the front passenger's seat belt tensioner 2P connector from the SRS side sub harness 2P connector (A).



5. Connect the special tool (2 Ω connector) to the SRS side sub harness 2P connector.

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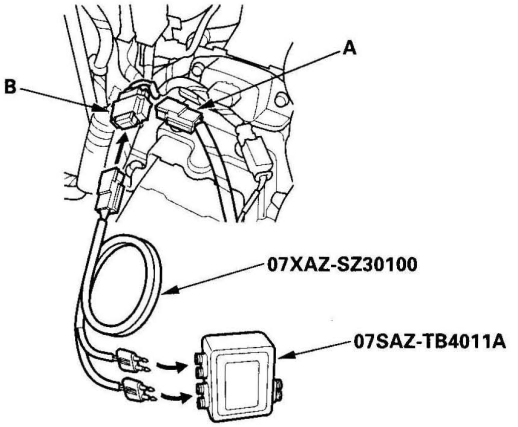
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 4-3 indicated?

   YES – Go to step 9.

   NO – Short in the front passenger's seat belt tensioner; replace the front passenger's seat belt (see page 23-4). ■

9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS side sub harness 4P connector C804 (A) (located under the center console, between the SRS unit and the rear blower motor, clipped to the floor bracket) from the SRS side harness 4P connector (B).



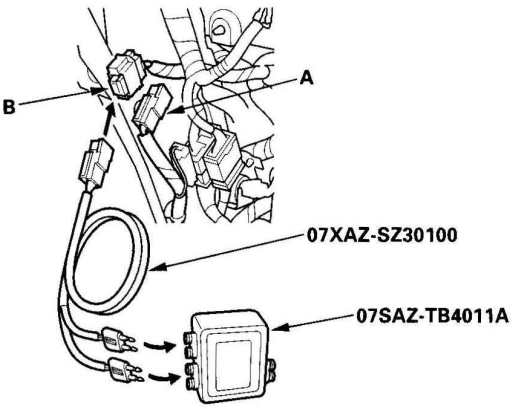
11. Connect the special tool (2 Ω connectors) to the SRS side harness 4P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 4-3 indicated?

    YES – Go to step 15.

    NO – Short in the SRS side sub harness; replace the SRS side sub harness. ■

15. Disconnect the battery negative cable, and wait for 3 minutes.
16. Disconnect the special tool from the SRS side harness 4P connector.
17. Disconnect the SRS side harness 4P connector C802 (A) (clipped to the dashboard support) from the SRS main harness 4P connector (B).



18. Connect the special tool (2 Ω connectors) to the SRS main harness 4P connector.
19. Reconnect the battery negative cable.
20. Erase the DTC memory.
21. Read the DTC.

    Is DTC 4-3 indicated?

    YES – Go to step 22.

    NO – Short in the SRS side harness; replace the SRS side harness. ■

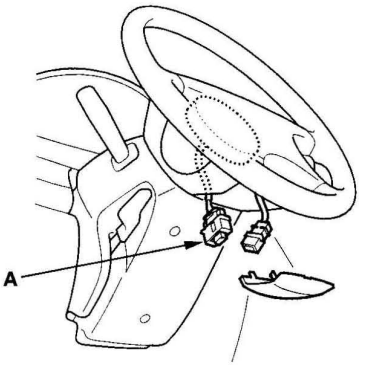
22. Disconnect the battery negative cable, and wait for 3 minutes.

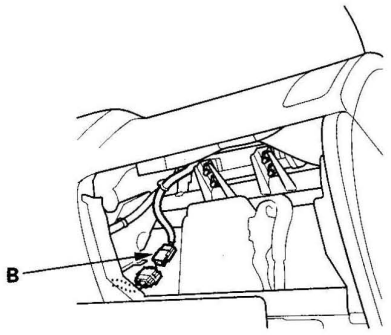
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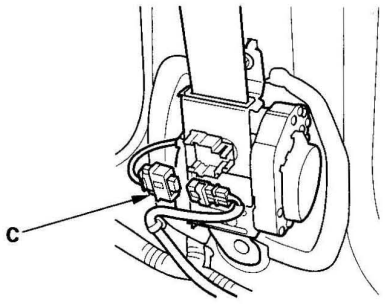
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DTC Troubleshooting (cont'd)

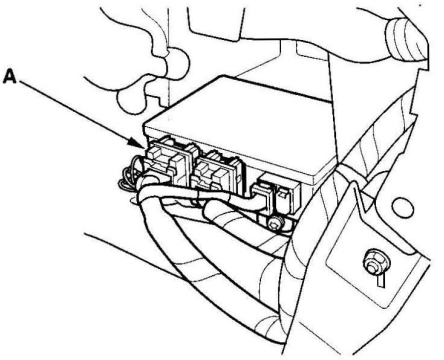
23. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and driver's seat belt tensioner (C).







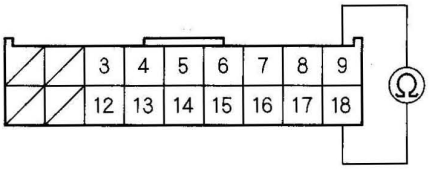
24. Disconnect SRS unit connector A (18P) from the SRS unit.



25. Disconnect the special tool from the SRS main harness 4P connector.

26. Check resistance between the No. 9 terminal and the No. 18 terminal of SRS unit connector A (18P). There should be 1 M Ω or more.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO – Short in the SRS main harness; replace the SRS main harness. ■

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DTC 4-4: Short to Power in Front Passenger's Seat Belt Tensioner

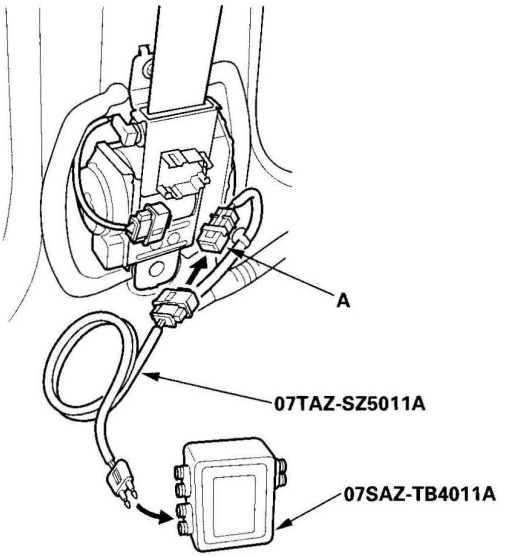
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's seat belt tensioner 2P connector from the SRS side sub harness 2P connector (A).

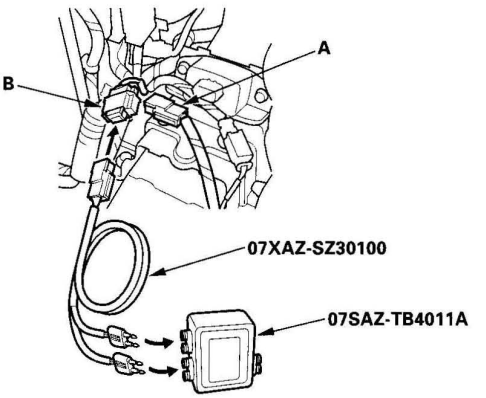


5. Connect the special tool (2 Ω connector) to the SRS side sub harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 4-4 indicated?

   YES – Go to step 9.

   NO – Short to power in the front passenger's seat belt tensioner; replace the front passenger's seat belt (see page 23-4). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS side sub harness 4P connector C804 (A) (located under the center console, between the SRS unit and the rear blower motor, clipped to the floor bracket) from the SRS side harness 4P connector (B).



11. Connect the special tool (2 Ω connectors) to the SRS side harness 4P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 4-4 indicated?

    YES – Go to step 15.

    NO – Short to power in the SRS side sub harness; replace the SRS side sub harness. ■

(cont'd)

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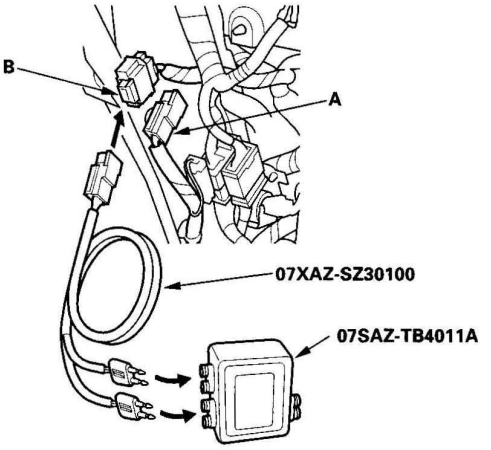
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DTC Troubleshooting (cont'd)

15. Disconnect the battery negative cable, and wait for 3 minutes.

16. Disconnect the special tool from the SRS side harness 4P connector.

17. Disconnect SRS side harness 4P connector C802 (A) (clipped to the dashboard support) from the SRS main harness 4P connector (B).



18. Connect the special tool (2 Ω connectors) to the SRS main harness 4P connector.

19. Reconnect the battery negative cable.

20. Erase the DTC memory.

21. Read the DTC.

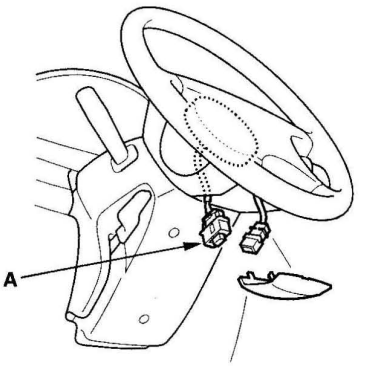
    Is DTC 4-4 indicated?

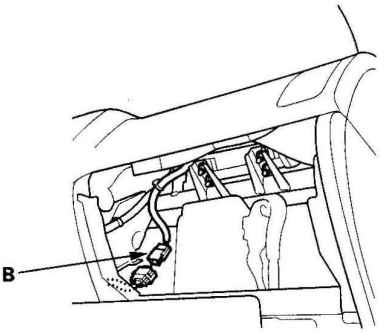
    YES—Go to step 22.

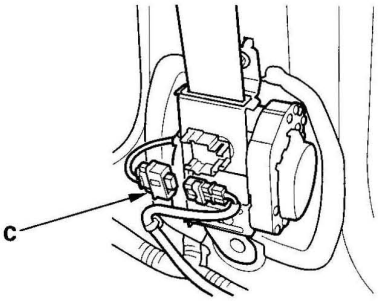
    NO—Short to power in the SRS side harness; replace the SRS side harness.■

22. Disconnect the battery negative cable, and wait for 3 minutes.

23. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and driver's seat belt tensioner connector (C).



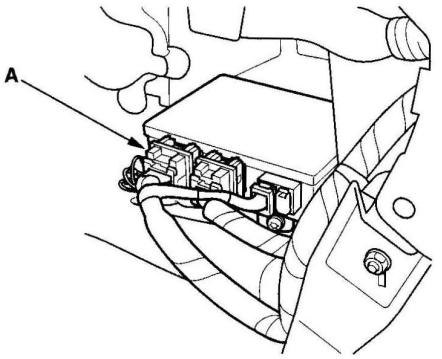




BACK

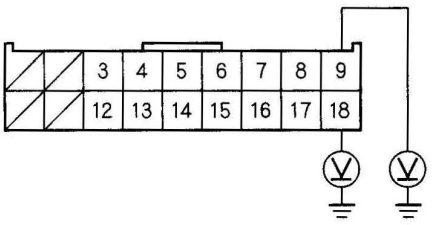
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24. Disconnect SRS unit connector A (18P) from the SRS unit.



25. Disconnect the special tool from the SRS main harness 4P connector.
26. Reconnect the battery negative cable.
27. Turn the ignition switch ON (II).
28. Check for voltage between the No. 9 terminal of SRS unit connector A (18P) and body ground, and the No. 18 terminal and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the voltage as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-128). ■

NO – Short to power in the SRS main harness; replace the SRS main harness. ■

DTC 4-5: Short to Ground in Front Passenger's Seat Belt Tensioner

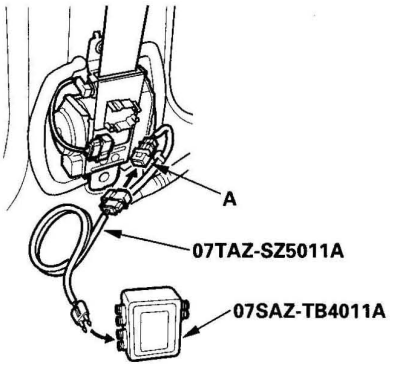
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's seat belt tensioner 2P connector from the SRS side sub harness 2P connector (A).



5. Connect the special tool (2 Ω connector) to the SRS side sub harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.

(cont'd)

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DTC Troubleshooting (cont'd)

8. Read the DTC.

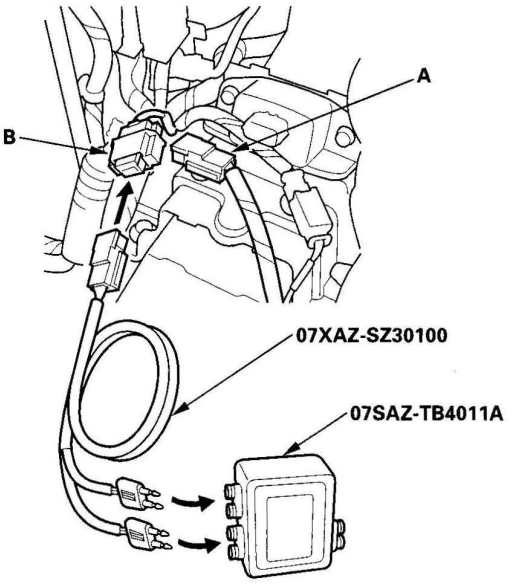
   Is DTC 4-5 indicated?

   YES – Go to step 9.

   NO – Short to ground in the front passenger's seat belt tensioner; replace the front passenger's seat belt (see page 23-4). ■

9. Disconnect the battery negative cable, and wait for 3 minutes.

10. Disconnect the SRS side sub harness 4P connector C804 (A) (located under the center console, between the SRS unit and the rear blower motor, clipped to the floor bracket) from the SRS side harness 4P connector (B).



11. Connect the special tool (2 Ω connectors) to the SRS side harness 4P connector.

12. Reconnect the battery negative cable.

13. Erase the DTC memory.

14. Read the DTC.

    Is DTC 4-5 indicated?

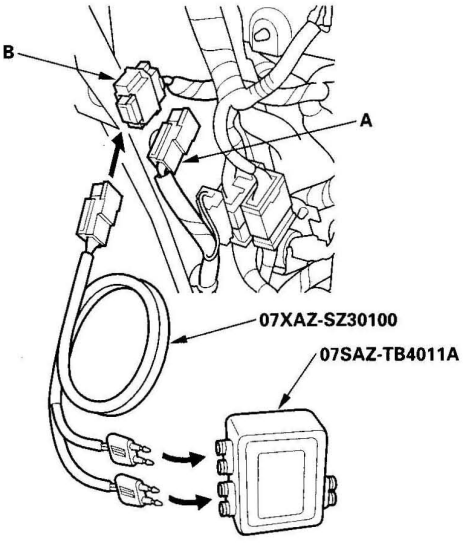
    YES – Go to step 15.

    NO – Short to ground in the SRS side sub harness; replace the SRS side sub harness. ■

15. Disconnect the battery negative cable, and wait for 3 minutes.

16. Disconnect the special tool from the SRS side harness 4P connector.

17. Disconnect the SRS side harness 4P connector C802 (A) (clipped to the dashboard support) from the SRS main harness 4P connector (B).



18. Connect the special tool (2 Ω connectors) to the SRS main harness 4P connector.

19. Reconnect the battery negative cable.

20. Erase the DTC memory.

21. Read the DTC.

    Is DTC 4-5 indicated?

    YES – Go to step 22.

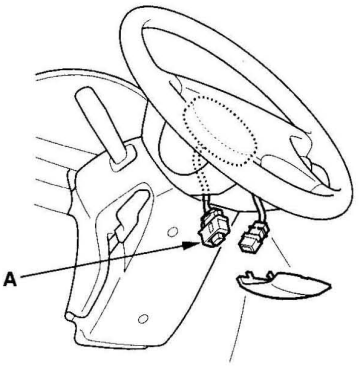
    NO – Short to ground in the SRS side harness; replace the SRS side harness. ■

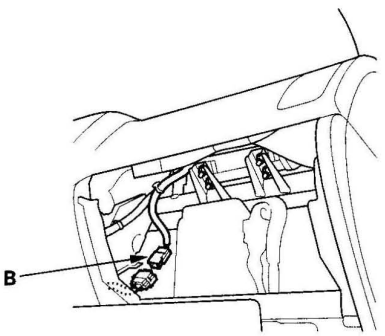
BACK

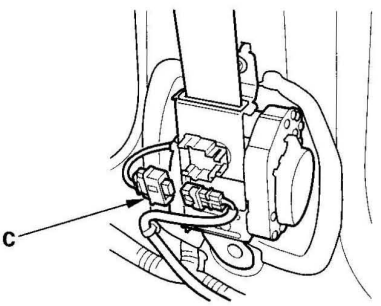
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22. Disconnect the battery negative cable, and wait for 3 minutes.

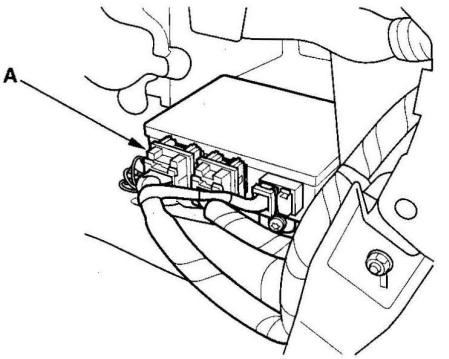
23. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and driver's seat belt tensioner connector (C).







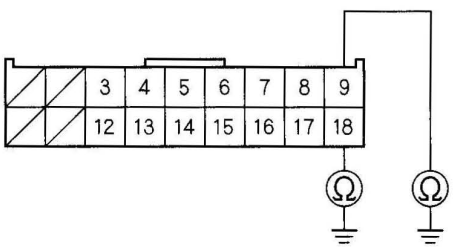
24. Disconnect SRS unit connector A (18P) from the SRS unit.



25. Disconnect the special tool from the SRS main harness 4P connector.

26. Check resistance between the No. 9 terminal of SRS unit connector A (18P) and body ground, and the No. 18 terminal and body ground. There should be 1 M Ω or more.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO – Short to ground in the SRS main harness; replace the SRS main harness. ■

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DTC Troubleshooting (cont'd)

DTC 5-1, 5-2, 5-4, 5-8, 6-3, 6-4, 6-7, 6-8, 7-1, 7-2, 7-3, 8-1, 8-2, 8-3, 8-4, 8-5, 8-6, 8-7, 8-8, 9-1, 9-2: Internal Failure of the SRS Unit

NOTE: Before troubleshooting any of these DTCs, check the battery/system voltage. If the voltage is low, repair the charging system before troubleshooting the SRS. If the battery/system voltage is now OK, ask the customer if the battery ever went dead.

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Replace the SRS unit (see page 23-127).

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).

DTC 10-1, 10-2, 10-3, 10-4, 10-5, 10-6, 10-7: Airbags, Side Airbags and/or Seat Belt Tensioners Deployed

The SRS unit must be replaced after any airbags have deployed (see page 23-127).■

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DTC 13-1, 13-2: Internal Failure of the Driver's Side Impact Sensor

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Replace the driver's side impact sensor (see page 23-128). ■

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).

DTC 14-1, 14-2: Internal Failure of the Front Passenger's Side Impact Sensor

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Replace the front passenger's side impact sensor (see page 23-128). ■

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).

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DTC Troubleshooting (cont'd)

DTC 9-3: Faulty Driver's Seat Belt Buckle Switch

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), then buckle and unbuckle the driver's seat belt several times.
3. Read the DTC.

   Is DTC 9-3 indicated?

   YES – Go to step 4.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
4. Check the No. 9 (10A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse blown?

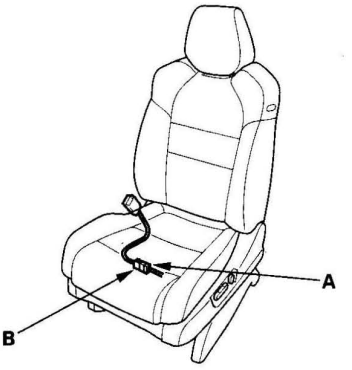
   YES – Go to step 5.

   NO – Go to step 6.
5. Replace the No. 9 (10A) fuse in the under-dash fuse /relay box, and turn the ignition switch ON (II) for 30 seconds.

   Did the fuse blow-out again?

   YES – Locate and repair the short to ground on the No. 9 fuse circuit, then clear the DTC.■

   NO – Go to step 6.
6. Turn the ignition switch OFF.
7. Disconnect the driver's seat wire harness 3P connector (A) from the driver's seat belt buckle switch 3P connector (B).

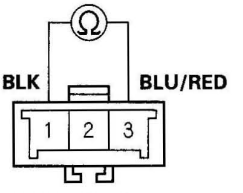


8. Buckle the driver's seat belt.

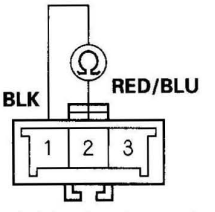
   Check resistance between the No. 1 and No. 3 terminals of the driver's seat belt buckle switch 3P connector. There should be 0 – 1 Ω.

   Check resistance between the No. 1 and No. 2 terminals of the same connector. There should be 1 MΩ or more.

DRIVER'S SEAT BELT BUCKLE SWITCH 3P CONNECTOR



Terminal side of male terminals



Terminal side of male terminals

Is the resistance as specified?

YES – Go to step 9.

NO – Replace the driver's seat belt buckle assembly, then clear the DTC.■

BACK

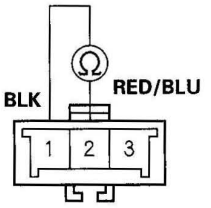
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9. Unbuckle the driver's seat belt.

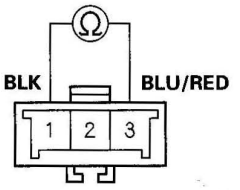
   Check resistance between the No. 1 and No. 2 terminals of the driver's seat belt buckle switch 3P connector. There should be 0 – 1 Ω.

   Check resistance between the No. 1 and No. 3 terminals of the same connector. There should be 1 MΩ or more.

DRIVER'S SEAT BELT BUCKLE SWITCH 3P CONNECTOR



Terminal side of male terminals



Terminal side of male terminals

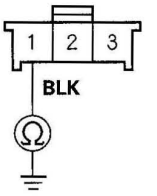
Is the resistance as specified?

YES – Go to step 10.

NO – Replace the driver's seat belt buckle assembly, then clear the DTC. ■

10. Check resistance between the No. 1 terminal of the driver's seat wire harness 3P connector and body ground. There should be 0 – 1 Ω.

DRIVER'S SEAT WIRE HARNESS 3P CONNECTOR



Wire side of female terminals

Is the resistance as specified?

YES – Go to step 11.

NO – Open in the driver's seat wire harness, open in the left floor wire harness, or poor ground connection at G631. If G631 is OK, replace the faulty harness. ■

11. Turn the ignition switch ON (II).

Does the seat belt reminder stay on?

YES – Go to step 16.

NO – Go to step 12.

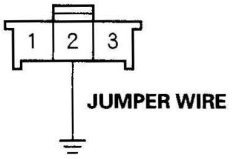
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DTC Troubleshooting (cont'd)

12. Connect the No. 2 terminal of the driver's seat wire harness 3P connector to body ground with a jumper wire.

DRIVER'S SEAT WIRE HARNESS 3P CONNECTOR



Wire side of female terminals

Does the seat belt reminder come on?

YES – Go to step 13.

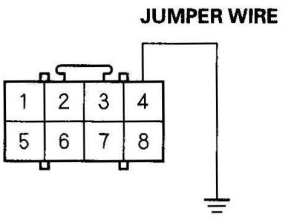
NO – Open in the driver's seat wire harness, left floor wire harness, dashboard wire harness A, or left side wire harness. Isloate the faulty harness, and replace the harness or component as necessary. ■

13. Turn the ignition switch OFF, then disconnect the negative cable from the battery, and wait at least 3 minutes.

14. Disconnect all SRS unit connectors from the SRS unit, then reconnect the battery.

15. Connect the No. 4 terminal of SRS unit connector C (8P) to body ground with a jumper wire. Turn the ignition switch ON (II).

SRS UNIT CONNECTOR C (8P)



Wire side of female terminals

Does the seat belt reminder come on?

YES – Disconnect the jumper wire, then go to step 18.

NO – Open in the SRS main harness or dashboard wire harness A. Replace the faulty harness. ■

16. Turn the ignition switch OFF, then disconnect the negative cable from the battery, and wait at least 3 minutes.

17. Disconnect SRS unit connector C (8P) from the SRS unit, reconnect the battery, and turn the ignition switch ON (II).

Does the seat belt reminder come on?

YES – Short to ground in the SRS main harness, dashboard wire harness A, left floor wire harness, driver's seat wire harness, or gauge assembly/ circuit board. Replace the faulty harness or component. ■

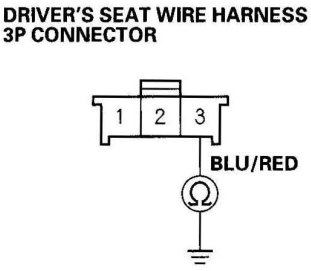
NO – Replace the SRS unit. ■

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18. Turn the ignition switch OFF.

19. Check resistance between the No. 3 terminal of the driver's seat wire harness 3P connector and body ground. There should be 1 MΩ or more.



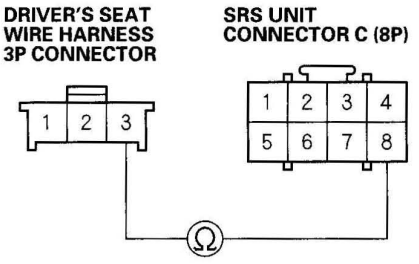
Wire side of female terminals

Is the resistance as specified?

YES — Go to step 20.

NO — Short to ground in the SRS main harness, dashboard wire harness A, left floor wire harness, or driver's seat wire harness. Replace the faulty harness. ■

20. Check resistance between the No. 8 terminal of SRS unit connector C (8P) and the No. 3 terminal of the driver's seat wire harness 3P connector. There should be 0 — 1 Ω.



Wire side of female terminals

Is the resistance as specified?

YES — Replace the SRS unit. ■

NO — Open in the SRS main harness, dashboard wire harness A, driver's seat wire harness, or left floor wire harness. Replace the faulty wire harness. ■

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DTC Troubleshooting (cont'd)

DTC 9-4: Faulty Front Passenger's Seat Belt Buckle Switch

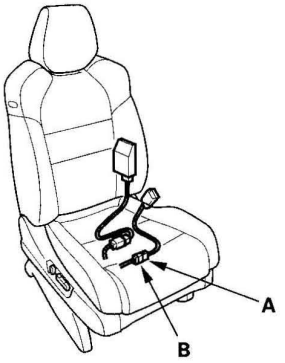
1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), then buckle and unbuckle the front passenger's seat belt several times.
3. Read the DTC.

   Is DTC 9-4 indicated?

   YES – Go to step 4.

   NO – Intermittent failure, system is OK at this time. Go to troubleshooting Intermittent Failures (see page 23-27).

4. Disconnect the front passenger's seat belt buckle switch 3P connector (A) from the passenger's seat wire harness 3P connector (B).

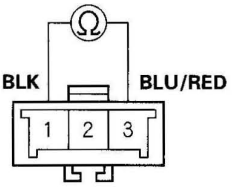


5. Buckle the front passenger's seat belt.

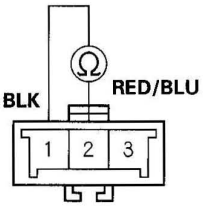
   Check resistance between the No. 1 and No. 3 terminals of the front passenger's seat belt buckle switch 3P connector. There should be 1 MΩ or more.

   Check resistance between the No. 1 and No. 2 terminals of the same connector. There should be 0 – 1 Ω.

FRONT PASSENGER'S SEAT BELT BUCKLE SWITCH 3P CONNECTOR



Terminal side of male terminals



Terminal side of male terminals

Is the resistance as specified?

YES – Go to step 6.

NO – Replace the front passenger's seat belt buckle assembly, then clear the DTC. ■

BACK

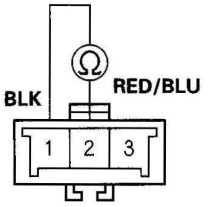
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6. Unbuckle the front passenger's seat belt.

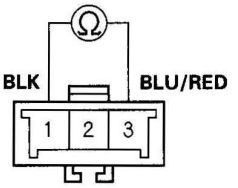
   Check resistance between the No. 1 and No. 2 terminals of the front passenger's seat belt buckle switch 3P connector. There should be 1 MΩ or more.

   Check resistance between the No. 1 and No. 3 terminals of the same connector. There should be 0—1 Ω.

FRONT PASSENGER'S SEAT BELT BUCKLE SWITCH 3P CONNECTOR



Terminal side of male terminals



Terminal side of male terminals

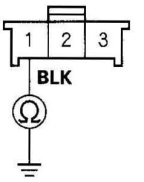
Is the resistance as specified?

YES—Go to step 7.

NO—Replace the front passenger's seat belt buckle assembly, then clear the DTC.■

7. Check resistance between the No. 1 terminal of the passenger's seat wire harness 3P connector and body ground. There should be 0—1 Ω.

PASSENGER'S SEAT WIRE HARNESS 3P CONNECTOR



Wire side of female terminals

Is the resistance as specified?

YES—Go to step 8.

NO—Open in the passenger's seat wire harness, open in the left floor wire harness, or poor ground connection at G631. If G631 is OK, replace the faulty harness.■

8. Disconnect the negative cable from the battery.

9. Disconnect SRS unit connector C (8P) from the SRS unit.

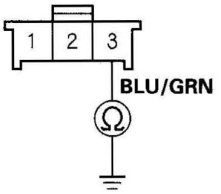
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DTC Troubleshooting (cont'd)

10. Check resistance between the No. 3 terminal of the passenger's seat wire harness 3P connector and body ground. There should be 1 MΩ or more.

PASSENGER'S SEAT WIRE HARNESS 3P CONNECTOR



Wire side of female terminals

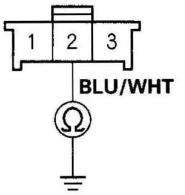
Is the resistance as specified?

YES – Go to step 11.

NO – Short to ground in the SRS main harness, dashboard wire harness A, left floor wire harness, or passenger's seat wire harness. Replace the faulty harness. ■

11. Check resistance between the No. 2 terminal of the passenger's seat wire harness 3P connector and body ground. There should be 1 MΩ or more.

PASSENGER'S SEAT WIRE HARNESS 3P CONNECTOR



Wire side of female terminals

Is the resistance as specified?

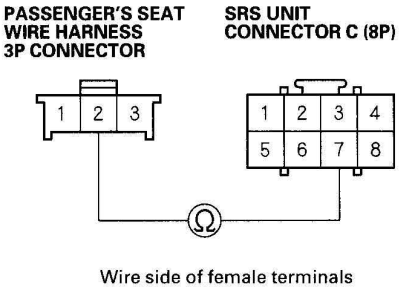
YES – Go to step 12.

NO – Short to ground in the SRS main harness, dashboard wire harness A, left floor wire harness, or passenger's seat wire harness. Isolate the faulty wire harness, and replace as necessary. ■

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12. Check resistance between the No. 7 terminal of SRS unit connector C (8P) and the No. 2 terminal of the passenger's seat wire harness 3P connector. There should be 0 — 1 Ω.

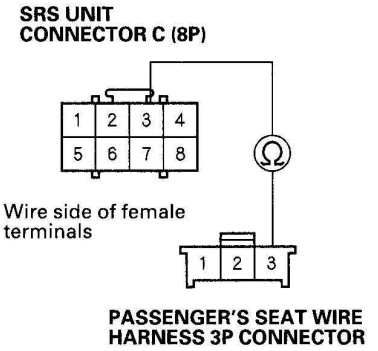


Is the resistance as specified?

YES — Go to step 13.

NO — Open in the SRS main harness, dashboard wire harness A, passenger's seat wire harness, or left floor wire harness. Isolate the faulty wire harness, and replace as necessary. ■

13. Check resistance between the No. 3 terminal of SRS unit connector C (8P) and the No. 3 terminal of the passenger's seat wire harness 3P connector. There should be 0 — 1 Ω.



Is the resistance as specified?

YES — Replace the SRS unit. ■

NO — Open in the SRS main harness, dashboard wire harness A, left floor wire harness, or passenger's seat wire harness. Isolate the faulty wire harness, and replace as necessary. ■

BACK

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DTC Troubleshooting (cont'd)

DTC 11-1: Open or Increased Resistance in Driver's Side Airbag Inflator

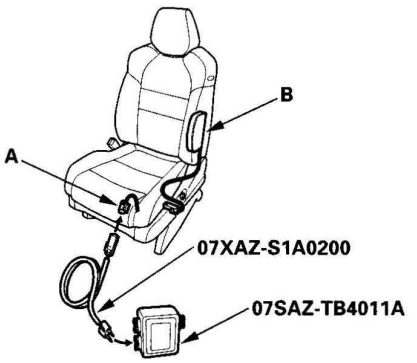
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS side harness 2P connector (A) from the driver's side airbag (B).

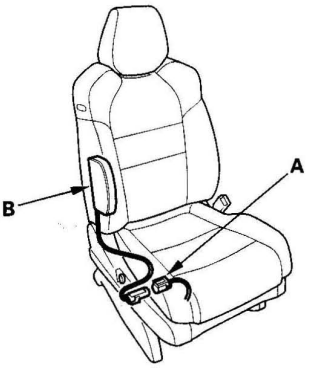


5. Connect the special tool (2 Ω connector) to the SRS side harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

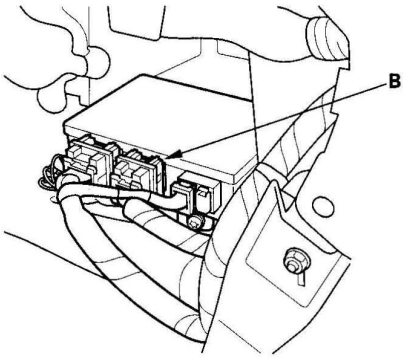
   Is DTC 11-1 indicated?

   YES – Go to step 9.

   NO – Open or increased resistance in the driver's side airbag inflator; replace the driver's side airbag. ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS side sub harness 2P connector (A) from the front passenger's side airbag (B).



11. Disconnect SRS unit connector B (14P) from the SRS unit. Do not disconnect the special tool from the SRS side harness 2P connector.

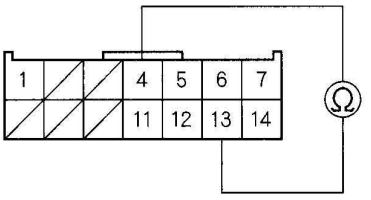


BACK

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12. Check resistance between the No. 4 and No. 13 terminals of SRS unit connector B (14P). There should be 2.0—3.0 Ω.

SRS UNIT CONNECTOR B (14P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at SRS unit connector B (14P) and the SRS unit. Check the connection at SRS unit connector B (14P) and SRS unit. If the connection is OK, replace the SRS unit.■

NO—Open or increased resistance in the SRS side harness; replace the SRS side harness.■

DTC 11-3: Short to Another Wire or Decreased Resistance in Driver's Side Airbag Inflator

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-27).

2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

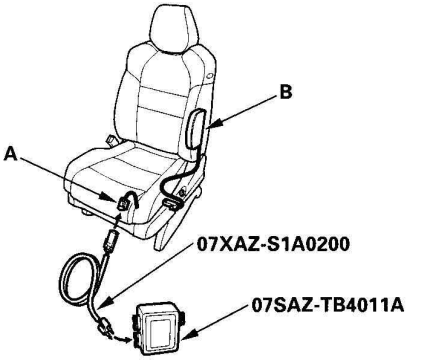
   Does the SRS indicator light stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the SRS side harness 2P connector (A) from the driver's side airbag (B).



5. Connect the special tool (2 Ω connector) to the SRS side harness 2P connector.

6. Reconnect the battery negative cable.

7. Erase the DTC memory.

(cont'd)

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DTC Troubleshooting (cont'd)

8. Read the DTC.

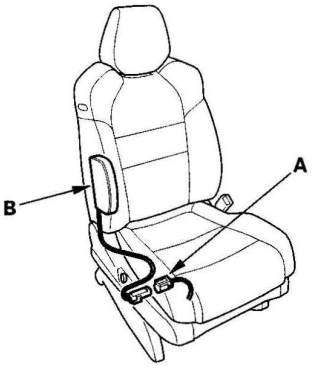
   Is DTC 11-3 indicated?

   YES – Go to step 9.

   NO – Short in the driver's side airbag inflator; replace the driver's side airbag. ■

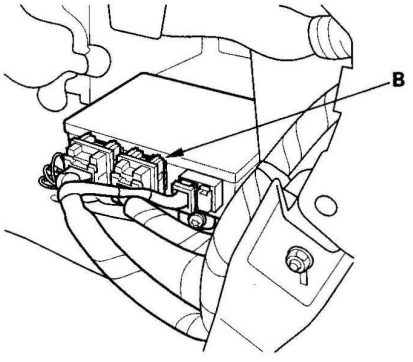
9. Disconnect the battery negative cable, and wait for 3 minutes.

10. Disconnect the SRS side sub harness 2P connector (A) from the front passenger's side airbag (B).



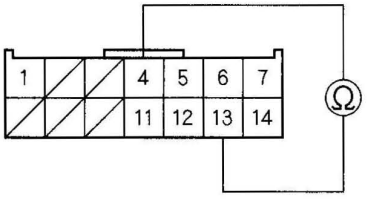
11. Disconnect the special tool from the SRS side harness 2P connector.

12. Disconnect SRS unit connector B (14P) from the SRS unit.



13. Check resistance between the No. 4 and No. 13 terminals of SRS unit connector B (14P). There should be 1 MΩ or more.

SRS UNIT CONNECTOR B (14P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short in the SRS side harness; replace the SRS side harness. ■

BACK

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DTC 11-4: Short to Power in Driver's Side Airbag Inflator

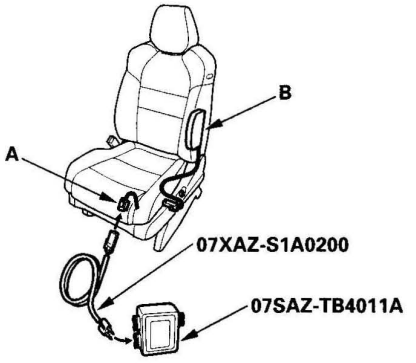
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS side harness 2P connector (A) from the driver's side airbag (B).

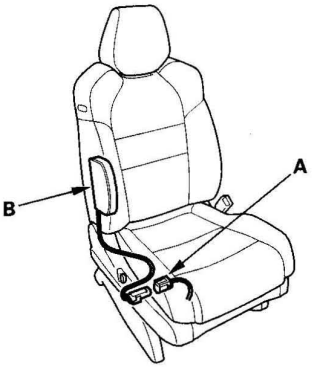


5. Connect the special tool (2 Ω connector) to the SRS side harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

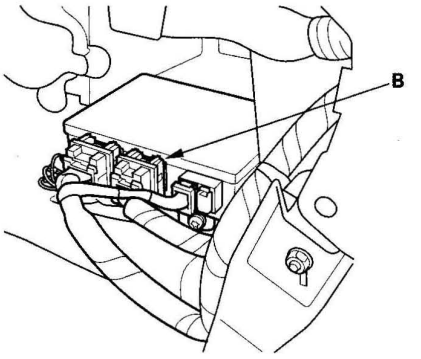
   Is DTC 11-4 indicated?

   YES – Go to step 9.

   NO – Short to power in the driver's side airbag inflator; replace the driver's side airbag. ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS side sub harness 2P connector (A) from the front passenger's side airbag (B).



11. Disconnect SRS unit connector B (14P) from the SRS unit.



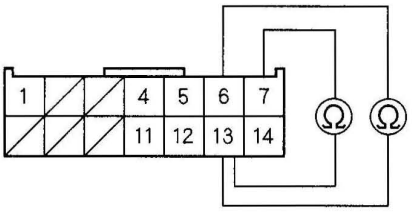
(cont'd)

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DTC Troubleshooting (cont'd)

12. Check resistance between the No. 13 and No. 6 terminals of SRS unit connector B (14P), and between the No. 13 and No. 7 terminals. There should be 1 MΩ or more.

SRS UNIT CONNECTOR B (14P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit.■

NO – Short to power in the SRS side harness; replace the SRS side harness.■

DTC 11-5: Short to Ground in Driver's Side Airbag Inflator

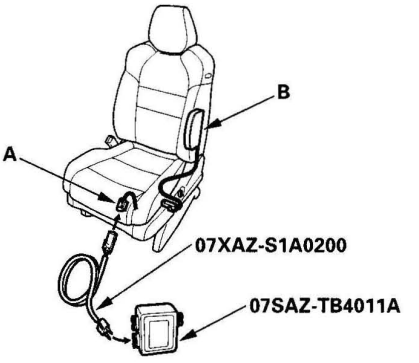
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS side harness 2P connector (A) from the driver's side airbag (B).



5. Connect the special tool (2 Ω connector) to the SRS side harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.

BACK

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8. Read the DTC.

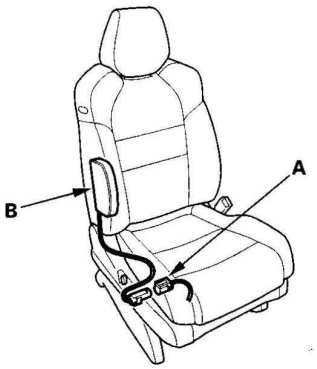
   Is DTC 11-5 indicated?

   YES – Go to step 9.

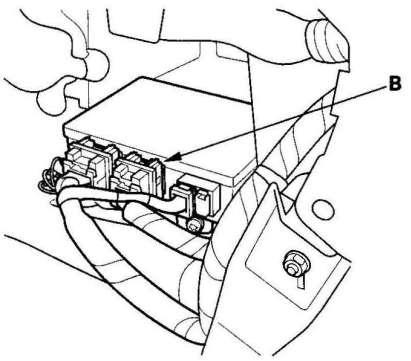
   NO – Short to ground in the driver's side airbag inflator; replace the driver's side airbag. ■

9. Disconnect the battery negative cable, and wait for 3 minutes.

10. Disconnect the SRS side sub harness 2P connector (A) from the front passenger's side airbag (B).

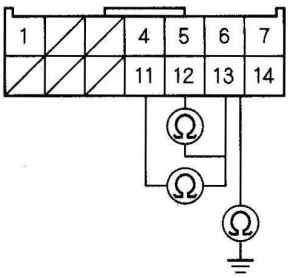


11. Disconnect SRS unit connector B (14P) from the SRS unit.



12. Check resistance between the No. 13 and No. 11 terminals of SRS unit connector B (14P), the No. 13 and No. 12 terminals, and the No. 13 terminal and body ground. There should be 1 MΩ or more.

SRS UNIT CONNECTOR B (14P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short to power in the SRS side harness; replace the SRS side harness. ■

BACK

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DTC Troubleshooting (cont'd)

DTC 12-1: Open or Increased Resistance in Front Passenger's Side Airbag Inflator

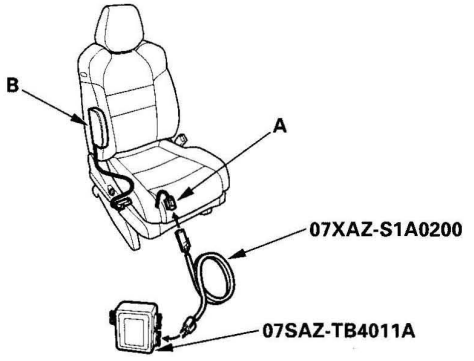
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS side harness 2P connector (A) from the front passenger's side airbag (B).

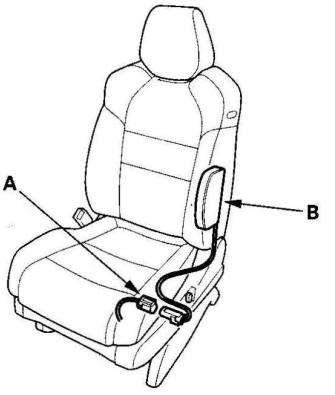


5. Connect the special tool (2 Ω connector) to the SRS side sub harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

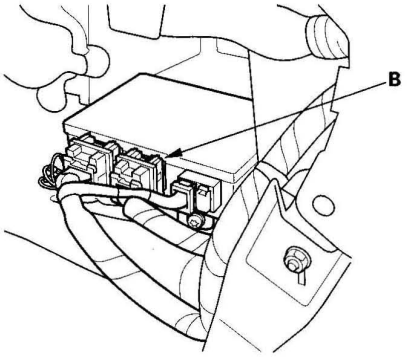
   Is DTC 12-1 indicated?

   YES – Go to step 9.

   NO – Open or increased resistance in the front passenger's side airbag inflator; replace the front passenger's side airbag. ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS side harness 2P connector (A) from the driver's side airbag (B).



11. Disconnect SRS unit connector B (14P) from the SRS unit. Do not disconnect the special tool from the SRS side harness 2P connector.

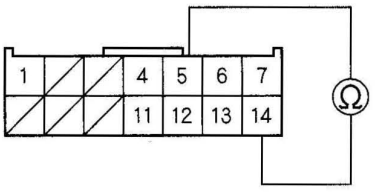


BACK

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12. Check resistance between the No. 5 and No. 14 terminals of SRS unit connector B (14P). There should be 2.0 – 3.0 Ω.

SRS UNIT CONNECTOR B (14P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit or poor contact at SRS unit connector B (14P) and the SRS unit. Check the connection at SRS unit connector B (14P) and SRS unit. If the connection is OK, replace the SRS unit. ■

NO – Open or increased resistance in the SRS side harness or SRS side sub harness; replace the faulty harness. ■

DTC 12-3: Short to Another Wire or Decreased Resistance in Front Passenger's Side Airbag Inflator

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-27).

2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

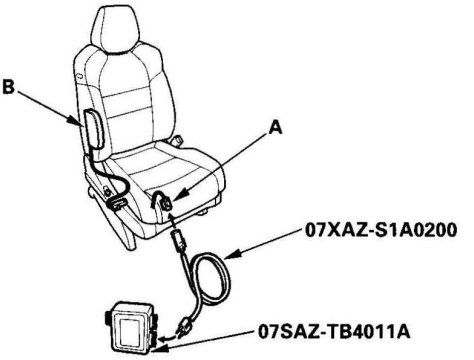
   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the SRS side sub harness 2P connector (A) from the front passenger's side airbag (B).



5. Connect the special tool (2 Ω connector) to the SRS side sub harness 2P connector.

6. Reconnect the battery negative cable.

7. Erase the DTC memory.

(cont'd)

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DTC Troubleshooting (cont'd)

8. Read the DTC.

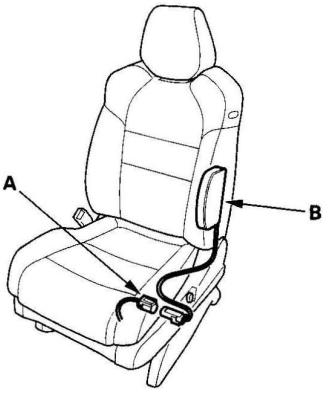
   Is DTC 12-3 indicated?

   YES – Go to step 9.

   NO – Short in the front passenger's side airbag inflator; replace the front passenger's side airbag. ■

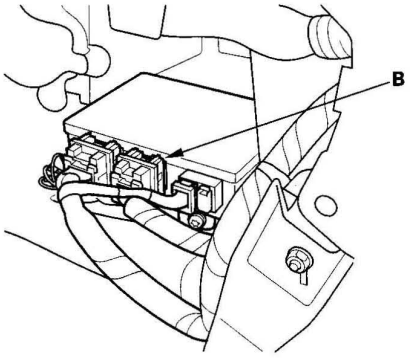
9. Disconnect the battery negative cable, and wait for 3 minutes.

10. Disconnect the SRS side harness 2P connector (A) from the driver's side airbag (B).



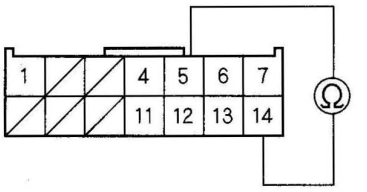
11. Disconnect the special tool from the SRS side sub harness 2P connector.

12. Disconnect SRS unit connector B (14P) from the SRS unit.



13. Check resistance between the No. 5 and No. 14 terminals of SRS unit connector B (14P). There should be 1 MΩ or more.

SRS UNIT CONNECTOR B (14P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short in the SRS side harness or SRS side sub harness; replace the faulty harness. ■

BACK

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DTC 12-4: Short to Power in Front Passenger's Side Airbag Inflator

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-27).

2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

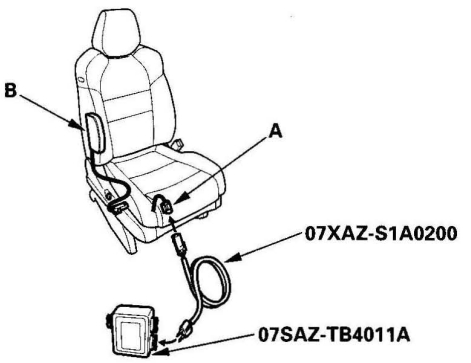
   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the SRS side sub harness 2P connector (A) from the front passenger's side airbag (B).



5. Connect the special tool (2 Ω connector) to the SRS side sub harness 2P connector.

6. Reconnect the battery negative cable.

7. Erase the DTC memory.

8. Read the DTC.

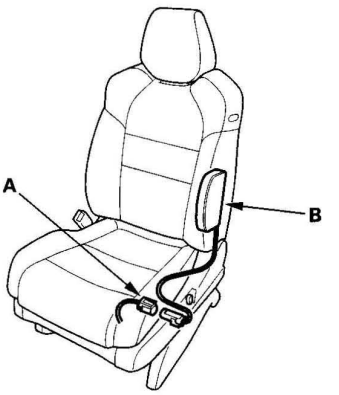
   Is DTC 12-4 indicated?

   YES – Go to step 9.

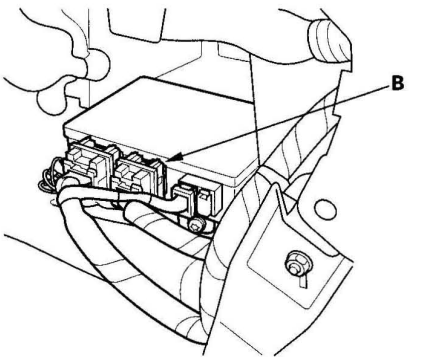
   NO – Short to power in the front passenger's side airbag inflator; replace the front passenger's side airbag. ■

9. Disconnect the battery negative cable, and wait for 3 minutes.

10. Disconnect the SRS side harness 2P connector (A) from the driver's side airbag (B).



11. Disconnect SRS unit connector B (14P) from the SRS unit.



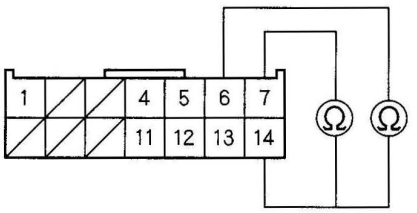
(cont'd)

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DTC Troubleshooting (cont'd)

12. Check resistance between the No. 14 and No. 6 terminals of SRS unit connector B (14P), and between the No. 14 and No. 7 terminals. There should be 1 MΩ or more.

SRS UNIT CONNECTOR B (14P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short to power in the SRS side harness or SRS side sub harness; replace the faulty harness. ■

DTC 12-5: Short to Ground in Front Passenger's Side Airbag Inflator

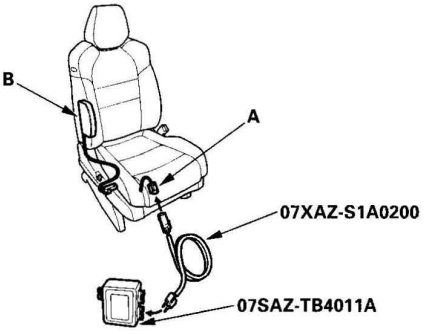
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS side sub harness 2P connector (A) from the front passenger's side airbag (B).



5. Connect the special tool (2 Ω connector) to the SRS side sub harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.

BACK

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8. Read the DTC.

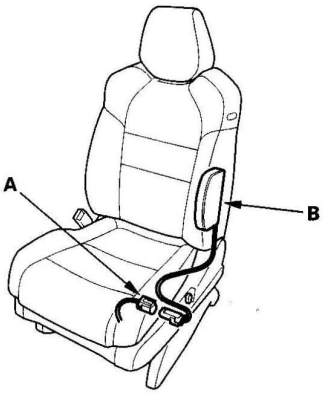
   Is DTC 12-5 indicated?

   YES – Go to step 9.

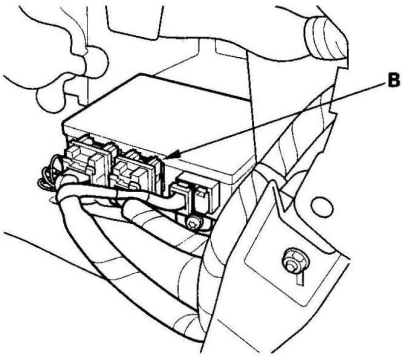
   NO – Short to ground in the front passenger's side airbag inflator; replace the front passenger's side airbag. ■

9. Disconnect the battery negative cable, and wait for 3 minutes.

10. Disconnect the SRS side harness 2P connector (A) from the driver's side airbag (B).

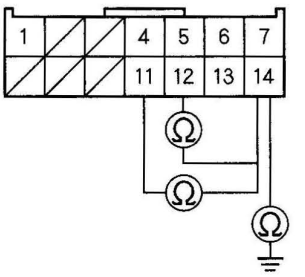


11. Disconnect SRS unit connector B (14P) from the SRS unit.



12. Check resistance between the No. 14 and No. 11 terminals of SRS unit connector B (14P), the No. 14 and No. 12 terminals, and the No. 13 terminal and body ground. There should be 1 MΩ or more.

SRS UNIT CONNECTOR B (14P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short to ground in the SRS side harness or SRS side sub harness; replace the faulty harness. ■

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DTC Troubleshooting (cont'd)

DTC 13-3: No Signal from the Driver's Side Impact Sensor

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead H 07YAZ-S3AA100

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Check the connection between the SRS side harness 2P connector and the driver's side impact sensor.

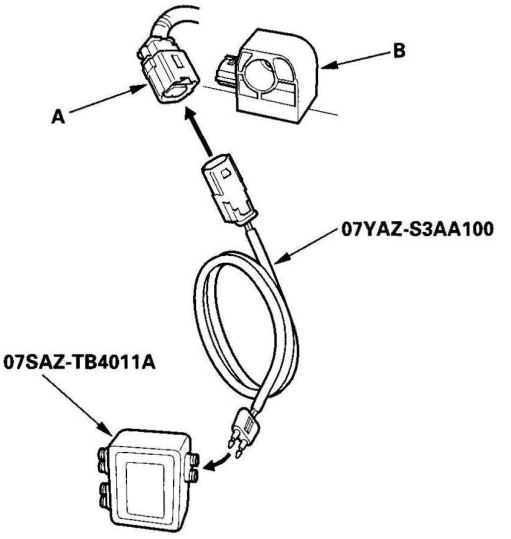
   Is the connection OK?

   YES – Go to step 5.

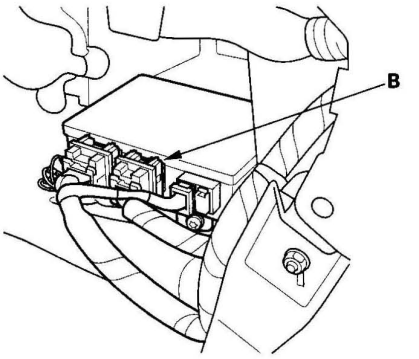
   NO – Poor contact between the SRS side harness 2P connector and the driver's side impact sensor; reconnect or replace the sensor. ■
5. Disconnect the driver's side airbag and front passenger's side airbag 2P connectors (A).



6. Disconnect the SRS side harness 2P connector (A) from the driver's side impact sensor (B).



7. Connect the special tool (jumper connector) to the SRS side harness 2P connector.
8. Disconnect SRS unit connector B (14P) from the SRS unit.

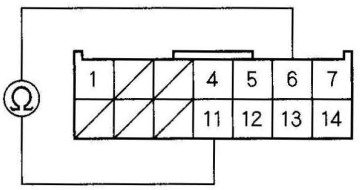


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9. Check resistance between the No. 6 and No. 11 terminals of SRS unit connector B (14P). There should be 0 – 1.0 Ω.

SRS UNIT CONNECTOR B (14P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty driver's side impact sensor or SRS unit; replace the driver's side impact sensor. If the problem is still present, replace the SRS unit. ■

NO – Open in the SRS side harness; replace the SRS side harness. ■

DTC 13-4: Faulty Power Supply to the Driver's Side Impact Sensor

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's side airbag and front passenger's side airbag 2P connectors (A).

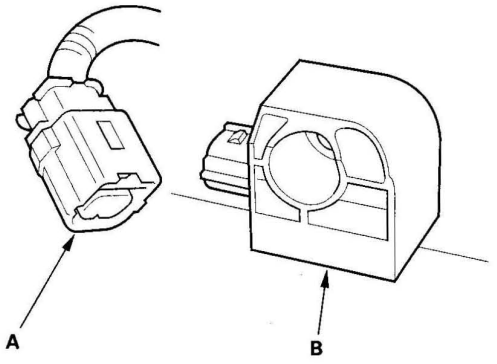


(cont'd)

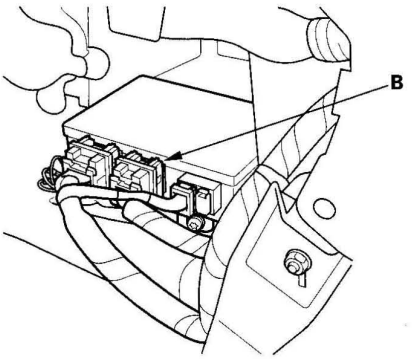
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DTC Troubleshooting (cont'd)

5. Disconnect the SRS side harness 2P connector (A) from the driver's side impact sensor (B).

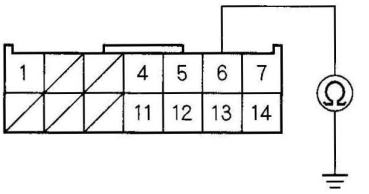


6. Disconnect SRS unit connector B (14P) from the SRS unit.



7. Check resistance between the No. 6 terminal of SRS unit connector B (14P) and body ground. There should be 1 MΩ or more.

SRS UNIT CONNECTOR B (14P)



Wire side of female terminals

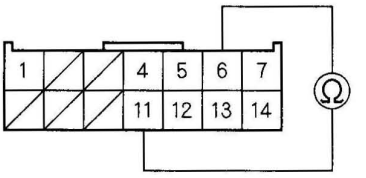
Is the resistance as specified?

YES – Go to step 8.

NO – Short to ground in the SRS side harness; replace the SRS side harness. ■

8. Check resistance between the No. 6 and No. 11 terminals of SRS unit connector B (14P). There should be 1 MΩ or more.

SRS UNIT CONNECTOR B (14P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty driver's side impact sensor or SRS unit; replace the driver's side impact sensor (see page 23-128). If the problem is still present, replace the SRS unit (see page 23-127). ■

NO – Short in the SRS side harness; replace the SRS side harness. ■

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DTC 14-3: No Signal from the Front Passenger's Side Impact Sensor

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead H 07YAZ-S3AA100

1. Erase the DTC memory (see page 23-27).

2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).

3. Disconnect the battery negative cable, and wait for 3 minutes.

4. Check the connection between the SRS side sub harness 2P connector and the front passenger's side impact sensor.

   Is the connection OK?

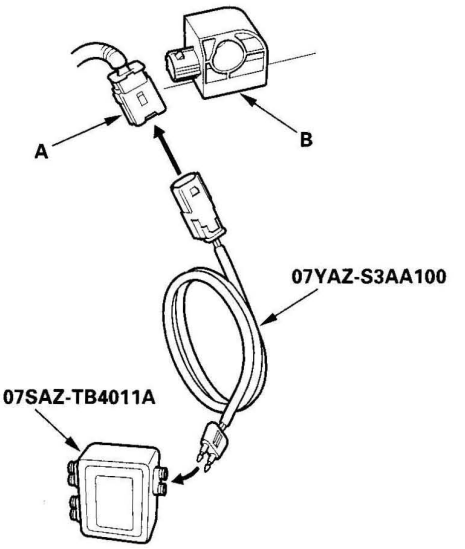
   YES – Go to step 5.

   NO – Poor contact between the SRS side sub harness 2P connector and the front passenger's side impact sensor; reconnect or replace the sensor (see page 23-128). ■

5. Disconnect the driver's side airbag and front passenger's side airbag 2P connectors (A).

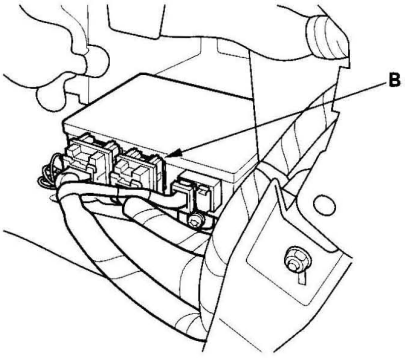


6. Disconnect the SRS side sub harness 2P connector (A) from the front passenger's side impact sensor (B).



7. Connect the special tool (jumper connector) to the SRS side sub harness 2P connector.

8. Disconnect SRS unit connector B (14P) from the SRS unit.



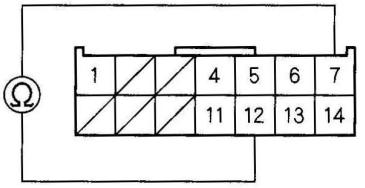
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DTC Troubleshooting (cont'd)

9. Check resistance between the No. 7 and No. 12 terminals of SRS unit connector B (14P). There should be 0 – 1.0 Ω.

SRS UNIT CONNECTOR B (14P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty front passenger's side impact sensor or SRS unit; replace the front passenger's side impact sensor (see page 23-128). If the problem is still present, replace the SRS unit (see page 23-127). ■

NO – Open in the SRS side harness or SRS side sub harness; replace the faulty harness. ■

DTC 14-4: Faulty Power Supply to the Front Passenger's Side Impact Sensor

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

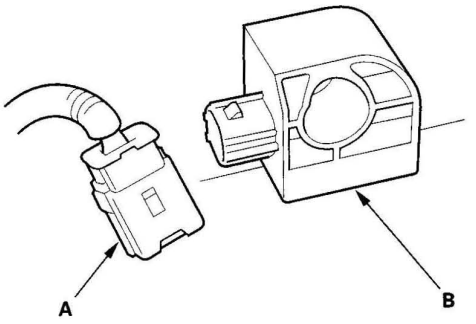
   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's side airbag and front passenger's side airbag 2P connectors (A).



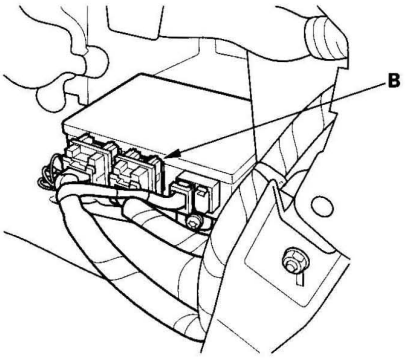
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5. Disconnect the SRS side sub harness 2P connector (A) from the front passenger's side impact sensor (B).

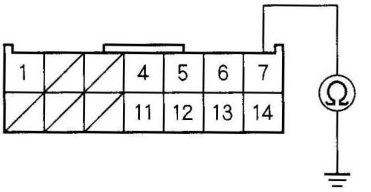


6. Disconnect SRS unit connector B (14P) from the SRS unit.



7. Check resistance between the No. 7 terminal of SRS unit connector B (14P) and body ground. There should be 1 MΩ or more.

SRS UNIT CONNECTOR B (14P)



Wire side of female terminals

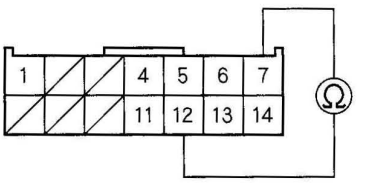
Is the resistance as specified?

YES – Go to step 8.

NO – Short to ground in the SRS side harness or SRS side sub harness; replace the faulty harness. ■

8. Check resistance between the No. 7 and No. 12 terminals of SRS unit connector B (14P). There should be 1 MΩ or more.

SRS UNIT CONNECTOR B (14P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty front passenger's side impact sensor or SRS unit; replace the front passenger's side impact sensor (see page 23-128). If the problem is still present, replace the SRS unit (see page 23-127). ■

NO – Short in the SRS side harness or SRS side sub harness; replace the faulty harness. ■

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DTC Troubleshooting (cont'd)

DTC 15-1: Faulty OPDS Unit

1. Make sure nothing is on the front passenger's seat.
2. Initialize the OPDS unit (see page 23-28).
3. Erase the DTC memory (see page 23-27).
4. Read the DTC.

   Is DTC 15-1 indicated?

   YES – Go to step 5.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).

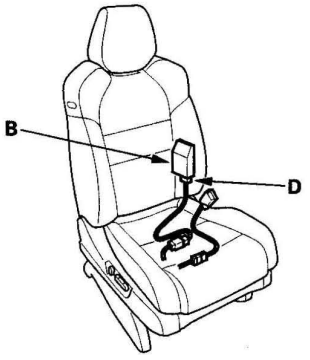
5. Check the No. 7 (7.5 A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES – Go to step 6.

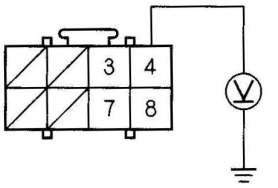
   NO – Go to step 13.

6. Disconnect OPDS unit connector D (8P) from the OPDS unit (B) (see page 23-129).



7. Turn the ignition switch ON (II).
8. Check for voltage between the No. 4 terminal of OPDS unit connector D (8P) and body ground. There should be battery voltage.

OPDS UNIT CONNECTOR D (8P)



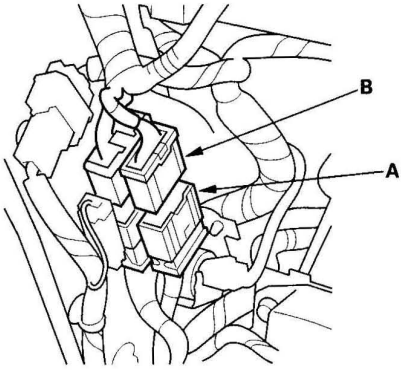
Wire side of female terminals.

Is there battery voltage?

YES – Go to step 20.

NO – Go to step 9.

9. Turn the ignition switch OFF.
10. Disconnect the left floor wire harness 12P (or 2P for vehicles without touring package) connector C632 (A) from the dashboard wire harness A 12P (or 2P) connector (B).



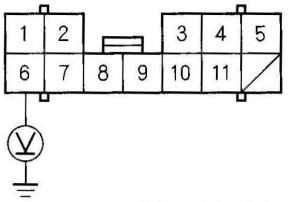
11. Turn the ignition switch ON (II).

BACK

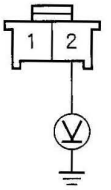
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12. Check for voltage between the No. 6 (or No. 2 for vehicles without touring package) terminal of the dashboard wire harness A 12P (or 2P) connector C632 and body ground. There should be battery voltage.

DASHBOARD WIRE HARNESS A 12P CONNECTOR (with touring package)



DASHBOARD WIRE HARNESS A 2P CONNECTOR (without touring package)



Wire side of female terminals

Is there battery voltage?

YES – Open in the left floor wire harness or OPDS unit harness; if the OPDS unit harness is OK, replace the left floor wire harness. ■

NO – Open in dashboard wire harness A; replace dashboard wire harness A. ■

13. Replace the No. 7 (7.5A) fuse in the driver's under-dash fuse/relay box.

14. Turn the ignition switch ON (II) for 30 seconds, then turn it OFF.

15. Check the No. 7 (7.5A) fuse in driver's under-dash fuse/relay box.

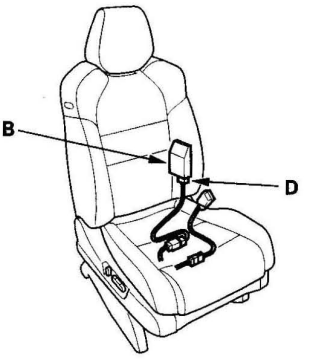
Is the fuse OK?

YES – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27). ■

NO – Go to step 16.

16. Replace the No. 7 (7.5A) fuse in the driver's under-dash fuse/relay box.

17. Disconnect OPDS unit connector D (8P) from the OPDS unit (B).



18. Turn the ignition switch ON (II) for 30 seconds, then turn it off.

19. Check the No. 7 (7.5A) fuse in the driver's under-dash fuse/relay box.

Is the fuse OK?

YES – Short to ground in the OPDS unit; replace the OPDS unit (see page 23-129). ■

NO – Short to ground in the No. 7 (7.5A) circuit; refer to section 22, and continue troubleshooting. ■

20. Turn the ignition switch OFF.

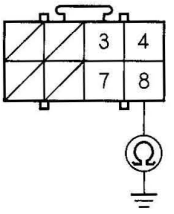
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DTC Troubleshooting (cont'd)

21. Check resistance between the No. 8 terminal of OPDS unit connector D (8P) and body ground. There should be 0 – 1.0 Ω.

OPDS UNIT CONNECTOR D (8P)



Wire side of female terminals

Is the resistance as specified?

YES – Go to step 22.

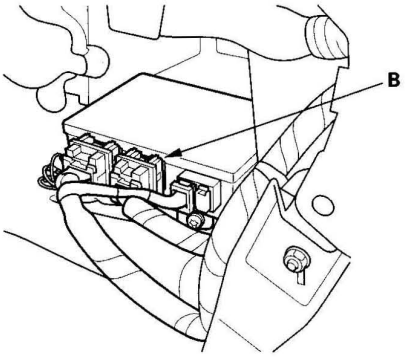
NO – Open in the left floor wire harness, open in the OPDS unit harness, or poor ground connection at G631. If G631 is OK, replace the faulty harness. ■

22. Disconnect the battery negative cable, and wait for 3 minutes.

23. Disconnect the side airbag connectors (A).

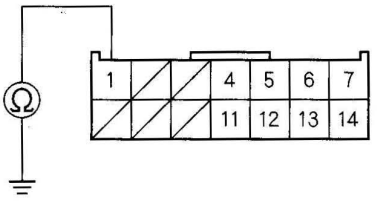


24. Disconnect SRS unit connector B (14P) from the SRS unit.



25. Check resistance between the No. 1 terminal of SRS unit connector B (14P) and body ground. There should be 1 MΩ or more.

SRS UNIT CONNECTOR B (14P)



Wire side of female terminals

Is the resistance as specified?

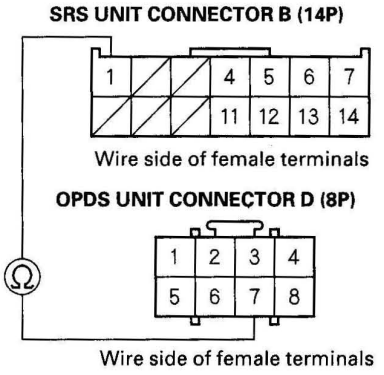
YES – Go to step 26.

NO – Short to ground in the SRS side harness, left floor wire harness, or OPDS unit harness; replace the faulty harness. ■

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26. Check resistance between the No. 1 terminal of SRS unit connector B (14P) and the No. 7 terminal of OPDS unit connector D (8P). There should be 0 – 1.0 Ω.

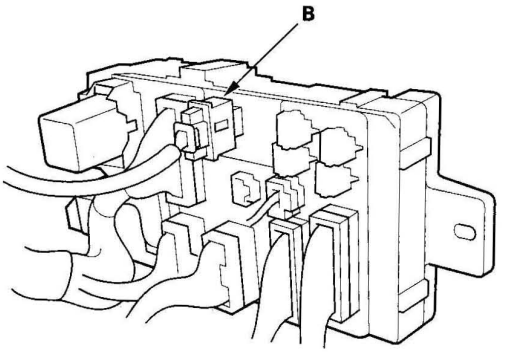


Is the resistance as specified?

YES – Go to step 27.

NO – Open in the SRS side harness, left floor wire harness, or OPDS unit harness; replace the faulty harness. ■

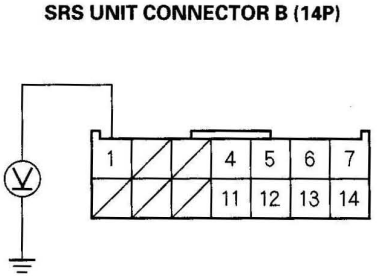
27. Disconnect SRS main harness 2P connector B (2P) from the driver's under-dash fuse/relay box.



28. Reconnect the negative battery cable.

29. Turn the ignition switch ON (II).

30. Check for voltage between the No. 1 terminal of SRS unit connector B (14P) and body ground. There should be 0.5 V or less.



Is the voltage as specified?

YES – Faulty OPDS unit or seat sensor/seat back foam. Replace the faulty part, and initialize the system (see page 23-28). ■

NO – Short to power in the SRS side harness, left floor wire harness, or OPDS unit harness; replace the faulty harness. ■

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DTC Troubleshooting (cont'd)

DTC 15-2: Faulty Side Airbag Cutoff Indicator Circuit

1. Make sure nothing is on the front passenger's seat.
2. Erase the DTC memory (see page 23-27).
3. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 4.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).
4. Turn the ignition switch ON (II), and check that the side airbag cutoff indicator comes on.

   Does the side airbag cutoff indicator come on?

   YES – Go to step 5.

   NO – Go to step 6.
5. Make sure the side airbag cutoff indicator comes on for 5 seconds and then goes off.

   Does the side airbag cutoff indicator go off?

   YES – Faulty OPDS unit or SRS unit; replace the OPDS unit (see page 23-129). If the problem is still present, replace the SRS unit (see page 23-127). ■

   NO – Go to step 36.
6. Turn the ignition switch OFF.
7. Check the No. 9 (10A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

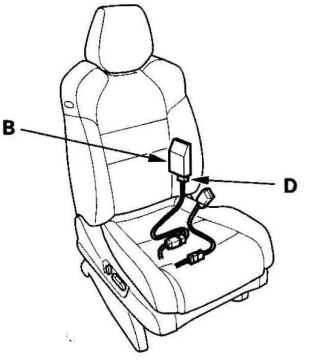
   YES – Go to step 8.

   NO – Short to ground in the No. 9 (10A) fuse circuit; refer to section 22 and continue troubleshooting. ■
8. Check for a blown side airbag cutoff indicator bulb.

   Is the side airbag cutoff indicator bulb OK?

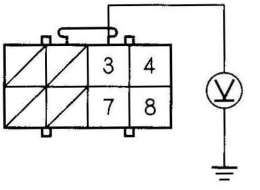
   YES – Go to step 9.

   NO – Blown side airbag cutoff indicator bulb; replace the bulb. ■
9. Disconnect OPDS unit connector D (8P) from the OPDS unit (B).



10. Turn the ignition switch ON (II).
11. Check for voltage between the No. 3 terminal of OPDS unit connector D (8P) and body ground. There should be battery voltage.

OPDS UNIT CONNECTOR D (8P)



Wire side of female terminals

Is there battery voltage?

YES – Go to step 12.

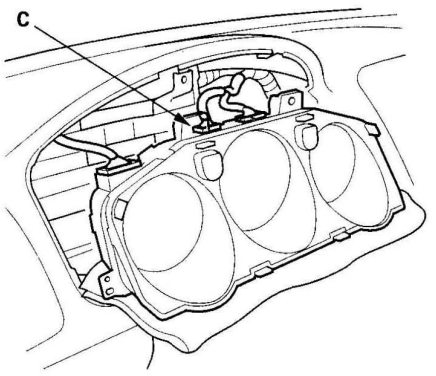
NO – Go to step 24.

12. Turn the ignition switch OFF.

BACK

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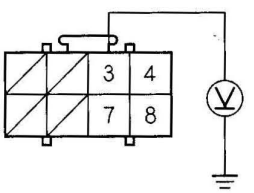
13. Disconnect gauge assembly connector C (14P) from the gauge assembly.



14. Turn the ignition switch ON (II).

15. Check for voltage between the No. 3 terminal of OPDS unit connector D (8P) and body ground. There should be 0.5 V or less.

OPDS UNIT CONNECTOR D (8P)



Wire side of female terminals

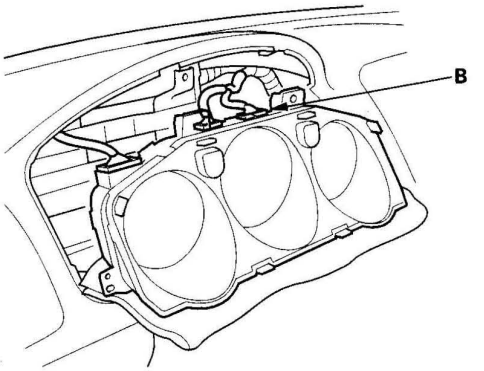
Is the voltage as specified?

YES—Faulty OPDS unit; replace the OPDS unit (see page 23-129). ■

NO—Go to step 16.

16. Turn the ignition switch OFF.

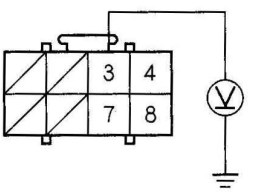
17. Disconnect gauge assembly connector B (18P) from the gauge assembly.



18. Turn the ignition switch ON (II).

19. Check for voltage between the No. 3 terminal of OPDS unit connector D (8P) and body ground. There should be 0.5 V or less.

OPDS UNIT CONNECTOR D (8P)



Wire side of female terminals

Is the voltage as specified?

YES—Short to power in the gauge assembly; replace the gauge assembly. ■

NO—Go to step 20.

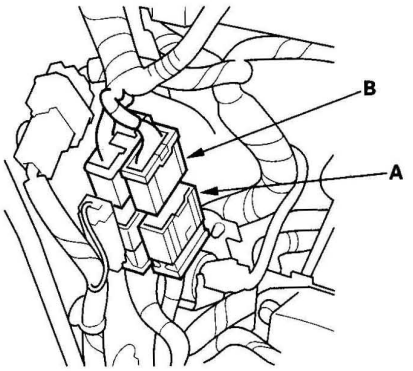
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DTC Troubleshooting (cont'd)

20. Turn the ignition switch OFF.

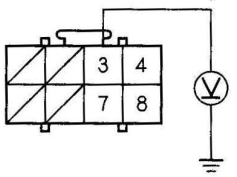
21. Disconnect the left floor wire harness 12P (or 2P for vehicles without touring package) connector (A) from the dashboard wire harness A 12P (or 2P) connector (B).



22. Turn the ignition switch ON (II).

23. Check for voltage between the No. 3 terminal of OPDS unit connector D (8P) and body ground. There should be 0.5 V or less.

OPDS UNIT CONNECTOR D (8P)



Wire side of female terminals

Is the voltage as specified?

YES – Short to power in dashboard wire harness A; replace dashboard wire harness A. ■

NO – Short to power in the left floor wire harness or in the OPDS unit harness; if the OPDS unit harness is OK, replace the left floor wire harness. ■

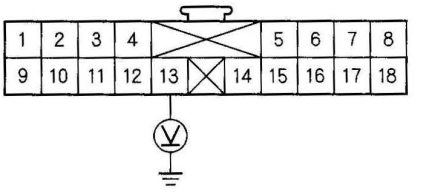
24. Turn the ignition switch OFF.

25. Backprobe the No. 13 terminal of gauge assembly connector B (18P). Do not disconnect the connector from the gauge assembly.

26. Turn the ignition switch ON (II).

27. Check for voltage between the No. 13 terminal of gauge assembly connector B (18P) and body ground. There should be battery voltage.

GAUGE ASSEMBLY CONNECTOR B (18P)



Wire side of female terminals

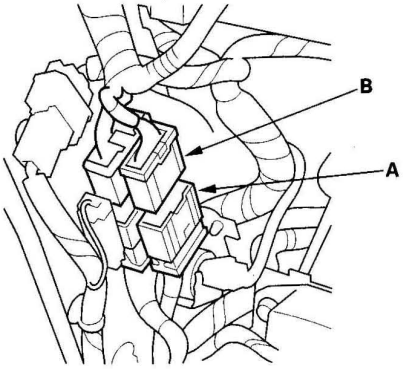
Is there battery voltage?

YES – Go to step 28.

NO – Go to step 32.

28. Turn the ignition switch OFF.

29. Disconnect the left floor wire harness 12P (or 2P for vehicles without touring package) connector C632 (A) from the dashboard wire harness A 12P (or 2P) connector (B).



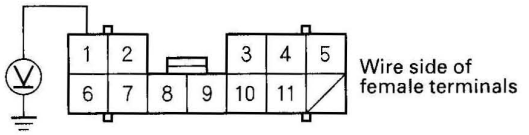
BACK

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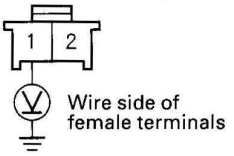
30. Turn the ignition switch ON (II).

31. Check for voltage between the No. 1 terminal of the dashboard wire harness A 12P (or 2P for vehicles without touring package) connector and body ground. There should be battery voltage.

DASHBOARD WIRE HARNESS A 12P CONNECTOR



DASHBOARD WIRE HARNESS A 2P CONNECTOR



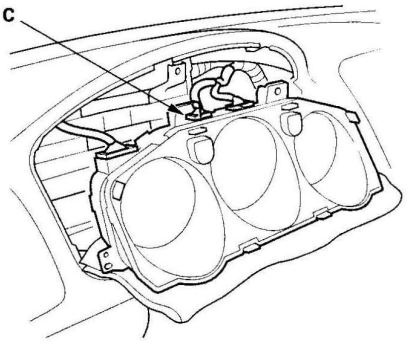
Is there battery voltage?

YES—Poor contact at the dashboard wire harness A 12P (or 2P) and left floor wire harness 12P (or 2P) connectors, or an open in the left floor wire harness or in the OPDS unit harness. Check the connection; if the connection is OK, replace the faulty harness. ■

NO—Poor contact at gauge assembly connector B (18P) or an open in dashboard wire harness A. Check gauge assembly connector B (18P); if the connection is OK, replace dashboard wire harness A. ■

32. Turn the ignition switch OFF.

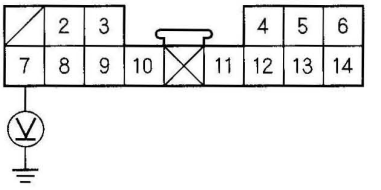
33. Disconnect gauge assembly connector C (14P) from the gauge assembly.



34. Turn the ignition switch ON (II).

35. Check for voltage between the No. 7 terminal of gauge assembly connector C (14P) and body ground. There should be battery voltage.

GAUGE ASSEMBLY CONNECTOR C (14P)



Is there battery voltage?

YES—Faulty side airbag cutoff indicator circuit; replace the gauge assembly. ■

NO—Open in dashboard wire harness A or left side wire harness; replace the faulty harness. ■

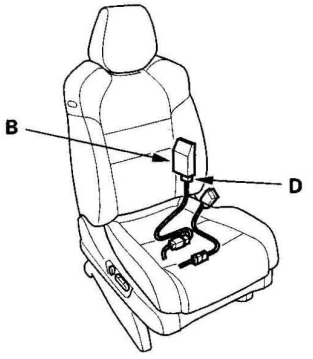
(cont'd)

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DTC Troubleshooting (cont'd)

36. Turn the ignition switch OFF.

37. Disconnect OPDS unit connector D (8P) from the OPDS unit (B).



38. Turn the ignition switch ON (II).

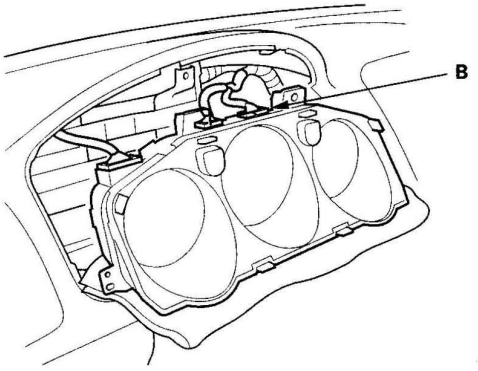
Does the side airbag cutoff indicator come on?

YES – Go to step 39.

NO – Faulty OPDS unit; replace the OPDS unit. ■

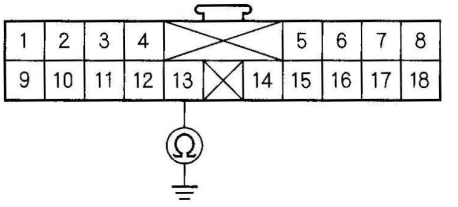
39. Turn the ignition switch OFF.

40. Disconnect gauge assembly connector B (18P) from the gauge assembly.



41. Check resistance between the No. 13 terminal of gauge assembly connector B (18P) and body ground. There should 1 MΩ or more.

GAUGE ASSEMBLY CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES – Short to ground in the side airbag cutoff indicator circuit; replace the gauge assembly. ■

NO – Short to ground in dashboard wire harness A, left floor wire harness, or OPDS unit harness; replace the faulty harness. ■

BACK

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DTC 15-3: Faulty OPDS sensor

1. Erase the DTC memory (see page 23-27).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds, and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-27).

   NOTE: Aftermarket devices (fluorescent map lights, laptop computers, etc.) used near the front passenger's seat-back can interfere with the seat-back sensors and cause a false DTC 15-3. If one of these devices was used, erase the DTC, operate the device near the seat-back, and recheck for DTCs. If DTC 15-3 is reset, erase it, and do not use the device near the seat-back.
3. Check the connection at the OPDS sensor connector and the OPDS unit connector.

   Are the connections OK?

   YES – Go to step 4.

   NO – Reconnect the OPDS sensor connector, and clear the DTC. ■
4. Replace the OPDS sensor/seat back foam (see page 20-83), and reinitialize the OPDS (see page 23-28).
5. Erase the DTC memory, then check for DTC 15-3.

   Is DTC 15-3 indicated?

   YES – Go to step 6.

   NO – The system is OK. ■
6. Replace the OPDS unit (see page 23-129), and initialize the system (see page 23-28).
7. Erase the DTC memory, then check for DTC 15-3.

   Is DTC 15-3 indicated?

   YES – Replace the SRS unit. ■

   NO – The system is OK. ■

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SRS Indicator Circuit Troubleshooting

The SRS Indicator Light Doesn't Come On

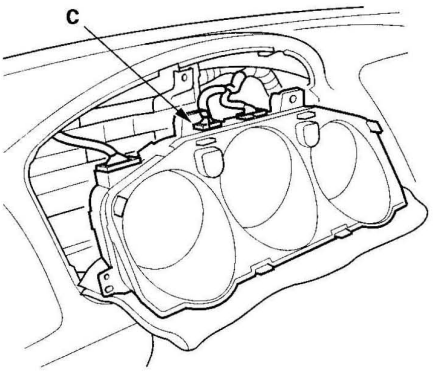
1. Turn the ignition switch ON (II), and check to see if the other indicators come on (brake system, etc).

   Do the other indicators come on?

   YES – Go to step 2.

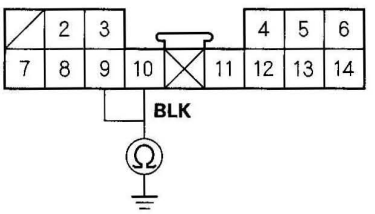
   NO – Go to step 9.

2. Turn the ignition switch OFF, then disconnect gauge assembly connector C (14P) from the gauge assembly.



3. Check resistance between the No. 9 and No. 10 terminals of gauge assembly connector C (14P) and body ground. There should be 0 – 1.0 Ω.

GAUGE ASSEMBLY CONNECTOR C (14P)



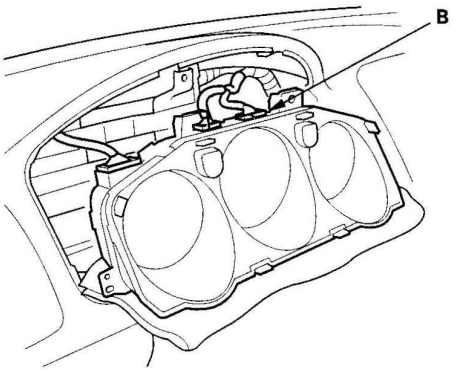
Wire side of female terminals

Is the resistance as specified?

YES – Go to step 4.

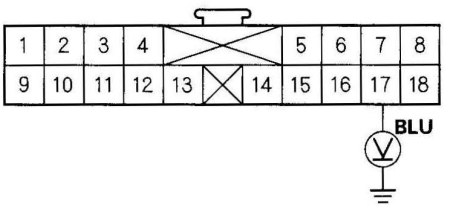
NO – Open in the BLK wire of dashboard wire harness A or faulty body ground terminal. If the body ground terminal is OK, replace dashboard wire harness A.■

4. Disconnect gauge assembly connector B (18P) from the gauge assembly.



5. Check for voltage between the No. 17 terminal of gauge assembly connector B (18P) and body ground within the first 6 seconds after turning the ignition switch ON (II). There should be 8.5 V or less.

GAUGE ASSEMBLY CONNECTOR B (18P)



Wire side of female terminals

Is the voltage as specified?

YES – Blown SRS indicator bulb or faulty SRS indicator light circuit in the gauge assembly. Check for a blown SRS indicator bulb. If the bulb is OK, replace the gauge assembly.■

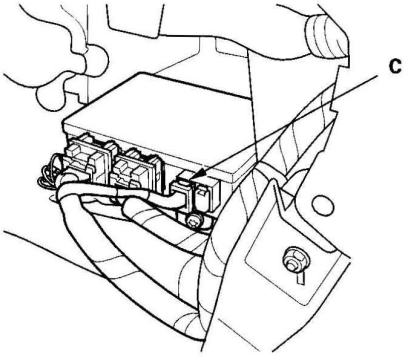
NO – Go to step 6.

6. Turn the ignition switch OFF.

BACK

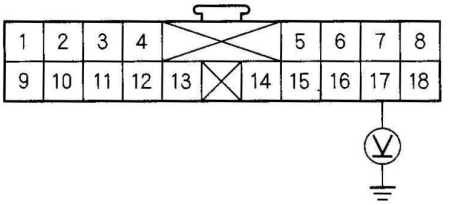
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7. Disconnect SRS connector C (8P) from the SRS unit.



8. Connect a voltmeter between the No. 17 terminal of gauge assembly connector B (18P) and body ground. Turn the ignition switch ON (II), and measure voltage. There should be 0.5 V or less.

GAUGE ASSEMBLY CONNECTOR B (18P)



Wire side of female terminals

Is the voltage as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short to power in the BLU wire of dashboard wire harness A or in the SRS main harness; replace the faulty harness. ■

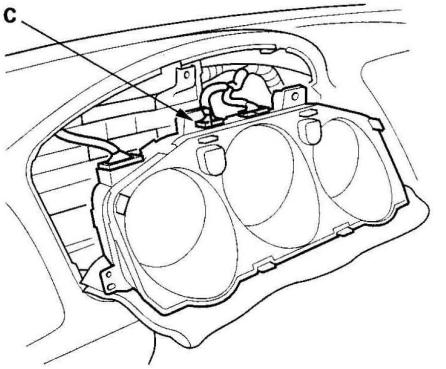
9. Turn the ignition switch OFF. Check the No. 9 (10A) fuse in the driver's under-dash fuse/relay box.

Is the fuse blown?

YES – Go to step 12.

NO – Go to step 10.

10. Disconnect gauge assembly connector C (14P) from the gauge assembly.



(cont'd)

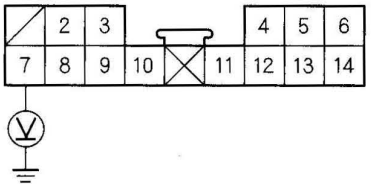
BACK

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SRS Indicator Circuit Troubleshooting (cont'd)

11. Connect a voltmeter between the No. 7 terminal of gauge assembly connector C (14P) and body ground. Turn the ignition switch ON (II), and measure the voltage. There should be battery voltage.

GAUGE ASSEMBLY CONNECTOR C (14P)



Wire side of female terminals

Is there battery voltage?

YES—Faulty SRS indicator light circuit in the gauge assembly or poor contact at gauge assembly connector C (14P) and the gauge assembly; if the connection is OK, replace the gauge assembly. ■

NO—Open in the driver's under-dash fuse/relay box No. 9 (10A) fuse line, in the YEL wire of dashboard wire harness A, or in the left side wire harness. If the driver's under-dash fuse/relay box is OK, replace the faulty harness. ■

12. Replace the No. 9 (10A) fuse, then check to see if the SRS indicator light comes on.

Does the SRS indicator light come on?

YES—The system is OK at this time. ■

NO—Short to ground in the driver's under-dash fuse/relay box No. 9 (10A) fuse line; go to the "Electrical" section, and continue with troubleshooting. ■

BACK

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The SRS Indicator Light Stays On When In "SCS" Menu Method

NOTE:
- Inability to retrieve DTCs with the PGM Tester. Retrieve the flash codes with the SCS mode (see page 23-25).
- A new SRS unit must sense the entire system is OK before completing its initial self-test. The most common cause of an incomplete self-test is the failure to replace all deployed parts after a collision, in particular, the seat belt tensioners.
- An incomplete self-test prevents the PGM Tester from retrieving DTCs, although flash codes are available in the Tester's SCS mode.

1. Erase the DTC memory with the "SRS Indicator Light Method" (see page 23-27).

   Does the SRS indicator light go off while the DTC memory is being erased?

   YES – Go to step 42.

   NO – Go to step 2.

2. Check the No. 2 (10A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES – Go to step 19.

   NO – Go to step 3.

3. Replace the No. 2 (10A) fuse in the driver's under-dash fuse/relay box.

4. Turn the ignition switch ON (II), and wait for 30 seconds. Then turn the ignition switch OFF.

5. Check the No. 2 (10A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

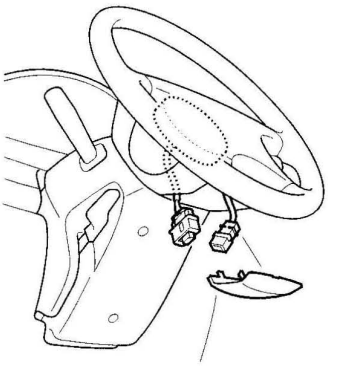
   YES – The system is OK at this time. ■

   NO – Go to step 6.

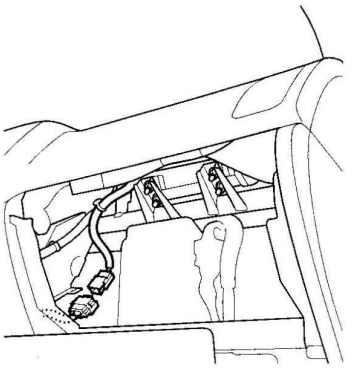
6. Replace the No. 2 (10A) fuse in the driver's under-dash fuse/relay box.

7. Disconnect the battery negative cable, and wait for 3 minutes.

8. Disconnect the driver's airbag 2P connector.



9. Disconnect the front passenger's airbag 4P connector.

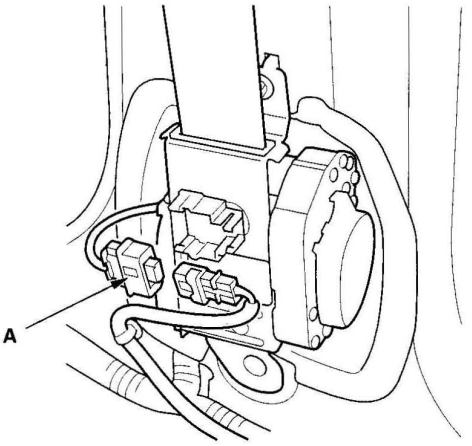


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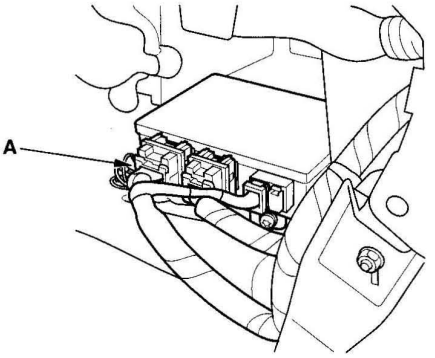
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SRS Indicator Circuit Troubleshooting (cont'd)

10. Disconnect both seat belt tensioner 2P connectors (A).



11. Disconnect SRS unit connector A (18P) from the SRS unit.



12. Reconnect the battery negative cable.

13. Turn the ignition switch ON (II), and wait for 30 seconds. Then turn the ignition switch OFF.

14. Check the No. 2 (10A) fuse in the driver's under-dash fuse/relay box.

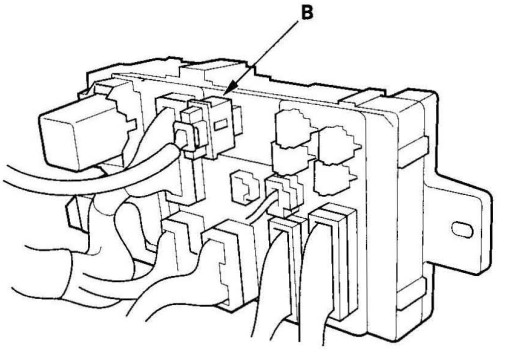
    Is the fuse OK?

    YES – Short to ground in the SRS unit; replace the SRS unit (see page 23-127). ■

    NO – Go to step 15.

15. Replace the No. 2 (10A) fuse in the driver's under-dash fuse/relay box.

16. Disconnect SRS main connector B (2P) from the driver's under-dash fuse/relay box.



17. Turn the ignition switch ON (II), and wait for 30 seconds. Then turn the ignition switch OFF.

18. Check the No. 2 (10A) fuse in the driver's under-dash fuse/relay box.

    Is the fuse OK?

    YES – Short to ground in the SRS main harness; replace the SRS main harness. ■

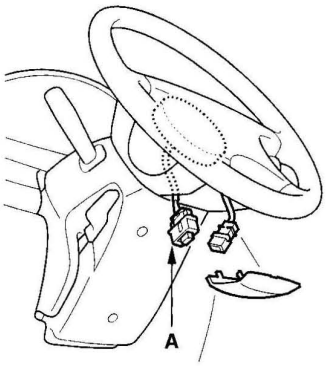
    NO – Repair the short to ground in the driver's under-dash fuse/relay box No. 2 (10A) fuse line; if the problem is still present, replace the driver's under-dash fuse/relay box. ■

BACK

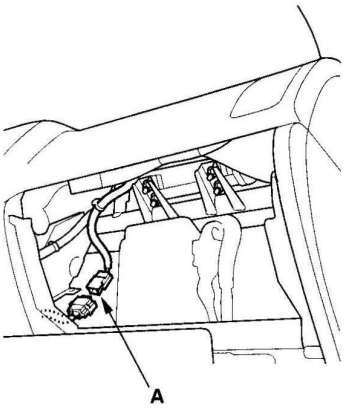
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19. Disconnect the battery negative cable, and wait for 3 minutes.

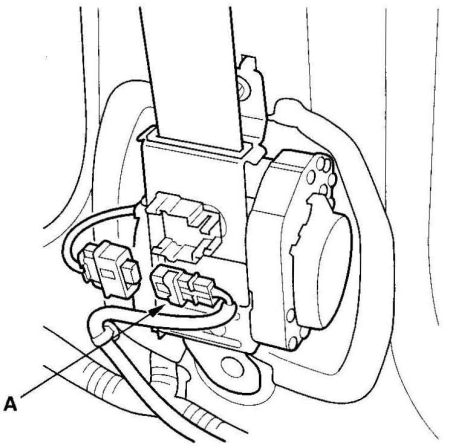
20. Disconnect the driver's airbag 2P connector (A).



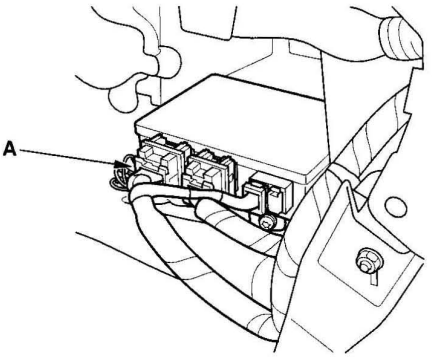
21. Disconnect the front passenger's 4P connector (A).



22. Disconnect both seat belt tensioner 2P connectors (A).



23. Disconnect SRS unit connector A (18P) from the SRS unit.



(cont'd)

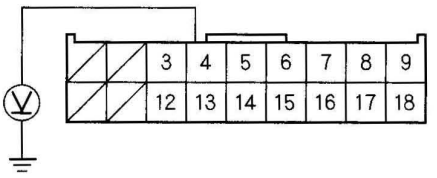
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SRS Indicator Circuit Troubleshooting (cont'd)

24. Reconnect the battery negative cable.

25. Connect a voltmeter between the No. 4 terminal of SRS unit connector A (18P) and body ground. Turn the ignition switch ON (II), and measure the voltage. There should be battery voltage.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

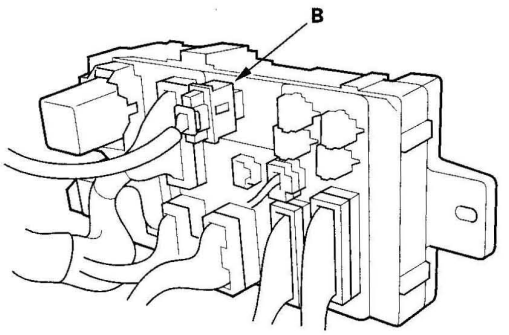
Is there battery voltage?

YES — Go to step 29.

NO — Go to step 26.

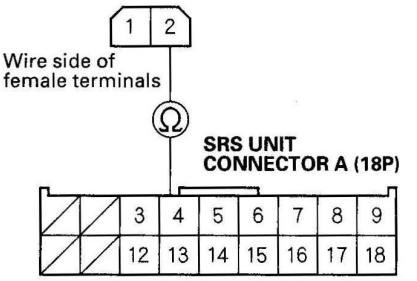
26. Turn the ignition switch OFF.

27. Disconnect SRS main connector B (2P) from the under-dash fuse/relay box.



28. Check resistance between the No. 4 terminal of SRS unit connector A (18P) and the No. 2 terminal of SRS main connector B (2P). There should be 0 — 1.0 Ω.

SRS MAIN CONNECTOR B (2P)



Wire side of female terminals

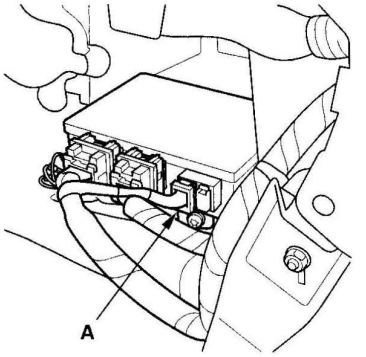
Is the resistance as specified?

YES — Open in the driver's under-dash fuse/relay box, or poor contact at SRS main connector B (2P); check the connection. If the connection is OK, replace the driver's under-dash fuse/relay box. ■

NO — Open in the SRS main harness; replace the SRS main harness. ■

29. Turn the ignition switch OFF.

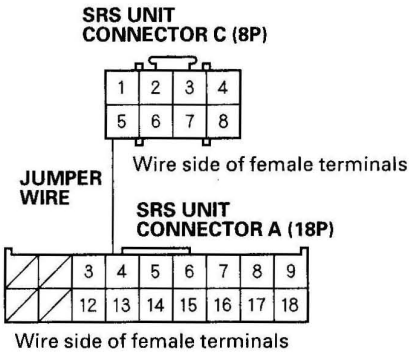
30. Disconnect SRS unit connector C (8P) from the SRS unit.



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31. Connect the No. 4 terminal of SRS unit connector A (18P) and the No. 5 terminal of SRS unit connector C (8P) with a jumper wire.



32. Turn the ignition switch ON (II).

33. Check the SRS indicator light.

Did the SRS indicator light go off?

YES – Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO – Go to step 34.

34. Turn the ignition switch OFF.

35. Disconnect the jumper wire between the No. 4 terminal of SRS unit connector A (18P) and the No. 5 terminal of SRS unit connector C (8P).

36. Check the No. 2 (10A) fuse in the driver's under-dash fuse/relay box.

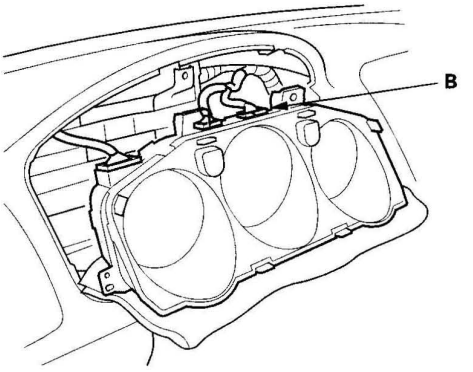
Is the fuse OK?

YES – Go to step 40.

NO – Go to step 37.

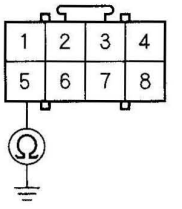
37. Replace the No. 2 (10A) fuse in the driver's under-dash fuse/relay box.

38. Disconnect gauge assembly connector B (18P) from the gauge assembly.



39. Check resistance between the No. 5 terminal of SRS unit connector C (8P) and body ground. There should be 1 MΩ or more.

SRS UNIT CONNECTOR C (8P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS indicator light circuit in the gauge assembly; replace the gauge assembly. ■

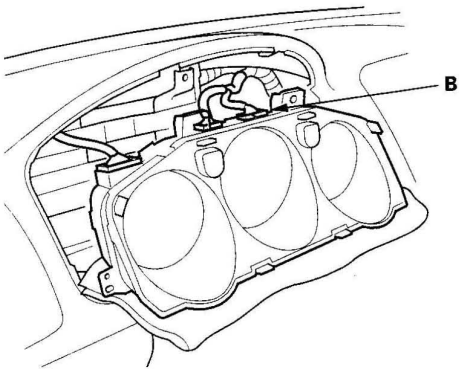
NO – Short to ground in the SRS main harness or in dashboard wire harness A; replace the faulty harness. ■

(cont'd)

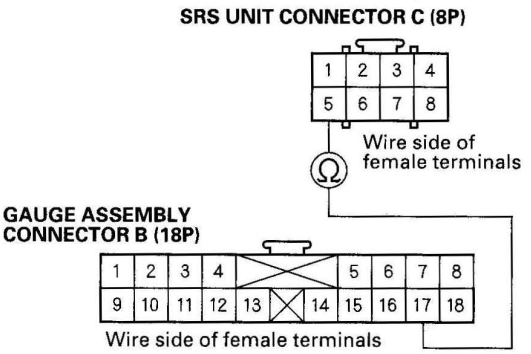
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SRS Indicator Circuit Troubleshooting (cont'd)

40. Disconnect gauge assembly connector B (18P) from the gauge assembly.



41. Check resistance between the No. 17 terminal of gauge assembly connector B (18P) and the No. 5 terminal of SRS unit connector C (8P). There should be 1 Ω or less.

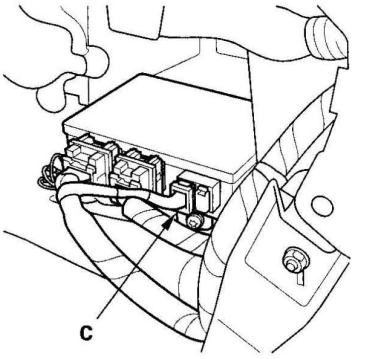


Is the resistance as specified?

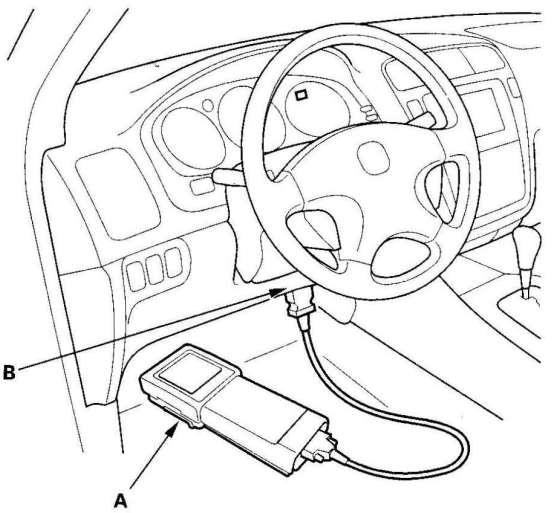
YES — Faulty SRS indicator light circuit in the gauge assembly or poor contact at gauge assembly connector B (18P). Check the connection. If the connection is OK, replace the gauge assembly. ■

NO — Open in the SRS main harness or in dashboard wire harness A; replace the faulty harness. ■

42. Disconnect SRS unit connector C (8P) from the SRS unit.



43. Connect the Honda PGM Tester (A) to the Data Link Connector (16P) (B), and follow the Tester's prompts in the "SCS" menu.

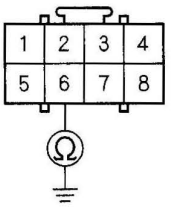


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44. Check resistance between the No. 6 terminal of SRS unit connector C (8P) and body ground. There should be 0 – 1.0 Ω.

SRS UNIT CONNECTOR C (8P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit or poor contact at SRS unit connector C (8P). Check the connection; If the connection is OK, replace the SRS unit (see page 23-127).■

NO – Open in the SCS line between the No. 6 terminal of SRS unit connector C (8P) and the No. 9 terminal (BRN wire) of the Data Link Connector (DLC), or open between the No. 4 terminal of the DLC and body ground. Repair the open wire(s).■

Component Replacement/ Inspection After Deployment

NOTE: Before doing any SRS repairs, use the PGM Tester SRS menu method to check for DTCs; refer to the DTC Troubleshooting Index for the less obvious deployed parts (seat belt tensioners, OPDS sensor, side airbag sensors, etc.)

After a collision where the seat belt tensioners deployed, replace these items:
- Seat belt tensioners
- SRS unit

After a collision where the airbag(s) deployed, replace these items:
- SRS unit
- Deployed airbag(s)
- Seat belt tensioners

After a collision where the side airbag(s) deployed, replace these items:
- SRS unit
- Deployed side airbag(s)
- Side impact sensor(s) for the side(s) that deployed

During the repair process, inspect these areas:
- Inspect all the SRS wire harnesses. Replace, don't repair, any damaged harnesses.
- Inspect the cable reel for heat damage. If there is any damage, replace the cable reel.

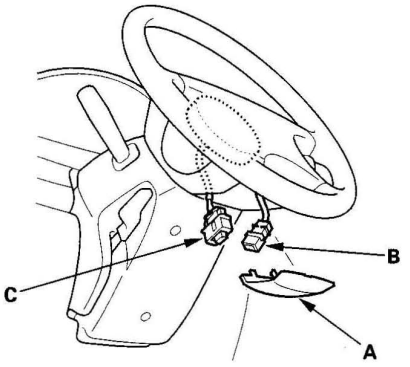
After the vehicle is completely repaired, turn the ignition switch ON (II). If the SRS indicator light comes on for about 6 seconds and then goes off, the SRS airbag system is OK. If the indicator light does not function properly, use the PGM Tester SRS Menu Method to read the DTC(s). If this doesn't retrieve any codes, use the Tester's SCS menu method (see page 23-25). If the SCS method doesn't work, you may need to install a known-good SRS unit to read the DTC(s). If you still cannot retrieve a code, go to SRS Indicator Circuit Troubleshooting.

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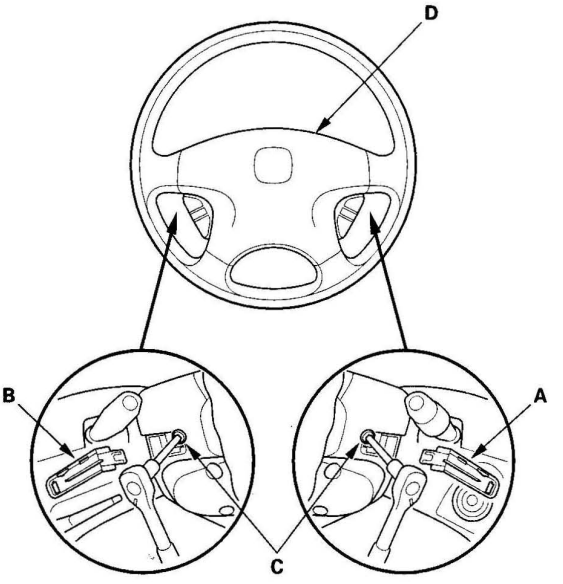
Driver's Airbag Replacement

Removal

1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Remove the access panel (A) from the steering wheel, then disconnect the connector between the cable reel 2P connector (B) and driver's airbag 2P connector (C).



3. Remove the covers (A, B) from the steering wheel, then remove the two Torx bolts (C) using a Torx T30 bit. Remove the driver's airbag (D).



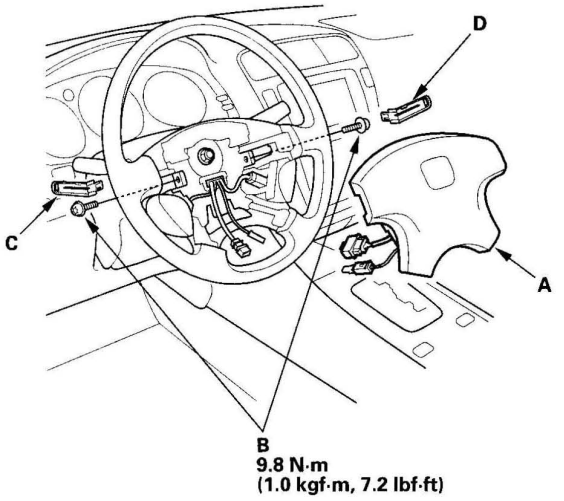
4. Disconnect the horn connector from the steering wheel.

BACK

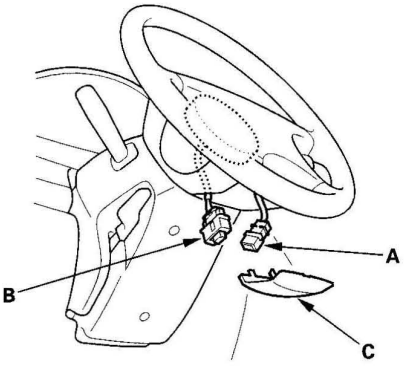
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Installation

1. Place the new driver's airbag (A) in the steering wheel, and secure it with new Torx bolts (B). Install the covers (C and D).



2. Connect the cable reel 2P connector (A) to the driver's airbag 2P connector (B), then install the access panel (C) on the steering wheel.



3. Connect the battery negative cable.

4. After installing the airbag, confirm proper system operation:

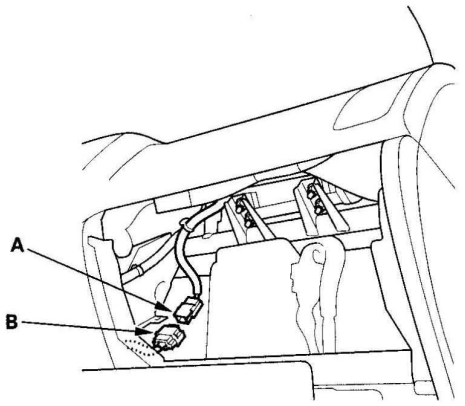
   - Turn the ignition switch ON (II); the SRS indicator light should come on for about 6 seconds and then go off.
   - Make sure the horn button works.

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Front Passenger's Airbag Replacement

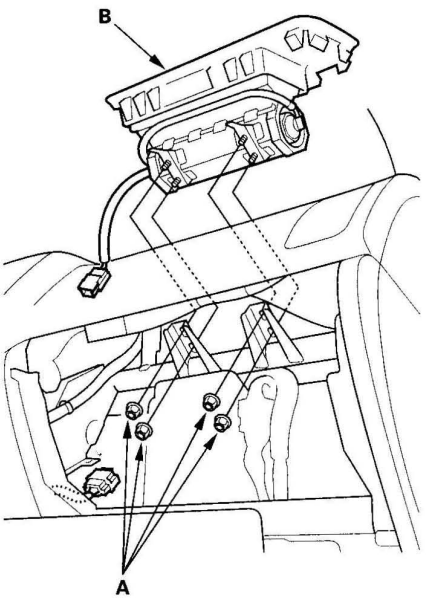
Removal

1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Remove the glove box (see page 20-69).
3. Disconnect the connector between the front passenger's airbag 4P connector (A) and SRS main harness 4P connector (B).



4. Remove the four mounting nuts (A) from the bracket. Cover the lid and dashboard with a cloth, and pry carefully with a screwdriver to lift the front passenger's airbag (B) out of the dashboard.

NOTE: The airbag lid has pawls on its side that attach it to the dashboard.

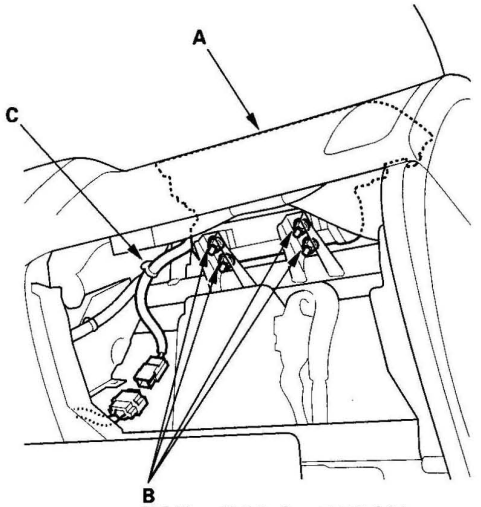


BACK

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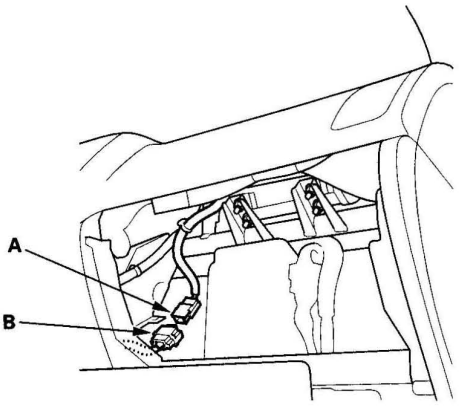
Installation

1. Place the new front passenger's airbag (A) into the dashboard. Tighten the front passenger's airbag mounting nuts (B), and install the harness clip (C).



9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

2. Connect the front passenger's airbag 4P connector (A) to the SRS main harness 4P connector (B), then reinstall the glove box.



3. Reconnect the battery negative cable.

4. After installing the airbag, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator light should come on for about 6 seconds and then go off.

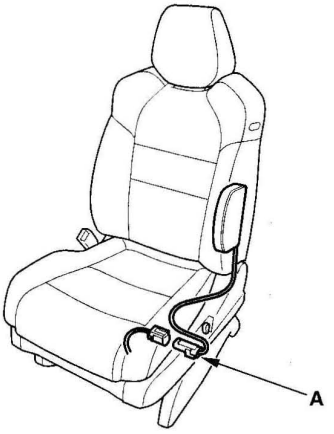
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Side Airbag Replacement

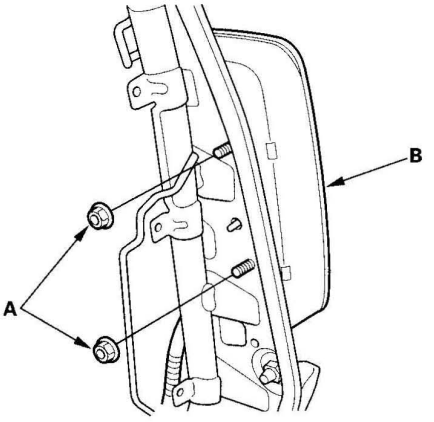
NOTE: Review the seat replacement procedure in the body section (see page 20-83) before performing repair or service.

Removal

1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Disconnect the side airbag harness 2P connector (A).



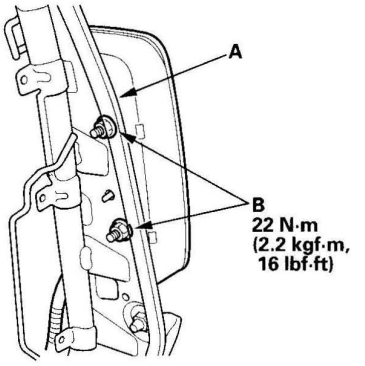
3. Remove the seat assembly (see page 20-77) and seat-back cover (see page 20-83).
4. Remove the two mounting nuts (A) and the side airbag (B).



Installation

NOTE:
- If the side airbag lid is secured by a tape, remove the tape.
- Do not open the lid of the side airbag cover.
- Use new mounting nuts tightened to the specified torque when you replace a side airbag.
- Make sure that the seat-back cover is installed properly. Improper installation may prevent proper deployment.
- Be sure to install the harness wires so that they are not pinched or interfering with other parts.

1. Place the new side airbag on the seat back-frame (A). Tighten the side airbag mounting nuts (B).



2. Install the new seat-back cover (see page 20-83).
3. Install the seat assembly (see page 20-4), then connect the side airbag harness 2P connector.
4. Move the front seat and the seat-back through their full ranges of movement, making sure the harness wires are not pinched or interfering with other parts.
5. Reconnect the battery negative cable.
6. After installing the side airbag, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator light should come on for about 6 seconds and then go off.

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Airbag Disposal

Special Tool Required
Deployment tool 07HAZ-SG00500

Before scrapping any airbags, side airbags, or seat belt tensioners (including those in a whole vehicle to be scrapped), the airbags, side airbags, or seat belt tensioners must be deployed. If the vehicle is still within the warranty period, the Acura District Parts and Service Manager must give approval and/or special instruction before deploying the airbags, side airbags, or seat belt tensioners. Only after the airbags, side airbags, or seat belt tensioners have been deployed (as the result of vehicle collision, for example), can they be scrapped.
If the airbags, side airbags, or seat belt tensioners appear intact (not deployed), treat them with extreme caution. Follow this procedure.

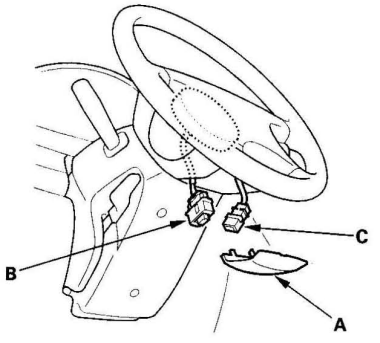
Deploying Airbags in the Vehicle

If an SRS equipped vehicle is to be entirely scrapped, its airbags, side airbags, or seat belt tensioners should be deployed while still in the vehicle. The airbags, side airbags, or seat belt tensioners should not be considered as salvageable parts and should never be installed in another vehicle.

1. Turn the ignition switch OFF, then disconnect the battery negative cable, and wait at least 3 minutes.
2. Confirm that each airbag, side airbag, or seat belt tensioner is securely mounted.
3. Confirm that the special tool is functioning properly by following the check procedure on the tool label.

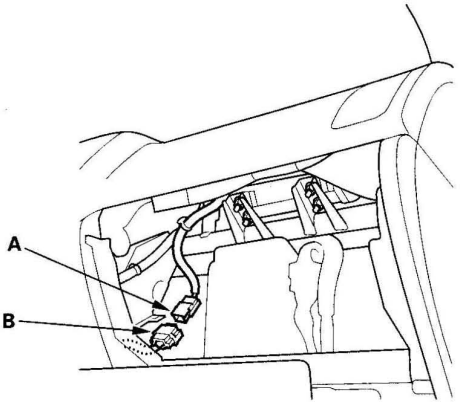
Driver's Airbag:

4. Remove the access panel (A), then disconnect the 2P connector between the driver's airbag (B) and the cable reel (C).



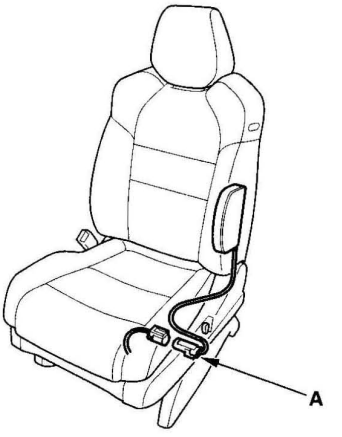
Front Passenger's Airbag:

5. Remove the glove box, then disconnect the 4P connector between the front passenger's airbag (A) and the SRS main harness (B).



Side Airbag:

6. Disconnect the 2P connector (A).



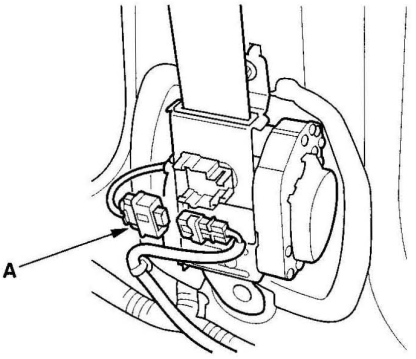
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Airbag Disposal (cont'd)

Seat belt tensioner:

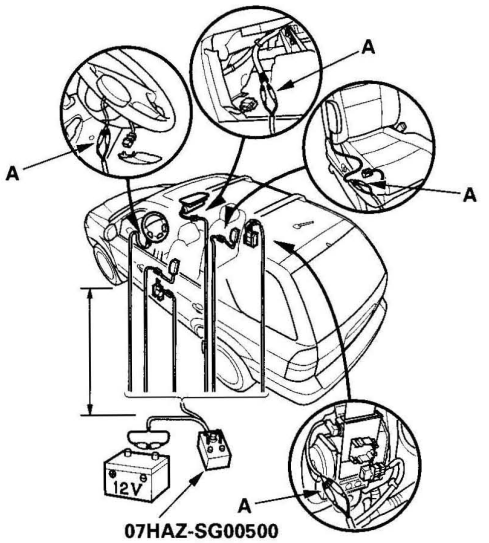
7. Disconnect the seat belt tensioner 2P connector (A).



8. Pull the seat belt out all the way and cut it.

9. Cut off each connector, strip the ends of the wires, and connect the deployment tool alligator clips (A) to the wires. Place the deployment tool at least 30 feet (10 meters) away from the vehicle.

   NOTE: The front passenger's airbag has four wires, two yellow and two red. Twist each pair of unlike colored wires together, and connect an alligator clip to each pair.



10. Connect a 12 volt battery to the tool.

    - If the green light on the tool comes on, the igniter circuit is defective and cannot deploy the component. Go to Disposal of Damaged Components.
    - If the red light on the tool comes on, the component is ready to be deployed.

11. Push the tool's deployment switch. The airbags and tensioners should deploy (deployment is both highly audible and visible: a loud noise and rapid inflation of the bag, followed by slow deflation).

    - If the components deploy and the green light on the tool comes on, continue with this procedure.
    - If a components doesn't deploy, yet the green light comes ON, its igniter is defective. Go to Disposal of Damaged Components.
    - During deployment the airbag can become hot enough to burn you. Wait 30 minutes after deployment before touching the airbag.

12. Dispose of the complete airbag. No part of it can be reused. Place it in a sturdy plastic bag (A), and seal it securely.

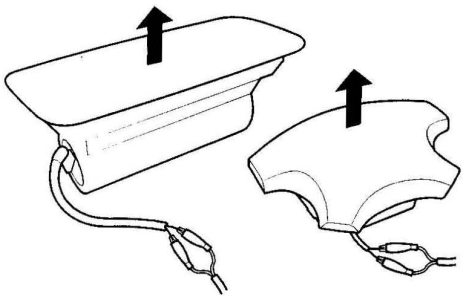


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Deploying Components Out of the Vehicle

If an intact airbag or tensioner has been removed from a scrapped vehicle, or has been found defective or damaged during transit, storage, or service, it should be deployed as follows:



1. Confirm that the special tool is functioning properly by following the check procedure on this page or on the tool label.
2. Position the airbag face up, outdoors, on flat ground, at least 30 feet (10 meters) from any obstacles or people.
3. Follow steps 9, 10, 11, and 12 of the in-vehicle deployment procedure.

Disposal of Damaged Components

1. If installed in a vehicle, follow the removal procedure for the driver's airbag (see page 23-116), front passenger's airbag (see page 23-118), side airbag (see page 23-120), and seat belt tensioner (see page 23-4).
2. In all cases, make a short circuit by twisting together the two inflator wires.
3. Package the component in exactly the same packaging that the new replacement part came in.
4. Mark the outside of the box "DAMAGED AIRBAG NOT DEPLOYED", "DAMAGED SIDE AIRBAG NOT DEPLOYED" or "DAMAGED SEAT BELT TENSIONER NOT DEPLOYED" so it does not get confused with your parts stock.
5. Contact your Acura District Parts and Service Manager for how and where to return it for disposal.

Deployment Tool Check

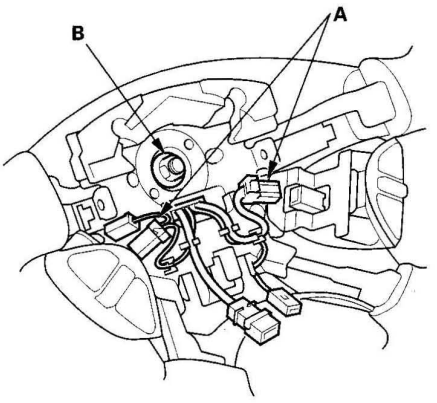
1. Connect the yellow clips to both switch protector handles on the tool; connect the tool to a battery.
2. Push the operation switch: green means the tool is OK; red means the tool is faulty.
3. Disconnect the battery and the yellow clips.

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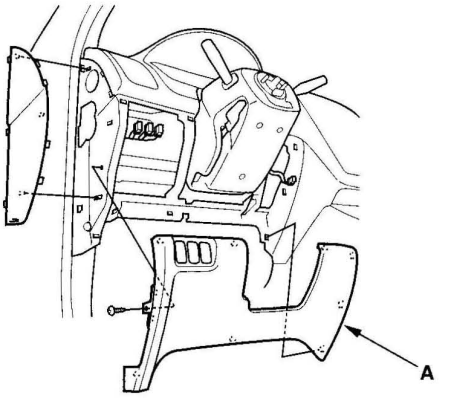
Cable Reel Replacement

Removal

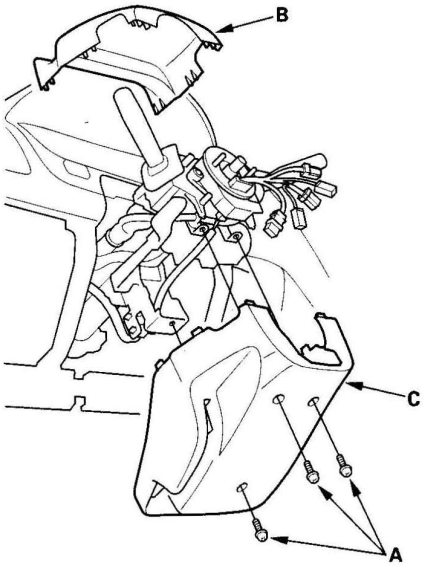
1. Make sure the front wheels are aligned straight ahead.
2. Disconnect the battery negative cable, and wait at least 3 minutes.
3. Remove the driver's airbag (see page 23-116).
4. Disconnect the connectors (A) from the radio remote switch and cruise control set/resume switch, then remove the steering wheel bolt (B).



5. Align the front wheels straight ahead, then remove the steering wheel (see step 3 on page 17-24).
6. Remove the dashboard lower cover (A).



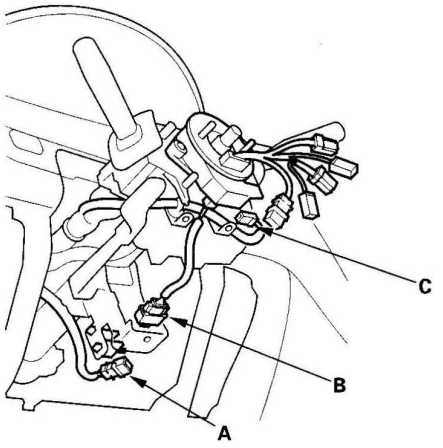
7. Remove the column cover screws (A), then remove the column covers (B, C).



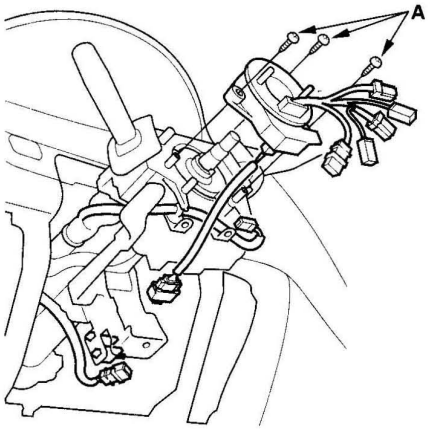
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8. Disconnect the SRS main harness 2P connector (A) from the cable reel 2P connector (B), then disconnect the dashboard harness 4P connector (C) from the cable reel (D).

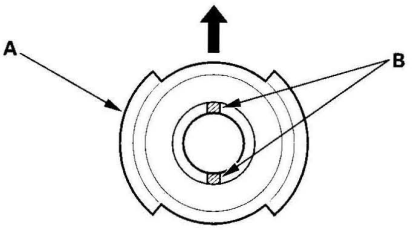


9. Remove the screws (A) from the cable reel, then remove the cable reel from the column.

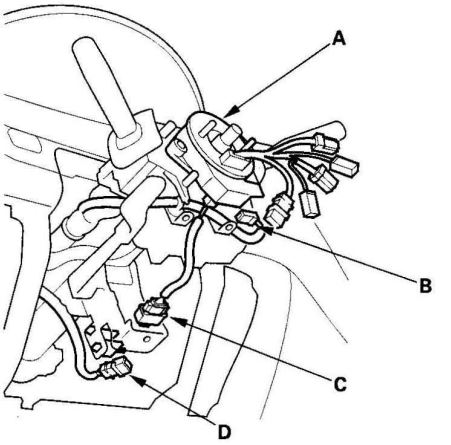


Installation

1. Before installing the steering wheel, align the front wheels straight ahead.
2. If not already done, disconnect the battery negative cable, and wait at least 3 minutes.
3. Set the cancel sleeve (A) so the projections (B) are aligned vertically.



4. Carefully install the cable reel (A) on the steering column shaft. Then connect the 4P connector (B) to the cable reel, and connect the 2P connector (C) to the SRS main harness 2P connector (D).



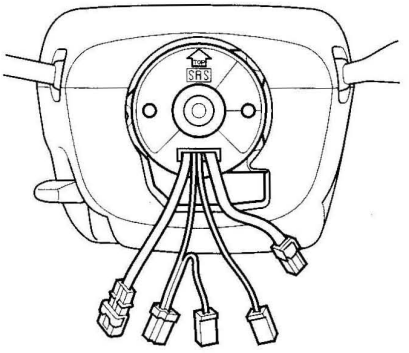
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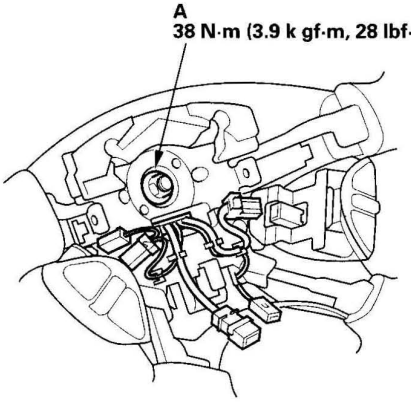
Cable Reel Replacement (cont'd)

5. Install the steering column covers.

6. If necessary, center the cable reel. (New replacement cable reels come centered.) Do this by first rotating the cable reel clockwise until it stops. Then rotate it counterclockwise (about 2 1/2 turns) until the arrow mark on the cable reel label points straight up.



7. Align the projections on the cable reel with the holes on the steering wheel, and install the steering wheel with a new steering wheel bolt (A).



8. Install the driver's airbag (see page 23-117).

9. Reconnect the battery negative cable.

10. After installing the cable reel, confirm proper system operation:

    - Turn the ignition switch ON (II); the SRS indicator light should come on for about 6 seconds and then go off.
    - After the SRS indicator light has turned off, turn the steering wheel fully left and right to confirm the SRS indicator light does not come on.
    - Make sure the horn button works.

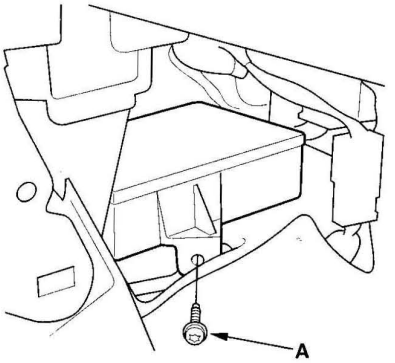
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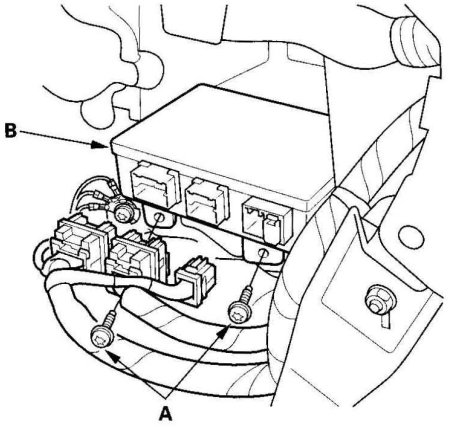
SRS Unit Replacement

Removal

1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Disconnect the driver's and front passenger's airbag connectors (see page 23-23).
3. Disconnect the side airbag connectors (see page 23-23).
4. Disconnect both seat belt tensioner connectors (see page 23-23).
5. Remove the center console trim (see page 20-65).
6. Pull down the carpet, then remove the Torx bolt (A) from the SRS unit.



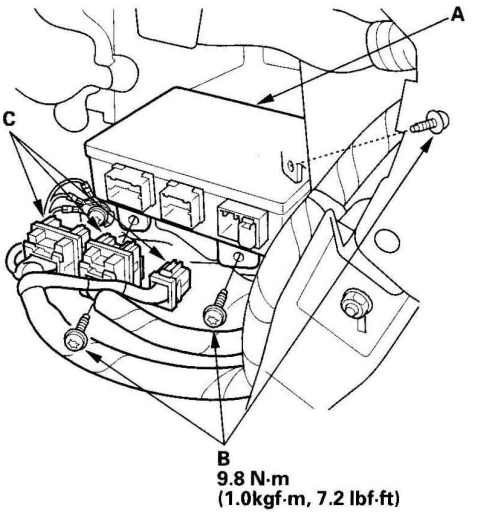
7. Disconnect the connectors and remove the two Torx bolts (A), then pull out the SRS unit.



Installation

1. Install the new SRS unit (A) with Torx bolts (B), then connect the connectors (C) to the SRS unit; push it into position until it clicks.

   NOTE: When tightening the Torx bolts to the specified torque, be careful to turn them in so that their heads rest squarely on the brackets.



2. Install the center console garnish (see page 20-65).
3. Reconnect the driver's and front passenger's airbag connectors (see page 23-23).
4. Reconnect the side airbag connectors (see page 23-23).
5. Reconnect both seat belt tensioner connectors (see page 23-23).
6. Reconnect the battery negative cable.
7. Initialize the OPDS unit (see page 23-28).
8. After installing the SRS unit, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator light should come on for about 6 seconds and then go off.

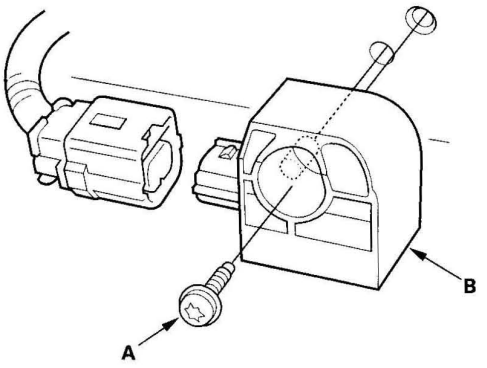
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Side Impact Sensor Replacement

Removal

NOTE:
- Removal of the side impact sensor must be performed according to the precautions/procedures described before.
- Before disconnecting the side impact sensor 2P connector(s), disconnect the side airbag 2P connector(s).
- Do not turn the ignition switch ON (II) and do not connect the battery cable while replacing the side impact sensor.

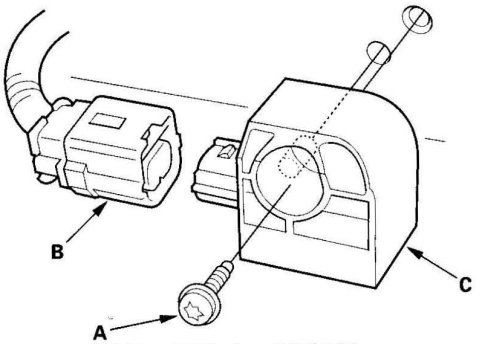
1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Remove the seat assembly (see page 20-77).
3. Remove the B pillar lower trim panel (see page 20-55).
4. Turn up the carpet, then disconnect the SRS side (sub) harness 2P connector from the side impact sensor.
5. Remove the Torx bolt (A) using a Torx T30 bit, then remove the side impact sensor (B).



Installation

NOTE:
- Be sure to install the harness wires so that they are not pinched or interfering with other parts.
- Do not turn the ignition switch ON (II) and do not connect the battery cable while replacing the side impact sensor.

1. Install the new side impact sensor with a new Torx bolt (A) then connect the SRS side (sub) harness 2P connector (B) to the side impact sensor (C).



2. Reconnect the battery negative cable.
3. After installing the side impact sensor, confirm proper system operation: Turn the ignition switch ON (II): the SRS indicator light should come on for about 6 seconds and then go off.

BACK

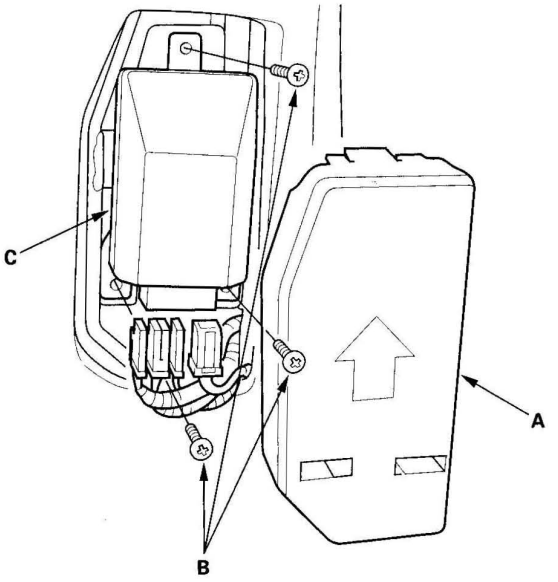
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OPDS Unit Replacement

NOTE: Review the seat replacement procedure in the body section (see page 20-83) before performing repair or service.

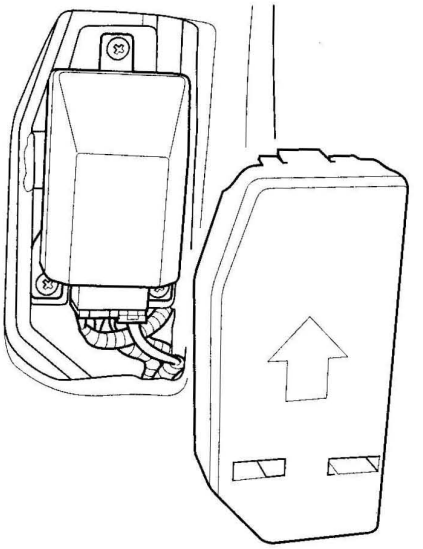
Removal

1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Disconnect the side airbag harness 2P connector (see page 23-23).
3. Remove the seat assembly (see page 20-77) and seat-back cover (see page 20-83).
4. Remove the cover (A), then disconnect the OPDS unit harness 8P and sensor connectors from the OPDS unit.
5. Remove the three screws (B) and OPDS unit (C).



Installation

1. Place the new OPDS unit on the seat-back frame. Tighten the three screws (A), and connect the OPDS unit harness 8P and sensor connector to the OPDS unit. Reinstall the cover.



2. Install the new seat-back cover (see page 20-83).
3. Install the seat assembly (see page 20-77), then connect the side airbag harness 2P connector.
4. Reconnect the battery negative cable.
5. Set the seat-back in the normal position, and make sure there is nothing on the front passenger's seat.
6. Initialize the OPDS unit (see page 23-28).
7. After installing the OPDS unit, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator light should come on for about 6 seconds and then go off.