

SUPPLEMENTAL RESTRAINT SYSTEM

The Acura TL SRS includes a driver's airbag located in the steering wheel hub and a passenger's airbag located in the dashboard above the glove box. Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (*) on the contents page include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special precautions and tools, and should therefore be done by an authorized Honda dealer.

WARNING

- **To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all SRS service work must be performed by an authorized Honda dealer.**
- **Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional activation of the front airbags, seat belt tensioners, and side airbags ('99-01 models).**
- **Do not bump the SRS unit. Otherwise, the system may fail in a collision, or the airbags may deploy when the ignition switch is ON (II).**
- **All SRS electrical wiring harnesses are covered with yellow insulation. Related components are located in the steering column, front console, dashboard, dashboard lower panel, in the dashboard above the glove box. Do not use electrical test equipment on these circuits.**

NOTE: The original radio has a coded theft protection circuit. Be sure to get the customer's code number before

- disconnecting the battery.
- removing the No. 39 (10A) fuse from the under-hood fuse/relay box.
- removing the radio.

After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

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Switch Test/Replacement

2.5L	23-252
3.2L	23-127a

Motor Test

2.5L	23-253
3.2L	23-128a

Wipers/Washer

Component Location

Index	
2.5L	23-254
3.2L	23-133a

Troubleshooting

2.5L	23-256
3.2L	23-135a

Switch Replacement

2.5L	23-257
3.2L	23-136a

Wiper/Washer Switch

Test	23-258
------	--------

Washer Motor

Test	23-259
------	--------

Windshield Wiper Motor

Test	23-260
------	--------

Security Alarm System

Component Location Index

2.5L	23-274
3.2L	23-145a

System Description

	23-276
--	--------

Troubleshooting

2.5L	23-282
3.2L	23-150a

Control Unit Input Test

2.5L	23-283
3.2L	23-151a

Security Indicator Test/

Replacement	23-286
-------------	--------

Hood Switch Test/

Replacement	23-286
-------------	--------

Security Trunk Latch Switch

Test	23-287
------	--------

Security Trunk Key Cylinder

Switch Test	23-287
-------------	--------

Passenger's Door Lock Knob

Switch Test	23-288
-------------	--------

Seat Heaters (3.2L Engine)

Component Location

Index	23-129a
-------	---------

Troubleshooting

	23-131a
--	---------

Switch

Replacement	23-131a
-------------	---------

Test	23-132a
------	---------

Heater Test

	23-132a
--	---------

Engine Electrical

Starting System

Component Location Index

2.5L	23-70
3.2L	23-60a

Starter Test

2.5L	23-72
3.2L	23-62a

Starter Solenoid Test

2.5L	23-73
3.2L	23-63a

Starter

Replacement

2.5L	23-74
3.2L	23-64a

Overhaul

2.5L	23-75
3.2L	23-65a

Armature Inspection and Test

2.5L	23-76
3.2L	23-66a

Starter Brush Holder Test

2.5L	23-78
3.2L	23-68a

Starter Brush Inspection

2.5L	23-78
3.2L	23-68a

Overrunning Clutch Inspection

2.5L	23-79
3.2L	23-69a

Starter Reassembly

2.5L	23-79
3.2L	23-69a

Performance Test

2.5L	23-80
3.2L	23-70a

Ignition System

Component Location Index

2.5L	23-81
3.2L	23-71a

System Description

2.5L	23-82
3.2L	23-72a

Ignition Timing Inspection

2.5L	23-84
3.2L	23-74a

Idle Speed Check

2.5L	23-85
3.2L	23-75a

Distributor (2.5L)

Removal	23-85
Overhaul	23-86
Top End Inspection	23-87
Installation	23-89

Noise Condenser Capacity Test

2.5L	23-87
3.2L	23-75a

Ignition Wire Inspection/Test

.....	23-88
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Ignition Control Module (ICM)

Input Test	
2.5L	23-90
3.2L	23-76a

Ignition Coil Test

2.5L	23-91
3.2L	23-77a

Spark Plug Inspection

2.5L	23-92
3.2L	23-78a

Charging System

Component Location Index

2.5L	23-93
3.2L	23-79a

System Description

.....	23-94
-------	-----------------------

Troubleshooting

Charging System Light	
2.5L	23-96
3.2L	23-81a

Alternator/Regulator

2.5L	23-98
3.2L	23-83a

Alternator

Replacement

2.5L	23-100
3.2L	23-85a

Overhaul

2.5L	23-101
3.2L	23-86a

Rectifier Test

.....	23-102
-------	------------------------

Brush Inspection

.....	23-102
-------	------------------------

Rotor Slip Ring Test

.....	23-103
-------	------------------------

Stator Test

.....	23-103
-------	------------------------

Belt Inspection and Adjustment

2.5L	23-104
3.2L	23-89a

Fan Controls

Component Location Index

2.5L	23-106
3.2L	23-91a

System Description

.....	23-106
-------	------------------------

Troubleshooting

2.5L	23-108
3.2L	23-93a

Radiator Fan Control Module Terminals

2.5L	23-109
3.2L	23-93a

Fan Motor Test

.....	23-109
-------	------------------------

Cruise Control

Component Location Index

.....	23-261
-------	------------------------

System Description

.....	23-263
-------	------------------------

Troubleshooting

2.5L	23-266
3.2L	23-139a

Control Unit Input Test

.....	23-267
-------	------------------------

Main Switch Test

.....	23-269
-------	------------------------

Set/Resume Switch

Test/Replacement	23-270
------------------------	------------------------

Brake Switch Test

.....	23-272
-------	------------------------

A/T Gear Position Switch Test

2.5L	23-272
3.2L	23-140a

Actuator Solenoid Test

(3.2L)	23-140a
--------------	-------------------------

Actuator Assembly Test

2.5L	23-273
3.2L	23-141a

Actuator/Cable Replacement

(3.2L)	23-142a
--------------	-------------------------

Actuator Disassembly

2.5L	23-273
3.2L	23-143a

Actuator Cable Adjustment

2.5L	23-273
3.2L	23-144a

Supplemental Restraint System (2.5L)

Special Tools	24-2	Backprobing Spring-loaded Lock		Troubleshooting of Intermittent Failures	
Component/Wiring Locations		Connectors	24-11	'95-96 Models	24-16
Index	24-3	Disconnecting the Airbag		'97-98 Models	24-41
Description	24-4	Connectors	24-12	DTC Chart	
Precautions/Procedures		Steering-related Precautions	24-13	'95-96 Models	24-17
General Precautions	24-7	Troubleshooting		'97-98 Models	24-42
Airbag Handling and Storage	24-7	Self-diagnostic Procedures		SRS Indicator Light Wire Connections	
SRS Unit Precautions	24-8	'95-96 Models	24-14	'95-96 Models	24-18
Inspection After Deployment	24-8	'97-98 Models	24-39	'97-98 Models	24-43
Wiring Precautions	24-9	Reading the DTC		Airbag	
Spring-loaded Lock		'95-96 Models	24-14	Replacement	24-67
Connectors	24-10	'97-98 Models	24-39	Disposal	24-71
Spring-loaded Lock Connectors with		Erasing the DTC Memory		Cable Reel	
Built-in Short Contact	24-11	'95-96 Models	24-16	Replacement	24-73
		'97-98 Models	24-41	SRS Unit	
				Replacement	24-77

Chassis and Paint Codes

1996 U.S. Model

Vehicle Identification Number

JH4 UA36 4 * T C 000001

Manufacturer, Make and Type of Vehicle

JH4: HONDA MOTOR CO., LTD.
ACURA Passenger vehicle

Line, Body and Engine Type

UA3: 3.2TL/C32A6

Body Type and Transmission Type

6: 4-door sedan/4-speed Automatic

Vehicle Grade (Series)

4: without moonroof

5: with moonroof (Premium Package)

Check Digit

Model Year

T: 1996

Factory Code

C: Saitama Factory in Japan (Sayama)

Serial Number

Transmission Number

M5HA - 1000001

Transmission Type

Serial Number

Paint Code

Paint Code	Color
R-91P	Garnet Red Pearl
G-79P	Bayern Green Pearl
NH-503P	Granada Black Pearl
NH-578	Taffeta White
YR-509P	Granite Silver Pearl
YR-506M	Arbere Taupe Metallic
NH-585P	Cayman White Pearl

Engine Number

C32A6 - 13 00001

Engine Type

Emission Group

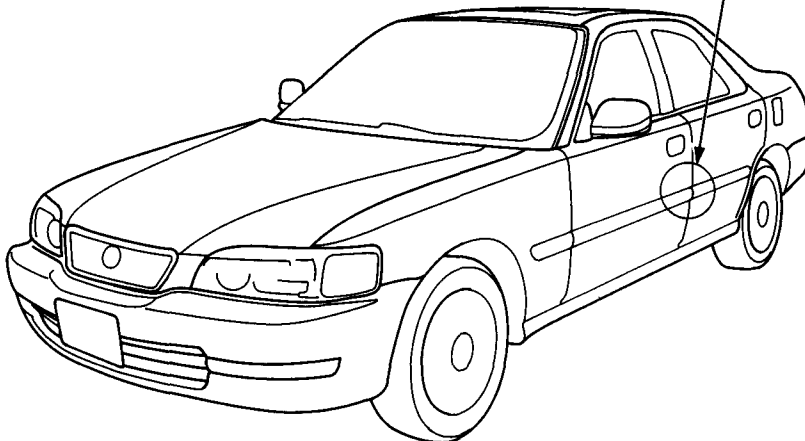
Serial Number

Vehicle Identification Number and Federal Motor Vehicle Safety Standard Certification.



Paint Code

COLOR
NH-503P





1997 U.S. Model

Vehicle Identification Number

JH4 UA3 6 4 * V C 000001

**Manufacturer, Make and
Type of Vehicle**

JH4: HONDA MOTOR CO., LTD.

ACURA Passenger vehicle

Line, Body and Engine Type

UA3: 3.2TL/C32A6

Body Type and Transmission Type

6: 4-door sedan/4-speed Automatic

Vehicle Grade (Series)

4: without moonroof

5: with moonroof (Premium Package)

Check Digit

Model Year

V: 1997

Factory Code

C: Saitama Factory in Japan (Sayama)

Serial Number

Transmission Number

M5HA - 2000001

Transmission Type

Serial Number

Paint Code

Paint Code	Color
B-68P	Pacific Blue Pearl
G-79P	Juniper Green Pearl
NH-585P	Cayman White Pearl
NH-592P	Flamenco Black Pearl
YR-506M	Desert Mist Metallic
YR-509P	Granite Silver Pearl

Engine Number

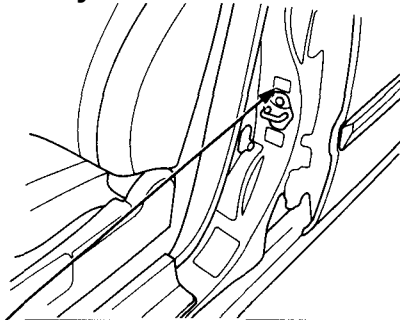
C32A6 - 23 00001

Engine Type

Emission Group

Serial Number

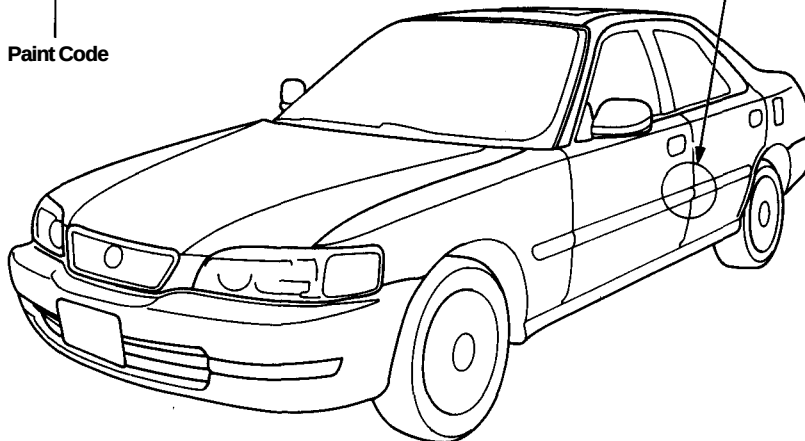
Vehicle Identification Number and Federal Motor Vehicle Safety Standard Certification.



COLOR LABEL

INT. COLOR
TYPE F
EXT. COLOR
G-79P
KA SZ5 A7 C

Paint Code



Chassis and Paint Codes

1998 U.S. Model

Vehicle Identification Number

JH4 UA3 6 4 *W C 000001

Manufacturer, Make and Type of Vehicle

JH4: HONDA MOTOR CO., LTD.
ACURA Passenger vehicle

Line, Body and Engine Type

UA3: 3.2TL/C32A6

Body Type and Transmission Type

6: 4-door sedan/4-speed Automatic

Vehicle Grade (Series)

Check Digit

Model Year

W: 1998

Factory Code

C: Saitama Factory in Japan (Sayama)

Serial Number

Transmission Number

M5HA - 3000001

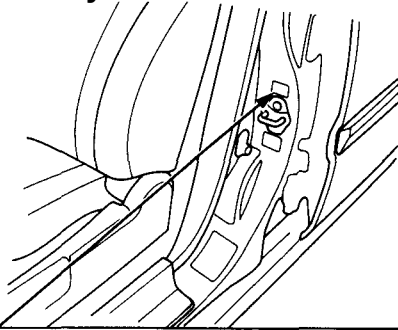
Transmission Type

Serial Number

Paint Code

Paint Code	Color
B-68P	Pacific Blue Pearl
B-91M	Crystal Blue Metallic
G-79P	Juniper Green Pearl
NH-585P	Cayman White Pearl
NH-592P	Flamenco Black Pearl
YR-509P	Granite Silver Pearl

Vehicle Identification Number and Federal Motor Vehicle Safety Standard Certification.



Engine Number

C32A6 - 3300001

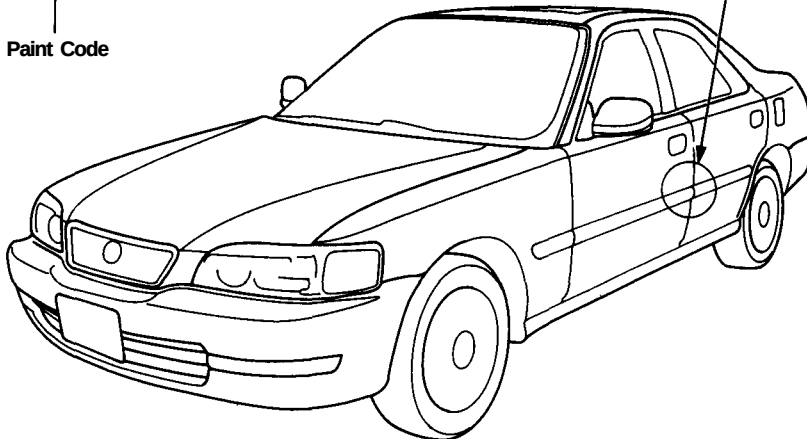
Engine Type

Serial Number

COLOR LABEL

INT. COLOR
TYPE F
EXT. COLOR
G-79P
KA SZ5 A7 C

Paint Code





1996 Canada Model

Vehicle Identification Number

JH4 UA365 * T C 800001

Manufacturer, Make and

Type of Vehicle

JH4: HONDA MOTOR CO., LTD.

ACURA Passenger vehicle

Line, Body and Engine Type

UA3: 3.2TL/C32A6

Body Type and Transmission Type

6: 4-door sedan/4-speed Automatic

Vehicle Grade (Series)

Check Digit

Model Year

T: 1996

Factory Code

C: Saitama Factory in Japan (Sayama)

Serial Number

Transmission Number

M5HA - 1000001

Transmission Type

Serial Number

Paint Code

Paint Code	Color
R-91P	Garnet Red Pearl
G-79P	Bayern Green Pearl
NH-503P	Granada Black Pearl
NH-578	Taffeta White
YR-509P	Granite Silver Pearl
YR-506M	Arbere Taupe Metallic
NH-585P	Cayman White Pearl

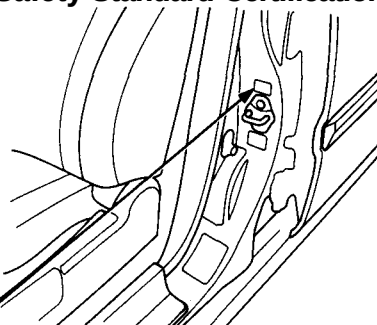
Engine Number

C32A6 - 1700001

Engine Type

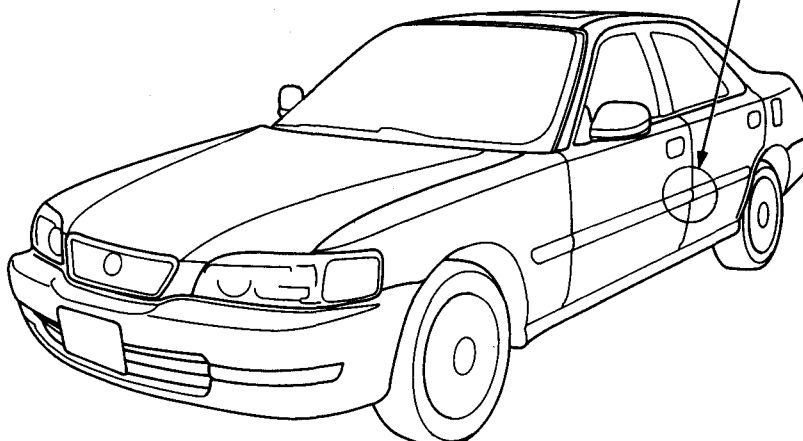
Serial Number

Vehicle Identification Number and Canadian Motor Vehicle Safety Standard Certification.



Paint Code

COLOR
NH-503P



Chassis and Paint Codes

1997 Canada Model

Vehicle Identification Number

JH4 UA3 6 5 * V C 800001

Manufacturer, Make and

Type of Vehicle

JH4: HONDA MOTOR CO., LTD.
ACURA Passenger vehicle

Line, Body and Engine Type

UA3: 3.2TL/C32A6

Body Type and Transmission Type

6: 4-door sedan/4-speed Automatic

Vehicle Grade (Series)

Check Digit

Model Year

V: 1997

Factory Code

C: Saitama Factory in Japan (Sayama)

Serial Number

Transmission Number

M5HA - 2000001

Transmission Type

Serial Number

Paint Code

Paint Code

Color

B-68P

G-79P

NH-585P

NH-592P

YR-509P

Pacific Blue Pearl

Juniper Green Pearl

Cayman White Pearl

Flamenco Black Pearl

Granite Silver Pearl

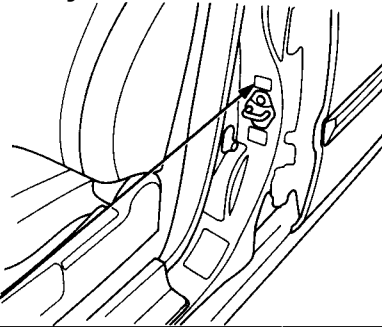
Engine Number

C32A6 - 2700001

Engine Type

Serial Number

Vehicle Identification Number and Canadian Motor Vehicle Safety Standard Certification.



COLOR LABEL

INT. COLOR

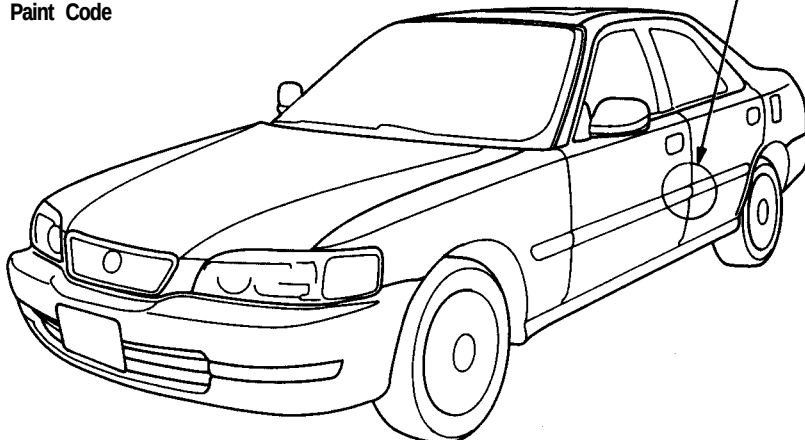
TYPE F

EXT. COLOR

G-79P

KC SZ5 C7 C

Paint Code





1998 Canada Model

Vehicle Identification Number

JH4 UA3 6 4 *WC 800001

**Manufacturer, Make and
Type of Vehicle**

JH4: HONDA MOTOR CO., LTD.
ACURA Passenger vehicle

Line, Body and Engine Type

UA3: 3.2TL/C32A6

Body Type and Transmission Type

6: 4-door sedan/4-speed Automatic

Vehicle Grade (Series)

Check Digit

Model Year

W: 1998

Factory Code

C: Saitama Factory in Japan (Sayama)

Serial Number

Transmission Number

M5HA - 3000001

Transmission Type

Serial Number

Paint Code

Paint Code	Color
B-68P	Pacific Blue Pearl
G-79P	Bayern Green Pearl
NH-585P	Cayman White Pearl
NH-592P	Starlight Black Pearl
YR-509P	Granite Silver Pearl

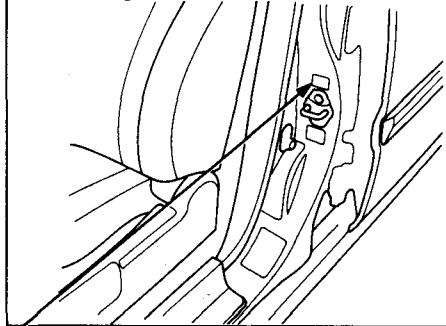
Engine Number

C32A6 - 3700001

Engine Type

Serial Number

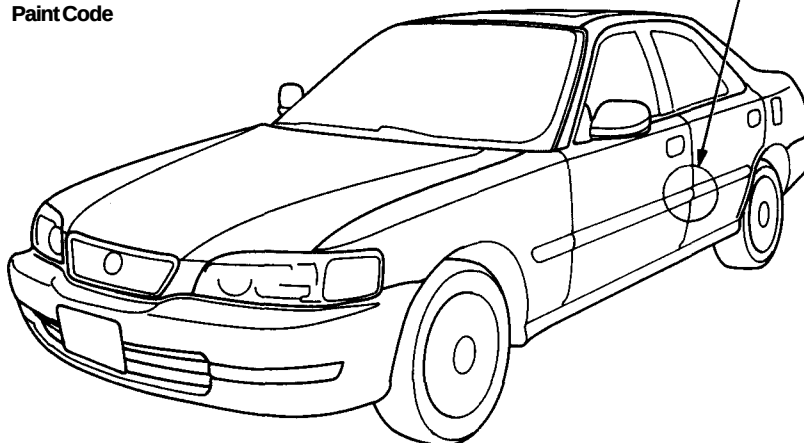
Vehicle Identification Number and Canadian Motor Vehicle Safety Standard Certification.



COLOR LABEL

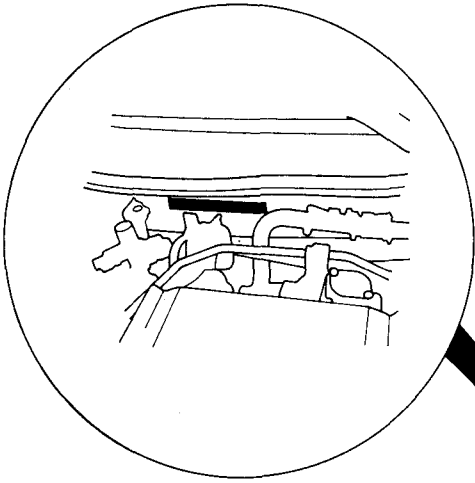
INT. COLOR
TYPE F
EXT. COLOR
G-79P
KC SZ5 C7 C

Paint Code

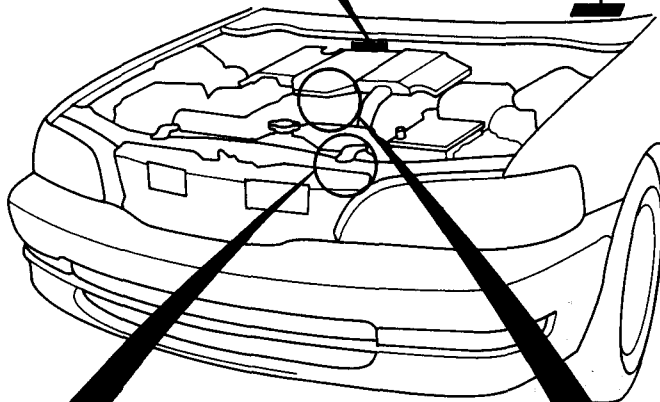
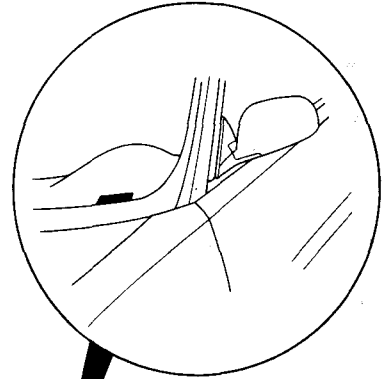


Identification Number Locations

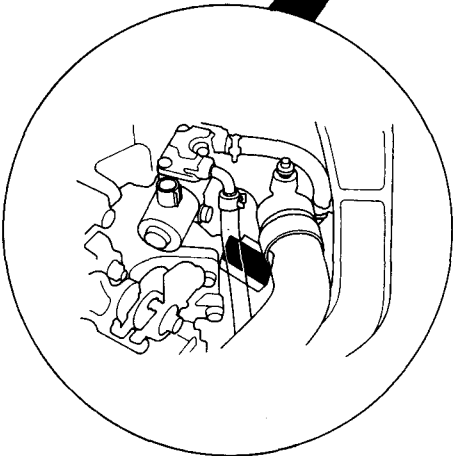
Vehicle Identification Number



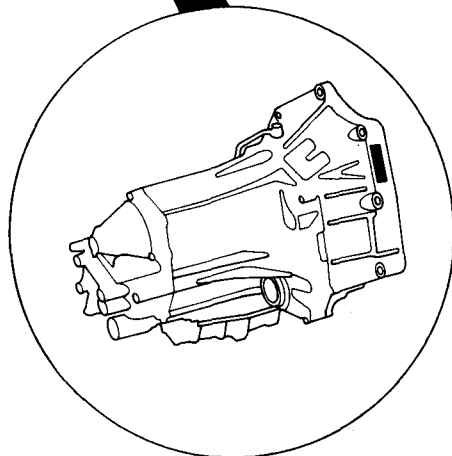
Vehicle Identification Number



Engine Number



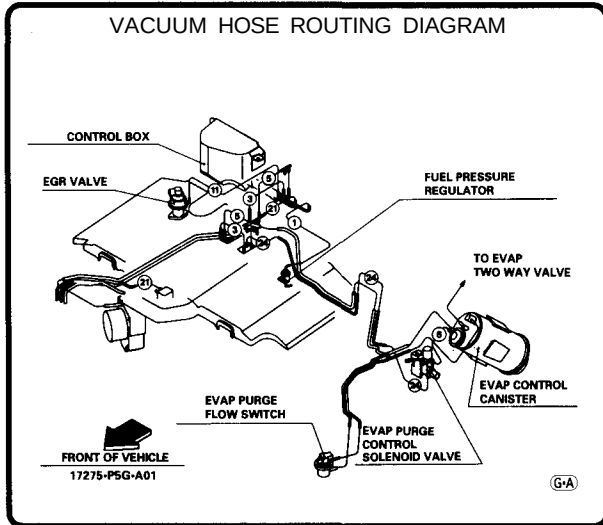
Transmission Number
(Automatic)



Under-hood Emissions Control Label

Emission Group Identification (1997 model)

Example:



VEHICLE EMISSION CONTROL INFORMATION			
ENGINE FAMILY-VHN3.2VJGKEK DISPLACEMENT-3206 cm ³ 196 CID EVAPORATIVE FAMILY-VHN1094AYMEZ			
CATALYST		TWC 2HO2S HO2S 3.2TL EGR SFI	
REFER TO SERVICE MANUAL FOR ADDITIONAL INFORMATION. TUNE UP CONDITIONS: ENGINE AT NORMAL OPERATING TEMPERATURE. ALL ACCESSORIES TURNED OFF. COOLING FAN OFF. TRANSMISSION IN NEUTRAL NO OTHER ADJUSTMENTS NEEDED.			
OBD II CERTIFIED			
IDLE SPEED	64 ± 50 rpm		
SPARK PLUG	TYPE	NGK: PFR5L-11 ND: PK16PR-L11	GAP
THIS VEHICLE CONFORMS TO U.S. EPA AND STATE OF CALIFORNIA REGULATIONS APPLICABLE TO 1997 MODEL YEAR NEW MOTOR VEHICLES.		32VJGKEG	
EXHAUST EMISSION STANDARDS STANDARD CATEGORY			
G+A	CERTIFICATION IN-USE	TIER 1 TIER 1 FULL	
17277-P5G-A01 HONDA MOTOR CO., LTD.			

50ST (50 State):

THIS VEHICLE CONFORMS TO U.S. EPA AND STATE OF CALIFORNIA REGULATIONS APPLICABLE TO 1997 MODEL YEAR NEW MOTOR VEHICLES.

49ST (49 States/Federal):

THIS VEHICLE CONFORMS TO U.S. EPA REGULATIONS APPLICABLE TO 1997 MODEL YEAR NEW MOTOR VEHICLES.

CAL (California):

THIS VEHICLE CONFORMS TO U.S. EPA AND STATE OF CALIFORNIA REGULATIONS APPLICABLE TO 1997 MODEL YEAR NEW PASSENGER CARS PROVIDED THAT THIS VEHICLE IS ONLY INTRODUCED INTO COMMERCE FOR SALE IN THE STATE OF CALIFORNIA.

Engine and Evaporative Families

Engine Family:

VHN3.2VJGKEK

Model Year

T: 1996

V: 1997

Manufacturer

HN: Honda

Displacement

Class

V: Light Duty Vehicle/Passenger Car

Fuel System and Number of Valves

J: Electronic Sequential Multiport Injection
(three or more valves per cylinder)

Fuel Type

G: Gasoline

Standard

F: 49 or 50 State Tier 1

K: 49 or 50 State Tier 1

1: California Tier 1

2: California TLEV

3: California LEV

4: California ULEV

Catalyst

E, F, G, H: Three Way Catalyst

OBD

K - T: OBD Equipped

Evaporative Family:

VHN1094AYMEZ

Model Year

T: 1996

V: 1997

Manufacturer

HN: Honda

Storage System

1: Canister

Canister Working Capacity (grams)

Canister Configuration

A: Plastic Housing (Closed Bottom)

B: Plastic Housing (Open Bottom)

Fuel System

Y: Fuel Injection

Fuel Tank

M: Metal

Standard

A: Current Evap

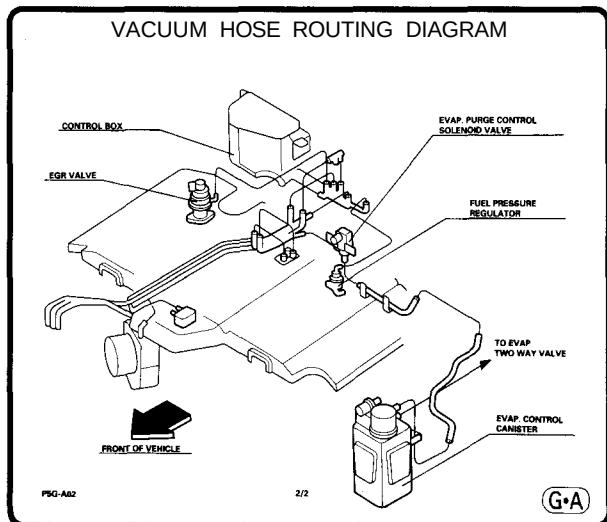
E: Enhanced Evap

Wild Card



Emission Group Identification (1998 model)

Example:



VEHICLE EMISSION CONTROL INFORMATION				
ENGINE FAMILY-WHNV03.2HA1				
DISPLACEMENT-3.2L				
EVAPORATIVE FAMILY-WHNXE0094AAZ (\$86.130-96 PROCEDURES)				
CATALYST TWC 2HO2S HO2S EGR SFI				
				
OBD II CERTIFIED				
NO OTHER ADJUSTMENTS NEEDED.				
SPARK PLUG	TYPE	NGK: PFR5L-11 ND: PK16PR-L11	GAP	1,1 $\frac{0}{-0,1}$ mm
THIS VEHICLE CONFORMS TO U.S. EPA AND STATE OF CALIFORNIA REGULATIONS APPLICABLE TO 1998 MODEL YEAR NEW MOTOR VEHICLES.			32VHGBBG	
			P56-A02 HONDA MOTOR CO., LTD.	
1/2				

50ST (50 States):

THIS VEHICLE CONFORMS TO U.S. EPA AND STATE OF CALIFORNIA REGULATIONS APPLICABLE TO 1998 MODEL YEAR NEW MOTOR VEHICLES.

49ST (49 States/Federal):

THIS VEHICLE CONFORMS TO U.S. EPA REGULATIONS APPLICABLE TO 1998 MODEL YEAR NEW MOTOR VEHICLES.

CAL (California):

THIS VEHICLE CONFORMS TO U.S. EPA AND STATE OF CALIFORNIA REGULATIONS APPLICABLE TO 1998 MODEL YEAR NEW PASSENGER CARS PROVIDED THAT THIS VEHICLE IS ONLY INTRODUCED INTO COMMERCE FOR SALE IN THE STATE OF CALIFORNIA.

Engine and Evaporative Families

Engine Family:

W HNX V 03.2 HA1

Model Year

W: 1998

Manufacturer

HNX: Honda

Type

V: Light Duty Vehicle/Passenger Car

Displacement

Sequence Characters

Evaporative Family:

W HNX E 0094 AAZ

Model Year

W: 1998

Manufacturer

HNX: Honda

Type

E: EVAP

Canister Work Capacity (grams)

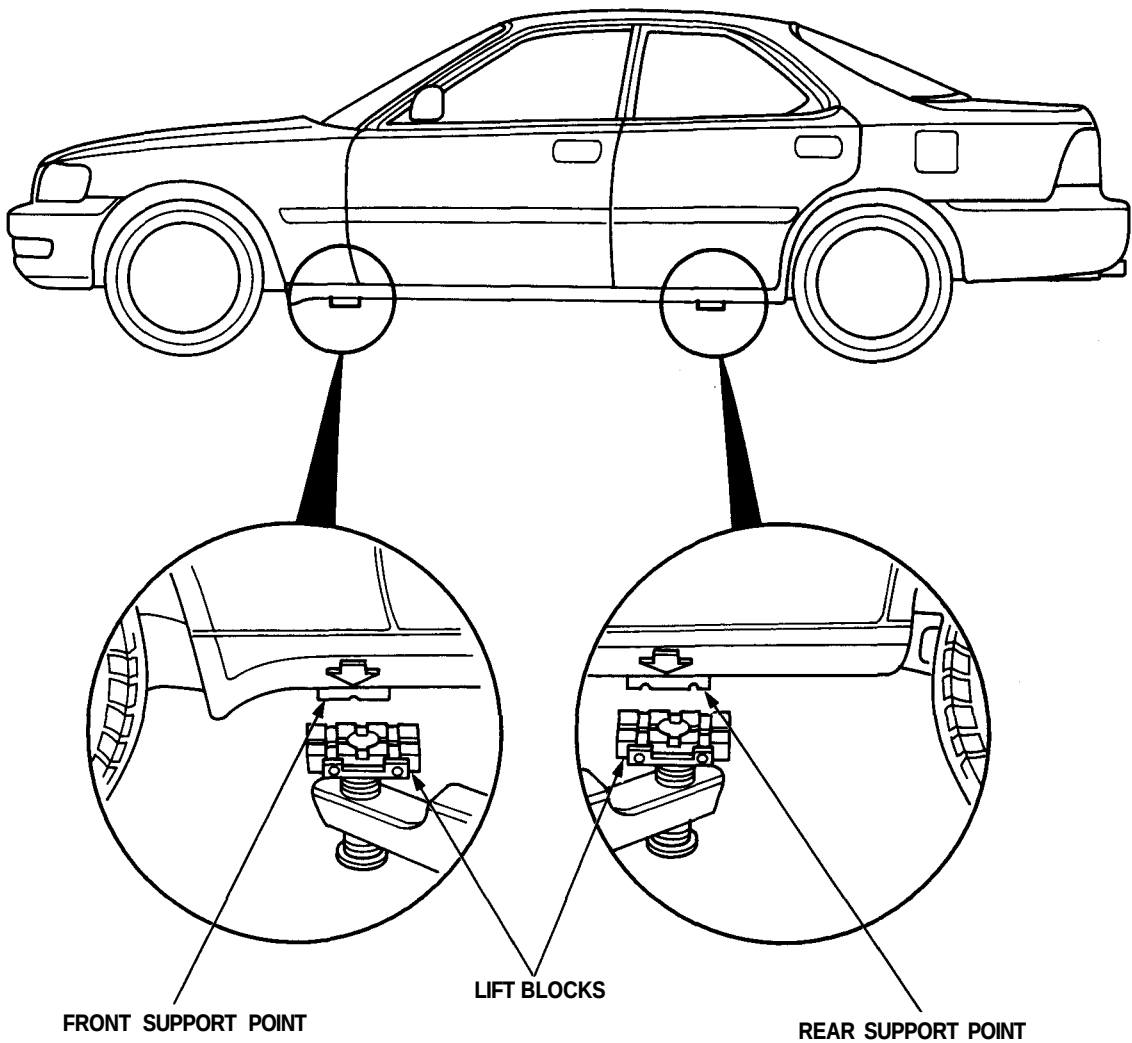
Sequence Characters

Lift and Support Points

Lift and Safety Stands

1. Place the lift blocks as shown.
2. Raise the hoist a few inches (centimeters), and rock the vehicle to be sure it is firmly supported.
3. Raise the hoist to full height, and inspect the lift points for solid support.

NOTE: Use the same support points to support the vehicle on safety stands.





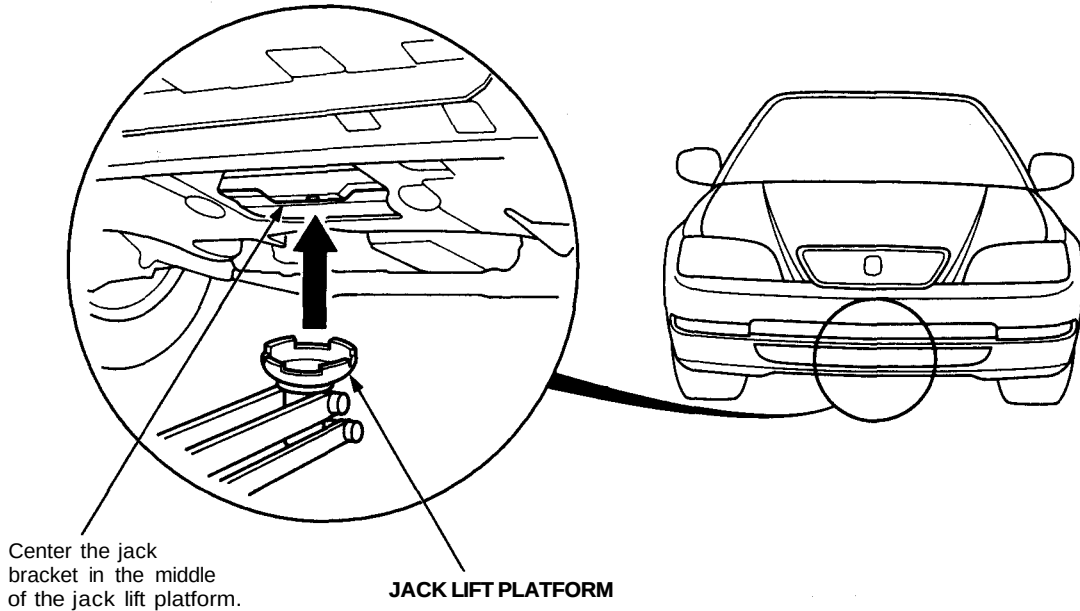
Floor Jack

1. Set the parking brake, and block the wheels that are not being lifted.
2. When lifting the rear of the vehicle, put the shift lever in **P** position.
3. Raise the vehicle high enough to insert the safety stands.
4. Adjust and place the safety stands so the vehicle will be approximately level, then lower the vehicle onto them.

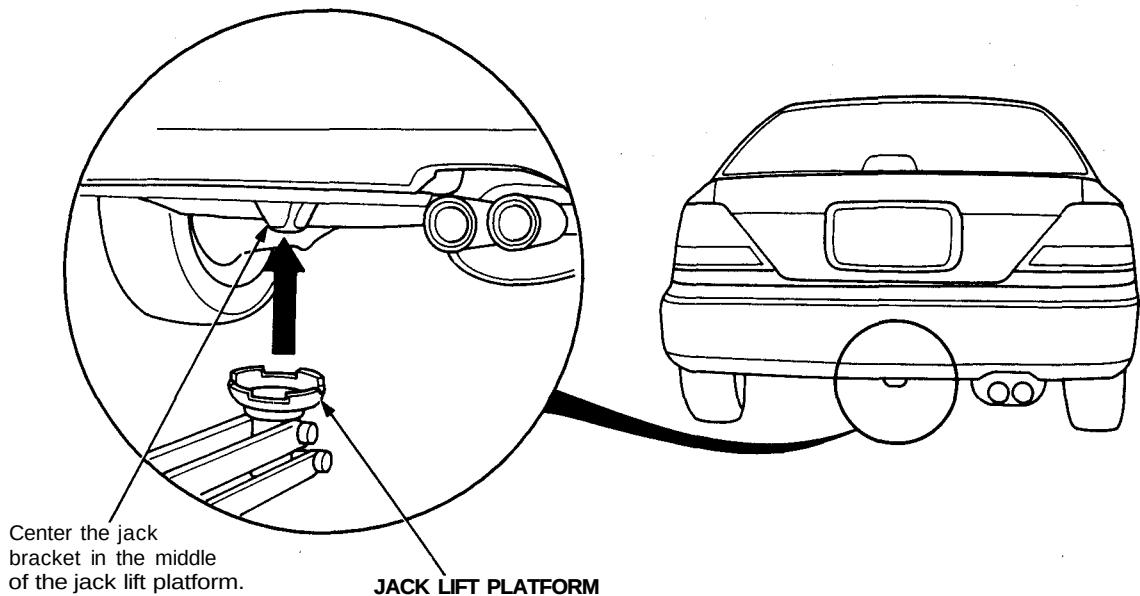
⚠ WARNING

- Always use safety stands when working on or under any vehicle that is supported by only a jack.
- Never attempt to use a bumper jack for lifting or supporting the vehicle.

Front



Rear



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 best way of transporting the vehicle.

Wheel Lift Equipment — The tow truck uses two pivoting arms that go under the tires (front or rear) and lifts them off the ground. The other two wheels remain on the ground.

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.

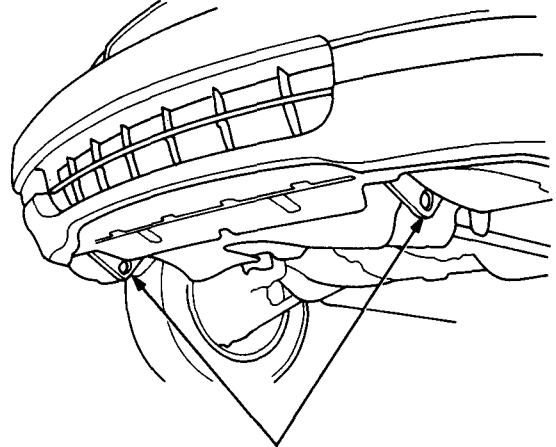
If the vehicle cannot be transported by flat-bed, it should be towed with the front wheels off the ground. If due to damage, the vehicle must be towed with the front wheels on the ground, do the following:

- Release the parking brake.
- Start the engine.
- Shift to **D** position, then **N** position.
- Turn off the engine.

CAUTION:

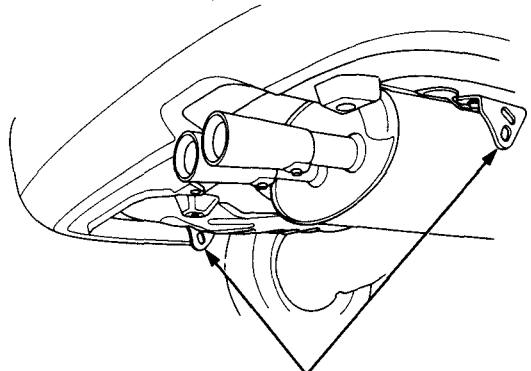
- Improper towing preparation will damage the transmission. Follow the above procedure exactly. If you cannot shift the transmission or start the engine, the vehicle must be transported on a flat-bed.
- It is best to tow the vehicle no farther than 50 miles (80 km), and keep the speed below 35 mph (55 km/h).
- 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.

Front:



TOWING HOOKS and
TIE DOWN BRACKETS

Rear:



TIE DOWN BRACKETS

Standards and Service Limits

Cylinder Head/Valve Train — Section 6

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Compression	200 rpm and wide open throttle kPa (kgf/cm ² , psi)	Nominal Minimum Maximum variation	1,370 (14.0, 199) 980 (10.0, 142) 200 (2.0, 28)	
Cylinder head	Warpage Height		———— 99.95 – 100.05 (3.935 – 3.939)	0.05 (0.002) ————
Camshaft	End play Camshaft-to-holder oil clearance Total runout Cam lobe height	IN EX	0.05 – 0.15 (0.002 – 0.006) 0.050 – 0.089 (0.0020 – 0.0035) 0.03 (0.001) max. 40.005 (1.5750) 37.766 (1.4868)	0.15 (0.006) 0.10 (0.004) 0.04 (0.002) ———— ————
Valve	Valve clearance Valve stem O.D. Stem-to-guide clearance	IN EX IN EX IN EX	0 (Hydraulic tappets, Auto-adjuster type) 0 (Hydraulic tappets, Auto-adjuster type) 5.48 – 5.49 (0.2157 – 0.2161) 5.45 – 5.46 (0.2146 – 0.2150) 0.02 – 0.05 (0.001 – 0.002) 0.05 – 0.08 (0.002 – 0.003)	———— ———— 5.45 (0.215) 5.42 (0.213) 0.08 (0.003) 0.11 (0.004)
Valve seat	Width Stem installed height	IN EX IN EX	1.25 – 1.55 (0.049 – 0.061) 1.25 – 1.55 (0.049 – 0.061) 46.935 – 47.425 (1.8478 – 1.8671) 47.885 – 48.375 (1.8852 – 1.9045)	2.0 (0.08) 2.0 (0.08) 47.625 (1.8750) 48.575 (1.9124)
Valve spring	Free length	IN EX	50.16 (1.975)* ¹ 50.17 (1.975)* ² 50.36 (1.983)	———— ———— ————
Valve guide	I.D. Installed height	IN and EX IN and EX	5.51 – 5.53 (0.217 – 0.218) 15.75 – 16.25 (0.620 – 0.640)	5.55 (0.219) ————
Rocker arm	Arm-to-shaft clearance		0.018 – 0.054 (0.0007 – 0.0021)	0.08 (0.003)

*1: NIHON HATSUJO manufactured valve spring *2: CHUO HATSUJO manufactured valve spring

Unit of length: mm (in)

Engine Block — Section 7

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface		0.07 (0.003) max.	0.10 (0.004)
	Bore diameter	A or I B or II	90.010 – 90.020 (3.5437 – 3.5441) 90.000 – 90.010 (3.5433 – 3.5437)	90.070 (3.5461) 90.070 (3.5461)
	Bore taper		—	0.05 (0.002)
	Reboring limit		—	0.5 (0.02)
Piston	Skirt O.D. at 17.0 mm (0.67 in) from bottom of skirt	No Letter (A) B	89.980 – 89.990 (3.5425 – 3.5429) 89.970 – 89.980 (3.5421 – 3.5425)	89.970 (3.5421) 89.960 (3.5417)
	Clearance in cylinder		0.02 – 0.04 (0.001 – 0.002)	0.08 (0.003)
	Groove width (for ring)	Top Second Oil	1.240 – 1.250 (0.0488 – 0.0492) 1.220 – 1.230 (0.0480 – 0.0484) 2.805 – 2.820 (0.1104 – 0.1110)	1.25 (0.0492) 1.25 (0.049) 2.84 (0.112)
Piston ring	Ring-to-groove clearance	Top Second	0.055 – 0.080 (0.0022 – 0.0031) 0.030 – 0.055 (0.0012 – 0.0022)	0.13 (0.005) 0.13 (0.005)
	Ring end gap	Top Second Oil	0.25 – 0.40 (0.010 – 0.016) 0.40 – 0.55 (0.016 – 0.022) 0.20 – 0.70 (0.008 – 0.028)*1 0.20 – 0.50 (0.008 – 0.020)*2	0.70 (0.028) 0.85 (0.033) 0.80 (0.031) 0.80 (0.031)
Piston pin	O.D.		21.994 – 22.000 (0.8659 – 0.8661)	—
	Pin-to-piston clearance		0.010 – 0.019 (0.0004 – 0.0007)	—
Connecting rod	Pin-to-rod interference		0.013 – 0.032 (0.0005 – 0.0013)	—
	Small end bore diameter		21.968 – 21.981 (0.8649 – 0.8654)	—
	Large end bore diameter	Nominal	57.0 (2.24)	—
	End play installed on crankshaft		0.15 – 0.30 (0.006 – 0.012)	0.40 (0.016)
Crankshaft	Main journal diameter		67.976 – 68.000 (2.6762 – 2.6772)	—
	Rod journal diameter		53.970 – 53.994 (2.1248 – 2.1257)	—
	Taper		0.005 (0.0002) max.	0.010 (0.0004)
	Out-of-round		0.004 (0.0002) max.	0.010 (0.0004)
	End play		0.10 – 0.29 (0.004 – 0.011)	0.45 (0.018)
	Total runout		0.020 (0.0008) max.	0.030 (0.0012)
Bearings	Main bearing-to-journal oil clearance		0.020 – 0.044 (0.0008 – 0.0017)	0.05 (0.002)
	Rod bearing-to-journal oil clearance		0.022 – 0.046 (0.0009 – 0.0018)	0.05 (0.002)

*1: RIKEN manufactured piston ring.

*2: TEIKOKU PISTON RING manufactured piston ring.

Engine Lubrication — Section 8

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity ℓ (US qt, Imp qt)		5.3 (5.6, 4.7) for engine overhaul 4.7 (5.0, 4.1) for oil change, including filter 4.0 (4.2, 3.5) for oil change, without filter	
Oil pump	Inner-to-outer rotor radial clearance		0.02 – 0.16 (0.001 – 0.006)	0.20 (0.008)
	Housing-to-outer rotor radial clearance		0.10 – 0.18 (0.004 – 0.007)	0.20 (0.008)
	Housing-to-rotor axial clearance		0.02 – 0.07 (0.001 – 0.003)	0.12 (0.005)
Relief valve	Pressure setting at oil temperature 176°F (80°C) kPa (kgf/cm², psi) at idle at 3,000 rpm		70 (0.7, 10) min. 340 (3.5, 50) min.	

Standards and Service Limits

Cooling — Section 10

	MEASUREMENT	STANDARD (NEW)
Radiator	Coolant capacity ℓ (US qt, Imp qt) (Including engine, heater, cooling line and reservoir) Reservoir capacity: 0.65 ℓ (0.69 US qt, 0.57 Imp qt)	7.7 (8.1, 6.8) for overhaul 3.2 (3.4, 2.8) for coolant change
Radiator cap	Opening pressure kPa (kgf/cm ² , psi)	93 – 123 (0.95 – 1.25, 14 – 18)
Thermostat	Start to open °F (°C) Fully open °F (°C) Valve lift at fully open	169 – 176 (76 – 80) 194 (90) 10.0 (0.39) min.
Cooling fan	Thermoswitch “ON” temperature °F (°C) Thermoswitch “OFF” temperature °F (°C) Fan timer “ON” temperature °F (°C) Fan timer “OFF” temperature °F (°C)	189 – 199 (87 – 93) Subtract 4 – 13 (2 – 7) from actual “ON” temperature 192 – 203 (89 – 95) Subtract 18 – 36 (10 – 20) from actual “ON” temperature

Fuel and Emissions — Section 11

	MEASUREMENT	STANDARD (NEW)
Pressure regulator	Pressure with regulator vacuum hose disconnected kPa (kgf/cm ² , psi)	260 – 309 (2.65 – 3.15, 37.7 – 44.8)
Fuel tank	Capacity ℓ (US gal, Imp gal)	65 (17.2, 14.3)
Engine	Idle speed rpm (with headlight and cooling fan off)	640 ± 50 (N or P position)
	Fast idle rpm	1,300 ± 200
	Idle CO %	0.1 max.

Unit of length: mm (in)

Automatic Transmission — Section 14

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission fluid	Capacity ℓ (US qt, Imp qt) '96 model '97, '98 models	3.3 ℓ (3.5 US qt., 2.9 Imp. qt.) at change 8.7 ℓ (9.2 US qt., 7.7 Imp. qt.) after overhaul 3.0 ℓ (3.2 US qt., 2.6 Imp. qt.) at change 8.6 ℓ (9.1 US qt., 7.6 Imp. qt.) after overhaul	
Hydraulic pressure '96 model kPa (kgf/cm ² , psi)	Line pressure at 2,000 rpm in N or P position	780 – 840 (8.0 – 8.6, 110 – 120)	740 (7.5, 110)
	2nd clutch pressure at 2,000 rpm in D₄ position	390 (4.0, 57) Fully closed throttle	370 (3.8, 54) Fully closed throttle
	3rd clutch pressure at 2,000 rpm in D₄ position	 840 (8.6, 120)	 740 (7.5, 110)
	4th clutch pressure at 2,000 rpm in D₄ position	More than 1/4 opened throttle	More than 1/4 opened throttle
	1st-hold clutch pressure at 2,000 rpm in 1 or 2 position	780 – 840 (8.0 – 8.6, 110 – 120)	740 (7.5, 110)
	2nd clutch pressure at 2,000 rpm in 2 position		
	1st clutch pressure at 2,000 rpm in 1 , D₄ or D₃ position		
	Reverse clutch pressure at 2,000 rpm in R position	1,170 – 1,250 (11.9 – 12.7, 169 – 181)	1,130 (11.5, 164)
	Throttle B pressure Fully closed throttle Fully open throttle	0 – 15 (0 – 0.15, 0 – 2) 580 – 630 (5.9 – 6.4, 84 – 91)	— 540 (5.5, 78)
Hydraulic pressure '97, '98 models kPa (kgf/cm ² , psi)	Line pressure at 2,000 rpm in N or P position	520 (5.3, 75) Fully closed throttle	500 (5.1, 73) Fully closed throttle
		 910 (9.3, 130) Fully opened throttle	 790 (8.1, 115) Fully opened throttle
	2nd clutch pressure at 2,000 rpm in D₄ position	530 – 590 (5.4 – 6.0, 77 – 85) Fully closed throttle	510 (5.2, 74) Fully closed throttle
	3rd clutch pressure at 2,000 rpm in D₄ position		
	4th clutch pressure at 2,000 rpm in D₄ position		
	1st-hold clutch pressure at 2,000 rpm in 1 or 2 position		
	2nd clutch pressure at 2,000 rpm in 2 position		
	1st clutch pressure at 2,000 rpm in 1 , D₄ or D₃ position		
	Reverse clutch pressure at 2,000 rpm in R position	760 – 850 (7.7 – 8.7, 110 – 120) Fully closed throttle	740 (7.5, 110) Fully closed throttle
	Throttle B pressure Fully closed throttle Fully open throttle	0 – 15 (0 – 0.15, 0 – 2) 550 – 590 (5.6 – 6.0, 80 – 85)	— 510 (5.2, 74)
Stall speed rpm (Check with vehicle on level ground)		2,000	1,850 – 2,150

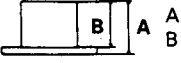
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Standards and Service Limits

Automatic Transmission (cont'd) — Section 14

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Clutch	Clutch initial clearance	1st-hold 0.7 – 0.9 (0.028 – 0.035)	_____
	1st	0.65 – 0.85 (0.026 – 0.033)	_____
	2nd, 3rd	0.6 – 0.8 (0.024 – 0.031)	_____
	4th	0.5 – 0.7 (0.020 – 0.028)	_____
	Reverse	0.75 – 0.95 (0.030 – 0.037)	_____
	Clutch return spring free length		
	1st-hold, 1st, 2nd, 3rd, 4th	33.7 (1.327)	31.7 (1.248)
	Reverse	30.3 (1.193)	28.3 (1.114)
	Clutch disc thickness		
	1st-hold, 1st, 2nd, Reverse	1.88 – 2.00 (0.074 – 0.079)	Until grooves worn out
	3rd, 4th	2.28 – 2.40 (0.090 – 0.094)	Until grooves worn out
	Clutch plate thickness		
	1st-hold, 1st, 2nd, 3rd, Reverse	1.95 – 2.05 (0.077 – 0.081)	Discoloration
	4th	2.55 – 2.65 (0.100 – 0.104)	
	Clutch end plate thickness		
	(1st, 2nd, 3rd, 4th)	Mark 1 2.05 – 2.10 (0.081 – 0.083)	
		Mark 2 2.15 – 2.20 (0.085 – 0.087)	
		Mark 3 2.25 – 2.30 (0.089 – 0.091)	
		Mark 4 2.35 – 2.40 (0.093 – 0.094)	
		Mark 5 2.45 – 2.50 (0.096 – 0.098)	
		Mark 6 2.55 – 2.60 (0.100 – 0.102)	
		Mark 7 2.65 – 2.70 (0.104 – 0.106)	
		Mark 8 2.75 – 2.80 (0.108 – 0.110)	
		Mark 9 2.85 – 2.90 (0.112 – 0.114)	
	Clutch end plate thickness		
	(1st-hold)	Mark L1 2.05 – 2.10 (0.081 – 0.083)	
		Mark L2 2.15 – 2.20 (0.085 – 0.087)	
		Mark L3 2.25 – 2.30 (0.089 – 0.091)	
		Mark L4 2.35 – 2.40 (0.093 – 0.094)	
		Mark L5 2.45 – 2.50 (0.096 – 0.098)	
		Mark L6 2.55 – 2.60 (0.100 – 0.102)	
		Mark L7 2.65 – 2.70 (0.104 – 0.106)	
		Mark L8 2.75 – 2.80 (0.108 – 0.110)	
		Mark L9 2.85 – 2.90 (0.112 – 0.114)	
	Clutch end plate thickness		
	(Reverse)	Mark R1 4.05 – 4.10 (0.159 – 0.161)	
		Mark R2 4.15 – 4.20 (0.163 – 0.165)	
		Mark R3 4.25 – 4.30 (0.167 – 0.169)	
		Mark R4 4.35 – 4.40 (0.171 – 0.173)	
		Mark R5 4.45 – 4.50 (0.175 – 0.177)	
		Mark R6 4.55 – 4.60 (0.179 – 0.181)	
		Mark R7 4.65 – 4.70 (0.183 – 0.185)	
		Mark R8 4.75 – 4.80 (0.187 – 0.189)	
		Mark R9 4.85 – 4.90 (0.191 – 0.193)	
			Discoloration
Valve body	Stator shaft needle bearing contact I.D. (torque converter side)	28.000 – 28.021 (1.102 – 1.103)	Wear or damage
	Stator shaft needle bearing contact I.D. (ATF pump side)	31.000 – 31.025 (1.220 – 1.221)	_____
	ATF pump driven gear I.D.	14.016 – 14.034 (0.552 – 0.553)	Wear or damage
	ATF pump driven gear shaft O.D.	13.980 – 13.990 (0.550 – 0.551)	Wear or damage
	ATF pump gear thrust clearance	0.03 – 0.05 (0.001 – 0.002)	0.07 (0.003)
	ATF pump gear-to-body clearance	0.210 – 0.265 (0.0083 – 0.0104)	_____
		0.070 – 0.125 (0.0028 – 0.0049)	_____
Regulator valve body	Sealing ring contact I.D.	37.000 – 37.025 (1.457 – 1.458)	37.05 (1.459)
Accumulator body	Sealing ring contact I.D.	42.000 – 42.030 (1.654 – 1.655)	42.05 (1.656)
Parking brake control	Parking brake cone	_____	Wear or other defect
	Parking brake pawl	_____	_____
	Parking gear	_____	Wear or other defect

Automatic Transmission — Section 14

Transmission	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
(cont'd)	Mainshaft reverse gear distance collar length	25.95 – 26.05 (1.022 – 1.026)	Wear or damage ↑ ↓
	Thrust washer, 29 mm thickness	3.95 – 4.00 (0.156 – 0.157)	
	Mainshaft 2nd gear collar length 	35.00 – 35.05 (1.378 – 1.380)	
		31.06 – 31.09 (1.223 – 1.224)	
	Countershaft reverse gear thrust washer thickness	3.95 – 4.05 (0.156 – 0.159)	Wear or damage ↑ ↓
	Countershaft reverse gear collar length	26.95 – 27.05 (1.061 – 1.065)	
		23.05 – 23.09 (0.907 – 0.909)	
	Reverse clutch distance collar length	35.45 – 35.55 (1.396 – 1.400)	Wear or damage ↑ ↓
	Mainshaft 1st gear thrust washer thickness	3.45 – 3.55 (0.136 – 0.140)	
	Mainshaft 1st gear distance collar length	34.05 – 34.08 (1.341 – 1.342)	
	Mainshaft 1st gear collar length 	33.90 – 33.97 (1.335 – 1.337)	
		30.05 – 30.10 (1.183 – 1.185)	Wear or damage ↑ ↓
	Thrust washer, 43 x 74 mm (mainshaft 4th gear)	9.67 – 9.70 (0.381 – 0.382)	
		9.72 – 9.75 (0.383 – 0.384)	
		9.77 – 9.80 (0.385 – 0.386)	
		9.82 – 9.85 (0.387 – 0.388)	
		9.87 – 9.90 (0.389 – 0.390)	
		9.92 – 9.95 (0.391 – 0.392)	
		9.97 – 10.00 (0.393 – 0.394)	
	Thrust washer, 43 x 74 mm difference	4.03 – 4.06 (0.159 – 0.160)	Wear or damage ↑ ↓
	Countershaft 2nd gear collar length 	35.95 – 36.00 (1.415 – 1.417)	
	Countershaft 1st gear collar length	27.95 – 28.05 (1.100 – 1.104)	
	1st-hold clutch distance collar length	23.50 – 23.55 (0.925 – 0.927)	
		71.97 – 72.00 (2.833 – 2.835)	Wear or damage ↑ ↓
		72.02 – 72.05 (2.835 – 2.837)	
		72.07 – 72.10 (2.837 – 2.839)	
		72.12 – 72.15 (2.839 – 2.841)	
		72.17 – 72.20 (2.841 – 2.843)	Wear or damage ↑ ↓
		72.22 – 72.25 (2.843 – 2.844)	
		72.27 – 72.30 (2.845 – 2.846)	
		72.32 – 72.35 (2.847 – 2.848)	
		72.37 – 72.40 (2.849 – 2.850)	Wear or damage ↑ ↓
		72.42 – 72.45 (2.851 – 2.852)	
		72.47 – 72.50 (2.853 – 2.854)	
		28.95 – 29.05 (1.140 – 1.144)	
	Countershaft 3rd gear collar length 	24.02 – 24.05 (0.946 – 0.947)	Wear or damage ↑ ↓
	Diameter of one-way clutch contact area	95.764 – 95.790 (3.770 – 3.771)	
	Countershaft 1st gear I.D.	86.487 – 86.513 (3.405 – 3.406)	
	Countershaft 2nd gear I.D.	79.107 – 79.120 (3.114 – 3.115)	
	One-way clutch hub O.D.	69.833 – 69.846 (2.749 – 2.750)	Wear or damage ↑ ↓
	Parking gear one-way clutch contact area O.D.	6.97 – 6.98 (0.274 – 0.275)	
	Feed pipe A O.D.	11.47 – 11.48 (0.452 – 0.452)	
	Feed pipe B O.D.	7.018 – 7.030 (0.276 – 0.277)	
	7 mm bushing I.D.	11.500 – 11.518 (0.4528 – 0.4535)	Wear or damage ↑ ↓
	11.5 mm bushing I.D.	1.87 – 1.97 (0.07 – 0.08)	
	Mainshaft sealing ring 37 mm thickness	1.87 – 1.97 (0.07 – 0.08)	
	Countershaft sealing ring 42 mm thickness	2.025 – 2.060 (0.080 – 0.081)	
	Mainshaft sealing ring groove width	2.025 – 2.060 (0.080 – 0.081)	Wear or damage ↑ ↓
	Countershaft sealing ring groove width	2.025 – 2.060 (0.080 – 0.081)	
	Diameter of needle bearing contact area	24.980 – 24.993 (0.983 – 0.984)	
	Mainshaft-stator shaft	53.968 – 53.984 (2.1247 – 2.1254)	
	Mainshaft 3rd gear	34.975 – 34.991 (1.377 – 1.378)	Wear or damage ↑ ↓
	Mainshaft 1st gear collar	34.975 – 34.991 (1.377 – 1.378)	
	Mainshaft 1st gear distance collar	34.975 – 34.991 (1.377 – 1.378)	
	Mainshaft 2nd gear collar	38.505 – 38.515 (1.5159 – 1.5163)	
	Countershaft-torque converter housing	47.975 – 47.991 (1.8888 – 1.8894)	Wear or damage ↑ ↓
	Countershaft 3rd gear collar	38.975 – 38.991 (1.534 – 1.535)	
	Countershaft 1st gear collar	38.975 – 38.991 (1.534 – 1.535)	
	Countershaft 2nd gear collar	33.975 – 33.991 (1.3376 – 1.3382)	
	Countershaft reverse gear collar	13.99 – 14.00 (0.5508 – 0.5512)	Wear or damage
	Reverse idler gear shaft		

(cont'd)

Standards and Service Limits

Automatic Transmission (cont'd) — Section 14

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission (cont'd)	Thrust washer, 45.5 x 60 mm thickness (Countershaft 2nd gear/parking gear)	1.27 – 1.30 (0.050 – 0.051) 1.32 – 1.35 (0.052 – 0.053) 1.37 – 1.40 (0.054 – 0.055) 1.42 – 1.45 (0.056 – 0.057) 1.47 – 1.50 (0.058 – 0.059) 1.52 – 1.55 (0.060 – 0.061) 1.57 – 1.60 (0.062 – 0.063) 1.62 – 1.65 (0.064 – 0.065) 1.67 – 1.70 (0.066 – 0.067) 1.72 – 1.75 (0.068 – 0.069) 1.77 – 1.80 (0.070 – 0.071) 1.82 – 1.85 (0.072 – 0.073) 1.87 – 1.90 (0.074 – 0.075)	———— ———— ———— ———— ———— ———— ———— ———— ———— ———— ———— ———— ————
	I.D.		
	Mainshaft 4th gear	59.000 – 59.016 (2.3228 – 2.3235)	Wear or damage
	Mainshaft 2nd gear	40.000 – 40.016 (1.5748 – 1.5754)	↑
	Mainshaft 1st gear	39.000 – 39.016 (1.535 – 1.536)	↓
	Countershaft 3rd gear	54.000 – 54.016 (2.126 – 2.127)	
	Countershaft 2nd gear	44.020 – 44.036 (1.733 – 1.734)	
	Countershaft 1st gear	44.000 – 44.016 (1.732 – 1.733)	
	Countershaft reverse gear	39.000 – 39.016 (1.535 – 1.536)	
	Reverse idler gear	18.007 – 18.020 (0.7089 – 0.7094)	Wear or damage
	End play		
	Mainshaft 4th gear	0.03 – 0.18 (0.001 – 0.007)	————
	1st/4th clutch	0 – 0.08 (0 – 0.03)	Adjust with a washer
	Mainshaft 2nd gear	0.06 – 0.16 (0.002 – 0.006)	————
	Mainshaft 1st gear	0.10 – 0.25 (0.004 – 0.010)	————
	Countershaft 3rd gear	0.02 – 0.12 (0.001 – 0.005)	————
	Countershaft 4th gear	0 – 0.08 (0 – 0.003)	Adjust with a washer
	Countershaft 2nd gear	0.05 – 0.13 (0.002 – 0.005)	Adjust with a washer
	Countershaft reverse gear	0.05 – 0.16 (0.002 – 0.006)	————
	Reverse idler gear	0.03 – 0.30 (0.001 – 0.012)	————
	Secondary driven gear shaft tapered roller bearing preload N·m (kgf·cm, lbf·in)	3.4 – 4.4 (35 – 45, 30 – 39)	————
	Thrust washer, 90 mm thickness ('96 model only) (torque converter housing side)	0.99 – 1.01 (0.039 – 0.040)	Wear or damage
	Thrust shim, 75 mm thickness		
	A	1.56 – 1.58 (0.061 – 0.062)	
	B	1.59 – 1.61 (0.0626 – 0.0634)	
	C	1.62 – 1.64 (0.064 – 0.065)	
	D	1.65 – 1.67 (0.065 – 0.066)	
	E	1.68 – 1.70 (0.066 – 0.067)	
	F	1.71 – 1.73 (0.067 – 0.068)	
	G	1.74 – 1.76 (0.0685 – 0.0693)	
	H	1.77 – 1.79 (0.0697 – 0.0705)	
	I	1.80 – 1.82 (0.071 – 0.072)	
	J	1.83 – 1.85 (0.072 – 0.073)	
	K	1.86 – 1.88 (0.073 – 0.074)	
	L	1.89 – 1.91 (0.074 – 0.075)	
	M	1.92 – 1.94 (0.0756 – 0.0764)	
	N	1.95 – 1.97 (0.077 – 0.078)	
	O	1.98 – 2.00 (0.078 – 0.079)	
	P	2.01 – 2.03 (0.079 – 0.080)	
	Q	2.04 – 2.06 (0.080 – 0.081)	
	R	2.07 – 2.09 (0.081 – 0.082)	
	S	2.10 – 2.12 (0.0827 – 0.0835)	
	T	2.13 – 2.15 (0.084 – 0.085)	
	U	2.16 – 2.18 (0.085 – 0.086)	
	V	2.19 – 2.21 (0.086 – 0.087)	
	W	2.22 – 2.24 (0.087 – 0.088)	
	X	2.25 – 2.27 (0.0886 – 0.0894)	
	Y	2.28 – 2.30 (0.090 – 0.091)	
	Z	2.31 – 2.33 (0.091 – 0.092)	
	AA	2.34 – 2.36 (0.092 – 0.093)	
	AB	2.37 – 2.39 (0.093 – 0.094)	
	AC	2.40 – 2.42 (0.094 – 0.095)	
	AD	2.43 – 2.45 (0.0957 – 0.0965)	

Unit of length: mm (in)

Automatic Transmission — Section 14

	MEASUREMENT	STANDARD (NEW)			
		Wire Dia.	O.D.	Free Length	No. of Coils
Springs '96 model	One-way ball spring	0.29 (0.011)	4.0 (0.157)	14.0 (0.551)	13.0
	4-3 kick down valve spring	1.1 (0.043)	7.1 (0.280)	51.3 (2.020)	22.5
	Regulator valve spring A	1.8 (0.071)	14.7 (0.579)	86.5 (3.406)	16.5
	Regulator valve spring B	1.7 (0.067)	6.0 (0.236)*	43.0 (1.693)	13.5
	Stator reaction spring	6.5 (0.256)	26.4 (1.039)*	30.3 (1.193)	1.9
	Modulator valve spring	1.5 (0.059)	9.4 (0.370)	30.6 (1.205)	9.9
		1.4 (0.055)	9.4 (0.370)	33.0 (1.299)	10.5
	Torque converter check valve spring	1.1 (0.043)	8.4 (0.331)	41.8 (1.646)	15.7
	Relief valve spring	0.9 (0.035)	8.4 (0.331)	56.5 (2.224)	22.4
	Cooler relief valve spring	1.1 (0.043)	8.4 (0.331)	46.8 (1.843)	17.0
	3-4 orifice control valve spring	1.0 (0.039)	6.6 (0.260)	49.6 (1.953)	26.8
	1-2 shift valve spring	0.9 (0.035)	7.6 (0.299)	55.5 (2.185)	24.0
	2-3, 3-4 shift valve spring	0.8 (0.031)	6.6 (0.260)	42.1 (1.657)	22.0
	4-3 shift timing valve spring	0.7 (0.028)	7.1 (0.280)	35.0 (1.378)	20.4
	1st accumulator spring	2.9 (0.114)	18.0 (0.709)	75.5 (2.972)	11.5
	4th accumulator spring	2.8 (0.110)	16.5 (0.650)	80.8 (3.181)	14.6
	2nd accumulator spring A	3.6 (0.142)	22.0 (0.866)	96.7 (3.807)	13.0
	2nd accumulator spring B	2.0 (0.079)	6.6 (0.260)*	80.0 (3.150)	19.6
	1st-hold accumulator spring	4.0 (0.157)	25.0 (0.984)	68.4 (2.693)	7.2
	3rd accumulator spring	3.2 (0.126)	19.0 (0.748)	78.4 (3.087)	11.1
	Reverse accumulator spring	3.5 (0.138)	18.6 (0.732)	115.5 (4.547)	19.0
	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	73.7 (2.902)	32.0
	Lock-up timing valve spring	0.8 (0.031)	6.6 (0.260)	61.2 (2.409)	38.5
	Lock-up control valve spring	0.7 (0.028)	6.6 (0.260)	36.3 (1.429)	14.1
		0.7 (0.028)	6.6 (0.260)	37.5 (1.476)	24.6
		0.7 (0.028)	6.6 (0.260)	38.5 (1.516)	24.6
	CPC valve spring	1.0 (0.039)	6.8 (0.268)	34.3 (1.350)	14.2
Springs '97, '98 models	Reverse accumulator spring	3.1 (0.122)	18.6 (0.732)	118.4 (4.661)	21.2
	1st-hold accumulator spring	4.0 (0.157)	25.0 (0.984)	68.4 (2.693)	7.2
	1-2 shift valve spring	0.9 (0.035)	7.6 (0.299)	55.5 (2.185)	24.0
	2-3 shift valve spring	0.8 (0.031)	6.6 (0.260)	42.1 (1.657)	22.0
	3-4 shift valve spring	0.8 (0.031)	6.6 (0.260)	42.1 (1.657)	22.0
	4-3 kick-down valve spring	1.1 (0.043)	7.1 (0.280)	44.6 (1.756)	22.5
	Main orifice control valve spring	1.0 (0.039)	6.6 (0.260)	42.0 (1.654)	21.6
	Relief valve spring	0.9 (0.035)	8.4 (0.331)	56.5 (2.224)	22.4
	Lock-up timing valve spring	0.8 (0.031)	6.6 (0.260)	61.2 (2.409)	38.5
	Lock-up control valve spring	0.7 (0.028)	6.6 (0.260)	38.6 (1.520)	17.6
		0.7 (0.028)	6.6 (0.260)	39.3 (1.547)	17.6
		0.7 (0.028)	6.6 (0.260)	40.0 (1.575)	17.6
	Regulator valve spring A	1.8 (0.071)	14.7 (0.579)	81.9 (3.224)	16.5
	Regulator valve spring B	1.7 (0.067)	6.0 (0.236)*	43.0 (1.693)	7.2
	Stator reaction spring	5.5 (0.217)	26.4 (1.039)*	30.3 (1.193)	2.1
	Cooler relief valve spring	1.0 (0.039)	8.4 (0.331)	33.8 (1.331)	10.8
	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	73.7 (2.902)	32.0
	Torque converter check valve spring	1.2 (0.047)	8.4 (0.331)	35.7 (1.406)	14.5
	3rd accumulator spring A	3.0 (0.118)	19.6 (0.772)	72.5 (2.854)	10.8
	3rd accumulator spring C	1.8 (0.071)	13.2 (0.520)	15.7 (0.618)	3.13
	4th accumulator spring	3.0 (0.118)	19.6 (0.772)	67.6 (2.661)	10.0
		3.3 (0.130)	19.6 (0.772)	77.3 (3.043)	11.7
	3-4 orifice control valve spring	1.1 (0.043)	7.1 (0.280)	47.7 (1.878)	22.9
	4-3 shift timing valve spring	0.7 (0.028)	7.1 (0.280)	35.0 (1.378)	20.4
	Line pressure control valve spring	0.8 (0.031)	6.1 (0.240)	24.1 (0.949)	14.6
	1st accumulator spring	2.7 (0.106)	18.0 (0.709)	83.3 (3.280)	14.4
	2nd accumulator spring A	3.2 (0.126)	23.7 (0.933)	92.8 (3.654)	11.8
	Modulator valve spring	1.2 (0.047)	7.0 (0.276)*	27.6 (1.087)	7.7

*: I.D.

Standards and Service Limits

Differential — Section 15

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Differential oil	Capacity ℓ (US qt, Imp qt)	1.10 (1.16, 0.97) for overhaul 1.05 (1.11, 0.92) for oil change	
Differential carrier	Pinion shaft contact area I.D. Carrier-to-pinion shaft clearance Driveshaft and intermediate shaft contact area I.D. Carrier-to-driveshaft clearance Carrier-to-intermediate shaft clearance	20.000 – 20.021 (0.7874 – 0.7882) 0.013 – 0.050 (0.0005 – 0.0020) 32.025 – 32.045 (1.2608 – 1.2616) 0.045 – 0.086 (0.0018 – 0.0034) 0.080 – 0.116 (0.0031 – 0.0046)	———— 0.1 (0.004) ———— 0.120 (0.0047) 0.120 (0.0047)
Differential pinion gear	Backlash I.D. Pinion gear-to-shaft clearance	0.05 – 0.15 (0.002 – 0.006) 20.042 – 20.066 (0.7891 – 0.7900) 0.055 – 0.095 (0.0022 – 0.0037)	0.30 (0.012) ———— 0.15 (0.006)
Drive pinion gear and ring gear	Backlash at inspection hole	0.06 – 0.14 (0.002 – 0.006)	Adjust with a shim
Drive pinion	Preload N·m (kgf·cm, lbf·in) New bearing Reused bearing	1.82 – 2.49 (18.6 – 25.4, 16.1 – 22.0) 1.42 – 1.91 (14.5 – 19.5, 12.6 – 16.9)	
Drive pinion and differential carrier	Total preload N·m (kgf·cm, lbf·in) ① ②	Tp* + 1.04 – 1.26 (10.6 – 12.8, 9.2 – 11.1) Tp* + 0.94 – 1.07 (9.6 – 10.9, 8.33 – 9.46)	Adjust with a shim

①: New differential carrier tapered roller bearing.

②: Reused differential carrier tapered roller bearing.

Tp*: Actual measurement of drive pinion preload.

Steering — Section 17

	MEASUREMENT	STANDARD (NEW)
Steering wheel	Rotational play at steering wheel circumference	0 – 10 (0 – 0.4)
	Starting load at steering wheel circumference N (kgf, lbf) Engine running	25 (2.5, 5.5) max.
Gearbox	Angle of rack-guide-screw loosened from locked position	20° ± 5°
Pump	Pump pressure with shut-off valve closed (oil temp./speed: 105°F (40°C) min./idle. Do not run for more than 5 seconds). kPa (kgf/cm ² , psi)	7,800 – 8,800 (80 – 90, 1,138 – 1,280)
Power steering fluid	Recommended fluid Fluid capacity ℓ (US qt, Imp qt) System Reservoir	Honda Power Steering Fluid-V or S 1.3 (1.4, 1.1) 0.5 (0.5, 0.4)
Power steering pump belt*	Deflection with 98 N (10 kgf, 22 lbf) between pulleys	11.0 – 13.5 (0.43 – 0.53) with used belt 8.0 – 9.5 (0.31 – 0.37) with new belt
	Belt tension N (kgf, lbf) Measured with belt tension gauge	340 – 540 (35 – 55, 77 – 120) with used belt 690 – 880 (70 – 90, 154 – 200) with new belt

* When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off.
Readjust deflection or tension to used belt values.

Suspension — Section 18

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Wheel alignment	Camber	Front	0°00' ± 1°
		Rear	–0°30' ± 1°
	Caster	Front	3°40' ± 1°
	Total toe	Front	OUT 1.0 ± 2.0 (1/16 ± 1/16)
		Rear	IN 3.0 ± 2.0 (1/8 ± 1/16)
	Front wheel turning angle	Inward wheel	47°30' ± 2°
		Outward wheel	34°30' (Reference)
Wheel	Rim runout (steel wheel)	Axial	0 – 1.0 (0 – 0.04)
		Radial	0 – 1.0 (0 – 0.04)
	Rim runout (aluminum wheel)	Axial	0 – 0.7 (0 – 0.03)
		Radial	0 – 0.7 (0 – 0.03)
Wheel bearing	End play	Front	0 – 0.05 (0 – 0.002)
		Rear	0 – 0.05 (0 – 0.002)

Brakes — Section 19

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Parking brake lever	Play in stroke at 196 N (20 kgf, 44 lbf) lever force	To be locked when pulled 7 – 11 notches	————
Foot brake pedal	Pedal height (with floor mat removed)	218 (8 11/16)	————
	Free play	1 – 5 (1/16 – 3/16)	————
Master cylinder	Piston-to-pushrod clearance	0 – 0.2 (0 – 0.01)	————
Disc brake	Disc thickness	Front	23.0 (0.91)
		Rear	9.0 (0.35)
	Disc runout	Front	————
		Rear	————
	Disc parallelism	Front and rear	————
	Pad thickness	Front	11.0 (0.43)
		Rear	9.0 (0.35)
			21.0 (0.83) 7.5 (0.30) 0.10 (0.004) 0.10 (0.004) 0.015 (0.0006) 1.6 (0.06) 1.6 (0.06)

Standards and Service Limits

Air Conditioning — Section 22

	MEASUREMENT	STANDARD (NEW)
Air conditioning system	Lubricant type: ND-OIL 8 (P/N 38897 – PR7 – A01AH or 38899 – PR7 – A01) (For Refrigerant HFC-134a (R-134a))	
	Lubricant capacity	Condenser 25 (5/6, 0.9)
	mℓ (fl oz, Imp oz)	Evaporator 50 (1 2/3, 1.8)
		Line or hose 20 (2/3, 0.7)
		Reservoir 15 (1/2, 0.5)
Compressor	Lubricant type: ND-OIL 8 (P/N 38897 – PR7 – A01AH or 38899 – PR7 – A01) (For Refrigerant HFC-134a (R-134a))	
	Lubricant capacity mℓ (fl oz, Imp oz)	140 (4 1/3, 4.9)
	Stator coil resistance Ω at 68°F (20°C)	3.4 – 3.8
	Pulley-to-pressure plate clearance	0.5 ± 0.15 (0.020 ± 0.006)
Compressor belt*	Deflection with 98 N (10 kgf, 22 lbf) between the pulleys	8 – 9.5 (0.31 – 0.37) with used belt 5.0 – 6.0 (0.20 – 0.24) with new belt
	Belt tension N (kgf, lbf)	390 – 590 (40 – 60, 88 – 132) with used belt
	Measured with belt tension gauge	830 – 1,030 (85 – 105, 187 – 231) with new belt

* When using a new belt, adjust deflection to new value. Run the engine for 5 minutes then turn it off. Readjust deflection to used belt value.

Electrical — Section 23

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Ignition coil	Rated voltage V	12	
	Primary winding resistance Ω at 77°F (25°C)	0.9 – 1.1	
	Firing order	1 – 4 – 2 – 5 – 3 – 6	
Spark plug	Type	See Section 23	
	Gap	1.0 – 1.1 (0.039 – 0.043)	1.3 (0.051)*2
Ignition timing	At idle °BTDC	15 ± 2 (Red)	
Alternator belt*1	Deflection with 98 N (10 kgf, 22 lbf) between pulleys	9.0 – 11.5 (0.35 – 0.45) with used belt 5.5 – 7.0 (0.22 – 0.28) with new belt	
	Belt tension N (kgf, lbf)	390 – 590 (40 – 60, 88 – 132) with used belt	
	Measured with belt tension gauge	780 – 980 (80 – 100, 176 – 220) with new belt	
Alternator	Output A (at 13.5 V, hot and 6,000 alternator rpm)	110	
	Brush length	10.5 (0.41)	1.5 (0.06)
Starting motor (DENSO)	Type/Output kW	Planetary gear reduction, field winding/1.8	
	Mica depth	0.55 – 0.85 (0.022 – 0.033)	0.20 (0.008)
	Commutator runout	0 – 0.02 (0 – 0.0008)	0.05 (0.002)
	Commutator O.D.	34.9 – 35.0 (1.374 – 1.378)	34.0 (1.339)
	Brush length	15.0 – 15.5 (0.59 – 0.61)	9.0 (0.35)
	Brush spring tension N (kgf, lbf)	22 – 27 (2.2 – 2.8, 4.9 – 6.2)	

*1 When using a new belt, adjust deflection to new value. Run the engine for 5 minutes then turn it off. Readjust deflection to used belt value.

*2 Do not adjust the gap, replace the spark plug if it is out of service limit.

Design Specifications

	ITEM	METRIC	ENGLISH	NOTES
DIMENSIONS	Overall Length	4,870 mm	191.7 in	
	Overall Width	1,800 mm	70.9 in	
	Overall Height	1,415 mm	55.7 in	
	Wheelbase	2,840 mm	111.8 in	
	Track Front/Rear	1,550/1,510 mm	61.0/59.4 in	
	Ground Clearance	160 mm	6.3 in	
	Seating Capacity	Five		
WEIGHT (USA)	Gross Vehicle Weight Rating (GVWR)	—	4,410 lbs	
WEIGHT (CANADA)	Gross Vehicle Weight Rating (GVWR)	2,000 kg	—	
ENGINE	Type	Water cooled, 4-stroke SOHC gasoline engine		
	Cylinder Arrangement	90° V6-cylinder		
	Bore and Stroke	90.0 x 84.0 mm	3.54 x 3.31 in	
	Displacement	3,206 cm ³ (mℓ)	196 cu-in	
	Compression Ratio	9.6		
	Valve Train	Belt driven, SOHC		
	Lubrication System	Forced and wet sump, trochoid pump		
	Oil Pump Displacement	42.3 ℓ/min	44.7 US qt/min	at 6,000 pump rpm
	[At oil temp. 248°F (120°C)]		37.2 Imp qt/min	
	Fuel Required	Premium UNLEADED gasoline		
	Water Pump Displacement	187 ℓ/min	198 US qt/min	at 5,760 pump rpm
	[At coolant temp. 77°F (25°C)]		165 Imp qt/min	
STARTER	Type/Make	Planetary gear reduction, field winding		
	Normal Output	DENSO		
	Nominal Voltage	1.8 kW		
	Hour Rating	12 V		
	Direction of Rotation	30 seconds		
	Weight	Clockwise as viewed from gear end		
		4.9 kg	10.8 lbs	
CLUTCH	Clutch Type	Torque converter		
TRANSMISSION	Transmission	Electronically controlled		
	Primary Reduction	4-speed automatic, 1 reverse		
		Direct 1 : 1		
	Gear Ratio	1st	2.458	
		2nd	1.454	
		3rd	0.948	
		4th	0.652	
		Reverse	1.880	
	Secondary Reduction	Gear type	Single helical gear	
		Gear ratio	1.333	
DIFFERENTIAL	Final Reduction	Gear type	Spiral bevel gear	
		Gear ratio	3.133	

(cont'd)

Design Specifications

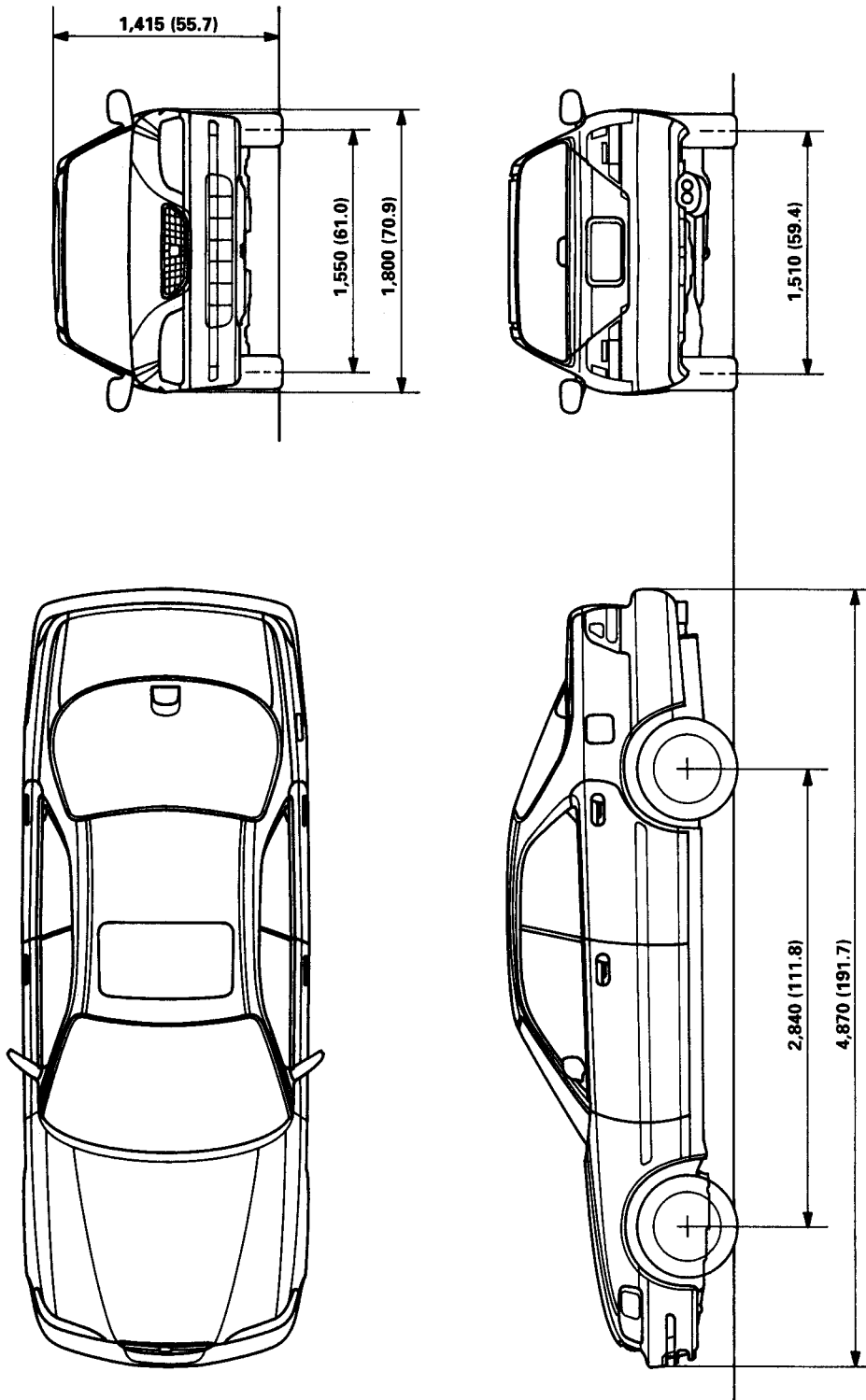
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	ITEM		METRIC	ENGLISH	NOTES
AIR CONDITIONING	Cooling Capacity		4,300 Kcal/h	17,060 BTU/h	
	Compressor	Type/Make No. of Cylinders Capacity Max. Speed Lubricant Capacity	Swash-plate/DENSO 10 207.4 cm ³ /rev 7,600 rpm 140 ml	12.7 cu-in/rev 4 1/3 fl oz, 4.9 Imp qt	Lubricant type: ND-OIL8
	Condenser	Type	Corrugated fin type		
	Evaporator	Type	Corrugated fin type		
	Blower	Type Motor Input Speed Control Max. Capacity	Sirocco fan 200 W/12 V Infinite variable 530 m ³ /h	18,700 cu-ft/h	at 13.5 V
	Temp Control		Air-mix type		
	Compressor clutch	Type Power Consumption	Dry, single plate, poly-V-belt drive 40 W/12 V		
	Refrigerant	Type Quantity	HFC-134a (R-134a) 750 $\frac{0}{-50}$ g	26.5 $\frac{0}{-1.8}$ oz	
STEERING SYSTEM	Type		Speed-sensitive, variable power assisted, rack and pinion		
	Overall Ratio Turns, Lock-to-Lock Steering Wheel Dia.		15.7 3.35 380 mm	15.0 in	
SUSPENSION	Type	Front Rear	Independent double wishbone, coil spring with stabilizer Independent double wishbone, coil spring with stabilizer Telescopic, hydraulic nitrogen gas-filled		
	Shock Absorber	Front and Rear			
WHEEL ALIGNMENT	Camber	Front Rear	0°00' -0°30' 3°40'		
	Caster Toe	Front Rear	Out 1.0 mm In 3.0 mm	Out 1/16 in In 1/8 in	
BRAKE SYSTEM	Type	Front Rear	Power-assisted self-adjusting ventilated disc Power-assisted self-adjusting solid disc		
	Pad and Lining Surface Area:	Front Rear	58.0 x 2 cm ² 27.9 x 2 cm ²	8.99 x 2 sq-in 4.32 x 2 sq-in	
	Parking Brake	Type	Mechanical actuating, rear two wheel brakes		

	ITEM	METRIC	ENGLISH	NOTES
TIRE	Size	205/65 R15 94 V T135/90 D15 (Spare tire)		
WASHER RESERVOIR	Capacity ℓ (US qt, Imp qt)	2.5 (2.6, 2.2) 6.0 (6.3, 5.3)		USA model Canada model
ELECTRICAL	Battery Starter Alternator Fuses In The Under-dash Fuse/Relay Box In The Under-hood Fuse/Relay Box Headlights High Low Front Turn Signal Lights Front Parking Lights Rear Turn Signal Lights Brake/Taillights Rear Side Marker Lights Front Fog Lights High Mount Brake Light Front Side Marker Lights Back-up Lights License Plate Light Ceiling Light Spot Light Trunk Lights Door Courtesy Lights Vanity Mirror Light Gauge Lights Indicator Lights Warning Lights Illumination and Pilot Lights Climate control Illumination Lights	12 V – 70 D23R-MF 12 V – 1.8 kW 12 V – 110 A 7.5 A, 10 A, 15 A, 20 A, 30 A 7.5 A, 10 A, 15 A, 20 A, 30 A, 40 A, 50 A, 120 A 12 V – 60 W 12 V – 55 W 12 V – 21 W 12 V – 5 W 12 V – 21 W 12 V – 21/5 W 12 V – 3 CP 12 V – 55 W 12 V – 21 W 12 V – 3 CP 12 V – 21 W 12 V – 8 W 12 V – 8 W 12 V – 5 W 12 V – 5 W 12 V – 3.4 W 12 V – 2 W 12 V – 3.4 W, 1.4 W 12 V – 0.56 W, 0.84 W, 1.12 W, 1.4 W, 2.0 W, 3.0 W 12 V – 1.4 W 12 V – 1.4 W, 1.12 W, 0.84 W 12 V – 0.56 W, LED 12 V – 1.12 W		

Body Specifications

Unit: mm (in)

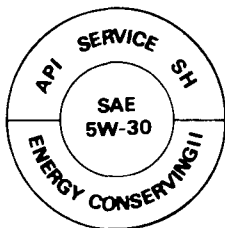
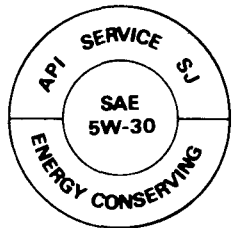


Lubrication Points

For the details of lubrication points and types 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 SH "Energy Conserving II" or SJ "Energy Conserving" grade oil. The oil container may also display the API Certification mark shown below. Make sure it says "For Gasoline Engines." SAE Viscosity: See chart below.
2	Transmission	Genuine Honda Premium Formula Automatic Transmission Fluid (ATF)* ¹
3	Brake Line (Includes Anti-lock brake line)	Genuine Honda DOT3 Brake Fluid* ²
4	Power steering gearbox	Steering grease P/N 08733 - B070E
5 6 7 8 9 10 11 12	Steering boots Throttle cable end Steering ball joints Shift lever (Automatic transmission) Pedal linkage Intermediate shaft Brake master cylinder pushrod Fuel fill lid	Multi-purpose grease
13 14 15 16	Trunk hinges Door hinges upper and lower Door opening detents Hood hinges and hood latch	Honda White Lithium Grease
17	Brake pipe joint (Front and rear wheel house)	Rust preventives
18	Caliper Piston seal, Dust seal, Caliper pin, Piston	Silicone grease
19	Power steering system	Genuine Honda Power Steering Fluid-V or S* ³
20	Differential	Hypoid gear Oil API service GL4 or GL5 Viscosity: at above -18°C (0°F): SAE 90 at less than -18°C (0°F): SAE 80 W-90
21	A/C compressor	Compressor oil: DENSO: ND-OIL8 (P/N 38897 - PR7 - A01AH or 38899 - PR7-A01) (For Refrigerant: HFC-134a (R-134a))

API SERVICE LABEL

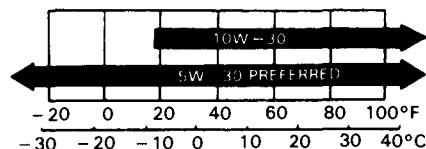


API CERTIFICATION MARK



Recommended Engine Oil

Engine oil viscosity for ambient temperature ranges

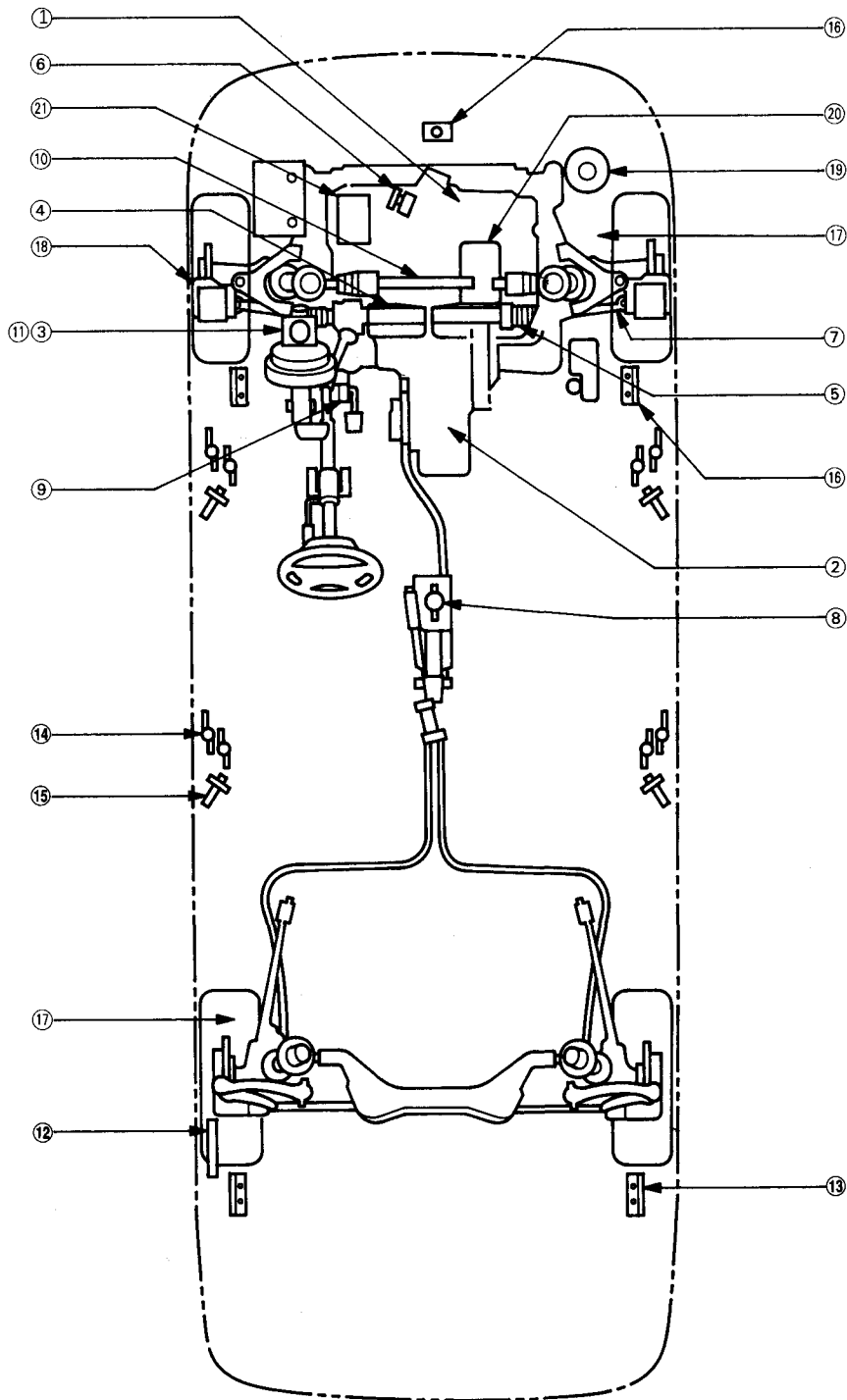


NOTE: The following information as marked *1, *2 and *3 on above chart details for 1997 model:

*1: Always use Genuine Honda Premium Formula Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.

*2: Always use Genuine Honda DOT3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.

*3: Always use Genuine Honda Power Steering Fluid-V or S. Using any other type of power steering fluid or automatic transmission fluid can cause increase wear and poor steering in cold weather.



Maintenance Schedule for 1996 Model

Normal Conditions

Follow the Normal Conditions Maintenance Schedule for 1996 models if the severe driving conditions specified in the Severe Conditions Maintenance Schedule for 1996 Model on pages 4-6 and 4-7 do not apply.

Service at the indicated distance or time — whichever comes first.	km x 1,000	24	48	72	96	120	144	168	NOTE	SECTION and PAGE
	miles x 1,000	15	30	45	60	75	90	105		
	months	12	24	36	48	60	72	84		
Replace engine oil	Replace every 7,500 miles (12,000 km) or 12 months								Capacity for change with filter: 4.7 ℓ (5.0 US qt, 4.1 Imp qt)	8-4
Replace engine oil filter	● ● ● ● ● ● ● ●									8-5
Check engine oil and coolant	Check oil and coolant at each fuel stop								Check levels and check for leaks.	8-4, 10-5
Replace air cleaner element	● ● ● ● ● ● ● ●									11-134
Replace spark plugs	Every 60,000 miles (96,000 km) or 72 months								NGK: PFR5L-11 DENSO: PK16PR-L11 Standard gap: 1.0 – 1.1 mm (0.039 – 0.043 in) Service limit: 1.3 mm (0.051 in)* ¹	23-78
Replace timing belt and inspect water pump	● ● ● ● ● ● ● ●									6-6, 10-10
Inspect and adjust drive belts	● ● ● ● ● ● ● ●								Check for cracks and damage. Check deflection and tension at center of following belts pressing with 98 N (10 kgf, 22 lbf) tension: Alternator drive belt: 9.0 – 11.5 mm (0.35 – 0.45 in) P/S pump belt: 11.0 – 13.5 mm (0.43 – 0.53 in) A/C compressor belt: 8.0 – 9.5 mm (0.31 – 0.97 in)	17-4, 22-24, 23-89
Inspect idle speed*	● ● ● ● ● ● ● ●								640 ± 50 rpm (in N or P position)	11-114
Replace engine coolant	● ● ● ● ● ● ● ●								Capacity for change: 3.2 ℓ (3.4 US qt, 2.8 Imp qt) Check specific gravity for freezing point.	10-5
Replace transmission fluid	● ● ● ● ● ● ● ●								3.3 ℓ (3.5 US qt, 2.9 Imp qt) for change with Genuine HONDA Premium Formula ATF	14-112
Replace front differential fluid	● ● ● ● ● ● ● ●								Capacity for change: 1.05 ℓ (1.11 US qt, 0.92 Imp qt)	15-4
Inspect front and rear brakes	● ● ● ● ● ● ● ●								• Check the brake pad and disc thickness. Check for damage and cracks. • Check the calipers for damage, leaks and tightness.	* ² 19-4, 19-8, 19-10, 19-12, 19-15
Replace brake fluid (Including ABS)	● ● ● ● ● ● ● ●								Use Genuine DOT3 brake fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.	* ² 19-7
Check parking brake adjustment	● ● ● ● ● ● ● ●								Fully engaged 7 to 11 notches.	* ² 19-6
Rotate tires (Check tire inflation and condition at least once per month)	Rotate tires every 7,500 miles (12,000 km)								The suggested rotation method is shown in the diagram of the Owner's Manual.	—

*1: Do not adjust the gap, replace the spark plug if it is out of service limit.

*2: Refer to Base Service Manual ('95 - '97 ACURA 2.5TL, P/N 61SW502)

Service at the indicated distance or time — whichever comes first.	km x 1,000	24	48	72	96	120	144	168	NOTE	SECTION and PAGE
	miles x 1,000	15	30	45	60	75	90	105		
	months	12	24	36	48	60	72	84		
Visually inspect the following items:									• Check for correct installation and position, check for cracks, deterioration, rust, and leaks. • Check tightness of screws, nuts, and joints. If necessary, retighten.	_____
Brake hoses and lines [including ABS]										** 19-30
All fluid levels and condition of fluid									Check levels and check for leaks. If necessary, add transmission fluid, engine coolant, brake fluid, wind-shield washer fluid.	10-5, 14-112, 15-4, **19-7
Tie-rod ends, steering gearbox, and boots									• Check rack grease and steering linkage. • Check the boot for damage and leaking grease. • Check the fluid line for damage and leaks.	*17-22
Suspension components										_____
Driveshaft boots	●	●	●	●	●	●	●	●	Check boots and boot band for cracks. Check rack grease.	16-3
Cooling system hoses and connections									Check all hoses for damage, leaks and deterioration. Check all hose clamps. Retighten if necessary.	10-3
Exhaust system*									Check the catalytic converter heat shield, exhaust pipe and muffler for damage, leaks and tightness.	9-4
Fuel lines, and connections*									Check fuel lines for loose connections, cracks and deterioration. Retighten loose connections and replace any damaged parts.	11-116
Inspect supplemental restraint system	10 years after production									_____

*1: Refer to Base Service Manual ('95 - '97 ACURA 2.5TL, P/N 61SW502)

According to state and federal regulations, failure to perform maintenance on the items marked with an asterisk (*) will not void customer's emission warranties. However, Acura recommends that all maintenance services be performed at the recommended time or mileage period to ensure long-term reliability.

For 1996 Canada Model:

This Maintenance Schedule outlines the minimum required maintenance that you should perform to ensure the trouble-free operation of Canadian model. Due to regional and climactic differences, some additional servicing may be required.



Maintenance Schedule for 1996 Model

Severe Conditions

4-6

Main Menu

Table of Contents

Follow the Severe Conditions Maintenance Schedule for 1996 models if the vehicle is driven MAINLY under one or more of the Severe Driving Conditions (page 4-7):

Service at the indicated distance or time — whichever comes first.	km x 1,000	24	48	72	96	120	144	168	NOTE	SECTION and PAGE
	miles x 1,000	15	30	45	60	75	90	105		
	months	12	24	36	48	60	72	84		
Replace engine oil and oil filter	Replace every 3,750 miles (6,000 km) or 6 months								Capacity for change with filter: 4.7 ℓ (5.0 US qt, 4.1 Imp qt)	8-4, 8-5
Check engine oil and coolant	Check oil and coolant at each fuel stop								Check levels and check for leaks.	8-4, 10-5
Clean (○) or replace (●) air cleaner element Use normal schedule except in dusty conditions	○	●	○	●	○	●	○			11-134
Replace spark plugs	Every 60,000 miles (96,000 km) or 72 months								NGK: PFR5L-11 DENSO: PK16PR-L11 Standard gap: 1.0 – 1.1 mm (0.039 – 0.043 in) Service limit: 1.3 mm (0.051 in)*1	23-78
Replace timing belt*3 and inspect water pump	Replace every 60,000 miles (96,000 km)									6-6, 10-10
Inspect and adjust drive belts		●		●		●			Check for cracks and damage. Check deflection and tension at center of following belts pressing with 98 N (10 kgf, 22 lbf) tension: Alternator drive belt: 9.0 – 11.5 mm (0.35 – 0.45 in) P/S pump belt: 11.0 – 13.5 mm (0.43 – 0.53 in) A/C compressor belt: 8.0 – 9.5 mm (0.31 – 0.37 in)	17-4, 22-24, 23-89
Inspect idle speed*				●					640 ± 50 rpm (in N or P position)	11-114
Replace engine coolant			●		●		●		Capacity for change: 3.2 ℓ (3.4 US qt, 2.8 Imp qt) Check specific gravity for freezing point.	10-5
Replace transmission fluid		●		●		●			3.3 ℓ (3.5 US qt, 2.9 Imp qt) for change with Genuine HONDA Premium Formula ATF	14-112
Replace front differential fluid	●	●	●	●	●	●	●	●	Capacity for change: 1.05 ℓ (1.11 US qt, 0.92 Imp qt)	15-4
Inspect front and rear brakes	Inspect every 7,500 miles (12,000 km) or 6 months								• Check the brake pad and disc thickness. Check for damage and cracks. • Check the calipers for damage, leaks and tightness.	*219-4, 19-8, 19-10, 19-12, 19-15
Replace brake fluid (Including ABS)			●			●			Use Genuine DOT3 brake fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.	*219-7
Check parking brake adjustment	●	●	●	●	●	●	●	●	Fully engaged 7 to 11 notches.	*219-6
Rotate tires (Check tire inflation and condition at least once per month)	Rotate tires every 7,500 miles (12,000 km)								The suggested rotation method is shown in the diagram of the Owner's Manual.	—

*1: Do not adjust the gap, replace the spark plug if it is out of service limit.

*2: Refer to Base Service Manual ('95 - '97 ACURA 2.5TL, P/N 61SW502)

*3: Replace the timing belt at 60,000 miles (U.S.) 100,000 km (Canada) if the vehicle regularly is driven in one or more of these conditions:

- In very high temperatures (over 110°F, 43°C).
- In very low temperatures (under -20°F, -29°C).

Service at the indicated distance or time — whichever comes first.	km x 1,000	24	48	72	96	120	144	168	NOTE	SECTION and PAGE
	miles x 1,000	15	30	45	60	75	90	105		
	months	12	24	36	48	60	72	84		
Visually inspect the following items:									• Check for correct installation and position, check for cracks, deterioration, rust, and leaks. • Check tightness of screws, nuts, and joints. If necessary, retighten.	—
Tie-rod ends, steering gear box, and boots	Every 7,500 miles (12,000 km) or 6 months								• Check rack grease and steering linkage. • Check the boot for damage and leaking grease. • Check the fluid line for damage and leaks.	*17-22
Suspension components										—
Driveshaft boots									Check boots and boot band for cracks. Check rack grease.	16-3
Brake hoses and lines [Including ABS]										*19-30
All fluid levels and condition of fluid									Check levels and check for leaks. If necessary, add transmission fluid, engine coolant, brake fluid, windshield washer fluid.	10-5, 14-112, 15-4, *19-7
Cooling system hoses and connections	●	●	●	●	●	●	●	●	Check all hoses for damage, leaks and deterioration. Check all hose clamps. Retighten if necessary.	10-3
Exhaust system*									Check the catalytic converter heat shield, exhaust pipe and muffler for damage, leaks and tightness.	9-4
Fuel lines, and connections*									Check fuel lines for loose connections, cracks and deterioration. Retighten loose connections and replace any damaged parts.	11-116
Inspect supplemental restraint system	10 years after production									—

*1: Refer to Base Service Manual ('95 - '97 ACURA 2.5TL, P/N 61SW502)

According to state and federal regulations, failure to perform maintenance on the items marked with an asterisk (*) will not void customer's emission warranties. However, Acura recommends that all maintenance services be performed at the recommended time or mileage period to ensure long-term reliability.

Severe Driving Conditions:

- Driving less than 5 miles (8 km) per trip or, in freezing temperatures, driving less than 10 miles (16 km) per trip.
- Driving in extremely hot [over 90°F (32°C)] conditions.
- Extensive idling or long periods of stop-and-go driving.
- Trailer towing, driving with a car-top carrier, or driving in mountainous conditions.
- Driving on muddy, dusty, or de-iced roads.

NOTE: If the car is driven OCCASIONALLY under a "severe" condition, you should follow the Normal Conditions Maintenance Schedule for 1996 Model on pages 4-4 and 4-5.



Maintenance Schedule for 1997 Model

Normal Conditions

Follow the Normal Conditions Maintenance Schedule for 1997 models if the severe driving conditions specified in the Severe Conditions Maintenance Schedule for 1997 Model on pages 4-10 and 4-11 do not apply.

Service at the indicated distance or time — whichever comes first.	miles x 1,000	15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Replace engine oil	Replace every 7,500 miles (12,000 km) or 12 months									Capacity for change with filter: 4.7 ℓ (5.0 US qt, 4.1 Imp qt)	8-4
Replace engine oil filter		●	●	●	●	●	●	●	●		8-5
Check engine oil and coolant	Check oil and coolant at each fuel stop									Check levels and check for leaks.	8-4, 10-5
Replace air cleaner element			●		●		●		●		11-134
Replace spark plugs								●		NGK: PFR5L-11 DENSO: PK16PR-L11 Standard gap: 1.0 – 1.1 mm (0.039 – 0.043 in) Service limit: 1.3 mm (0.051 in)*1	23-78
Replace timing belt and inspect water pump								●			6-6, 10-10
Inspect and adjust drive belts			●		●		●		●	Check for cracks and damage. Check deflection and tension at center of following belts pressing with 98 N (10 kgf, 22 lbf) tension: Alternator drive belt: 9.0 – 11.5 mm (0.35 – 0.45 in) P/S pump belt: 11.0 – 13.5 mm (0.43 – 0.53 in) A/C compressor belt: 8.0 – 9.5 mm (0.31 – 0.37 in)	17-4, 22-24, 23-89
Inspect idle speed								●		640 ± 50 rpm (in N or P position)	11-114
Replace engine coolant				●		●		●		Capacity for change: 3.2 ℓ (3.4 US qt, 2.8 Imp qt) Check specific gravity for freezing point.	10-5
Replace transmission fluid							●			3.0 ℓ (3.2 US qt, 2.6 Imp qt) for change with Genuine HONDA Premium Formula ATF	14-112
Replace front differential fluid					●		●		●	Capacity for change: 1.05 ℓ (1.11 US qt, 0.92 Imp qt)	15-4
Inspect front and rear brakes		●	●	●	●	●	●	●	●	• Check the brake pad, disc thickness and free movement. • Check the calipers for leakage.	*219-4, 19-8, 19-10, 19-12, 19-15
Replace brake fluid (Including ABS)				●			●			Use Genuine Honda DOT3 brake fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.	*219-7
Check parking brake adjustment		●	●	●	●	●	●	●	●	Fully engaged 7 to 11 notches.	*219-6
Rotate tires (Check tire inflation and condition at least once per month)	Rotate tires every 7,500 miles (12,000 km)									The suggested rotation method is shown in the diagram of the Owner's Manual.	—

*1: Do not adjust the gap, replace the spark plug if it is out of service limit.

*2: Refer to Base Service Manual ('95 - '97 ACURA 2.5TL, P/N 61SW502)

Main Menu

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Service at the indicated distance or time — whichever comes first.	miles x 1,000	15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Visually inspect the following items:											
Tie-rod ends, steering gearbox, and boots										• Check steering linkage for looseness. • Check condition of boots. • Check for fluid leaks.	^{*1} 17-22
Suspension components										• Check the bolts for tightness. • Check the conditon of ball joint boots.	_____
Driveshaft boots										Check condition of boots.	16-3
Brake hoses and lines (including ABS)										Check for damage or leakage.	^{**} 19-30
All fluid levels and condition of fluid	●	●	●	●	●	●	●	●	●	Check levels, condition of fluids, and check for leaks. If brake fluid is low, check brake pad thickness.	10-5, 14-112, 15-4, ^{*1} 19-7
Cooling system hoses and connections										• Check all hoses for damage, leaks and deterioration. • Check for proper fan operation.	10-3
Exhaust system*										Check the catalytic converter heat shield, exhaust pipe, and muffler for damage, leaks and tightness.	9-4
Fuel lines, and connections*										Check for leaks. Retighten loose connections and replace any damaged parts.	11-116
Inspect supplemental restraint system	10 years after production										_____

*1: Refer to Base Service Manual ('95 - '97 ACURA 2.5TL, P/N 61SW502)

According to state and federal regulations, failure to perform maintenance on the items marked with an asterisk (*) will not void customer's emission warranties. However, Acura recommends that all maintenance services be performed at the recommended time or mileage period to ensure long-term reliability.

For 1997 Canada Model: Follow the Severe Conditions Maintenance Schedule for 1997 Model on pages 4-10 and 4-11.



Maintenance Schedule for 1997 Model

Severe Conditions

Follow the Severe Conditions Maintenance Schedule for 1997 models if the vehicle is driven MAINLY under one or more of the Severe Driving Conditions (page 4-11):

Service at the indicated distance or time — whichever comes first.	miles x 1,000	15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Replace engine oil and oil filter	Replace every 3,750 miles (6,000 km) or 6 months									Capacity for change with filter: 4.7 ℓ (5.0 US qt, 4.1 Imp qt)	8-4, 8-5
Check engine oil and coolant	Check oil and coolant at each fuel stop									Check levels and check for leaks.	8-4, 10-5
Clean (○) or replace (●) air cleaner element Use normal schedule except in dusty conditions	○	●	○	●	○	●	○	●			11-134
Replace spark plugs								●		NGK: PFR5L-11 DENSO: PK16PR-L11 Standard gap: 1.0 – 1.1 mm (0.039 – 0.043 in) Service limit: 1.3 mm (0.051 in)*1	23-78
Replace timing belt*3 and inspect water pump								●			6-6, 10-10
Inspect and adjust drive belts		●		●		●		●		Check for cracks and damage. Check deflection and tension at center of following belts pressing with 98 N (10 kgf, 22 lbf) tension: Alternator drive belt: 9.0 – 11.5 mm (0.35 – 0.45 in) P/S pump belt: 11.0 – 13.5 mm (0.43 – 0.53 in) A/C compressor belt: 8.0 – 9.5 mm (0.31 – 0.37 in)	17-4, 22-24, 23-89
Inspect idle speed								●		640 ± 50 rpm (in N or P position)	11-114
Replace engine coolant			●		●		●			Capacity for change: 3.2 ℓ (3.4 US qt, 2.8 Imp qt) Check specific gravity for freezing point.	10-5
Replace transmission fluid		●		●		●				3.0 ℓ (3.2 US qt, 2.6 Imp qt) for change with Genuine HONDA Premium Formula ATF	14-112
Replace front differential fluid		●	●	●	●	●	●	●		Capacity for change; 1.05 ℓ (1.11 US qt, 0.92 Imp qt)	15-4
Inspect front and rear brakes	Inspect every 7,500 miles (12,000 km) or 6 months									• Check the brake pad, disc thickness and free movement. • Check the calipers for leakage.	*219-4, 19-8, 19-10, 19-12, 19-15
Replace brake fluid (Including ABS)			●			●				Use Genuine Honda DOT3 brake fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.	*219-7
Check parking brake adjustment	●	●	●	●	●	●	●	●	●	Fully engaged 7 to 11 notches.	*219-6
Lubricate locks and hinges	●	●	●	●	●	●	●	●	●		4-2, 4-3
Rotate tires (Check tire inflation and condition at least once per month)	Rotate tires every 7,500 miles (12,000 km)									The suggested rotation method is shown in the diagram of the Owner's Manual.	—

*1: Do not adjust the gap, replace the spark plug if it is out of service limit.

*2: Refer to Base Service Manual ('95 - '97 ACURA 2.5TL, P/N 61SW502)

*3: Replace the timing belt at 60,000 miles (U.S.) 100,000 km (Canada) if the vehicle regularly is driven in one or more of these conditions:

- In very high temperatures (over 110°F, 43°C).
- In very low temperatures (under -20°F, -29°C).

Service at the indicated distance or time — whichever comes first.	miles x 1,000	15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Visually inspect the following items:											
Tie-rod ends, steering gear box, and boots	Every 7,500 miles (12,000 km) or 6 months									• Check steering linkage for looseness. • Check condition of boots. • Check for fluid leaks.	*1 17-22
Suspension components										• Check the bolts for tightness. • Check the condition of ball joint boots.	—
Driveshaft boots										Check condition of boots.	16-3
Brake hoses and lines (Including ABS)										Check for damage or leakage.	* 19-30
All fluid levels and condition of fluid										Check levels, condition of fluids, and check for leaks. If brake fluid is low, check brake pad thickness.	10-5, 14-112, 15-4, *19-7
Cooling system hoses and connections										• Check all hoses for damage, leaks and deterioration. • Check for proper fan operation.	10-3
Exhaust system*	●	●	●	●	●	●	●	●	●	Check the catalytic converter heat shield, exhaust pipe, and muffler for damage, leaks and tightness.	9-4
Fuel lines, and connections*										Check for leaks.	11-116
Lights and controls										Check all lighting functions.	—
Vehicle underbody										Check for damage and fluid leaks.	—
Inspect supplemental restraint system	10 years after production										—

*1: Refer to Base Service Manual ('95-'97 ACURA 2.5TL, P/N 61SW502)

According to state and federal regulations, failure to perform maintenance on the items marked with an asterisk (*) will not void customer's emission warranties. However, Acura recommends that all maintenance services be performed at the recommended time or mileage period to ensure long-term reliability.

Severe Driving Conditions:

- Driving less than 5 miles (8 km) per trip or, in freezing temperatures, driving less than 10 miles (16 km) per trip.
- Driving in extremely hot [over 90°F (32°C)] conditions.
- Extensive idling or long periods of stop-and-go driving.
- Trailer towing, driving with a car-top carrier, or driving in mountainous conditions.
- Driving on muddy, dusty, or de-iced roads.

NOTE: If the car is driven OCCASIONALLY under a "severe" condition, you should follow the Normal Conditions Maintenance Schedule for 1997 Model on pages 4-8 and 4-9.



Maintenance Schedule for 1998 Model

Normal Conditions

Follow the Normal Conditions Maintenance Schedule for 1998 models if the severe driving conditions specified in the Severe Conditions Maintenance Schedule for 1998 Model on pages 4-14 and 4-15 do not apply.

Service at the indicated distance or time — whichever comes first.	miles x 1,000	15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Replace engine oil	Every 7,500 miles (12,000 km) or 12 months									Capacity for change with filter: 4.7 ℓ (5.0 US qt, 4.1 Imp qt)	8-4
Replace engine oil filter	●	●	●	●	●	●	●	●	●		8-5
Check engine oil and coolant	Check oil and coolant at each fuel stop									Check levels and check for leaks.	8-4, 10-5
Replace air cleaner element		●		●		●		●			11-134
Replace spark plugs							●			NGK: PFR5L-11 DENSO: PK16PR-L11 Standard gap: 1.0 – 1.1 mm (0.039 – 0.043 in) Service limit: 1.3 mm (0.051 in)*1	23-78
Replace timing belt and inspect water pump							●				6-6, 10-10
Inspect and adjust drive belts		●		●		●		●		Check for cracks and damage. Check deflection and tension at center of following belts pressing with 98 N (10 kgf, 22 lbf) tension: Alternator drive belt: 9.0 – 11.5 mm (0.35 – 0.45 in) P/S pump belt: 11.0 – 13.5 mm (0.43 – 0.53 in) A/C compressor belt: 8.0 – 9.5 mm (0.31 – 0.37 in)	17-4, 22-24, 23-89
Inspect idle speed							●			640 ± 50 rpm (in N or P position)	11-114
Replace engine coolant			●		●		●			Capacity for change: 3.2 ℓ (3.4 US qt, 2.8 Imp qt) Check specific gravity for freezing point.	10-5
Replace transmission fluid							●			3.0 ℓ (3.2 US qt, 2.6 Imp qt) for change with Genuine HONDA Premium Formula ATF	14-112
Replace front differential fluid				●		●		●		Capacity for change: 1.05 ℓ (1.11 US qt, 0.92 Imp qt)	15-4
Inspect front and rear brakes	●	●	●	●	●	●	●	●	●	• Check the brake pad, disc thickness and free movement. • Check the calipers for leakage.	*219-4, 19-8, 19-10,19-12,19-15
Replace brake fluid (Including ABS)			●			●				Use Genuine Honda DOT3 brake fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.	*219-7
Check parking brake adjustment	●	●	●	●	●	●	●	●	●	Fully engaged 7 to 11 notches.	*219-6
Rotate tires (Check tire inflation and condition at least once per month)	Rotate tires every 7,500 miles (12,000 km)									The suggested rotation method is shown in the diagram of the Owner's Manual.	—

*1: Do not adjust the gap, replace the spark plug if it is out of service limit.

*2: Refer to Base Service Manual ('95 - '97 ACURA 2.5TL, P/N 61SW502)

Service at the indicated distance or time — whichever comes first.	miles x 1,000	15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Visually inspect the following items:											
Tie-rod ends, steering gearbox, and boots										• Check steering linkage for looseness. • Check condition of boots. • Check for fluid leaks.	^{*1} 17-22
Suspension components										• Check the bolts for tightness. • Check the condition of ball joint boots.	—
Driveshaft boots										Check condition of boots.	16-3
Brake hoses and lines (including ABS)										Check for damage or leakage.	^{*1} 19-30
All fluid levels and condition of fluid	●	●	●	●	●	●	●	●	●	Check levels, condition of fluids, and check for leaks. If brake fluid is low, check brake pad thickness.	10-5, 14-112, 15-4, ^{*1} 19-7
Cooling system hoses and connections										• Check all hoses for damage, leaks and deterioration. • Check for proper fan operation.	10-3
Exhaust system*										Check the catalytic converter heat shield, exhaust pipe, and muffler for damage, leaks and tightness.	9-4
Fuel lines, and connections*										Check for leaks. Retighten loose connections and replace any damaged parts.	11-116

•1: Refer to Base Service Manual ('95 - '97 ACURA 2.5TL, P/N 61SW502)

According to state and federal regulations, failure to perform maintenance on the items marked with an asterisk (*) will not void customer's emission warranties. However, Acura recommends that all maintenance services be performed at the recommended time or mileage period to ensure long-term reliability.

For 1997 Canada Model: Follow the Severe Conditions Maintenance Schedule for 1997 Model on pages [4-10](#) and [4-11](#).



Maintenance Schedule for 1998 Model

Severe Conditions

Follow the Severe Conditions Maintenance Schedule for 1998 models if the vehicle is driven MAINLY under one or more of the Severe Driving Conditions (page 4-15):

Service at the indicated distance or time — whichever comes first.	miles x 1,000	15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Replace engine oil and oil filter		Every 3,750 miles (6,000 km) or 6 months								Capacity for change with filter: 4.7 ℓ (5.0 US qt, 4.1 Imp qt)	8-4, 8-5
Check engine oil and coolant		Check oil and coolant at each fuel stop								Check levels and check for leaks.	8-4, 10-5
Clean (○) or replace (●) air cleaner element Use normal schedule except in dusty conditions		○	●	○	●	○	●	○	●		11-134
Replace spark plugs								●		NGK: PFR5L-11 DENSO: PK16PR-L11 Standard gap: 1.0 – 1.1 mm (0.039 – 0.043 in) Service limit: 1.3 mm (0.051 in)*1	23-78
Replace timing belt*3 and inspect water pump								●			6-6, 10-10
Inspect and adjust drive belts			●		●		●		●	Check for cracks and damage. Check deflection and tension at center of following belts pressing with 98 N (10 kgf, 22 lbf) tension: Alternator drive belt: 9.0 – 11.5 mm (0.35 – 0.45 in) P/S pump belt: 11.0 – 13.5 mm (0.43 – 0.53 in) A/C compressor belt: 8.0 – 9.5 mm (0.31 – 0.37 in)	17-4, 22-24, 23-89
Inspect idle speed								●		640 ± 50 rpm (in N or P position)	11-114
Replace engine coolant				●		●		●		Capacity for change: 3.2 ℓ (3.4 US qt, 2.8 Imp qt) Check specific gravity for freezing point.	10-5
Replace transmission fluid			●		●		●		●	3.0 ℓ (3.2 US qt, 2.6 Imp qt) for change with Genuine HONDA Premium Formula ATF	14-112
Replace front differential fluid			●	●	●	●	●	●	●	Capacity for change; 1.05 ℓ (1.11 US qt, 0.92 Imp qt)	15-4
Inspect front and rear brakes		Every 7,500 miles (12,000 km) or 6 months								• Check the brake pad, disc thickness and free movement. • Check the calipers for leakage.	*219-4, 19-8, 19-10, 19-12, 19-15
Replace brake fluid (Including ABS)				●			●			Use Genuine Honda DOT3 brake fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.	*219-6
Check parking brake adjustment		●	●	●	●	●	●	●	●	Fully engaged 7 to 11 notches.	*219-5
Lubricate locks and hinges		●	●	●	●	●	●	●	●		4-2, 4-3
Rotate tires (Check tire inflation and condition at least once per month)		Rotate tires every 7,500 miles (12,000 km)								The suggested rotation method is shown in the diagram of the Owner's Manual.	—

*1: Do not adjust the gap, replace the spark plug if it is out of service limit.

*2: Refer to Base Service Manual ('95 - '97 ACURA 2.5TL, P/N 61SW502)

*3: Replace the timing belt at 60,000 miles (U.S.) 100,000 km (Canada) if the vehicle regularly is driven in one or more of these conditions:

- In very high temperatures (over 110°F, 43°C).
- In very low temperatures (under -20°F, -29°C).

Service at the indicated distance or time — whichever comes first.	miles x 1,000	15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Visually inspect the following items:											
Tie-rod ends, steering gear box, and boots	Every 7,500 miles (12,000 km) or 6 months									• Check steering linkage for looseness. • Check condition of boots. • Check for fluid leaks.	*17-22
Suspension components										• Check the bolts for tightness. • Check the conditon of ball joint boots.	_____
Driveshaft boots										Check condition of boots.	16-3
Brake hoses and lines [Including ABS]	●	●	●	●	●	●	●	●	Check for damage or leakage.	*19-30	
All fluid levels and condition of fluid									Check levels, condition of fluids, and check for leaks. If brake fluid is low, check brake pad thickness.	10-5, 14-112, 15-4, *19-7	
Cooling system hoses and connections									• Check all hoses for damage, leaks and deterioration. • Check for proper fan operation.	10-3	
Exhaust system*									Check the catalytic converter heat shield, exhaust pipe, and muffler for damage, leaks and tightness.	9-4	
Fuel lines, and connections*									Check for leaks.	11-116	
Lights and controls									Check all lighting functions.	_____	
Vehicle underbody									Check for damage and fluid leaks.	_____	

*1: Refer to Base Service Manual ('95 - '97 ACURA 2.5TL, P/N 61SW502)

According to state and federal regulations, failure to perform maintenance on the items marked with an asterisk (*) will not void customer's emission warranties. However, Acura recommends that all maintenance services be performed at the recommended time or mileage period to ensure long-term reliability.

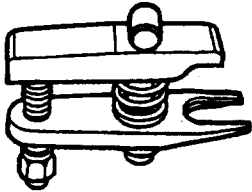
Severe Driving Conditions:

- Driving less than 5 miles (8 km) per trip or, in freezing temperatures, driving less than 10 miles (16 km) per trip.
- Driving in extremely hot [over 90°F (32°C)] conditions.
- Extensive idling or long periods of stop-and-go driving.
- Trailer towing, or driving in mountainous conditions.
- Driving on muddy, dusty, or de-iced roads.

NOTE: If the car is driven OCCASIONALLY under a "severe" condition, you should follow the Normal Conditions Maintenance Schedule for 1997 Model on pages 4-8 and 4-9.



Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07MAC-SL00100	Ball Joint Remover, 32 mm	1	5-8
 ①				



Engine Removal/Installation

Removal

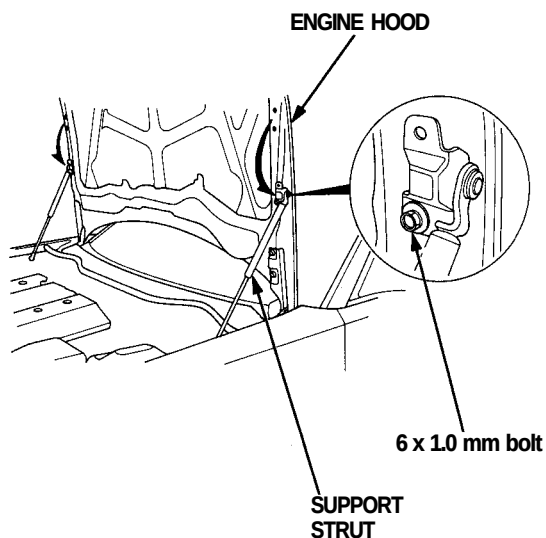
⚠ WARNING

- Make sure jacks and safety stands are placed properly and hoist brackets are attached to the correct positions on the engine.
- Make sure the car will not roll off stands and fall while you are working under it.

CAUTION:

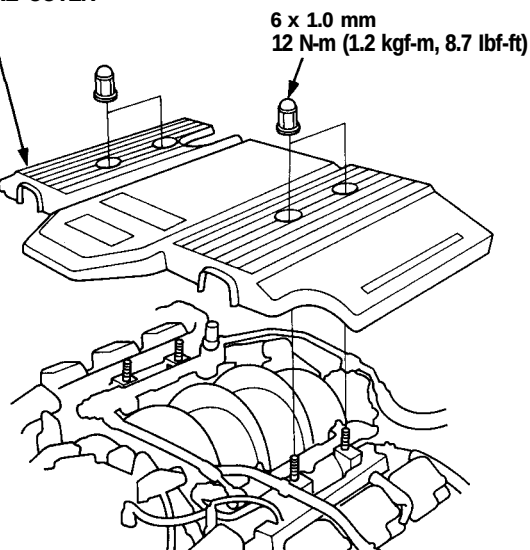
- Use fender covers to avoid damaging painted surfaces.
- Unplug the wiring connectors carefully while holding the connector portion to avoid damage.
- Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses or interfere with other parts.

1. Move the front passenger's seat forward.
2. Remove the support struts from the engine hood, and fix the engine hood in a vertical position, then reinstall the support struts by using 6 x 1.0 mm bolts.

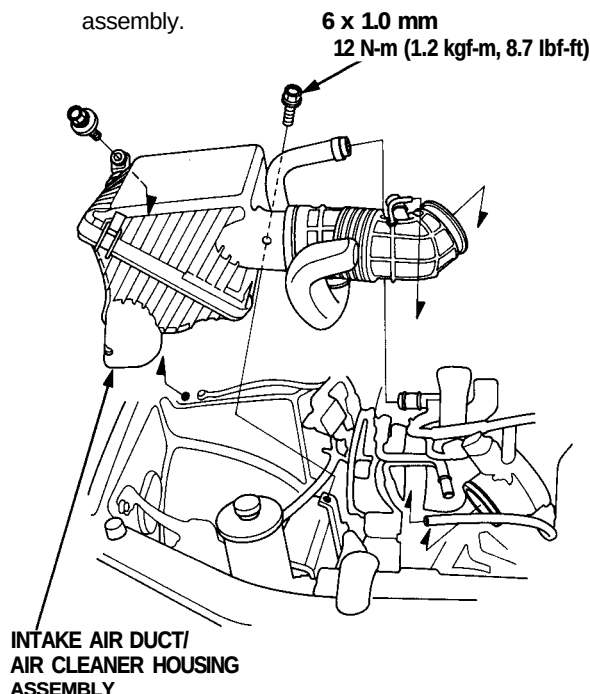


3. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
4. Disconnect the battery negative terminal first, then the positive terminal.
5. Remove the engine cover.

ENGINE COVER



6. Remove the intake air duct and air cleaner housing assembly.



(cont'd)

Engine Removal/Installation

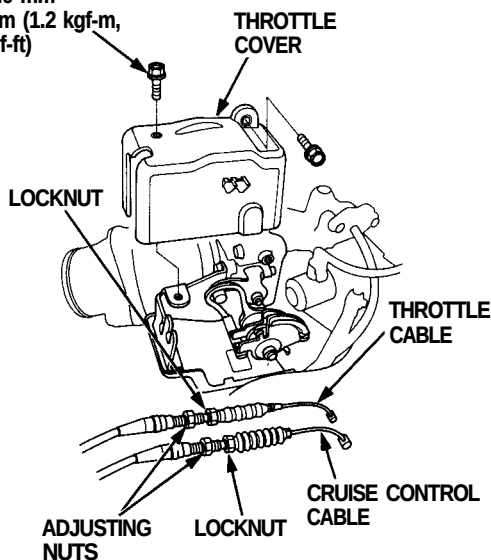
Removal (cont'd)

7. Remove the throttle cover.
8. Remove the throttle cable and cruise control cable by loosening the locknuts, then slip the cable ends out of the accelerator linkage.

NOTE:

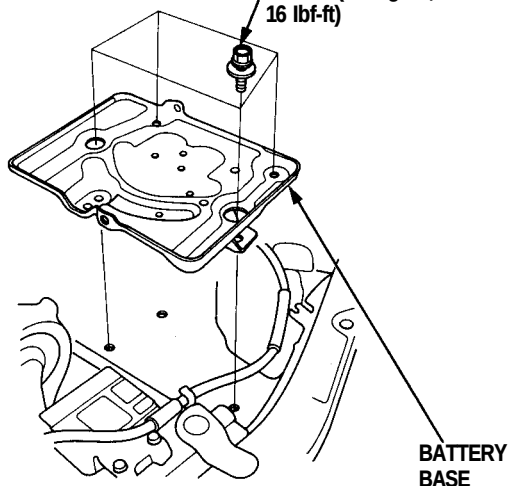
- Take care not to bend a cable when removing it. Always replace any kinked cable with a new one.
- Adjust the throttle cable when installing (see [section 11](#)).
- Adjust the cruise control cable when installing (see [section 23](#)).

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

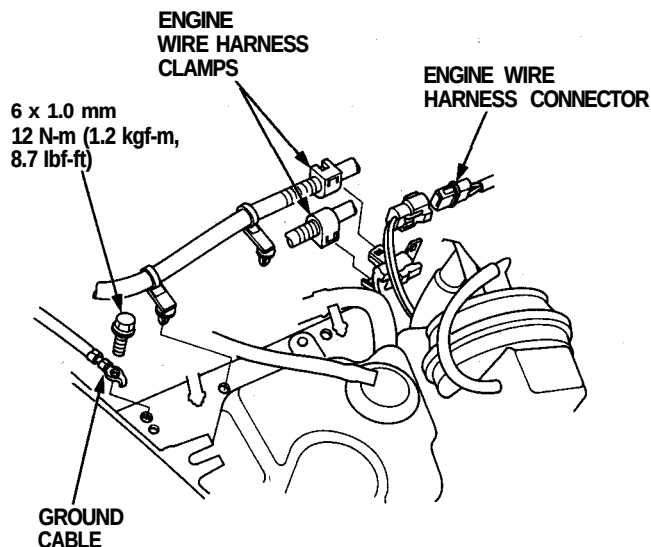


9. Remove the battery and battery base.

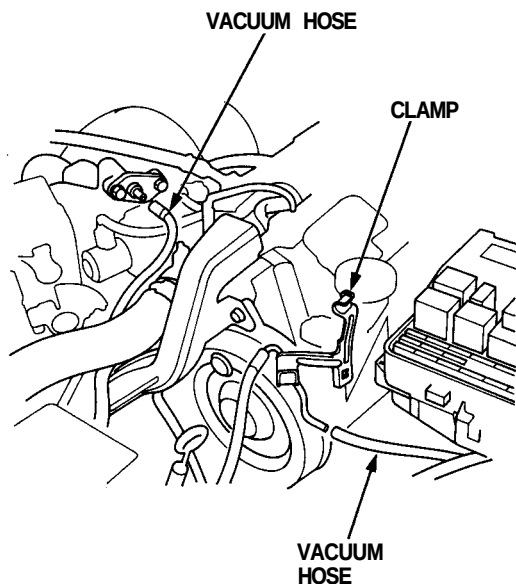
8 x 1.25 mm
22 N-m (2.2 kgf-m,
16 lbf-ft)



10. Disconnect the engine wire harness connector on the left side of the engine compartment.
11. Remove the engine ground cable and engine wire harness clamps.



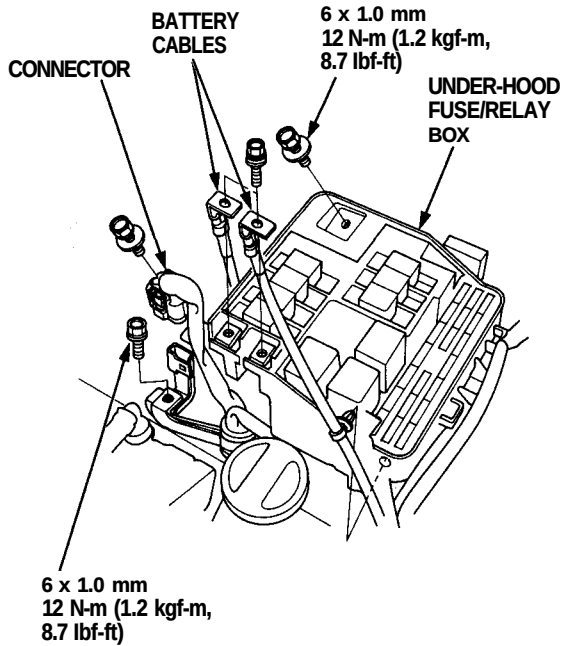
12. Remove the vacuum hoses, then remove the clamp from the under-hood fuse/relay box.





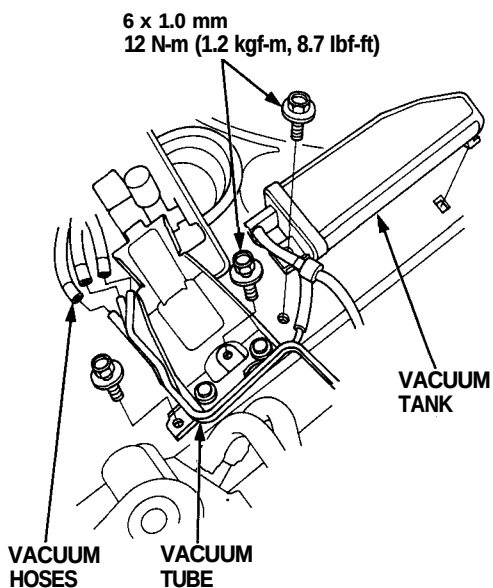
13. Remove the battery cables from the under hood fuse/relay box, then remove the under-hood fuse/relay box.

14. Remove the engine wire harness connector.

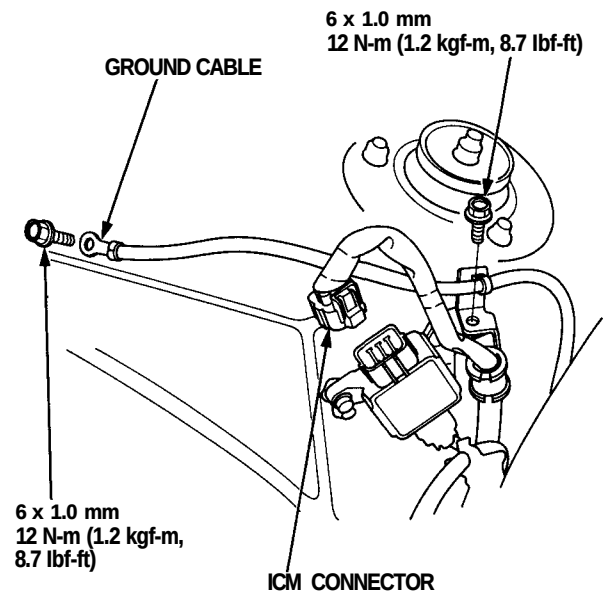


15. Raise the power steering (P/S) fluid reservoir, then remove the vacuum hoses, vacuum tube and vacuum tank.

NOTE: Do not disconnect the P/S hoses.

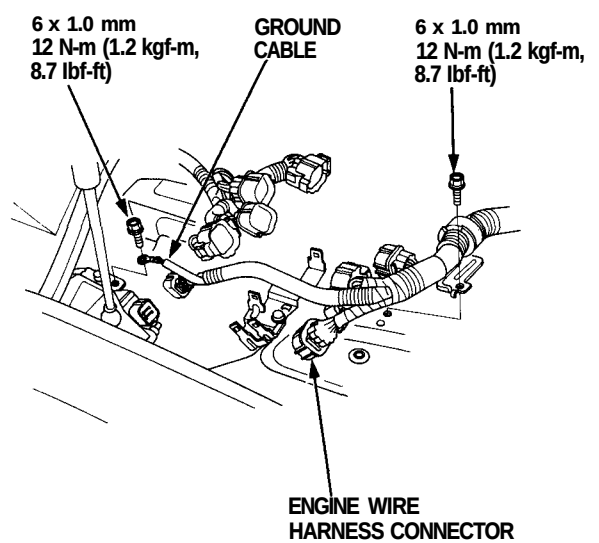


16. Disconnect the ignition control module (ICM) connector, and remove the engine ground cable.



17. Disconnect the engine wire harness connector on the right side of the engine compartment.

18. Remove the ground cable and wire harness clamp.



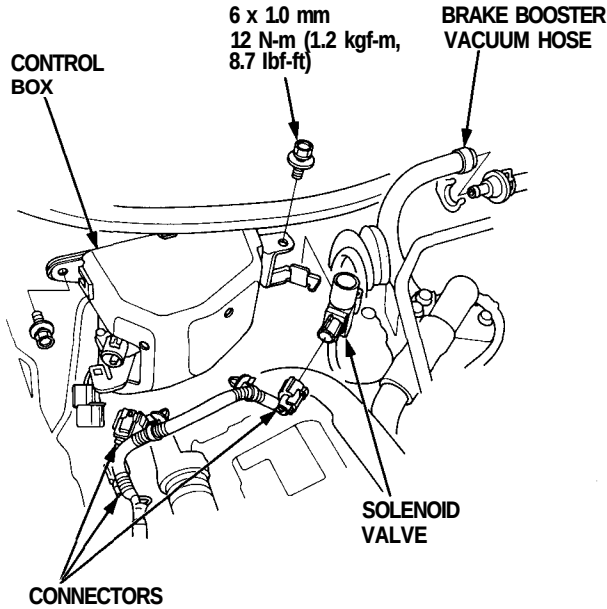
(cont'd)

Engine Removal/Installation

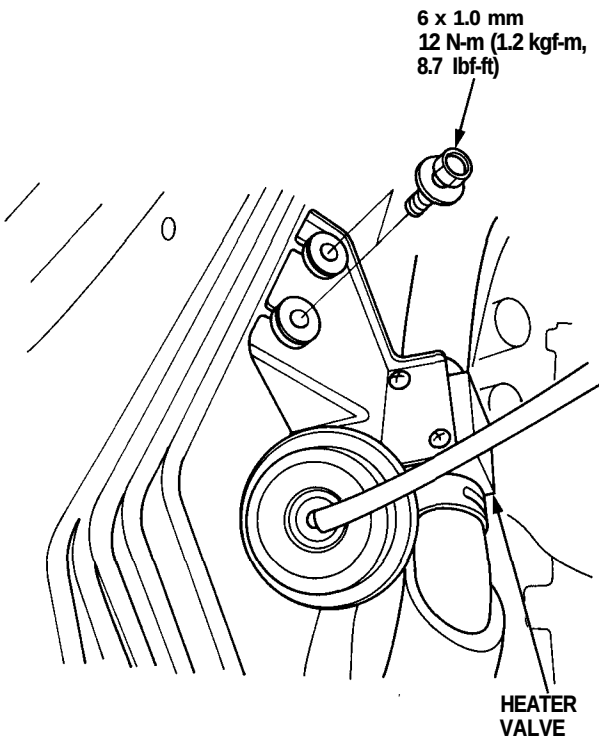
Removal (cont'd)

19. Disconnect the connectors, then remove the control box and solenoid valve.

20. Disconnect the brake booster vacuum hose.



21. Remove the heater valve.

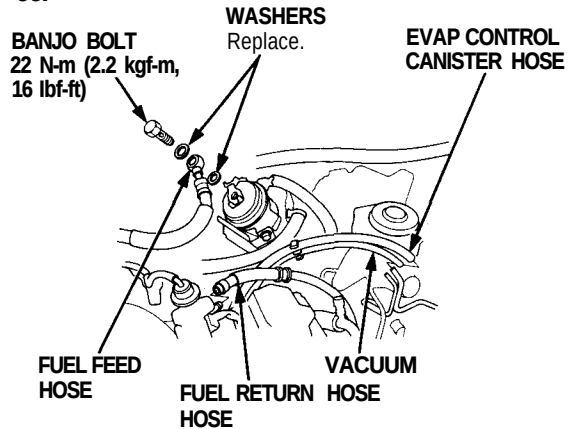


22. Relieve fuel pressure (see [section 11](#)).

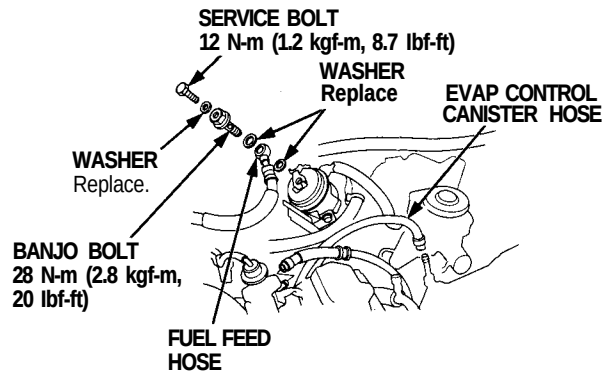
⚠ WARNING Do not smoke while working on the fuel system. Keep open flame or spark away from the work area. Drain fuel only into an approved container.

23. Remove the fuel feed hose, fuel return hose, vacuum hose and evaporative emission (EVAP) control canister hose.

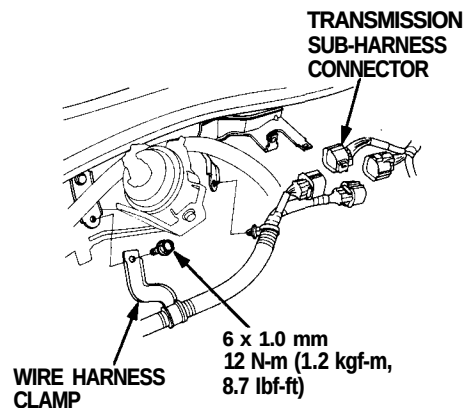
'96:



'97 - '98:

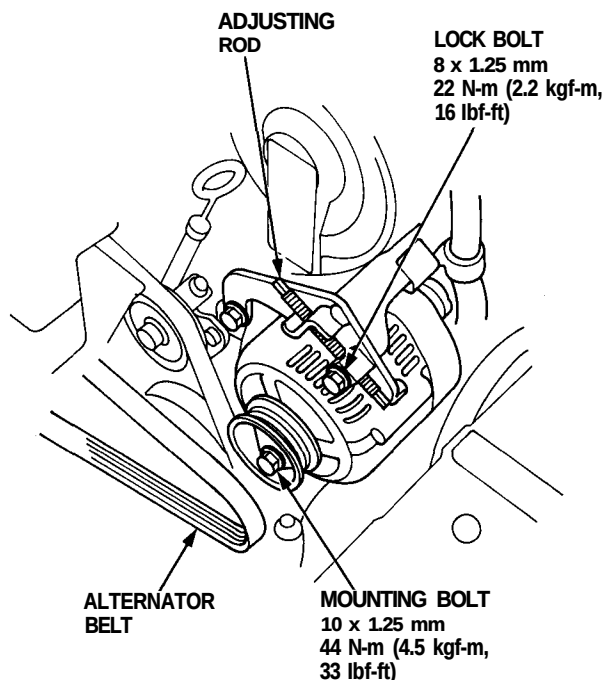


24. Disconnect the transmission sub-harness connector, and remove the wire harness clamp.

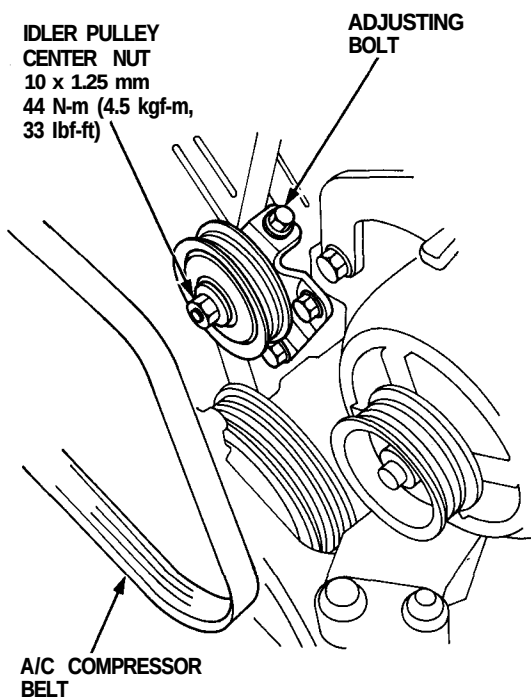




25. Loosen the mounting bolt, lock bolt and adjusting rod, then remove the alternator belt.



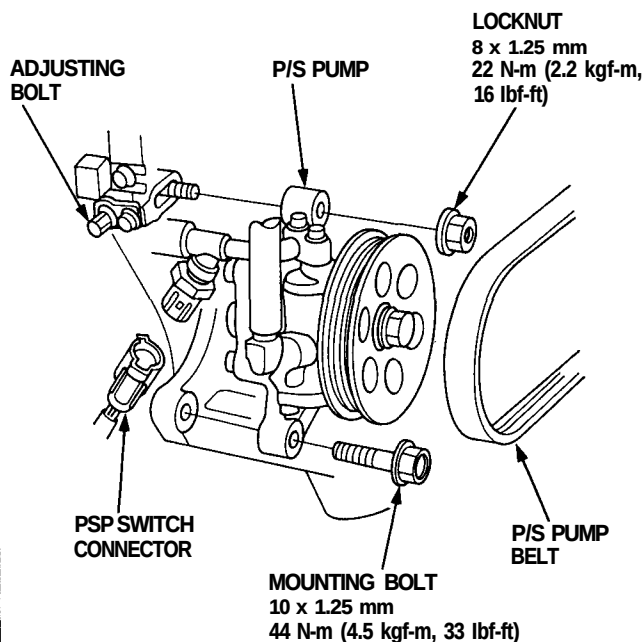
26. Loosen the idler pulley center nut and adjusting bolt, then remove the air conditioning (A/C) compressor belt.



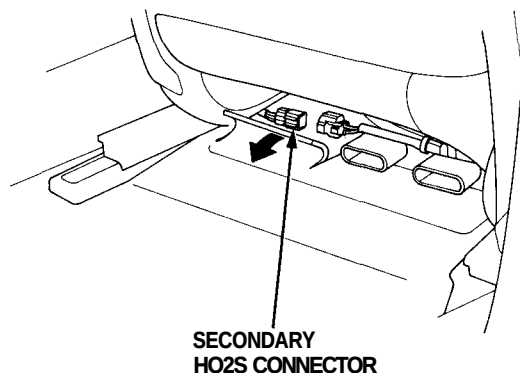
27. Disconnect the power steering pressure (PSP) switch connector.

28. Remove the adjusting bolt, locknut and mounting bolt, then remove the P/S pump belt and pump.

- Do not disconnect the P/S hose.



29. Pull the carpet back to expose the secondary heated oxygen sensor (Secondary HO2S) connector, then disconnect the secondary HO2S connector.



(cont'd)

Engine Removal/Installation

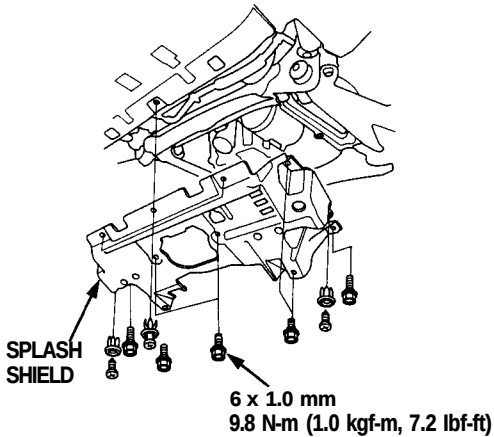
Removal (cont'd)

30. Remove the radiator cap.

⚠ WARNING Use care when removing the radiator cap to avoid scalding by hot coolant or steam.

31. Raise the hoist to full height.

32. Remove the front tires/wheels and splash shield.



33. Drain the engine coolant (see page 10-5).

- Loosen the drain plug in the radiator.

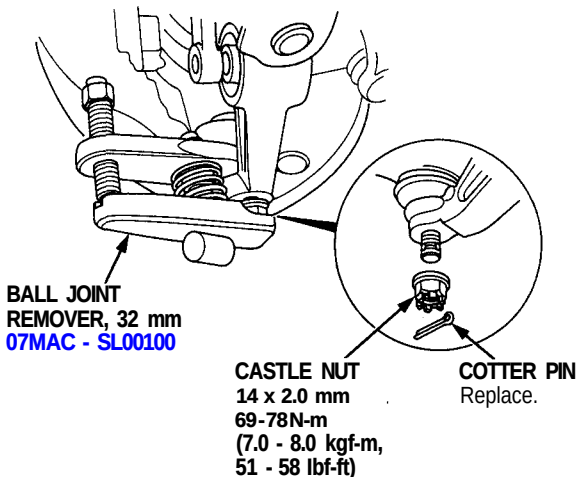
34. Drain the automatic transmission fluid (ATF). Reinstall the drain plug using a new washer (see section 14).

35. Drain the differential oil. Reinstall the drain plug using a new washer (see section 15).

36. Drain the engine oil. Reinstall the drain bolt using a new washer (see page 8-4).

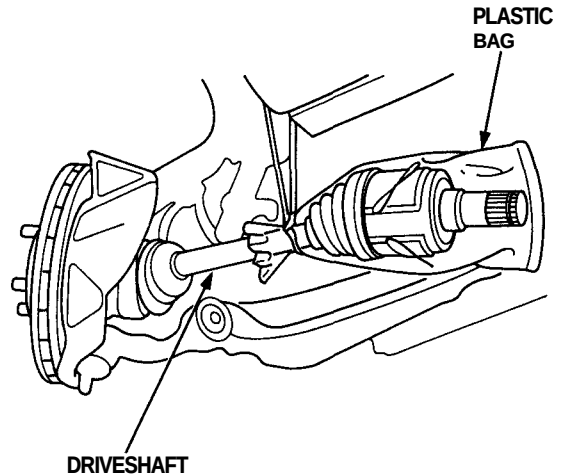
37. Remove the damper forks (see section 18).

38. Disconnect the suspension lower arm ball joints with the special tool. Refer to section 18 for the proper procedure.



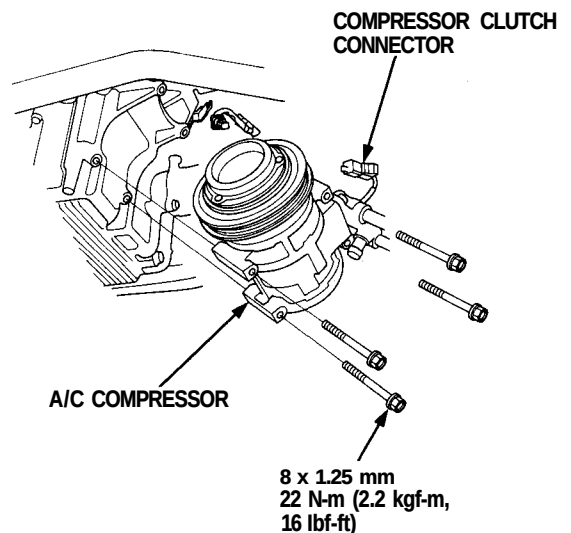
39. Remove the driveshafts (see section 16).

NOTE: Coat all precision finished surfaces with clean engine oil. Tie plastic bags over the driveshaft ends.



40. Disconnect the compressor clutch connector, then remove the A/C compressor.

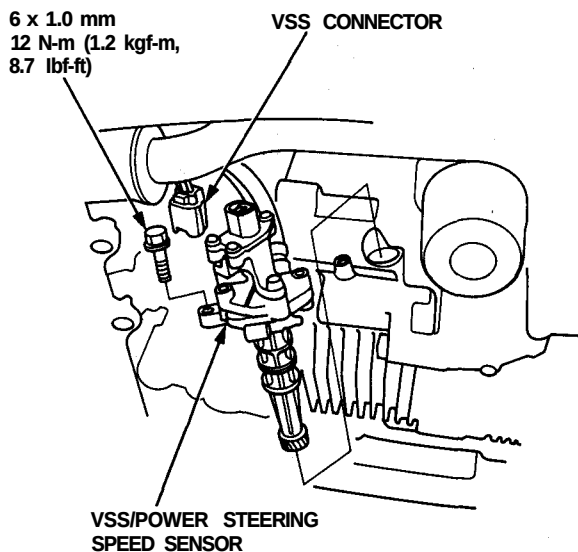
NOTE: Do not disconnect the A/C hoses.



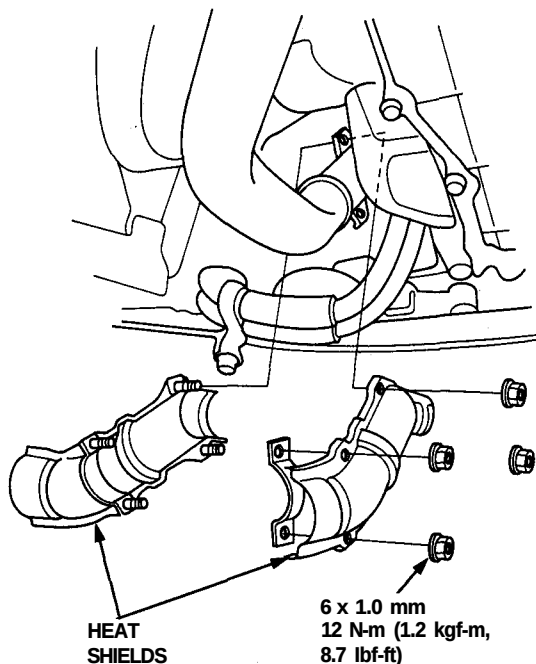


41. Disconnect the vehicle speed sensor (VSS) connector, then remove the VSS/power steering speed sensor.

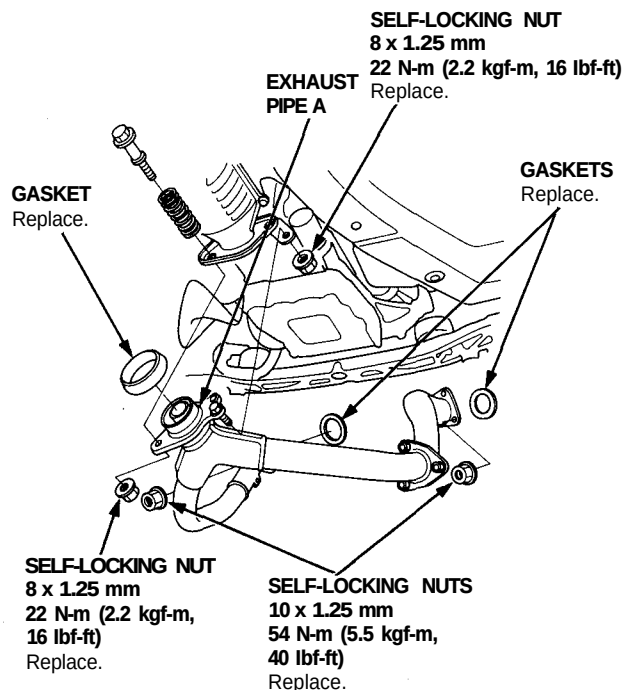
- Do not disconnect the fluid hoses.



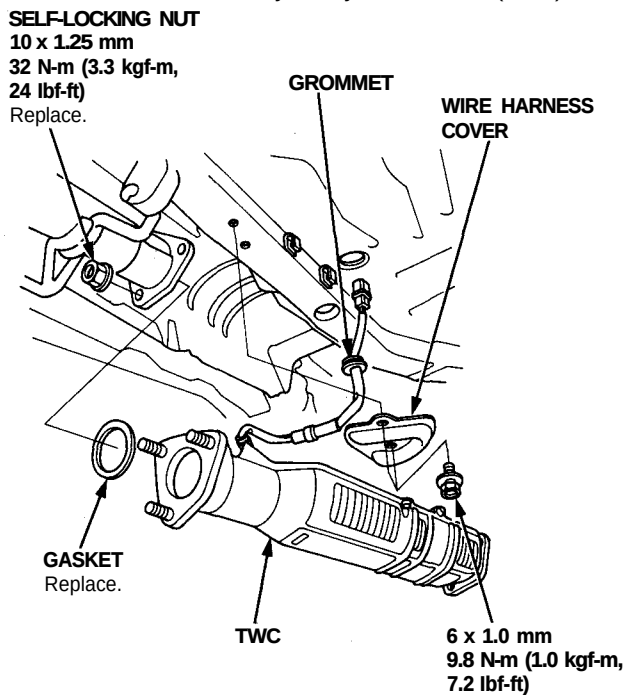
42. Remove the heat shields from exhaust pipe A.



43. Remove exhaust pipe A.



44. Remove the wire harness cover and grommet, then remove the three way catalytic converter (TWC).

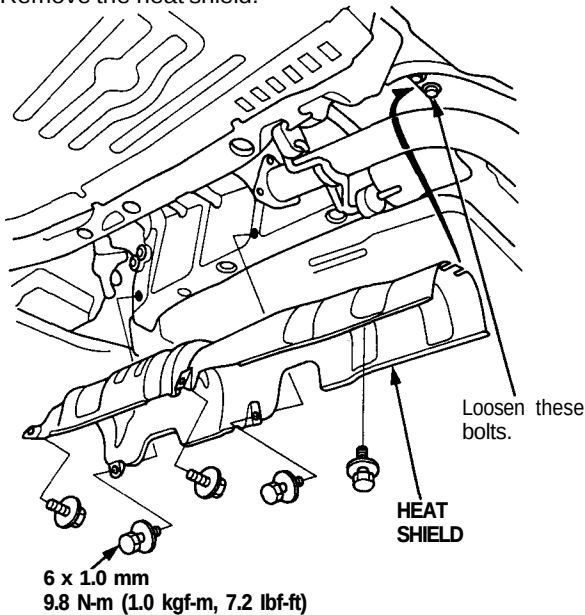


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Engine Removal/Installation

Removal (cont'd)

45. Remove the heat shield.



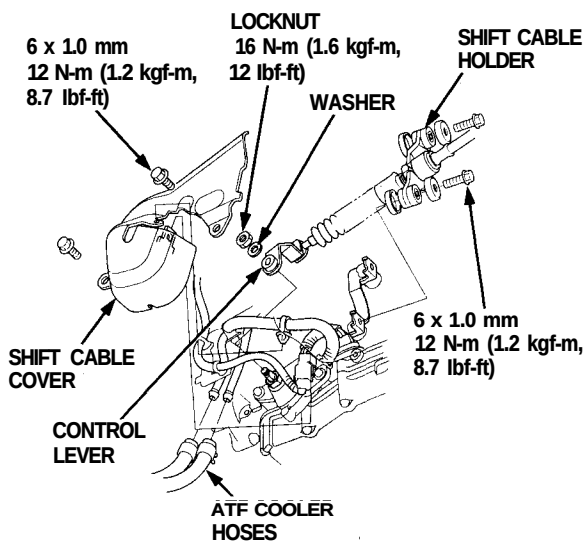
46. Remove the ATF cooler hoses, then plug the ATF cooler hoses and pipes.

47. Remove the shift cable cover mounting bolts, then remove the A/T gear position switch harness clamp and the shift control solenoid valve/linear solenoid harness connector from the shift cable cover.

48. Remove the shift cable cover from the transmission housing.

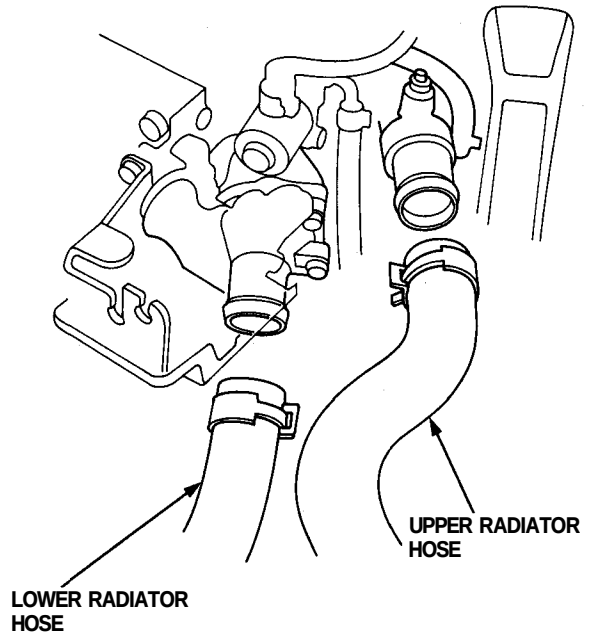
49. Remove the shift cable with shift cable holder from the shift cable holder base.

50. Remove the control lever from the control shaft.



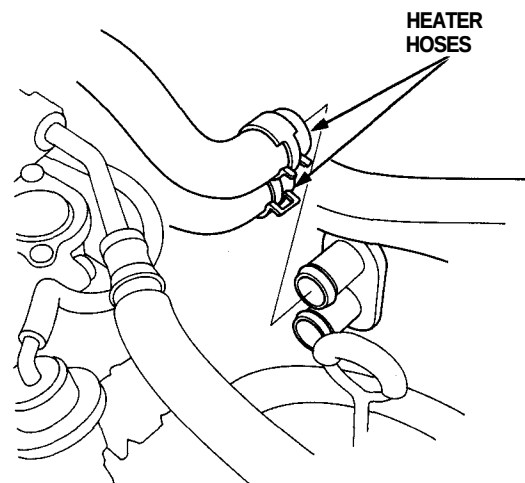
51. Lower the hoist.

52. Remove the upper and lower radiator hoses.



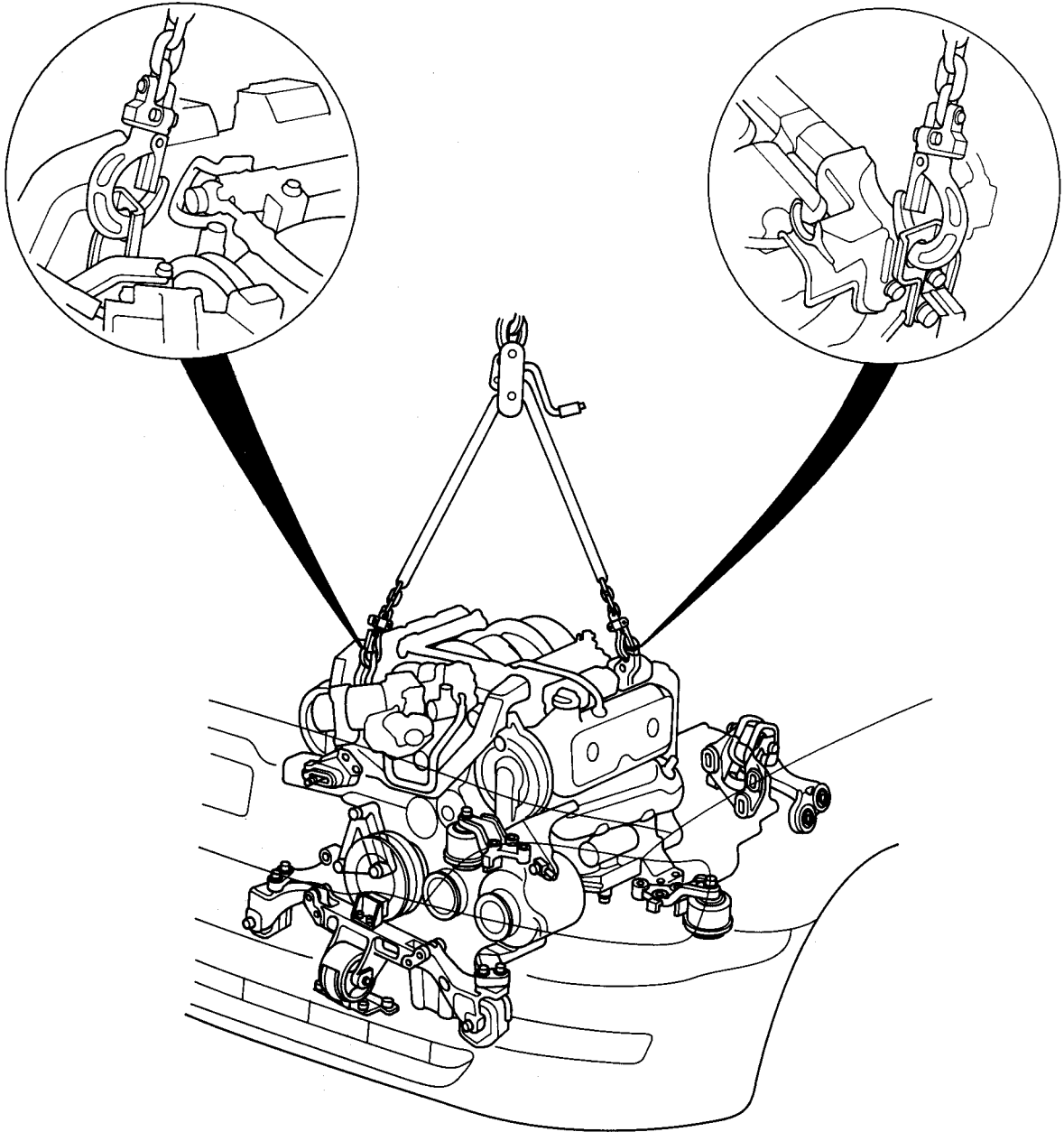
53. Remove the radiator assembly (see page 10-4).

54. Remove the heater hoses.





55. Attach the chain hoist to the engine.

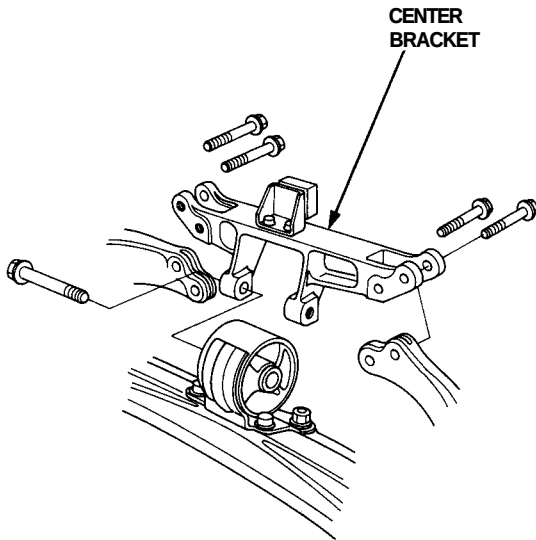


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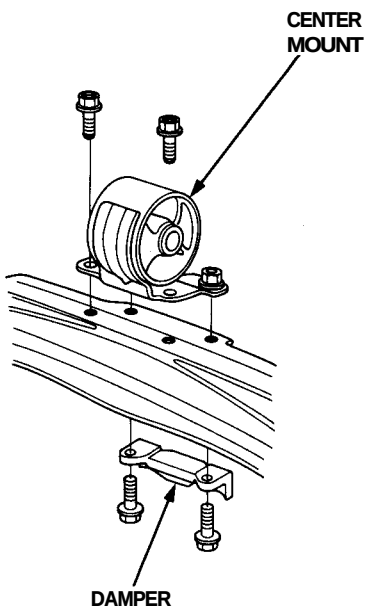
Engine Removal/Installation

Removal (cont'd)

56. Remove the center bracket.

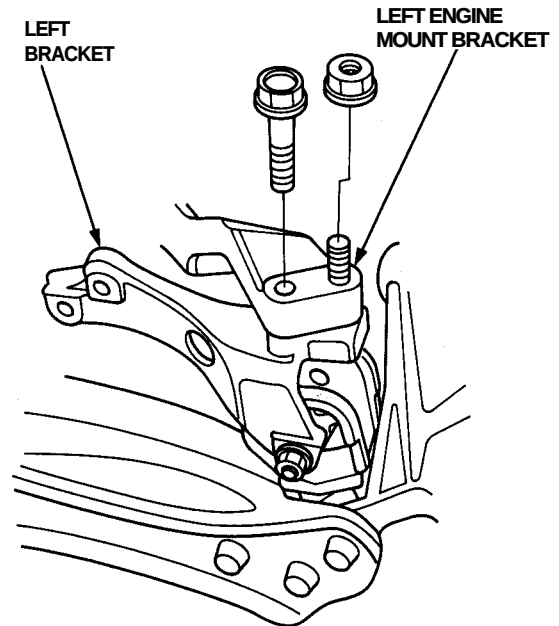


57. Remove the center mount.

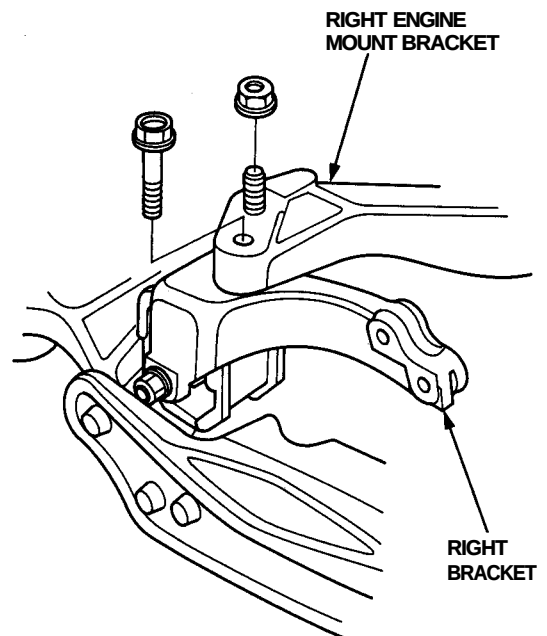


58. Separate the left and right engine mount brackets from the left and right brackets.

LEFT:



RIGHT:



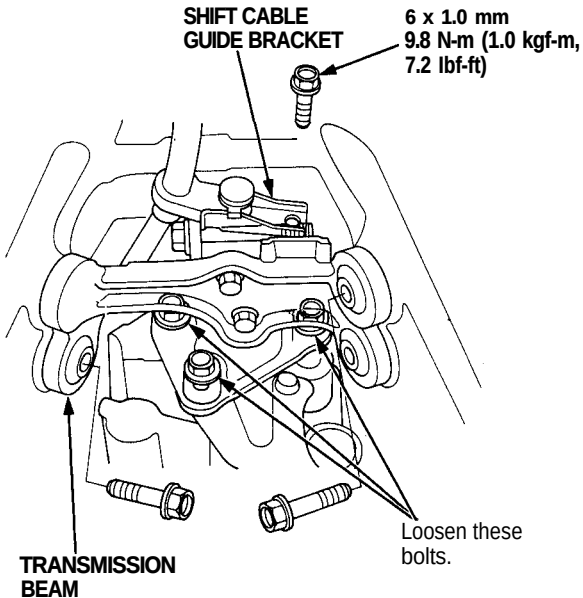


59. Raise the hoist.

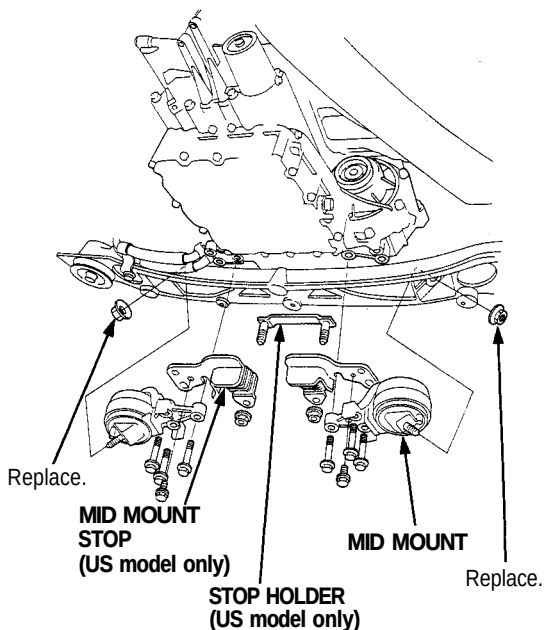
60. Remove the shift cable guide bracket.

CAUTION: Take care not to bend the shift cable.

61. Remove the transmission beam from the body, and loosen the three bolts on the transmission bracket.



62. Remove the stop holder, mid mount stops and mid mounts.



63. Lower the hoist.

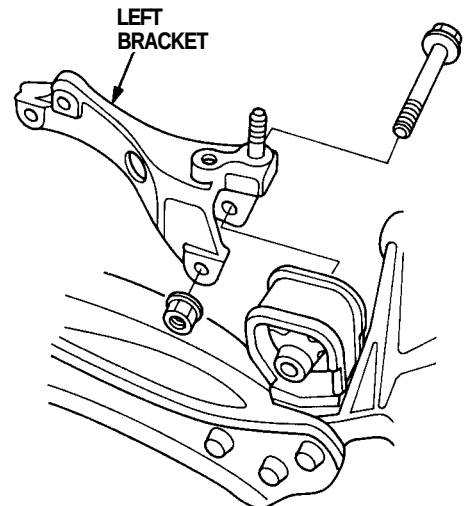
64. Raise the chain hoist to remove all slack from the chain.

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

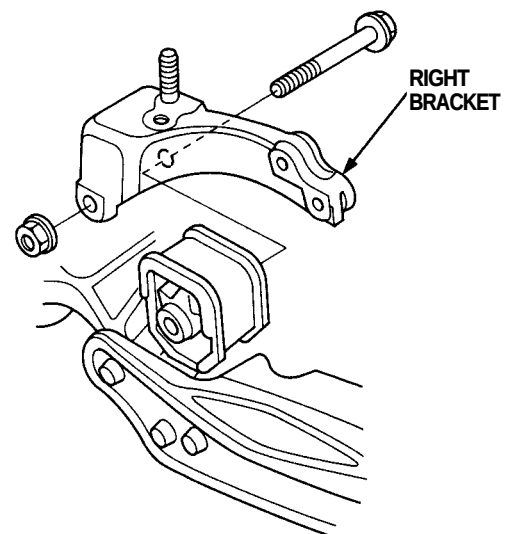
66. Slowly raise the engine approximately 150 mm (6 in). Check once again that all hoses and wires are disconnected from the engine/transmission.

67. Remove the left and right brackets.

LEFT:



RIGHT:

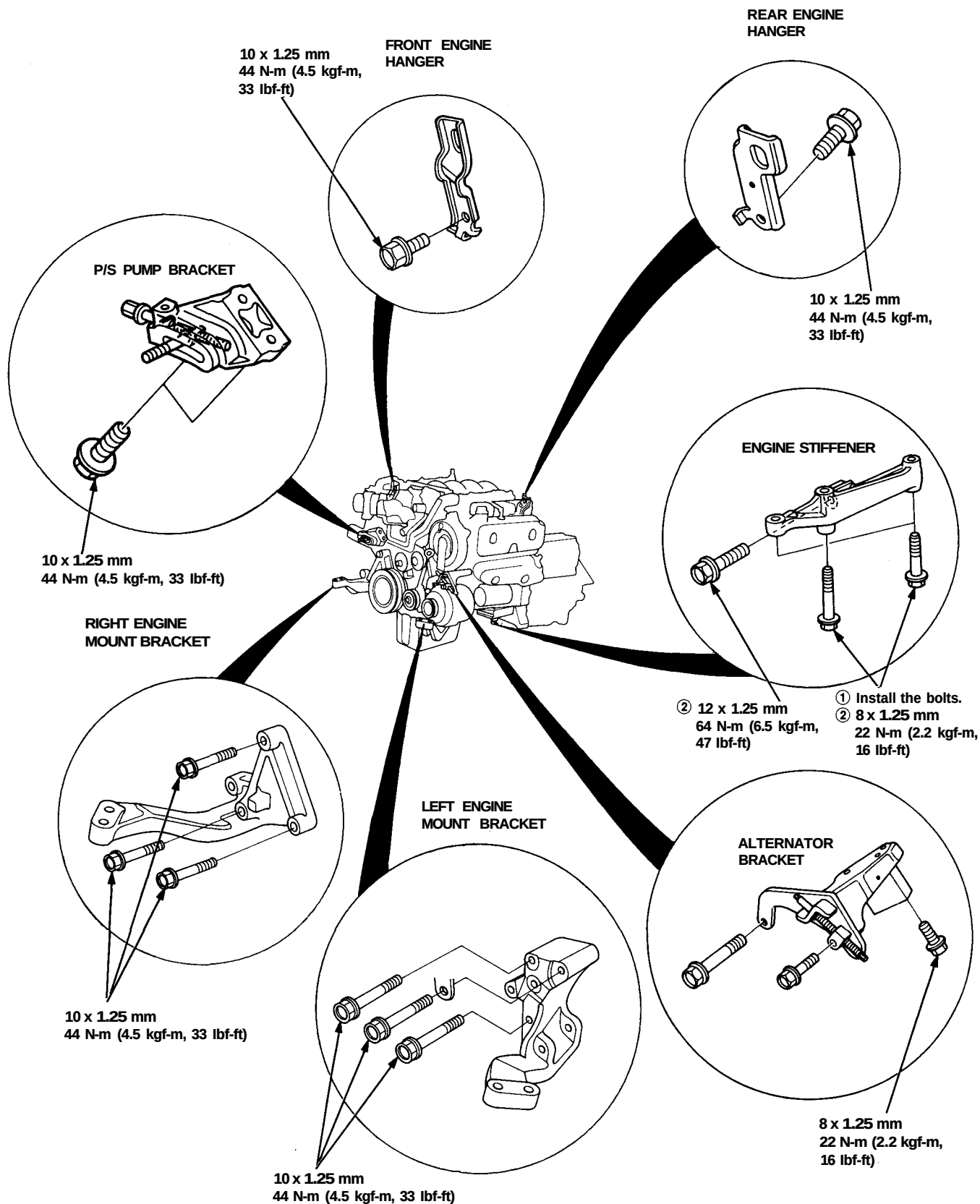


68. Raise the engine all the way and remove it from the vehicle.

Engine Removal/Installation

Installation

Bracket Bolts Torque Specifications:

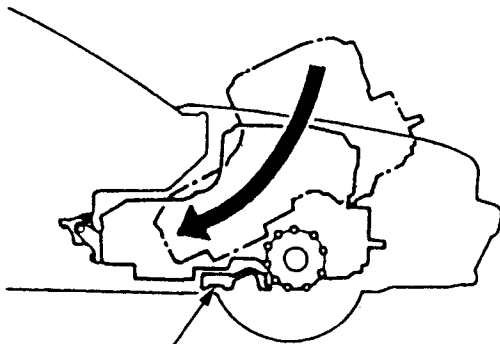




Engine Installation:

Install the engine in the reverse order of removal. Reinstall the mount bolts/nuts in the following sequence. Failure to follow these procedures may cause excessive noise and vibration, and reduce bushing life.

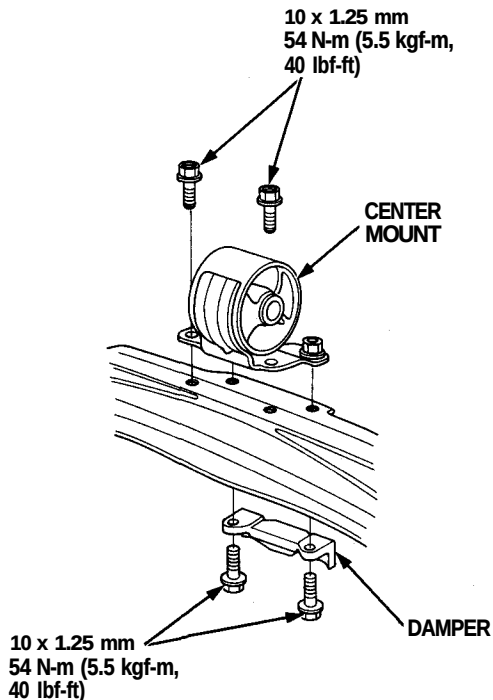
CAUTION: Take care not to damage the rear beam when installing the engine/transmission assembly.



REAR BEAM

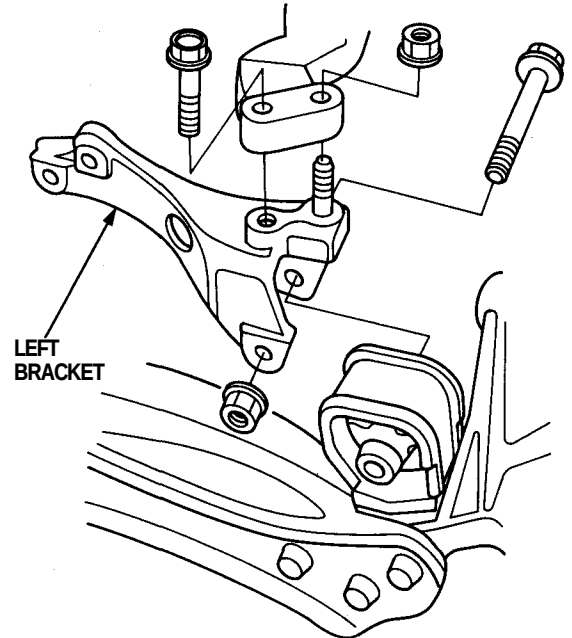
- Mount the engine so that the rear beam does not hit the transmission.

1. Install the center mount, then tighten the bolts.



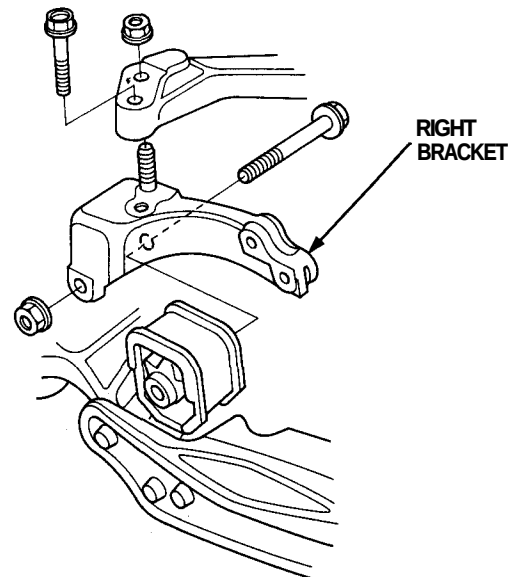
2. Install the left bracket, then install the bolts/nut.

- Do not tighten the bolts/nut.



3. Install the right bracket, then install the bolts/nut.

- Do not tighten the bolts/nut.

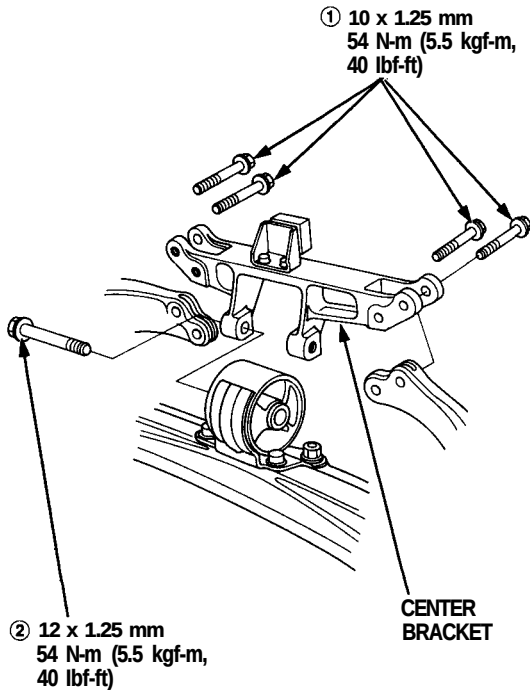


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Engine Removal/Installation

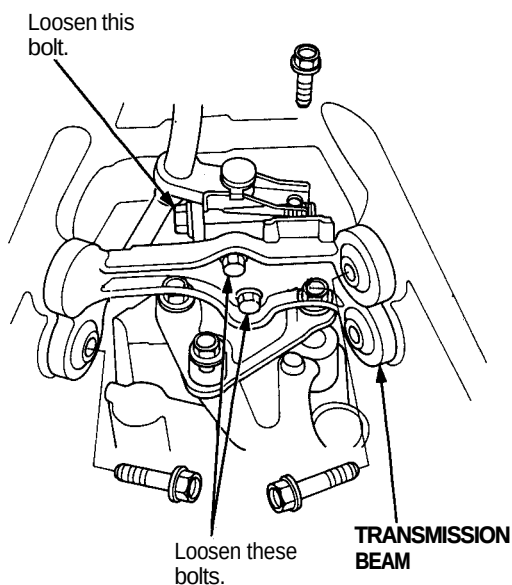
Installation (cont'd)

4. Install the center bracket, then tighten the bolts in the numbered sequence as shown (① - ②).

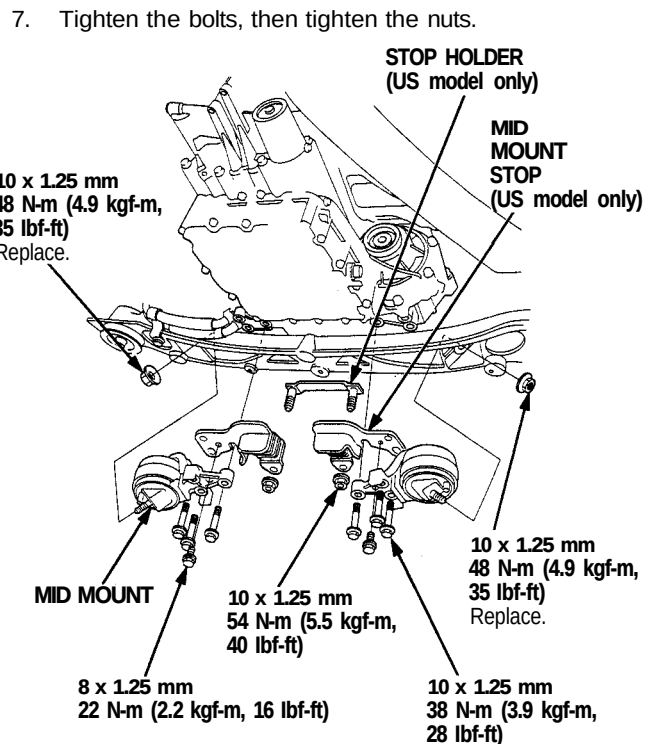


5. Install the transmission beam mounting bolts, then loosen the mount bolts.

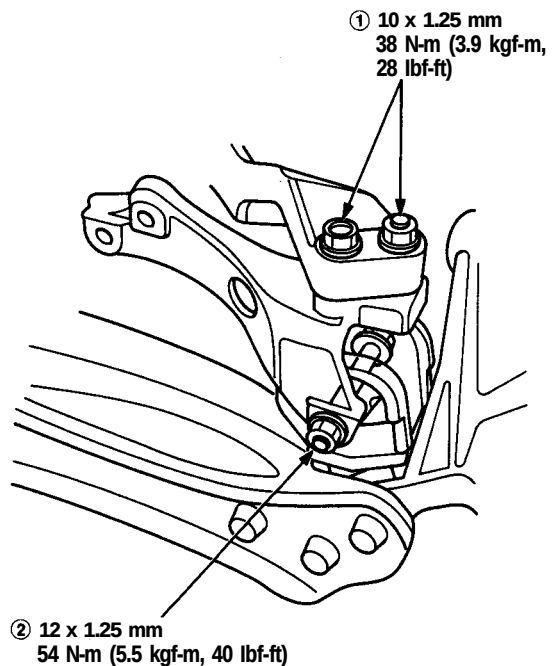
NOTE: Do not tighten the transmission beam mounting bolts.



6. Install the mid mounts, then install the mid mount stops on the mid mounts. Tighten the 8 mm bolts loosely, then install the stop holder.



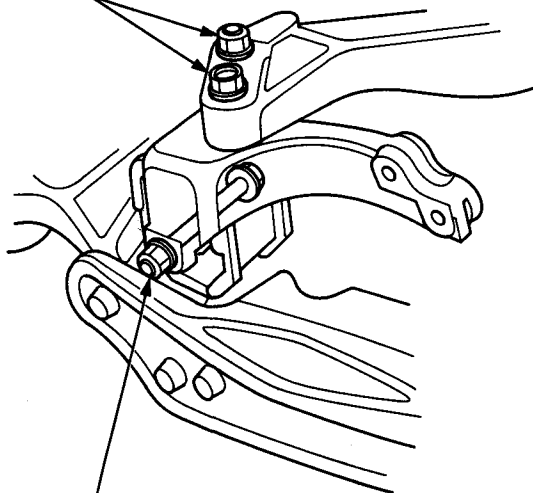
8. Tighten the bolts and nuts on the left bracket in the numbered sequence as shown (① - ②).





9. Tighten the bolts and nuts on the right bracket in the numbered sequence as shown (① – ②).

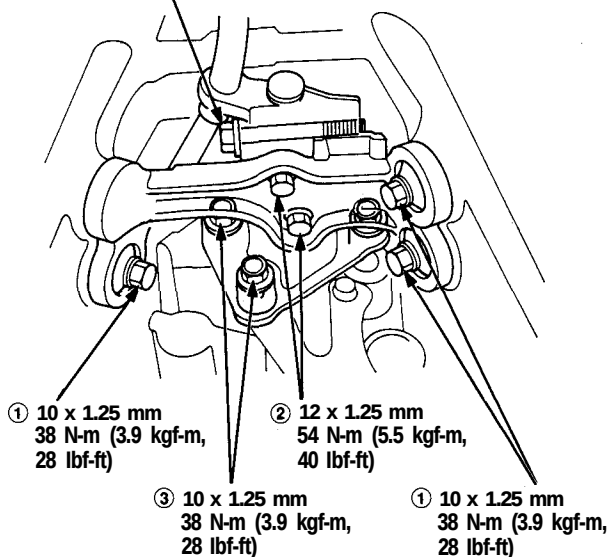
① 10 x 1.25 mm
38 N-m (3.9 kgf-m,
28 lbf-ft)



② 12 x 1.25 mm
54 N-m (5.5 kgf-m,
40 lbf-ft)

10. Tighten the bolts on the transmission bracket/mount and transmission beam in the numbered sequence as shown (① – ④).

④ 12 x 1.25 mm
54 N-m (5.5 kgf-m, 40 lbf-ft)



① 10 x 1.25 mm
38 N-m (3.9 kgf-m,
28 lbf-ft)

② 12 x 1.25 mm
54 N-m (5.5 kgf-m,
40 lbf-ft)

③ 10 x 1.25 mm
38 N-m (3.9 kgf-m,
28 lbf-ft)

① 10 x 1.25 mm
38 N-m (3.9 kgf-m,
28 lbf-ft)

11. Do the following checks and adjustments:

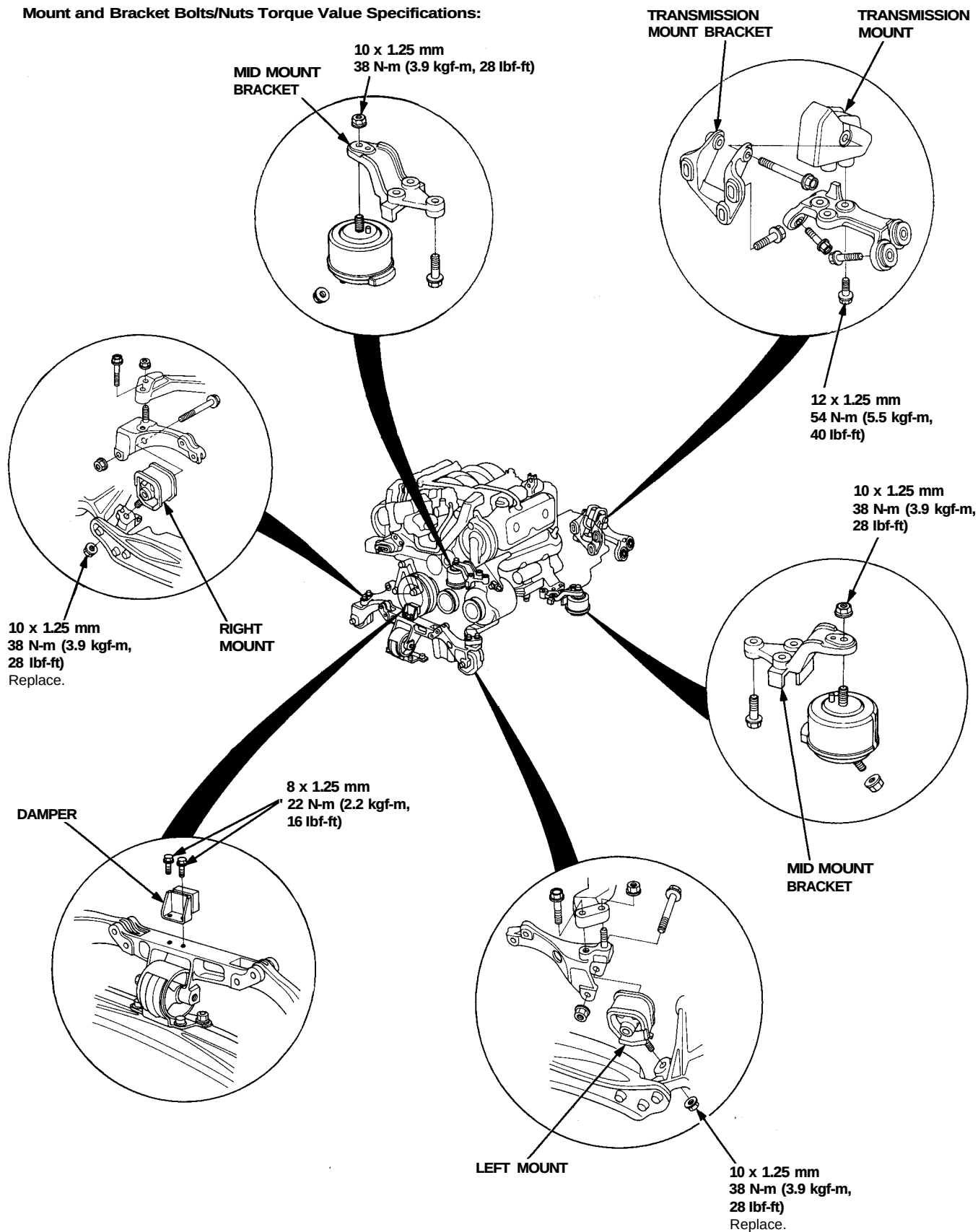
- Check that the spring clips on the ends of the driveshaft and intermediate shaft click into place.
CAUTION: Use new spring clips.
- Adjust the shift cable (see [section 14](#)).
- Adjust the throttle cable (see [section 11](#)).
- Adjust the cruise control cable (see [section 23](#)).
- Refill the engine with engine oil (see page [8-4](#)).
- Refill the transmission with ATF (see [section 14](#)).
- Refill the differential with differential oil (see [section 15](#)).
- Refill the radiator with engine coolant (see page [10-5](#)).
- Bleed air from the cooling system at the bleed bolt with the heater valve open (see page [10-5](#)).
- Clean the battery posts and cable terminals with sandpaper, assemble them, then apply grease to prevent corrosion.
- Inspect for fuel leakage (see [section 11](#)).
 - After assembling all fuel line parts, turn on the ignition switch (do not operate the starter) so that the fuel pump operates for approximately two seconds and the fuel line pressurizes. Repeat this operation two or three times, and check for fuel leakage at any point in the fuel line.
- Enter the anti-theft code for the radio, then enter the customer's radio station presets.

(cont'd)

Engine Removal/Installation

Installation (cont'd)

Mount and Bracket Bolts/Nuts Torque Value Specifications:

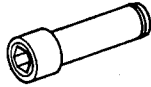


Special Tools

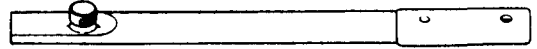
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07HAH-PJ7010B	Valve Guide Reamer, 5.5 mm	1	6-31
②	07JAA-001020A	Socket, 19 mm	1	6-3
③	07JAB-001020A	Holder Handle	1	6-3
④	07MAB-PY3010A	Holder Attachment, 50 mm Offset	1	6-3
⑤	07742-0010100	Valve Guide Driver, 5.5 mm	1	6-30, 6-31
⑥	07757-PJ1010A	Valve Spring Compressor Attachment	1	6-26



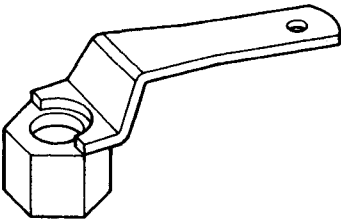
①



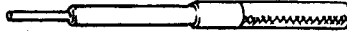
②



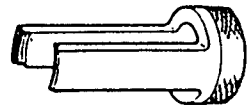
③



④



⑤



⑥



Crankshaft Pulley and Pulley Bolt

Replacement

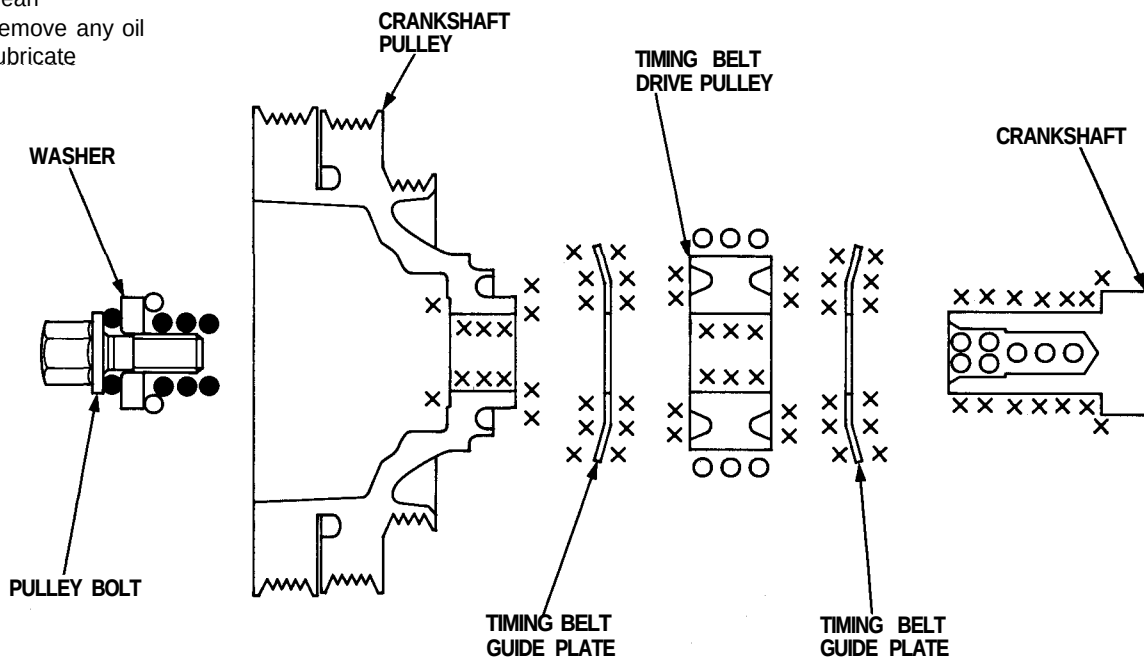
When installing and tightening the pulley, follow the procedure below.

Clean, remove any oil, and lubricate the points shown below.

○ : Clean

× : Remove any oil

● : Lubricate



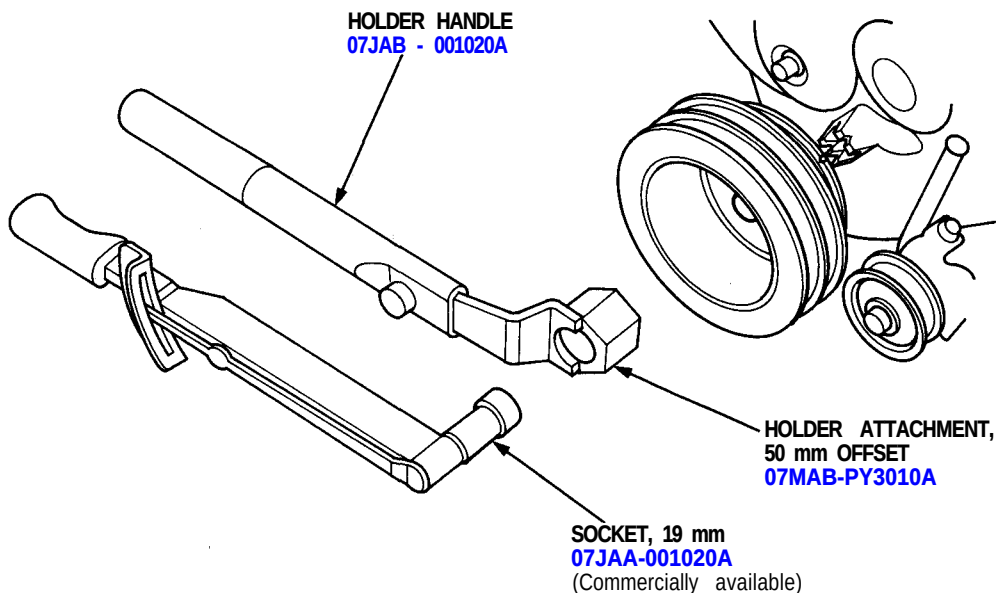
Crankshaft pulley bolt size and torque value:

16 x 1.5 mm

245 N-m (25.0 kgf-m, 181 lbf-ft)

NOTE:

- Do not use an impact wrench when installing.
- Remove the center bracket before removing the crankshaft pulley (see page 6-5).

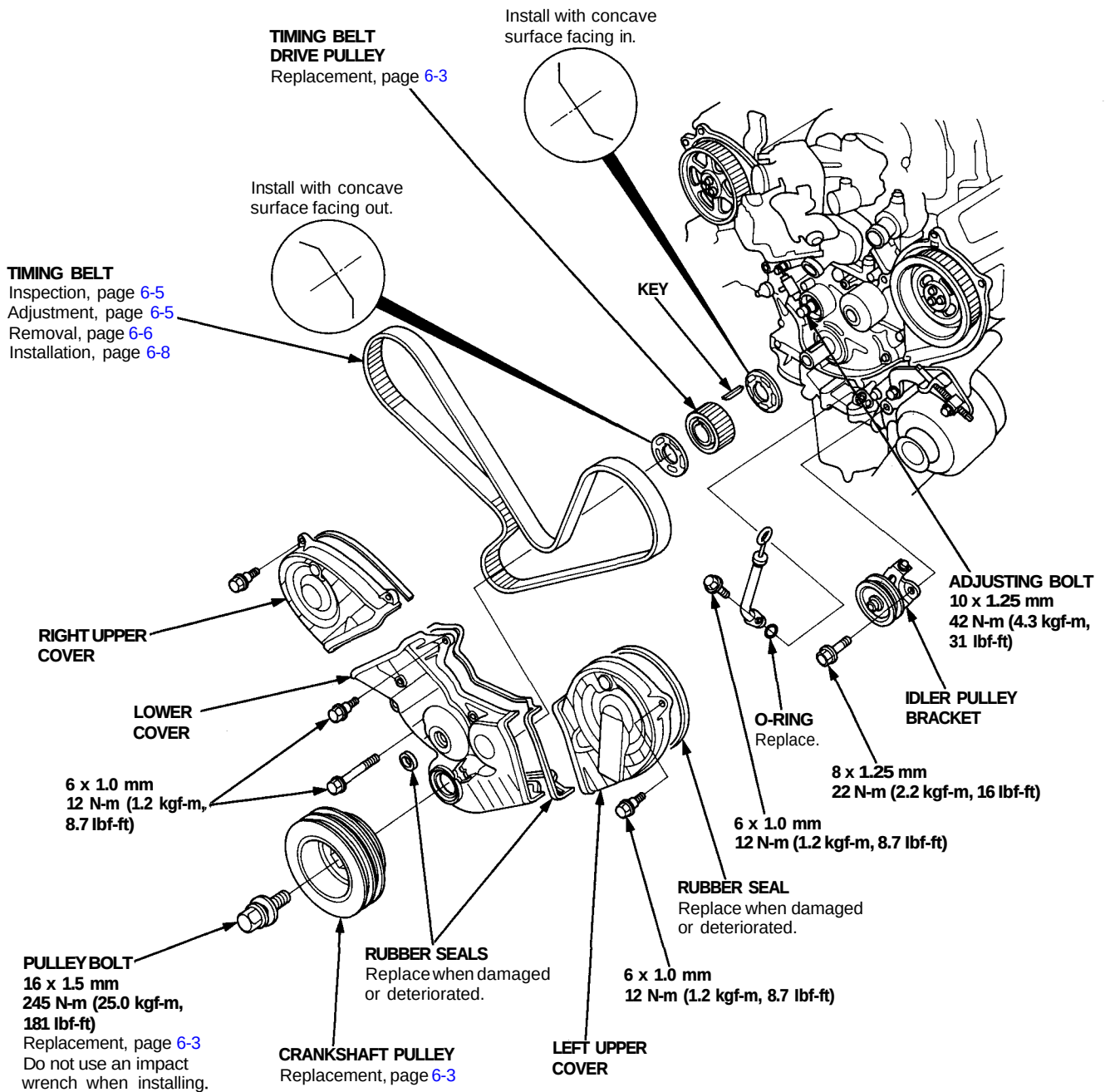


Timing Belt

Illustrated Index

NOTE:

- Refer to page 6-8 for how to position the crankshaft and pulley before installing the belt.
- Mark the direction of rotation on the belt before removing it.
- Do not use the upper covers and lower cover to store removed items.
- Clean the upper covers and lower cover before installing them.
- Replace the camshaft seals and crankshaft seals if there is oil leakage.
- Refer to page 6-3 before installing the timing belt.
- Remove the center bracket before removing the crankshaft pulley (see page 6-5).



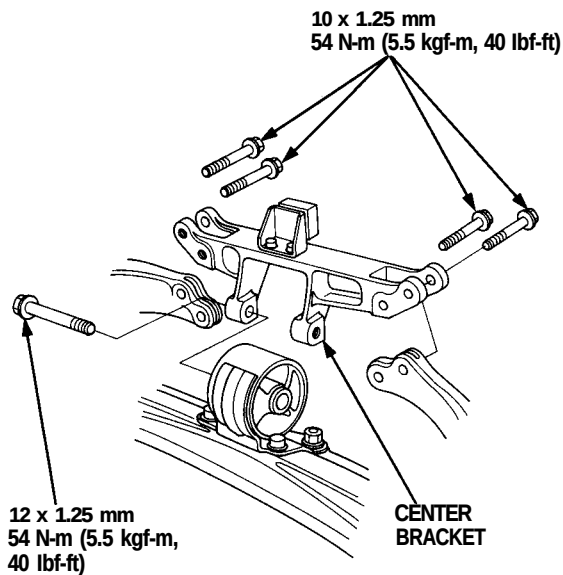


Inspection

1. Remove the left upper cover.
2. Remove the center bracket.

NOTE:

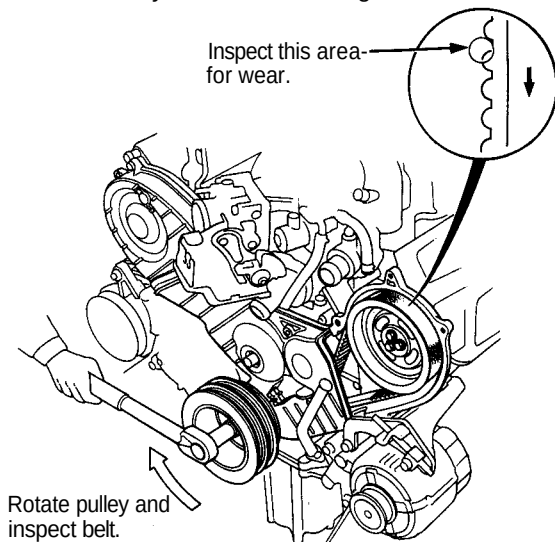
- Support the engine with a jack before removing the center bracket is removed.
- Make sure to place a cushion between the oil pan and the jack.
- Refer to page 5-16 when installing the center bracket.



3. Inspect the timing belt for cracks and oil or coolant soaking.

NOTE:

- Replace the belt if oil or coolant soaked.
- Remove any oil or solvent that gets on the belt.



Tension Adjustment

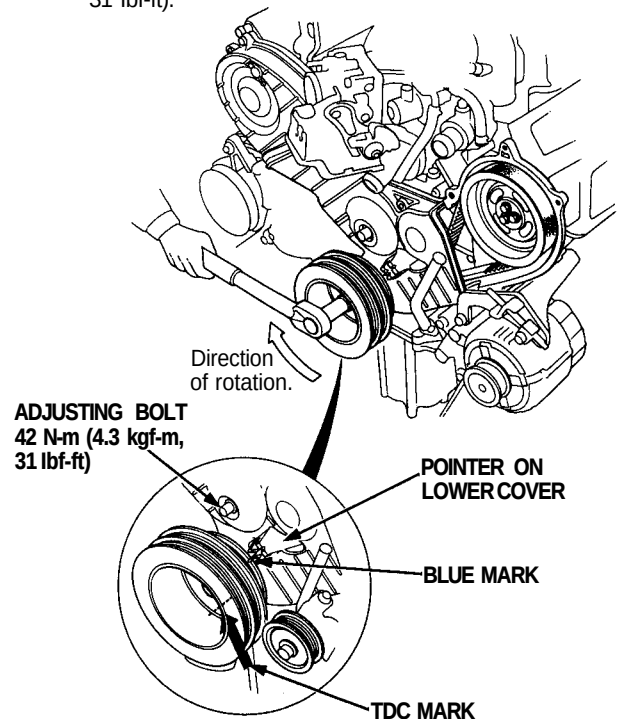
CAUTION:

- Always adjust the timing belt tension with the engine cold.
- Do not rotate the crankshaft when the adjusting bolt is loose.

NOTE:

- The tensioner is spring-loaded to apply tension to the belt automatically after making the following adjustment.
- Inspect the timing belt before adjusting the belt tension.
- Always rotate the crankshaft clockwise when viewed from the pulley side. Rotating it counterclockwise may result in improper adjustment of the belt tension.

1. Remove the left upper cover.
2. Remove the center bracket (As shown in the left column).
3. Set the No. 1 piston at TDC (see page 6-10).
4. Rotate the crankshaft clockwise nine teeth on the camshaft pulley (The blue mark on the crankshaft pulley should line up with the pointer on the lower cover).
5. Loosen the timing belt adjusting bolt 180°.
6. Tighten the adjusting bolt, torque to 42 N-m (4.3 kgf-m, 31 lbf-ft).



Timing Belt

Removal

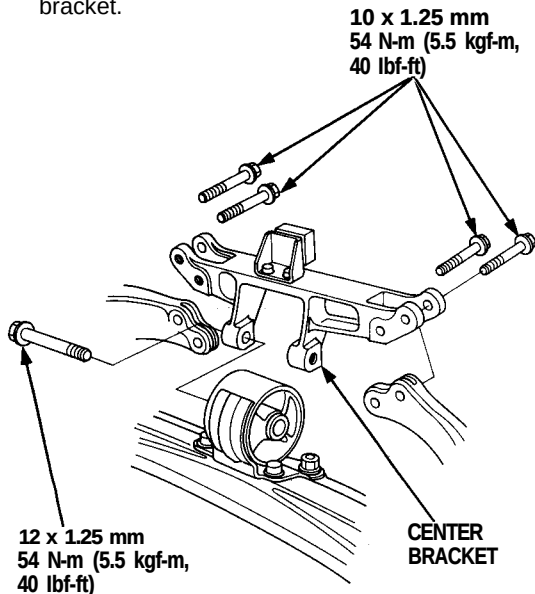
NOTE:

- Replace the timing belt at 105,000 miles (168,000 km) according to the maintenance schedule (normal conditions/severe conditions).
If the vehicle is regularly driven in one or more of the following conditions, replace the timing belt at 60,000 miles (U.S.A.) 100,000 km (Canada).
 - In very high temperatures (over 110°F, 43°C)
 - In very low temperatures (under -20°F, -29°C)
- Turn the crankshaft pulley so the No. 1 piston is at top dead center (TDC) before removing the belt (see page 6-8).
- Inspect the water pump before installing the timing belt (see page 10-10).

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative terminal from the battery.
3. Remove the center bracket.

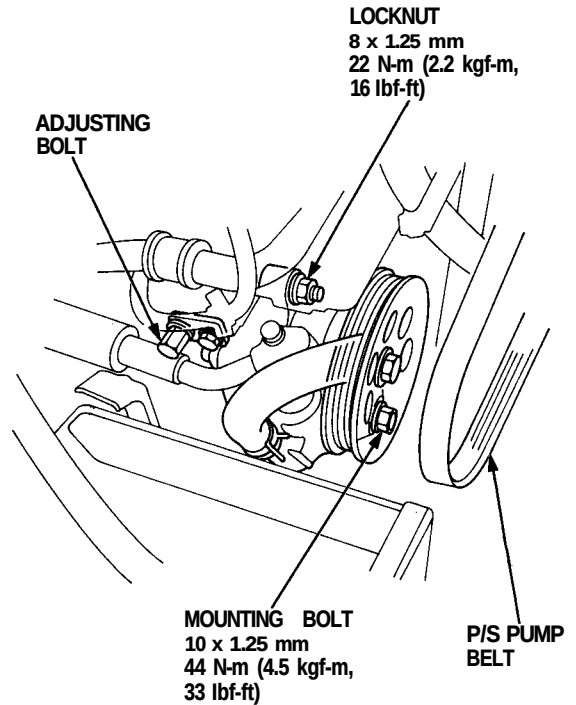
NOTE:

- Support the engine with a jack before removing the center bracket is removed.
- Make sure to place a cushion between the oil pan and the jack.
- Refer to page 5-16 when installing the center bracket.



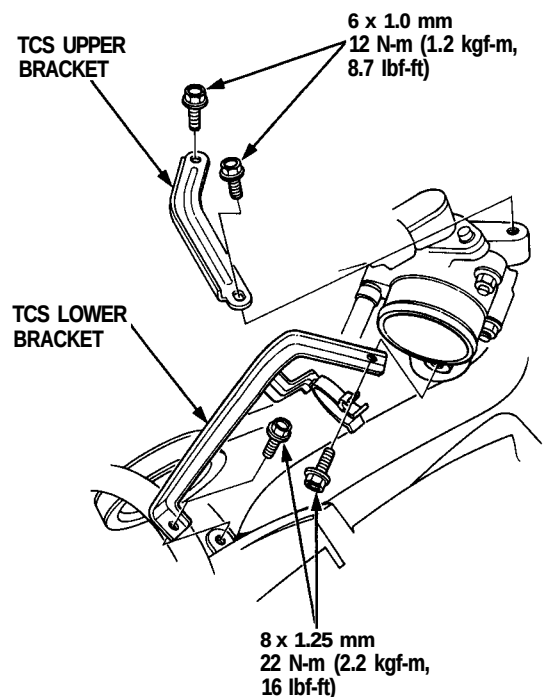
4. Loosen the mounting bolt, lock bolt and adjusting rod, then remove the alternator belt (see page 5-7).
5. Loosen the idler pulley center nut and adjusting bolt, then remove the air conditioning (A/C) compressor belt (see page 5-7).

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



7. Remove the TCS upper and lower brackets.

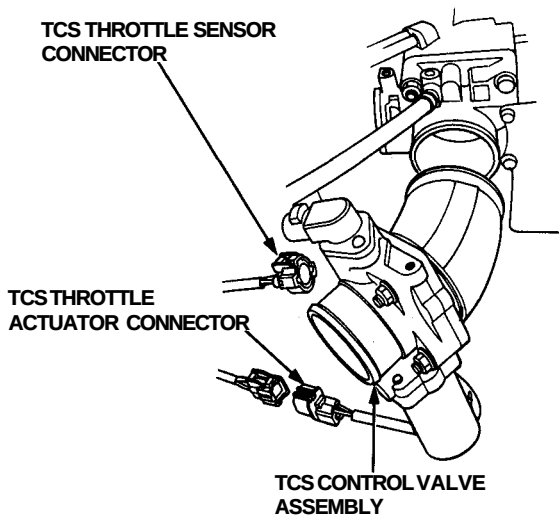
NOTE: Refer to section 19 when installing the brackets.



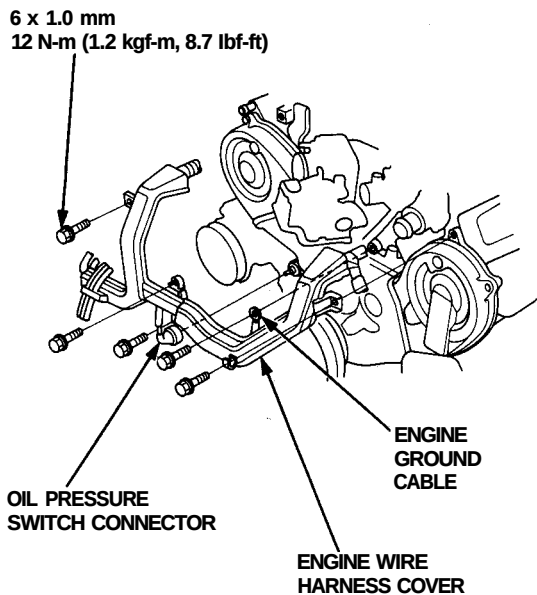


8. Disconnect the TCS throttle sensor connector and TCS throttle actuator connector, then remove the TCS control valve assembly.

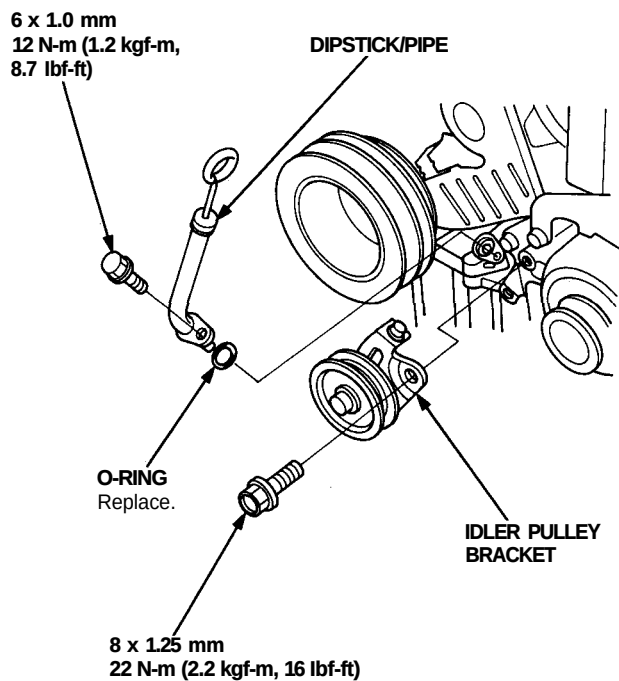
- Do not disconnect the breather pipe bypass hose.



9. Remove the oil pressure switch connector, engine ground cable and engine wire harness cover.

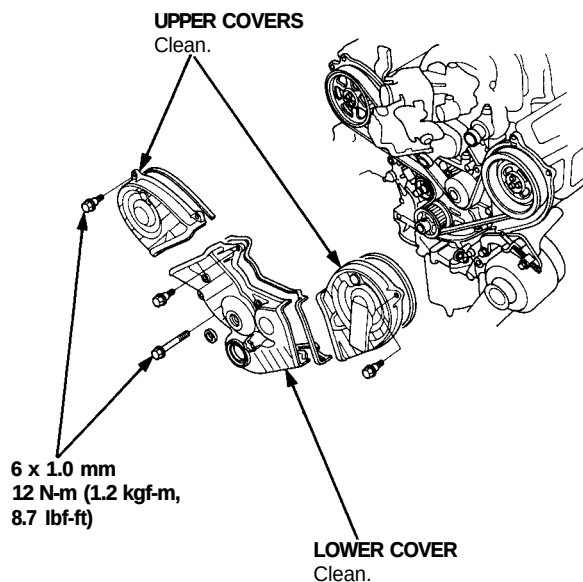


10. Remove the idler pulley bracket, dipstick and pipe.



11. Remove the crankshaft pulley.
12. Remove the upper and lower covers.

NOTE: Do not use the upper and lower covers to store removed items.

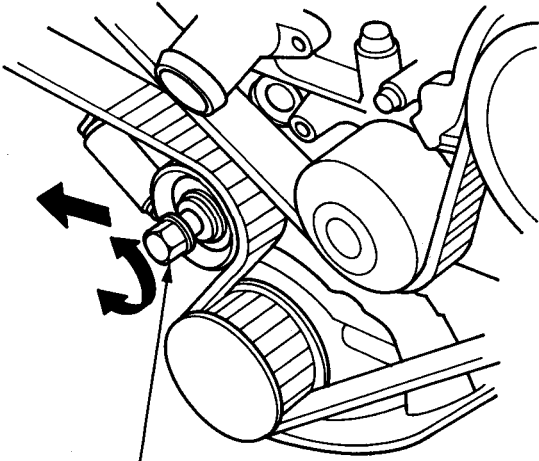


(cont'd)

Timing Belt

Removal(cont'd)

13. Loosen the adjusting bolt 180°. Push the tensioner to remove tension from the timing belt, then retighten the adjusting bolt.



ADJUSTING BOLT
10 x 1.25 mm
42 N-m (4.3 kgf-m, 31 lbf-ft)

14. Remove the timing belt.

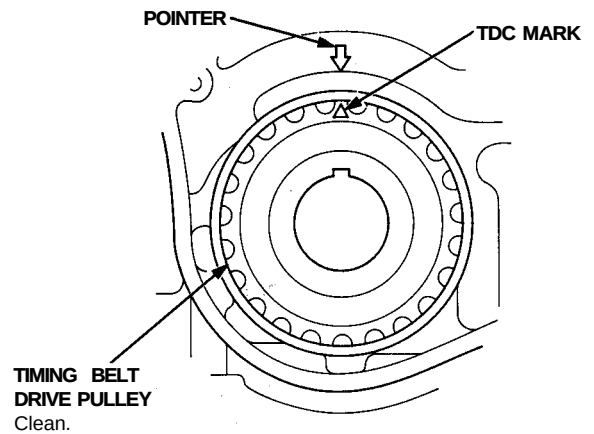
Timing Belt

Installation

Install the timing belt in the reverse order of removal; Only key points are described here.

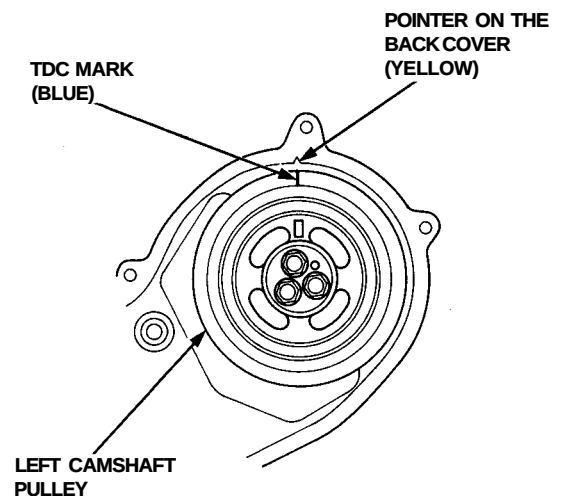
CAUTION: Do not rotate the crankshaft pulley or camshaft pulleys with the timing belt removed. The pistons may hit the valves and cause damage.

1. Remove the spark plugs.
2. Set the timing belt drive pulley so that the No. 1 piston is at top dead center (TDC). Align the TDC mark on the tooth of the timing belt drive pulley with the ↓ pointer on the oil pump.



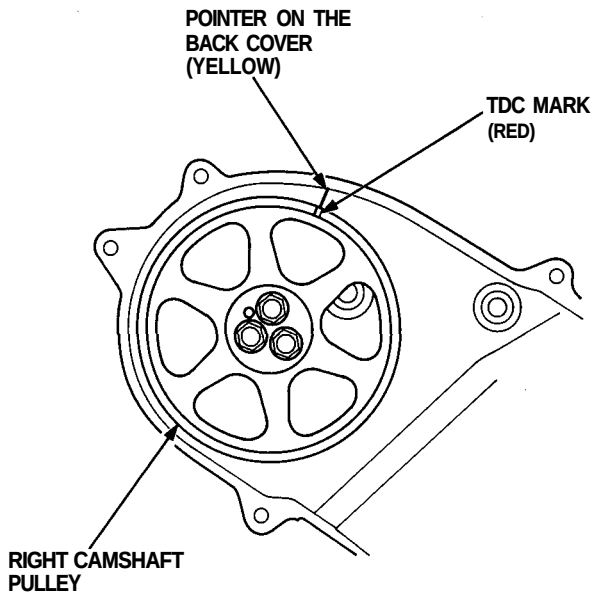
3. Set the camshaft pulleys so that the No. 1 piston is at TDC. Align the TDC marks on the camshaft pulleys to the pointers on the back covers.

LEFT:





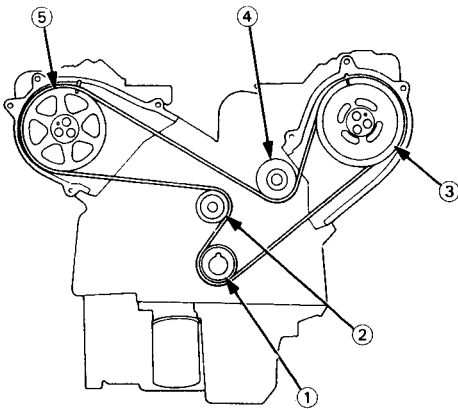
RIGHT:



4. Install the timing belt in the sequence shown.
 (1) Timing belt drive pulley (crankshaft) → (2) Adjusting pulley → (3) Left camshaft pulley → (4) Water pump pulley → (5) Right camshaft pulley.

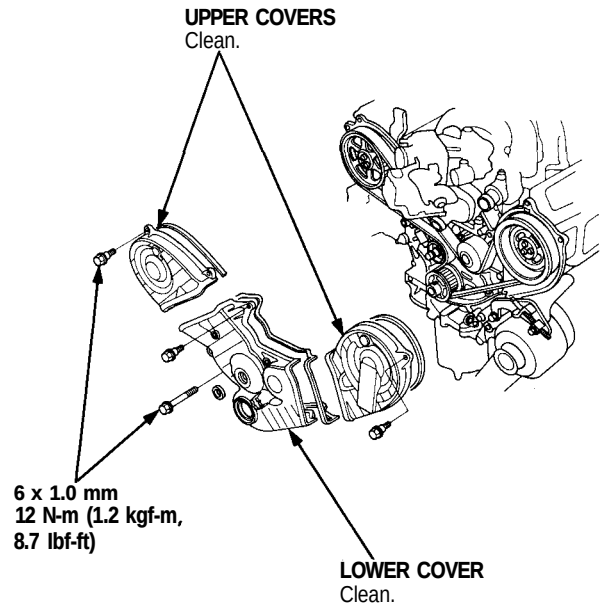
NOTE:

- For easier installation, advance the right camshaft pulley by about a half tooth from the TDC position.
- Make sure the timing belt drive pulley and camshaft pulleys are at TDC.

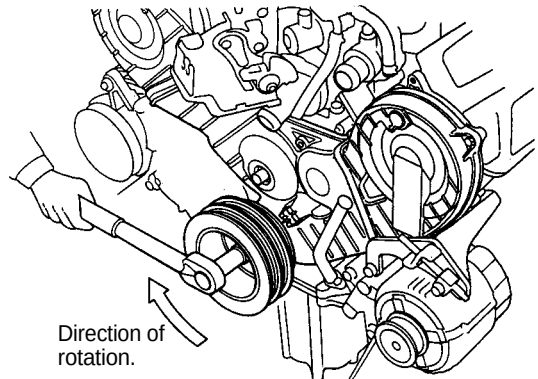


5. Loosen and retighten the adjusting bolt to tension the timing belt.
6. Install the upper and lower covers.

NOTE: Clean the upper and lower covers before installation.



7. Install the crankshaft pulley, then tighten the pulley bolt (see page 6-3).
8. Rotate the crankshaft pulley about five or six turns clockwise so that the timing belt positions on the pulleys.



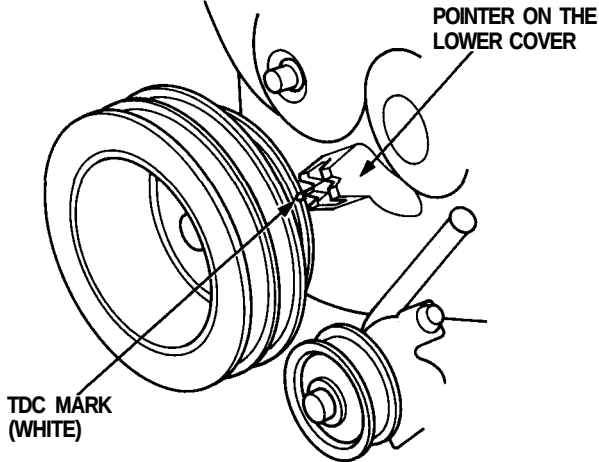
(cont'd)

Timing Belt

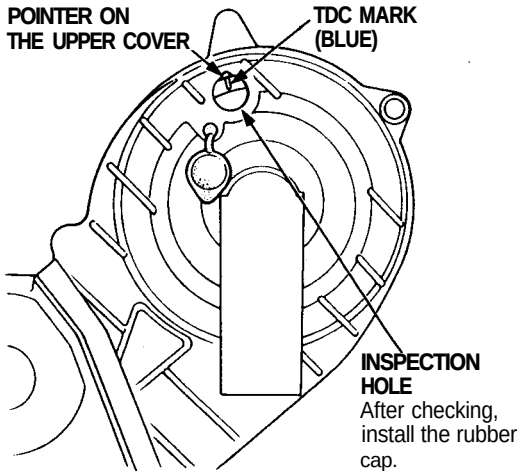
Installation (cont'd)

9. Adjust the timing belt tension (see page 6-5).
10. Check that the crankshaft pulley and camshaft pulleys are at TDC.

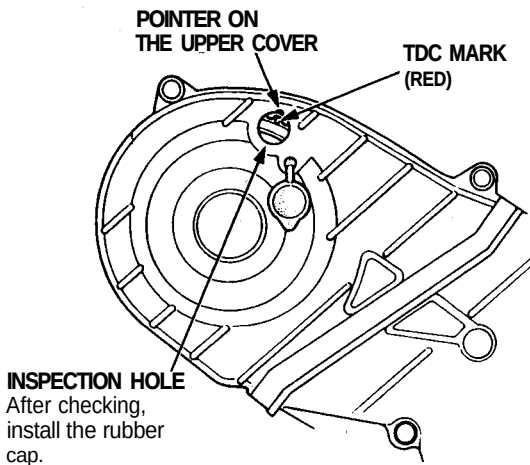
CRANKSHAFT PULLEY:



LEFT CAMSHAFT PULLEY:



RIGHT CAMSHAFT PULLEY:



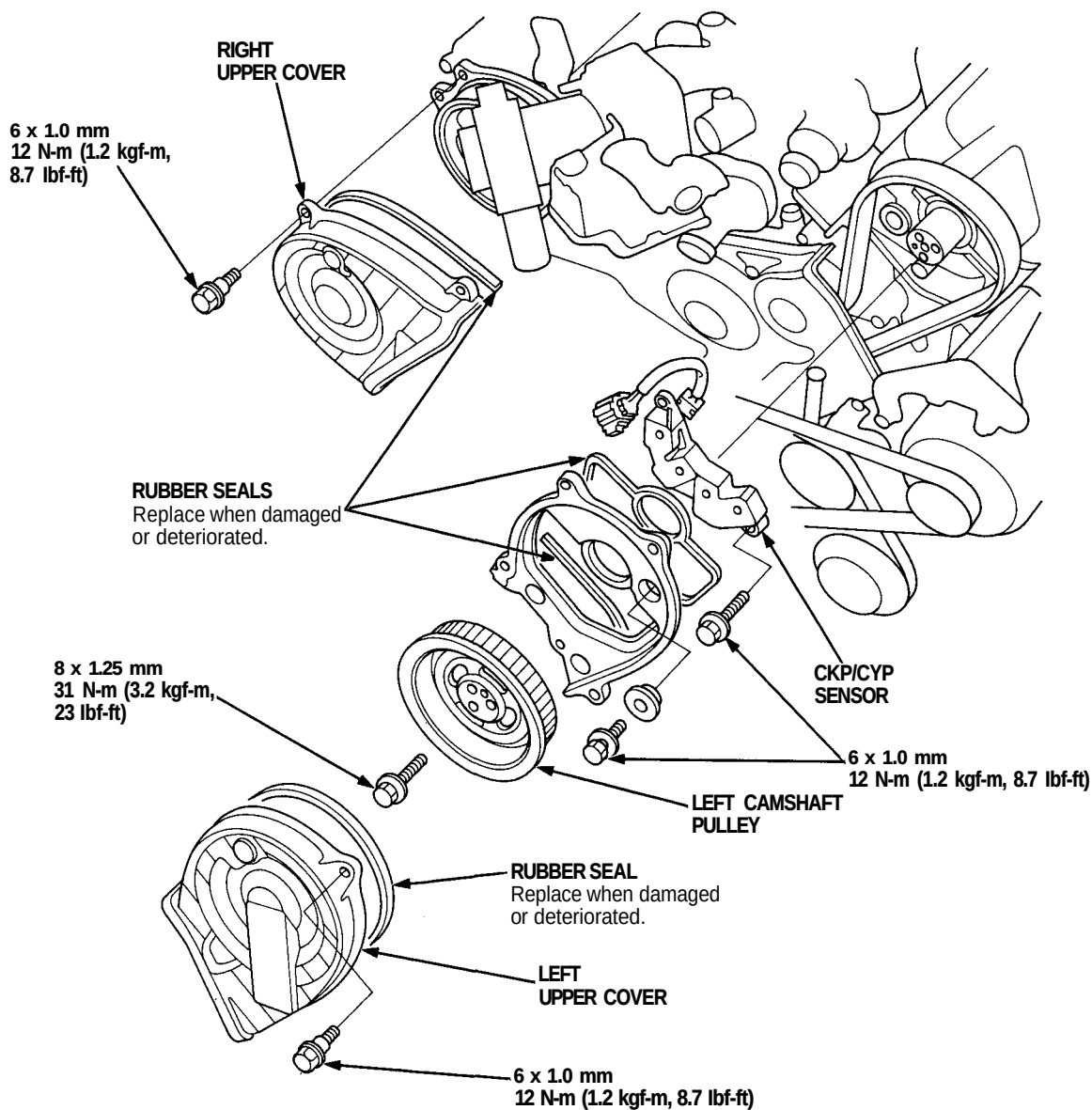
11. If either camshaft pulley is not positioned at TDC, remove the timing belt and adjust the positioning following the procedure on page 6-8, then reinstall the timing belt.
12. After installation, adjust the tension of each belt.
 - See [section 23](#) for alternator belt tension adjustment.
 - See [section 22](#) for A/C compressor belt tension adjustment.
 - See [section 17](#) for P/S pump belt tension adjustment.
13. Enter the anti-theft code for the radio, then enter the customer's radio station presets.



CKP/CYP Sensor

Replacement

1. Remove the center bracket (see page 6-6).
2. Turn the crankshaft so that the No. 1 piston is at top dead center (see page 6-10).
3. Remove the upper covers.
4. Remove the timing belt from the right and left camshaft pulleys (see page 6-6).
5. Remove the left camshaft pulley.
6. Remove the left back cover.
7. Remove the CKP/CYP sensor from the left cylinder head.
8. Install the CKP/CYP sensor in the reverse order of removal;
 - Refer to page 6-8 when installing the timing belt.



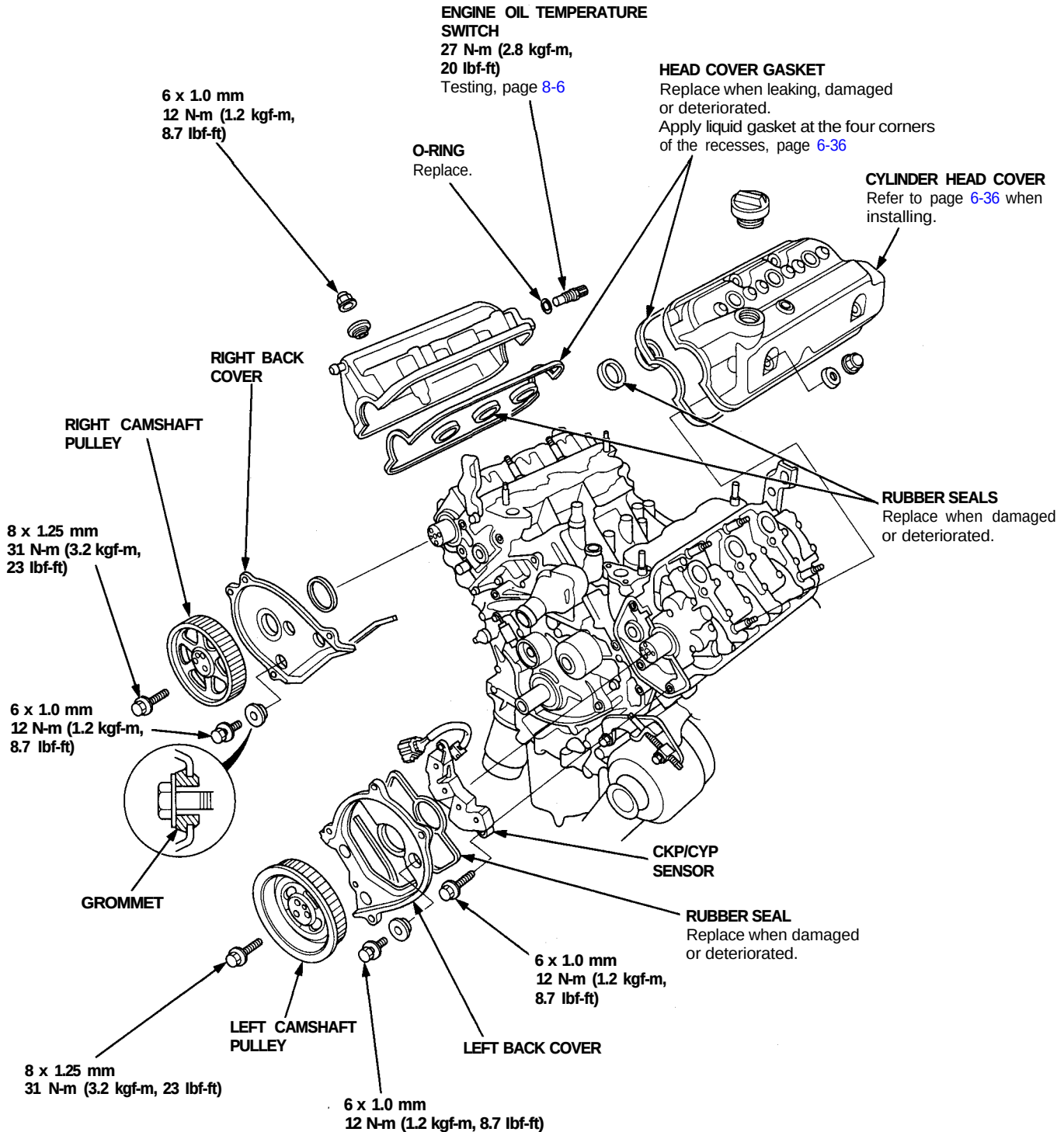
Cylinder Heads

Illustrated Index

CAUTION:

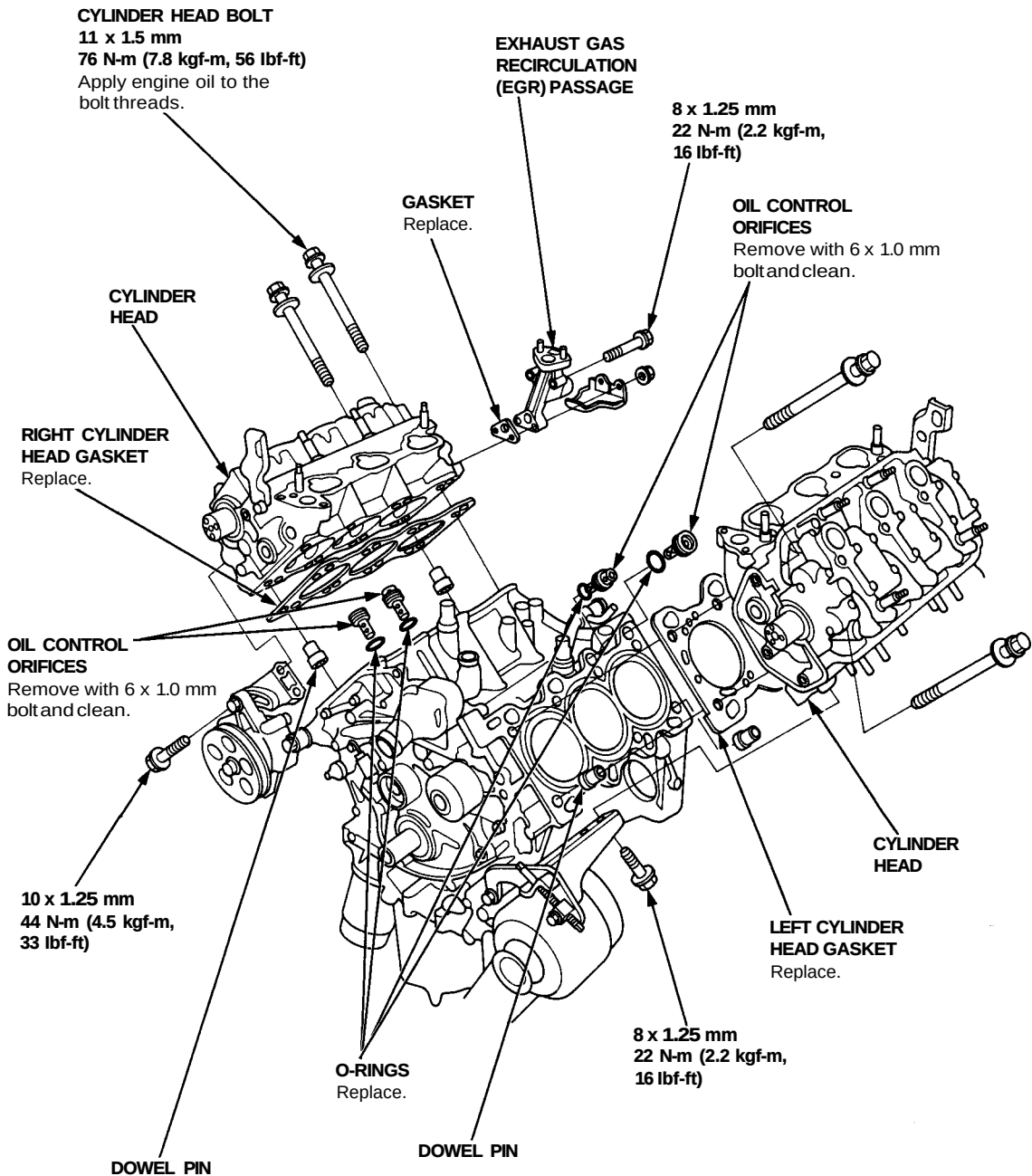
- To avoid damage, wait until the engine coolant temperature drops below 100°F (38°C) before removing a cylinder head.
- When handling a metal gasket, take care not to fold it or damage the contact surface.

NOTE: Use new O-rings and gaskets when reassembling.





NOTE: Clean the oil control orifice when installing.



(cont'd)

Cylinder Heads

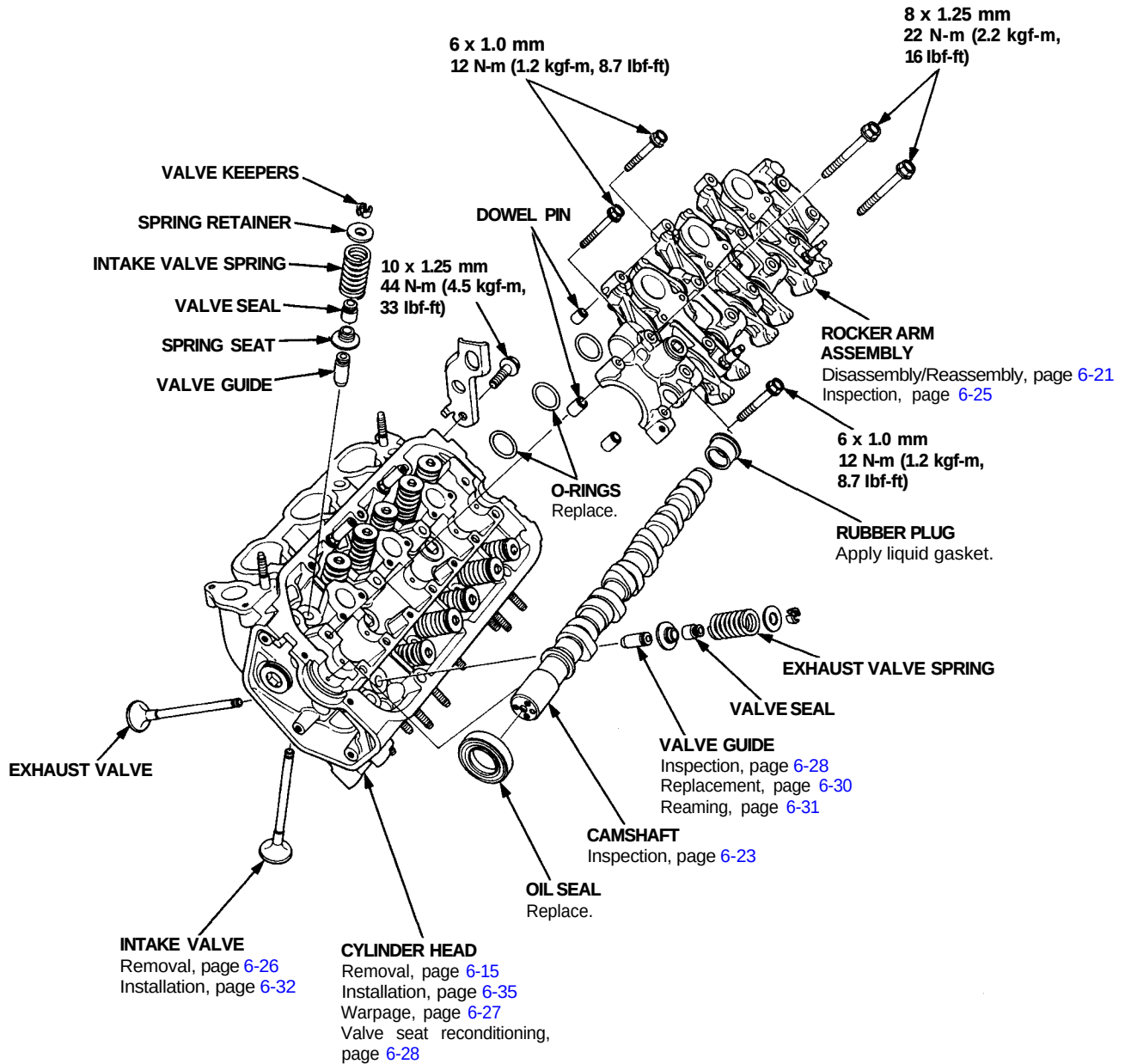
Illustrated Index (cont'd)

NOTE:

- Use new O-rings and gaskets when reassembling.
- Use liquid gasket, Part No. 08718 - 0001 or 08718 - 0003.



Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricant to any contact parts.





Cylinder Heads

Removal

Engine removal is not required for this procedure.

⚠ WARNING Make sure jacks and safety stands are placed properly and hoist brackets are attached to the correct positions on the engine.

CAUTION:

- Use fender covers to avoid damaging painted surfaces.
- Unplug the wiring connectors carefully while holding the connector portion to avoid damage.
- To avoid damaging the cylinder head, wait until the engine coolant temperature drops below 100°F (38°C) before loosening the retaining bolts.

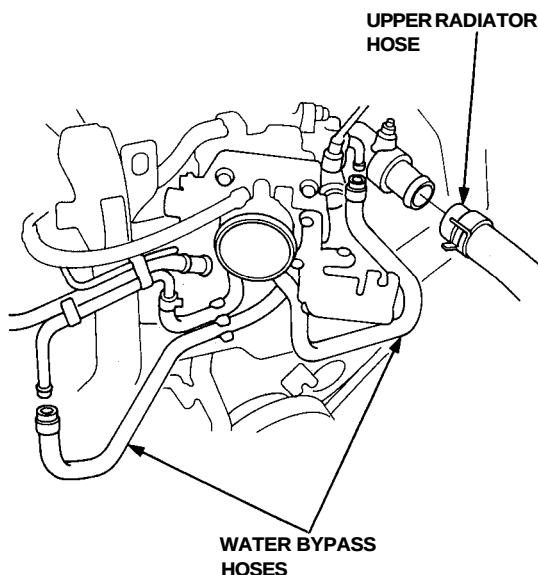
NOTE:

- 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.
 - Inspect the timing belt before removing the cylinder head.
 - Turn the crankshaft pulley so that the No. 1 piston is at top dead center (see page 6-10).
1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
 2. Disconnect the battery negative terminal first, then the positive terminal.
 3. Drain the engine coolant (see page 10-5).
 4. Remove the engine cover (see page 5-3).
 5. Remove the intake air duct and air cleaner housing assembly (see page 5-3).
 6. Remove the throttle cover (see page 5-4).
 7. Remove the throttle cable and cruise control cable by loosening the locknuts, then slip the cable ends out of the accelerator linkage (see page 5-4).

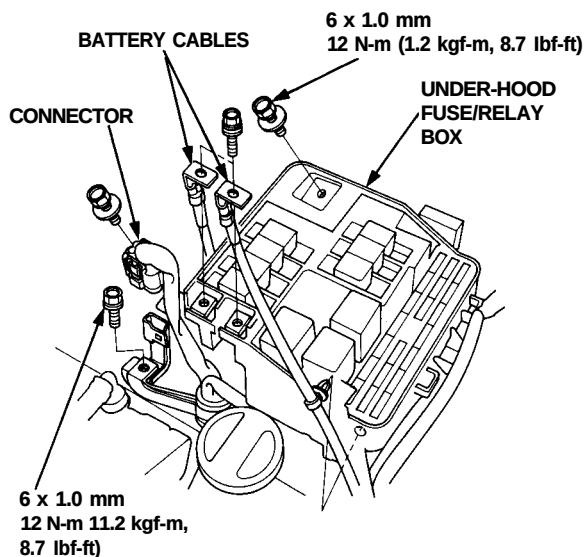
NOTE:

- Take care not to bend a cable when removing it. Always replace any kinked cable with a new one.
- Adjust the throttle cable when installing (see section 11).
- Adjust the cruise control cable when installing (see section 23).

8. Remove the upper radiator hose and water bypass hoses.



9. Remove the battery and battery base (see page 5-4).
10. Remove the vacuum hoses, then remove the clamp from the under-hood fuse/relay box (see page 5-4).
11. Remove the battery cables from the under-hood fuse/relay box, then remove the under-hood fuse/relay box.
12. Remove the engine wire harness connector.



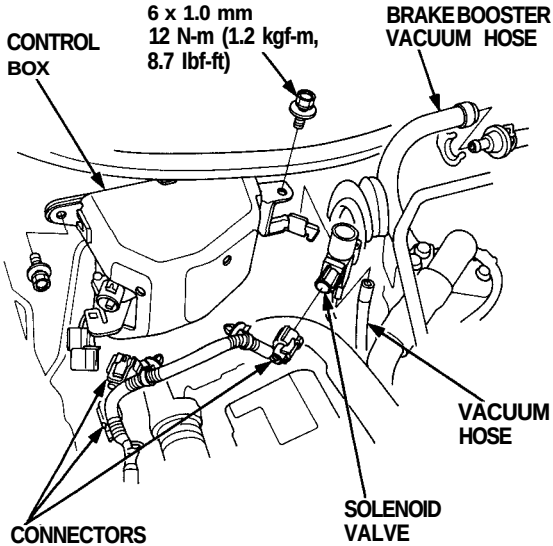
(cont'd)

Cylinder Heads

Removal(cont'd)

13. Disconnect the connectors, then remove the control box, vacuum hose and solenoid valve.

14. Disconnect the brake booster vacuum hose.

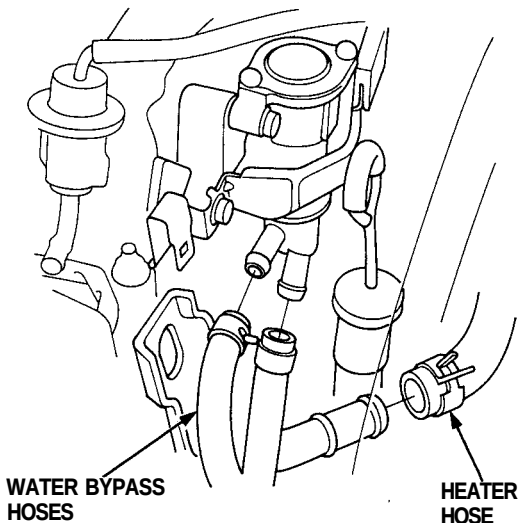


15. Relieve fuel pressure (see [section 11](#)).

⚠ WARNING Do not smoke while working on the fuel system. Keep open flame or spark away from the work area. Drain fuel only into an approved container.

16. Remove the fuel feed hose, fuel return hose, vacuum hose and evaporative emission (EVAP) control canister hose (see page [5-6](#)).

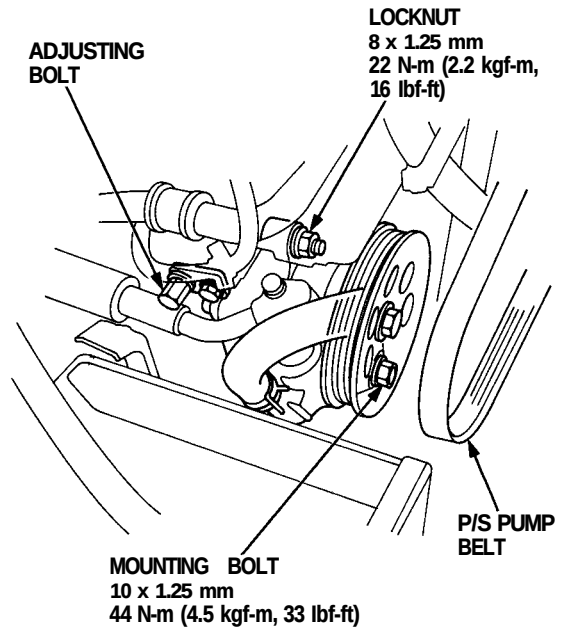
17. Remove the water bypass hoses and heater hose.



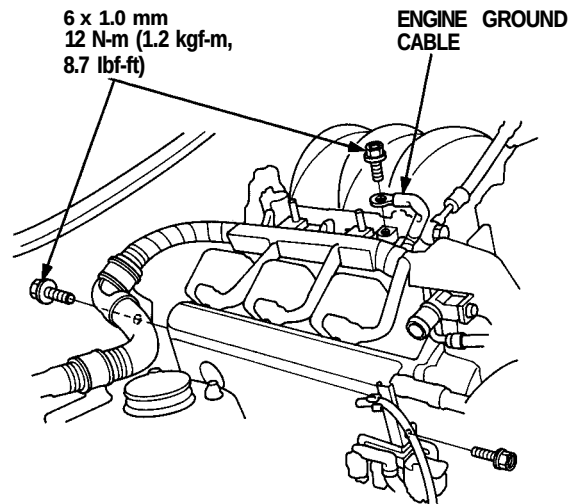
18. Loosen the mounting bolt, lock bolt and adjusting rod, then remove the alternator belt (see page [5-7](#)).

19. Loosen the idler pulley center nut and adjusting bolt, then remove the air conditioning (A/C) compressor belt (see page [5-7](#)).

20. Loosen the adjusting bolt, locknut and mounting bolt, then remove the power steering (P/S) pump belt.



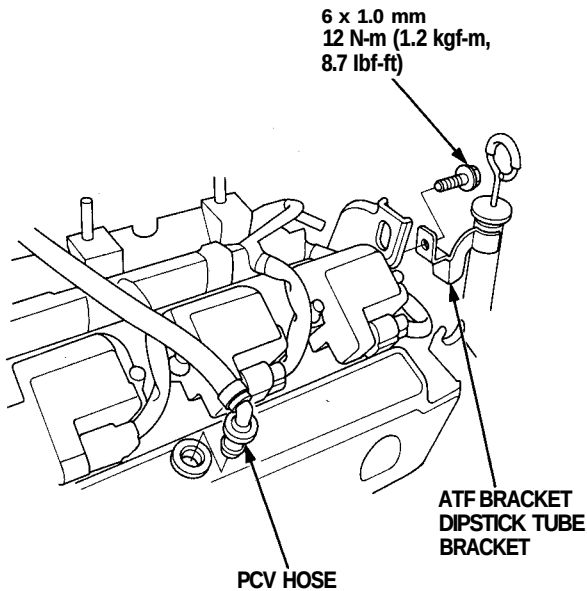
21. Remove the engine ground cable and wire harness clamps.





22. Remove the positive crankcase ventilation (PCV) hose.

23. Remove the bolt securing the automatic transmission fluid (ATF) dipstick tube bracket.

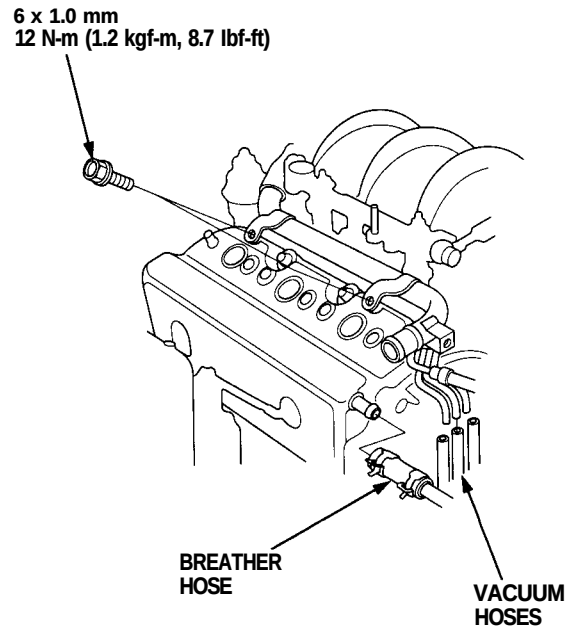


24. Remove the engine wire harness connectors and wire harness clamps from the cylinder heads and intake manifold.

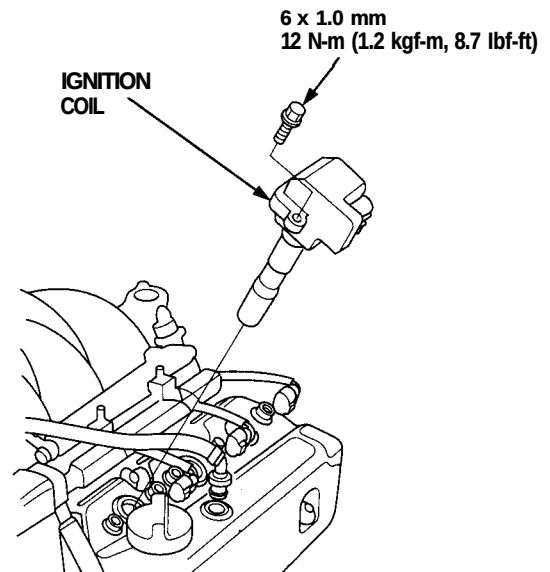
- Six injector connectors
- Six ignition coil connectors
- Throttle position sensor connector
- CKP/CYP sensor connector
- Intake air temperature (IAT) sensor connector
- Exhaust gas recirculation (EGR) valve lift sensor connector
- Idle air control (IAC) valve connector
- Engine coolant temperature (ECT) sensor connector
- ECT gauge sending unit connector
- Engine oil temperature sensor connector
- Left primary heated oxygen sensor (left primary HO2S) connector
- Right primary heated oxygen sensor (right primary HO2S) connector
- Evaporative emission (EVAP) purge control solenoid valve connector ('97 - '98)

25. Remove the inlet pipe mounting bolts from the right cylinder head cover.

26. Remove the vacuum hoses and breather hose.



27. Remove the six ignition coils from the left and right cylinder head covers.



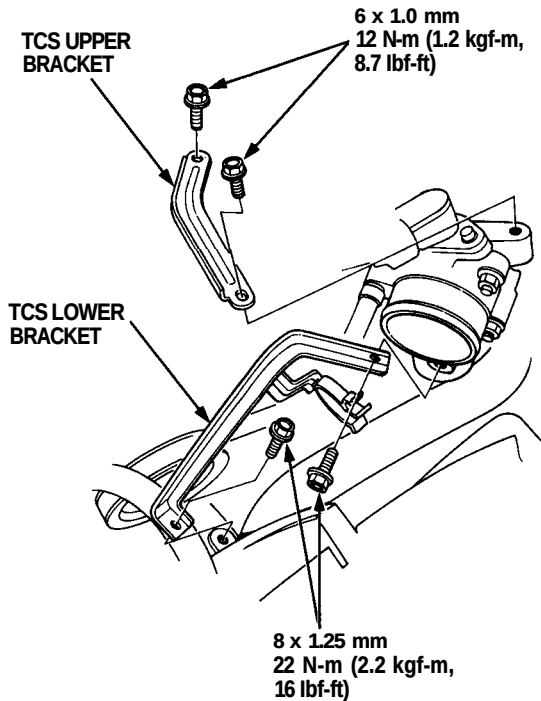
(cont'd)

Cylinder Heads

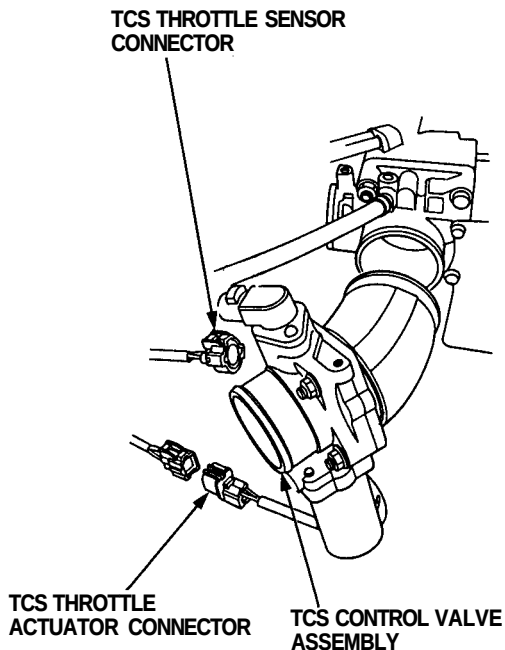
Removal (cont'd)

28. Remove the TCS upper and lower brackets.

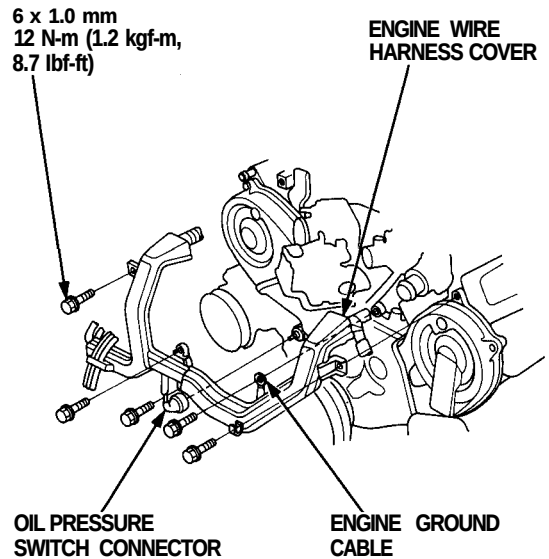
NOTE: Refer to [section 19](#) when installing the brackets.



29. Disconnect the TCS throttle position sensor connector and TCS throttle actuator connector, then remove the TCS control valve assembly.

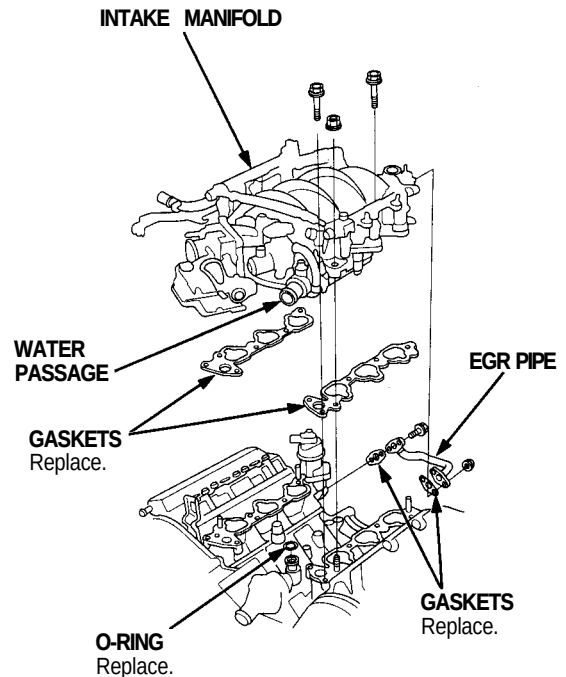


30. Remove the oil pressure switch connector, engine ground cable and engine wire harness cover.



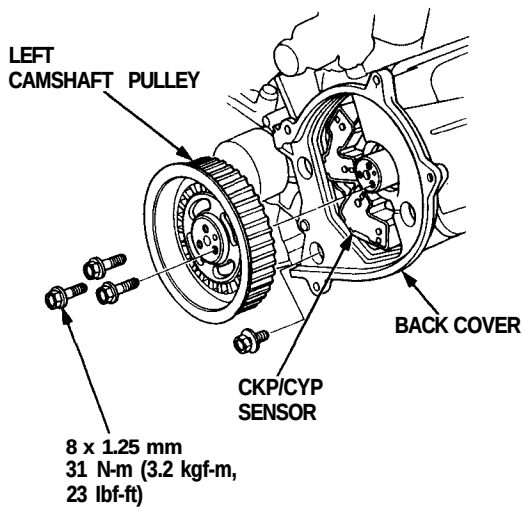
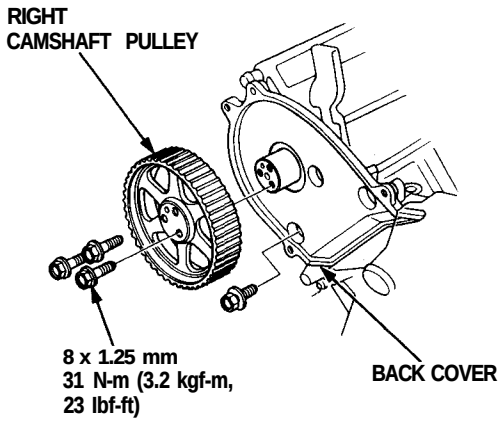
31. Remove the EGR pipe, then remove the intake manifold and water passage.

NOTE: Fill the cylinder head intake ports with clean shop towels to prevent foreign materials from getting into the cylinders.

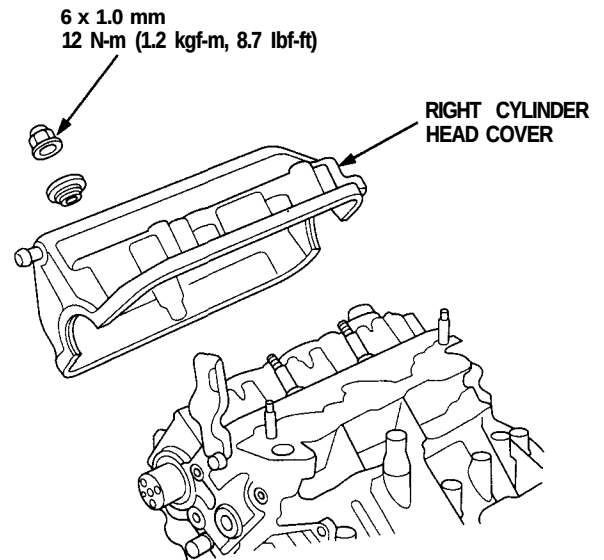
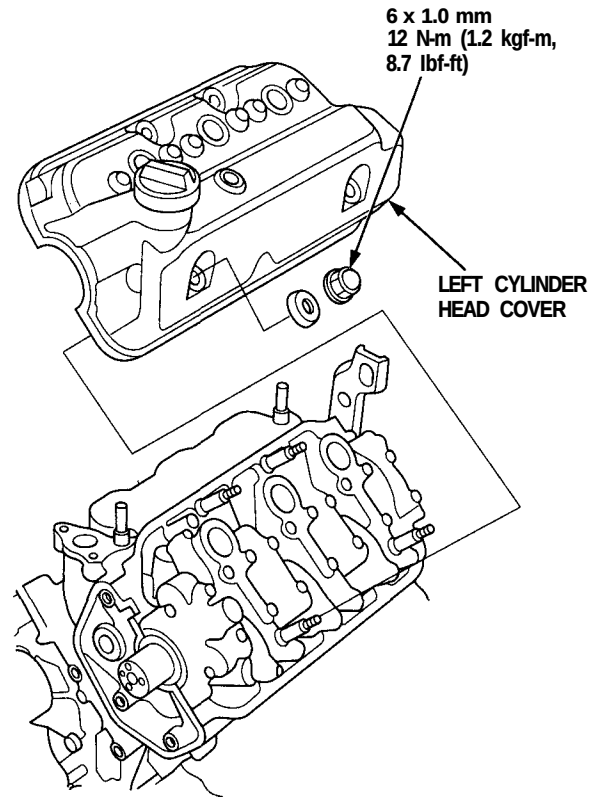




32. Remove the covers, then remove the left and right exhaust manifolds (see page 9-3).
33. Remove the timing belt (see page 6-6).
34. Remove the left and right camshaft pulleys, then remove the left and right back covers.



35. Remove the left and right cylinder head covers.

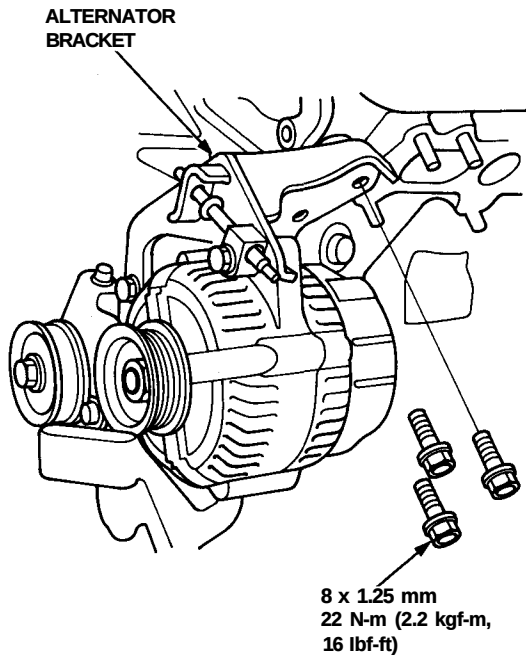


(cont'd)

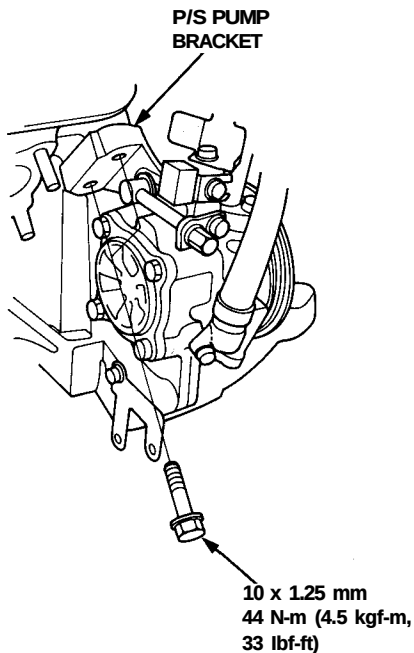
Cylinder Heads

Removal (cont'd)

36. Remove the three bolts securing the alternator bracket.



37. Remove the two bolts securing the P/S pump bracket.

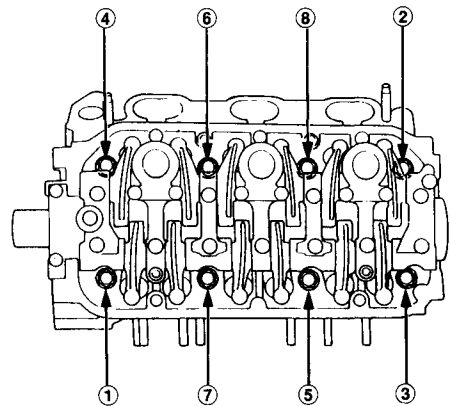


38. Remove the cylinder head bolts, then remove the cylinder heads.

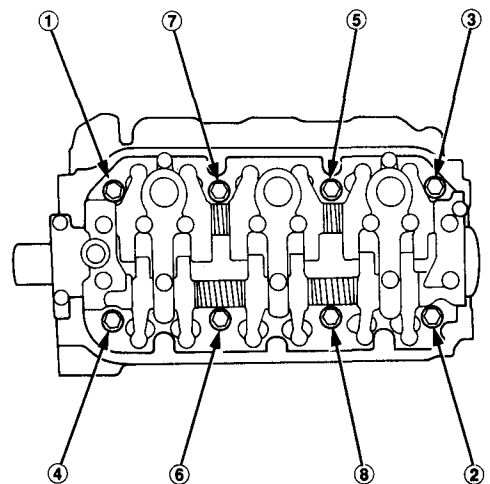
CAUTION: To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat the sequence until all bolts are loose.

CYLINDER HEAD BOLTS LOOSENING SEQUENCE:

Engine No. 1300001-1309262 (U.S.A.), 1700001-1700751 (Canada):



Engine No. 1309263-, 2300001-, 3300001- (U.S.A.), 1700752-, 2700001-, 3700001- (Canada):





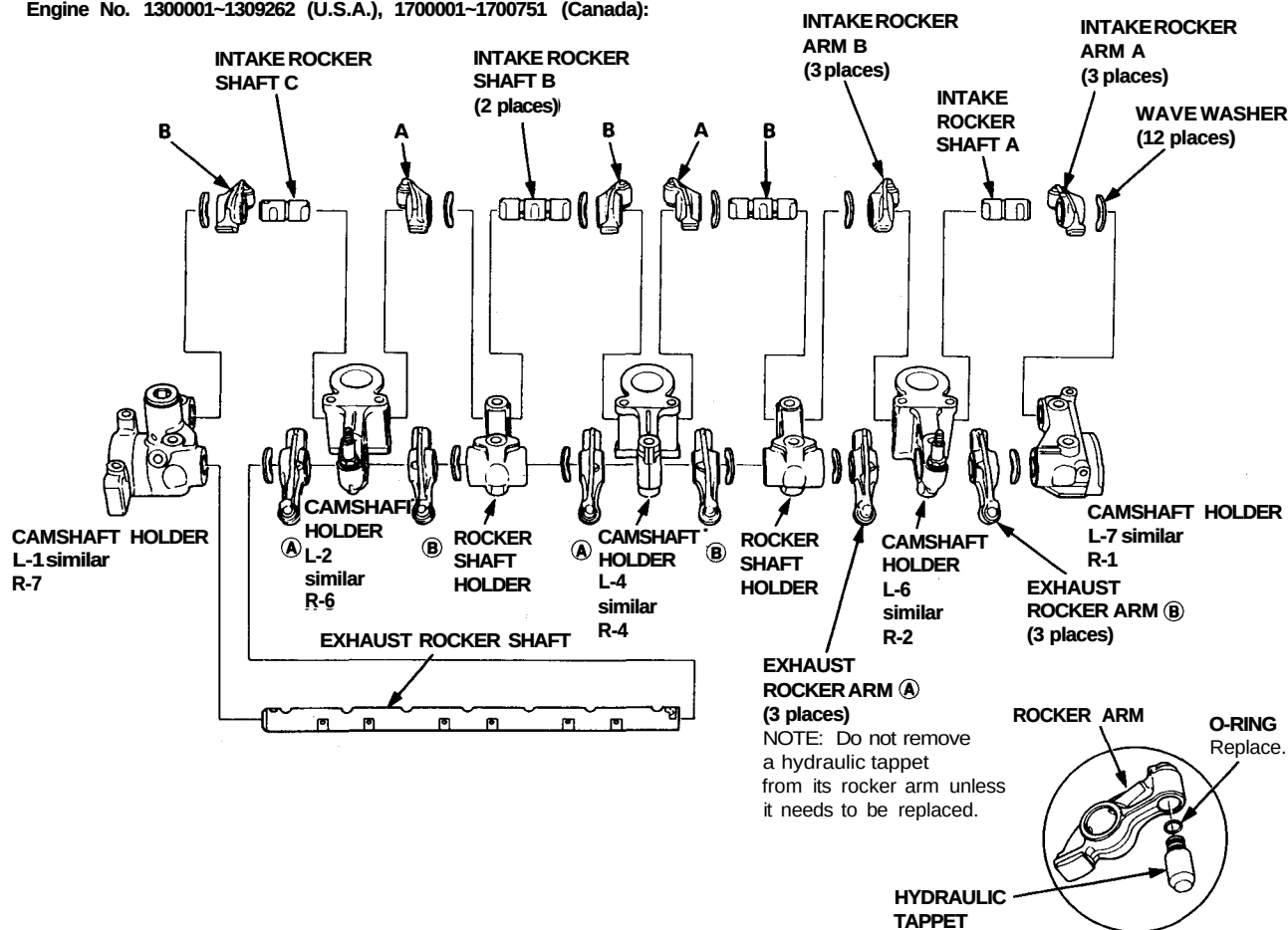
Rocker Arm Assembly

Disassembly/Reassembly

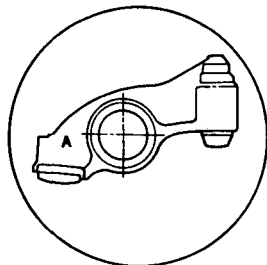
NOTE:

- Refer to page 6-23 for rocker arm assembly removal.
- Identify parts as they are removed to ensure reinstallation in original locations.
- Inspect the rocker shafts and rocker arms (see page 6-25).
- Rocker arms must be installed in the same position if reused.
- When removing or installing the rocker arm assembly, do not remove the camshaft holder bolts. The bolts will keep the holders, springs and rocker arms on the shaft.

Engine No. 1300001-1309262 (U.S.A.), 1700001-1700751 (Canada):

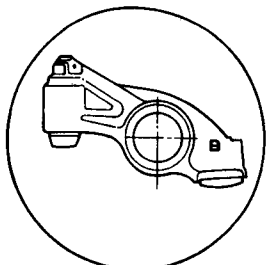


INTAKE ROCKER ARM A



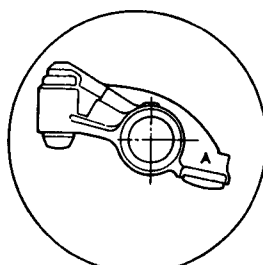
Letter "A" is stamped on rocker arm.

INTAKE ROCKER ARM B



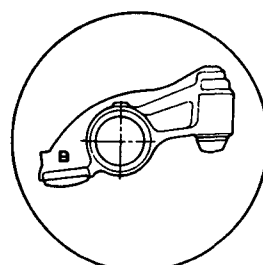
Letter "B" is stamped on rocker arm.

EXHAUST ROCKER ARM A



Letter "A" is stamped on rocker arm.

EXHAUST ROCKER ARM B



Letter "B" is stamped on rocker arm.

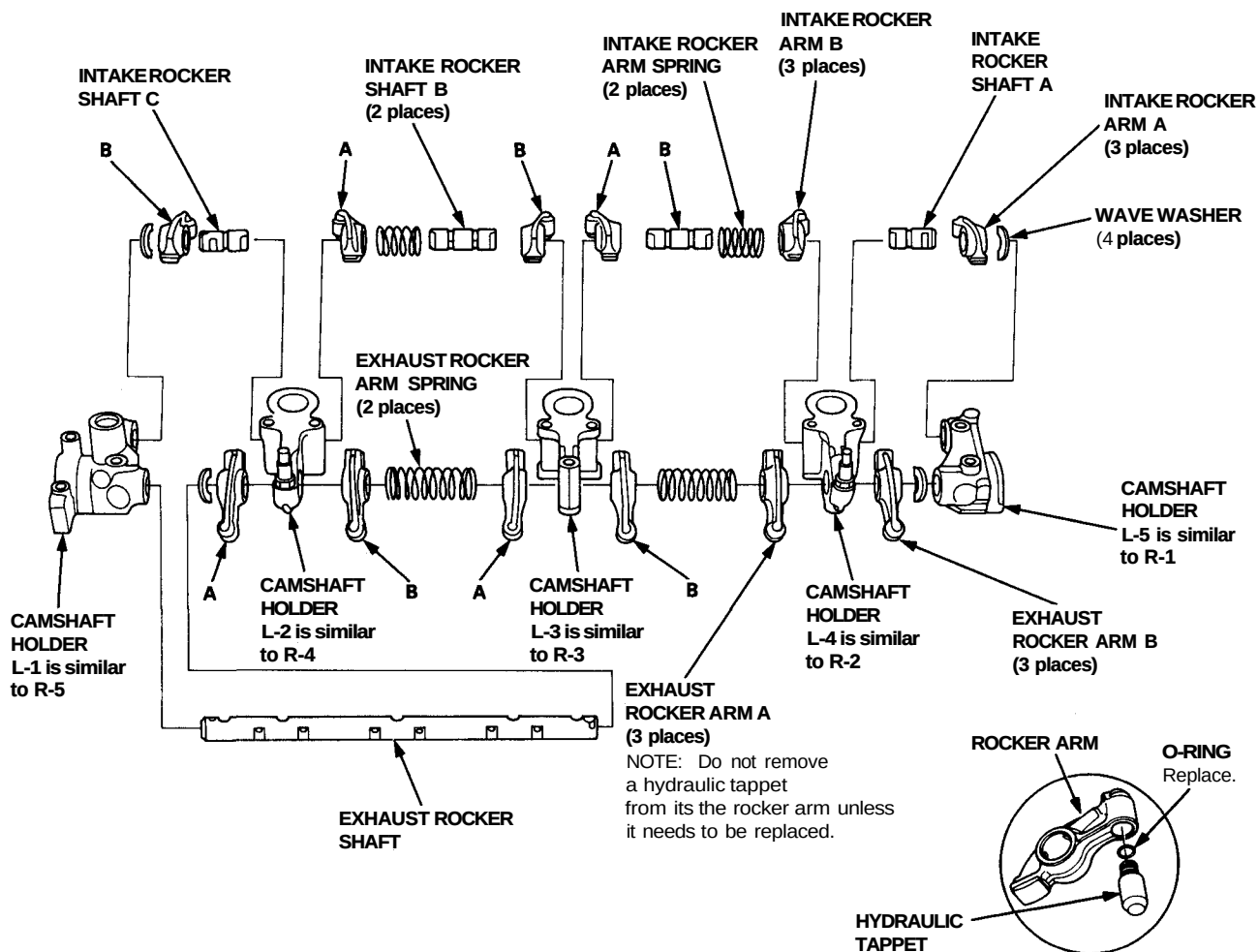
L: Left
R: Right

(cont'd)

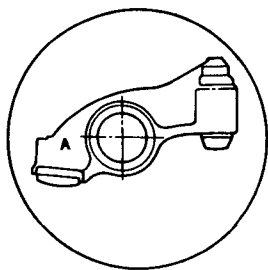
Rocker Arm Assembly

Disassembly/Reassembly (cont'd)

Engine No. 1309263 ~, 2300001 ~, 3300001 ~ (U.S.A.), 1700752 ~, 2700001 ~, 3700001 ~ (Canada):

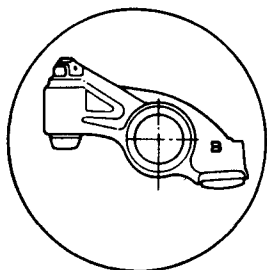


INTAKE ROCKER ARM A



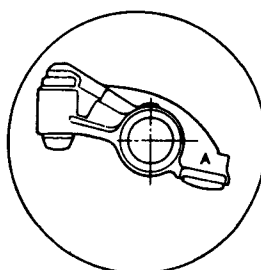
Letter "A" is stamped on rocker arm.

INTAKE ROCKER ARM B



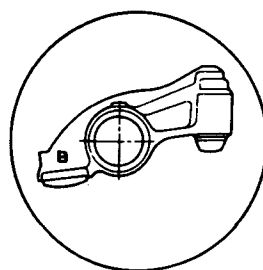
Letter "B" is stamped on rocker arm.

EXHAUST ROCKER ARM A



Letter "A" is stamped on rocker arm.

EXHAUST ROCKER ARM B



Letter "B" is stamped on rocker arm.

L: Left
R: Right



Rocker Arm Assembly

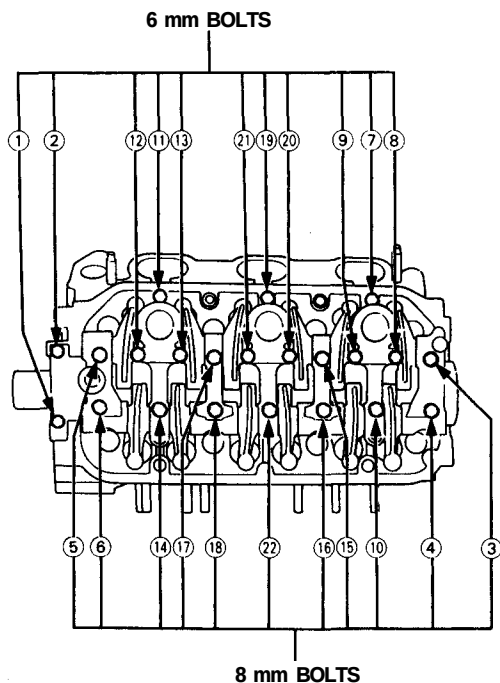
Removal

NOTE:

- Unscrew the camshaft holder bolts, two turns at a time in a crisscross pattern, to prevent damaging the valves or rocker arm assembly.
- When removing the rocker arm assembly, do not remove the camshaft holder bolts. The bolts will keep the camshaft holders, the springs and the rocker arms on the shafts.

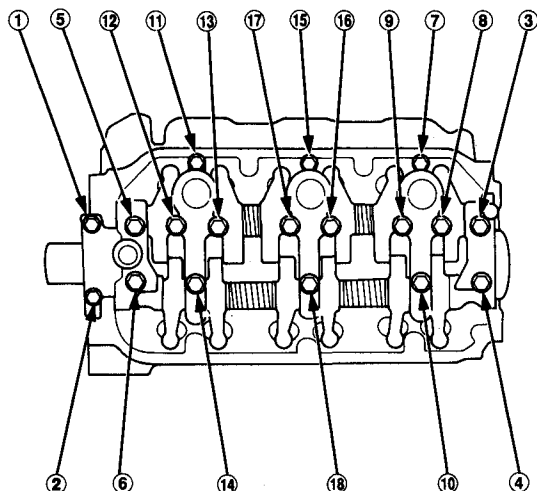
CAMSHAFT HOLDER BOLTS LOOSENING SEQUENCE:

Engine No. 1300001~1309262 (U.S.A.), 1700001~1700751 (Canada):



Engine No. 1309263~, 2300001~, 3300001~ (U.S.A.), 1700752~, 2700001~, 3700001~ (Canada):

8 mm bolts: ③, ④, ⑤, ⑥, ⑩, ⑭, ⑱



NOTE: Refer to page 6-33 when installing.

(cont'd)



Camshaft

Inspection

NOTE:

- Do not rotate the camshaft during inspection.
- Remove the rocker arms and rocker shafts.

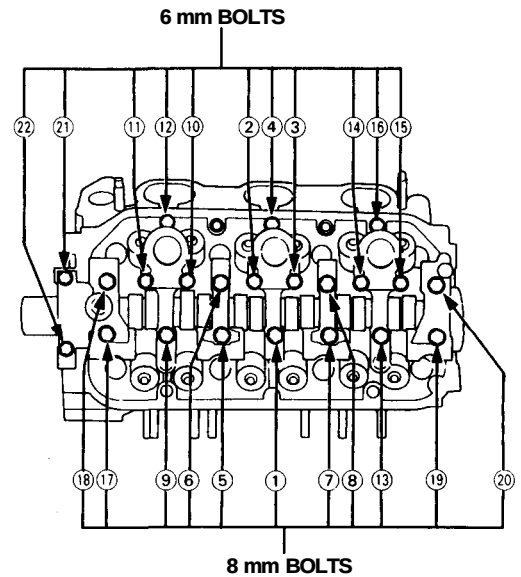
1. Put the camshaft and the camshaft holders on the cylinder head, then tighten the bolts to the specified torque.

Specified torque:

8 mm bolts: 22 N-m (2.2 kgf-m, 16 lbf-ft)

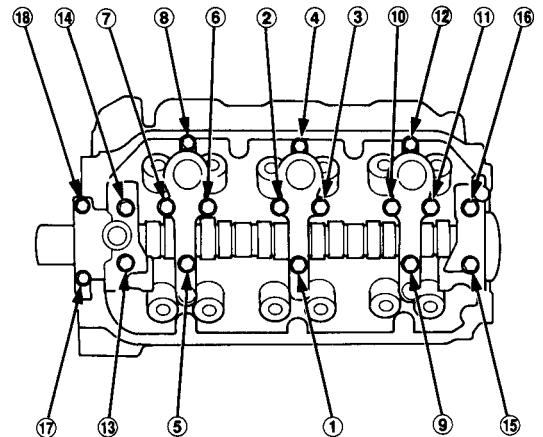
6 mm bolts: 12 N-m (1.2 kgf-m, 8.7 lbf-ft)

Engine No. 1300001~1309262 (U.S.A.), 1700001~1700751 (Canada):



Engine No. 1309263~, 2300001~, 3300001~ (U.S.A.), 1700752~, 2700001~, 3700001~ (Canada):

8 mm bolts: ③, ④, ⑤, ⑥, ⑩, ⑭, ⑱



2. Seat the camshaft by pushing it toward the rear end of cylinder head.

(cont'd)

Camshaft

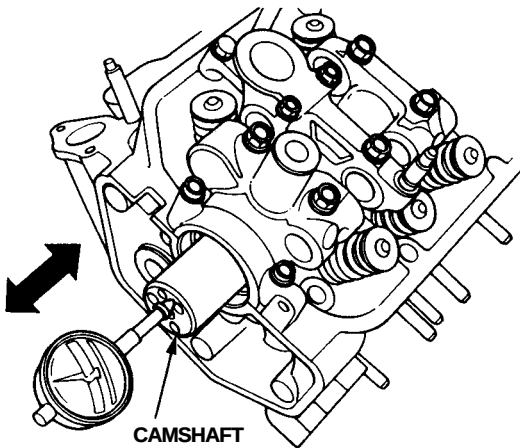
Inspection (cont'd)

3. Zero the dial indicator against the rear end of the camshaft. Push the camshaft back and forth, and read the end play.

Camshaft End Play:

Standard (New): 0.05 - 0.15 mm
(0.002 - 0.006 in)

Service Limit: 0.15 mm (0.006 in)

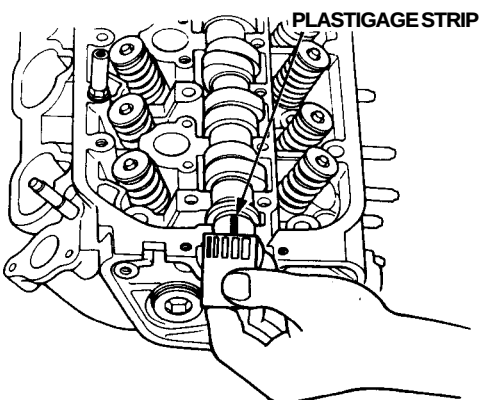


4. Remove the bolts, then remove the camshaft holders from the cylinder head.
5. Lift the camshaft out of the cylinder head, wipe it clean, then inspect the lift ramps. Replace the camshaft if any lobes are pitted, scored, or excessively worn.
6. Clean the camshaft bearing surfaces in the cylinder head, then set the camshaft back in place.
7. Insert a plastigage strip across each journal.
8. Install the camshaft holders, then tighten the bolts to the specified torque shown on the previous page.
9. Remove the camshaft holders. Measure the widest portion of plastigage on each journal.

Camshaft-to-Holder Oil Clearance:

Standard (New): 0.050 - 0.089 mm
(0.0020 - 0.0035 in)

Service Limit: 0.10 mm (0.004 in)



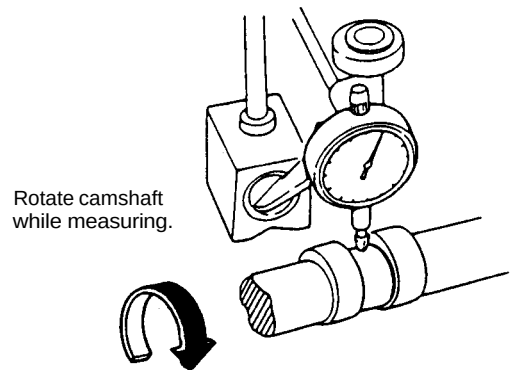
10. If camshaft-to-holder oil clearance is out of tolerance:

- And the camshaft has already been replaced, you must replace the cylinder head.
- If the camshaft has not been replaced, first check the total runout with the camshaft supported on V-blocks.

Camshaft Total Runout:

Standard (New): 0.03 mm (0.001 in) max.

Service Limit: 0.04 mm (0.002 in)



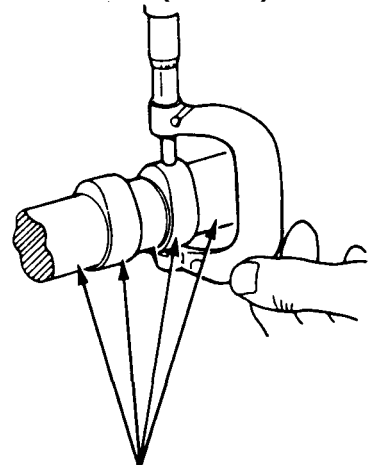
- If the total runout of the camshaft is within tolerance, replace the cylinder head.
- If the total runout is out of tolerance, replace the camshaft and recheck. If the oil clearance is still out of tolerance, replace the cylinder head.

11. Check cam lobe height wear.

Cam Lobe Height Standard (New):

INTAKE 40.005 mm (1.5750 in)

EXHAUST 37.766 mm (1.4868 in)



Check this area for wear.

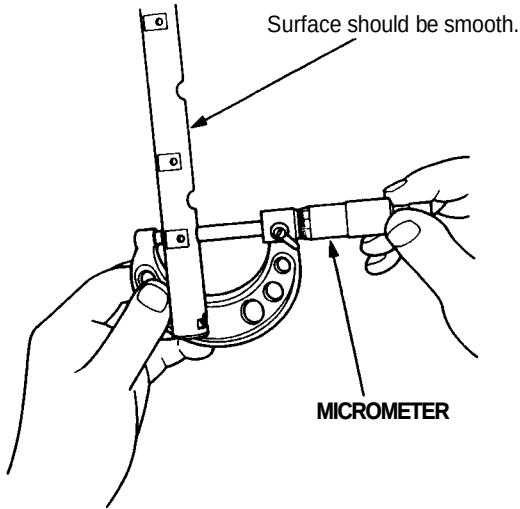


Rocker Arms and Shafts

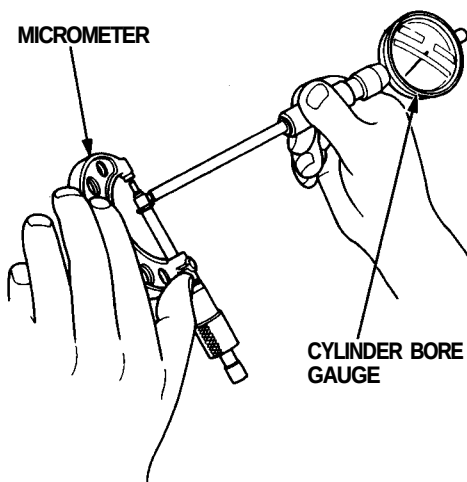
Clearance Inspection

Measure the intake rocker shafts and exhaust rocker shaft.

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



2. Zero the gauge to the shaft diameter.

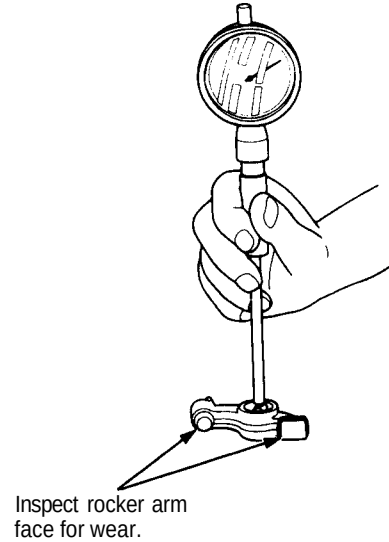


3. Measure the inside diameter of the rocker arm, and check for an out-of-round condition.

Rocker Arm-to-Shaft Clearance:

Standard (NEW): 0.018 - 0.054 mm
(0.0007 - 0.0021 in)

Service Limit: 0.08 mm (0.003 in)



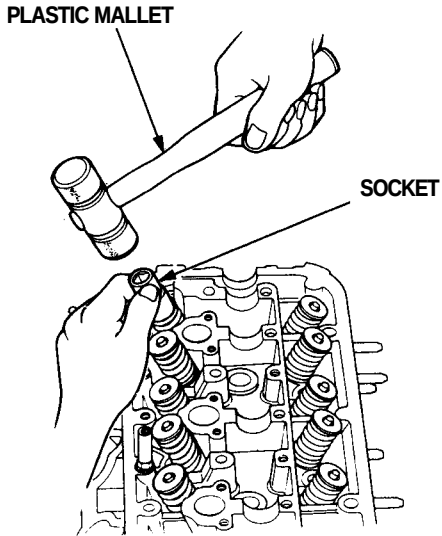
4. Repeat for all rockers.
— If over the service limit, replace the rocker shaft and all overtolerance rocker arms.

Valves, Valve Springs and Valve Seals

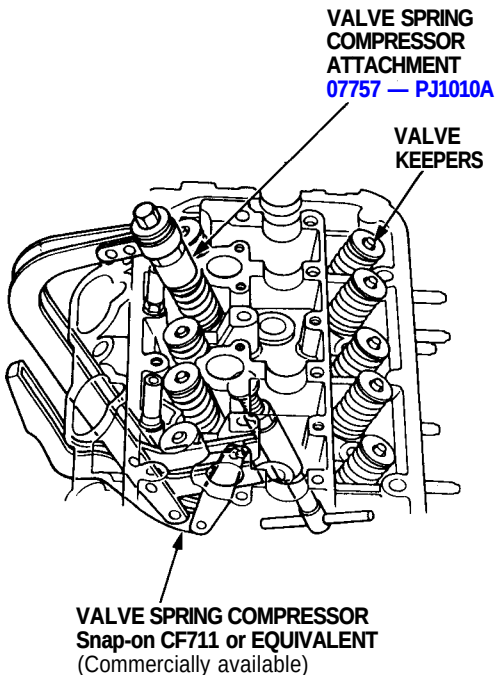
Removal

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

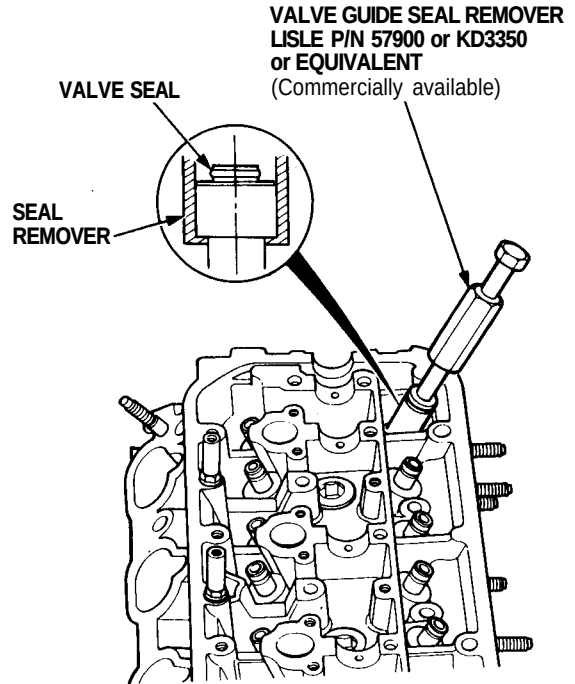
1. Using an appropriate-sized socket and plastic mallet, lightly tap the valve retainer to loosen the valve keepers before installing the valve spring compressor.



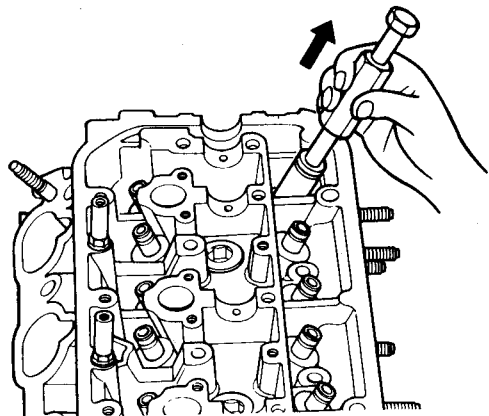
2. Install the valve spring compressor. Compress the spring and remove the valve keepers.

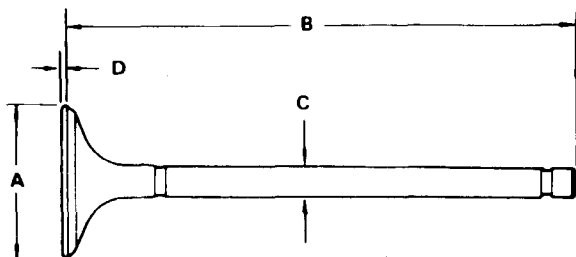


3. Install the special tool as shown.



4. Remove the valve seal.



**Intake Valve Dimensions**

- A Standard (New):** 32.90 - 33.10 mm
(1.295-1.303 in)
- B Standard (New):** 113.58-113.88 mm
(4.472 - 4.483 in)
- C Standard (New):** 5.48 - 5.49 mm
(0.216-0.216 in)
- C Service Limit:** 5.45 mm (0.215 in)
- D Standard (New):** 0.85-1.15 mm
(0.033 - 0.045 in)
- D Service Limit:** 0.65 mm (0.026 in)

Exhaust Valve Dimensions

- A Standard (New):** 27.90 - 28.10 mm
(1.098-1.106 in)
- B Standard (New):** 116.03-116.33 mm
(4.568 - 4.580 in)
- C Standard (New):** 5.45 - 5.46 mm
(0.215-0.215 in)
- C Service Limit:** 5.42 mm (0.213 in)
- D Standard (New):** 1.35-1.65 mm
(0.053 - 0.065 in)
- D Service Limit:** 1.15 mm (0.045 in)



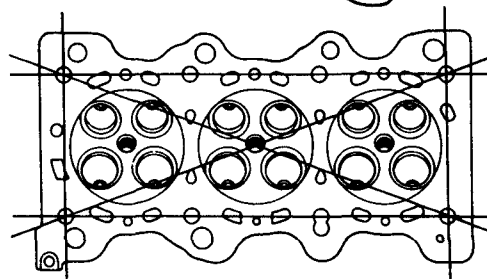
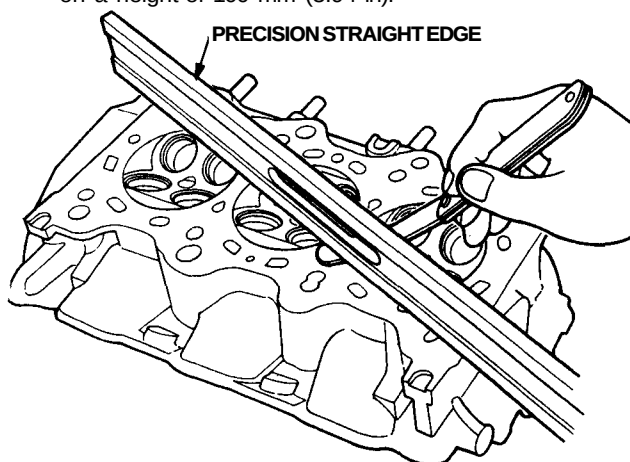
Cylinder Heads

Warpage

NOTE: If camshaft-to-holder oil clearance (see page 6-23) is not within specifications, the cylinder head cannot be resurfaced.

If camshaft-to-holder oil clearance is within specifications, check the cylinder head for warpage.

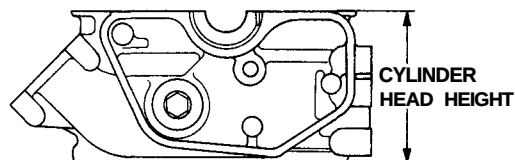
- If warpage is less than 0.05 mm (0.002 in) cylinder head resurfacing is not required.
- If warpage is between 0.05 mm (0.002 in) and 0.2 mm (0.008 in), resurface the cylinder head.
- Maximum resurface limit is 0.2 mm (0.008 in) based on a height of 100 mm (3.94 in).



Measure along edges, and three ways across the center.

Cylinder Head Height:

Standard (New): 99.95 - 100.05 mm
(3.935 - 3.939 in)



Measure the cylinder head height at several points.

Valve Guides

Valve Movement

Measure the guide-to-stem clearance with a dial indicator while rocking the stem in the direction of normal thrust (wobble method).

Intake Valve Stem-to-Guide Clearance:

Standard (New): 0.04 - 0.10 mm
(0.002 - 0.004 in)

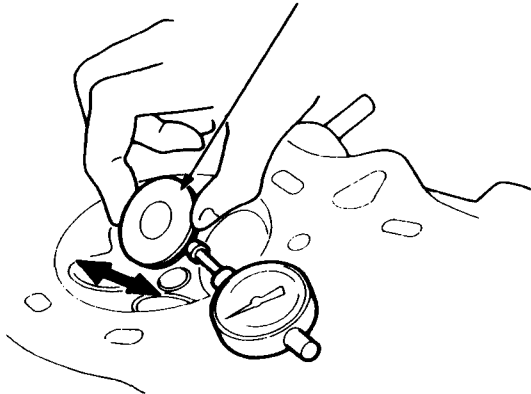
Service Limit: 0.16 mm (0.006 in)

Exhaust Valve Stem-to-Guide Clearance:

Standard (New): 0.10-0.16 mm
(0.004-0.006 in)

Service Limit: 0.22 mm (0.009 in)

Valve extended 10 mm out from seat.



- If the measurement exceeds the service limit, recheck using a new valve.
- If the measurement is now within the service limit, reassemble using a new valve.
- If the measurement still exceeds the limit, recheck using the alternate method that follows, then replace the valve and guide, if necessary.

NOTE: An alternate method of checking guide to stem clearance is to 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): 0.02 - 0.05 mm
(0.001 - 0.002 in)

Service Limit: 0.08 mm (0.003 in)

Exhaust Valve Stem-to-Guide Clearance:

Standard (New): 0.05 - 0.08 mm
(0.002 - 0.003 in)

Service Limit: 0.11 mm (0.004 in)

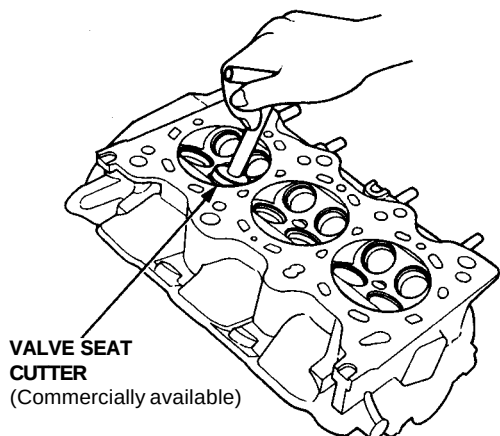


Valve Seats

Reconditioning

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

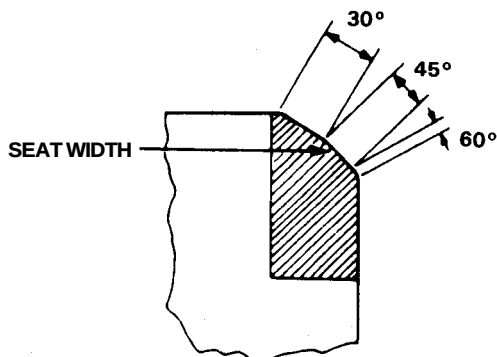
NOTE: If the guides are worn (see page 6-28), replace them (see page 6-30) before cutting the valve seats.



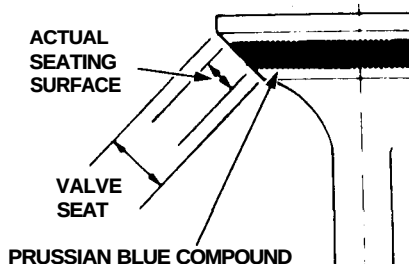
2. Carefully cut a 45° seat, removing only enough material to ensure a smooth and concentric seat.
3. Bevel the upper edge of the seat with the 30° cutter and the lower edge of the seat with the 60° cutter. Check the width of the seat and adjust accordingly.
4. Make one more very light pass with the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

Valve Seat Width:

Standard (New):	Intake	0.80 - 1.00 mm (0.031 - 0.039 in)
	Exhaust	1.25 - 1.55 mm (0.049 - 0.061 in)
Service Limit:	Intake	2.0 mm (0.08 in)
	Exhaust	2.0 mm (0.08 in)



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



6. The actual valve seating surface, as shown by the blue compound, should be centered on the seat.

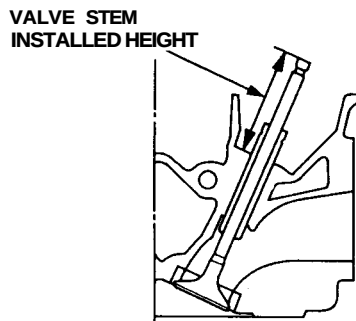
- If it is too high (closer to the valve stem), you must make a second cut with the 60° cutter to move it down, then one more cut with the 45° cutter to restore seat width.
- If it is too low (closer to the valve edge), you must make a second cut with the 30° cutter to move it up, then one more cut with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

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

7. Insert the intake and exhaust valves in the head and measure the valve stem installed height.

Valve Stem Installed Height:

Standard (New):	Intake	46.935 - 47.425 mm (1.8478-1.8671 in)
	Exhaust	47.885 - 48.375 mm (1.8852-1.9045 in)
Service Limit:	Intake	47.625 mm (1.8750 in)
	Exhaust	48.575 mm (1.9124 in)

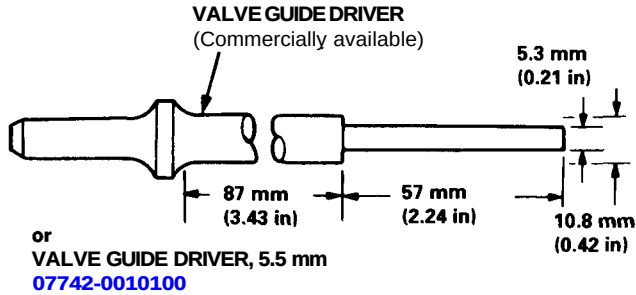


8. If valve stem installed height is over the service limit, replace the valve and recheck. If it is still over the service limit, replace the cylinder head; the valve seat in the head is too deep.

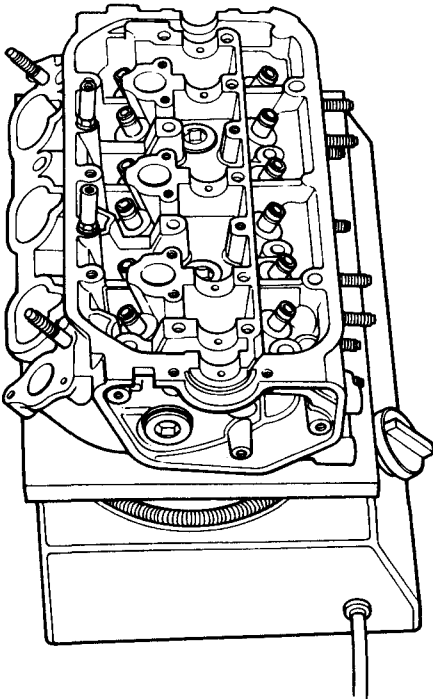
Valve Guides

Replacement

1. As illustrated below, use a commercially - available air-impact valve guide driver attachment 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.



CAUTION:

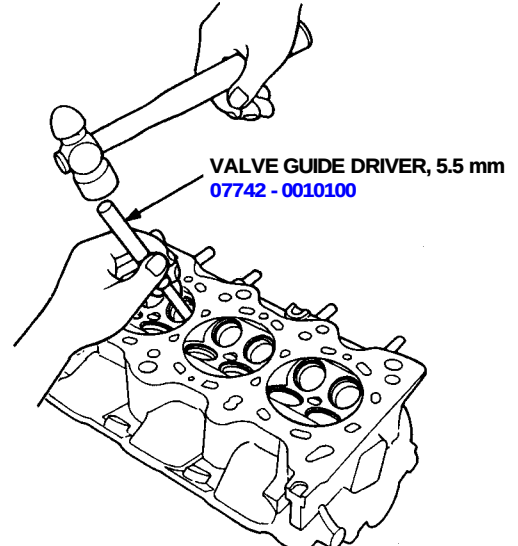
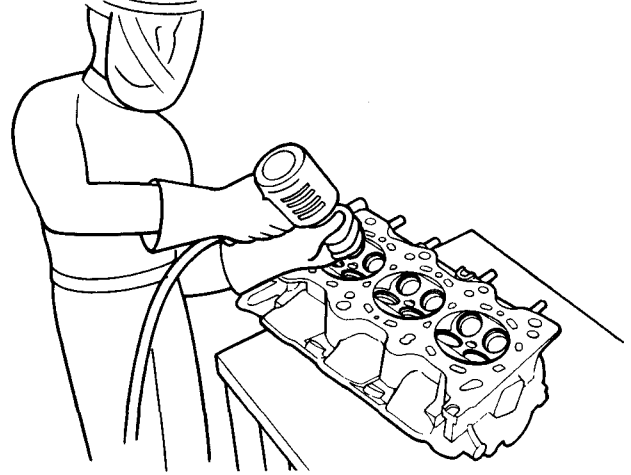
- Do not use a torch; it may warp the head.
- Do not get the head hotter than 300°F (150°C); excessive heat may loosen the valve seats.
- To avoid burns, use heavy gloves when handling the heated cylinder head.

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.

CAUTION:

- Always wear safety goggles or a face shield when driving valve guides.
- Hold the air hammer directly in line with the valve guide to prevent damaging the driver.

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



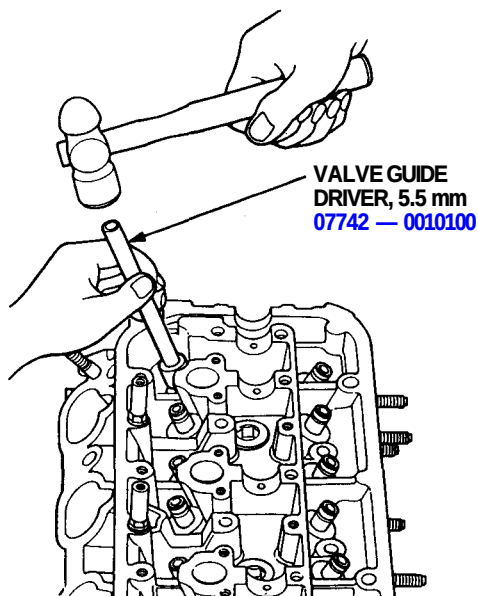
If a valve guide still won't move, drill it out with a 8 mm (5/16 in) bit, then try again.

CAUTION: Drill guides only in extreme cases: you could damage the cylinder head if the guide breaks.

6. Remove the new guides from the freezer, one at a time, as you need them. (cont'd)



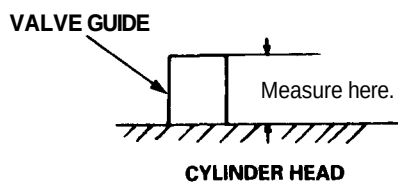
7. Apply a thin coat of clean engine oil to the outside of the new valve guide. Install the guide from the camshaft side of the head; use the special tool to drive the guide in to the specified installed height. If you have all 12 guides to do, you may have to reheat the head.



Valve Guide Installed Height:

Intake: 15.75 - 16.25 mm (0.620 - 0.640 in)

Exhaust: 15.75 - 16.25 mm (0.620 - 0.640 in)

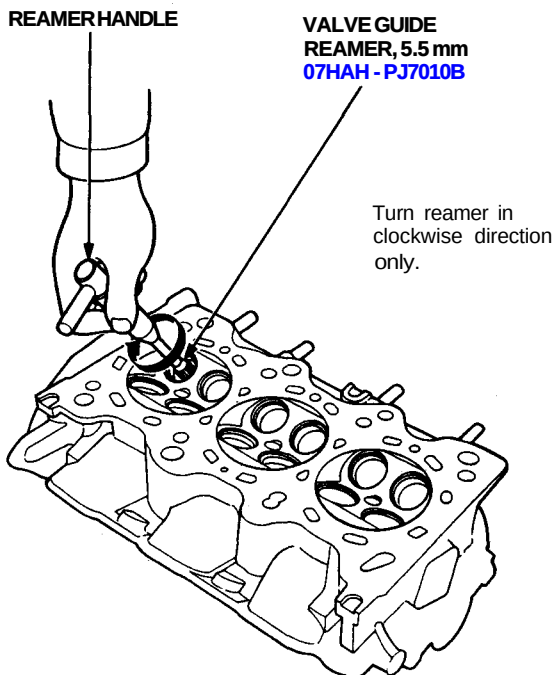




Reaming

NOTE: For new valve guides only.

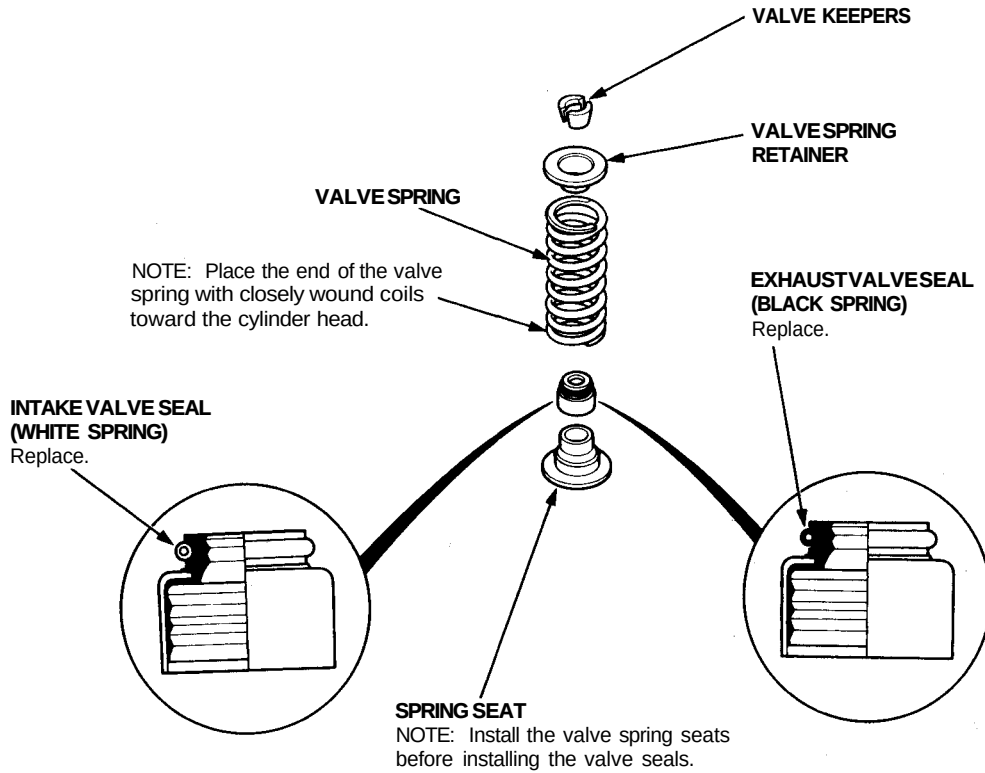
1. Coat both the reamer and valve guide with cutting oil.
2. Rotate the reamer clockwise the full length of the valve guide bore.
3. Continue to rotate the reamer clockwise while removing it from the bore.
4. Thoroughly wash the guide in detergent and water to remove any cutting residue.
5. Check the clearance with a valve (see page [6-28](#)).
— Verify that a valve slides in the valve guide without exerting pressure.



Valves, Valve Springs and Valve Seals

Installation Sequence

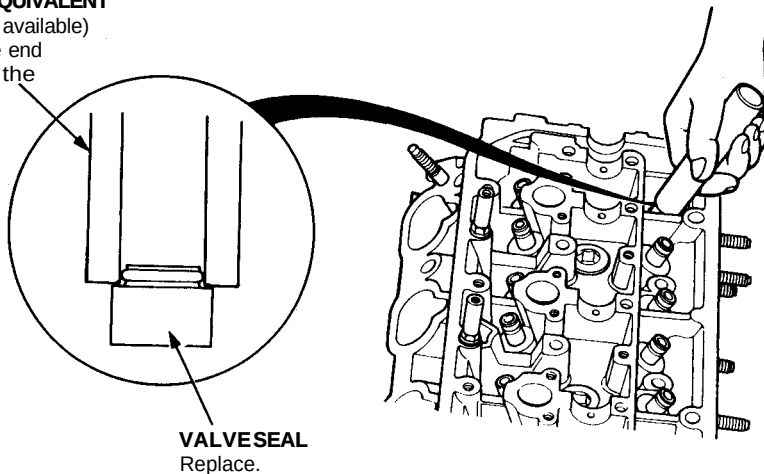
NOTE: Exhaust and intake valve seals are NOT interchangeable.



VALVE GUIDE SEAL INSTALLER KD - 2899 or EQUIVALENT

(Commercially available)

NOTE: Use the end of the tool with the smallest I.D.





Hydraulic Tappets

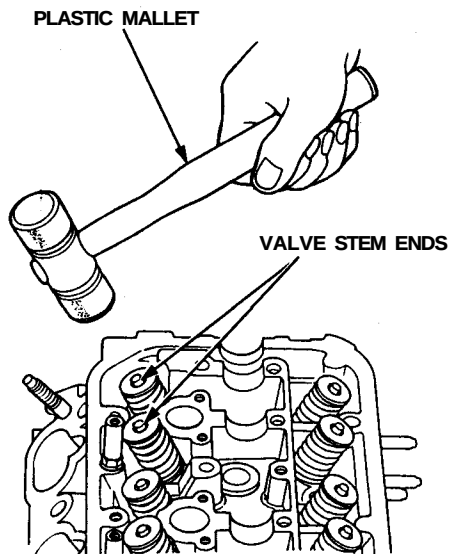
Valve Installation

When installing valves in the cylinder head, coat the valve stems with oil before inserting them into the valve guides. Make sure the valves move up and down smoothly.

When the valves and springs are in place, lightly tap the end of each valve stem two or three times with a plastic mallet to ensure proper seating of the valve and valve keepers.

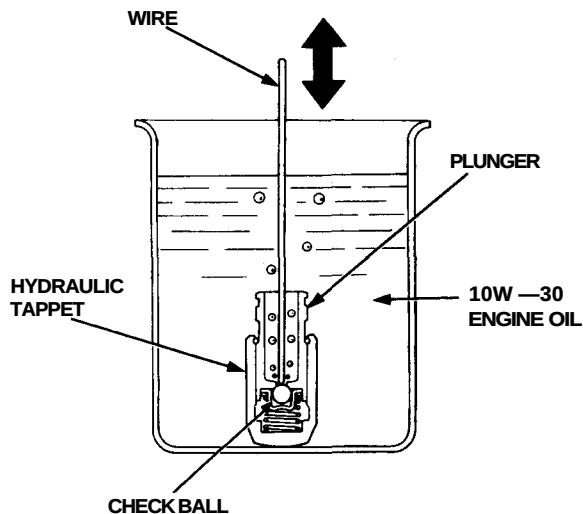
NOTE:

- Make sure that the valve keepers are properly positioned on the valve stem.
- Tap the valve stem only along its axis so you do not bend the stem.



Bleeding

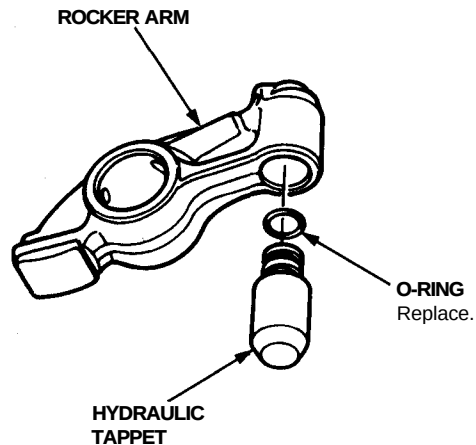
1. Fill a container with 10W - 30 engine oil and place the hydraulic tappet in it. Press down on the check ball with a thin wire. Bleed the tappet of air by pumping the plunger slowly until no bubbles come out of the hydraulic tappet.



2. Install the hydraulic tappet to the rocker arm.

NOTE:

- Use a new O-ring when reassembling.
- Apply oil to the O-ring before installation.



Camshafts/Rocker Arms and Camshaft Seals

Installation

CAUTION:

- Make sure that all rockers are in alignment with their valves when torquing the rocker assembly bolts.
- To prevent the rocker arm assembly from coming apart, leave the camshaft holder bolts in the holes.
- Handle the rocker arms carefully so that the oil does not come out of the hydraulic tappets.

1. Install the camshaft and rubber cap, then install the camshaft seal with the open side (spring) facing in.

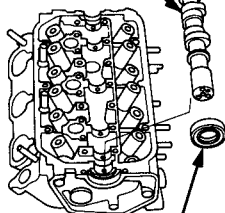
NOTE:

- Position the camshaft with pin hole at the top.
- Do not apply oil to the camshaft holder mating surface of the camshaft seal.
- Apply liquid gasket around the rubber cap.

RUBBER CAP

Replace if there was oil leakage.

CAMSHAFT



OIL SEAL

Replace.
Seal housing surface should be dry.
Apply a light coat of oil to camshaft and inner lip of seal.

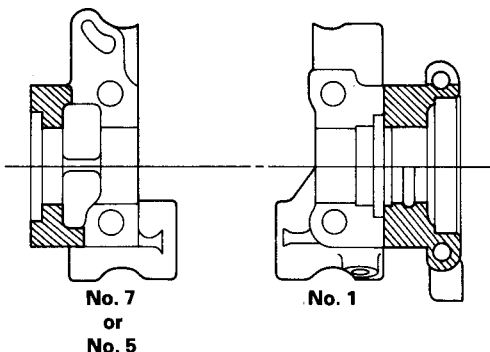
2. **Engine No. 1300001~1309262 (U.S.A.), 1700001~1700751 (Canada):**

Apply liquid gasket to the head mating surfaces of the No. 1 and the No. 7 camshaft holders.

Engine No. 1309263~, 2300001~, 3300001~ (U.S.A.), 1700752~, 2700001~, 3700001~ (Canada):

Apply liquid gasket to the head mating surfaces of the No. 1 and the No. 5 camshaft holders.

— Apply liquid gasket to the shaded areas.



3. Tighten each bolt two turns at a time in the sequence shown below to ensure that the rockers do not bind on the valves.

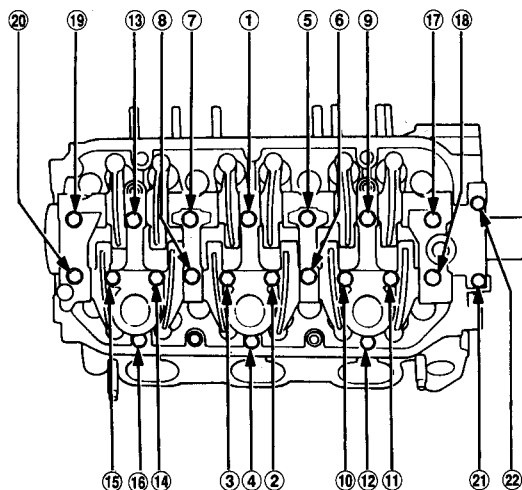
Specified torque:

8 mm bolts: 22 N·m (2.2 kgf-m, 16 lbf-ft)

6 mm bolts: 12 N·m (1.2 kgf-m, 8.7 lbf-ft)

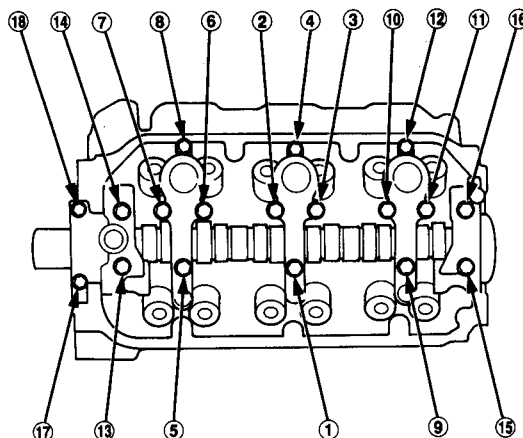
Engine No. 1300001~1309262 (U.S.A.), 1700001~1700751 (Canada):

6 mm bolts: ②, ③, ④, ⑩, ⑪, ⑫, ⑭, ⑮, ⑯, ⑰, ⑱, ⑲, ⑳



Engine No. 1309263~, 2300001~, 3300001~ (U.S.A.), 1700752~, 2700001~, 3700001~ (Canada):

8 mm bolts: ①, ⑤, ⑧, ⑬, ⑭, ⑮, ⑯





Cylinder Heads

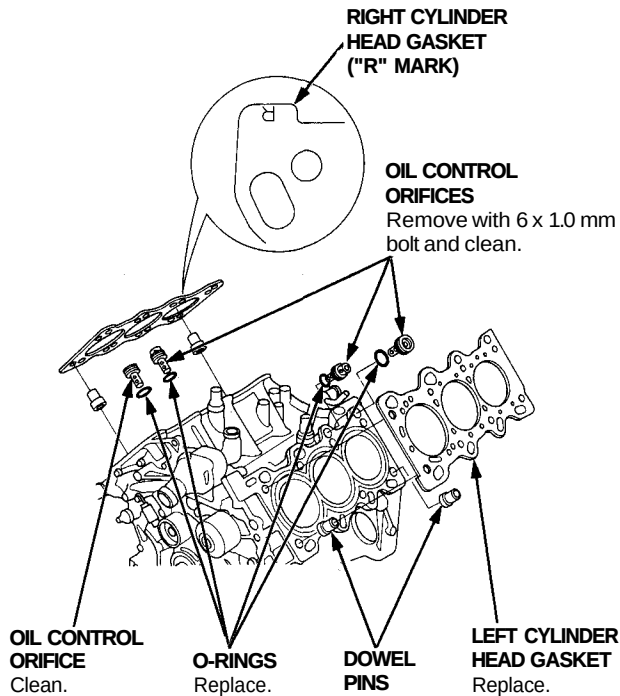
Installation

Install the cylinder heads in the reverse order of removal.

NOTE:

- Always use new cylinder head gaskets.
- Cylinder heads and cylinder block surface must be clean.
- Turn the camshafts so the pulley locating pin holes are at the top.
- Turn the crankshaft so the No. 1 piston is at TDC (see page 6-8).
- Clean the oil control orifices before installing.
- Do not use the upper and lower covers to store removed item.
- Clean the upper and lower covers before installation.

1. Align the cylinder head dowel pins.
2. Install the oil control orifices and cylinder head gaskets.



3. Apply clean engine oil to the threads of the cylinder head bolts.

4. Install the cylinder heads on the cylinder block.
5. Tighten the cylinder head bolts sequentially in two or three steps.

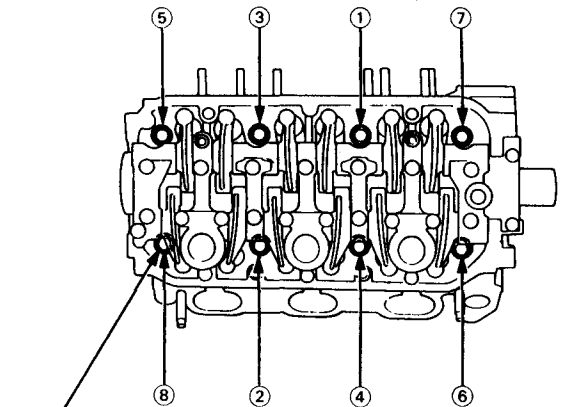
Specified Torque:

76 N·m (7.8 kgf-m, 56 lbf-ft)

NOTE:

- We recommend using 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.

CYLINDER HEAD BOLTS TORQUE SEQUENCE



(cont'd)

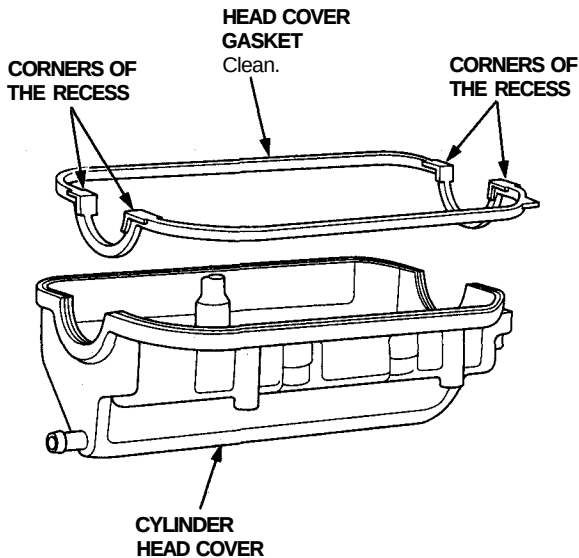
Cylinder Heads

Installation (cont'd)

6. Install the head cover gasket in the groove of the cylinder head cover. Seat the recesses for the camshaft first, then work it into the groove around the outside edges.

NOTE:

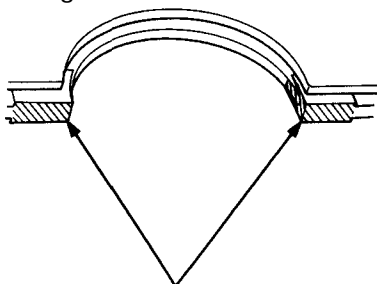
- Before installing the cylinder head cover gasket, thoroughly clean the seal and the groove.
- When installing, make sure the head cover gasket is seated securely in the corners of the recesses with no gap.



7. Apply liquid gasket to the head cover gasket at the four corners of the recesses.

NOTE:

- Use liquid gasket, Part No. 08718 - 0001 or 08718 - 003.
- Check that the mating surfaces are clean and dry before applying liquid gasket.
- Do not install the parts if five minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.
- After assembly, wait at least 30 minutes before filling the engine with oil.



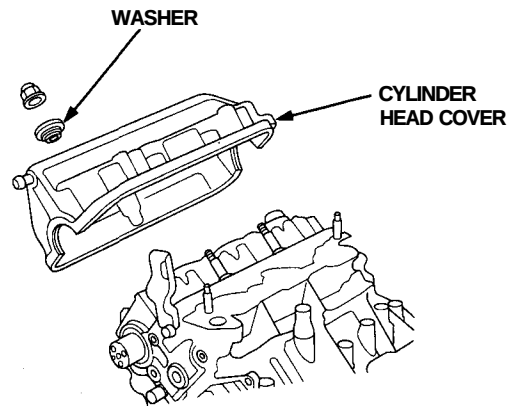
Apply liquid gasket to the shaded areas.

8. When installing the cylinder head cover, hold the head cover gasket in the groove by placing your fingers on the camshaft contacting surfaces (top of the semicircles).

Once the cylinder head cover is on the cylinder head, slide the cover slightly back and forth to seat the head cover gasket.

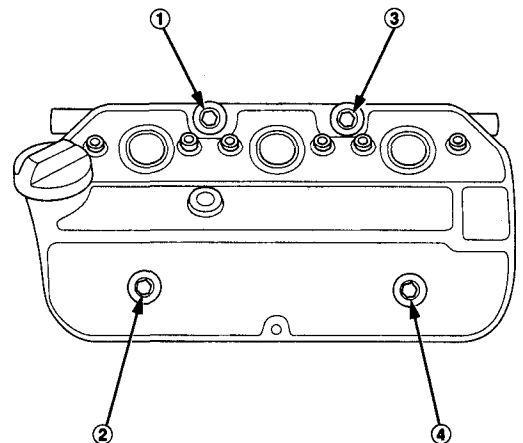
NOTE:

- Before installing the cylinder head cover, clean the cylinder head contacting surfaces with a shop towel.
- Do not touch the parts where liquid gasket was applied.
- Replace the washer when damaged or deteriorated.



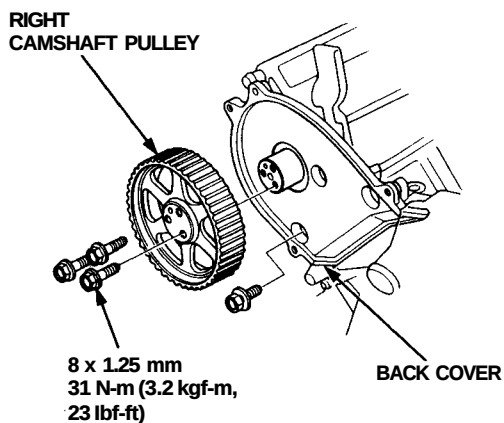
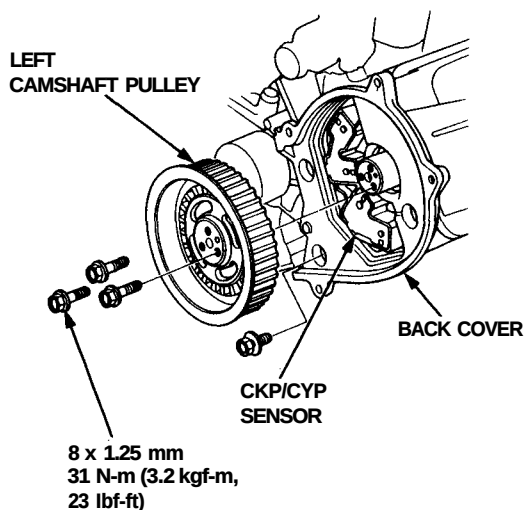
9. Tighten the nuts in two or three steps. In the final step, tighten all nuts, in sequence, to 12 N-m (1.2 kgf-m, 8.7 lbf-ft).

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





10. Install the left and right back covers, then install the left and right camshaft pulleys.

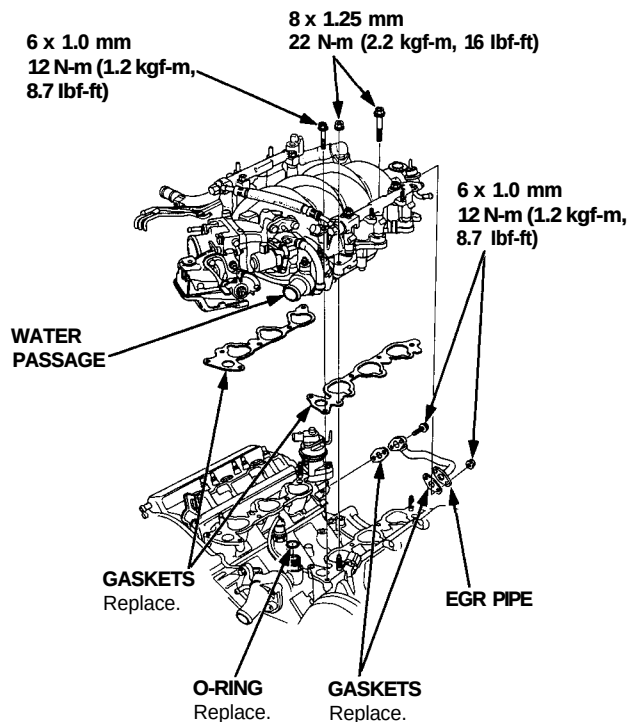


11. Install the timing belt (see page 6-8).

12. Install the intake manifold and water passage, then tighten the intake manifold mounting bolts and nuts in a crisscross pattern in two or three steps, beginning with the inner bolts.

- Always use new intake manifold gaskets.

13. Install the EGR pipe.



14. Install the exhaust manifolds, and tighten the nuts in a crisscross pattern in two or three steps, beginning with the inner nut (see page 9-3).

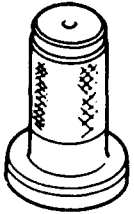
- Always use new exhaust manifold gaskets.

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

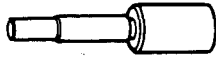
16. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAD - PH70201	Seal Driver	1	7-25
②	07GAF - PH60300	Piston Pin Base Insert	1	7-14, 7-15
③	07GAF-PH70100	Pilot Collar	1	7-14, 7-15
④	07HAF-PL20102	Piston Base Head	1	7-14, 7-15
⑤	07LAB-PV00100	Ring Gear Holder	1	7-6
⑥	07749-0010000	Driver	1	7-20, 7-25
⑦	07948-SB00101	Driver Attachment	1	7-20, 7-25
⑧	07973-PE00310	Piston Pin Driver Shaft	1	7-14, 7-15
⑨	07973 - PE00320	Piston Pin Driver Head	1	7-14, 7-15
⑩	07973 - 6570500	Piston Base	1	7-14, 7-15
⑪	07973 - 6570600	Piston Base Spring	1	7-14, 7-15



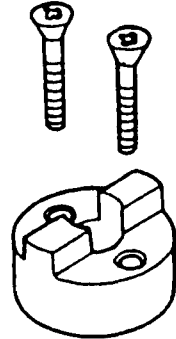
①



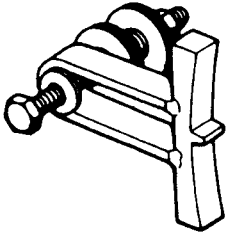
②



③



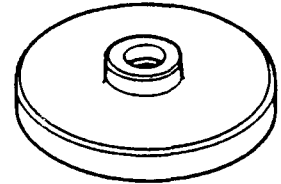
④



⑤



⑥



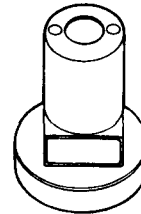
⑦



⑧



⑨



⑩



⑪



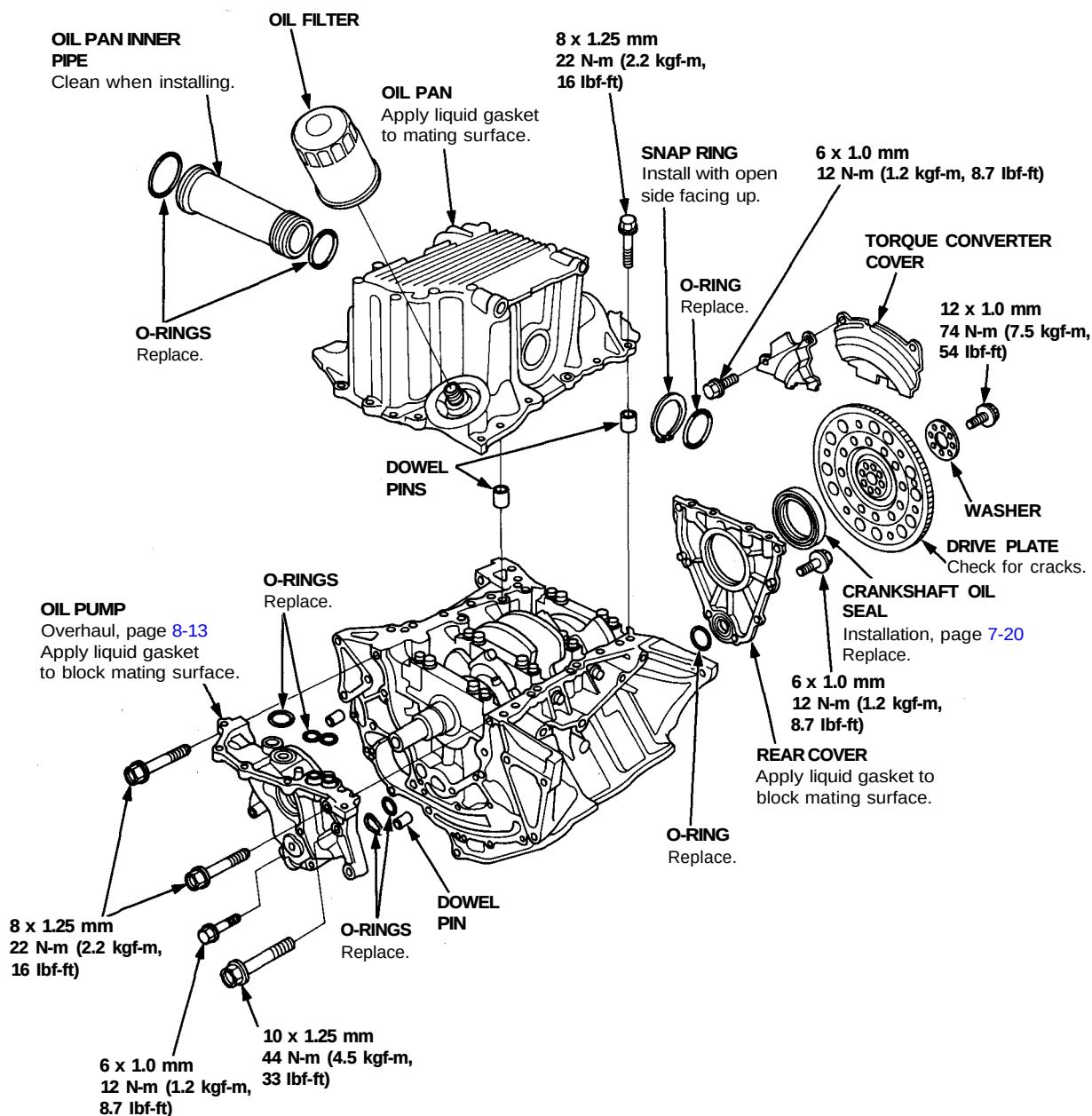
Illustrated Index



Lubricate all internal parts with engine oil during reassembly.

NOTE:

- Apply liquid gasket to the mating surfaces of the rear cover and oil pump case before installing them.
- Use liquid gasket, Part No. 08718 - 0001 or 08718 - 0003.



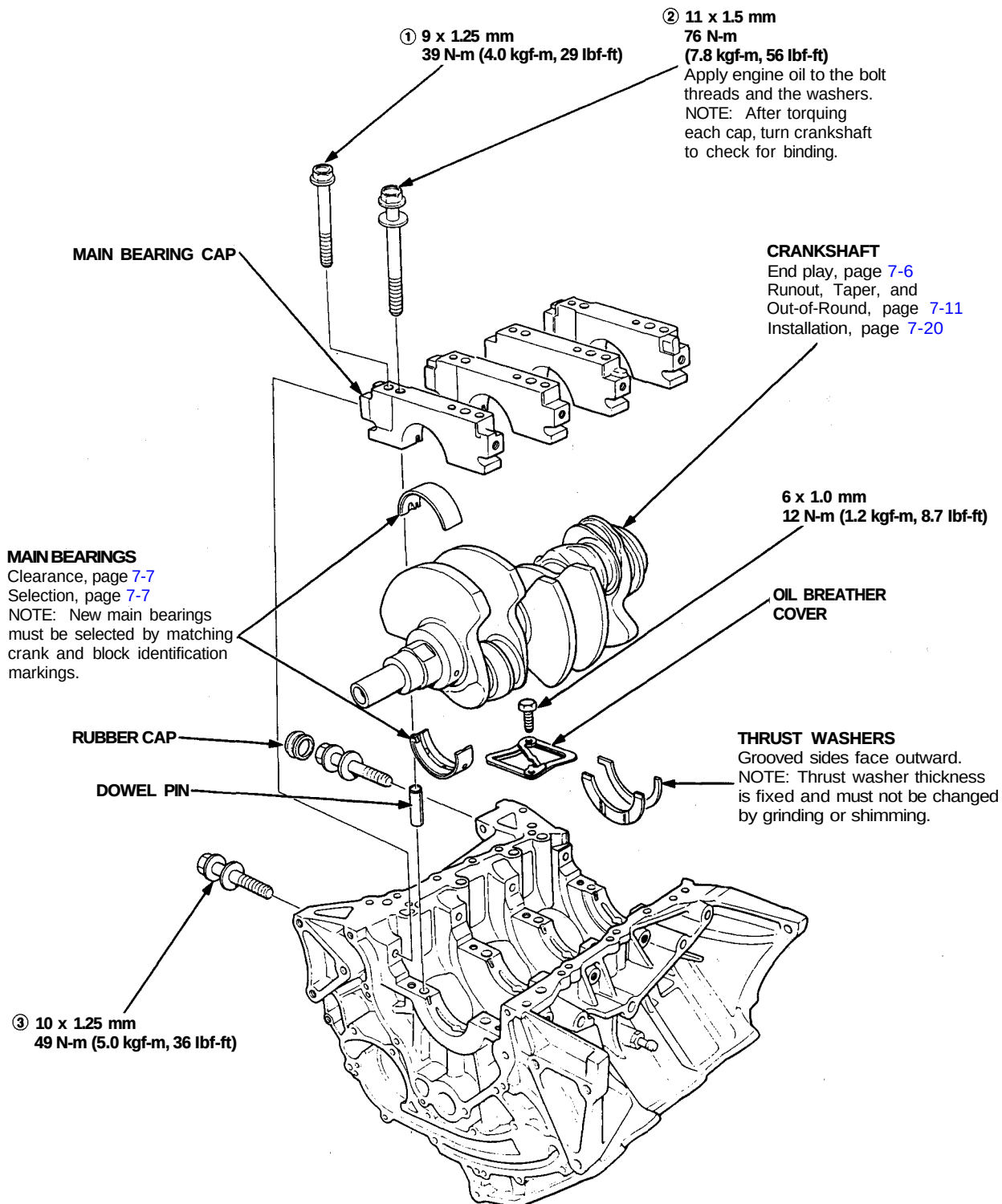
(cont'd)

Illustrated Index

(cont'd)

NOTE:

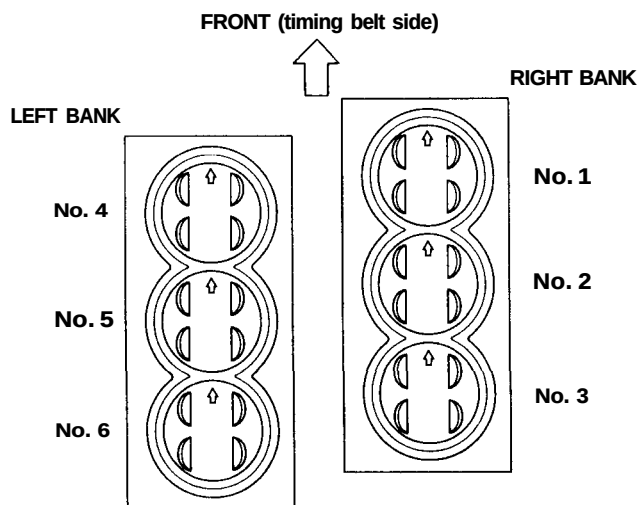
- Lubricate all internal parts with engine oil during reassembly.
- Use liquid gasket, Part No. 08718 - 0001 or 08718 - 0003.





NOTE: New rod bearings must be selected by matching connecting rod assembly and crankshaft identification markings (see page 7-8).

 Lubricate all internal parts with engine oil during reassembly.



PISTON

Inspection, page 7-12

NOTE: To maintain proper clearance, match the letter on the piston top with the letter for each cylinder stamped on the block.

On the piston top	On the block
No letter	A or I
B	B or il

PISTON PIN

Removal, page 7-14

Installation, page 7-15

Inspection, page 7-16

CYLINDER BLOCK

Cylinder bore inspection, page 7-13

Warpage inspection, page 7-13

Cylinder bore honing, page 7-14

CONNECTING ROD BEARING CAP

Installation, page 7-20

NOTE: Install caps so the bearing recess is on the same side as the recess in the rod.

PISTON RINGS

Replacement, page 7-17

Measurement, pages 7-17 and 7-18

Alignment, page 7-18

CONNECTING ROD

End play, page 7-6

Selection, page 7-15

Inspect the top of each cylinder bore for carbon build-up or a ridge before removing the piston.
Remove ridge if necessary, page 7-9

CONNECTING ROD BEARINGS

Clearance, page 7-8

Selection, page 7-8

CONNECTING ROD CAP NUT
9 x 0.75 mm
44 N·m (4.5 kgf-m,
33 lbf-ft)

Apply engine oil to the nut threads

NOTE: After torquing each bearing cap, rotate the crankshaft to check for binding.

No. 1	BAA	No. 3
No. 4	ABB	No. 6

CYLINDER BORE SIZES

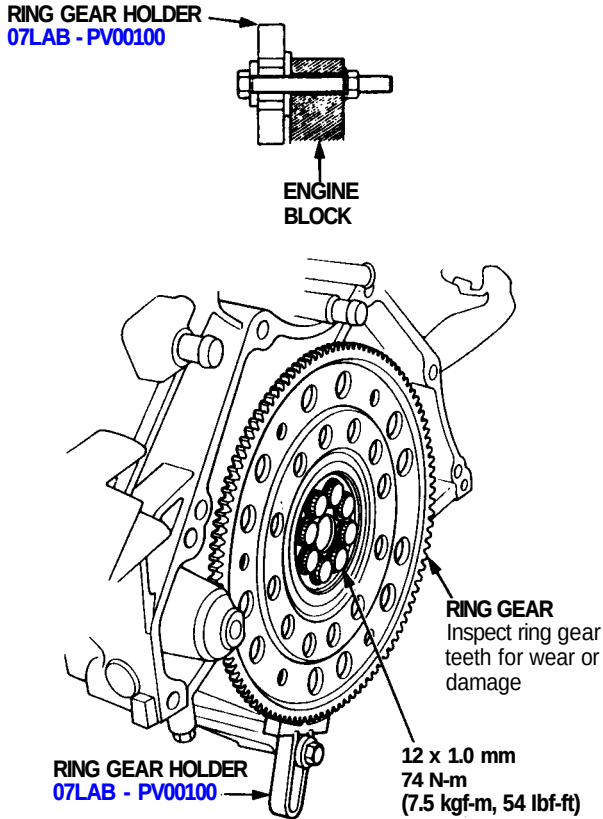
NOTE: To maintain proper piston clearance, match these letters with the letters on the pistons. The letters on the block read from front to rear, No. 1 through No. 3 cylinders on the first line and No. 4 through No. 6 cylinders on the second line.

On the block	On the piston top
A or I	No letter
B or il	B

Drive Plate

Replacement

Remove the eight drive plate bolts, then separate the drive plate from the crankshaft flange. After installation, tighten the bolts in a crisscross pattern.



Connecting Rod and Crankshaft

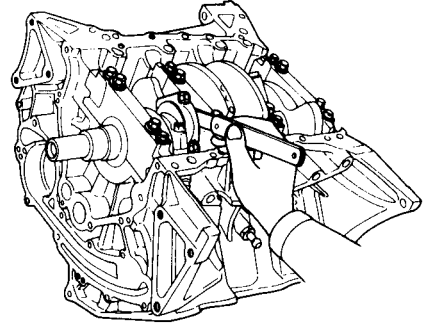
End Play

Connecting Rod End Play:

Standard (New): 0.15 - 0.30 mm

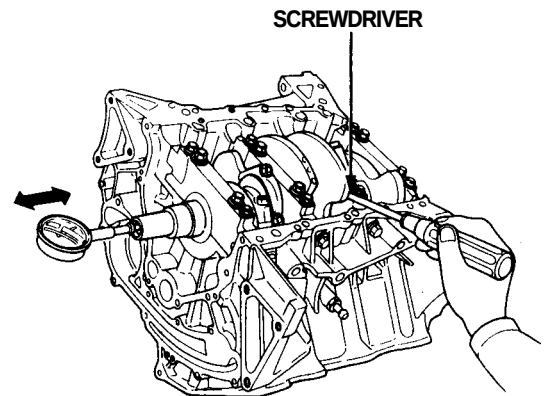
(0.006-0.012 in)

Service Limit: 0.40 mm (0.016 in)



- If out-of-tolerance, install a new connecting rod.
- If still out-of-tolerance, replace the crankshaft (see pages 7-9 and 7-20).

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 service limit.



Crankshaft End Play:

Standard (New): 0.10 - 0.29 mm

(0.004-0.011 in)

Service Limit: 0.45 mm (0.018 in)

- If end play is excessive, inspect the thrust washers and thrust surface on the crankshaft. Replace parts as necessary.

NOTE: Thrust washer thickness is fixed and must not be changed either by grinding or shimming. Thrust washers are installed with the grooved side facing outward.



Main Bearings

Clearance

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.

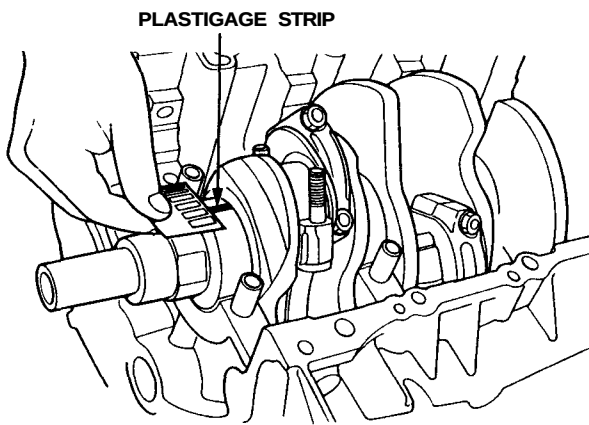
NOTE: If the engine is still in the car when you bolt the main cap down to check clearance, the weight of the crankshaft and flywheel will flatten the plastigage further than just the torque on the cap bolts, and give you an incorrect reading. For an accurate reading, support the crankshaft with a jack under the counterweights and check only one bearing at a time.

4. Reinstall the bearings and caps, then torque the 9 mm cap bolts to 39 N-m (4.0 kgf-m, 29 lbf-ft). Torque the 11 mm cap bolts to 76 N-m (7.8 kgf-m, 57 lbf-ft).
5. Torque the side bolts to 49 N-m (5.0 kgf-m, 36 lbf-ft).
6. Remove the caps and bearings, 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: 0.05 mm (0.002 in)



7. 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 (select the color as shown in the right column of this page), and recheck the clearance.

CAUTION: Do not file, shim, or scrape the bearings or the caps to adjust clearance.

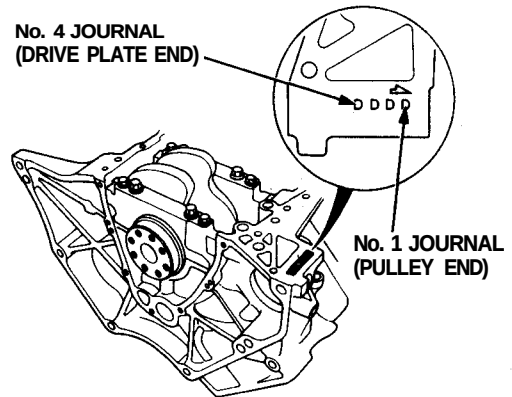
8. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check again.
NOTE: If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crankshaft and start over.

Selection

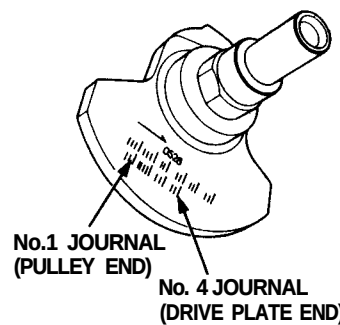
CAUTION: If the codes are indecipherable because of an accumulation of dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.

Crankshaft Bore Code Locations

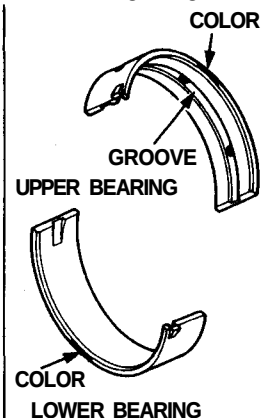
Letters or bars have been stamped on the end of the cylinder block as a code for the size of each of the four main journal bores. Use them, and the numbers or bars stamped on the crankshaft (codes for main journal size), to choose the correct bearings.



Main Journal Code Locations (Numbers or Bars)



Bearing Design



Bearing Identification

Color code is on the edge of the bearing.

↓	1 or I	↓
↓	2 or II	↓
↓	3 or III	↓
↓	4 or IIII	↓
↓	5 or IIIII	↓
↓	6 or IIIII	↓

Smaller
main
journal

Smaller
bearing
(thicker)

→ Larger crank bore
A or I B or II C or III D or IIII
→ Small bearing (thinner)

Pink	Pink Yellow	Yellow	Yellow Green
Pink Yellow	Yellow	Yellow Green	Green
Yellow	Yellow Green	Green	Green Brown
Yellow Green	Green	Green Brown	Brown
Green	Green Brown	Brown	Brown Black
Green Brown	Brown	Brown Black	Black

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

Connecting Rod Bearings

Clearance

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 plastigage strip across the rod journal.
4. Reinstall the bearing half and cap, and torque the nuts to 44 N-m (4.5 kgf-m, 33 lbf-ft).

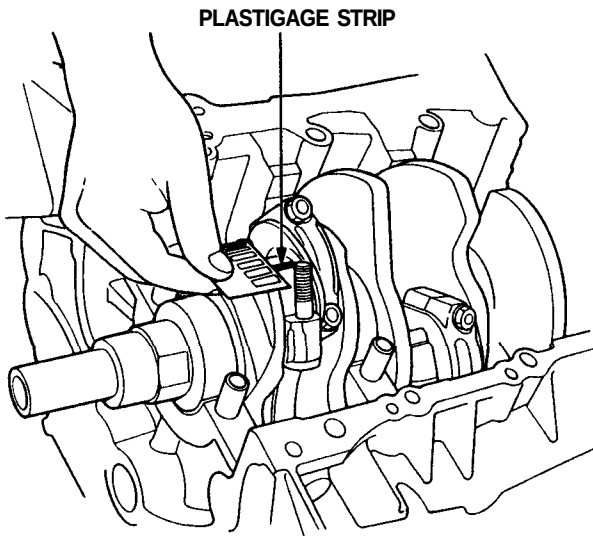
NOTE: Do not rotate the crankshaft during inspection.

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): 0.022 - 0.046 mm
(0.0009 - 0.0018 in)

Service Limit: 0.05 mm (0.002 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 (select the color as shown in the right column of this page), and recheck the clearance.

CAUTION: 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.

NOTE: If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crankshaft and start over.

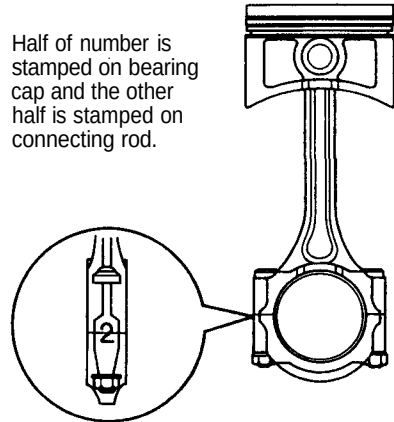
Selection

CAUTION: 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.

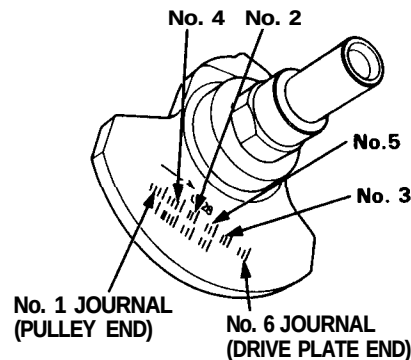
Connecting Rod Code Location

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.

Half of number is stamped on bearing cap and the other half is stamped on connecting rod.



Connecting Rod Journal Code Locations (Letters or Bars)



Bearing Identification

Color code is on the edge of the bearing.

		Larger big end bore			
		1 or I	2 or II	3 or III	4 or IIII
Smaller rod journal	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 IIII	Green	Green Brown	Brown	Brown Black
	F or IIII	Green Brown	Brown	Brown Black	Black
		Smaller bearing (thicker)			

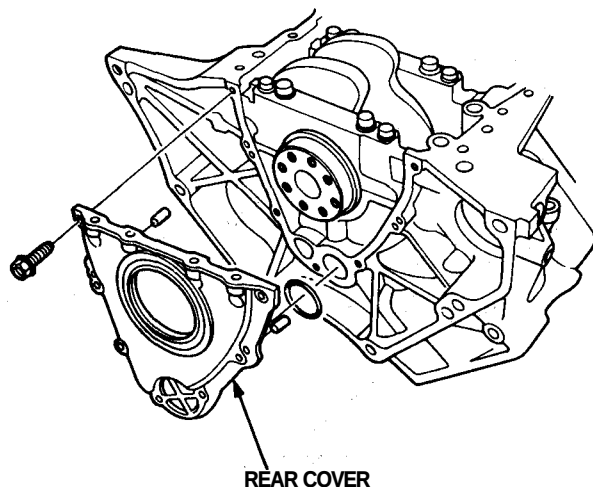
NOTE: When using bearing halves of different colors, it does not matter which color is used in the top or bottom.



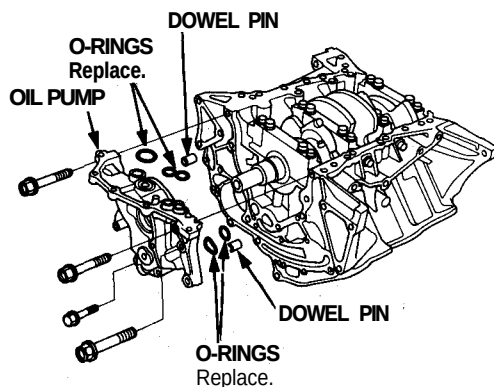
Pistons and Crankshaft

Removal

1. Remove the oil pan assembly.
2. Remove the rear cover.

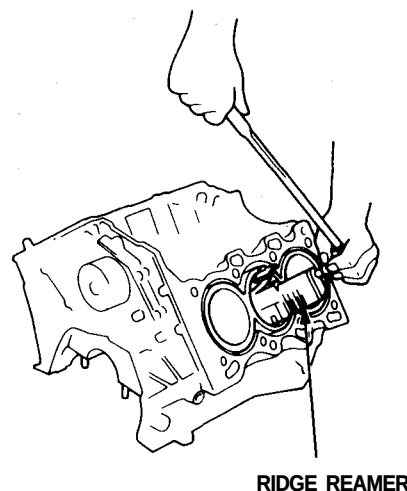


3. Remove the oil pump.



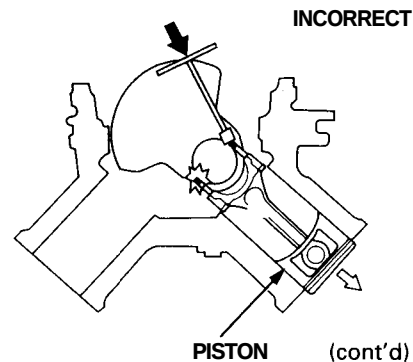
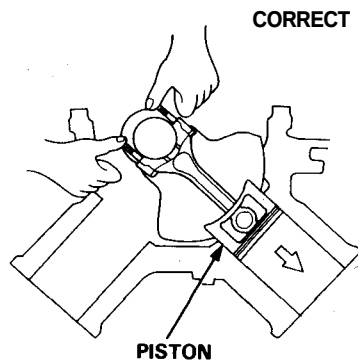
4. If you can feel a ridge of metal or hard carbon around the top of any cylinder, remove it with a ridge reamer. Follow reamer manufacturer's instructions.

CAUTION: If the ridge is not removed, it may damage the pistons as they are pushed out.



- Remove the connecting rod caps after setting the crank pin at BDC for each cylinder. Remove the piston assembly by pushing on the connecting rod.

CAUTION: Take care not to damage the crank pin or cylinder with the connecting rod.



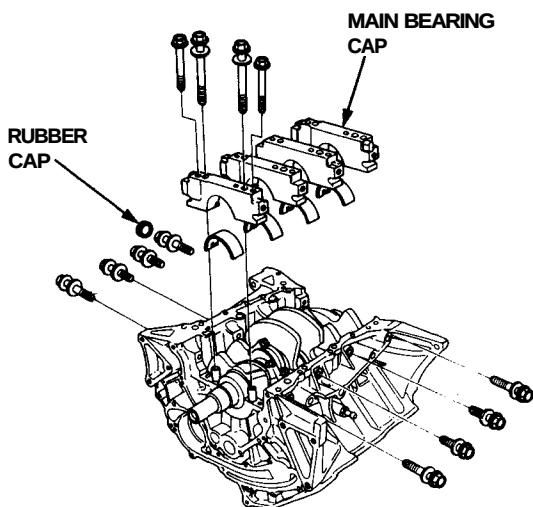
Pistons and Crankshaft

Removal (cont'd)

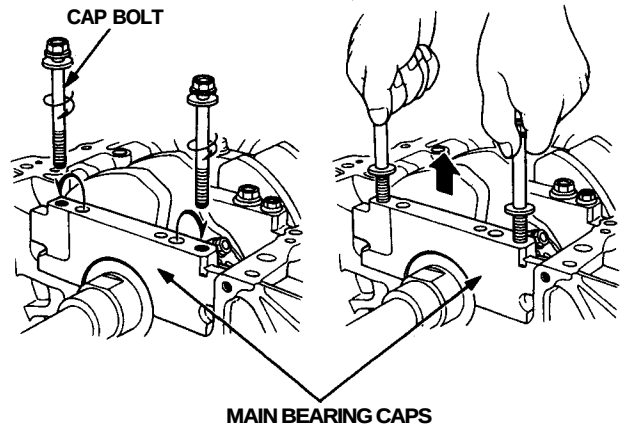
5. Remove the bearing from the cap. Keep all caps/bearings in order.
6. Remove the upper bearing halves from the connecting rods and set them aside with their respective caps.
7. Reinstall the cap on the rod after removing each piston/connecting rod assembly.
8. To avoid mixup on reassembly, mark each piston/connecting rod assembly with its cylinder number.

NOTE: The existing number on the connecting rod does not indicate its position in the engine, it indicates the rod bore size.

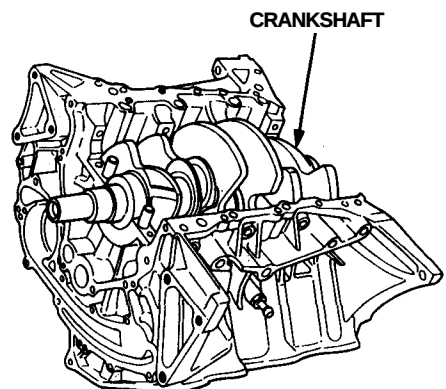
9. Remove the bearing cap bolts and bearing cap side bolts, then remove the bearing caps.



- To help with removal of the caps, install the cap bolts in the outside bolt holes.



10. Lift the crankshaft out of the cylinder block, being careful not to damage the journals.



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



Crankshaft

Inspection

- Clean the crankshaft oil passages with pipe cleaners or a suitable brush.
- Check the keyway and threads.

Alignment

- Measure runout on all main journals to make sure the crankshaft is not bent.
- The difference between measurements on each journal must not be more than the service limit.

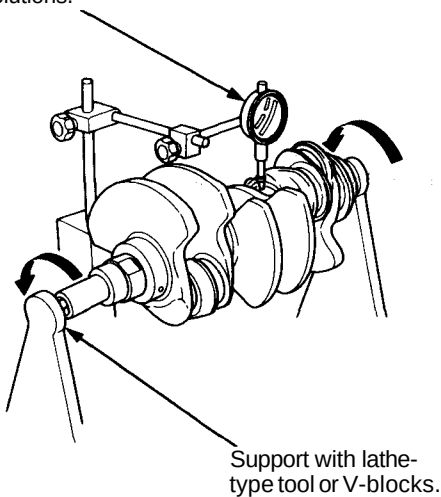
Crankshaft Total Runout:

Standard (New): 0.020 mm (0.0008 in) max.

Service Limit: 0.030 mm (0.0012 in)

DIAL INDICATOR

Rotate two complete revolutions.



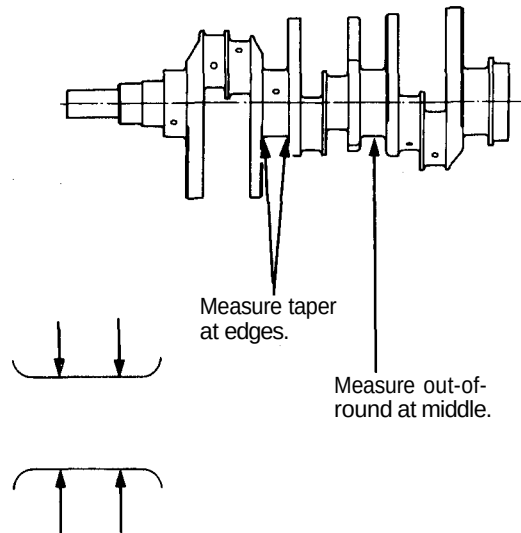
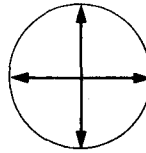
Out-of-Round and Taper

- 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): 0.004 mm (0.0002 in) max.

Service Limit: 0.010 mm (0.0004 in)



- Measure taper at 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)

Pistons

Inspection

1. Check the piston for distortion or cracks.

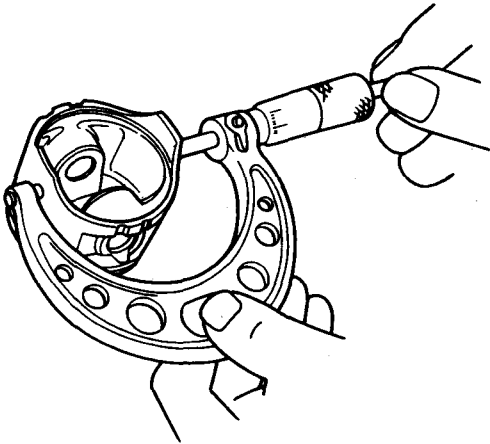
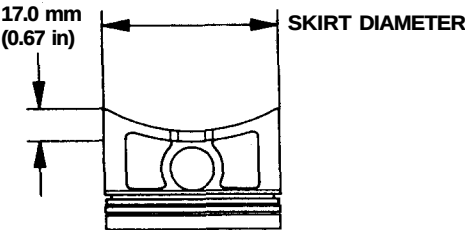
NOTE: If cylinder is bored, an oversized piston must be used.

2. Measure piston diameter at a point 17.0 mm (0.67 in) from bottom of skirt.

NOTE: There are two standard-size pistons (No letter or A, and B). The letter is stamped on the top of the piston. Letters are also stamped on the cylinder block as cylinder bore sizes.

Piston Diameter

	Standard (New)	Service Limit
No Letter (A)	89.980 - 89.990 mm (3.5425 - 3.5429 in)	89.970 mm (3.5421 in)
B	89.970-89.980 mm (3.5421-3.5425in)	89.960mm (3.5417 in)

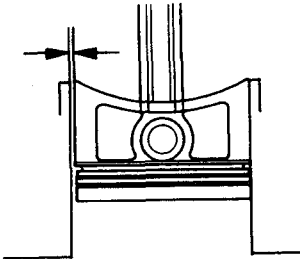


3. Calculate the difference between cylinder bore diameter on page 7-13 and piston diameter.

Piston-to-Block Clearance

Standard (New): 0.02 - 0.04 mm
(0.001 - 0.002 in)
Service Limit: 0.08 mm (0.003 in)

SERVICE LIMIT
0.08 mm (0.003 in)



Oversize Piston Diameter

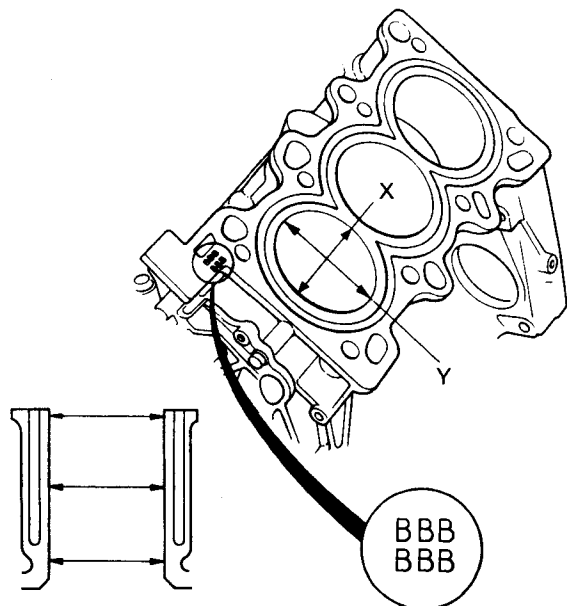
0.25: 90.220 - 90.230 mm (3.5520 - 3.5524 in)
0.50: 90.470 - 90.480 mm (3.5618 - 3.5622 in)



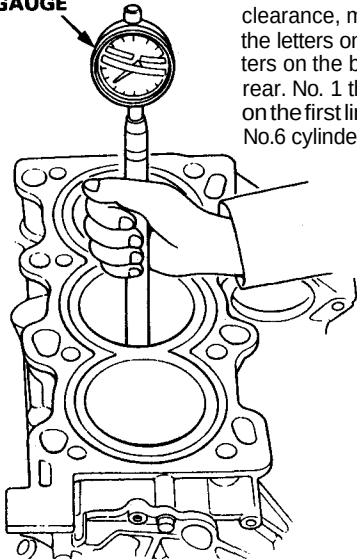
Cylinder Block

Inspection

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



CYLINDER BORE GAUGE



CYLINDER BORE SIZES (A or I, B or II)

NOTE: To maintain proper piston clearance, match these letters with the letters on the pistons. The letters on the block read from front to rear. No. 1 through No. 3 cylinders on the first line and No. 4 through No. 6 cylinders on the second line.

Cylinder Bore Size

	Standard (New)	Service Limit
A or I	90.010-90.020 mm (3.5437 - 3.5441 in)	90.070 mm (3.5461 in)
B or II	90.000 -90.010 mm (3.5433 - 3.5437 in)	90.070 mm (3.5461 in)

Oversize

0.25: 90.250 - 90.270 mm (3.5531 - 3.5539 in)

0.50: 90.500 - 90.520 mm (3.5630 - 3.5638 in)

Bore Taper

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

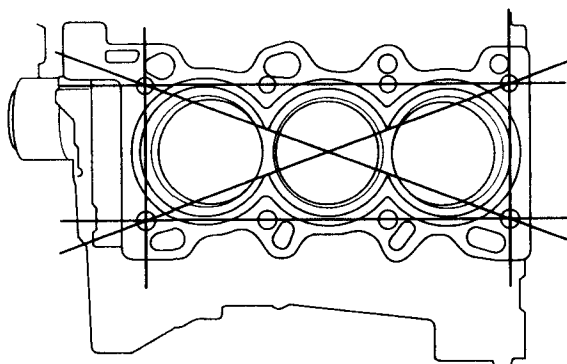
- If measurements in any cylinder are beyond oversize bore service limit, replace the cylinder block.
- If the block is to be rebored, refer to Piston Clearance Inspection (page 7-12) after reboring.

NOTE: Scored or scratched cylinder bores must be honed.

Reboring Limit: 0.5 mm (0.02 in)

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

SURFACES TO BE MEASURED

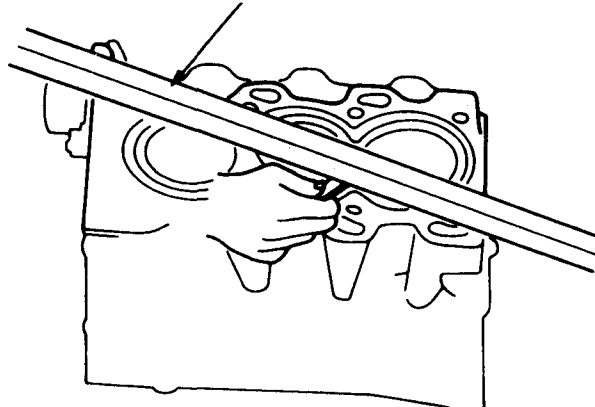


Cylinder Block Warpage:

Standard (New): 0.07 mm (0.003 in) max.

Service Limit: 0.10 mm (0.004 in)

PRECISION STRAIGHT EDGE



Cylinder Block

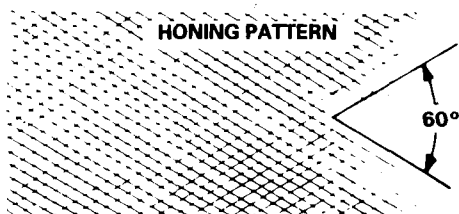
Piston Pins

Bore Honing

1. Measure the cylinder bores as shown on page 7-13. If the cylinder block is to be reused, hone the cylinders and remeasure the bores.
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.

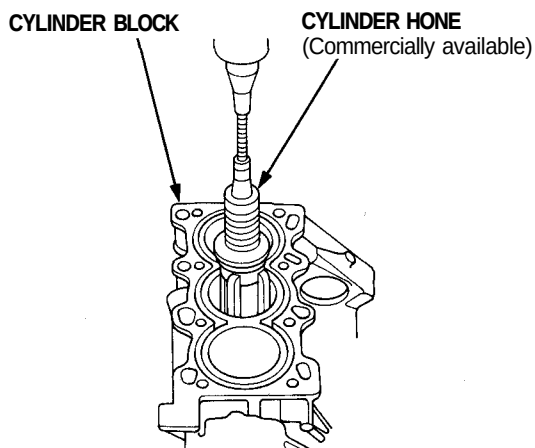


3. When honing is complete, thoroughly clean the cylinder block of all metal particles. Wash the cylinder bores with hot soapy water, then dry and oil them immediately to prevent rusting.

NOTE: 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.

NOTE: 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.

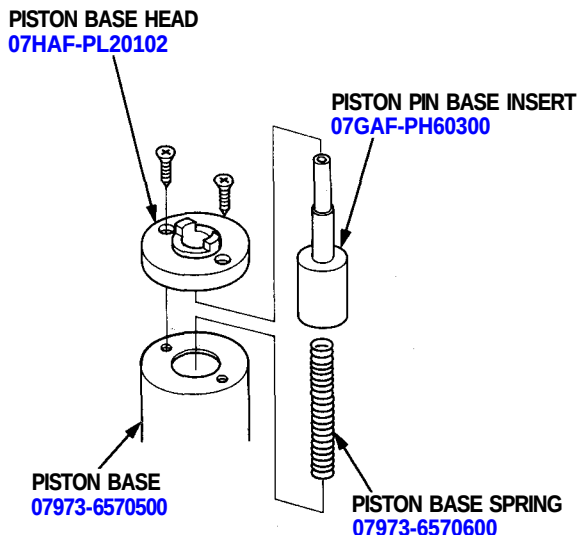


NOTE:

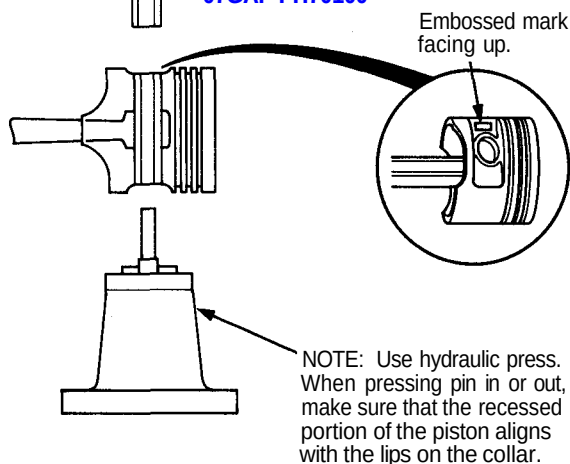
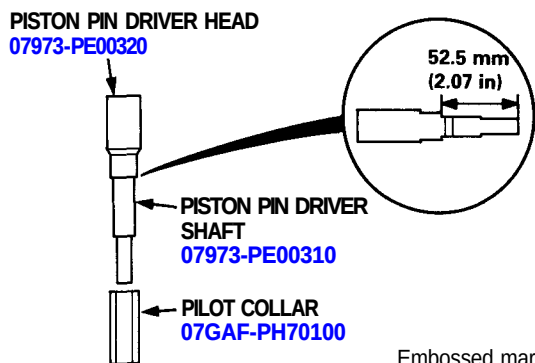
- After honing, clean the cylinder thoroughly with soapy water.
- Only scored or scratched cylinder bores must be honed.

Removal

1. Assemble the special tool as shown.



2. Adjust the length of the piston pin driver to 52.5 mm (2.07 in) as shown.



3. Place the piston on the piston base and press the pin out with a hydraulic press.



Connecting Rods

Piston Pins

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.

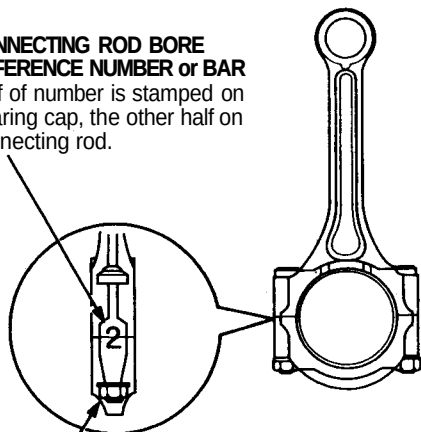
It's then stamped with a number (1, 2, 3 or 4/I, II, III or IIII) indicating the range. You may find any combination of 1, 2, 3 or 4/I, II, III or IIII in any engine.

Normal Bore Size: 57.0 mm (2.24 in)

NOTE:

- Reference numbers or bars are for big end bore size and do not indicate the position of the rod in the engine.
- Inspect each connecting rod for cracks and heat damage.

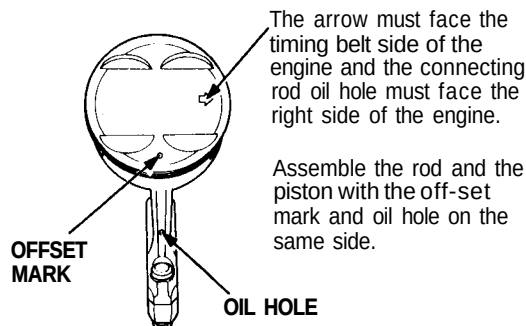
**CONNECTING ROD BORE
REFERENCE NUMBER or BAR**
Half of number is stamped on bearing cap, the other half on connecting rod.



Inspect bolts and nuts for stress cracks.

Installation

1. Use a hydraulic press for installation.
- When pressing the pin in or out, be sure to position the recessed flat on the piston against the lugs on the piston base head.



**PISTON PIN DRIVER HEAD
07973 - PE00320**

Adjust the length of the piston pin driver to 52.5 mm (2.07 in)

52.5 mm
(2.07 in)

**PISTON PIN DRIVER SHAFT
07973 - PE00310**

Embossed mark facing up.

**PISTON PIN
PILOT COLLAR
07GAF-PH70100**

**PISTON PIN BASE INSERT
07GAF-PH60300**

**PISTON BASE HEAD
07HAF-PL20102**

NOTE: Use a hydraulic press. When pressing the pin in or out, make sure that the recessed portion of the piston aligns with the lugs on the piston base head.

Piston Pins

Inspection

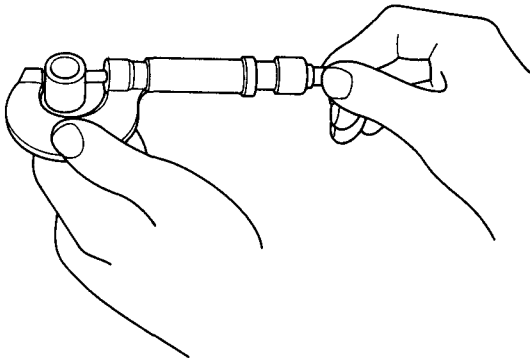
1. Measure the diameter of the piston pin.

Piston Pin Diameter:

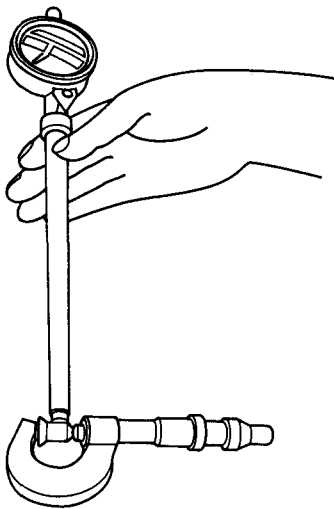
Standard (New): 21.994 - 22.000 mm
(0.8659 - 0.8661 in)

Oversize: 21.997 - 22.003 mm
(0.8660 - 0.8663 in)

NOTE: All replacement piston pins are oversize.



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



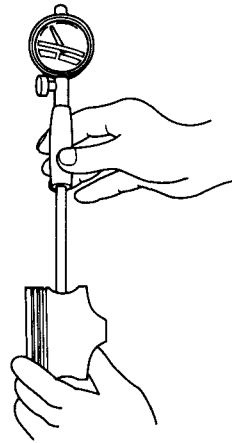
3. Measure the piston pin-to-piston clearance.

NOTE: Check the piston for distortion or cracks.

If the piston pin clearance is greater than 0.024 mm (0.0009 in), remeasure using an oversize piston pin.

Piston Pin-to-Piston Clearance:

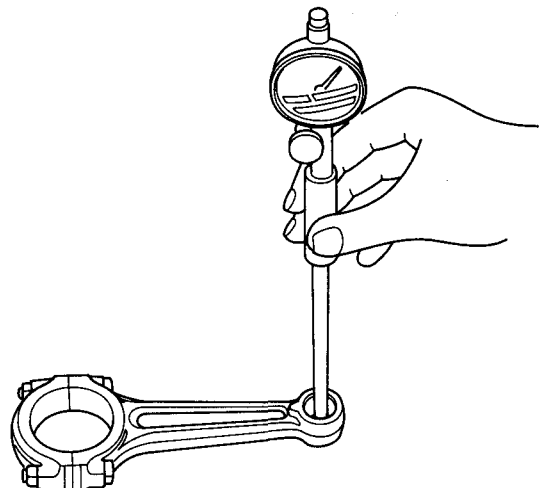
Standard (New): 0.010 - 0.019 mm
(0.0004 - 0.0007 in)



4. Check the difference between the piston pin diameter and connecting rod small end diameter.

Piston Pin-to-Connecting Rod Interference:

Standard (New): 0.013 - 0.032 mm
(0.0005 - 0.0013 in)





Piston Rings

End Gap

- Using a piston, push a new ring into the cylinder bore 15-20 mm (0.6 - 0.8 in) from the bottom.
- Measure the piston ring end-gap 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 on page 7-13. If the bore is over the service limit, the cylinder block must be rebored.

Piston Ring End-Gap:

Top Ring

Standard (New): 0.25 - 0.40 mm
(0.010-0.016 in)

Service Limit: 0.70 mm (0.028 in)

Second Ring

Standard (New): 0.40 - 0.55 mm
(0.016-0.022 in)

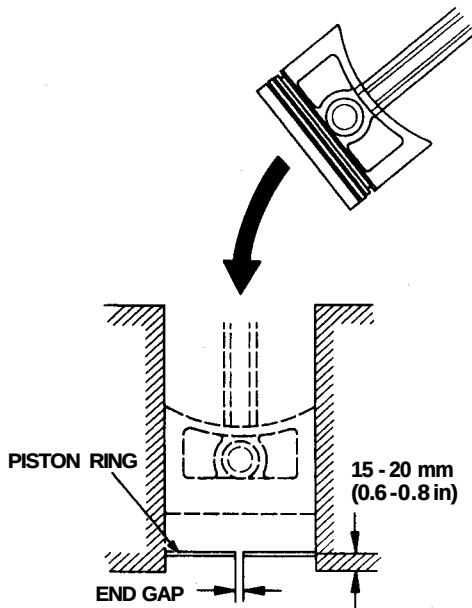
Service Limit: 0.85 mm (0.033 in)

Oil Ring

Standard (New): 0.20 - 0.70 mm
(0.008 - 0.028 in) *1

0.20 - 0.50 mm
(0.008 - 0.020 in) *2

Service Limit: 0.80 mm (0.031 in)



*1: RIKEN manufactured piston ring.

*2: TEIKOKU PISTON RING manufactured piston ring.

Replacement

- Using a ring expander, remove the old piston rings.
- Clean all ring grooves thoroughly.

NOTE:

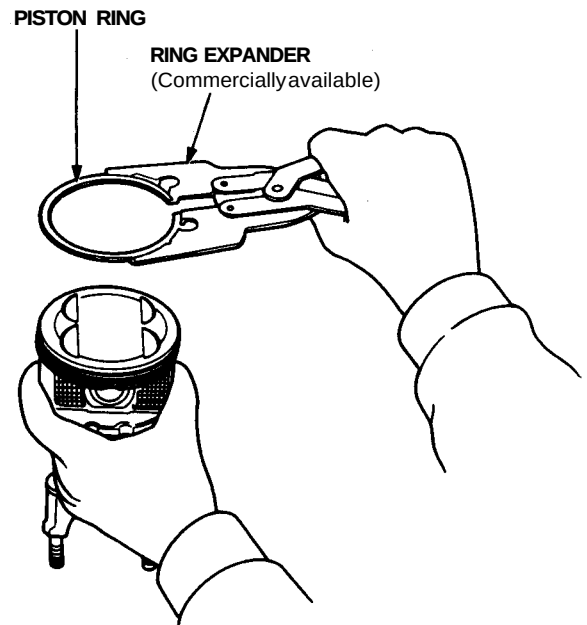
- Use a squared-off broken ring or ring groove cleaner with blade to fit the piston grooves. File down blade if necessary.
- Top and 2nd ring grooves are 1.2 mm (0.05 in) wide and oil ring groove is 2.8 mm (0.11 in) wide.

CAUTION: Do not use a wire brush to clean the ring grooves, or cut 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.

- Install new rings in proper sequence and position (page 7-18).

NOTE: Do not reuse old piston rings.



Piston Rings

Ring-to-Groove Clearance

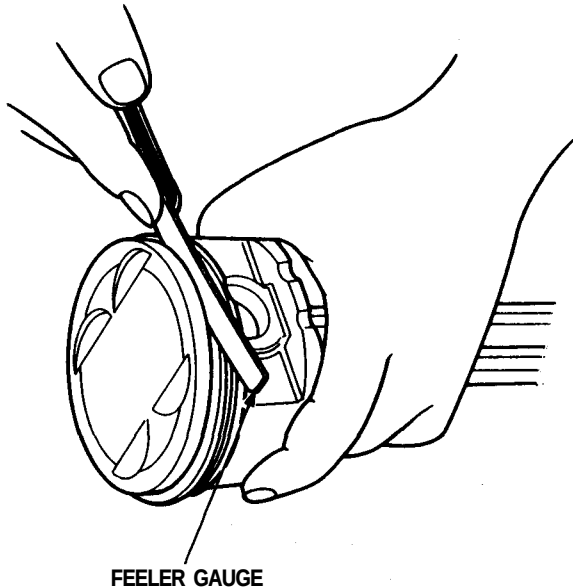
After installing a new set of rings, measure the ring-to-groove clearance:

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)

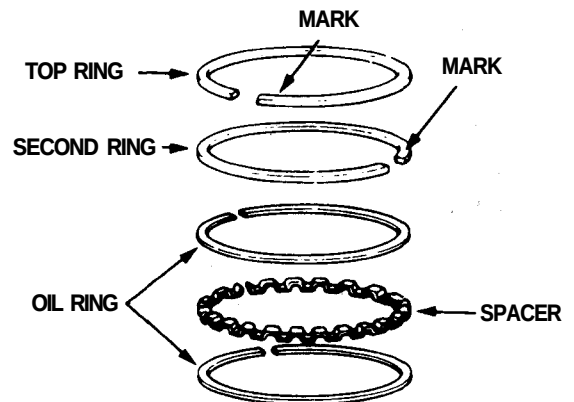
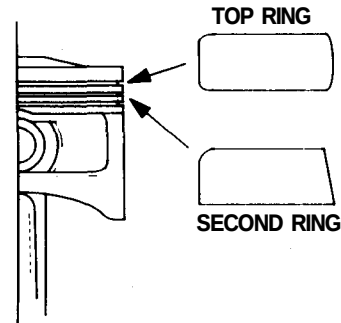


Alignment

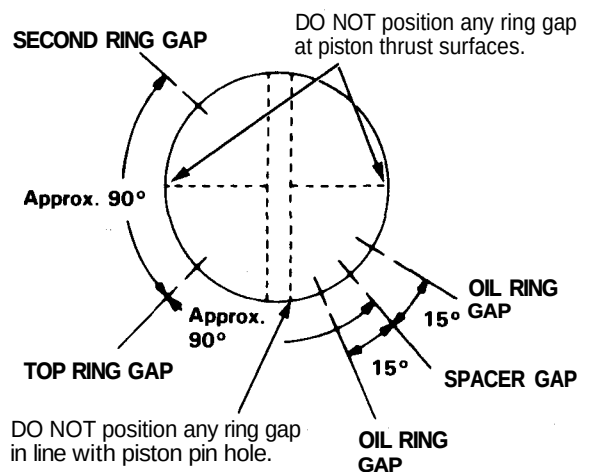
1. Install the rings as shown on page 7-17.

Identify the top and second rings by the chamfer on the edge. Make sure they are in the proper grooves on the piston.

NOTE: The manufacturing marks must be facing upward.



2. Rotate the rings in the grooves to make sure they do not bind.
3. Position the ring end gaps as shown:





Pistons

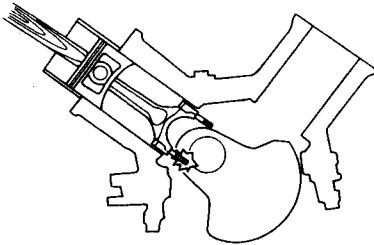
Installation

 Before installing the piston, apply a coat of engine oil to the ring grooves and cylinder bores.

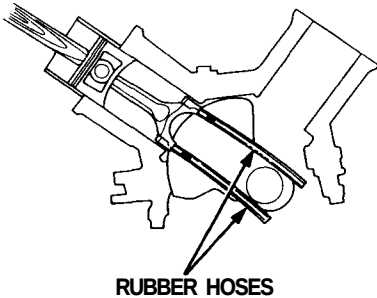
1. If the crankshaft is already installed:

- Guide the piston carefully to prevent damage.
- Fit long rubber hoses (about 30 cm (12 in) long) to the connecting rod bolts to protect the crankshaft.
- Install the pistons after setting the crankshaft to BDC for each cylinder.

INCORRECT



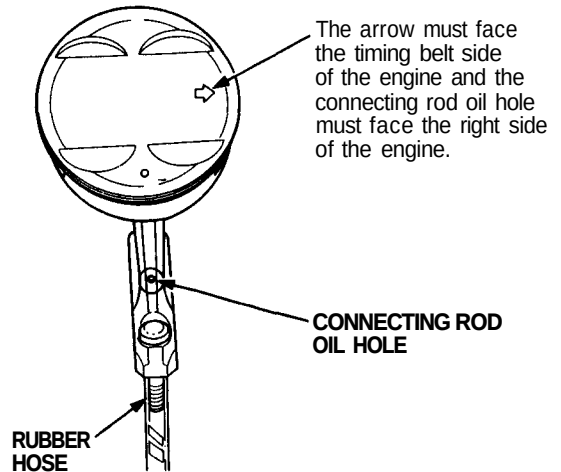
CORRECT



- Remove the connecting rod caps, then slip the long rubber hoses over the threaded ends of the connecting rod bolts.
- Install the ring compressor, check that the bearing is securely in place; then position the piston in the cylinder and tap it in using the wooden handle of a hammer.
- Stop after the ring compressor pops free, and check the connecting rod-to-crank journal alignment before pushing the piston into place.
- Install the rod caps with bearings, and torque the nuts to 44 N-m (4.5 kgf-m, 33 lbf-ft).

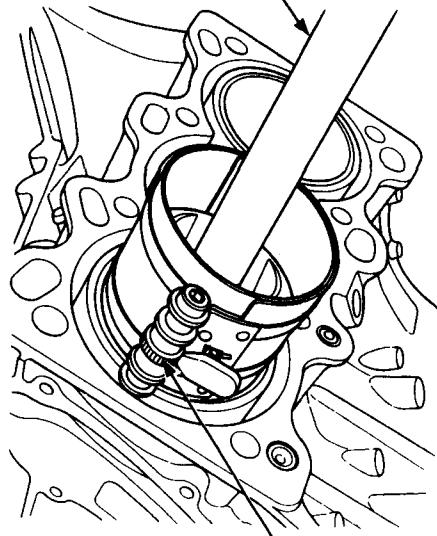
2. If the crankshaft is not installed:

- Remove the rod caps and bearings, install the ring compressor, then position the piston in the cylinder and tap it in using the wooden handle of a hammer.



NOTE: Maintain downward force on the ring compressor to prevent rings from expanding before entering the cylinder bore.

Use the wooden handle of a hammer to push, or tap the piston into the cylinder bore.



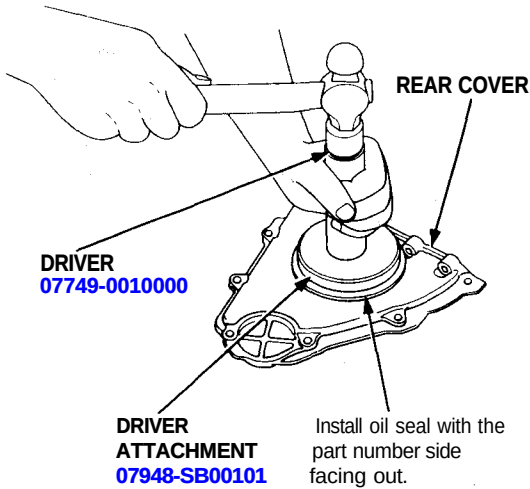
RING COMPRESSOR
(Commercially available)

Crankshaft Oil Seal

Installation

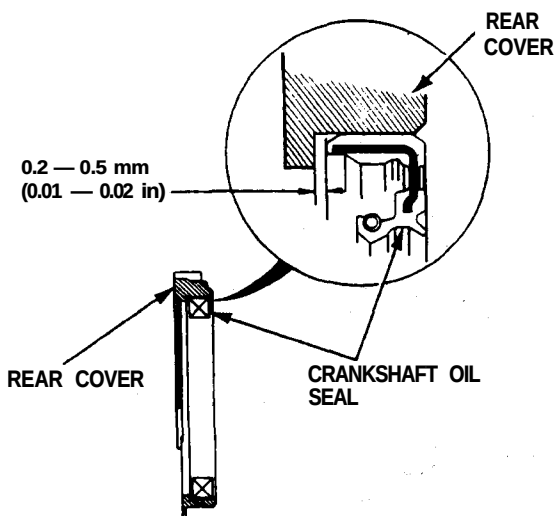
-  The seal surface on the block should be dry.
Apply a light coat of oil to the crankshaft and to the lip of the oil seal.

1. Using the special tool, drive the crankshaft oil seal into the rear cover.



2. Confirm that the clearance is equal all the way around with a feeler gauge.

Clearance: 0.2 - 0.5 mm (0.01 - 0.02 in)



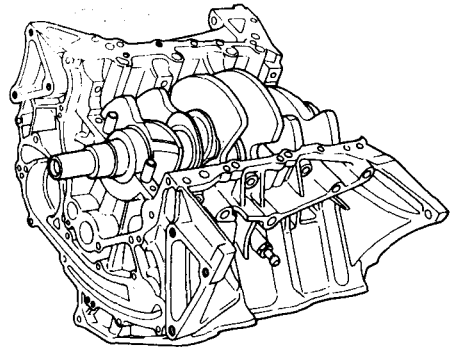
NOTE: Refer to pages [7-25](#) and [8-12](#) for installation of the oil pump side oil seal.

Crankshaft

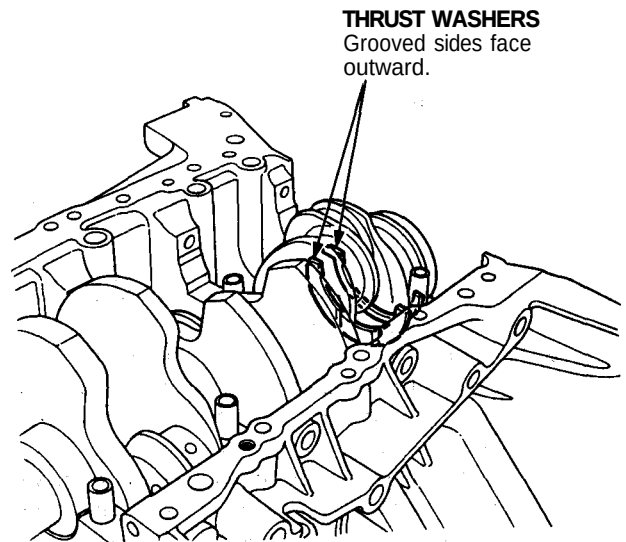
Installation

 Before installing the crankshaft, apply a coat of engine oil to the main bearings and rod bearings.

1. Insert the bearing halves in the cylinder block and connecting rods.
2. Lower the crankshaft into the block.

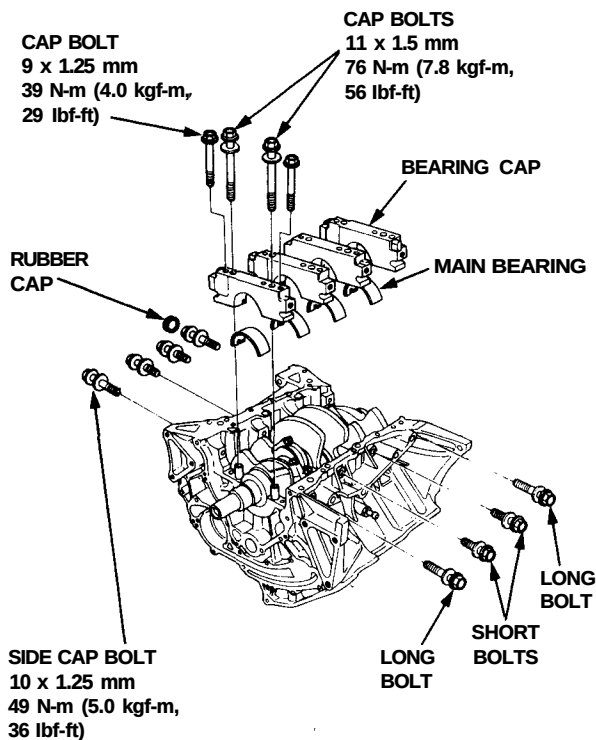
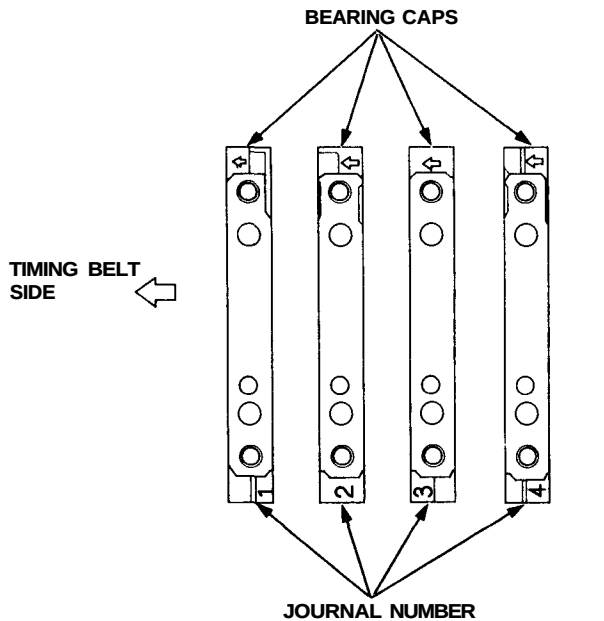


3. Install the thrust washers on the No. 4 journal. Oil the thrust washer surfaces.



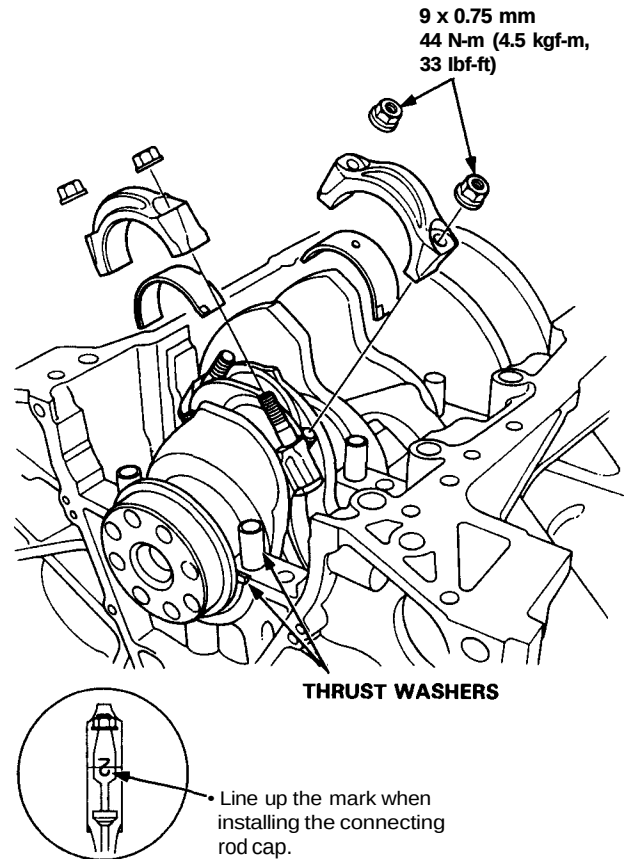


4. Install the bearings and caps. Torque the cap bolts.



5. Check the connecting rod bearing clearance with plastigage (see page 7-7), then torque the connecting rod cap nuts.

NOTE: Reference numbers on the connecting rods are for big-end bore tolerance and do NOT indicate the position of the piston in the engine.



(cont'd)

Crankshaft

Installation (cont'd)

6. Tighten the 9 x 1.25 mm cap bolts to the specified torque.

Torque: 39 N-m (4.0 kgf-m, 29 lbf-ft)

7. Tighten the 11 x 1.5 mm cap bolts to the specified torque.

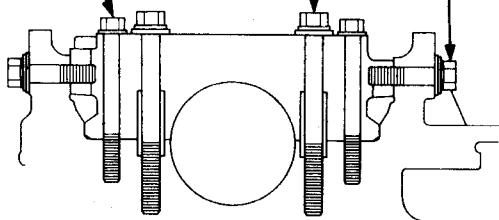
Torque: 76 N-m (7.8 kgf-m, 56 lbf-ft)

8. Tighten the 10 x 1.25 mm cap side bolts to the specified torque.

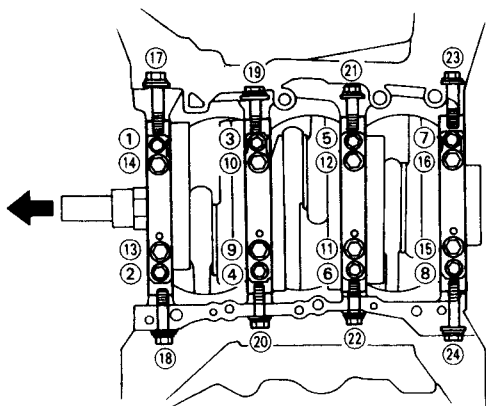
Torque: 49 N-m (5.0 kgf-m, 36 lbf-ft)

- Coat the bolt thread and seat surfaces with engine oil.

- ① 9 x 1.25 mm
39 N-m (4.0 kgf-m,
29 lbf-ft)
- ② 11 x 1.5 mm
76 N-m (7.8 kgf-m,
56 lbf-ft)
- ③ 10 x 1.25 mm
49 N-m (5.0 kgf-m,
36 lbf-ft)

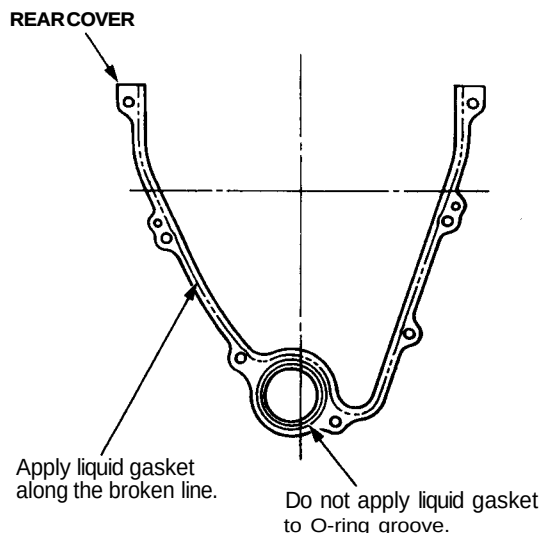


BEARING CAP BOLTS TORQUE SEQUENCE



CAUTION: Whenever any crankshaft bearing 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 approximately 15 minutes.

9. Apply liquid gasket to the cylinder block mating surface of the rear cover, then install it on the cylinder block.



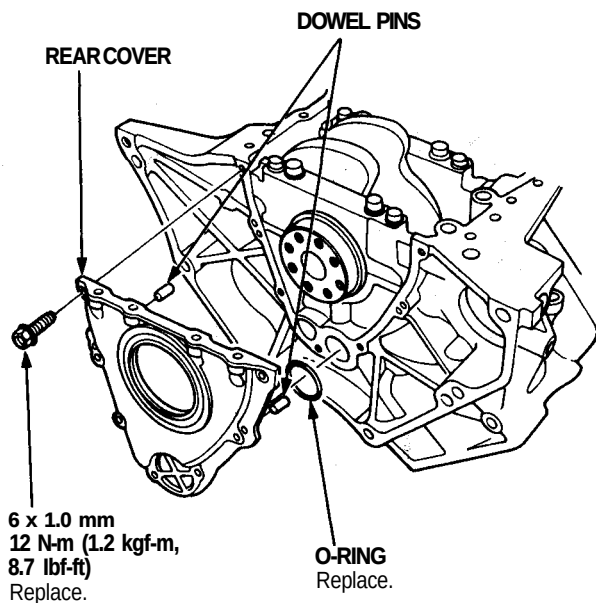
NOTE:

- Use liquid gasket, Part No. 08718 - 0001 or 08718 - 0003.
- Check that the mating surfaces are clean and dry before applying liquid gasket.
- Apply liquid gasket evenly, being careful to cover all the mating surface.
- To prevent oil leakage, apply liquid gasket to the inner threads of the bolt holes.
- Do not apply liquid gasket to O-ring grooves.
- Do not install the parts if five minutes or more have elapsed since applying liquid gasket. Instead reapply liquid gasket after removing old residue.
- After assembly, wait at least 30 minutes before filling the engine with oil.



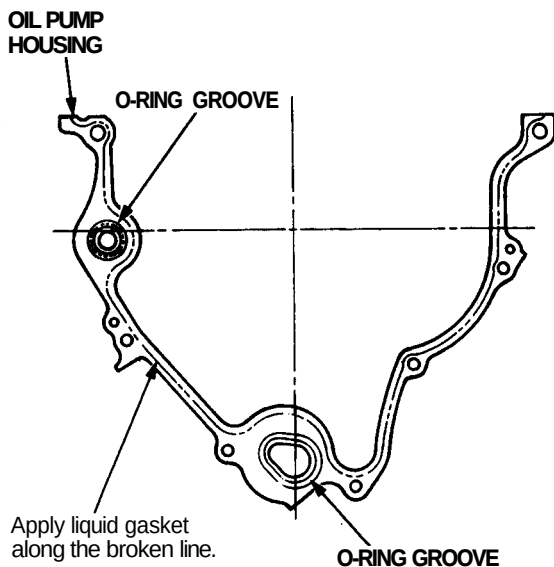
NOTE:

- Apply a light coat of oil to the crankshaft and to the lip of the oil seal.
- Use a new O-ring and apply oil when installing it.
- Use new special bolts when installing the rear cover.



10. Apply liquid gasket to the cylinder block mating surface of the oil pump.

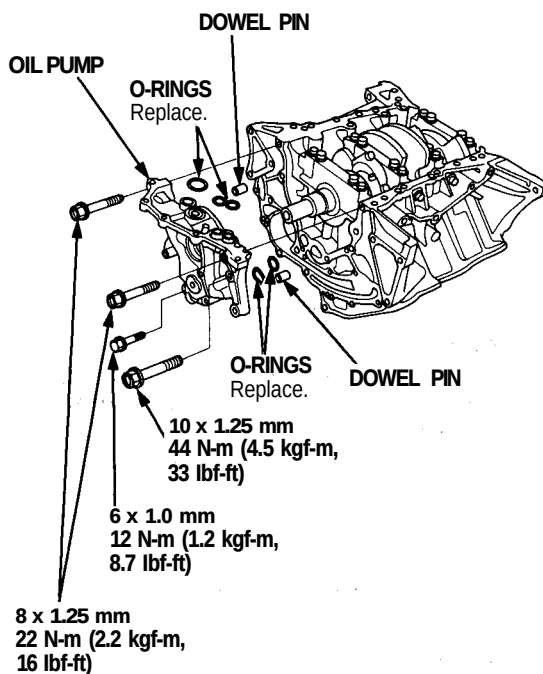
NOTE: Do not apply liquid gasket to O-ring grooves.



NOTE:

- Apply a light coat of oil to the crankshaft and to the lip of the seal.
- Use new O-rings and apply oil when installing them.
- Use new special bolts when installing the oil pump housing.

11. Install the oil pump with new O-rings.

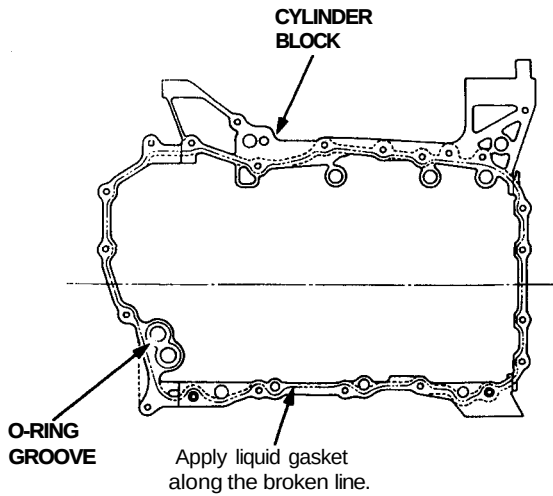


(cont'd)

Crankshaft

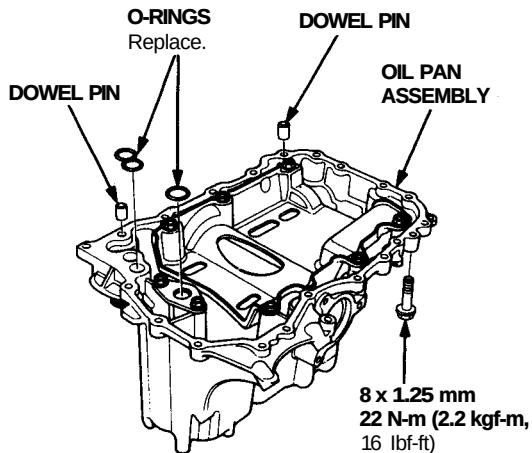
Installation (cont'd)

12. Apply liquid gasket to the cylinder block, then install the oil pan.



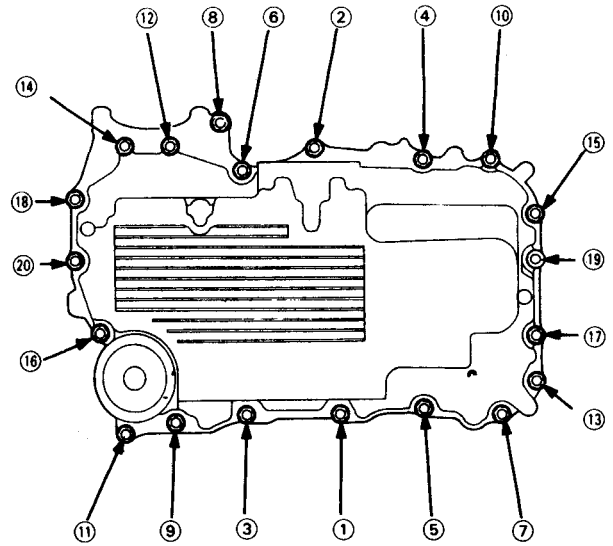
NOTE:

- Do not apply liquid gasket to the O-ring grooves.
- Use new O-rings and apply oil when installing them.



13. Tighten the oil pan bolts as shown.

OIL PAN BOLT TIGHTENING SEQUENCE 8 x 1.25 mm: 22 N-m (2.2 kgf-m, 16 lbf-ft)



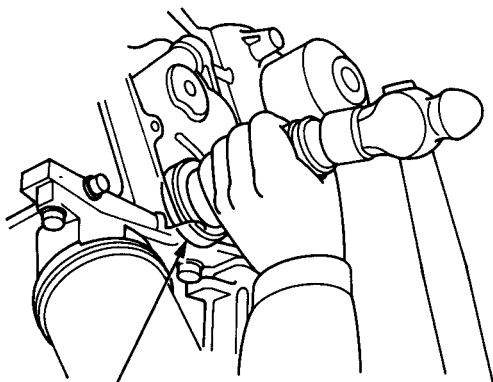


Crankshaft Oil Seals

Installation (engine removal not required)

NOTE: The seal surface on the block should be dry. Apply a light coat of grease to the crankshaft and to the lips of the seals.

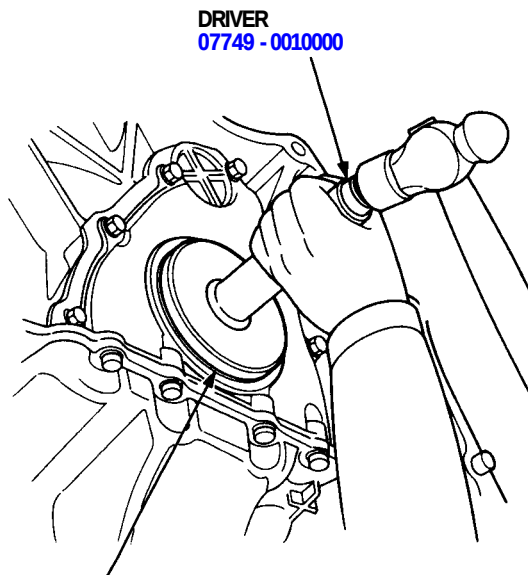
1. Using the special tool, drive in the crankshaft oil seal until the driver bottoms against the oil pump. When the seal is in place, clean any excess grease off the crankshaft and check that the oil seal lip is not distorted.



SEAL DRIVER
07GAD - PH70201
Install seal with the
part number side
facing out.

2. Measure the crankshaft oil seal thickness and the oil seal housing depth. Using the special tool, drive the crankshaft oil seal into the rear cover to the point where the clearance between the bottom of the oil seal and the rear cover is 0.2 - 0.5 mm (0.01 - 0.02 in) (see page 7-20).

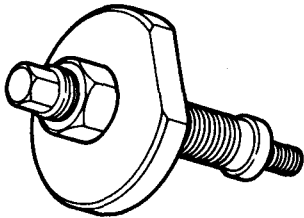
NOTE: Align the hole in the driver attachment with the pin on the crankshaft.



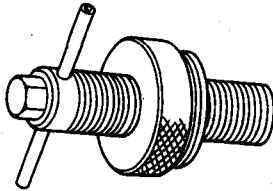
DRIVER ATTACHMENT
07948 - SB00101
Install seal with the
part number side
facing out.

Special Tools

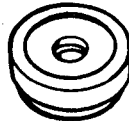
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07LAC-PW50101	Extension Shaft Puller	1	8-8
②	07MAF-PY40101	Extension Shaft Installer	1	8-10
③	07746-0010500	Attachment, 62 x 68 mm	1	8-13
④	07749-0010000	Driver	1	8-13
⑤	07912-6110001	Oil Filter Wrench	1	8-5



①



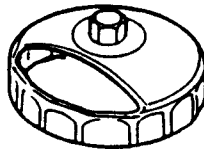
②



③



④



⑤



Illustrated Index

NOTE:

- Use new O-rings when reassembling.
- Apply oil to O-rings before installation.
- Use liquid gasket, Part No. 08718 - 0001 or 08718 - 0003.
- Clean the oil control orifice before installing.

**OIL CONTROL ORIFICES
(CAMSHAFT JOURNAL)**
Remove with 6 x 1.0 mm
bolt and clean.

**OIL CONTROL ORIFICE
(HYDRAULIC TAPPET)**
Remove with 6 x 1.0 mm bolt
and clean.

**OIL CONTROL ORIFICE
(HYDRAULIC TAPPET)**
Remove with 6 x 1.0 mm bolt
and clean.

O-RING
Replace.

O-RINGS
Replace.

OIL PUMP
Overhaul, page 8-11
Inspection, page 8-12
Apply liquid gasket to
block mating surface.

**ENGINE OIL PRESSURE
SWITCH**
18 N-m (1.8 kgf-m, 13 lbf-ft)
1/8 in. BSPT (British
Standard Pipe Taper)
28 threads/inch. Use
proper liquid sealant.

**DOWEL
PINS**

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

O-RING
Replace.

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

O-RING
Replace.

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

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

SNAP RING
Install with open
side facing up.

OIL FILTER
Replacement, page 8-5

WASHER
Replace.

DRAIN BOLT
14 x 1.5 mm
44 N-m (4.5 kgf-m, 33 lbf-ft)
Do not overtighten.

**OIL PAN INNER
PIPE**
Clean when installing.

O-RINGS
Replace.

OIL PAN
Apply liquid gasket
to mating surface.

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

OIL SCREEN

**LOWER BAFFLE
PLATE**

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

BAFFLE PLATE

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

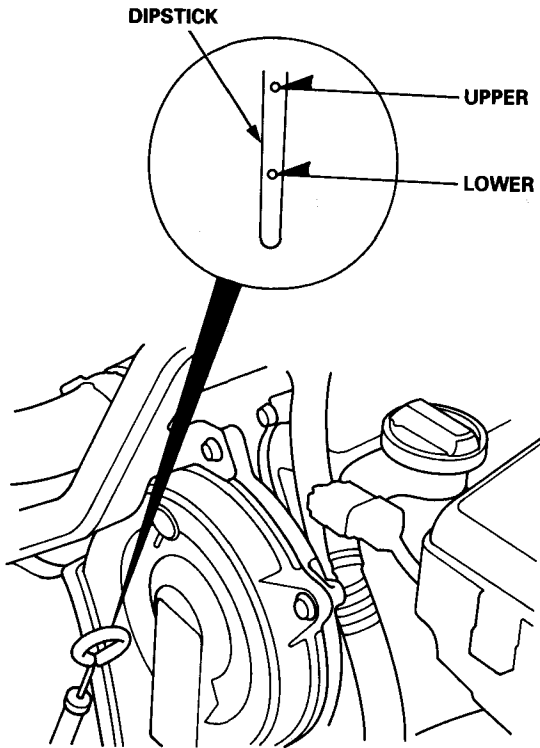
O-RINGS
Replace.

Engine Oil

Inspection

1. Check engine oil with the engine off and the car parked on level ground.
2. Make certain that the oil level indicated on the dipstick is between the upper and lower marks.
3. If the level has dropped close to the lower mark, add oil until it reaches the upper mark.

CAUTION: Insert the dipstick carefully to avoid bending it.

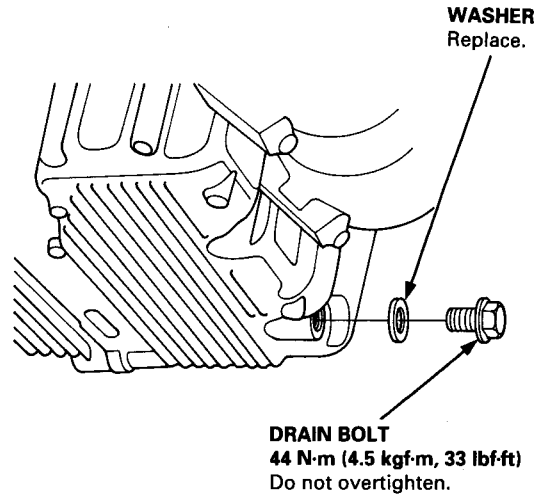


Engine Oil

Replacement

CAUTION: Remove the drain bolt carefully while the engine is hot; the hot oil may cause scalding.

1. Warm up the engine.
2. Drain the engine oil.



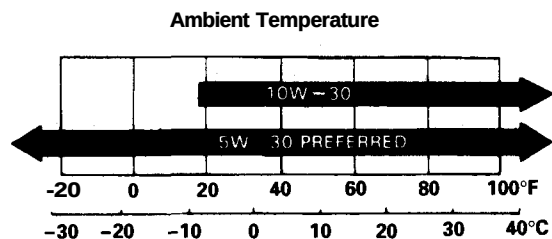
3. Reinstall the drain bolt with a new washer, and refill with the recommended oil.

Requirement	API Service Grade: Use an "Energy Conserving" SJ grade oil or an "Energy Conserving II" SH grade oil, SAE 5 W – 30 preferred. You can also use an oil that bears the API CERTIFICATION mark.
Capacity	4.0 ℓ (4.2 US qt, 3.5 Imp qt) at oil change. 4.7 ℓ (5.0 US qt, 4.1 Imp qt) at oil change including filter. 5.3 ℓ (5.6 US qt, 4.7 Imp qt) after engine overhaul.
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).

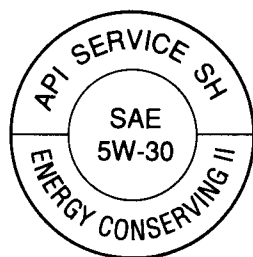
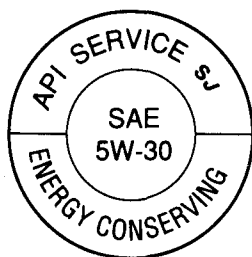
NOTE: Under normal conditions, the oil filter should be replaced at every oil change. Under severe conditions, the oil filter should be replaced at each oil change.



The numbers in the middle of the API Service label tell you the oil's SAE viscosity or weight. Select the oil for your car according to this chart:



An oil with a viscosity of 5W - 30 is preferred for improved fuel economy and year-round protection in the car. You may use a 10W - 30 oil if the climate in your area is limited to the temperature range shown on the chart.



API SERVICE LABEL



API CERTIFICATION MARK

4. Run the engine for more than three minutes, then check for oil leakage.



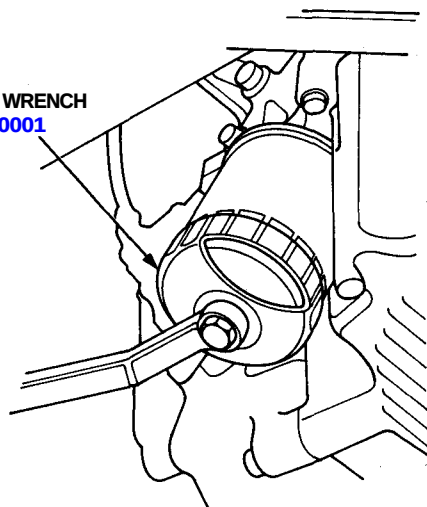
Oil Filter

Replacement

CAUTION: Loosen the engine oil filter carefully while the engine is hot, the hot oil may cause scalding.

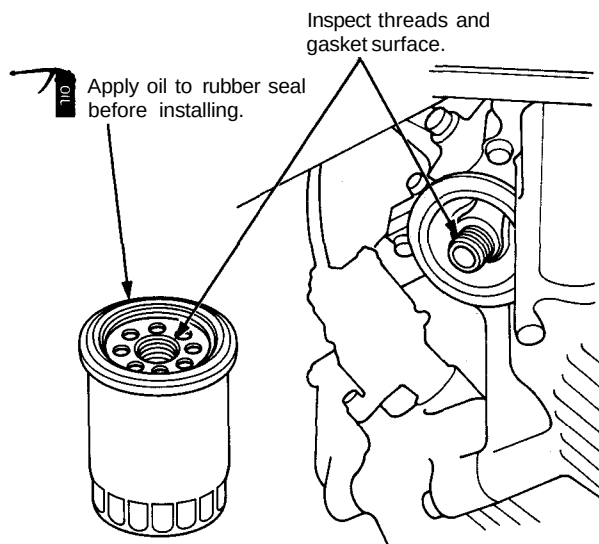
1. Remove the engine oil filter with the oil filter wrench.

OIL FILTER WRENCH
07912-6110001



2. Inspect the threads and rubber seal on the new filter. Wipe off the seat on the oil filter base, then apply a light coat of oil to the rubber seal.
3. Install the oil filter by hand.
4. After the rubber seal is seated, tighten the oil filter by turning it approximately one turn.

Torque: One turn or 22 N-m (2.2 kgf-m, 16 lbf-ft).



4. Start the engine and check the filter for oil leakage.

Oil Pressure

Testing

If the oil pressure warning light 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.
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:

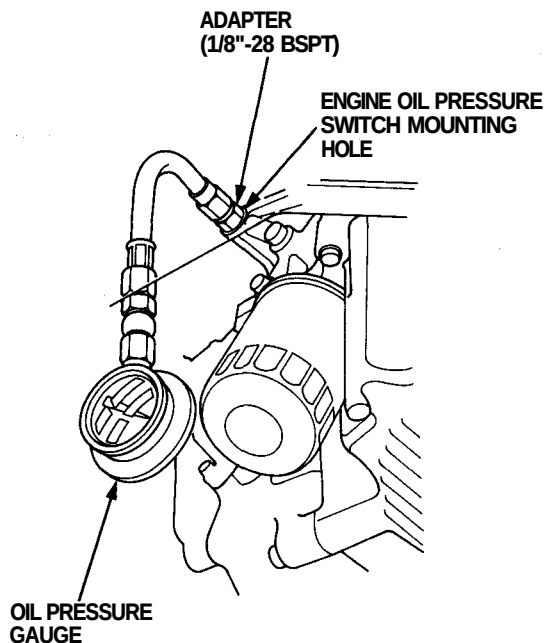
Engine Oil Temperature: 176°F (80°C)

Engine Oil Pressure:

At Idle: 70 kPa (0.7 kgf/cm², 10 psi)
minimum

At 3,000 rpm: 340 kPa (3.5 kgf/cm², 50 psi)
minimum

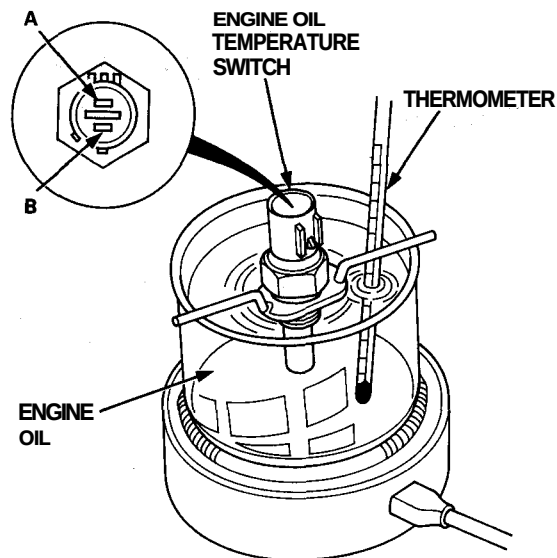
- If oil pressure is within specifications, replace the oil pressure switch and recheck.
- If oil pressure is NOT within specifications, inspect the oil pump (see page 8-12).



Engine Oil Temperature Switch

Testing

1. Remove the engine oil temperature switch from the right cylinder head cover (see page 6-12).
2. Suspend the engine oil temperature switch in a container of engine oil as shown.



3. Heat the engine oil and check the temperature with a thermometer.

CAUTION: Do not let the thermometer touch the bottom of the hot container.

4. Measure the resistance between the A and B terminals according to the table.

		Terminal	
Operation	Temperature	A	B
SWITCH	ON 192° – 203°F (89° – 95°C)	○	○
	OFF 18° – 36°F (10° – 20°C) lower than the temperature when it goes on		

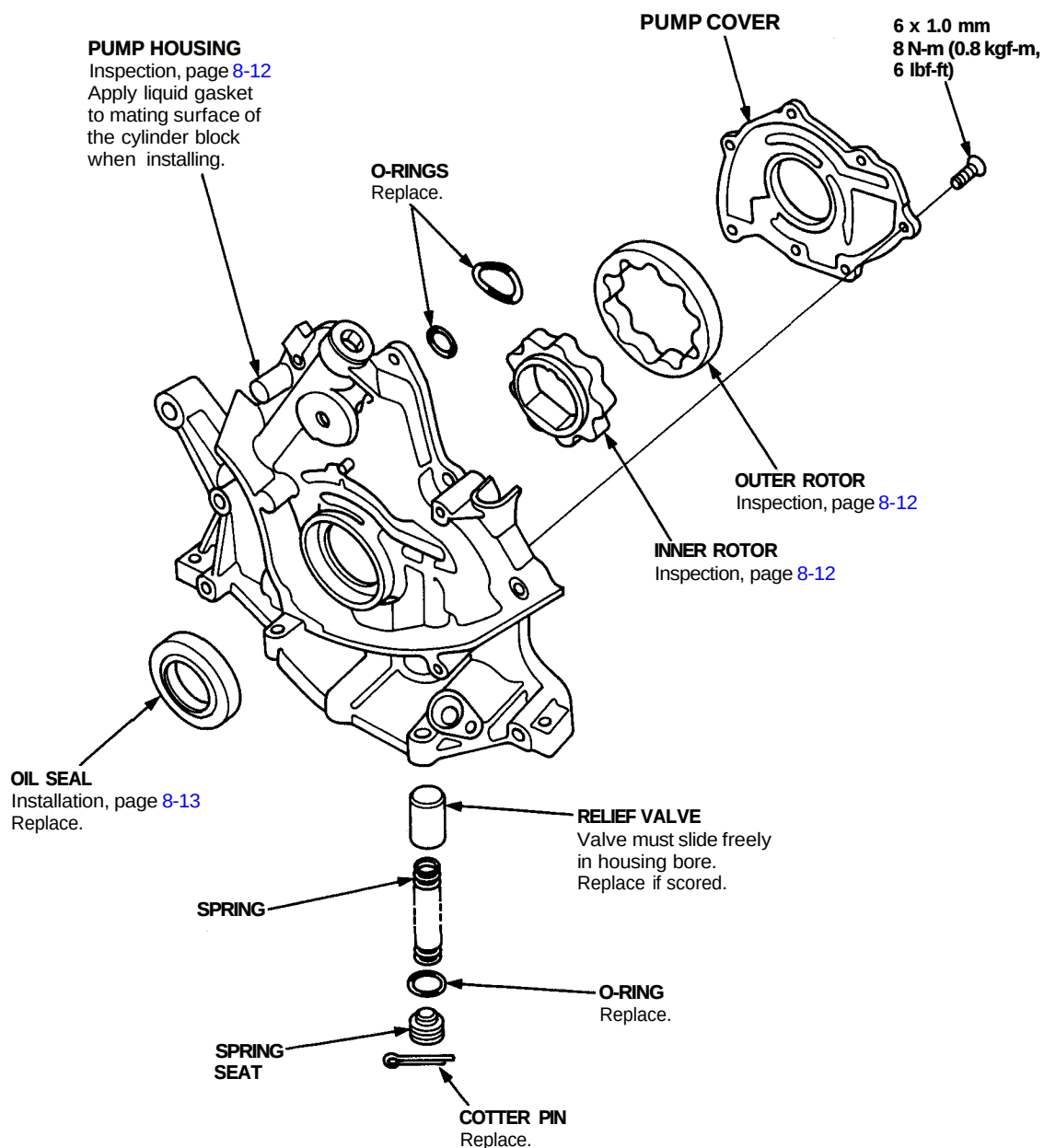


Oil Pump

Overhaul

NOTE:

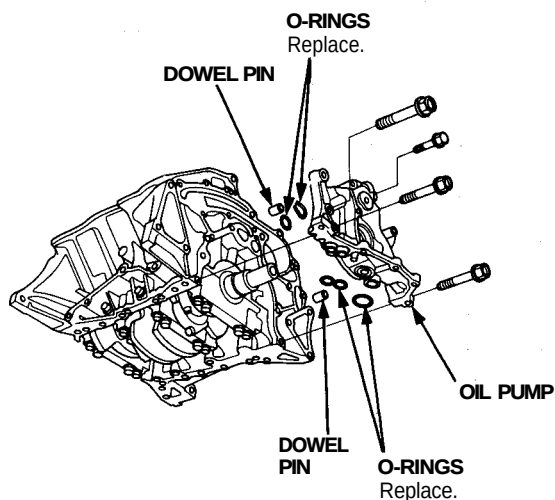
- Use new O-rings when reassembling.
- Apply oil to the O-rings before installation.
- Use liquid gasket, Part No. 08718 - 0001 or 08718 - 0003.
- The rotors must be installed in the same direction.
- After reassembly, check that the rotors move without binding.



Oil Pump

Removal/Inspection/Installation

1. Drain the engine oil and the differential oil.
2. Turn the crankshaft to TDC (see page 6-10).
3. Remove the timing belt (see page 6-6).
4. Remove the oil pan (see page 8-7).
5. Remove the special bolts, then remove the oil pump.

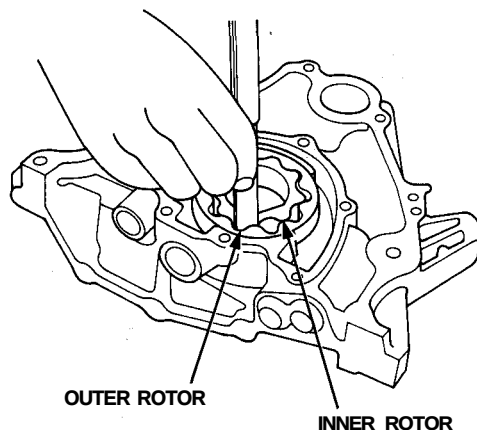


6. Remove the screws from the pump housing, then separate the housing and cover.
7. Check the inner-to-outer rotor radial clearance on the pump rotor.

Inner Rotor-to-Outer Rotor Radial Clearance

Standard (New): 0.02 - 0.16 mm
(0.001 - 0.006 in)

Service Limit: 0.20 mm (0.008 in)



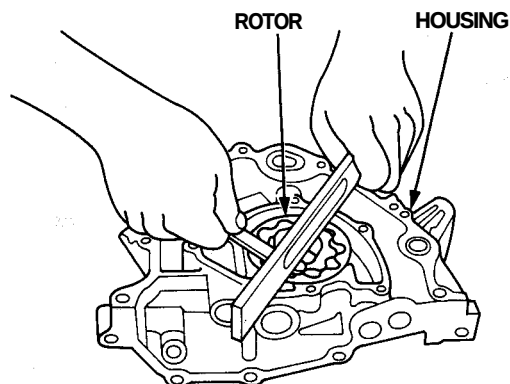
— If the inner-to-outer rotor clearance exceeds the service limit, replace the inner and outer rotors.

8. Check the housing-to-rotor axial clearance on the pump rotor.

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)



— If the housing-to-rotor axial clearance exceeds the service limit, replace the set of inner and outer rotors and/or the pump housing.

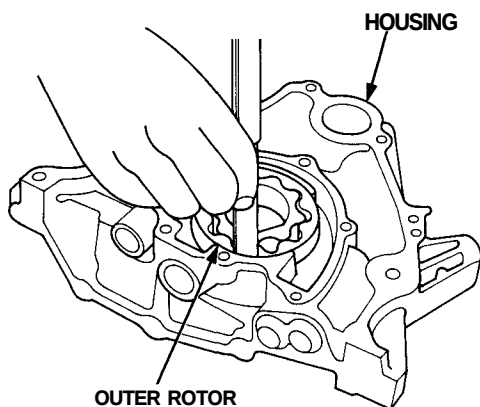


9. Check the housing-to-outer rotor radial clearance.

Housing-to-Outer Rotor Radial Clearance

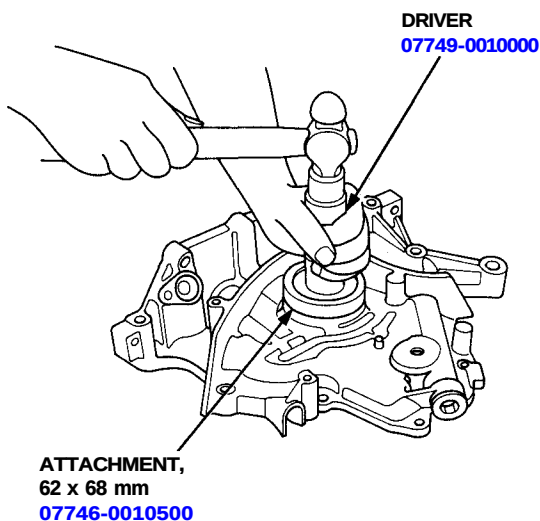
Standard (New): 0.10 - 0.18 mm
(0.004 - 0.007 in)

Service Limit: 0.20 mm (0.008 in)



— If the housing-to-outer rotor radial clearance exceeds the service limit, replace the set of inner and outer rotors and/or the pump housing.

10. Inspect both rotors and the pump housing for scoring or other damage. Replace parts if necessary.
11. Remove the old oil seal from the oil pump.
12. Using the special tool, gently tap in the new crankshaft oil seal until the tool bottoms on the pump.



13. Reassemble the oil pump, applying liquid thread lock to the pump housing screws.

14. Check that the oil pump turns freely.

15. Apply a light coat of oil to the seal lip.

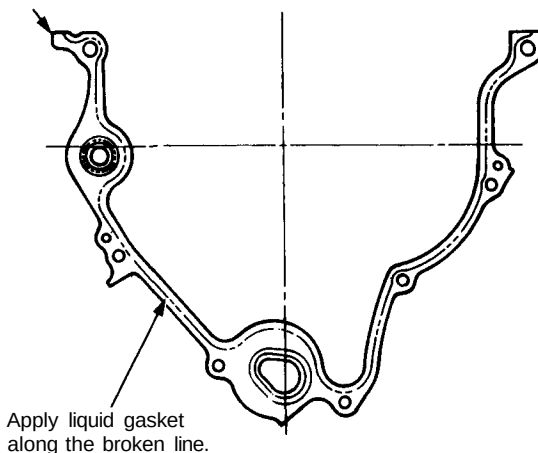
16. Install the two dowel pins and new O-ring on the cylinder block.

17. Apply liquid gasket to the cylinder block mating surface of the oil pump.

NOTE:

- Use liquid gasket, Part No. 08718 - 0001 or 08718 - 0003.
- Check that the mating surfaces are clean and dry before applying liquid gasket.
- Apply liquid gasket evenly, in a narrow bead centered on the mating surface.
- Do not apply liquid gasket to the O-ring grooves.
- To prevent leakage, apply liquid gasket to the inner threads of the bolt holes.
- Do not install the parts if five minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.
- After assembly, wait at least 30 minutes before filling the engine with oil.

OIL PUMP HOUSING

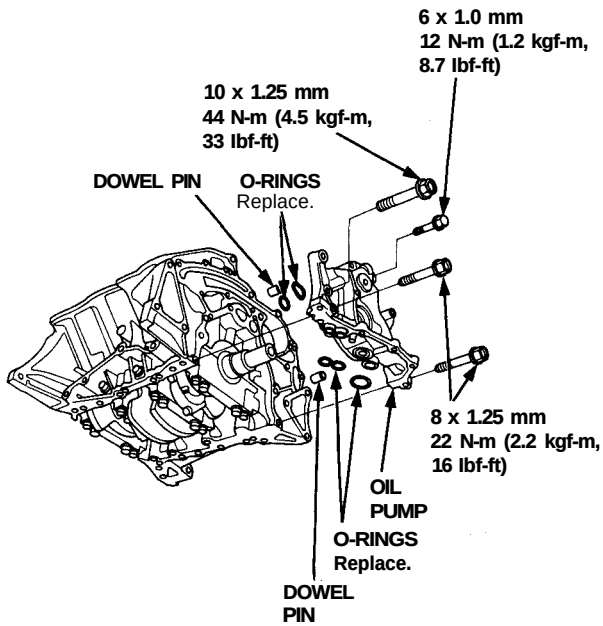


(cont'd)

Oil Pump

Removal/Inspection/Installation (cont'd)

18. Install the oil pump to the cylinder block.

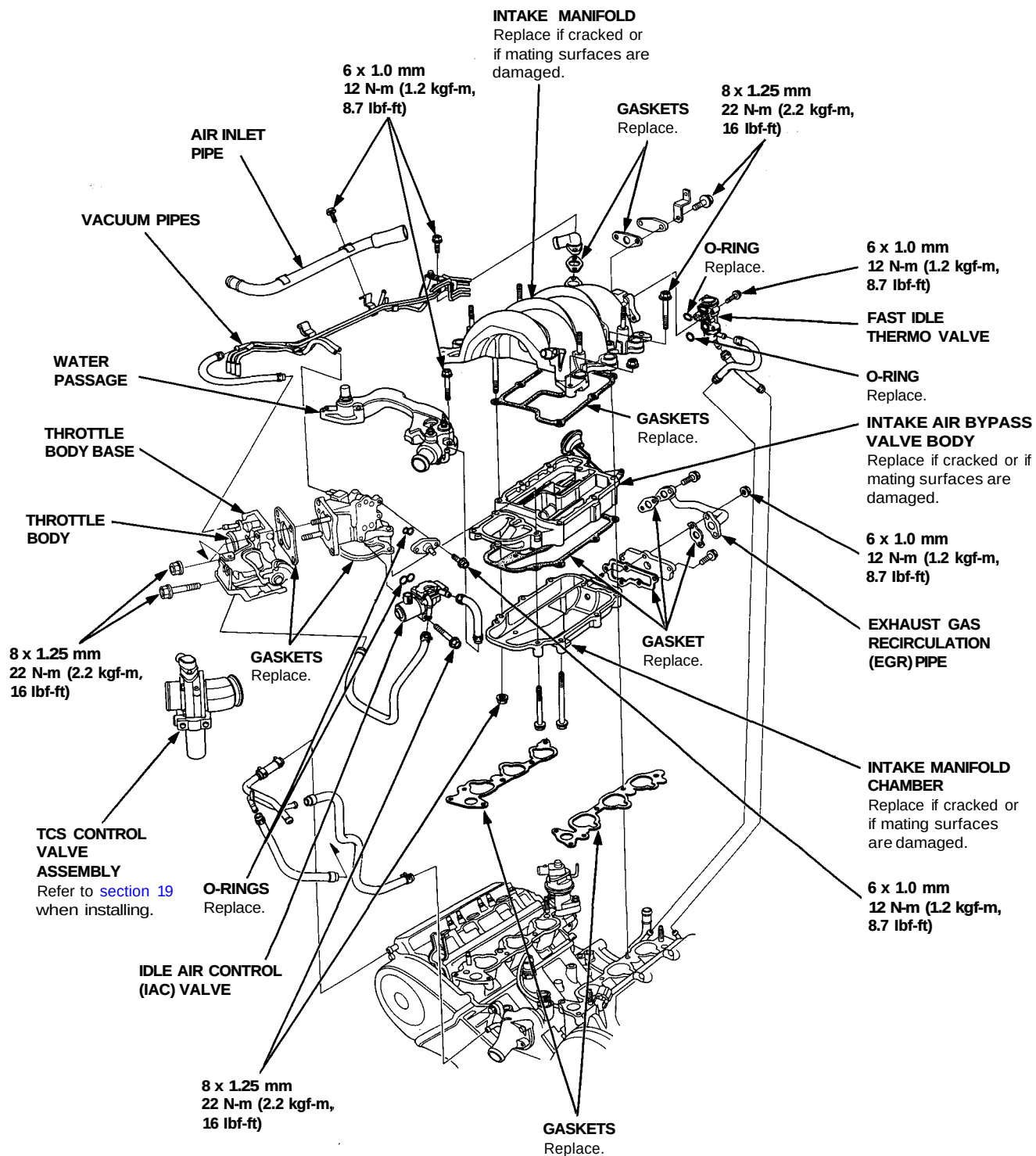


19. Install the oil pan (see page [8-9](#)).
20. Install the timing belt (see page [6-8](#)).

Intake Manifold

Replacement

NOTE: Use new O-rings and gaskets when reassembling.



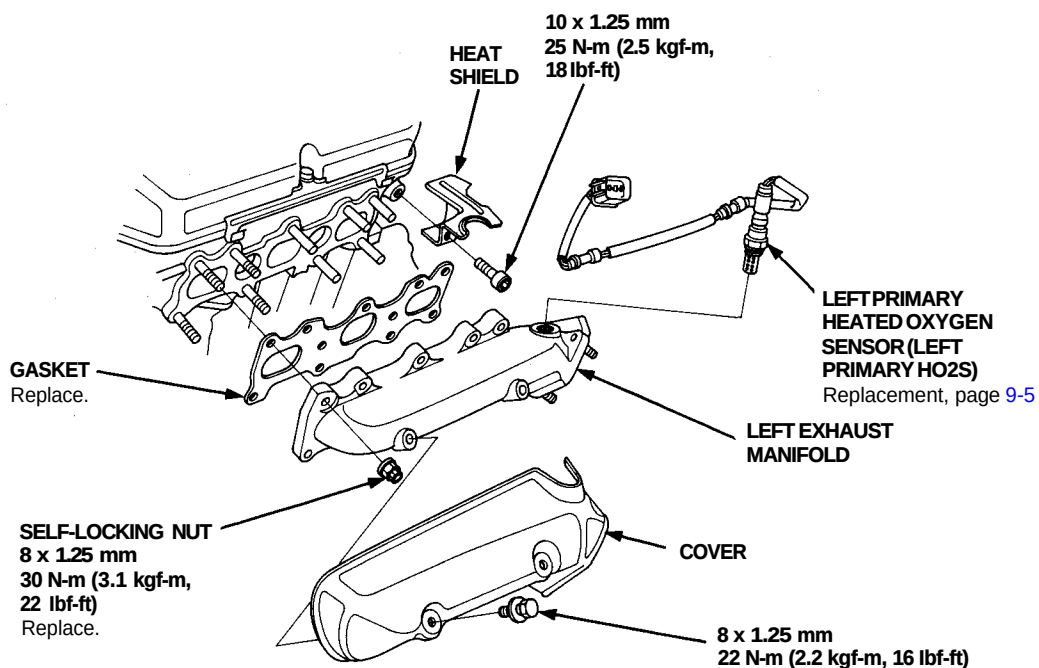


Exhaust Manifold

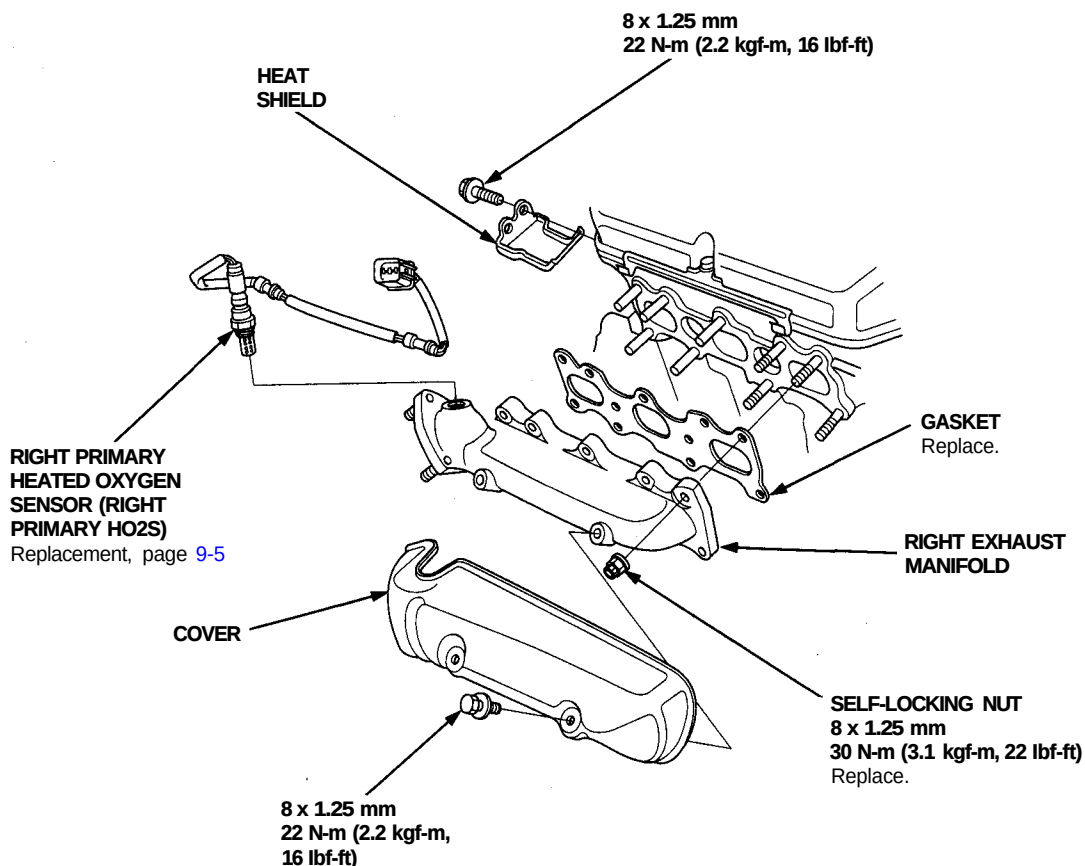
Replacement

NOTE: Use new gaskets and self-locking nuts when reassembling.

LEFT:



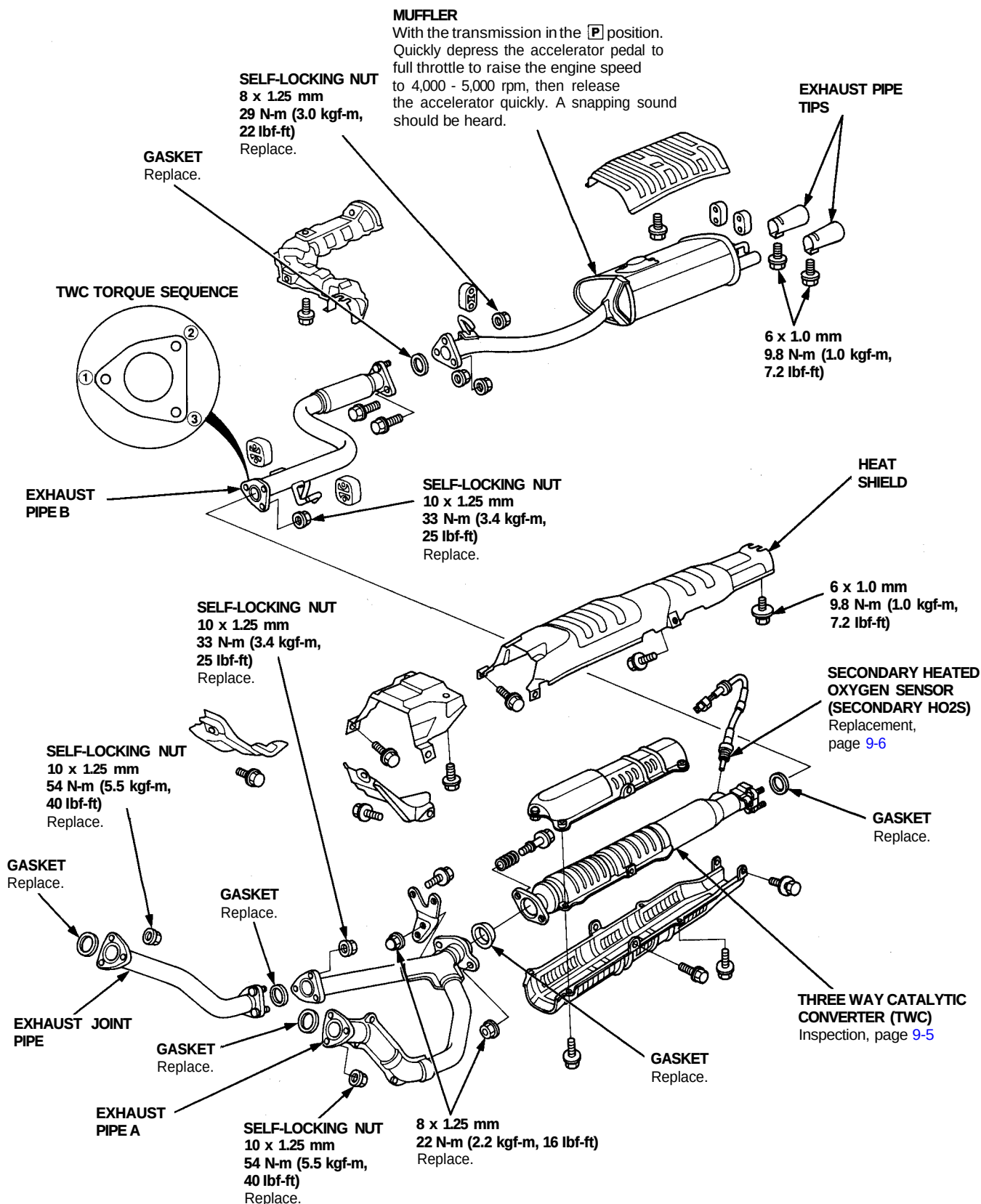
RIGHT:



Exhaust Pipe and Muffler

Replacement

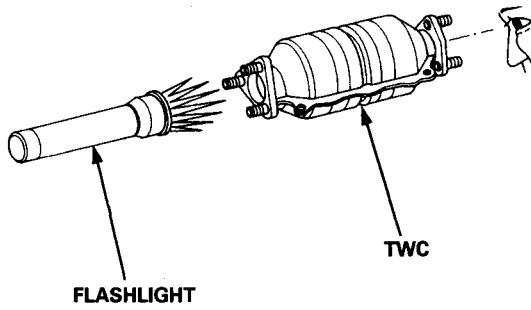
NOTE: Use new gaskets and self-locking nuts when reassembling.





Inspection

1. Using a flashlight, make a visual check for plugging, melting or cracking of the catalyst.





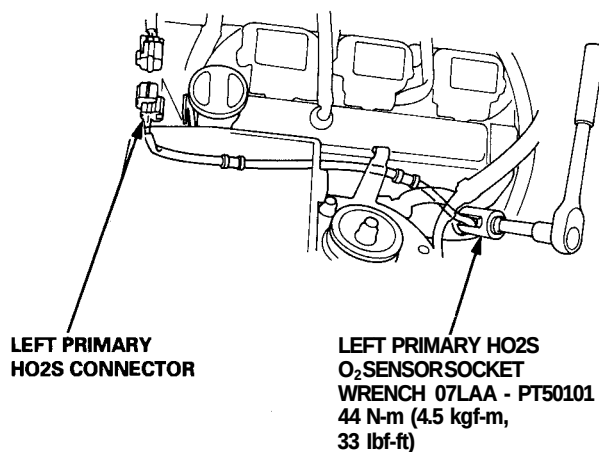
HO2S

Replacement

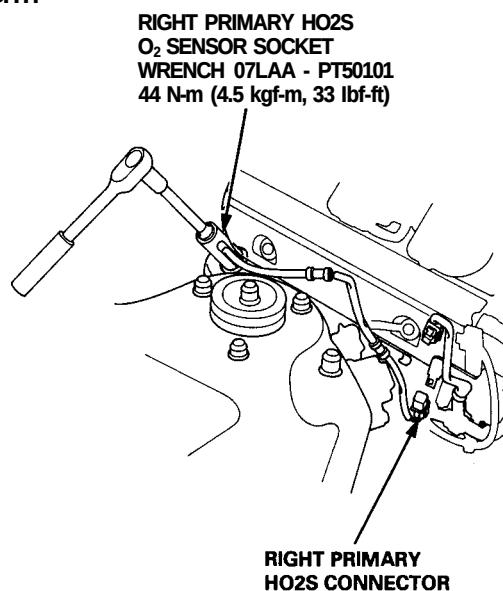
Primary HO2S:

1. Disconnect the left and/or right primary HO2S connector, then remove the left and/or right primary HO2S.

LEFT:



RIGHT:



2. Install the left and/or right primary HO2S in reverse order of removal.

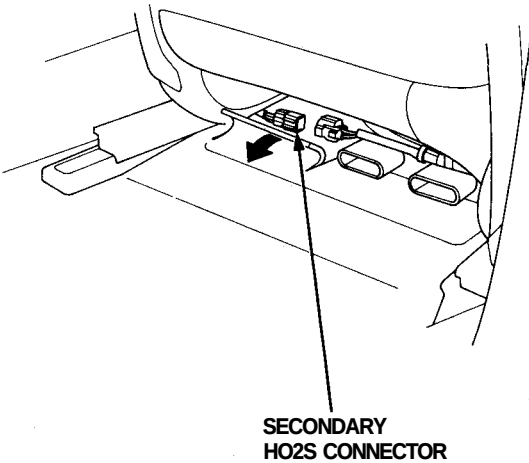
(cont'd)

H02S

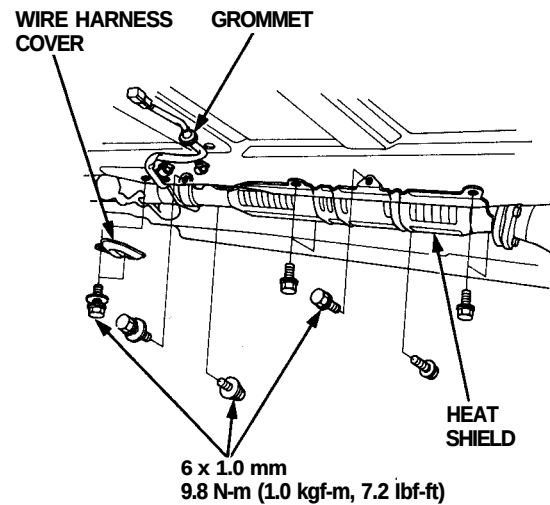
Replacement (cont'd)

Secondary H02S:

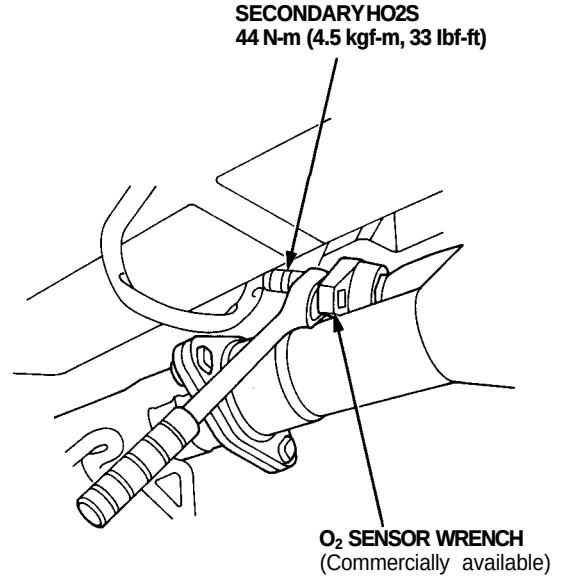
1. Move the front passenger's seat forward. Pull the carpet back to expose the secondary H02S connector.
2. Disconnect the secondary H02S connector.



3. Remove the wire harness cover, then remove the grommet.
4. Remove the heat shields.



5. Remove the secondary H02S.



6. Install the secondary H02S in reverse order of removal.

Radiator

Illustrated Index

⚠ WARNING System is under high pressure when the engine is hot. To avoid danger of releasing scalding coolant, remove the cap only when the engine is cool.

Total Cooling System Capacity (Including heater and reservoir)

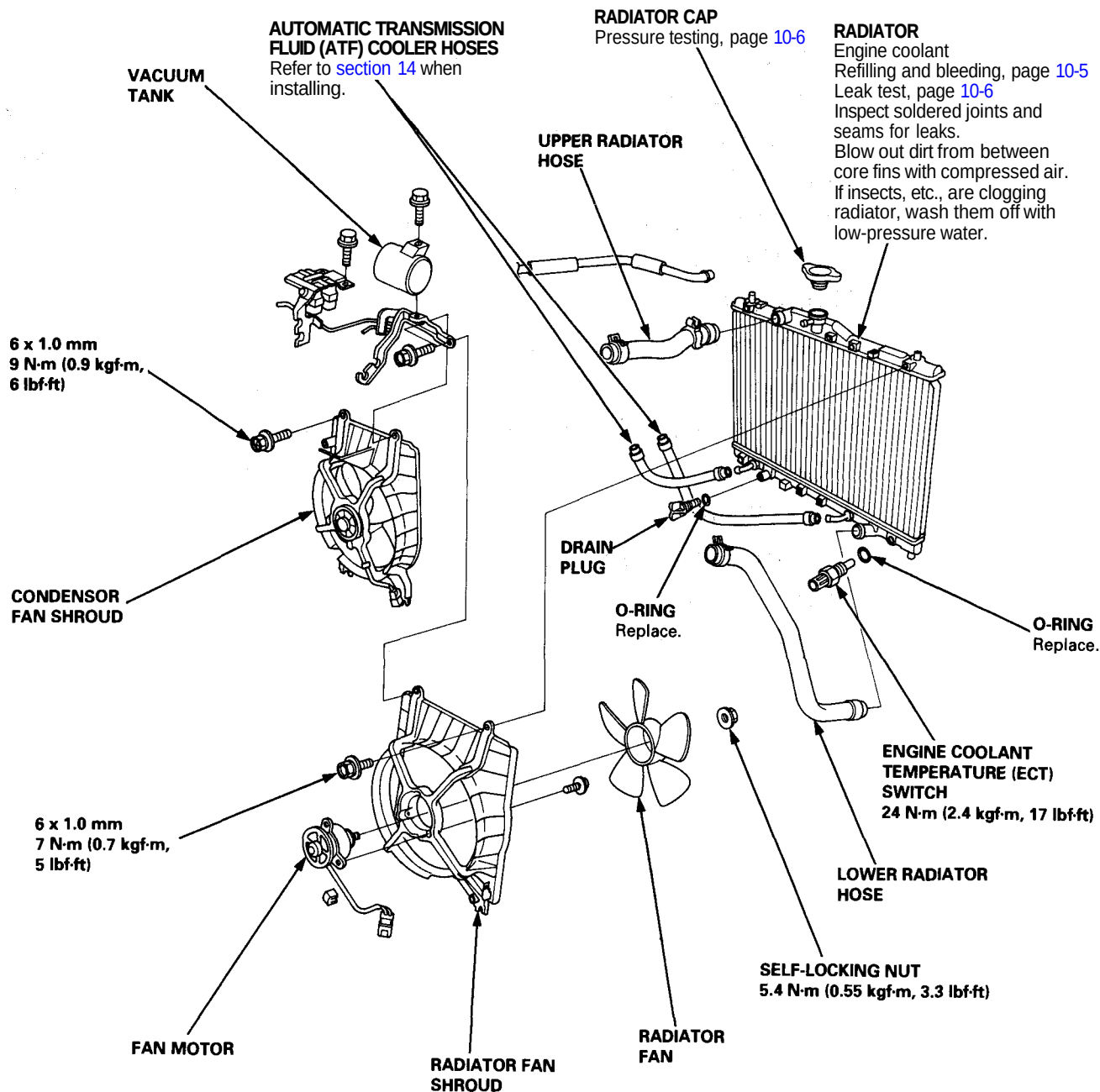
7.7 ℓ (8.1 US qt, 6.8 Imp qt)

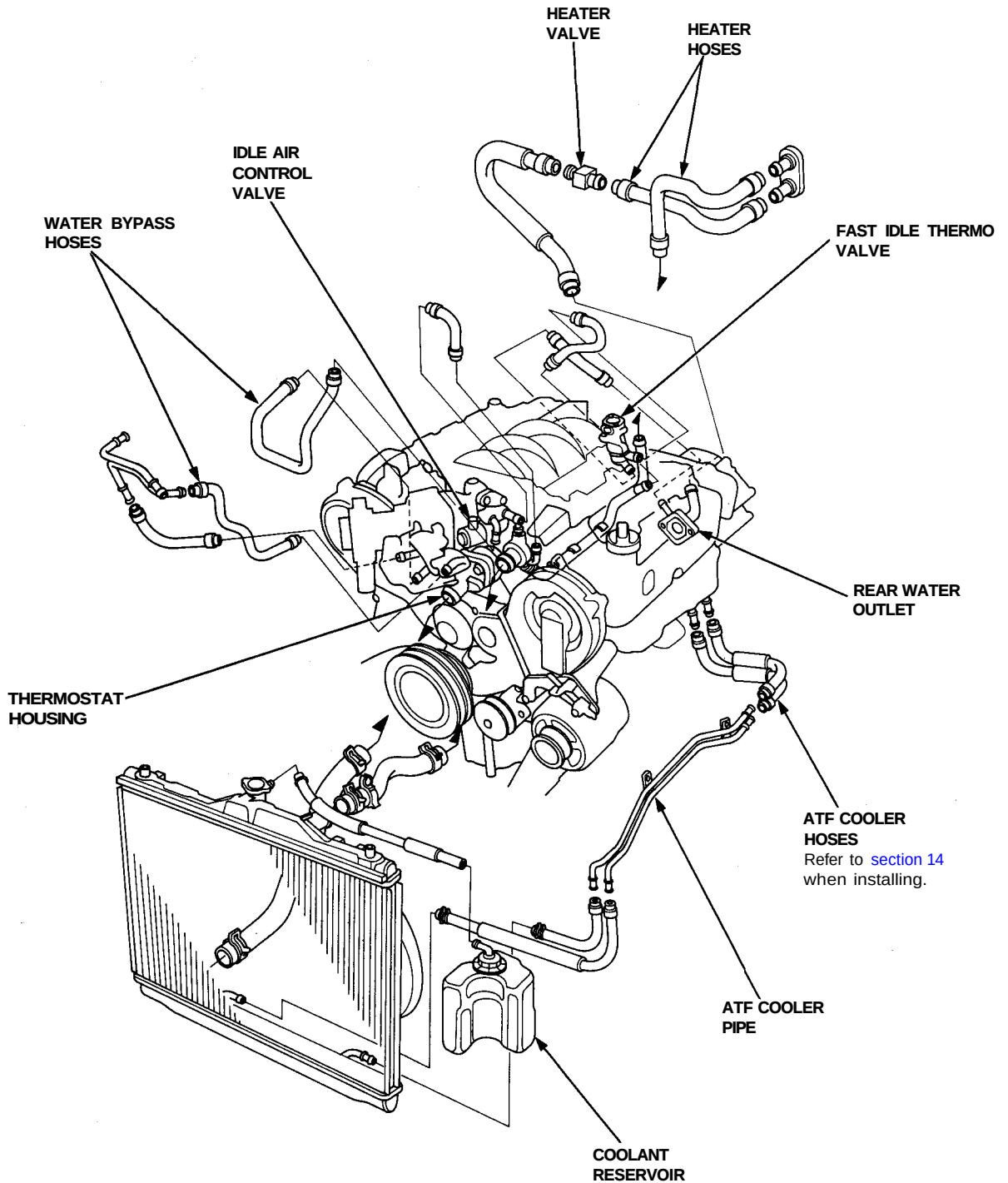
Reservoir capacity: 0.65 ℓ (0.69 US qt, 0.57 Imp qt)

CAUTION: When pouring engine coolant, be sure to shut the relay box lid and not to spill coolant on the electrical parts or the painted portion. If any coolant spills, rinse it off immediately.

NOTE:

- Check all cooling system hoses for damage, leaks or deterioration and replace if necessary.
- Check all hose clamps and retighten if necessary.
- Use new O-rings when reassembling.



**Engine Hose Connections:**

Radiator

Replacement

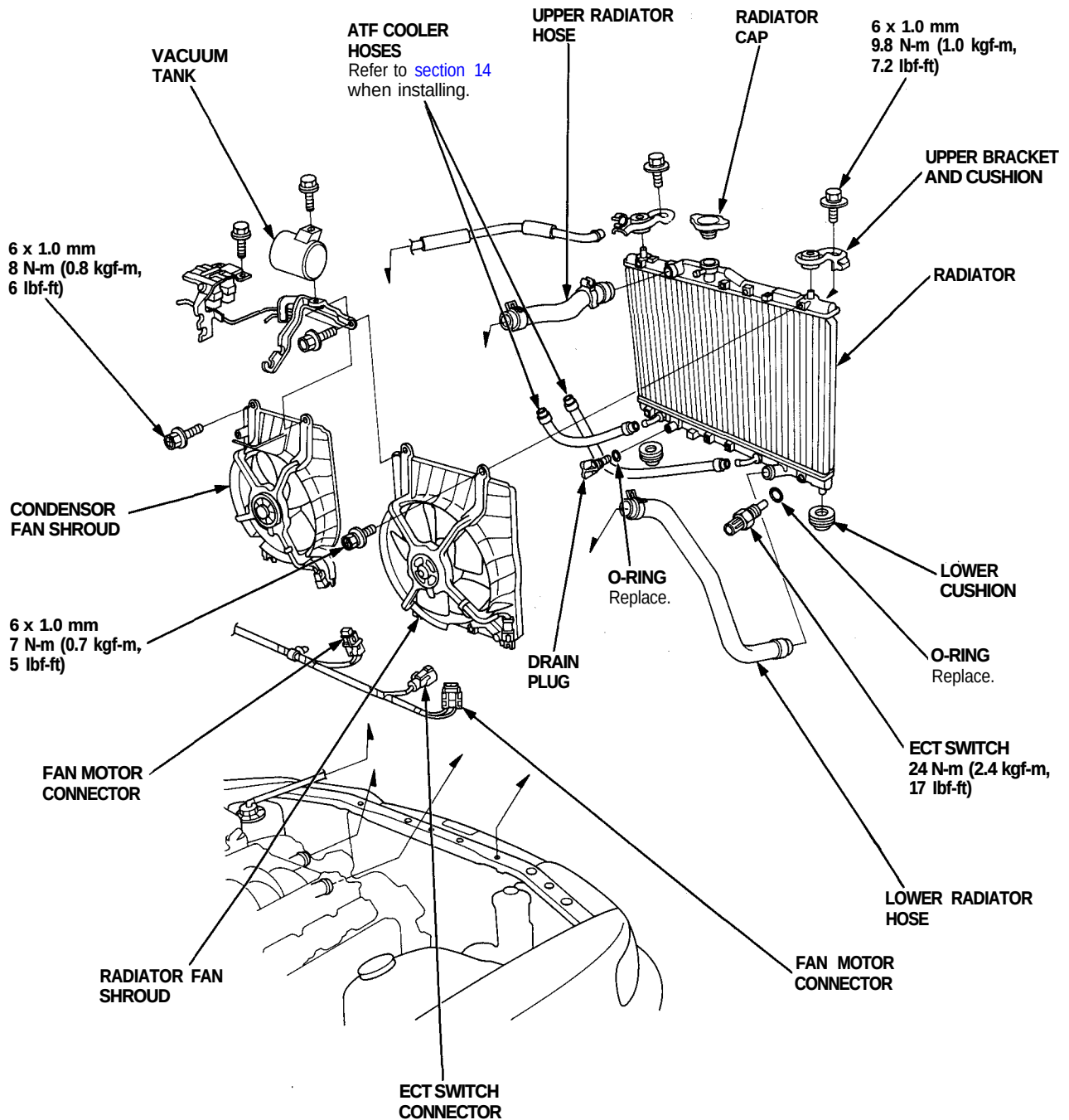
1. Drain the engine coolant.
2. Remove the upper and lower radiator hoses, and ATF cooler hoses.
3. Disconnect the fan motor connectors and ECT switch connector.
4. Remove the radiator upper brackets, then pull up the radiator.

5. Remove the fan shroud assemblies and other parts from the radiator.

Install the radiator in the reverse order of removal:

NOTE:

- Set the upper and lower cushions securely.
- Fill the radiator with engine coolant and bleed the air.



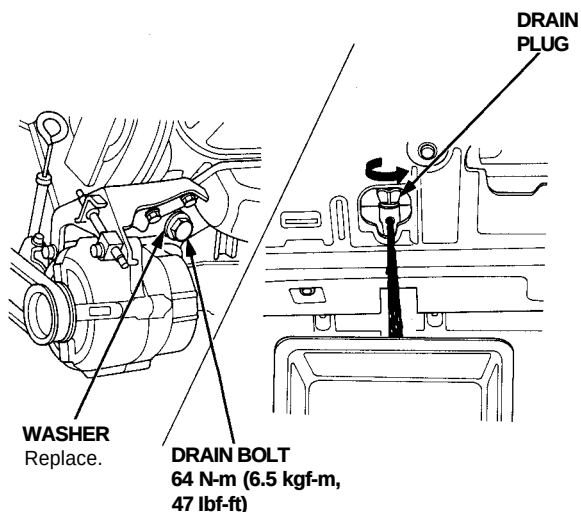


Engine Coolant Refilling and Bleeding

CAUTION: When pouring engine coolant, be sure to shut the relay box lid and not to let coolant spill on the electrical parts or the paint. If any coolant spills, rinse it off immediately.

NOTE:

- Perform this procedure when the engine is cool.
 - Before replacing the coolant, turn the ignition ON (II), slowly turn the climate control temperature knob to 90° and turn off the ignition. This will allow the coolant in the heater to drain out with the rest of the system.
1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's pre-set buttons.
 2. Disconnect the battery negative terminal first, then the positive terminal, then remove the battery and battery base (see page 5-4).
 3. When the radiator is cool, remove the radiator cap. Loosen the drain plug, and drain the coolant.
 4. Remove the drain bolt from the left side of the cylinder block to drain the block.



5. Apply liquid gasket to the drain bolt threads, then reinstall the bolt with a new washer and tighten it securely.
6. Tighten the radiator drain plug securely.
7. Remove, drain and reinstall the reservoir. Fill the tank halfway to the MAX mark with water, then up to the MAX mark with antifreeze.

8. Mix the recommended antifreeze with an equal amount of water in a clean container.

NOTE:

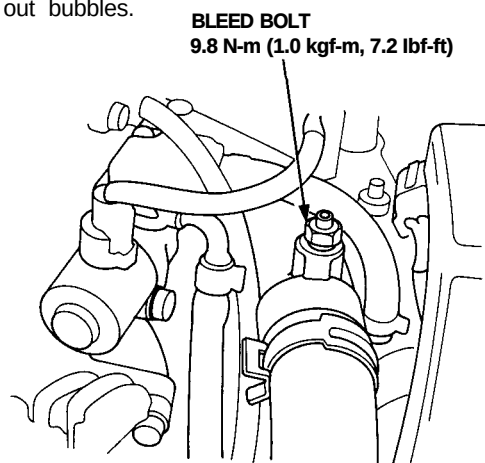
- Use only genuine Honda antifreeze/coolant.
- For best corrosion protection, the coolant concentration must be maintained year-round at 50% minimum. Coolant concentrations less than 50% may not provide sufficient protection against corrosion or freezing.
- Coolant concentrations greater than 60% will impair cooling efficiency and are not recommended.

CAUTION:

- Do not mix different brands of antifreeze/coolants.
- Do not use additional rust inhibitors or anti-rust products; they may not be compatible with the coolant.

Engine Coolant Refill Capacity [Including reservoir (0.65 ℓ (0.69 US qt, 0.57 Imp qt))]:
3.2 ℓ (3.4 US qt, 2.8 Imp qt)

9. Loosen the air bleed bolt in the water passage, then fill the radiator to the bottom of the filler neck with the coolant mixture. Tighten the bleed bolt as soon as coolant starts to run out in a steady stream without bubbles.

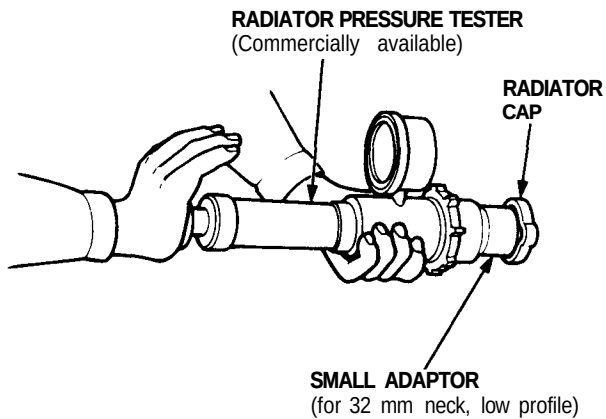


10. With the radiator cap off, start the engine and let it run until warmed up (radiator fan comes on at least twice). Then, if necessary, add more coolant mix to bring the level back up to the bottom of the filler neck.
11. Put the radiator cap on tightly, then run the engine again and check for leaks.
12. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Radiator

Cap Testing

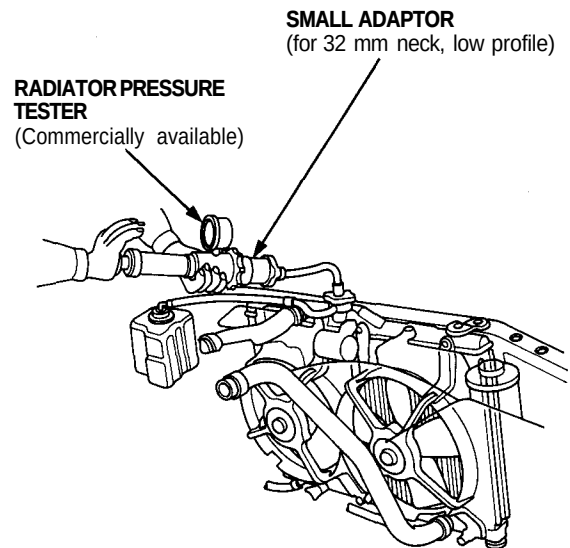
1. Remove the radiator cap, wet its seal with engine coolant, then install it on the pressure tester.
2. Apply a pressure of 93-123 kPa (0.95-1.25 kgf/cm², 14- 18 psi).
3. Check for a drop in pressure.
4. If the pressure drops, replace the cap.



Testing

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 the pressure tester 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.

NOTE: Check for engine oil in the coolant and/or coolant in the engine oil.

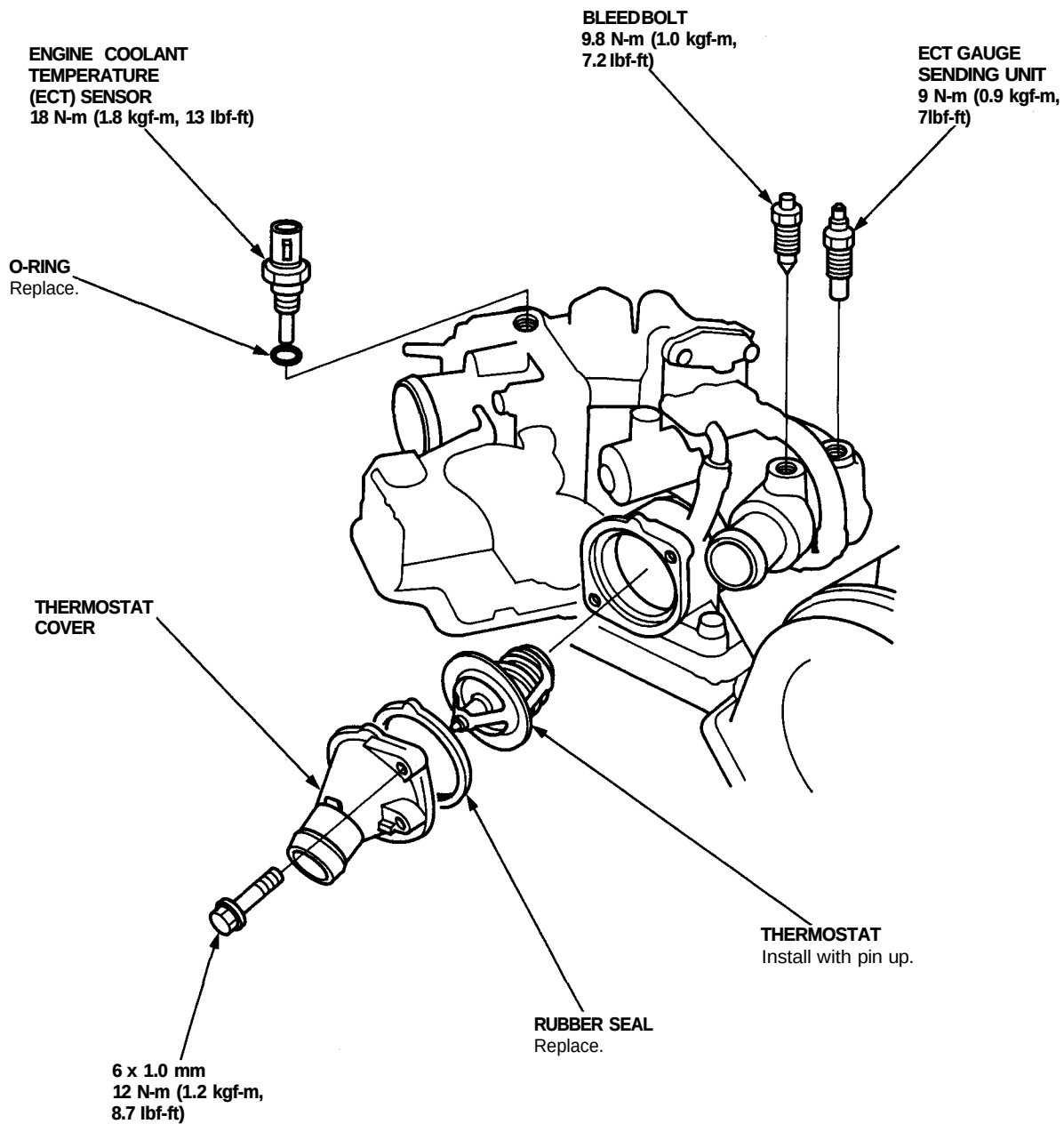




Thermostat

Replacement

NOTE: Use new O-rings when reassembling.



Thermostat

Testing

Replace the thermostat if it is open at room temperature.

To test a closed thermostat:

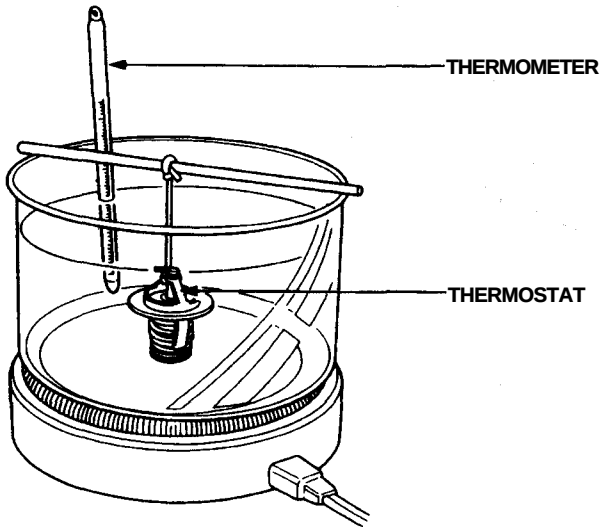
1. Suspend the thermostat in a container of water as shown.
2. Heat the water, and check the temperature with a thermometer. Check the temperature at which the thermostat first opens, and at which it is fully open.

CAUTION: Do not let the thermometer touch the bottom of the hot container.

3. Measure 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)



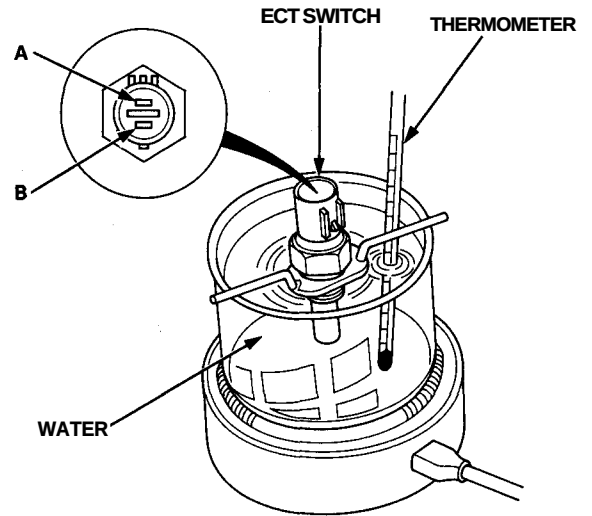
ECT Switch

Testing

⚠ WARNING Removing the ECT switch while the engine is hot can cause the coolant to spray out, seriously scalding you. Always let the engine and radiator cool down before removing the ECT switch.

NOTE: Bleed air from the cooling system after installing the ECT switch (see page 10-5).

1. Remove the ECT switch from the radiator (see page 10-2).
2. Suspend the ECT switch in a container of water as shown.



3. Heat the water and check the temperature with a thermometer.

CAUTION: Do not let the thermometer touch the bottom of the hot container.

4. Measure the resistance between the A and B terminals according to the table.

		Terminal	
Operation	Temperature	A	B
SWITCH	ON 189 – 199°F (87 – 93°C)	○	○
	OFF 4 – 13°F (2 – 7°C) lower than the temperature when it goes on		

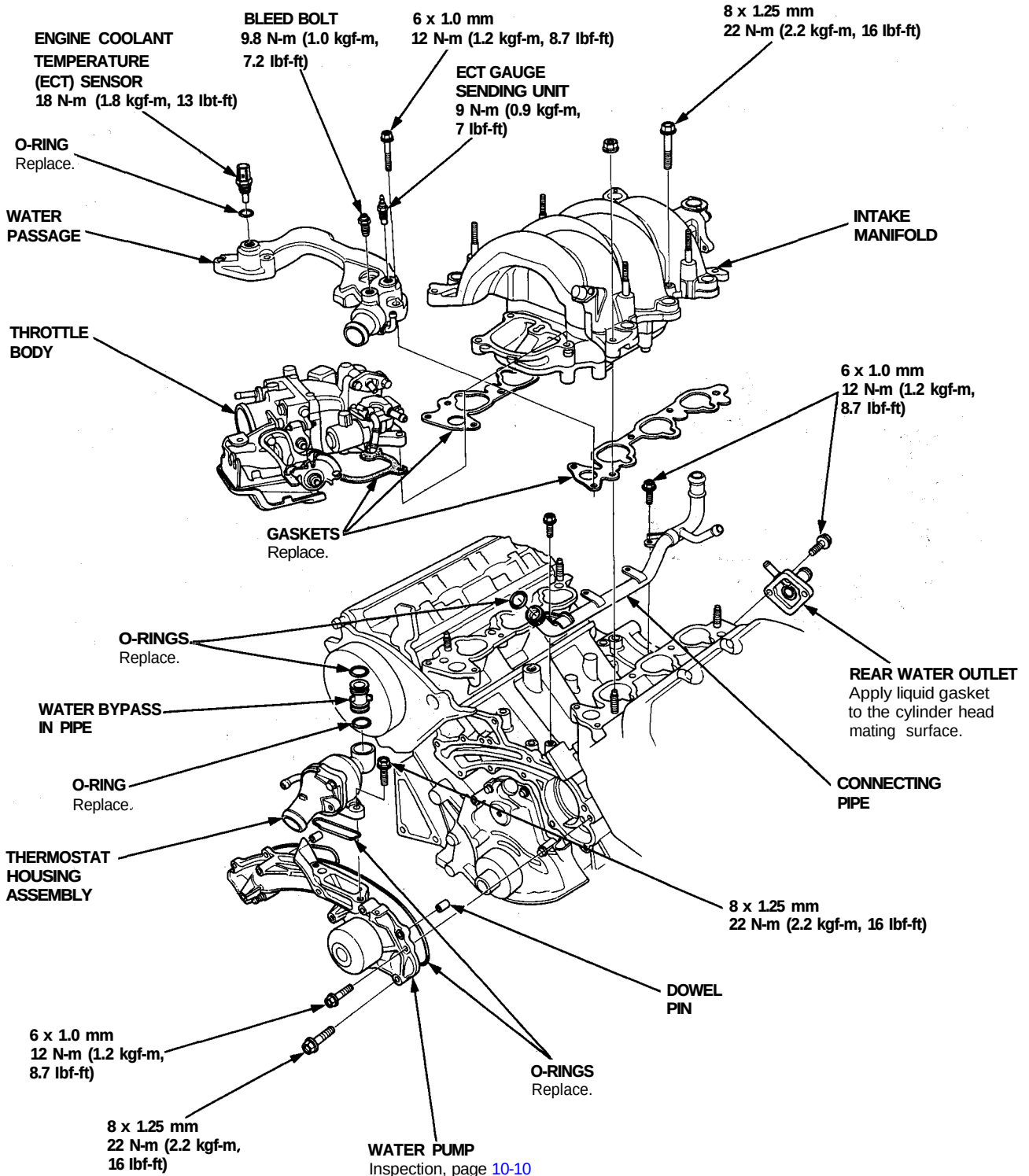


Water Pump

Illustrated Index

NOTE:

- Use new O-rings when reassembling.
- Use liquid gasket, Part No. 08718-0001 or 08718 - 0003.

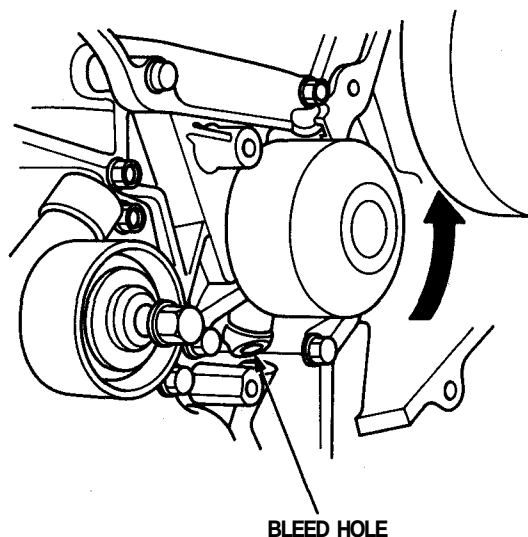


Water Pump

Inspection

1. Remove the timing belt (see page 6-6).
2. Turn the water pump pulley counterclockwise. Check that it turns freely.
3. Check for signs of seal leakage.

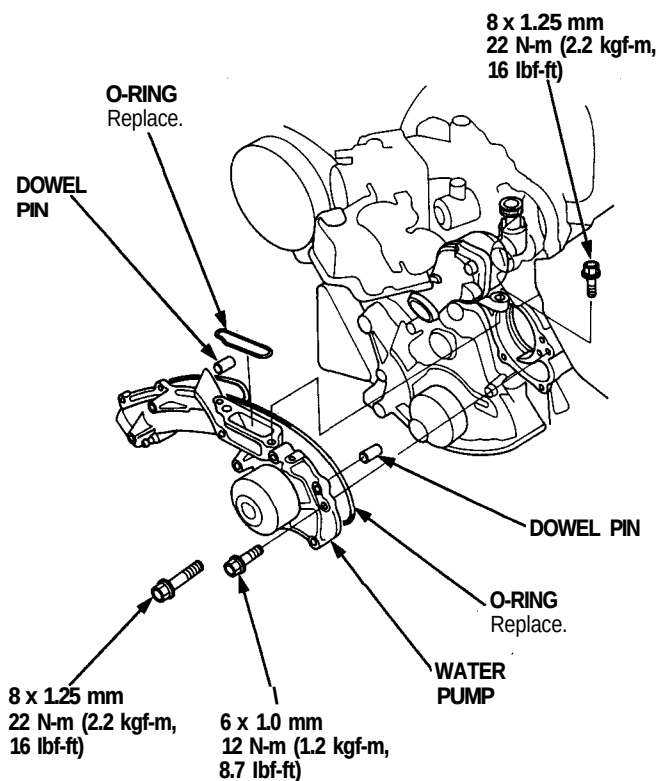
NOTE: A small amount of "weeping" from the bleed hole is normal.



Replacement

1. Remove the timing belt (see page 6-6).
2. Remove the left camshaft pulley and back cover (see page 6-19).
3. Remove the water pump.

NOTE: Inspect, repair and clean the O-ring groove and mating surface with the cylinder block.



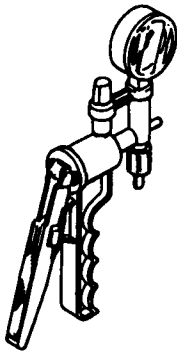
4. Install the water pump in the reverse order of removal.

NOTE:

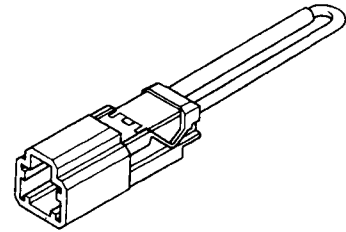
- Keep the O-ring in position when installing.
- Clean the spilled engine coolant.

Special Tools

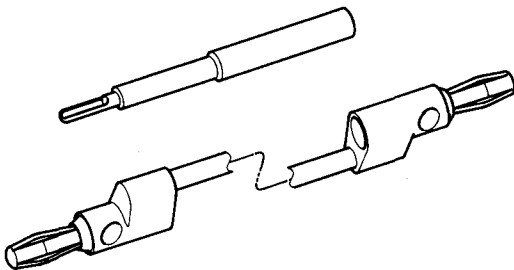
Ref. No.	Tool Number	Description	Qty	Page Reference
①	A973X - 041 - XXXXX	Vacuum Pump/Gauge, 0-30 in.Hg	1	11-136 , 11-139 , 11-140 , 11-143 , 11-148 , 11-149 , 11-150 , 11-155 , 11-156 , 11-161 , 11-162 , 11-164 , 11-166 , 11-167
②	07PAZ-0010100	SCS Service Connector	1	11-32
③	07SAZ-001000A	Backprobe Set	2	11-34
④	07406 - 0040001	Fuel Pressure Gauge	1	11-120 , 11-124



①



②



③



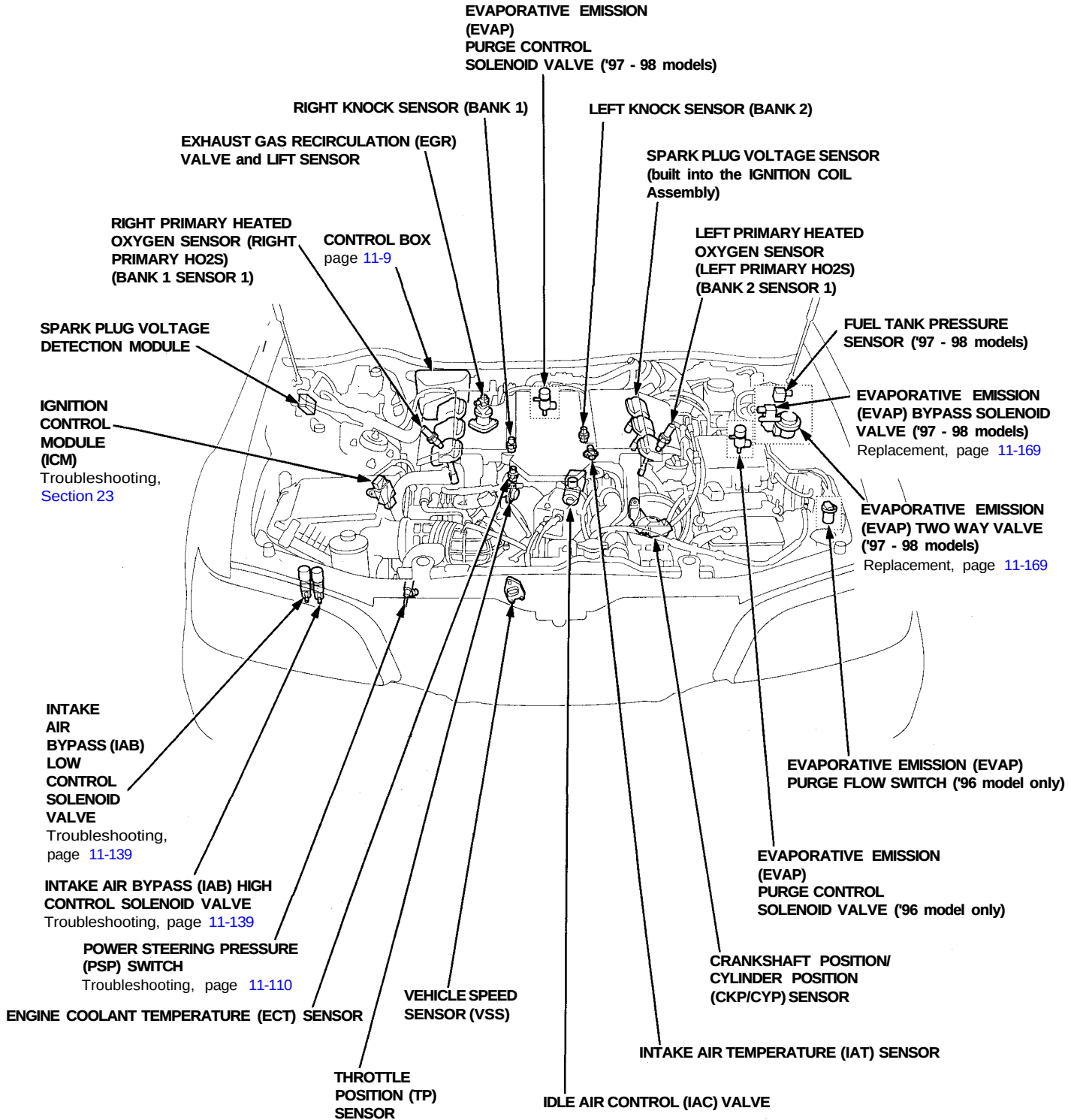
④



Component Locations

Index

For Troubleshooting of DTC related components, see chart on page [11-45](#).

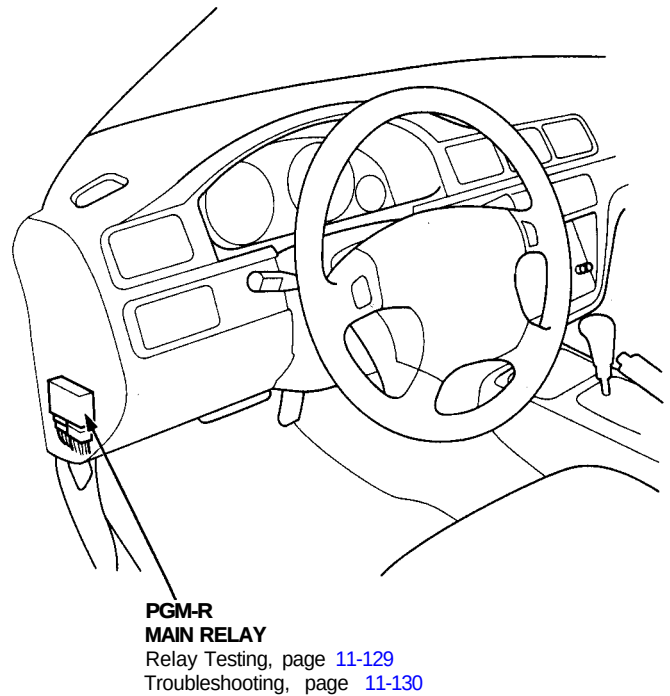
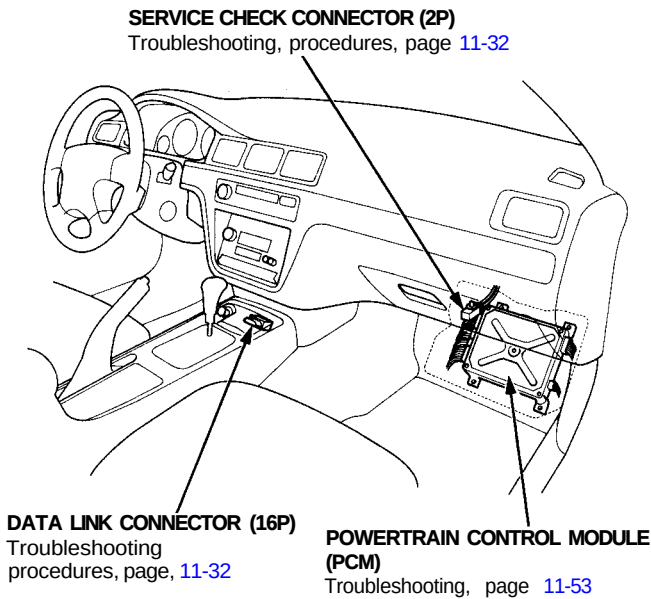
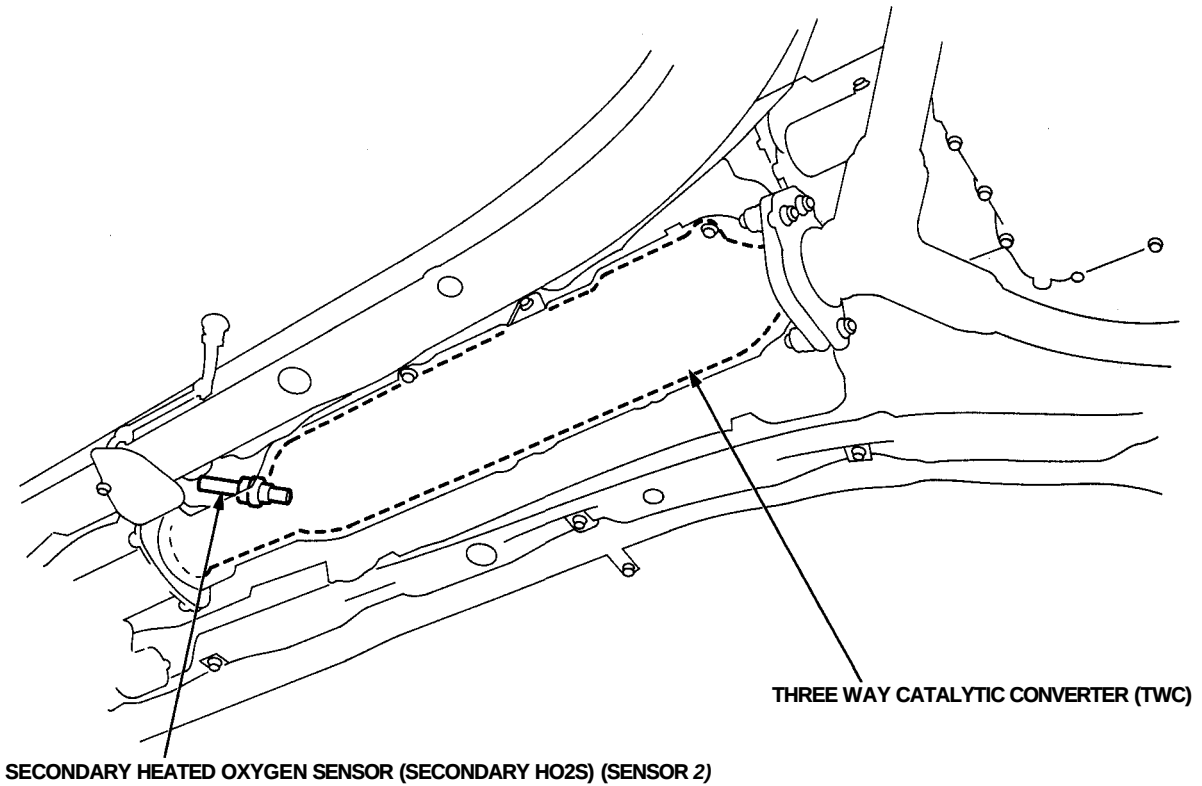


(cont'd)

Component Locations

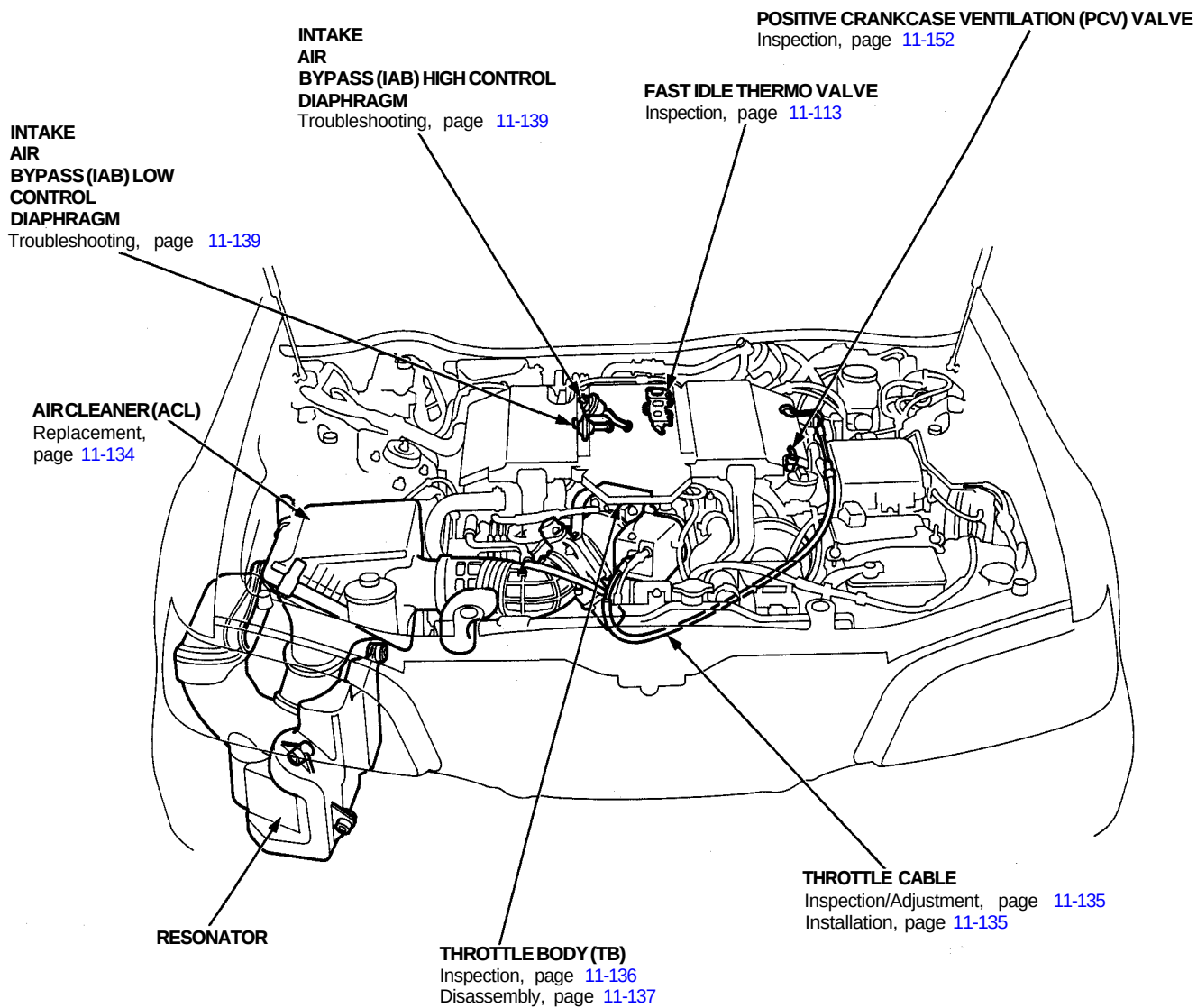
Index (cont'd)

For Troubleshooting of DTC related components, see chart on page [11-45](#).





For Troubleshooting of DTC related components, see chart on page [11-45](#).



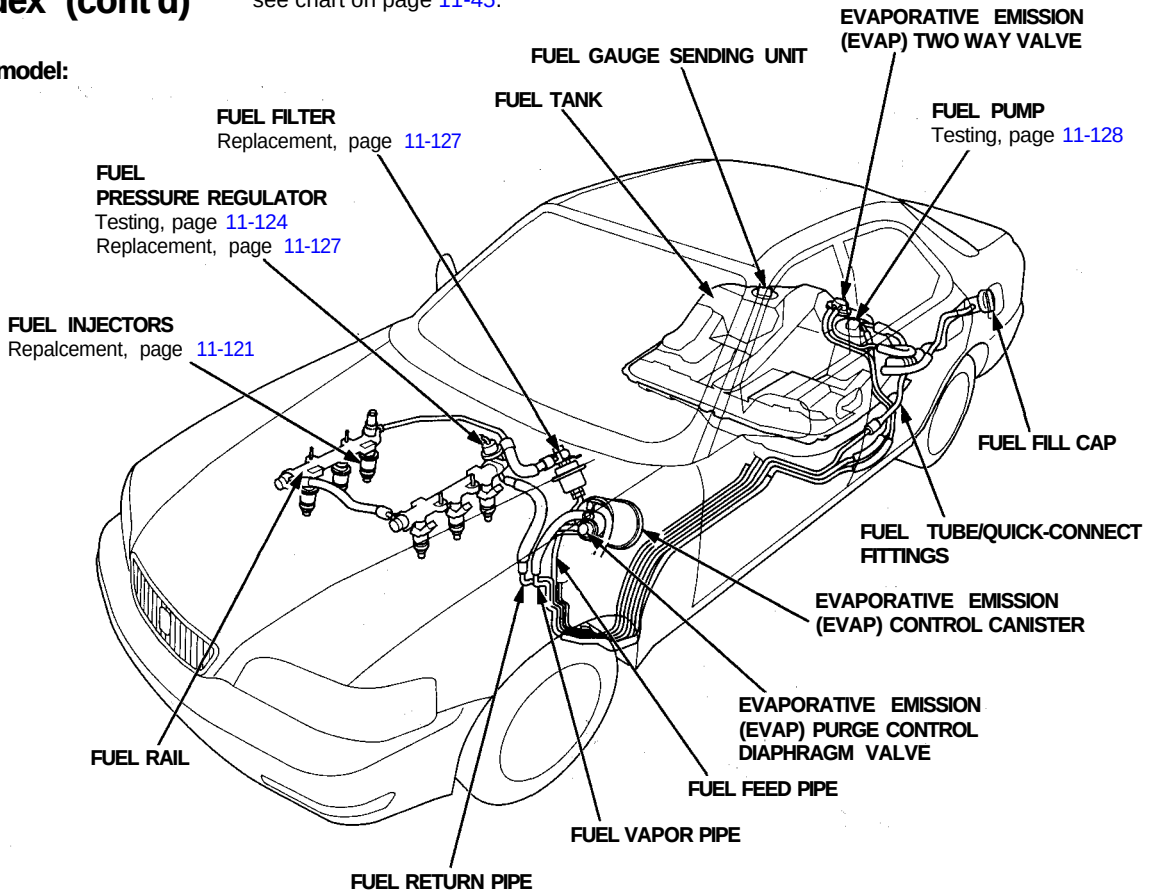
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Component Locations

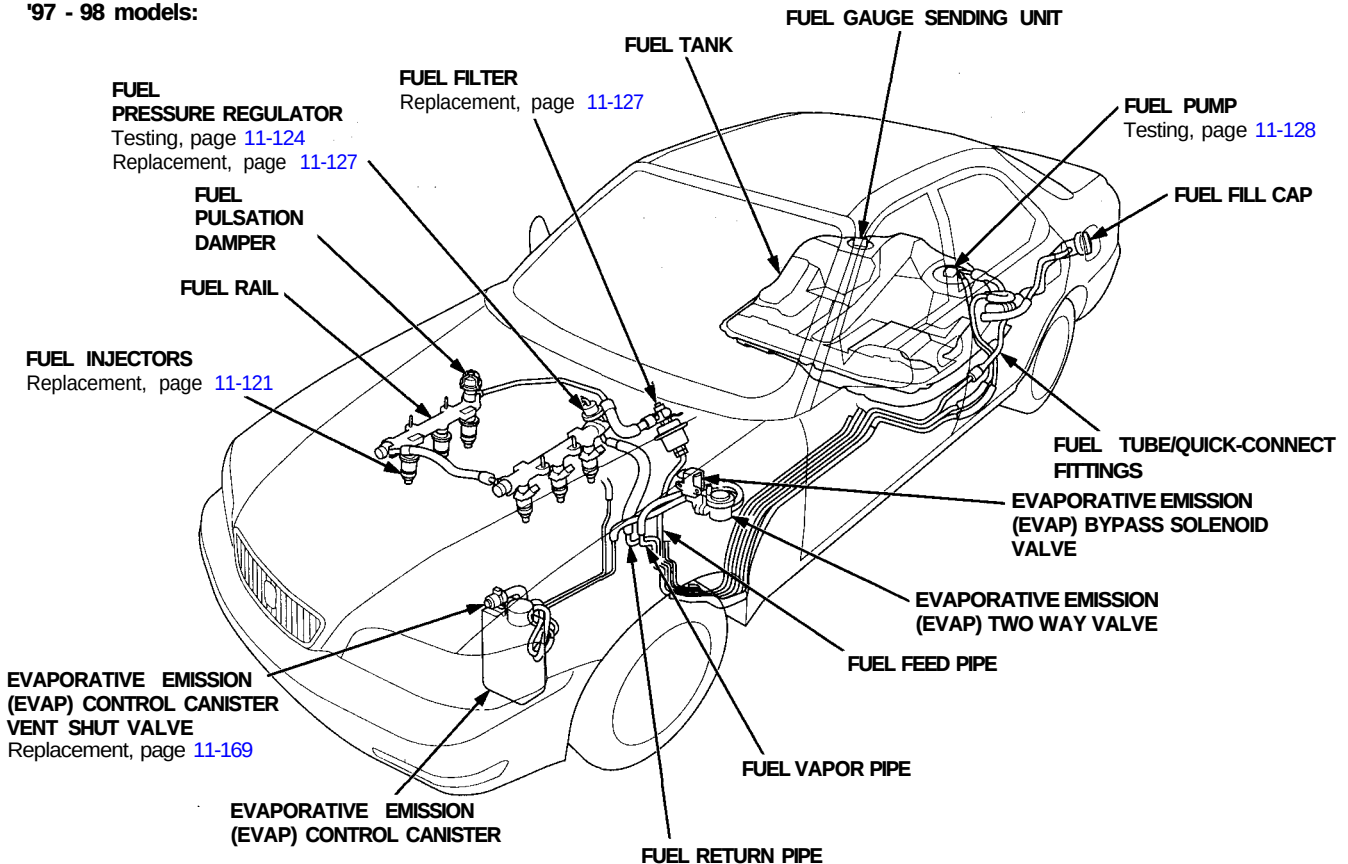
Index (cont'd)

For Troubleshooting of DTC related components,
see chart on page 11-45.

'96 model:



'97 - 98 models:



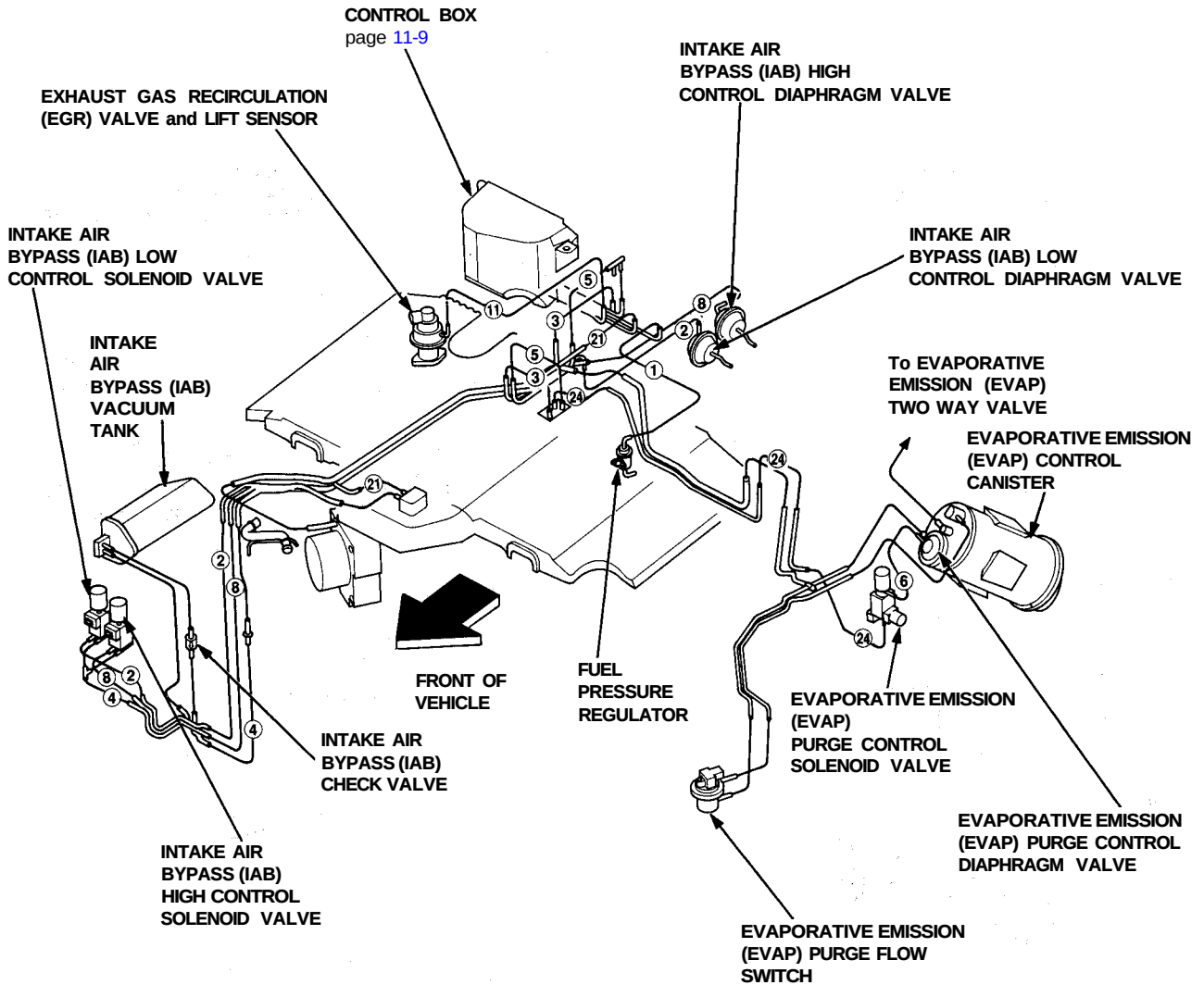


System Description

Vacuum Connections

'96 model:

For Troubleshooting of DTC related components, see chart on page [11-45](#).



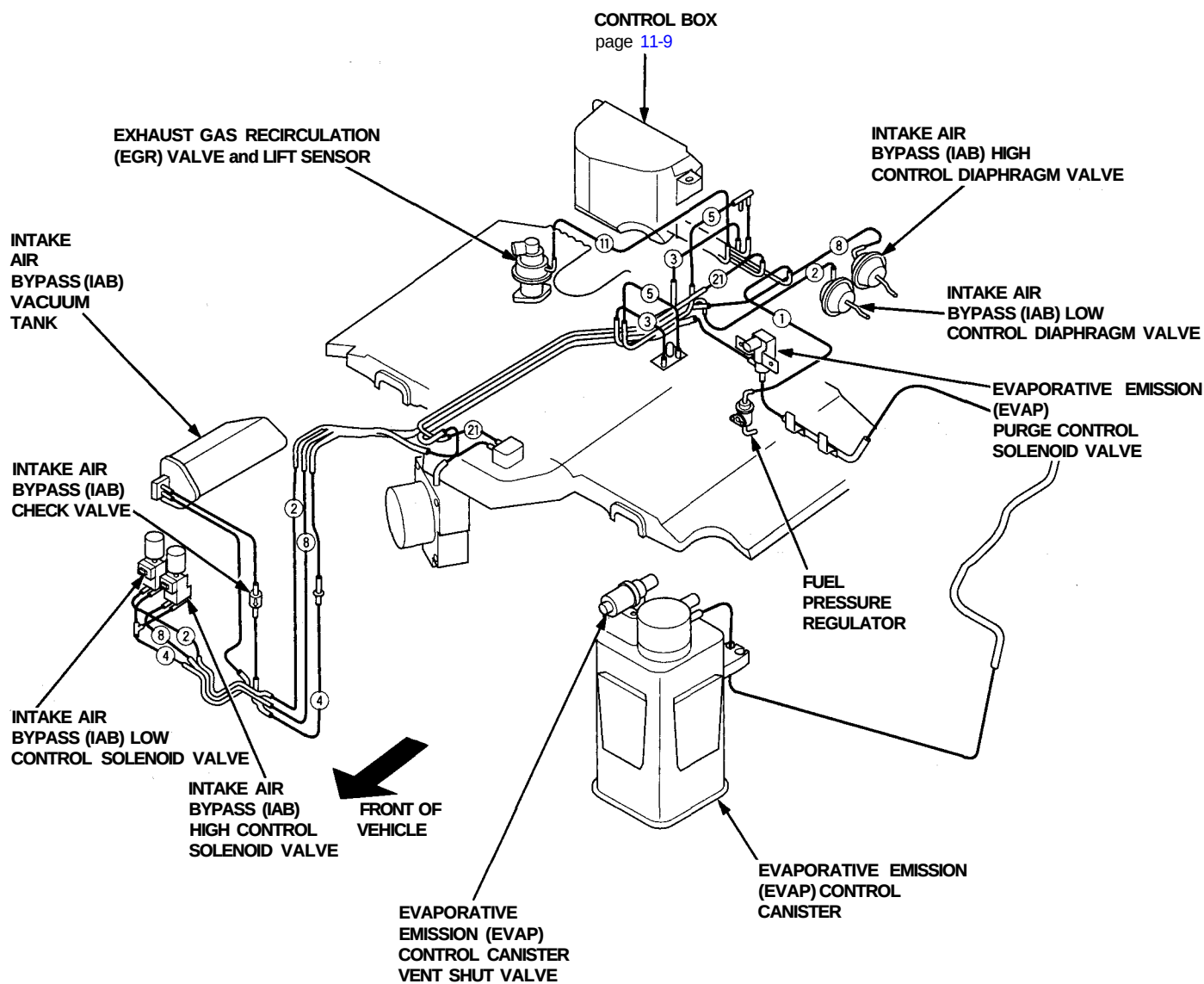
(cont'd)

System Description

Vacuum Connections (cont'd)

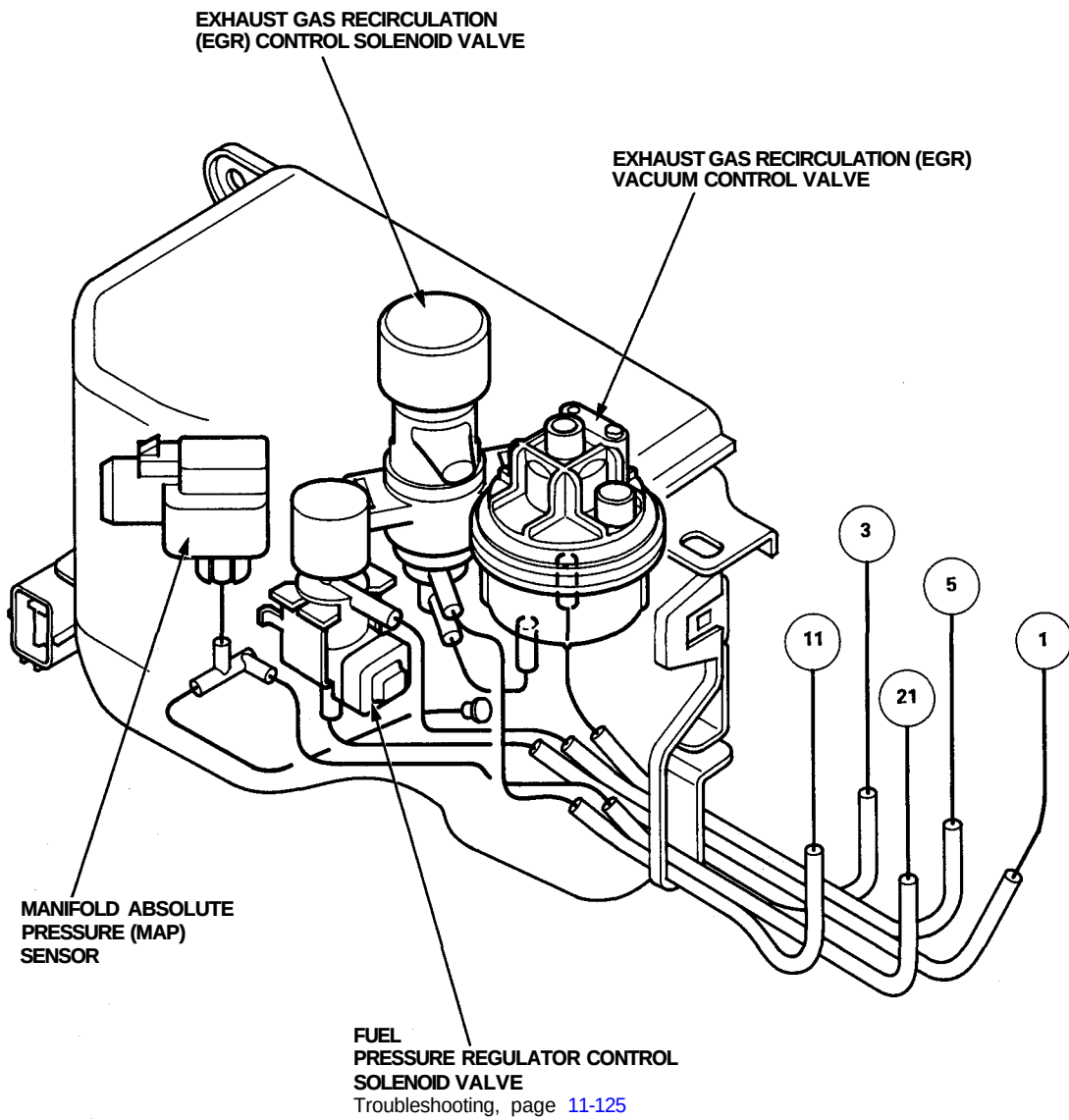
'97-98 models:

For Troubleshooting of DTC related components, see chart on page [11-45](#).



**Control Box:**

For Troubleshooting of DTC related components, see chart on page [11-45](#).

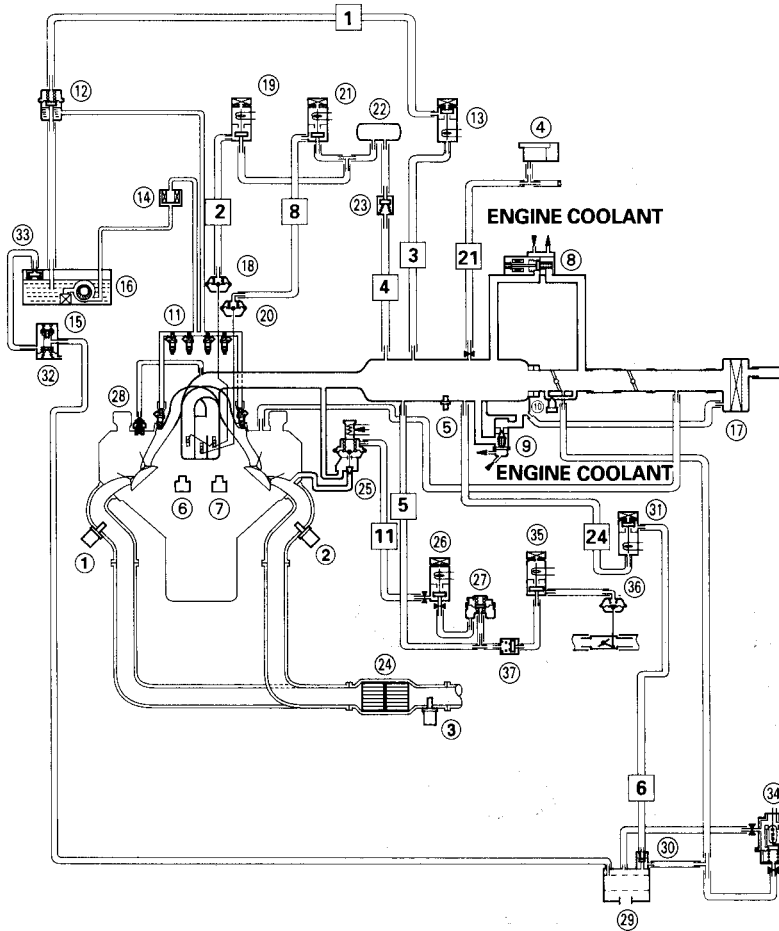


(cont'd)

System Description

Vacuum Connections (cont'd)

'96 model:



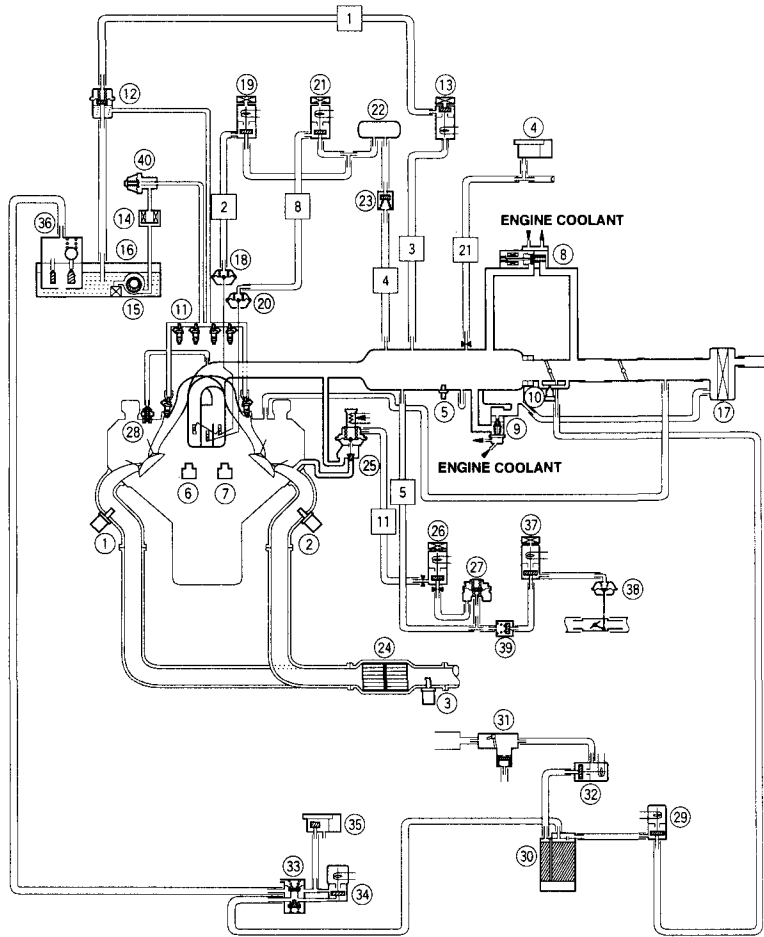
□: Vacuum hose No.

- ① LEFT PRIMARY HEATED OXYGEN SENSOR (LEFT PRIMARY HO2S) (BANK 2 SENSOR 1)
- ② RIGHT PRIMARY HEATED OXYGEN SENSOR (RIGHT PRIMARY HO2S) (BANK 1 SENSOR 1)
- ③ SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) (SENSOR 2)
- ④ MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
- ⑤ INTAKE AIR TEMPERATURE (IAT) SENSOR
- ⑥ LEFT KNOCK SENSOR (LEFT KS) (BANK 2)
- ⑦ RIGHT KNOCK SENSOR (RIGHT KS) (BANK 1)
- ⑧ IDLE AIR CONTROL (IAC) VALVE
- ⑨ FAST IDLE THERMO VALVE
- ⑩ IDLE ADJUSTING SCREW
- ⑪ FUEL INJECTOR
- ⑫ FUEL PRESSURE REGULATOR
- ⑬ FUEL PRESSURE REGULATOR CONTROL SOLENOID VALVE
- ⑭ FUEL FILTER
- ⑮ FUEL PUMP (FP)
- ⑯ FUEL TANK
- ⑰ AIR CLEANER (ACL)
- ⑱ INTAKE AIR BYPASS (IAB) LOW CONTROL DIAPHRAGM VALVE
- ⑲ INTAKE AIR BYPASS (IAB) LOW CONTROL SOLENOID VALVE
- ⑳ INTAKE AIR BYPASS (IAB) HIGH CONTROL DIAPHRAGM VALVE
- ㉑ INTAKE AIR BYPASS (IAB) HIGH CONTROL SOLENOID VALVE

- ㉒ INTAKE AIR BYPASS (IAB) VACUUM TANK
- ㉓ INTAKE AIR BYPASS (IAB) CHECK VALVE
- ㉔ THREE WAY CATALYTIC CONVERTER (TWC)
- ㉕ EXHAUST GAS RECIRCULATION (EGR) VALVE AND LIFT SENSOR
- ㉖ EXHAUST GAS RECIRCULATION (EGR) CONTROL SOLENOID VALVE
- ㉗ EXHAUST GAS RECIRCULATION (EGR) VACUUM CONTROL VALVE
- ㉘ POSITIVE CRANKCASE VENTILATION (PCV) VALVE
- ㉙ EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER
- ㉚ EVAPORATIVE EMISSION (EVAP) PURGE CONTROL DIAPHRAGM VALVE
- ㉛ EVAPORATIVE EMISSION (EVAP) PURGE CONTROL SOLENOID VALVE
- ㉜ EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE
- ㉝ FUEL TANK EVAPORATIVE EMISSION (EVAP) VALVE
- ㉞ EVAPORATIVE EMISSION (EVAP) PURGE FLOW SWITCH
- ㉟ WATER VALVE CONTROL SOLENOID VALVE
- ㊱ WATER VALVE CONTROL DIAPHRAGM
- ㊲ WATER VALVE CHECK VALVE



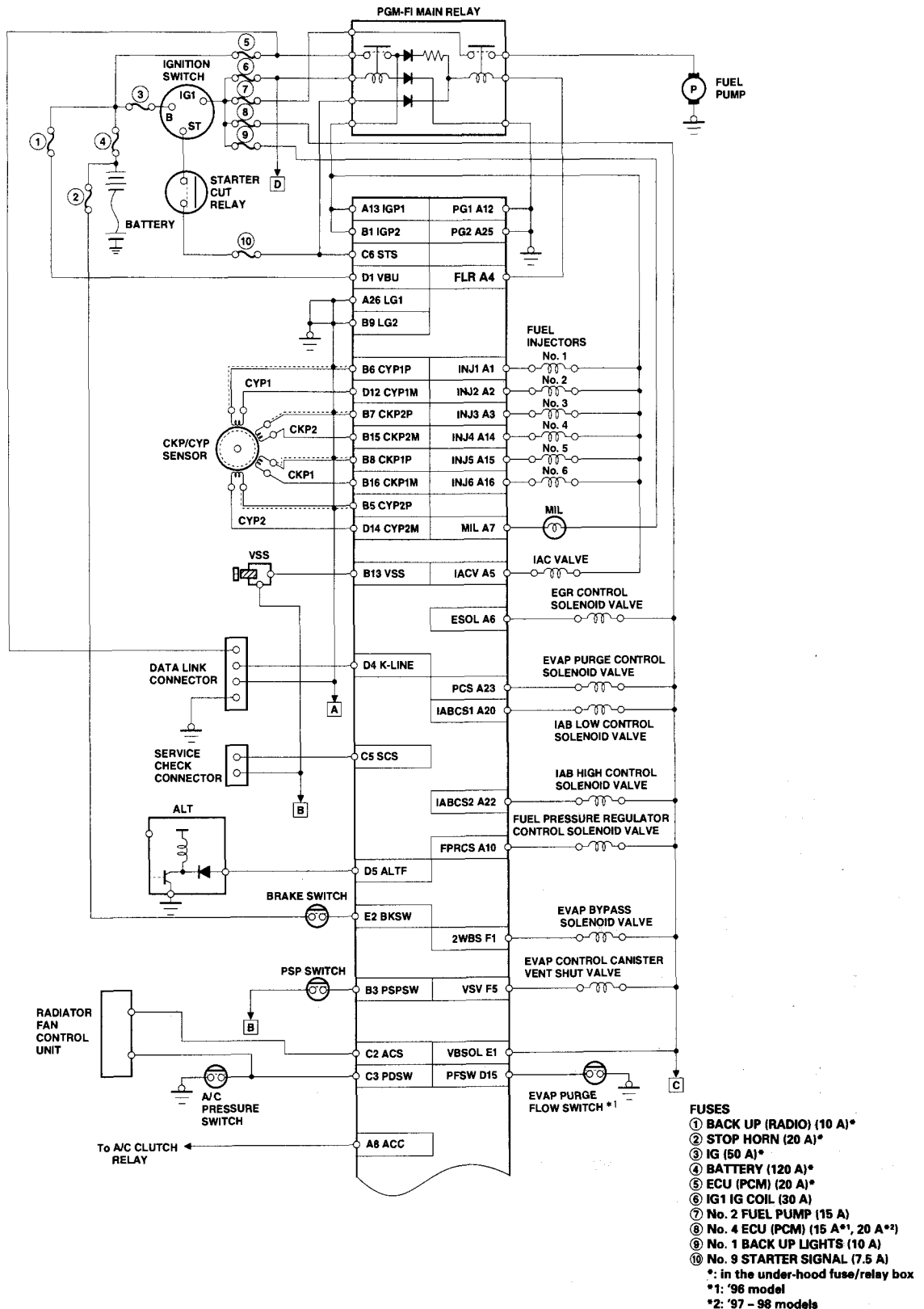
'97 - 98 models:

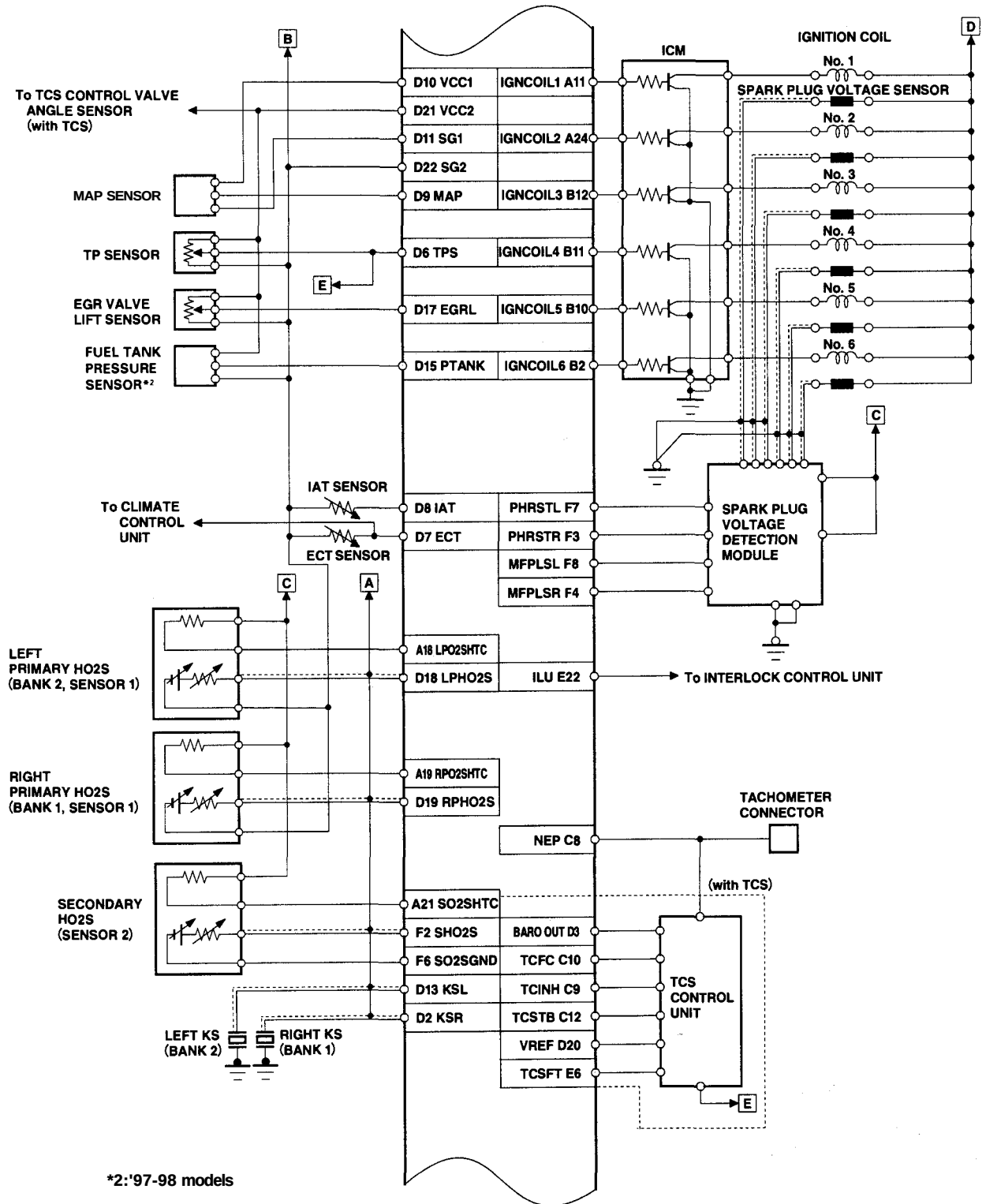


- | | |
|---|---|
| ① LEFT PRIMARY HEATED OXYGEN SENSOR (LEFT PRIMARY HO2S) (BANK 2 SENSOR 1) | ②② INTAKE AIR BYPASS (IAB) VACUUM TANK |
| ② RIGHT PRIMARY HEATED OXYGEN SENSOR (RIGHT PRIMARY HO2S) (BANK 1 SENSOR 1) | ②③ INTAKE AIR BYPASS (IAB) CHECK VALVE |
| ③ SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) (SENSOR 2) | ②④ THREE WAY CATALYTIC CONVERTER (TWC) |
| ④ MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR | ②⑤ EXHAUST GAS RECIRCULATION (EGR) VALVE AND LIFT SENSOR |
| ⑤ INTAKE AIR TEMPERATURE (IAT) SENSOR | ②⑥ EXHAUST GAS RECIRCULATION (EGR) CONTROL SOLENOID VALVE |
| ⑥ LEFT KNOCK SENSOR (LEFT KS) (BANK 2) | ②⑦ EXHAUST GAS RECIRCULATION (EGR) VACUUM CONTROL VALVE |
| ⑦ RIGHT KNOCK SENSOR (RIGHT KS) (BANK 1) | ②⑧ POSITIVE CRANKCASE VENTILATION (PCV) VALVE |
| ⑧ IDLE AIR CONTROL (IAC) VALVE | ②⑨ EVAPORATIVE EMISSION (EVAP) PURGE CONTROL SOLENOID VALVE |
| ⑨ FAST IDLE THERMO VALVE | ③① EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER |
| ⑩ IDLE ADJUSTING SCREW | ③② EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER VENT SHUT VALVE |
| ⑪ FUEL INJECTOR | ③③ EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE |
| ⑫ FUEL PRESSURE REGULATOR | ③④ EVAPORATIVE EMISSION (EVAP) BYPASS SOLENOID VALVE |
| ⑬ FUEL PRESSURE REGULATOR CONTROL SOLENOID VALVE | ③⑤ FUEL TANK PRESSURE SENSOR |
| ⑭ FUEL FILTER | ③⑥ FUEL TANK EVAPORATIVE EMISSION (EVAP) VALVE |
| ⑮ FUEL PUMP (FP) | ③⑦ WATER VALVE CONTROL SOLENOID VALVE |
| ⑯ FUEL TANK | ③⑧ WATER VALVE CONTROL DIAPHRAGM |
| ⑰ AIR CLEANER (ACL) | ③⑨ WATER VALVE CHECK VALVE |
| ⑱ INTAKE AIR BYPASS (IAB) LOW CONTROL DIAPHRAGM VALVE | ④① FUEL PULSATION DAMPER |
| ⑲ INTAKE AIR BYPASS (IAB) LOW CONTROL SOLENOID VALVE | |
| ⑳ INTAKE AIR BYPASS (IAB) HIGH CONTROL DIAPHRAGM VALVE | |
| ㉑ INTAKE AIR BYPASS (IAB) HIGH CONTROL SOLENOID VALVE | |

System Description

Electrical Connections

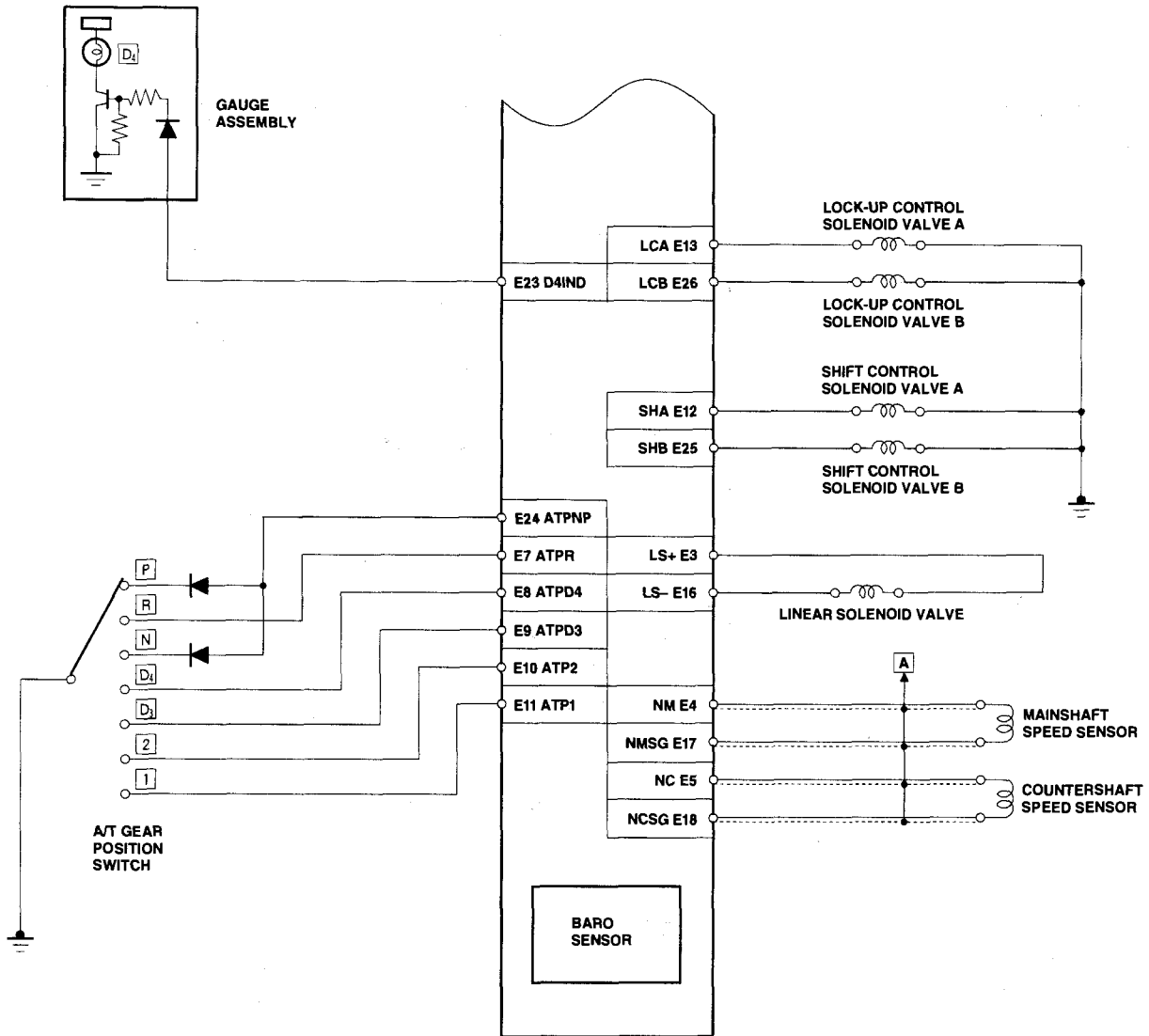




(cont'd)

System Description

Electrical Connections (cont'd)



PCM A (26P)

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26

PCM B (16P)

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

PCM C (12P)

1	2	3	4	5	6
7	8	9	10	11	12

PCM D (22P)

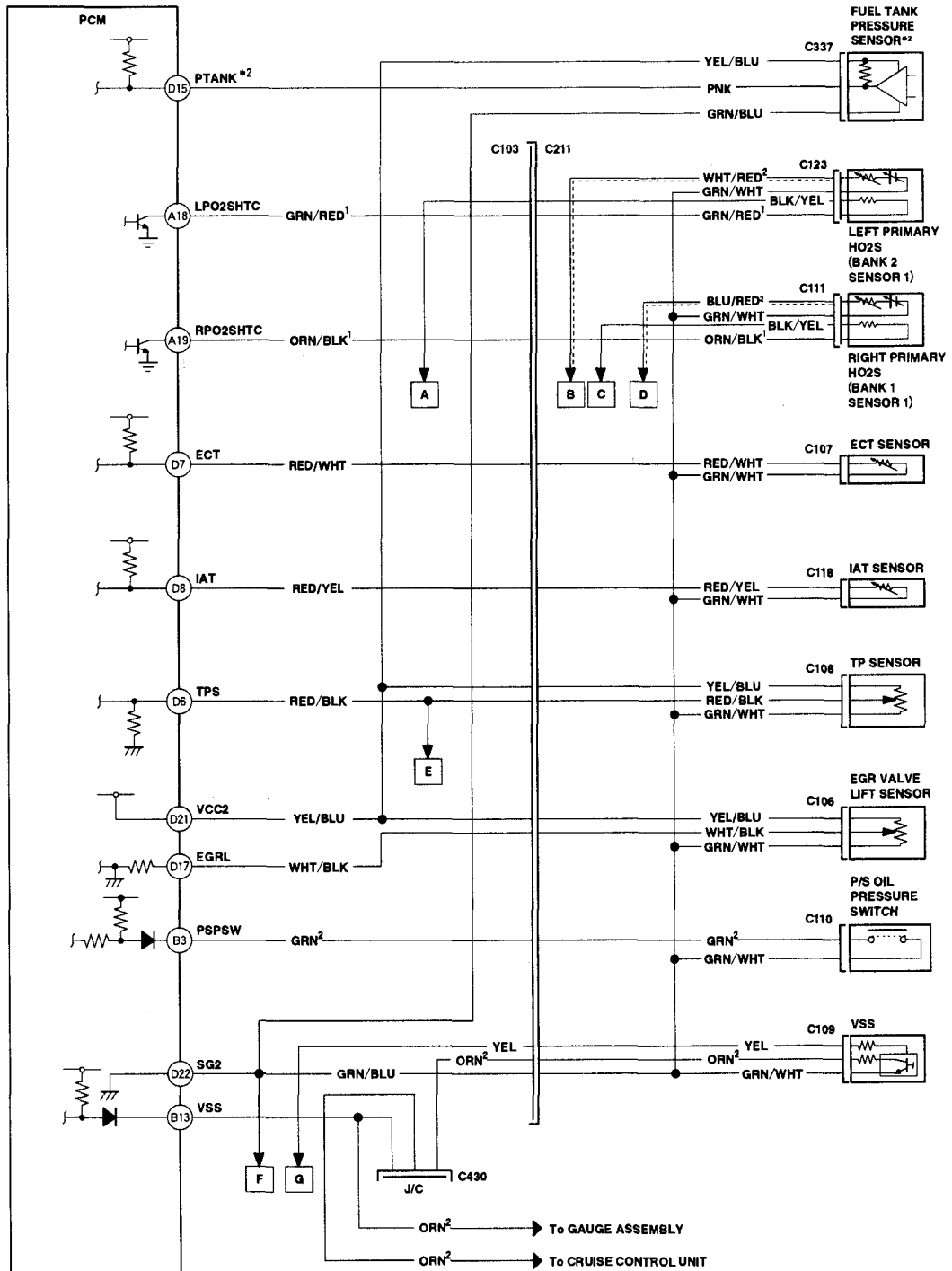
1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22

PCM E (26P)

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26

PCM F (8P)

1	2	3	4
5	6	7	8

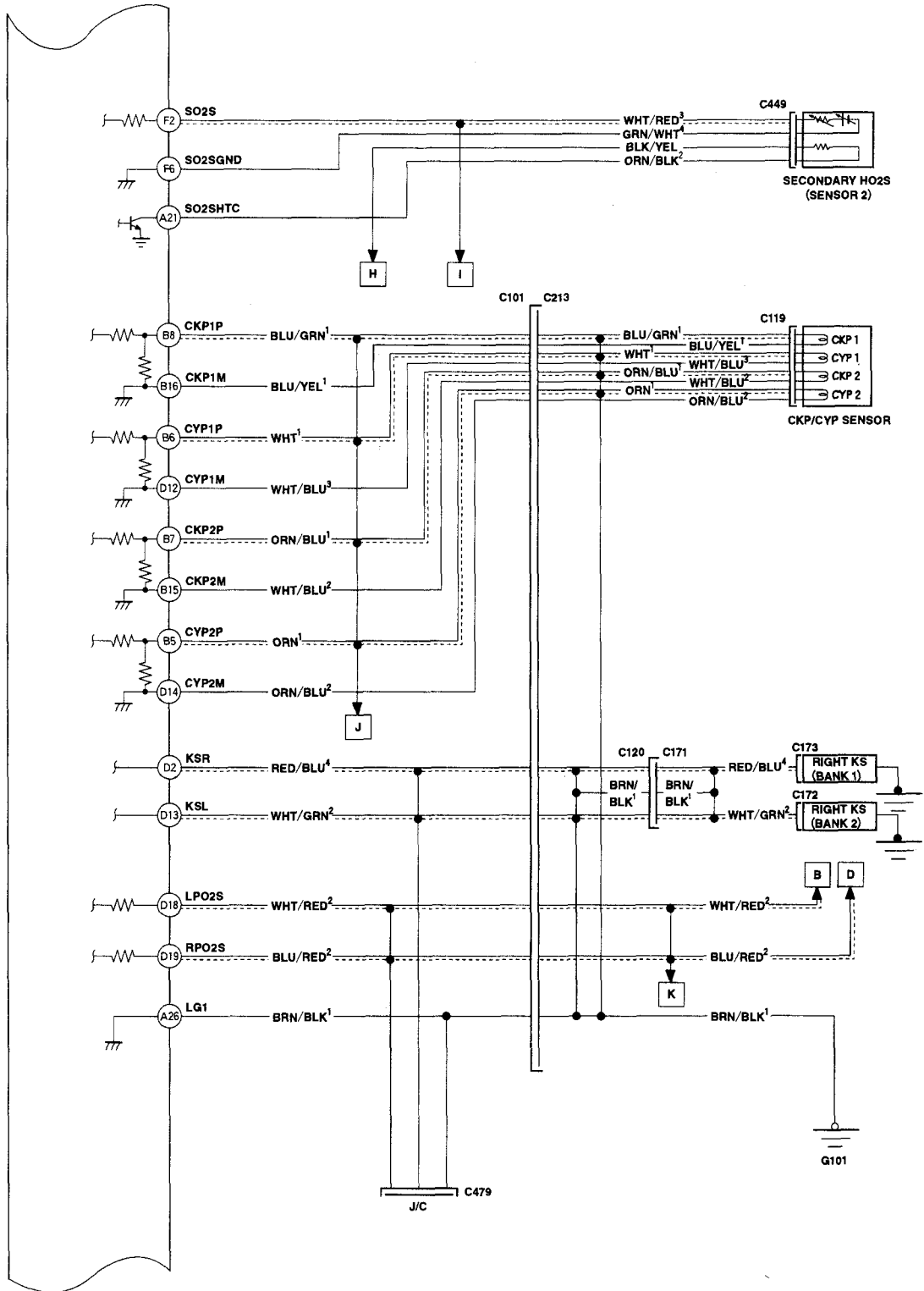


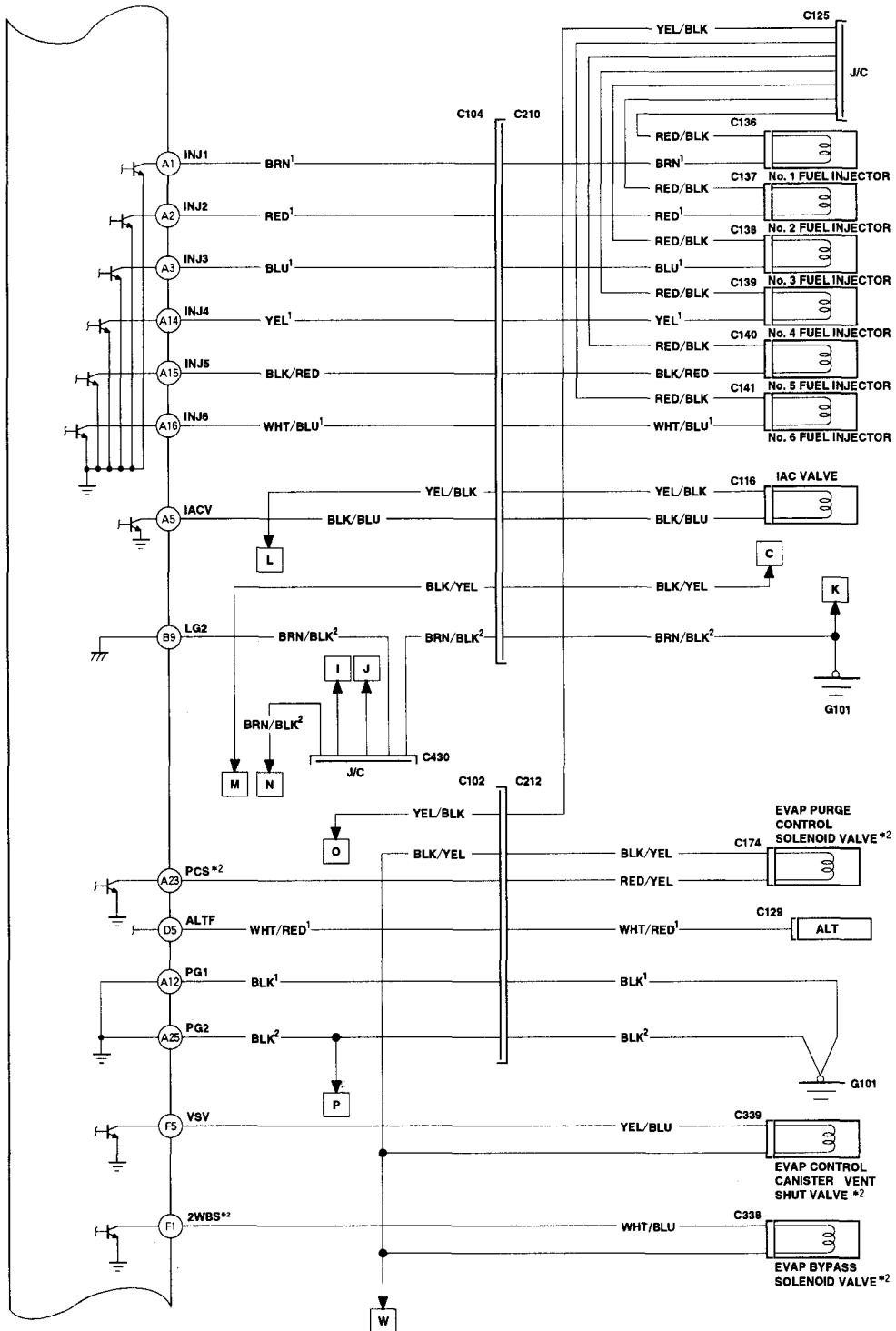
*2: '97-98 models

(cont'd)

System Description

Electrical Connections (cont'd)



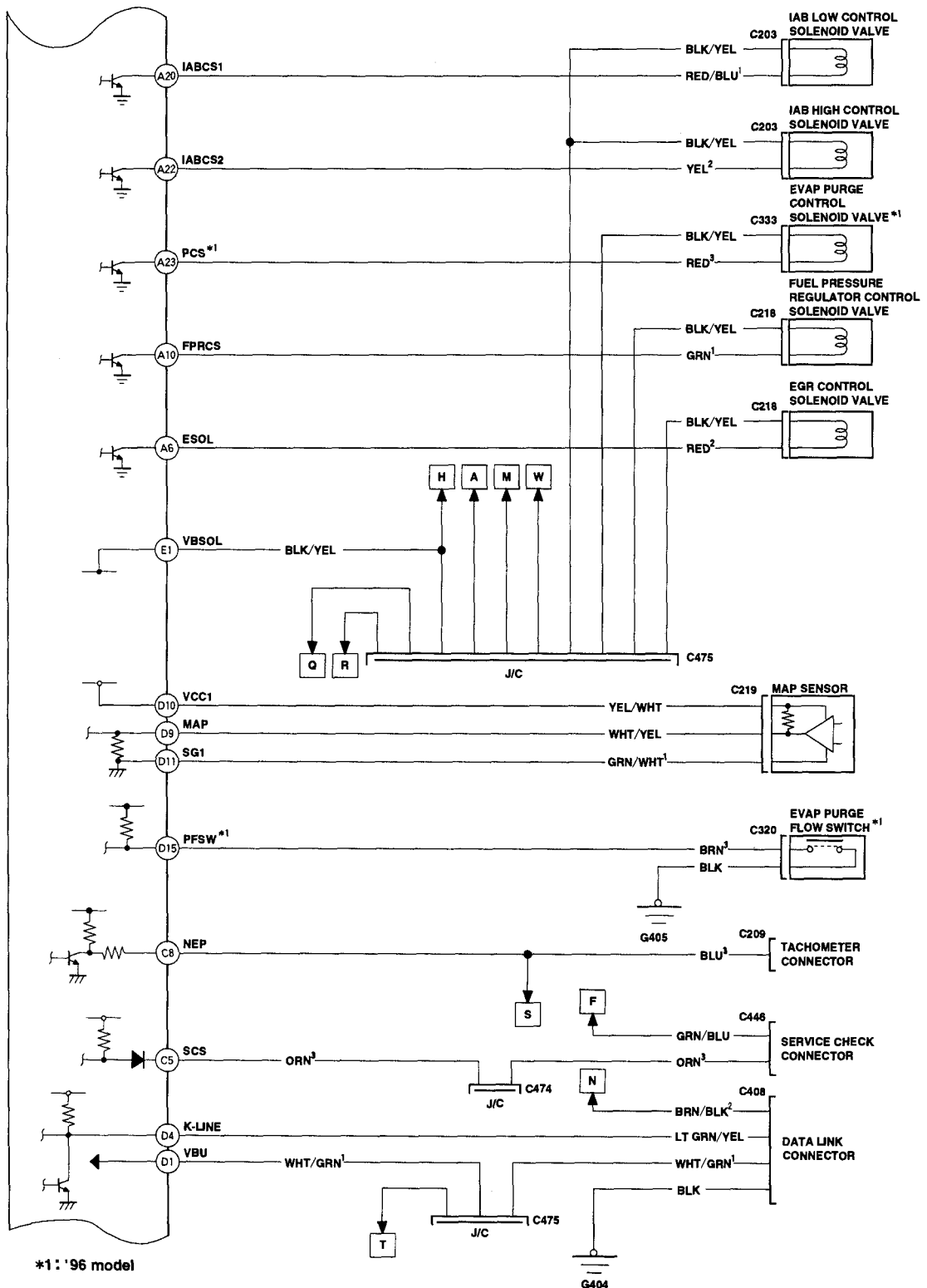


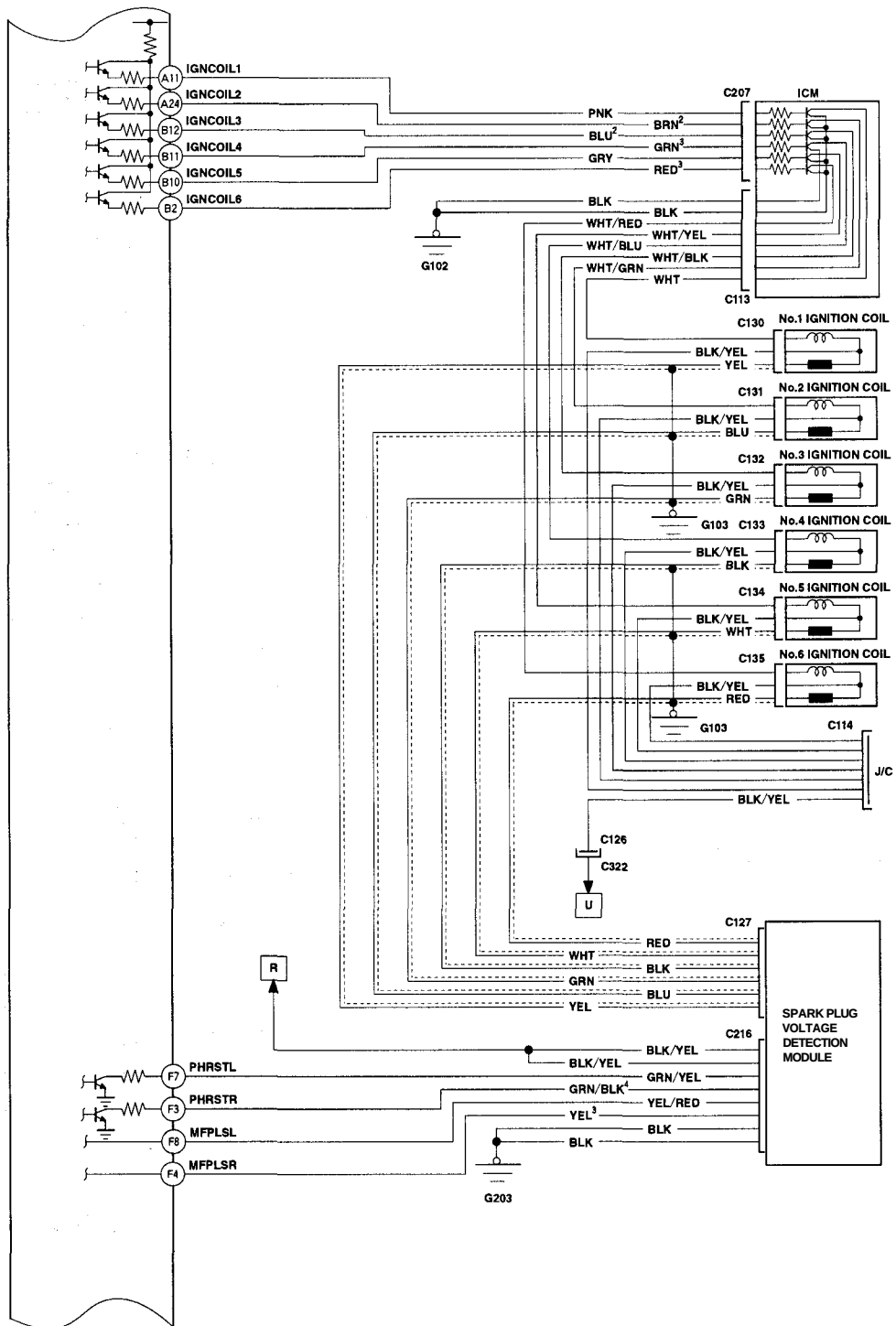
*2: '97-98 models

(cont'd)

System Description

Electrical Connections (cont'd)

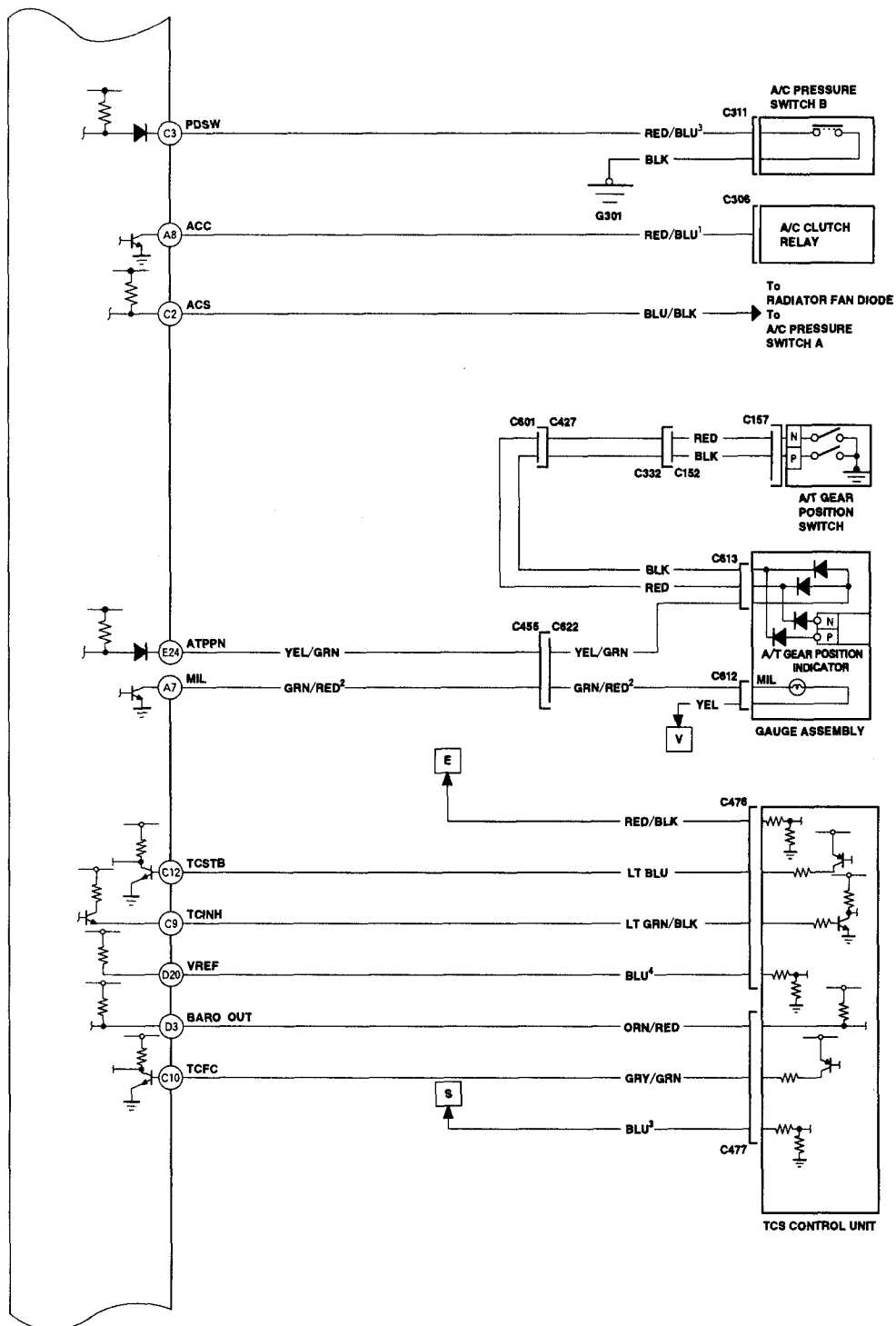


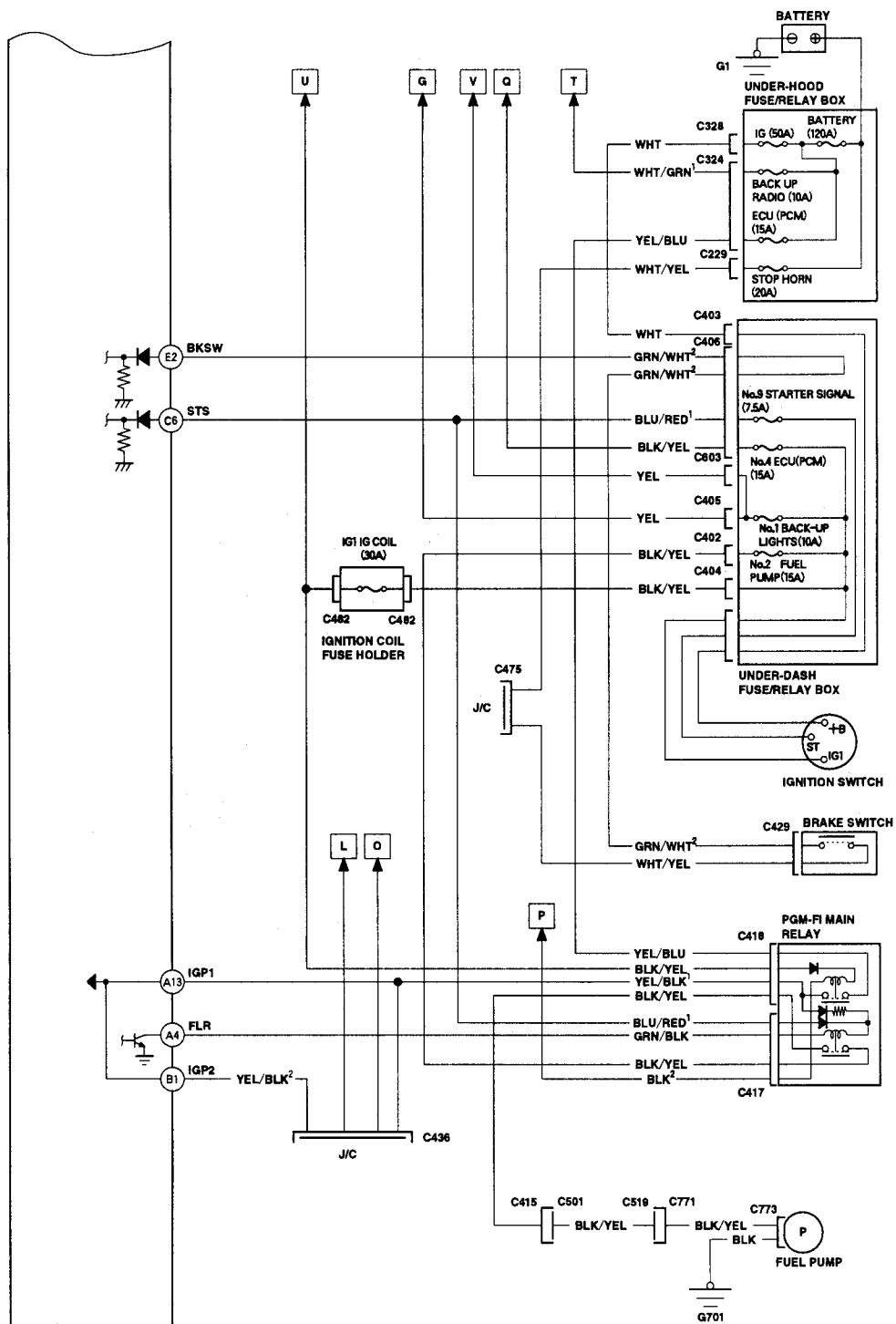


(cont'd)

System Description

Electrical Connections (cont'd)



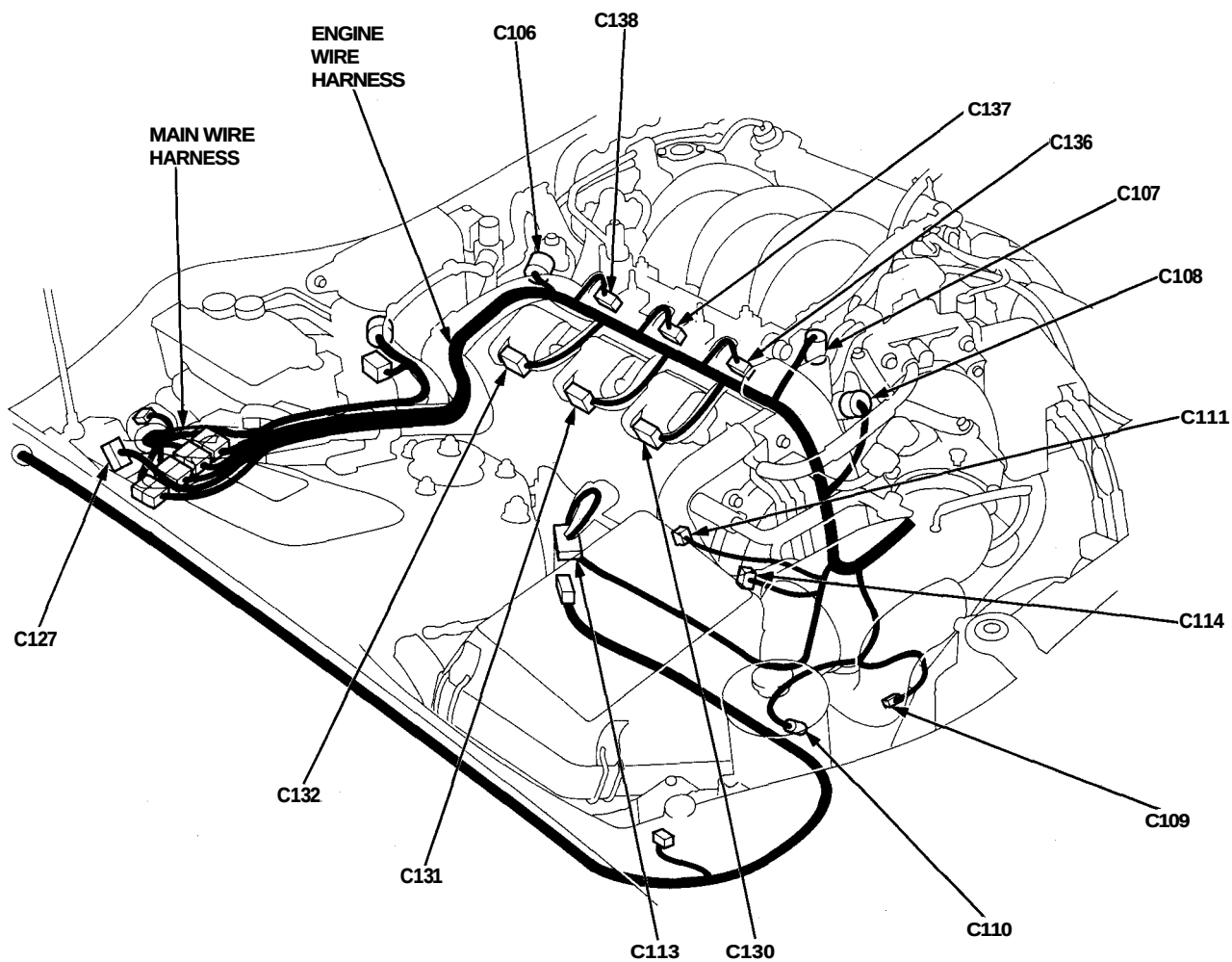


*1: '96 model

*2: '97-98 models

System Description

System Connectors [Engine Compartment]





C106



①	WHT/BLK
②	GRN/WHT
③	YEL/BLU

C107



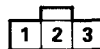
①	GRN/WHT
②	RED/WHT

C108



①	GRN/WHT
②	RED/BLK
③	YEL/BLU

C109



①	GRN/WHT
②	YEL
③	ORN ²

C110



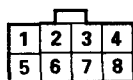
①	GRN ²
②	GRN/WHT

C111



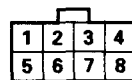
①	BLU/RED ²
②	GRN/WHT
③	BLK/YEL
④	ORN/BLK ¹

C113



①	WHT/BLK	⑤	WHT/RED
②	BLK	⑥	WHT/YEL
③	WHT/GRN	⑦	BLK
④	WHT	⑧	WHT/BLU

C114



①	BLK/YEL	⑤	BLK/YEL
②	BLK/YEL	⑥	BLK/YEL
③	BLK/YEL	⑦	BLK/YEL
④	BLK/YEL	⑧	BLK/YEL

C127



①	GRN
②	BLU
③	YEL
④	RED
⑤	WHT
⑥	BLK

C130



①	BLK/YEL
②	WHT
③	YEL

C131



①	BLK/YEL
②	WHT/GRN
③	BLU

C132



①	BLK/YEL
②	WHT/BLK
③	GRN

C136



①	BRN ¹
②	RED/BLK

C137



①	RED ¹
②	RED/BLK

C138



①	BLU ¹
②	RED/BLK

NOTE: • Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK¹ and YEL/BLK² are not the same).

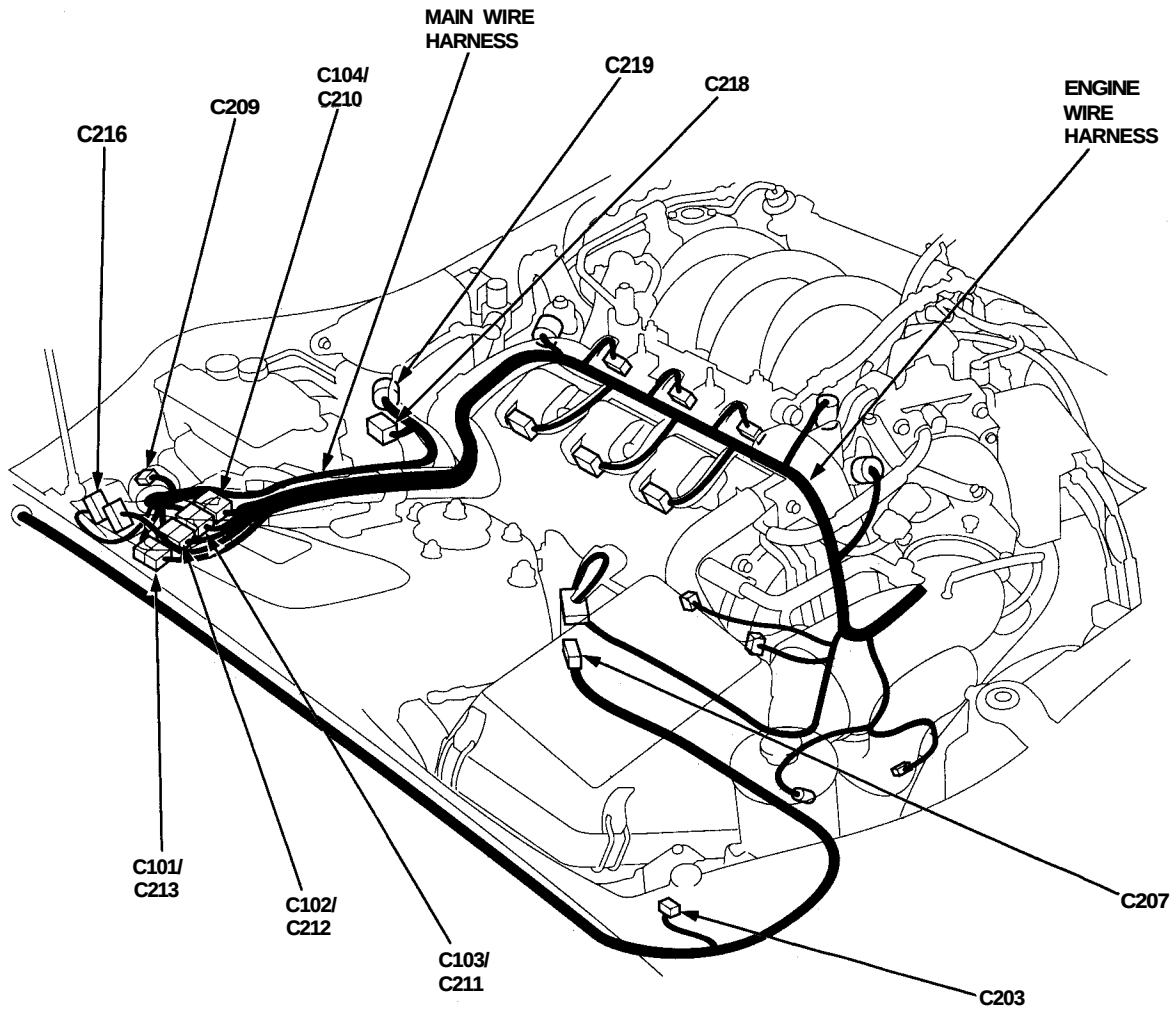
○: Related to Fuel and Emissions System.

- Connector with male terminals (double outline): View from terminal side
- Connector with female terminals (single outline): View from wire side

(cont'd)

System Description

System Connectors [Engine Compartment] (cont'd)





C203



①	BLK/YEL
②	BLK/YEL
③	YEL ²
④	RED/BLU ¹

C207



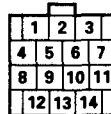
①	PNK
②	BRN ²
③	BLU ²
④	GRN ²
⑤	GRY
⑥	RED ²

C209



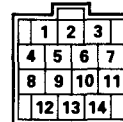
1	—
②	BLU ³

C210

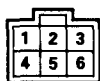


①	BRN/BLK ²	⑧	YEL ¹
②	BLK/BLU	⑨	BLK/RED
③	YEL/BLK	⑩	WHT/BLU ¹
④	BRN ¹	⑪	BLK/YEL
⑤	RED ¹	12	RED
⑥	BLU ¹	13	YEL/RED
7	YEL/GRN	14	BLU/GRN

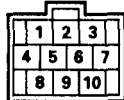
C211



①	GRN ²	⑧	ORN/BLK ¹
②	BLK/YEL	⑨	YEL
③	ORN ²	⑩	RED/WHT
④	YEL/BLU	⑪	GRN/BLU
⑤	WHT/BLK	⑫	GRN/RED ¹
⑥	RED/BLK	13	BLK/YEL
⑦	YEL/BLU	⑭	RED/YEL

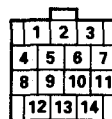
C212
(Without TCS)

①	BLK ¹
②	BLK ²
3	WHT/BLU
④	YEL/BLK
5	WHT/GRN
⑥	WHT/RED ¹

C212
(With TCS)

①	BLK ¹	⑥	WHT/RED ¹
②	BLK ²	7	WHT/BLU
③	YEL/BLU	8	—
④	YEL/BLK	9	BLU/YEL
5	WHT/GRN	10	BLU/BLK

C213



1	ORN	⑧	ORN ¹
②	BLU/RED ²	⑨	WHT/BLU ³
③	WHT/RED ²	⑩	WHT ¹
④	ORN/BLU ¹	⑪	ORN/BLU ²
⑤	BLU/YEL ¹	⑫	BRN/BLK ¹
⑥	BLU/GRN ¹	⑬	RED/BLU ⁴
⑦	WHT/BLU ²	⑭	WHT/GRN ²

C216



①	BLK	⑤	BLK/YEL
②	GRN/BLK ⁴	⑥	YEL/RED
③	YEL ⁵	⑦	GRN/YEL
④	BLK/YEL	⑧	BLK

C218



①	BLK/YEL
②	RED ²
③	GRN ¹
④	BLK/YEL

C219



①	YEL/WHT
②	GRN/WHT ¹
③	WHT/YEL

NOTE: • Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK¹ and YEL/BLK² are not the same).

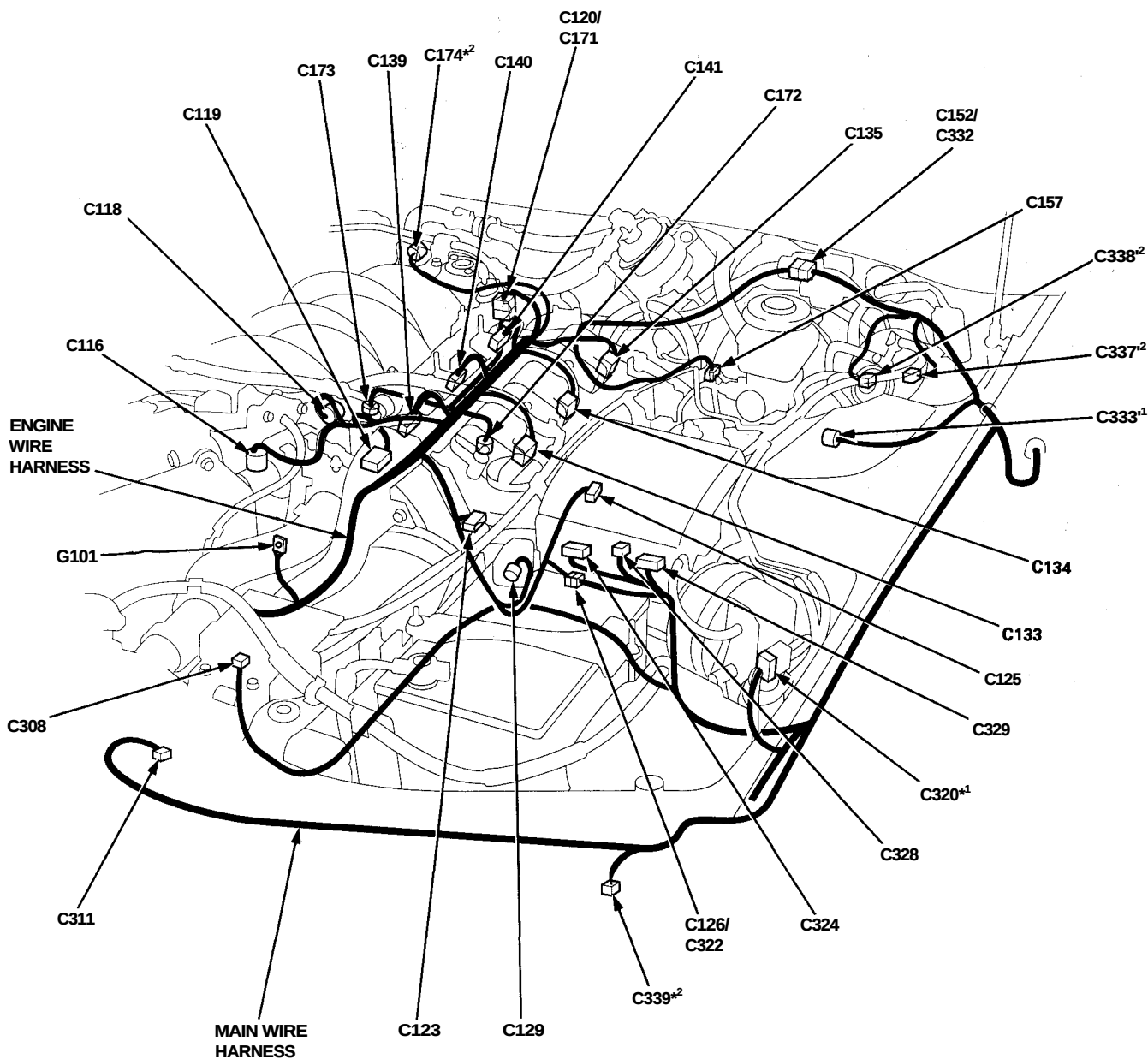
○: Related to Fuel and Emissions System.

- Connector with male terminals (double outline): View from terminal side
- Connector with female terminals (single outline): View from wire side

(cont'd)

System Description

System Connectors [Engine Compartment] (cont'd)



*1: '96 model

*2: '97 - 98 models



C116

1

2

①

BLK/BLU

②

YEL/BLK

C118

1

2

①

GRN/WHT

②

RED/YEL

C119

1

2

3

4

5

6

7

8

①

BLU/GRN¹

②

BLU/YEL¹

③

WHT/BLU²

④

ORN/BLU¹

⑤

ORN¹

⑥

ORN/BLU²

⑦

WHT/BLU²

⑧

WHT¹

C120

1

2

3

①

RED/BLU

②

BRN/BLK¹

③

WHT/GRN²

C123

1

2

3

4

①

WHT/RED²

②

GRN/WHT

③

BLK/YEL

④

GRN/RED¹

C125

1

2

3

4

5

6

7

8

①

RED/BLK

②

RED/BLK

③

RED/BLK

④

RED/BLK

⑤

YEL/BLK

6

⑦

RED/BLK

⑧

RED/BLK

C129

1

2

3

4

1

WHT/GRN

②

WHT/RED¹

3

BLK/YEL

4

WHT/BLU

C133

1

2

3

①

BLK/YEL

②

WHT/BLU

③

BLK

C134

1

2

3

①

BLK/YEL

②

WHT/YEL

③

WHT

C135

1

2

3

①

BLK/YEL

②

WHT/RED

③

RED

C139

1

2

①

YEL¹

②

RED/BLK

C140

1

2

①

BLK/RED

②

RED/BLK

C141

1

2

①

WHT/BLU¹

②

RED/BLK

C157

2

4

5

6

7

8

9

10

11

12

14

1

8

PNK

②

BLK

9

GRY

3

10

BRN

4

GRN

11

BLU

5

BLU/WHT

12

GRN/BLK

⑥

RED

13

7

WHT

14

YEL

C172

1

①

WHT/GRN²

2

C173

1

①

RED/BLU⁴

2

C308

1

2

3

4

1

RED

②

RED/BLU¹

3

WHT

4

BLK/YEL

C311

1

2

4

3

①

BLK

2

PNK

3

BLU/BLK

④

RED/BLU³

C320

1

2

①

BRN³

②

BLK

C322

1

2

1

BLK/WHT

②

BLK/YEL

C324

1

2

3

4

5

6

7

8

9

10

11

1

WHT/GRN

6

WHT/RED

2

WHT/BLU

⑦

WHT/GRN¹

3

BLU/WHT

8

BLU/RED

4

WHT/GRN

⑨

YEL/BLU

5

GRN

10

RED/GRN

11

WHT

C328

1

①

WHT

C329

1

2

3

4

5

1

YEL/RED

2

YEL/BLK

3

RED/WHT

4

WHT/GRN

⑤

WHT/YEL

C332

1

2

3

4

5

6

7

8

9

10

①

BLK

6

BLU

2

WHT

7

BRN

③

RED

8

BLK

4

YEL

9

PNK

5

GRN

10

GRY

C333

1

2

①

BLK/YEL

②

RED³

C337

1

2

3

①

YEL/BLU

②

GRN/BLU

③

PNK

C338

1

2

①

BLK/YEL

②

WHT/BLU

C339

1

2

①

RED/YEL

②

BLK/YEL

C174

1

2

①

BLK/YEL

②

YEL/BLU

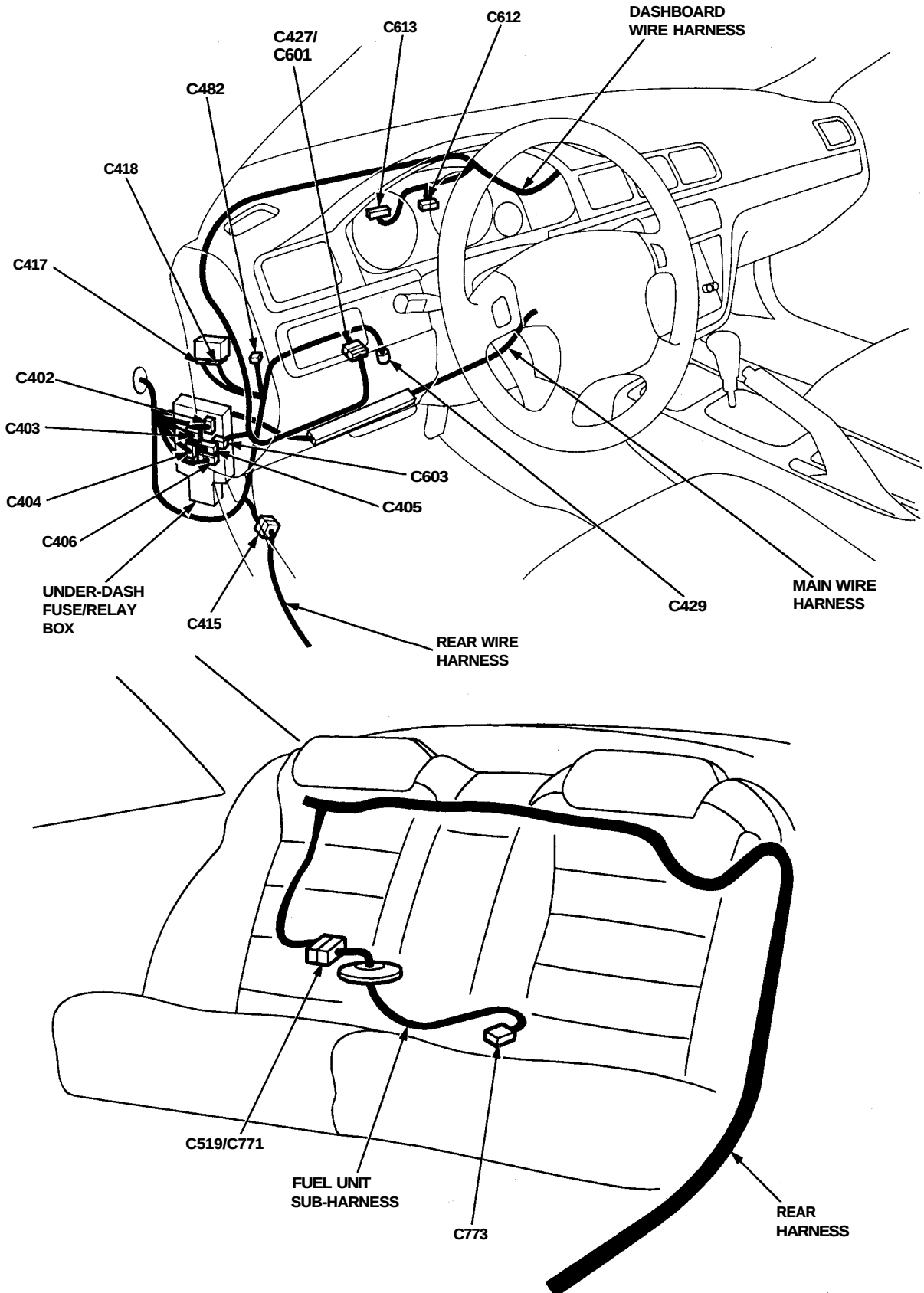
NOTE: • Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK¹ and YEL/BLK² are not the same).

○: Related to Fuel and Emissions System.

- Connector with male terminals (double outline): View from terminal side
- Connector with female terminals (single outline): View from wire side

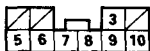
System Description

System Connectors [Dash and Floor]





C402



1	---	6	BLK
2	---	7	BLK
③	BLK/YEL	8	BLK
4	---	9	BLK
5	BLK/YEL	10	BLK

C404



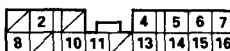
1	WHT/RED
②	BLK/YEL
3	---
4	WHT/YEL
5	BLK/YEL

C403



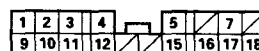
①	WHT
2	WHT/BLU
3	YEL/GRN

C405



1	---	9	---
2	RED/BLK	10	BLU
3	---	11	BLU
4	BLU/WHT	12	---
5	GRN	13	BLK/YEL
6	BLK	14	GRN/RED
7	BLU/YEL	15	YEL
8	BLU	⑩	YEL

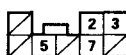
C406



①	GRN/WHT ¹	⑩	GRN/WHT ²
2	GRN/WHT	11	YEL/BLK ¹
3	YEL/BLK	⑫	BLU/RED
4	YEL/BLK	13	---
5	GRN/YEL	14	---
6	---	15	WHT/BLU
⑦	BLK/YEL	16	GRN/BLU
8	---	17	GRN/BLU
9	GRN/WHT	18	BLK/YEL

*: Canada

C417



1	---	⑤	BLK/YEL
②	GRN/BLK ¹	6	---
③	BLU/RED ¹	⑦	BLK ²
4	---	8	---

C418



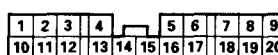
①	YEL/BLK
②	BLK/YEL
③	YEL/BLU
④	BLK/YEL

C482



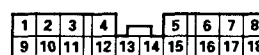
①	BLK/YEL
②	BLK/YEL

C415



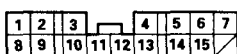
1	WHT/RED	11	GRY
2	BLU/YEL	12	LT BLU
3	GRN/YEL	13	GRN/YEL
4	GRN/BLK	14	GRN/BLU
5	YEL/RED	⑩	BLK/YEL
6	GRN/BLK	16	WHT/RED
7	GRN/YEL	17	GRN
8	RED/YEL	18	GRN/ORN
9	WHT/BLK	19	BLU/GRN
10	WHT/GRN	20	WHT/BLU

C415



1	WHT/RED	10	GRY
2	BLU/YEL	11	LT BLU
3	GRN/YEL	12	GRN/YEL
4	GRN/BLK	13	GRN/BLU
5	YEL/RED	⑩	BLK/YEL
6	GRN/BLK	15	WHT/RED
7	GRN/YEL	16	GRN
8	RED/YEL	17	GRN/ORN
9	WHT/GRN	18	BLU/GRN

C427



1	YEL/GRN	9	RED
2	BLK/YEL	10	BLU/WHT
3	BLU	⑪	BLK
4	BLU/GRN	12	GRN/RED
5	GRY/BLK	13	LT GRN
6	BLU/BLK	14	YEL/WHT
7	YEL/BLU	15	LT GRN
⑧	RED	16	---

C429



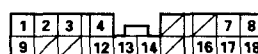
1	GRY
②	WHT/YEL
③	GRN/WHT ²
4	LT GRN

C519



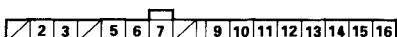
1	YEL/BLU
2	LT GRN/RED
③	BLK/YEL

C603



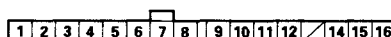
1	BLU/RED	10	---
2	BLU	11	RED/BLK
3	GRN/BLU	12	GRN/YEL
4	BLU/RED	13	YEL/GRN
5	---	14	BLK
6	---	15	---
7	GRN/BLU	16	BLK/YEL
⑧	YEL	17	GRN/RED
9	YEL/BLK	18	GRN/WHT

C612



1	---	⑩	YEL
2	RED	10	YEL/BLU
3	ORN	11	BRN
4	---	12	BLU
⑤	GRN/RED ²	13	GRN
6	LT GRN/RED	14	BLK
7	BLU/RED	15	RED/BLK
8	GRY/BLK	16	BLU/RED

C613



1	GRN/BLU	⑩	BLK
2	GRN/YEL	10	WHT
3	GRN/RED	⑪	RED
4	RED/BLU	12	BLU
5	RED/GRN	13	---
6	BLU/RED	14	GRN/BLK
7	BLU/BLK	15	ORN
⑧	YEL/GRN	16	GRN/WHT

C773



①	BLK
②	BLK/YEL

NOTE: • Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK¹ and YEL/BLK² are not the same).

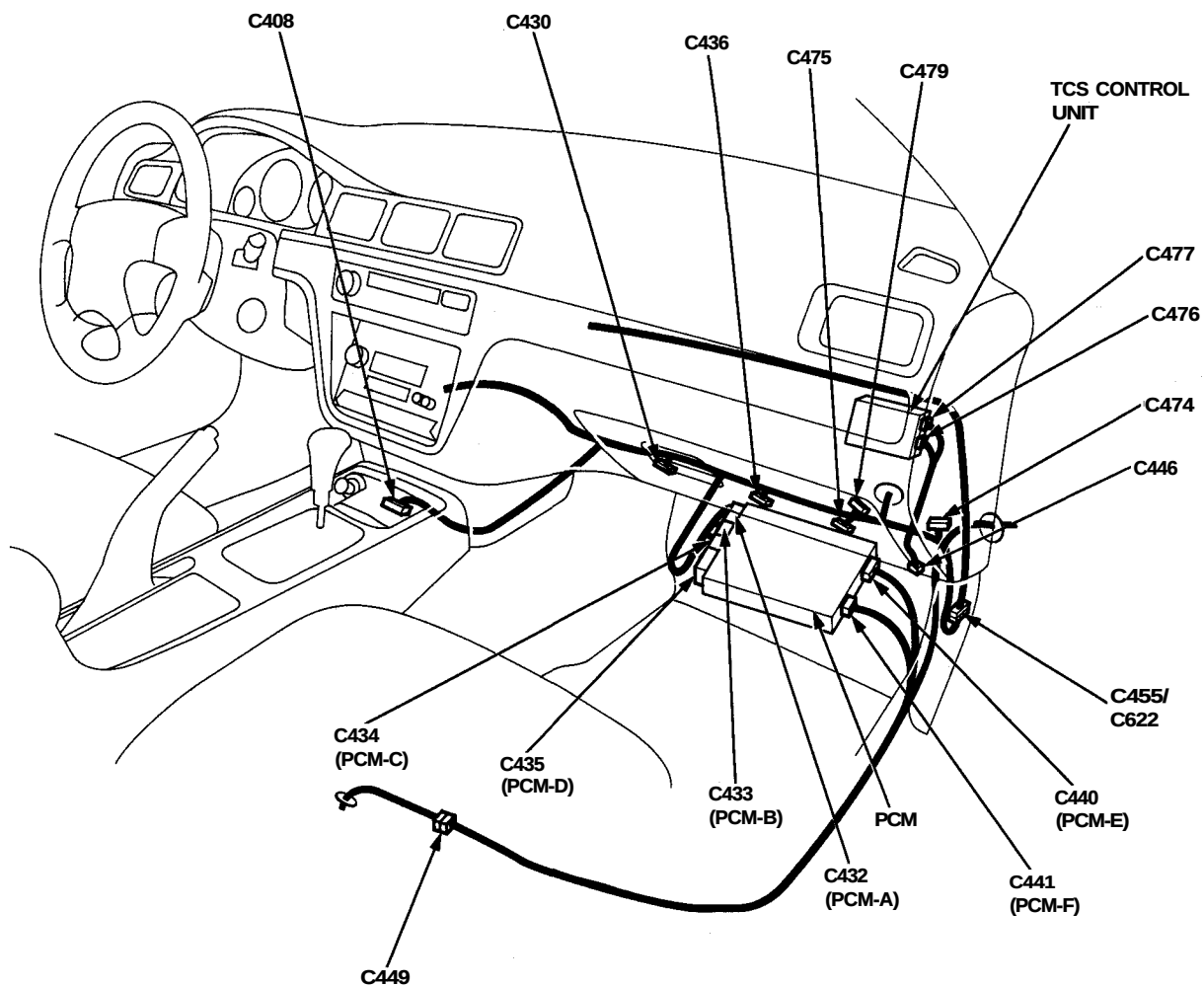
○: Related to Fuel and Emissions System.

- Connector with male terminals (double outline): View from terminal side
- Connector with female terminals (single outline): View from wire side

(cont'd)

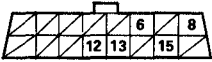
System Description

System Connectors [Dash and Floor] (cont'd)



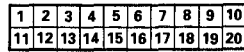


C408



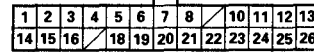
1	---	9	---
2	---	10	---
3	---	11	---
4	---	12	BLK
5	---	13	BRN/BLK
6	LT BLU	14	---
7	---	15	LT GRN/YEL
8	WHT/GRN	16	---

C430



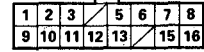
①	BRN/BLK ²	11	RED
②	BRN/BLK ²	12	RED
③	BRN/BLK ²	13	RED
④	BRN/BLK ²	14	RED
5	GRN/WHT	15	BLK/YEL
6	GRN/WHT	16	BLK/YEL
7	GRN/WHT	17	BLK/YEL
8	GRN/RED	⑩	ORN ²
9	GRN/RED	⑪	ORN ²
10	GRN/RED	⑫	ORN ²

C432 (PCM-A)



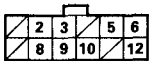
①	BRN ¹	⑭	YEL ¹
②	RED ¹	⑮	BLK/RED
③	BLU ¹	⑯	WHT/BLU ¹
④	GRN/BLK ¹	17	---
⑤	BLK/BLU	⑰	GRN/RED ¹
⑥	RED ²	⑱	ORN/BLK ¹
⑦	GRN/RED ²	⑲	RED/BLU ¹
⑧	RED/BLU ²	⑳	ORN/BLK ²
9	---	㉑	YEL ²
⑩	GRN ¹	㉒	RED ³
⑪	PNK	㉓	BRN ²
⑫	BLK ¹	㉔	BLK ²
⑬	YEL/BLK ¹	㉕	BRN/BLK ¹

C433 (PCM-B)



①	YEL/BLK ²	⑧	BRN/BLK ²
②	RED ³	⑨	GRY
③	GRN ²	⑩	GRN ³
4	---	⑪	BLU ²
⑤	ORN ¹	⑫	ORN ²
⑥	WHT ¹	14	---
⑦	ORN/BLU ¹	⑬	WHT/BLU ²
⑧	BLU/GRN ¹	⑭	BLU/YEL ¹

C434 (PCM-C)



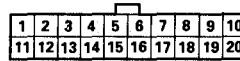
1	---	7	---
②	BLU/BLK	⑧	BLU ²
③	RED/BLU ²	⑨	LT GRN/BLK
4	---	⑩	GRY/GRN
⑤	ORN ³	11	---
⑥	BLU/RED ¹	⑪	LT BLU

C435 (PCM-D)



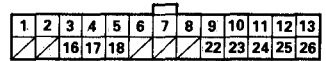
①	WHT/GRN ¹	⑫	WHT/BLU ³
②	RED/BLU ⁴	⑬	WHT/GRN ²
③	ORN/RED	⑭	ORN/BLU ²
④	LT GRN/YEL	⑮	BRN ³ (PNK ^{**})
⑤	WHT/RED ¹	16	---
⑥	RED/BLK	⑰	WHT/BLK
⑦	RED/WHT	⑱	WHT/RED ²
⑧	RED/YEL	⑲	BLU/RED ²
⑨	WHT/YEL	⑳	BLU ⁴
⑩	YEL/WHT	㉑	YEL/BLU
⑪	GRN/WHT ¹	㉒	GRN/BLU

C436



1	RED/BLK	⑩	YEL/BLK
2	RED/BLK	⑪	YEL/BLK
3	RED/BLK	⑫	YEL/BLK
4	RED/BLK	14	YEL/BLK
5	RED/BLK	15	BLU/YEL
6	RED/BLK	16	BLU/YEL
7	RED/BLK	17	BLU/GRN
8	RED/BLK	18	BLU/GRN
9	RED/BLK	19	ORN
10	RED/BLK	20	ORN

C440 (PCM-E)



1	BLK/YEL	14	---
②	GRN/WHT ²	15	---
3	RED ³	16	WHT ³
4	ORN/BLU ²	17	WHT/BLU ⁴
5	BLU/GRN ²	18	BLU/YEL ³
6	BLU/RED ³	19	---
7	WHT ²	20	---
8	YEL ¹	21	---
9	GRN ⁴	22	WHT/GRN
10	BLU ³	23	GRN/BLK ³
11	BRN ⁴	㉔	YEL/GRN
12	BLU/YEL ²	25	GRN/WHT ³
13	YEL ⁴	26	GRN/BLK ³

C441 (PCM-F)



1	---	5	---
②	WHT/RED ³	⑥	GRN/WHT ¹
③	GRN/BLK ⁴	⑦	GRN/YEL
④	YEL ¹	⑧	YEL/RED

C446



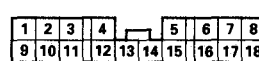
①	GRN/BLU
②	ORN ³

C449



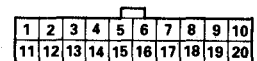
①	WHT/RED ²
②	GRN/WHT ¹
③	BLK/YEL
④	ORN/BLK ²

C455



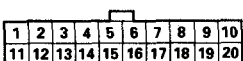
1	BLU/RED	10	WHT/GRN
②	GRN/RED ²	11	RED/GRN
3	ORN	12	BLK/GRN
4	RED/BLU	13	ORN/WHT
5	GRN	14	GRN/BLK
6	BLU	⑮	YEL/GRN
7	BRN	16	YEL/RED
8	PNK	17	WHT
9	WHT/BLU	18	BLU/WHT

C474



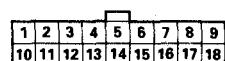
1	GRN/YEL	11	GRN/YEL
2	YEL/RED	12	WHT/RED
3	YEL/RED	13	WHT/RED
4	YEL/RED	14	WHT/RED
5	GRY	15	ORN
6	GRY	⑮	ORN ²
7	GRY	⑰	ORN ³
8	GRN/RED	18	BLU/WHT
9	GRN/RED	19	BLU/WHT
10	GRN/RED	20	BLU/WHT

C475



①	BLK/YEL	11	WHT/GRN
②	BLK/YEL	12	WHT/GRN
③	BLK/YEL	⑬	WHT/GRN ¹
④	BLK/YEL	⑭	WHT/GRN ¹
⑤	BLK/YEL	15	WHT/GRN
⑥	BLK/YEL	⑯	WHT/GRN ¹
7	BLK/YEL	⑰	WHT/YEL
⑧	BLK/YEL	18	WHT/YEL
⑨	BLK/YEL	⑱	WHT/YEL
10	BLK/YEL	20	WHT/YEL

C476



1	GRN/BLK	⑧	LT GRN/BLK
2	GRY/BLK	9	GRY
3	GRN/BLU	⑩	LT BLU
4	BRN/BLK	11	WHT/BLK
5	GRN/YEL	⑫	BLU ⁴
6	BLU/GRN	13	WHT
7	LT BLU	⑬	RED/BLK

C477



1	BLK/YEL	11	GRN/WHT
2	GRN/RED	⑫	BLU ¹
3	ORN	⑬	ORN/RED
4	BLU	⑭	GRY/GRN
5	BLU/RED	15	BRN/BLK
6	RED/BLK	16	WHT/GRN
7	---	17	GRY/BLK
8	---	18	BLK
9	BLK	19	BLU/BLK
10	BRN/WHT	20	BLU/YEL

C479



①	BRN/BLK ¹	11	WHT/BLU
②	BRN/BLK ¹	12	WHT/BLU
③	BRN/BLK ¹	13	WHT/BLU
④	BRN/BLK ¹	14	WHT/BLU
⑤	BRN/BLK ¹	15	WHT/BLU
⑥	BRN/BLK ¹	16	WHT/BLU
7	RED/BLU	17	GRN/RED
8	RED/BLU	18	GRN/RED
9	RED/BLU	19	GRN/RED
10	RED/BLU	20	GRN/RED

NOTE: ● Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK¹ and YEL/BLK² are not the same).

○: Related to Fuel and Emissions System.

- — Connector with male terminals (double outline): View from terminal side
- Connector with female terminals (single outline): View from wire side

*2: '97 - 98 models

Troubleshooting

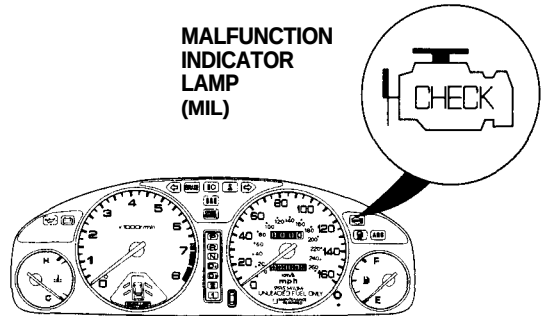
Troubleshooting Procedures

I. How To Begin Troubleshooting

When the Malfunction Indicator Lamp (MIL) has been reported on, or there is a driveability problem, use the appropriate procedure below to diagnose and repair the problem.

A. When the MIL has come on:

1. Connect the Honda PGM Tester or an OBD II scan tool to the 16P Data Link Connector (DLC) located on the center console behind the ashtray.
2. Turn the ignition switch ON (II).
3. Check the DTC and note it. Also check and note the freeze frame data.
Refer to the Diagnostic Trouble Code Chart and begin troubleshooting.



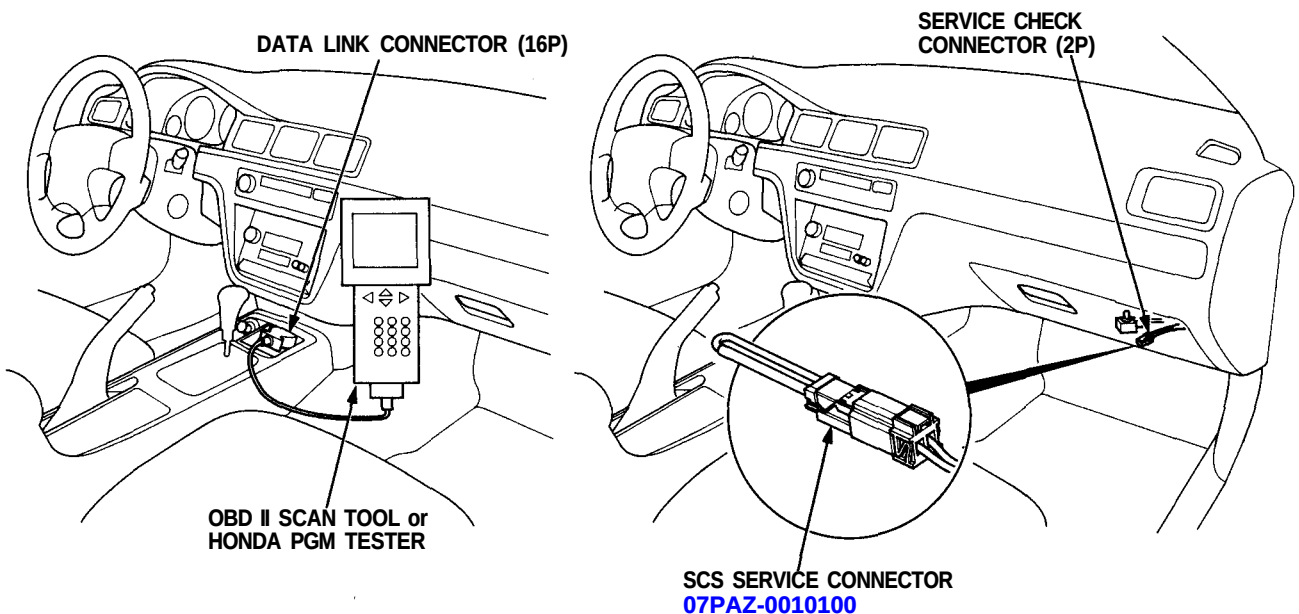
NOTE:

- See the OBD II scan tool or Honda PGM Tester user's manuals for specific operating instructions.
- The scan tool or tester can read the Diagnostic Trouble Codes (DTC), freeze frame data, current data, and other Powertrain Control Module (PCM) data.
- Freeze frame data indicates the engine conditions when the first malfunction, misfire or fuel trim malfunction was detected. It can be useful information when troubleshooting.

B. When the MIL has not come on, but there is a driveability problem, refer to the Symptom Chart on page [11-34](#).

C. DTCs will be indicated by the blinking of the Malfunction Indicator Lamp (MIL) with the SCS service connector connected.

- Connect the SCS service connector to Service Check Connector as shown. (The 2P Service Check Connector is located under the dash on the passenger's side of the car.) Turn the ignition switch ON (II).





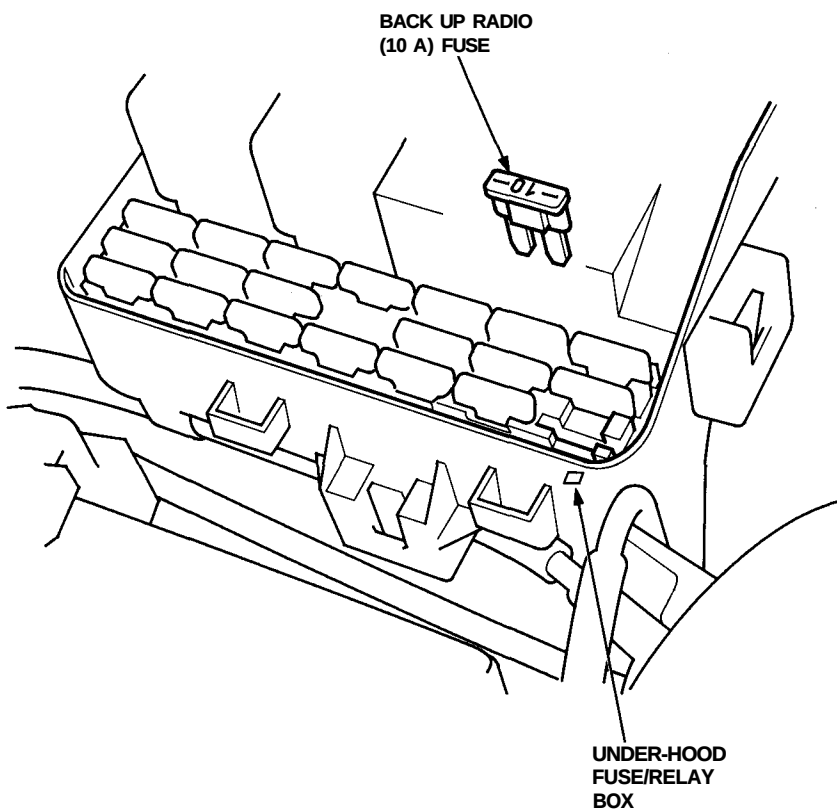
II. Powertrain Control Module (PCM) Reset Procedure

Either of the following actions will reset the PCM

- Use the OBD II scan tool or Honda PGM Tester to clear the PCM's memory.

NOTE: See the OBD II scan tool or Honda PGM Tester user's manuals for specific operating instructions.

- Turn the ignition switch OFF. Remove the BACK UP RADIO (10 A) fuse from the under-hood fuse/relay box for 10 seconds.



III. Final Procedure (this procedure must be done after any troubleshooting)

1. Remove the SCS Service Connector if it is connected.

NOTE: If the SCS service connector is connected and there are no DTCs stored in the PCM, the MIL will stay on when the ignition switch is turned ON (II).

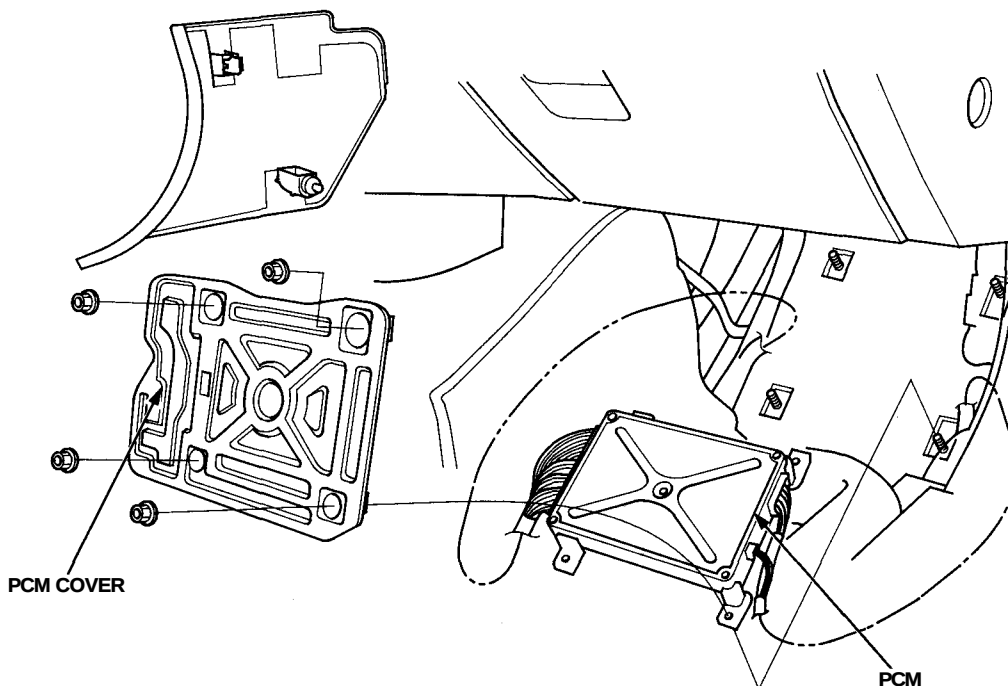
2. Do the PCM Reset Procedure.
3. Turn the ignition switch OFF.
4. Disconnect the OBD II scan tool or Honda PGM Tester from the Data Link Connector (16P).

(cont'd)

Troubleshooting

Troubleshooting Procedures (cont'd)

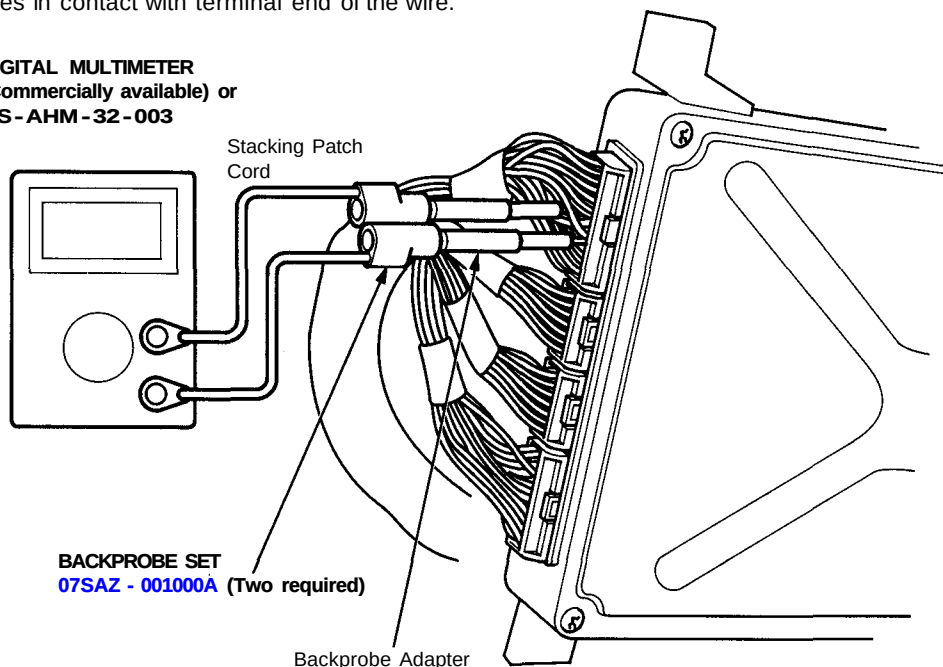
If the inspection for a particular code requires voltage or resistance checks at the PCM connectors, remove the right door sill molding. Pull the carpet back to expose the PCM. Unbolt the PCM cover, and connect the backprobe sets and a digital multimeter as described below. Check the system according to the procedure described for the appropriate code(s) listed on the following pages.



How to Use the Backprobe Sets

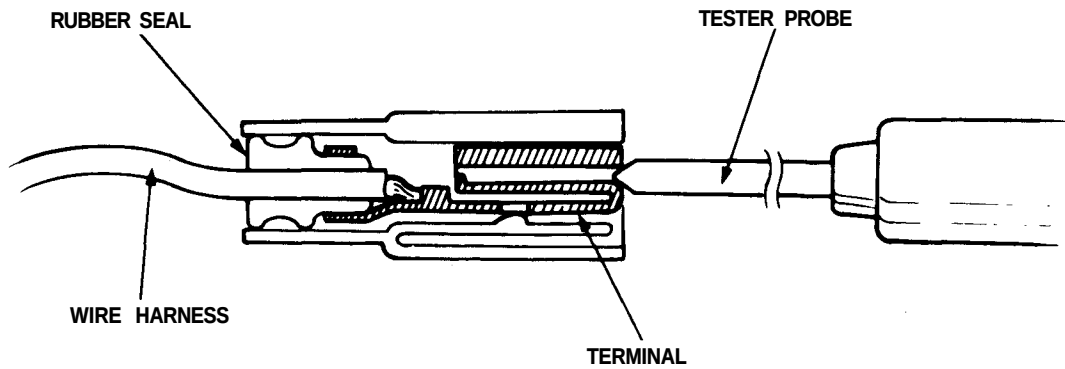
Connect the backprobe adapters to the stacking patch cords, and connect the cords to a multimeter. Using the wire insulation as a guide for the contoured tip of the backprobe adapter, gently slide the tip into the connector from the wire side until it comes in contact with terminal end of the wire.

DIGITAL MULTIMETER
(Commercially available) or
KS-AHM-32-003



**CAUTION:**

- Puncturing the insulation on a wire can cause poor or intermittent electrical connections.
- Bring the tester probe into contact with the terminal from the terminal side of wire harness connectors in the engine compartment. For female connectors, just touch lightly with the tester probe and do not insert the probe.



(cont'd)

Troubleshooting

Troubleshooting Procedures (cont'd)

Symptom Chart

Listed below are symptoms and probable causes for problems that DO NOT cause the Malfunction Indicator Lamp (MIL) to come on. If the MIL was reported on, go to page [11-32](#).

Troubleshoot each probable cause in the order listed (from left to right) until the symptom is eliminated.

The probable cause and troubleshooting page reference can be found below.

SYMPTOM	PROBABLE CAUSE
Engine will not start	2, 3, 21, 13, 1
Hard starting	2, 10, 12, 20, 21
Cold fast idle too low	5, 6, 7, 4
Cold fast idle too high	5, 6, 7, 9, 8
Idle speed fluctuates	5, 14, 15, 6, 7, 9, 8
Misfire or rough running	Troubleshoot for misfire on pages 11-85 , 11-89
Low power	2, 8, 9, 11, 18, 17, 19, 10
Engine stalls	2, 5, 10, 21, 7, 3, 16

Other Probable Causes for an engine that will not start:

- Compression
- PGM-FI main relay
- Engine locked up
- Timing belt
- Starting system
- Ignition system
- Overheating
- Battery

Probable Cause List (for DTC chart see page [11-45](#)).

Probable Cause	Page	System
1	11-53 , 11-54	Powertrain Control Module (PCM)
2	11-119	Fuel pressure
3	(See DTC chart)	Crankshaft Position/Cylinder Position sensor circuit
4	(See DTC chart)	Intake Air Temperature (IAT) sensor circuit
5	(See DTC chart)	Idle Air Control (IAC) Valve
6	11-113	Fast idle thermo valve
7	11-114	Idle speed adjustment
8	11-136	Throttle body
9	11-135	Throttle cable
10	(See DTC chart)	Manifold Absolute Pressure (MAP) sensor
11	(See DTC chart)	Throttle Position (TP) sensor
12	(See DTC chart)	Barometric pressure (BARO) sensor
13	Section 14	A/T gear position signal
14	11-104	Air Conditioning Signal
15	11-106	Alternator FR Signal
16	11-112	Brake switch signal
17	11-134	Air Cleaner
18	11-138	Intake Air Bypass (IAB) control system and intake air duct
19	11-144	Three Way Catalytic Converter (TWC)
20	11-153	Evaporative emission (EVAP) control
21	—	Contaminated fuel



Powertrain Control Module Data

By connecting the OBD II scan tool or the Honda PGM Tester to the 16P data link connector (DLC), various data can be retrieved from the PCM. The items listed in the table below conform to the SAE recommended practice.

The Honda PGM Tester also reads data beyond that recommended by SAE.

Understanding this data will help to find the causes of intermittent failures or engine problems.

NOTE:

- The "operating values" given below are approximate values and may be different depending on the environment and the individual car.
- Unless noted otherwise, "at idle speed" means idling with the engine completely warmed up, transmission in **P** or **N** 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.	○
Engine Speed	The PCM computes engine speed from the signals sent from the Crankshaft Position sensor. This data is used for determining the time and amount of fuel injection.	Nearly the same as tachometer indication at idle speed: 640 ± 50 rpm	○
Vehicle Speed	The PCM converts pulse signals from the Vehicle Speed Sensor (VSS) into speed data.	Nearly the same as speedometer indication	○
Manifold Absolute Pressure (MAP)	The absolute pressure created in the intake manifold by engine load and speed.	With engine stopped: Nearly the same as atmospheric pressure at idle speed: 24-37 kPa (180-280 mmHg, 7.1-11.0 inHg)	○
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 IAT With engine warmed up: approx. 158-212°F (70-100°C)	○
Heated Oxygen Sensor (HO2S) (Bank 1, Sensor 1) (Bank 2, Sensor 1) (Sensor 2)	The Heated Oxygen Sensor 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	○ (Sensor 1)

(cont'd)

Troubleshooting

Troubleshooting Procedures (cont'd)

Data	Description	Operating Value	Freeze Data
HO2S Feedback Loop Status (Bank 1: Right) (Bank 2: Left)	Loop 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 TP, MAP, and ECT sensors to control the amount of injected fuel.	At idle speed: closed	○
Short Term Fuel Trim (Bank 1: Right) (Bank 2: Left)	The air/fuel ratio correction coefficient for correcting the amount of injected fuel when HO2S feedback is in the closed loop status. When the signal from the HO2S is weak, short term fuel trim gets higher, and the PCM increases the amount of injected fuel. The air/fuel ratio gradually gets richer, causing a higher HO2S output. 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.	-30%~+43%	○
Long Term Fuel Trim (Bank 1: Right) (Bank 2: Left)	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.	-19%~+25%	○
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	○
Throttle Position	Based on the accelerator pedal position, the opening angle of the throttle valve is indicated.	At idle: Approx. 10% At full throttle: Approx. 90%	○
Ignition Timing	The ignition advance angle is set by the PCM. The PCM matches ignition timing to the driving conditions.	At idle speed: 15 + 2° BTDC with the SCS service connector connected.	×
Calculated Load Value (CLV)	CLV is the engine load calculated from the MAP data.	At idle speed: 15-35% At 2,500 rpm with no load: 12-30%	○



Powertrain Control Module Terminal Arrangement

PCM CONNECTOR A (26P)

1 INJ1	2 INJ2	3 INJ3	4 FLR	5 IACV	6 ESOL	7 MIL	8 ACC	9 /	10 FP RCS	11 IGN COIL1	12 PG1	13 IGP1
14 INJ4	15 INJ5	16 INJ6	17 /	18 LPO2S HTC	19 RPO2S HTC	20 IAB CS1	21 SO2S HTC	22 IAB CS2	23 PCS	24 IGN COIL2	25 PG2	26 LG1

Wire side of female terminals

PCM CONNECTOR A (26P)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	BRN	INJ1 (No. 1 FUEL INJECTOR)	Drives No. 1 fuel injector.	With engine running: pulses
2	RED	INJ2 (No. 2 FUEL INJECTOR)	Drives No. 2 fuel injector.	
3	BLU	INJ3 (No. 3 FUEL INJECTOR)	Drives No. 3 fuel injector.	
4	GRN/BLK	FLR (FUEL PUMP RELAY)	Drives fuel pump relay.	0 V for two seconds after turning ignition switch ON (II), then battery voltage
5	BLK/BLU	IACV (IDLE AIR CONTROL VALVE)	Drives IAC valve.	With engine running: pulses
6	RED	ESOL (EGR CONTROL SOLENOID VALVE)	Drives EGR control solenoid valve.	With EGR operating during driving with fully warmed up engine: duty controlled With EGR not operating: battery voltage
7	GRN/RED	MIL (MALFUNCTION INDICATOR LAMP)	Drives MIL.	With MIL turned ON: 0 V With MIL turned OFF: battery voltage
8	RED/BLU	ACC (A/C CLUTCH RELAY)	Drives A/C clutch relay.	With compressor ON: 0 V With compressor OFF: battery voltage
10	GRN	FP RCS (FUEL PRESSURE REGULATOR CONTROL SOLENOID VALVE)	Drives Fuel Pressure Regulator Control Solenoid Valve	Within a few minutes after restart with high ECT: 0 V
11	PNK	IGN COIL1 (No. 1 IGNITION COIL part of IGNITION CONTROL MODULE)	Sends ignition pulse.	With ignition switch ON (II): 0 V With engine running: pulses
12	BLK	PG1 (POWER GROUND)	Ground for the PCM power circuit.	Less than 1.0 V at all times
13	YEL/BLK	IGP1 (POWER SOURCE)	Power source for the PCM control circuit.	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V
14	YEL	INJ4 (No. 4 FUEL INJECTOR)	Drives No. 4 fuel injector.	With engine running: pulses
15	BLK/RED	INJ5 (No. 5 FUEL INJECTOR)	Drives No. 5 fuel injector.	
16	WHT/BLU	INJ6 (No. 6 FUEL INJECTOR)	Drives No. 6 fuel injector.	
18	GRN/RED	LPO2SHTC (LEFT PRIMARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives left primary heated oxygen sensor heater.	With ignition switch ON (II): battery voltage With fully warmed up engine running: 0 V
19	ORN/BLK	RPO2SHTC (RIGHT PRIMARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives right primary heated oxygen sensor heater.	With ignition switch ON (II): battery voltage With fully warmed up engine running: 0 V
20	RED/BLU	IABCS1 (IAB CONTROL SOLENOID VALVE1)	Drives IAB low control solenoid valve.	With engine speed below 3,400 rpm: battery voltage With engine speed above 3,400 rpm: 0 V
21	ORN/BLK	SO2SHTC (SECONDARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives secondary heated oxygen sensor heater.	With ignition switch ON (II): battery voltage With fully warmed up engine running: pulses
22	YEL	IABCS2 (IAB CONTROL SOLENOID VALVE2)	Drives IAB high control solenoid valve.	With engine speed below 4,300 rpm: battery voltage With engine speed above 4,300 rpm: 0 V
23*1	RED	PCS (EVAP PURGE CONTROL SOLENOID VALVE)	Drives EVAP purge control solenoid valve.	With engine running, engine coolant below 158°F (70°C): battery voltage With engine running, engine coolant above 158°F (70°C): 0 V
23*2	RED/YEL	PCS (EVAP PURGE CONTROL SOLENOID VALVE)	Driver EVAP purge control solenoid valve.	With engine running, engine coolant below 99°F (37°C): battery voltage With engine running, engine coolant above 99°F (37°C): duty controlled
24	BRN	IGN COIL2 (No. 2 IGNITION COIL part of IGNITION CONTROL MODULE)	Sends ignition pulse.	With ignition switch ON (II): 0 V With engine running: pulses
25	BLK	PG2 (POWER GROUND)	Ground for the PCM power circuit.	Less than 1.0 V at all times
26	BRN/BLK	LG1 (LOGIC GROUND)	Ground for the PCM control circuit.	Less than 1.0 V at all times

*1: '96 model

*2: '97 - 98 models

(cont'd)

Troubleshooting

Powertrain Control Module Terminal Arrangement (cont'd)

PCM CONNECTOR B (16P)



1 IGP2	2 IGN COIL6	3 PSP SW	4	5 CYP 2P	6 CYP 1P	7 CKP 2P	8 CKP 1P
9 LG2	10 IGN COIL5	11 IGN COIL4	12 IGN COIL3	13 VSS	14	15 CKP 2M	16 CKP 1M

Wire side of female terminals

PCM CONNECTOR B (16P)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	YEL/BLK	IGP2 (POWER SOURCE)	Power source for the PCM control circuit.	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V
2	RED	IGN COIL6 (No. 6 IGNITION COIL part of IGNITION CONTROL MODULE)	Sends ignition pulse.	With ignition switch ON (II): 0 V With engine running: pulses
3	GRN	PSPSW (P/S OIL PRESSURE SWITCH)	Detects PSP switch signal.	At idle with steering wheel in straight ahead position: 0 V At idle with steering wheel at full lock: battery voltage
5	ORN	CYP 2P (CYP SENSOR 2P SIDE)	Detects CYP sensor 2.	With engine running: pulses
6	WHT	CYP 1P (CYP SENSOR 1P SIDE)	Detects CYP sensor 1.	With engine running: pulses
7	ORN/BLU	CKP 2P (CKP SENSOR 2P SIDE)	Detects CKP sensor 2.	With engine running: pulses
8	BLU/GRN	CKP 1P (CKP SENSOR 1P SIDE)	Detects CKP sensor 1.	With engine running: pulses
9	BRN/BLK	LG2 (LOGIC GROUND)	Ground for the PCM control circuit.	Less than 1.0 V at all times
10	GRY	IGN COIL5 (No. 5 IGNITION COIL part of IGNITION CONTROL MODULE)	Sends ignition pulse.	With ignition switch ON (II): 0 V With engine running: pulse
11	GRN	IGN COIL4 (No. 4 IGNITION COIL part of IGNITION CONTROL MODULE)	Sends ignition pulse.	With ignition switch ON (II): 0 V With engine running: pulses
12	BLU	IGN COIL3 (No. 3 IGNITION COIL part of IGNITION CONTROL MODULE)	Sends ignition pulse.	With ignition switch ON (II): 0 V With engine running: pulse
13	ORN	VSS (VEHICLE SPEED SENSOR)	Detects VSS signal.	With ignition switch ON (II) and front wheels rotating: cycles 0 V – 5 V
15	WHT/BLU	CKP 2M (CKP SENSOR 2 M SIDE)	Ground for CKP sensor 2.	
16	BLU/YEL	CKP 1M (CKP SENSOR 1 M SIDE)	Ground for CKP sensor 1.	



PCM CONNECTOR C (12P)

	2	3		5	6
	ACS	PDSW		SCS	STS
	8	9	10		12
	NEP	TCINH	TCFC		TCSTB

Wire side of female terminals

PCM CONNECTOR C (12P)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
2	BLU/BLK	ACS (A/C SWITCH SIGNAL)	Detects A/C switch signal.	With A/C switch ON: 0 V With A/C switch OFF: approx. 10 V
3	RED/BLU	PDSW (A/C PRESSURE SWITCH B)	Detects A/C pressure switch B signal.	With A/C pressure switch B ON: 0 V With A/C pressure switch B OFF: approx. 5 V
5	ORN	SCS (SERVICE CHECK SIGNAL)	Detects service check connector signal (the signal causing a DTC indication)	With the connector connected: 0 V With the connector disconnected: about 5 V or battery voltage
6	BLU/RED	STS (STARTER SWITCH SIGNAL)	Detects starter switch signal.	With starter switch ON: battery voltage With starter switch OFF: 0 V
8	BLU	NEP (ENGINE SPEED PULSE)	Outputs engine speed pulse.	With engine running: pulses
9*3	LT GRN/BLK	TCINH (TRACTION CONTROL INHIBIT)	FI → TCS, TCS operation permission signal	With engine running: pulses
10*3	GRY/GRN	TCFC (TRACTION CONTROL FUEL CUT)	TCS → FI, Fuel cut (torque down) signal	With engine running: pulses
12*3	LT BLU	TCSTB (TRACTION CONTROL STANDBY)	TCS → FI, TCS operation start signal	With TCS OFF: approx. 5 V With TCS ON: 0 V

*3: with TCS only.

(cont'd)

Troubleshooting

Powertrain Control Module Terminal Arrangement (cont'd)

PCM CONNECTOR D (22P)

1	2	3	4	5	6	7	8	9	10	11
VBU	KSR	BARO OUT	K-LINE	ALTF	TPS	ECT	IAT	MAP (PB)	VCCI	SG1
12	13	14	15		17	18	19	20	21	22
CYP 1M	KSL	CYP 2M	PFSW*1 PTANK*2		EGRL	VREF	LP O2S	RP O2S	VCC2	SG2

Wire side of female terminals

PCM CONNECTOR D (22P)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	WHT/GRN	VBU (VOLTAGE BACK UP)	Power source for the PCM control circuit. Power source for the DTC memory.	Battery voltage at all times
2	RED/BLU	KSR (RIGHT KNOCK SENSOR (BANK 1))	Detects knock sensor signal.	With engine knocking: pulses
3*3	ORN/RED	BARO OUT (BAROMETRIC SENSOR OUTPUT SIGNAL)	Sends barometric sensor output signal.	With ignition switch ON (II): about 3 V (depending on barometric pressure)
4	LT GRN/YEL	K-LINE	Sends and receives OBD II scan tool and PGM tester signal.	With ignition switch ON (II): about 5 V
5	WHT/RED	ALTF (ALTERNATOR FR SIGNAL)	Detects alternator FR signal.	With fully warmed up engine running: 0 V – battery voltage (depending on electrical load)
6	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
7	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)
8	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)
9	WHT/YEL	MAP (MANIFOLD ABSOLUTE PRESSURE SENSOR)	Detects MAP sensor signal.	With ignition switch ON (II): about 3 V At idle: about 1.0 V (depending on engine speed)
10	YEL/WHT	VCC1 (SENSOR VOLTAGE)	Power source for MAP sensor.	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
11	GRN/WHT	SG1 (SENSOR GROUND)	Ground for MAP sensor.	
12	WHT/BLU	CYP 1M (CYP SENSOR 1 M SIDE)	Ground for CYP sensor 1.	
13	WHT/GRN	KSL (LEFT KNOCK SENSOR (BANK 2))	Detects knock sensor signal.	With engine knocking: pulses
14	ORN/BLU	CYP 2M (CYP SENSOR 2 M SIDE)	Ground for CYP sensor 2.	
15*1	BRN	PFSW (EVAP PURGE FLOW SWITCH)	Detects the EVAP purge flow.	During purge flow: battery voltage No purge flow: 0 V
15*2	PNK	PTANK (FUEL TANK PRESSURE SENSOR)	Detects fuel tank pressure sensor signal.	With fuel fill cap opened: about 2.5 V
17	WHT/BLK	EGRL (EGR VALVE LIFT SENSOR)	Detects EGR valve lift sensor signal.	At idle without vacuum: about 1.2 V With 27 kPa (200 mmHg, 8 in.Hg): about 4.3 V
18	WHT/RED	LPO2S (LEFT PRIMARY OXYGEN SENSOR)	Detects primary oxygen sensor signal.	With throttle fully opened, fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
19	BLU/RED	RPO2S (RIGHT PRIMARY OXYGEN SENSOR)	Detects primary oxygen sensor signal.	With throttle fully opened, fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
20*3	BLU	VREF (REFERENCE VOLTAGE)	Provides reference voltage to TCS control unit.	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
21	YEL/BLU	VCC2 (SENSOR VOLTAGE)	Provides sensor voltage.	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
22	GRN/BLU	SG2 (SENSOR GROUND)	Sensor ground.	

*1: '96 model

*2: '97 - 98 models

*3: with TCS



PCM CONNECTOR E (26P)

1 VB SOL	2 BKSW	3 LS+	4 NM	5 NC	6 TC SFT	7 ATPR	8 ATPD4	9 ATPD3	10 ATP2	11 ATP1	12 SHA	13 LCA
		16 LS-	17 NMSG	18 NCSG				22 ILU	23 D4IND	24 ATPPN	25 SHB	26 LCB

Wire side of female terminals

PCM CONNECTOR E(26P)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	BLK/YEL	VB SOL (VOLTAGE BACK-UP SOLENOID VALVE)	Power source for solenoid valves.	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V
2	GRN/WHT	BKSW (BRAKE SWITCH)	Detects brake switch signal.	With brake pedal released: 0 V With brake pedal depressed: battery voltage
3	RED	LS + (LINEAR SOLENOID VALVE +)	Drives linear solenoid valve.	With ignition switch ON (II): pulses
4	ORN/BLU*1 WHT/GRN*2	NM (MAINSHAFT SPEED SENSOR)	Detects mainshaft speed sensor signal.	With engine running: pulses
5	BLU/GRN*1 RED/BLU*2	NC (COUNTERSHAFT SPEED SENSOR)	Detects countershaft speed sensor signal.	With engine running: pulses
6	BLU/RED	TCSFT (TCS SHIFT CONTROL)	Sends TCS shift control signal.	With engine running: pulses
7	WHT	ATPR (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In R position: 0 V In any other position: battery voltage
8	YEL	ATPD4 (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In D4 position: 0 V In any other position: battery voltage
9	GRN	ATPD3 (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In D3 position: 0 V In any other position: battery voltage
10	BLU	ATP2 (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In 2 position: 0 V In any other position: battery voltage
11	BRN	ATP1 (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In 1 position: 0 V In any other position: battery voltage
12	BLU/YEL	SHA (SHIFT CONTROL SOLENOID VALVE A)	Drives shift control solenoid valve A.	With engine running in 2 , 3 : battery voltage With engine running in 1 , 4 : about 0 V
13	YEL	LC A (LOCK-UP CONTROL SOLENOID VALVE A)	Drives lock-up control solenoid valve A.	With lock-up ON: battery voltage With lock-up OFF: 0 V
16	WHT	LS - (LINEAR SOLENOID VALVE -)	Drives linear solenoid valve.	With ignition switch NO (II): pulses
17	WHT/BLU	NMSG (MAINSHAFT SPEED SENSOR GROUND)	Ground for mainshaft speed sensor.	
18	BLU/YEL	NCSG (COUNTERSHAFT SPEED SENSOR GROUND)	Ground for countershaft speed sensor.	
22	WHT/GRN	ILU (INTERLOCK CONTROL UNIT)	Detects interlock control unit signal.	With ignition switch ON (II) and brake pedal depressed: battery voltage
23	GRN/BLK	D4 IND (D4 INDICATOR LIGHT)	Drives D4 indicator light.	With D4 indicator light turned ON: 0 V With D4 indicator light turned OFF: battery voltage
24	YEL/GRN	ATPPN (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In N or P position: 0 V In any other position: battery voltage
25	GRN/WHT	SHB (SHIFT CONTROL SOLENOID VALVE B)	Drives shift control solenoid valve B.	With engine running in 1 , 2 : battery voltage With engine running in 3 , 4 : about 0 V
26	GRN/BLK	LC B (LOCK-UP CONTROL SOLENOID VALVE B)	Drives lock-up control solenoid valve B.	With lock-up ON: battery voltage With lock-up OFF: 0 V

*1: '96 model

*2: '97 - 98 models

(cont'd)

Troubleshooting

Powertrain Control Module Terminal Arrangement (cont'd)

PCM CONNECTOR F (8P)

1 2WBS ^{*2}	2 SHO2S	3 PHRST R	4 MFPLS R
5 VSV ^{*2}	6 SO2S GND	7 PHRST L	8 MFPLS L

Wire side of male terminals

PCM CONNECTOR F (8P)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1*2	WHT/BLU	2WBS (EVAP BYPASS SOLENOID VALVE)	Drives EVAP bypass solenoid valve	With ignition switch ON (II): battery voltage
2	WHT/RED	SHO2S (SECONDARY HEATED OXYGEN SENSOR, SENSOR 2)	Detects secondary heated oxygen sensor (sensor 2) signal	With throttle fully opened, fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
3	GRN/BLK	PHRST R (RIGHT PEAK HOLD RESET)	Sends peak hold reset signal	With engine running: pulses
4	YEL	MFPLS R (RIGHT MISFIRE PULSE)	Detects misfire pulse	With engine running: pulses
5*2	YEL/BLU	VSV (EVAP CONTROL CANISTER VENT SHUT VALVE)	Drives EVAP control canister vent shut valve	With ignition switch ON (II): battery voltage
6	GRN/WHT	SO2SGND (SECONDARY OXYGEN SENSOR, SENSOR 2 GROUND)	Sensor ground for secondary heated oxygen sensor (sensor 2)	
7	GRN/YEL	PHRST L (LEFT PEAK HOLD RESET)	Sends peak hold reset signal	With engine running: pulses
8	YEL/RED	MFPLS L (LEFT MISFIRE PULSE)	Detects misfire pulse	With engine running: pulses

*2: '97 - 98 models



Diagnostic Trouble Code (DTC) Chart

DTC (MIL indication* ¹)	Detection Item	Probable Cause	Page
P0106 (5)* ²	Manifold Absolute Pressure Circuit Range/Performance Problem	• Vacuum connection • MAP sensor	11-57
P0107 (3)	Manifold Absolute Pressure Circuit Low Input	• Open or short in MAP sensor circuit • MAP sensor • PCM	11-59
P0108 (3)	Manifold Absolute Pressure Circuit High Input	• Open in MAP sensor circuit • MAP sensor • PCM	11-61
P0111 (10)* ⁴	Intake Air Temperature Circuit Range/Performance Problem	• IAT sensor	11-63
P0112 (10)	Intake Air Temperature Circuit Low Input	• Short in IAT sensor circuit • IAT sensor • PCM	11-64
P0113 (10)	Intake Air Temperature Circuit High Input	• Open in IAT sensor circuit • IAT sensor • PCM	11-65
P0116 (86)	Engine Coolant Temperature Circuit Range/Performance Problem	• ECT sensor • Cooling system	11-66
P0117 (6)	Engine Coolant Temperature Circuit Low Input	• Short in ECT sensor circuit • ECT sensor • PCM	11-67
P0118 (6)	Engine Coolant Temperature Circuit High Input	• Open in ECT sensor circuit • ECT sensor • PCM	11-68
P0122 (7)	Throttle Position Circuit Low Input	• Open or short in TP sensor circuit • TP sensor • PCM	11-69
P0123 (7)	Throttle Position Circuit High Input	• Open in TP sensor circuit • TP sensor • PCM	11-71
P0131 (2)	Right Primary Heated Oxygen Sensor Circuit Low Voltage (Bank 1, Sensor 1)	• Short in Right Primary HO₂S (Bank 1, Sensor 1) circuit • Right Primary HO₂S (Bank 1, Sensor 1) • Fuel supply system • PCM	11-73
P0132 (2)	Right Primary Heated Oxygen Sensor Circuit High Voltage (Bank 1, Sensor 1)	• Open in Right Primary HO₂S (Bank 1, Sensor 1) circuit • Right Primary HO₂S (Bank 1, Sensor 1) • PCM	11-75
P0133 (62)	Right Primary Heated Oxygen Sensor Slow Response (Bank 1, Sensor 1)	• Right Primary HO₂S (Bank 1, Sensor 1) • Exhaust system	11-76
P0135 (42)	Right Primary Heated Oxygen Sensor Heater Circuit Malfunction (Bank 1, Sensor 1)	• Open or short in Right Primary HO₂S (Bank 1, Sensor 1) heater circuit • PCM	11-80

*1: These DTCs will be indicated by the blinking of the Malfunction Indicator Lamp (MIL) with the SCS service connector connected

*2: '96 model

*4: '97 model

(cont'd)

Troubleshooting

Diagnostic Trouble Code (DTC) Chart (cont'd)

DTC (MIL indication)	Detection Item	Probable Cause	Page
P0137 (63)	Secondary Heated Oxygen Sensor Circuit Low Voltage (Sensor 2)	• Short in Secondary H02S (Sensor 2) circuit • Secondary H02S (Sensor 2) • PCM	11-77
P0138 (63)	Secondary Heated Oxygen Sensor Circuit High Voltage (Sensor 2)	• Open in Secondary H02S (Sensor 2) circuit • Secondary H02S (Sensor 2) • PCM	11-78
P0139 (63)	Secondary Heated Oxygen Sensor Slow Response (Sensor 2)	• Secondary H02S (Sensor 2)	11-79
P0141 (65)	Secondary Heated Oxygen Sensor Heater Circuit Malfunction (Sensor 2)	• Open or short in Secondary H02S (Sensor 2) heater circuit • PCM	11-80
P0151 (1)	Left Primary Heated Oxygen Sensor Circuit Low Voltage (Bank 2, Sensor 1)	• Short in Left Primary H02S (Bank 2, Sensor 1) circuit • Left Primary H02S (Bank 2, Sensor 1) • Fuel supply system • PCM	11-73
P0152 (1)	Left Primary Heated Oxygen Sensor Circuit High Voltage (Bank 2, Sensor 1)	• Open in Left Primary H02S (Bank 2, Sensor 1) circuit • Left Primary H02S (Bank 2, Sensor 1) • PCM	11-75
P0153 (61)	Left Primary Heated Oxygen Sensor Slow Response (Bank 2, Sensor 1)	• Left Primary H02S (Bank 2, Sensor 1) • Exhaust system	11-76
P0155 (41)	Left Primary Heated Oxygen Sensor Heater Circuit Malfunction (Bank 2, Sensor 1)	• Open or short in Left Primary H02S (Bank 2, Sensor 1) heater circuit • PCM	11-80
P0171 (46)	System Too Lean [Right Bank (Bank 1)]	• Fuel supply system • Right Primary H02S (Bank 1, Sensor 1) • MAP sensor • Contaminated fuel • Valve clearance • Exhaust leakage	11-82
P0172 (46)	System Too Rich [Right Bank (Bank 1)]	• Fuel supply system • Right Primary H02S (Bank 1, Sensor 1) • MAP sensor • Contaminated fuel • Valve clearance	11-82
P0174 (45)	System Too Lean [Left Bank (Bank 2)]	• Fuel supply system • Left Primary H02S (Bank 2, Sensor 1) • MAP sensor • Contaminated fuel • Exhaust leakage	11-82
P0175 (45)	System Too Rich [Left Bank (Bank 2)]	• Fuel supply system • Left Primary H02S (Bank 2, Sensor 1) • MAP sensor • Contaminated fuel	11-82



DTC (MIL indication)	Detection Item	Probable Cause	Page
P0325 (53)	Right Knock Sensor (Bank 1) Circuit Malfunction	• Open or short in Right Knock Sensor (Bank 1) circuit • Right Knock Sensor (Bank 1) • PCM	11-84
P0330 (23)	Left Knock Sensor (Bank 2) Circuit Malfunction	• Open or short in Left Knock Sensor (Bank 2) circuit • Left Knock Sensor (Bank 2) • PCM	11-84
P0335 (4)	Crankshaft Position Sensor 1 Circuit Malfunction	• Crankshaft Position Sensor 1 • Crankshaft Position Sensor 1 circuit • PCM	11-94
P0336 (4)	Crankshaft Position Sensor 1 Range/Performance	• Crankshaft Position Sensor 1 • Timing belt skipped teeth	11-94
P0401 (80)	Exhaust Gas Recirculation Insufficient Flow Detected	• EGR valve • EGR line	11-147
P0420 (67)	Catalyst System Efficiency Below Threshold	• Three Way Catalytic converter • Secondary HO2S	11-145
P0441 (92)* ²	Evaporative Emission Control System Incorrect Purge Flow	• EVAP Purge Control Solenoid valve • EVAP Purge Control Solenoid valve circuit • EVAP Purge Flow Switch • EVAP Purge Flow Switch circuit • Throttle Body (purge port) • Tubing • PCM	11-155
P0452 (91)	Evaporative Emission Control System Pressure Sensor (Fuel Tank Pressure Sensor) Circuit Low Input	• Open or short in Fuel Pressure Sensor circuit • Fuel Tank Pressure Sensor • PCM	11-157
P0453 (91)	Evaporative Emission Control System Pressure Sensor (Fuel Tank Pressure Sensor) Circuit High Input	• Open in Fuel Tank Pressure Sensor circuit • Fuel Tank Pressure Sensor • PCM	11-159
P0505 (14)	Idle Control System Malfunction	• IAC valve • Fast idle thermo valve • Throttle Body	11-101
P0700 P0715 P0720 P0730 P0740 P0753 P0758 (70)* ⁵	Automatic Transaxle	—	Section 14
P1106 (13)* ³	Barometric Pressure Circuit Range/Performance Problem	• PCM (Baro sensor)	11-96
P1107 (13)	Barometric Pressure Circuit Range/Performance Problem	• PCM (Baro sensor)	11-97
P1108 (13)	Barometric Pressure Circuit High Input	• PCM (Baro sensor)	11-97

*2: '96 model

*3: '97 - 98 models

*5: The  indicator light and the Malfunction Indicator Lamp (MIL) may come on simultaneously.

(cont'd)

Troubleshooting

Diagnostic Trouble Code (DTC) Chart (cont'd)

DTC (MIL indication)	Detection Item	Probable Cause	Page
P1121 (7)* ³	Throttle Position Lower Than Expected	• TP sensor	11-72
P1122 (7)* ³	Throttle Position Higher Than Expected	• TP sensor	11-72
P1128 (5)* ³	Manifold Absolute Pressure Lower Than Expected	• MAP sensor	11-62
P1129 (5)* ³	Manifold Absolute Pressure Higher Than Expected	• MAP sensor	11-62
P1201 P1202 P1203 P1204 P1205 P1206 (71 72 73 74 75 76)	— Cylinder 1 — Cylinder 2 — Cylinder 3 — Cylinder 4 — Cylinder 5 — Cylinder 6 Misfire Detected	• Fuel injector • Fuel injector circuit • Ignition system • Low compression	11-85
P1300 (71 72 73 74 75 76)	Random Misfire	• Ignition system • Fuel supply system • MAP sensor • EGR system • Contaminated fuel • Lack of fuel	11-89
P1301 P1302 P1303 P1304 P1305 P1306 (71 72 73 74 75 76)	— Cylinder 1 — Cylinder 2 — Cylinder 3 — Cylinder 4 — Cylinder 5 — Cylinder 6 Misfire Detected	• Ignition system	11-85
P1316 (79)	Spark Plug Voltage Detection Circuit Malfunction [Left Bank (Bank 2)]	• Open or short in Spark Plug Voltage Detection Module circuit • Spark Plug Voltage Detection Module • PCM	11-90
P1317 (79)	Spark Plug Voltage Detection Circuit Malfunction [Right Bank (Bank 1)]	• Open or short in Spark Plug Voltage Detection Module circuit • Spark Plug Voltage Detection Module • PCM	11-90
P1318 (79)	Spark Plug Voltage Detection Module Reset Circuit Malfunction [Left Bank (Bank 2)]	• Open or short in Spark Plug Voltage Detection Module Reset circuit • Spark Plug Voltage Detection Module • PCM	11-92
P1319 (79)	Spark Plug Voltage Detection Module Reset Circuit Malfunction [Right Bank (Bank 1)]	• Open or short in Spark Plug Voltage Detection Module Reset circuit • Spark Plug Voltage Detection Module • PCM	11-92
P1336 (54)	Crankshaft Position Sensor 2 Circuit Range/Performance Problem	• Crankshaft Position Sensor 2 • Timing belt skipped teeth	11-94
P1337 (54)	Crankshaft Position Sensor 2 Circuit Malfunction	• Crankshaft Position Sensor 2 • Crankshaft position Sensor 2 circuit • PCM	11-94
P1381 (9)	Cylinder Position Sensor 1 Range/Performance Problem	• Cylinder Position Sensor 1	11-94
P1382 (9)	Cylinder Position Sensor 1 Circuit Malfunction	• Cylinder Position Sensor 1 • Cylinder Position Sensor 1 circuit • PCM	11-94
P1386 (59)	Cylinder Position Sensor 2 Range/Performance Problem	• Cylinder Position Sensor 2	11-94

*3: '97 - 98 models



DTC (MIL indication)	Detection Item	Probable Cause	Page
P1387 (59)	Cylinder Position Sensor 2 Circuit Malfunction	• Cylinder Position Sensor 2 • Cylinder Position Sensor 2 circuit • PCM	11-94
P1456 (90)	Evaporative Emission Control System Leak Detected (Fuel Tank Area)	• Vacuum connection • Fuel tank • Fuel tank pressure sensor • Fuel fill cap • EVAP bypass solenoid valve • EVAP two way valve • EVAP control canister vent shut valve • EVAP control canister • EVAP purge control solenoid valve	11-161
P1457 (90)	Evaporative Emission Control System Leak Detected (EVAP Control Canister Area)	• Vacuum connection • EVAP control canister • Fuel tank pressure sensor • EVAP bypass solenoid valve • EVAP two way valve • EVAP control canister vent shut valve • Fuel Tank • EVAP purge control solenoid valve	11-161
P1459 (92)* ²	Evaporative Emission Purge Flow Switch Malfunction	• EVAP Purge Flow Switch • EVAP Purge Flow Switch circuit • Tubing • PCM	11-166
P1491 (12)	EGR Valve Lift Insufficient Detected	• EGR valve (with lift sensor) • EGR valve lift sensor circuit • EGR control solenoid valve • EGR control solenoid valve circuit • EGR line • PCM	11-148
P1498 (12)	EGR Valve Lift Sensor High Voltage	• EGR valve (with lift sensor) • EGR valve lift sensor circuit • PCM	11-151
P1508 (14)	Idle Air Control Valve Circuit Failure	• IAC valve • IAC valve circuit • PCM	11-103
P1607 (–)	Powertrain Control Module Internal Circuit Failure	• PCM	11-98
P1690 (35)* ⁶	TCSTB Line Failure	• TCSTB Line • TCS Control unit • PCM	Section 19
P1696 (36)* ⁶	TCFC Signal Low Input	• TCFC Line • TCS Control Unit • PCM	Section 19
P1697 (36)* ⁶	TCFC Signal High Input	• TCFC Line • TCS Control Unit • PCM	Section 19
P1705 P1706 P1753 P1758 P1768 P1791 (70)* ⁵	Automatic Transaxle	—	Section 14

*2: '96 model

*5: The  indicator light and the Malfunction Indicator Lamp (MIL) may come on simultaneously.

*6: with TCS

Troubleshooting

How to Read Flowcharts

A flowchart is designed to be used from start to final repair. It's like a map showing you the shortest distance. But beware: if you go off the "map" anywhere but a "stop" symbol, you can easily get lost.

START

(bold type)

Describes the conditions or situation to start a troubleshooting flowchart.

ACTION

Asks you to do something; perform a test, set up a condition etc.

DECISION

Asks you about the result of an action, then sends you in the appropriate troubleshooting direction.

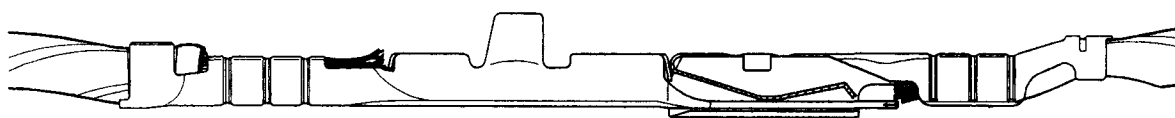
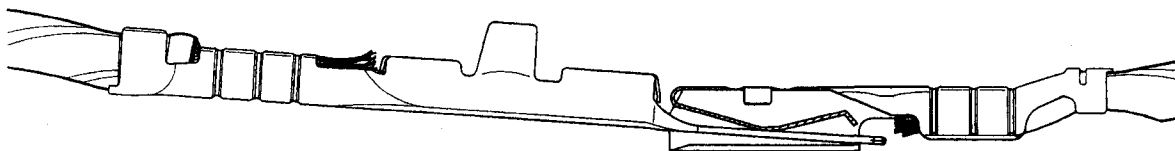
STOP

(bold type)

The end of a series of actions and decisions, describes a final repair action and sometimes directs you to an earlier part of the flowchart to confirm your repair.

NOTE:

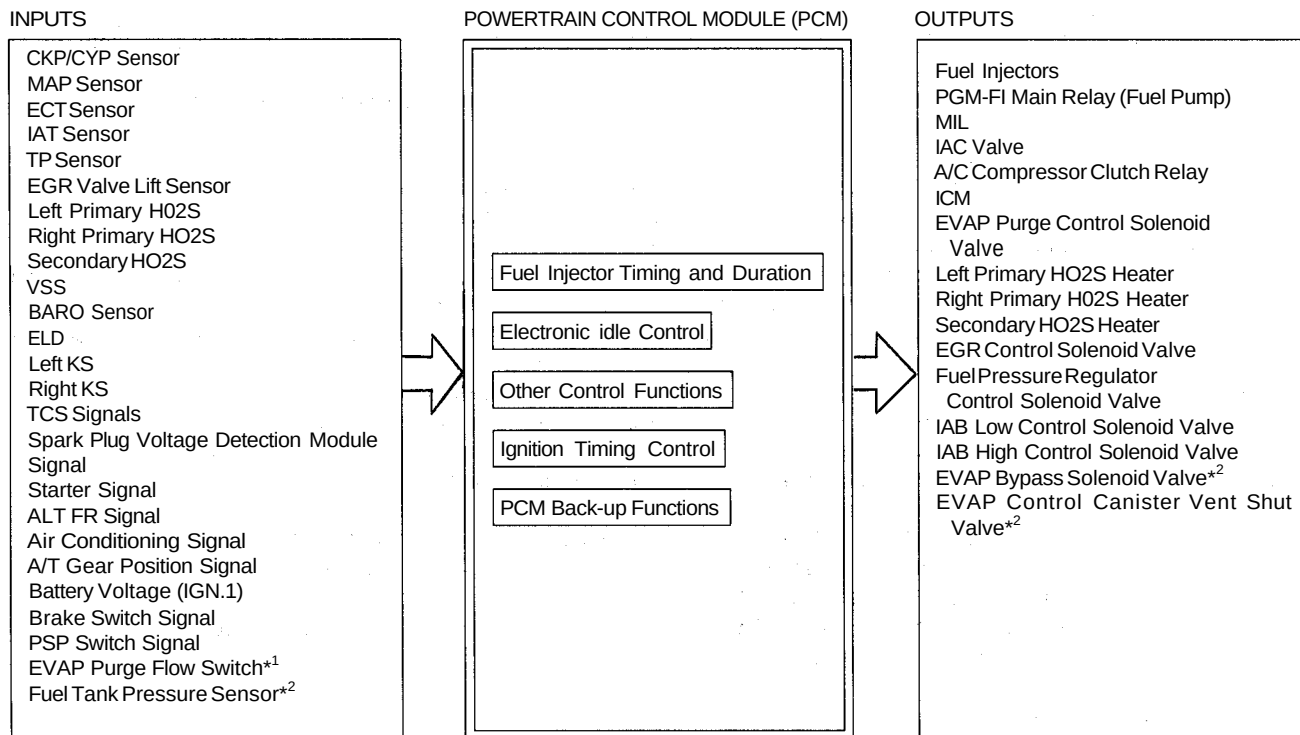
- The term "Intermittent Failure" is used in these charts. It simply means a system may have had a failure, but it checks out OK at this time. If the Malfunction Indicator Lamp (MIL) on the dash does not come on, check for poor connections or loose wires at all connectors related to the circuit that you are troubleshooting (see illustration below).
- Most of the troubleshooting flowcharts have you reset the Powertrain Control Module (PCM) and try to duplicate the Diagnostic Trouble Code (DTC). If the problem is intermittent and you can't duplicate the code, do not continue through the flowchart. To do so will only result in confusion and, possibly, a needlessly replaced PCM.
- "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. In complex electronics (like PCM's), this can sometimes mean something works, but not the way it's supposed to.

TIGHT**LOOSE**



PGM-FI System

System Description



*1:'96 model

*2:'97 - 98 models

PGM-FI System

The PGM-FI system on this model is a sequential multiport fuel injection system.

Fuel Injector Timing and Duration

The PCM contains memories for the basic discharge durations 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.

Idle Air Control

When the engine is cold, the A/C compressor is on, the transmission is in gear, the brake pedal is depressed, the P/S load is high, or the alternator is charging, the PCM controls current to the Idle Air Control Valve (IAC Valve) to maintain the correct idle speed.

Ignition Timing Control

- The PCM contains memories for basic ignition timing at various engine speeds and manifold air flow rates. Ignition timing is also adjusted for engine coolant temperature.
- A knock control system is also used. When detonation is detected by a knock sensor (KS), the ignition timing is retarded.

Other Control Functions

1. Starting Control
When the engine is started, the PCM provides a rich mixture by increasing fuel injector duration.
2. Fuel Pump Control
 - When the ignition switch is initially turned on, the PCM supplies ground to the PGM-FI main relay that supplies current to the fuel pump for two seconds to pressurize the fuel system.
 - When the engine is running, the PCM supplies ground to the PGM-FI main relay that supplies 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.

(cont'd)

PGM-FI System

System Description (cont'd)

3. Fuel Cut-off Control

- During deceleration with the throttle valve closed, current to the fuel injectors is cut off to improve fuel economy at speeds over 1,000 rpm.
- Fuel cut-off action also takes place when engine speed exceeds 6,500 rpm, regardless of the position of the throttle valve, to protect the engine from over-revving.

4. A/C Compressor Clutch Relay

When the PCM receives a demand for cooling from the air conditioning system, it delays the compressor from being energized, and enriches the mixture to assure a smooth transition to the A/C mode.

5. Evaporative Emission (EVAP) Purge Control Solenoid Valve

'96 model: When the engine coolant temperature is below 158°F (70°C), the PCM controls the EVAP purge control solenoid valve which cuts vacuum to the EVAP purge control canister diaphragm.

'97 - 98 models: When the engine coolant temperature is above 99°F (37°C), the PCM controls the EVAP purge control solenoid valve which controls vacuum to the EVAP purge control canister.

6. Intake Air Bypass (IAB) Low Control Solenoid Valve, Intake Air Bypass (IAB) High Control Solenoid Valve

When engine speed is below 3,350 rpm, the IAB High Control Solenoid Valve and IAB Low Control Solenoid Valve are activated by a signal from the PCM. Intake air flows through a long chamber path, increasing torque at low RPM.

When engine speed is 3,350 - 3,950 rpm, the IAB Low Control Solenoid Valve is deactivated by the PCM. Intake air flows through a short chamber path, increasing mid-range torque.

When the engine rpm is above 3,950 rpm, the IAB Low Control Solenoid Valve and IAB High Control Solenoid Valve are deactivated by the PCM. This creates a very short intake path and increases high-speed torque.

7. Exhaust Gas Recirculation (EGR) Control Solenoid Valve

When the EGR is required for control of oxides of nitrogen (NOx) emissions, the PCM controls the EGR control solenoid valve which supplies regulated vacuum to the EGR valve.

ECM Fail-safe/Back-up Functions

1. Fail-safe Function

When an abnormality occurs in a 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.

2. Back-up Function

When an abnormality occurs in the PCM itself, the fuel injectors are controlled by a back-up circuit independent of the system in order to permit minimal driving.

3. Self-diagnosis Function [Malfunction Indicator Lamp (MIL)]

When an abnormality occurs in a signal from a sensor, the PCM supplies ground for the MIL and stores the DTC in erasable memory. When the ignition is initially turned on, the PCM supplies ground for the MIL for two seconds to check the MIL bulb condition.

4. Two Driving Cycle Detection Method

To prevent false indications, the two driving cycle detection method is used for the H02S, fuel metering-related, idle control system, ECT sensor, EGR system, TWC, EVAP control system and other 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 informs the driver by lighting the MIL.

However, to ease troubleshooting, this function is cancelled when you short the service check connector. The MIL will then blink immediately when an abnormality occurs.