

Rear Differential

Rear Differential

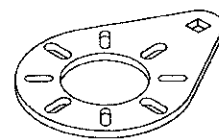
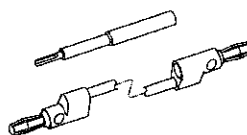
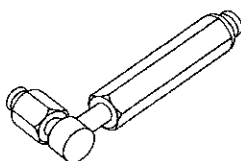
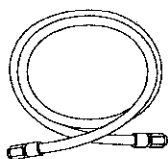
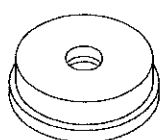
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Rear Differential

Special Tools

Ref. No.	Tool Number	Description	Qty
①	07GAD-SD40101	Bearing Driver Attachment, 78 x 90 mm	1
②	07MAJ-PY4011A	Oil Pressure Hose	1
③	07MAJ-PY40120	Oil Pressure Hose Adapter	1
④	07SAZ-001000A	Backprobe Set	2
⑤	07XAB-0010101	Companion Flange Holder	1
⑥	070AD-PYZA100	Driver, 56 x 62 mm	1
⑦	070AD-RJC0110	Oil Seal Driver A	1
⑧	070AD-RJC0120	Oil Seal Driver B	1
⑨	070AD-RJC0130	Oil Seal Driver C	1
⑩	070AD-RJC0140	Oil Seal Driver D	1
⑪	070AD-RJC0150	Oil Seal Driver E	1
⑫	070AJ-SJAA101	Adapter, Torque Wrench	1
⑬	07406-0070100	Oil Pressure Gauge	1
⑭	07746-0030100	Inner Driver Handle, 40 mm	1
⑮	07749-0010000	Driver Handle 15 x 135L	1



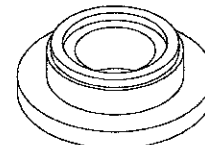
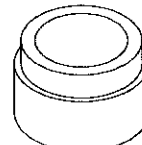
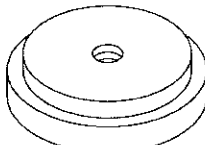
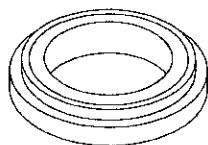
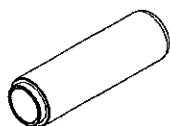
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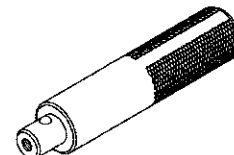
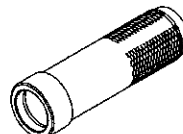
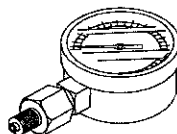
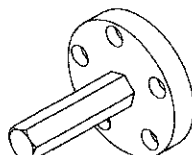
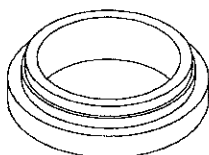
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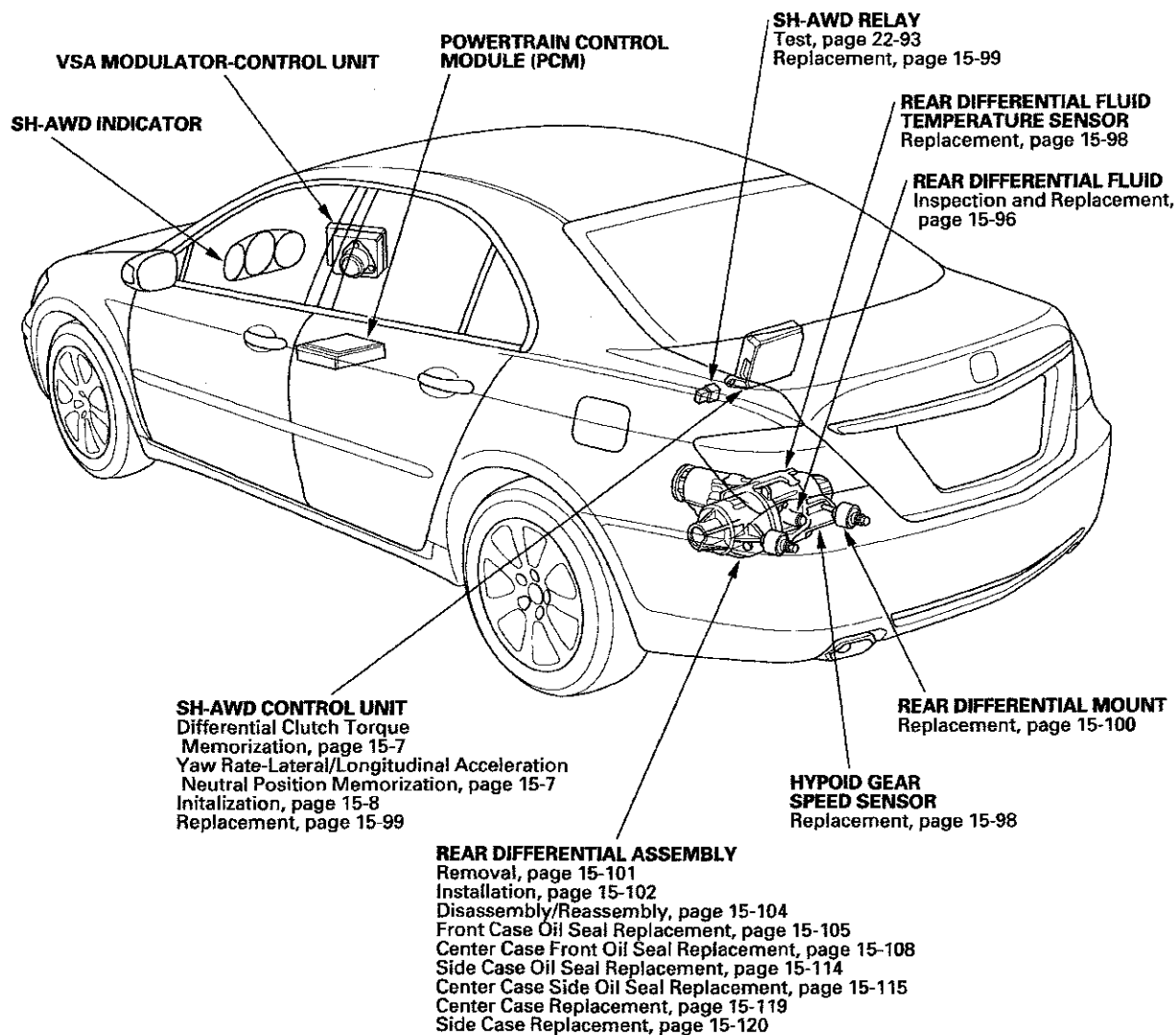
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Component Location Index



Rear Differential

General Troubleshooting Information

SH-AWD Indicator

The SH-AWD indicator will come on under certain conditions even if the AWD system is working normally. Here are some examples:

- When you use high-powered wireless equipment such as a CB or Ham radio in the vehicle.
- When you keep spinning the rear wheels while the vehicle is stuck in sand, mud, snow, etc.
- When the battery voltage suddenly drops below 8 volts or rises above 16 volts.

After the SH-AWD indicator comes on, it stays on until you turn the ignition switch to LOCK (0).

Diagnostic Trouble Code (DTC)

- The SH-AWD control unit can memorize up to seven different DTCs. The system displays the DTCs by blinking the SH-AWD indicator. Multiple DTCs are displayed in the order they occurred, beginning with the most recent.
- If the same DTC is detected more than once, the most recent DTC is written over the earlier one. Therefore, when the same problem is detected more than once, it is memorized as a single DTC.
- The DTCs are memorized in the SH-AWD unit EEPROM (non-volatile memory). Therefore, the memorized DTCs are not cleared when the battery is disconnected or the SH-AWD control unit is disconnected.
- If there is a problem in the central processing unit (CPU) of the SH-AWD control unit, the SH-AWD indicator comes on, but no DTC is memorized. Refer to the symptom troubleshooting.

Self-diagnosis

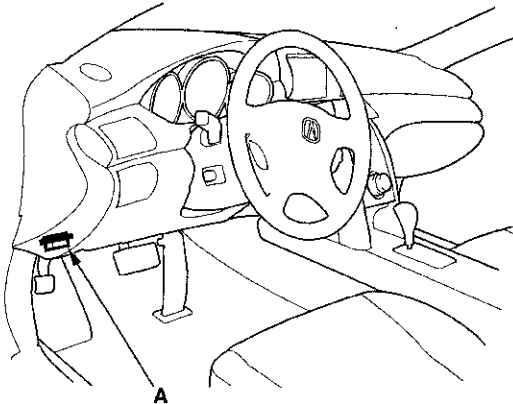
When a problem is detected during self-diagnosis, the system does the following:

- Turns the SH-AWD indicator on.
- Memorizes the DTC if possible.
- Stops AWD control and puts the vehicle back into two-wheel drive (front wheel only).
- Reduces engine torque to suit the driving conditions when an abnormality was detected (The client may notice a decrease in engine performance).



How to Use the HDS (Honda Diagnostic System)

1. With the ignition switch in LOCK (0), connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.



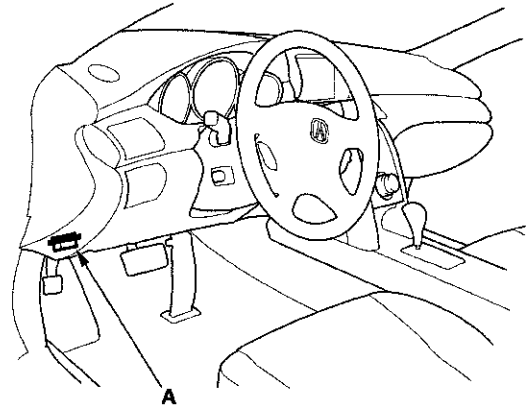
2. Turn the ignition switch to ON (II).
3. Make sure the HDS communicates with the vehicle and the SH-AWD control unit. If it does not, go to the DLC circuit troubleshooting (see page 11-211).
4. Check the diagnostic trouble code (DTC) and the freeze data, for all systems in the vehicle, troubleshoot the powertrain DTCs first and note them. Then refer to the indicated DTC's troubleshooting, and do the appropriate troubleshooting procedure.

NOTE:

- The HDS can read the DTC, the freeze data, the current data, and other system data.
- For specific operations, refer to the Help menu that came with the HDS.
- It is best to do an ALL DTC CHECK to look for other systems DTCs that are related to the problem.

How to Clear DTCs

1. With the ignition switch in LOCK (0), connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.



2. Turn the ignition switch to ON (II).
3. Make sure the HDS communicates with the vehicle and the SH-AWD control unit. If it does not, go to the DLC circuit troubleshooting (see page 11-211).
4. Clear the DTC(s) by following the screen prompts on the HDS.
5. Turn the ignition switch to LOCK (0).

NOTE: If the DTC that was cleared is related to another system, that system's DTC must be repaired, or the SH-AWD DTC will return.

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Rear Differential

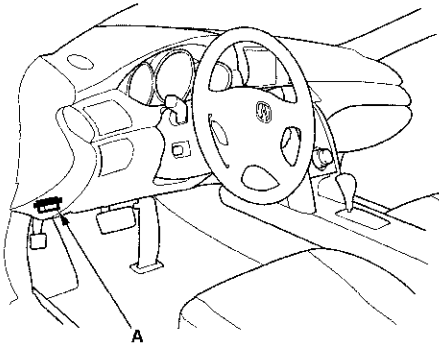
General Troubleshooting Information (cont'd)

How to Check for Diagnostic Trouble Codes (DTCs)

When the SH-AWD control unit senses an abnormality in the input or output systems, the SH-AWD indicator in the gauge control module will usually come on, and the malfunction indicator lamp (MIL), the D indicator, the VSA indicator, and/or the ABS indicator may also come on.

NOTE: Check the vehicle battery condition and charging system before troubleshooting.

1. With the ignition switch to LOCK (0), connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.



2. Turn the ignition switch to ON (II), then make sure the HDS communicates with vehicle and the SH-AWD control unit. If it does not, go to the DLC circuit troubleshooting (see page 11-211). Follow the prompts on the HDS to display the DTC(s) on the screen. Check the DTC and freeze data for all systems. After determining the DTC(s), refer to the DTC Troubleshooting.

NOTE: See the HDS Help menu for specific instructions.

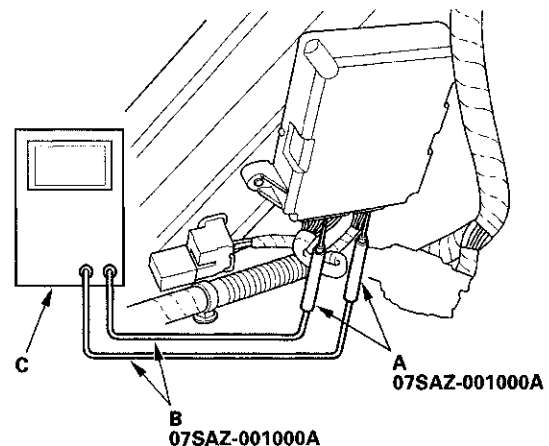
3. If there are fuel and emission DTCs, A/T DTCs, and VSA system DTC's at the same time, troubleshoot the fuel and emission DTCs first, otherwise the SH-AWD DTC may return.
4. After recording the DTCs, clear all DTCs.
5. Test-drive the vehicle for several minutes in AWD mode, and check for DTCs. If the DTC returns, refer to the DTC Troubleshooting. If the DTC does not return, there was an intermittent problem within the circuit. Make sure all connectors and terminals in the circuit are tight.

How to Troubleshoot Circuits at the SH-AWD Control Unit

Special Tools Required

Backprobe set 07SAZ-001000A (two required)

1. Remove the rear seat (see page 20-140).
2. Remove the trunk front trim panel (see page 20-83).
3. Inspect the circuit on the SH-AWD control unit according to the DTC Troubleshooting using the backprobe set and a digital multimeter or an analog circuit tester.
4. Connect the backprobe adapters (A) to the stacking patch cords (B), and connect the cords to a digital multimeter or an analog circuit tester (C). Using the wire insulator as a guide for the contoured-tip of the backprobe adapter, gently slide the tip into the connector from the wire side until it comes in contact with the terminal end of the wires.

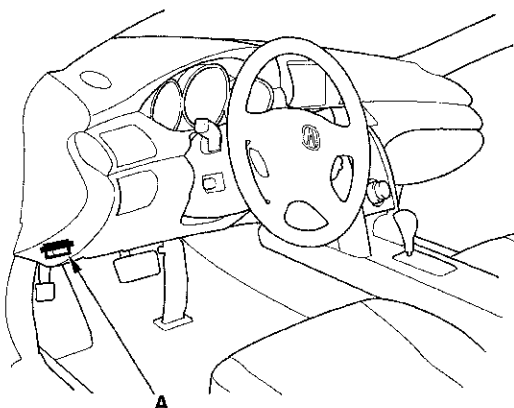




SH-AWD Differential Clutch Torque Memorization

Whenever the side clutch set is replaced, the differential clutch torque memorization must be done.

1. With the ignition switch in LOCK (0), connect the HDS to the DLC (A) located under the driver's side of the dashboard.



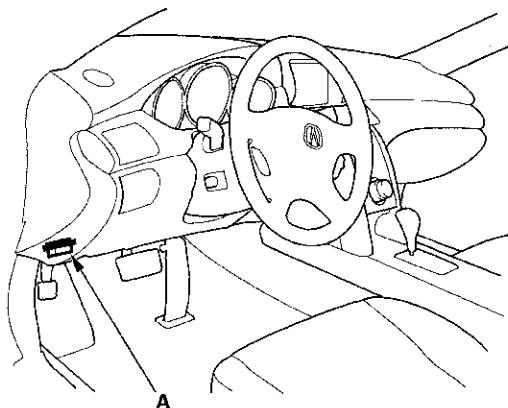
2. Turn the ignition switch to ON (II).
3. Make sure the HDS communicates with vehicle and the SH-AWD control unit. If it does not, go to the DLC circuit troubleshooting (see page 11-211).
4. From the mode menu, select MISCELLANEOUS TEST, then select NEUTRAL MENU with the HDS and follow the screen prompts.

NOTE: See the HDS Help menu for specific instructions.

Yaw Rate-Lateral/Longitudinal Acceleration Neutral Position Memorization

Whenever the yaw rate-lateral/longitudinal acceleration sensor is replaced, its neutral position memorization must be done.

1. With the ignition switch in LOCK (0), connect the HDS to the DLC (A) located under the driver's side of the dashboard.



2. Turn the ignition switch to ON (II).
3. Make sure the HDS communicates with vehicle and the SH-AWD control unit. If it does not, go to the DLC circuit troubleshooting (see page 11-211).
4. From the mode menu, select MISCELLANEOUS TEST, then select NEUTRAL MENU with the HDS and follow the screen prompts.

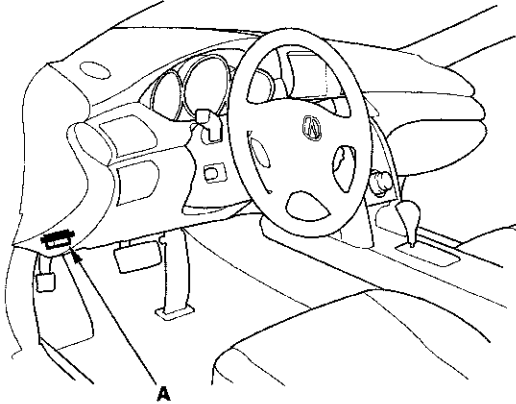
NOTE: See the HDS Help menu for specific instructions.

Rear Differential

SH-AWD Control Unit Initialization

Whenever the SH-AWD control unit is replaced, it must be initialized.

1. With the ignition switch in LOCK (0), connect the HDS to the DLC (A) located under the driver's side of the dashboard.



2. Turn the ignition switch to ON (II).
3. Make sure the HDS communicates with vehicle and the SH-AWD control unit. If it does not, go to the DLC circuit troubleshooting (see page 11-211).
4. From the mode menu, select MISCELLANEOUS TEST, then select INITIALIZATION with the HDS and follow the screen prompts.

NOTE: See the HDS Help menu for specific instructions.



DTC Troubleshooting Index

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12-2	ON	Lateral Acceleration Sensor Malfunction	(see page 15-32)
12-3	ON	Lateral Acceleration Sensor Malfunction	(see page 15-32)
14-1	ON	Lateral Acceleration Sensor Neutral Position Incorrect	(see page 15-32)
14-2	ON	Lateral Acceleration Sensor Neutral Position Incorrect	(see page 15-32)
16-1	ON	Steering Angle Sensor Signal Malfunction	(see page 15-33)
16-3	ON	Steering Angle Sensor Neutral Position Incorrect	(see page 15-33)
27-1	ON	Hypoid Gear Speed Sensor (Open or Short)	(see page 15-34)
27-2	ON	Hypoid Gear Speed Sensor Malfunction	(see page 15-38)
33-1	ON	Yaw Rate Sensor Malfunction	(see page 15-41)
33-2	ON	Yaw Rate Sensor Malfunction	(see page 15-41)
33-3	ON	Yaw Rate Sensor Malfunction	(see page 15-41)
35-1	ON	Yaw Rate Sensor Neutral Position Incorrect	(see page 15-41)
35-2	ON	Yaw Rate Sensor Neutral Position Incorrect	(see page 15-41)
41-1	ON	F-CAN Malfunction (Lost of Communication with Powertrain Control Module (PCM))	(see page 15-42)
41-2	ON	F-CAN Malfunction (Lost of Communication with VSA Modulator-Control Unit)	(see page 15-43)
41-3	ON	F-CAN Malfunction (Lost of Communication with Gauge Control Module)	(see page 15-44)
41-6	ON	F-CAN Malfunction (Lost of Communication with Steering Angle Sensor)	(see page 15-45)
42-1	ON	Differential fluid Temperature Sensor (Short to Power)	(see page 15-46)
42-2	ON	Differential fluid Temperature Sensor (Open/GND Short)	(see page 15-47)
43-1	ON	Differential fluid Temperature Sensor Circuit Malfunction	(see page 15-50)
44-11	ON	SH-AWD Control Unit	(see page 15-51)
44-12	ON	SH-AWD Relay Stuck ON	(see page 15-52)
44-21	ON	SH-AWD Control Unit	(see page 15-53)
44-31	ON	SH-AWD Relay Stuck OFF	(see page 15-53)
44-32	ON	SH-AWD Control Unit Power Supply Stuck ON	(see page 15-56)
44-41	ON	SH-AWD Control Unit Power Supply Stuck OFF	(see page 15-56)
44-50	ON	SH-AWD Control Unit Power Supply Voltage Low	(see page 15-57)
46-1	ON	SH-AWD Control Unit Internal Power Supply Circuit (Open or Short)	(see page 15-59)

* : DTCs are indicated by the SH-AWD indicator when the 16P data link connector (DLC) is connected to the HDS.

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Rear Differential

DTC Troubleshooting Index (cont'd)

DTC	SH-AWD Indicator Light	Detection Item	Page
52-3	ON	Left Clutch Electromagnetic Coil Current Malfunction	(see page 15-60)
53-1	ON	Left Clutch Electromagnetic Coil (Open)	(see page 15-63)
53-2	ON	Left Clutch Electromagnetic Coil (Short)	(see page 15-65)
53-3	ON	Left Clutch Electromagnetic Coil (Open)	(see page 15-63)
53-4	ON	Left Clutch Electromagnetic Coil (Short)	(see page 15-65)
56-3	ON	Right Clutch Electromagnetic Coil Current Malfunction	(see page 15-67)
57-1	ON	Right Clutch Electromagnetic Coil (Open)	(see page 15-70)
57-2	ON	Right Clutch Electromagnetic Coil (Short)	(see page 15-72)
57-3	ON	Right Clutch Electromagnetic Coil (Open)	(see page 15-70)
57-4	ON	Right Clutch Electromagnetic Coil (Short)	(see page 15-72)
59-1	ON	SH-AWD Control Unit Power Supply Monitor Circuit	(see page 15-74)
61-1	ON	Shift Solenoid Valve (Open)	(see page 15-74)
61-2	ON	Shift Solenoid Valve (Short)	(see page 15-76)
74-1	ON	One Way Clutch Malfunction	(see page 15-77)
75-1	ON	Acceleration Device Malfunction (Stuck OFF)	(see page 15-78)
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76-1	ON	Rear Differential Fluid Overheats	(see page 15-80)
77-1	ON	The Functional Abnormalities of Fuel Emission or Automatic Transmission.	(see page 15-83)
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78-xx	ON	SH-AWD Control Unit Self-diagnostic Malfunction	(see page 15-85)
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82-3	ON	Right Search Coil Sensor Magnetic Flux Characteristic	(see page 15-91)

* : DTCs are indicated by the SH-AWD indicator when the 16P data link connector (DLC) is connected to the HDS.



Symptom Troubleshooting Index

NOTE: Most problems in the SH-AWD unit can be diagnosed by identifying noises from the gears or bearings. Care should be taken during diagnosis not to confuse differential noises with those from other drivetrain components.

Symptom	Diagnostic Procedure	Also check for
The SH-AWD indicator does not go off, and no DTCs are stored	Symptom troubleshooting (see page 15-92).	Low battery voltage
The SH-AWD indicator does not come on	Symptom troubleshooting (see page 15-93).	
Gear or bearing noises	• Fluid level too low. • Incorrect or worn out fluid. • Damaged or chipped gears. • Incorrect tire size (rolling circumference).	• Add fluid • Drain and fill the differential • Replace the differential carrier assembly
Rear differential overheats	• Fluid level too low. • Incorrect fluid type. • Incorrect tire size (rolling circumference).	• Add fluid • Drain and fill the differential
Rear differential leaks fluid	• Fluid level too high. • Clogged breather hose. • Worn or damaged oil seal. • Damaged sealing washer. • Loose mounting bolts or inadequate sealing.	• Lower to proper level • Clean or replace • Replace the oil seal • Replace the sealing washer • Recheck torque or apply sealant
Rear differential screeches, whines, moans, or squeaks	• Fluid level too low. • Incorrect or worn out fluid. • Incorrect tire rolling circumference. • Damaged oil pump.	• Add fluid • Drain and fill the differential • Adjust tire pressure or replace tires • Replace the differential carrier assembly
Noise during acceleration, or when accelerating from a full stop	• Incorrect pre-load. • Incorrect of backlash of hypoid gear. • Damaged or chipped gears. • Incorrect tire size (rolling circumference).	• Pre-load adjustment • Replace the differential carrier assembly
HDS does not communicate with the SH-AWD control unit or the vehicle	Troubleshooting the DLC circuit (see page 11-211).	

Rear Differential

System Description

SH-AWD System

Outline

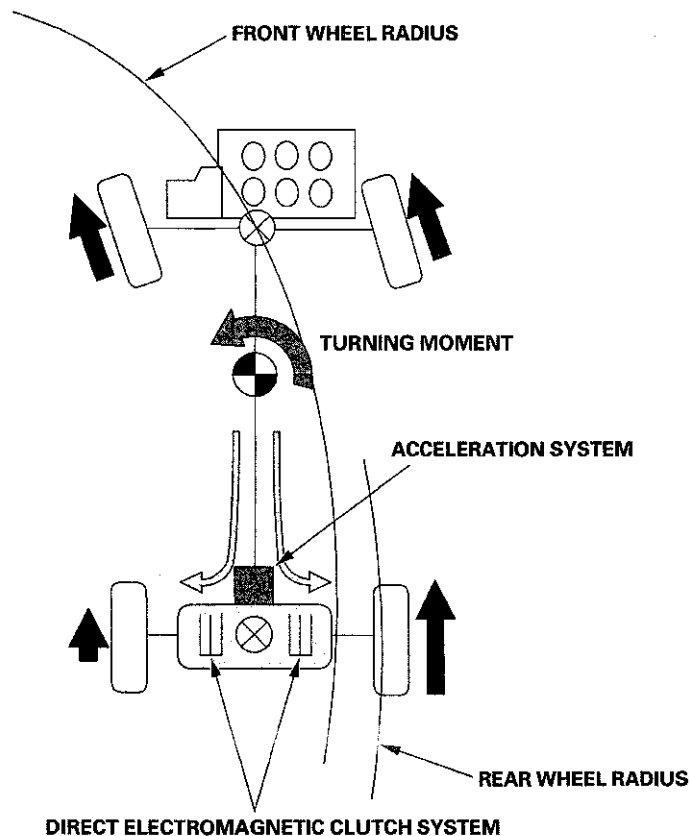
This vehicle is equipped with a Super Handling All-Wheel Drive® (SH-AWD®) rear differential system. This system uses electromagnetic clutches, an acceleration system, and the SH-AWD control unit to control front to rear torque distribution and independent left to right rear torque distribution. This allows the system to function both as a limited slip differential and as a torque distribution system to improve standing start performance, straight-line stability, climbing, and cornering ability.

SH-AWD features include:

- Independent torque distribution to the front and rear wheels, and to the left and right wheels for neutral handling when cornering.
- Controls differential (inside/outside) wheel speed in a turn to increase cornering stability.
- Limited slip differential function for better acceleration.

Operation

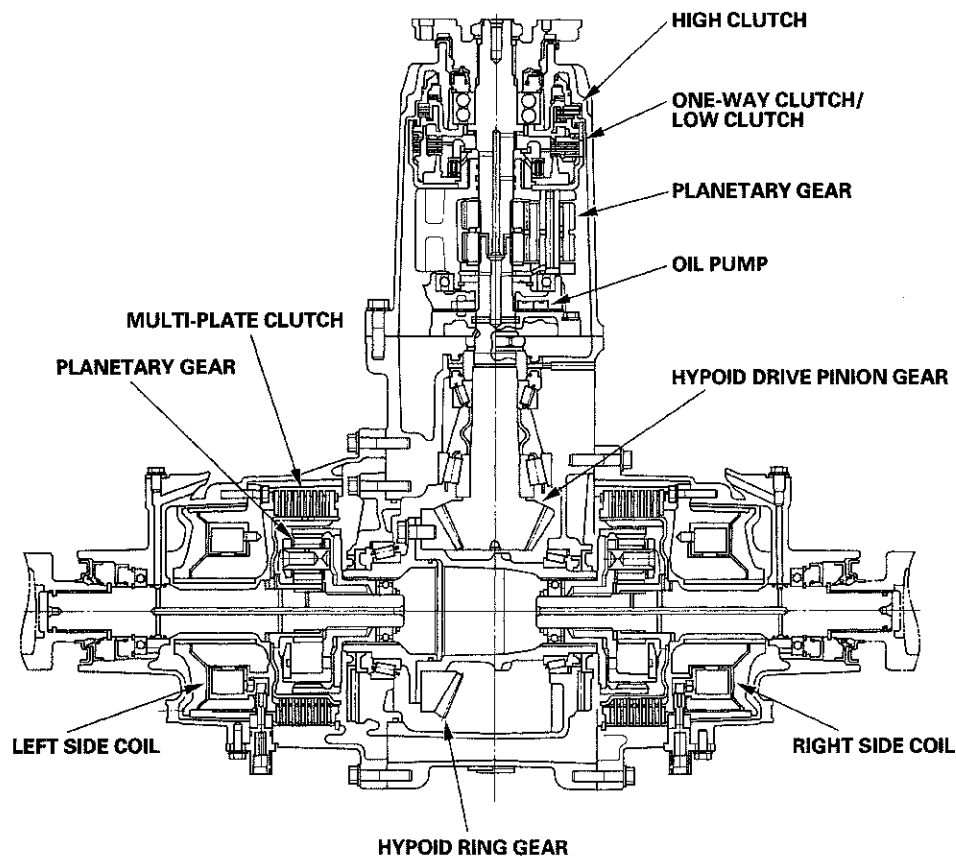
In a normal turn, the radius of the front wheels is shorter than the radius that the rear wheels travel. If the front and rear wheels are driven at the same speed, full power is not transmitted. The SH-AWD system monitors the speed of the front wheels and increases the speed of the outside rear wheel proportionally to accelerate it around the larger radius. This improves stability and steering response. On slippery surfaces this provides the improved traction of a 4-wheel drive system.





Construction

1. The differential assembly has a conventional hypoid ring and pinion gear set.
2. The acceleration system consists of the high clutch, the one-way clutch/low clutch, the planetary gear set, and the oil pump. When accelerating straight ahead, the one-way clutch and the low clutch applies the driving force to the rear wheels. During normal straight ahead driving, only the low clutch applies driving force to the rear wheels. When turning, the high clutch connects the acceleration planetary gear to the differential. This speeds up the rear wheels to compensate for the different paths the front and rear wheels take. When decelerating, the differential drives the oil pump to generate hydraulic pressure.
3. The direct electromagnetic clutch system consists of the coils, the planetary gear sets, and the multi-plate clutches that are installed in the side cases on either side of the differential carrier. When driving straight ahead, both rear wheels rotate at the same speed. When turning, current is applied to the appropriate outside wheel main coil to engage the clutch. The amount of current passed through the electromagnetic clutch controls the amount of driving force to the outside wheel.



(cont'd)

Rear Differential

System Description (cont'd)

SH-AWD 4WD Control System

Control System

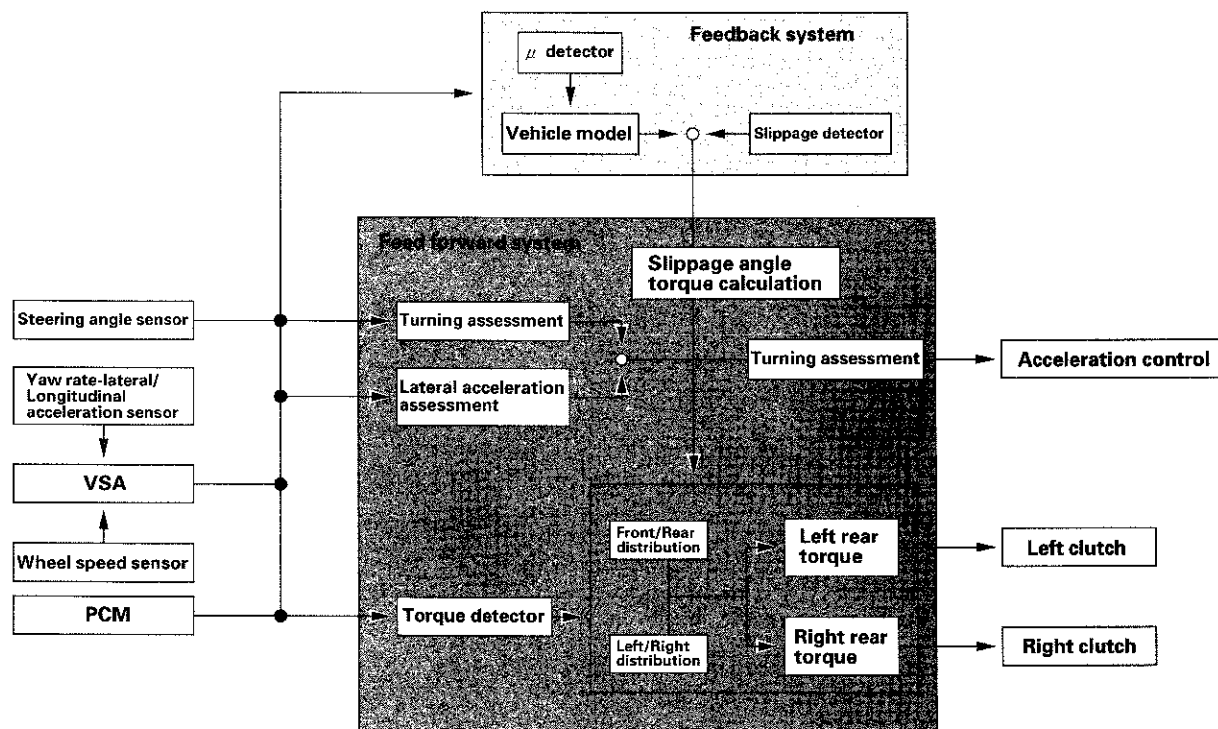
The SH-AWD control system consists of a SH-AWD control unit, the PCM, the VSA modulator-control unit, along with various sensors and switches that detect the steering angle, the lateral G force, the yaw, and the vehicle speed. A fluid temperature sensor and a hypoid gear speed sensor are located on the rear differential. The control units exchange information via the CAN communication lines. The SH-AWD control unit has a self-diagnostic function. If a malfunction is detected, the SH-AWD control unit turns on the SH-AWD indicator in the gauge control module and the system goes into fail-safe mode. When in fail-safe mode, the vehicle disables the SH-AWD differential. The vehicle defaults to front wheel drive, and reduces engine torque to suit the driving conditions.

Driving Force Control

The driving force control distributes the power based on the driver's inputs. It distributes torque to the front and rear wheels based on the throttle opening and the available engine torque output. When turning, torque is applied to the rear wheels independently based on the lateral G input and the direction of the turn. This generates an inward yaw movement to help steer the vehicle around the turn.

Feedback Control

In low traction conditions, where a wheel will spin or the vehicle tends to skid, the amount of torque is distributed to match the traction available.

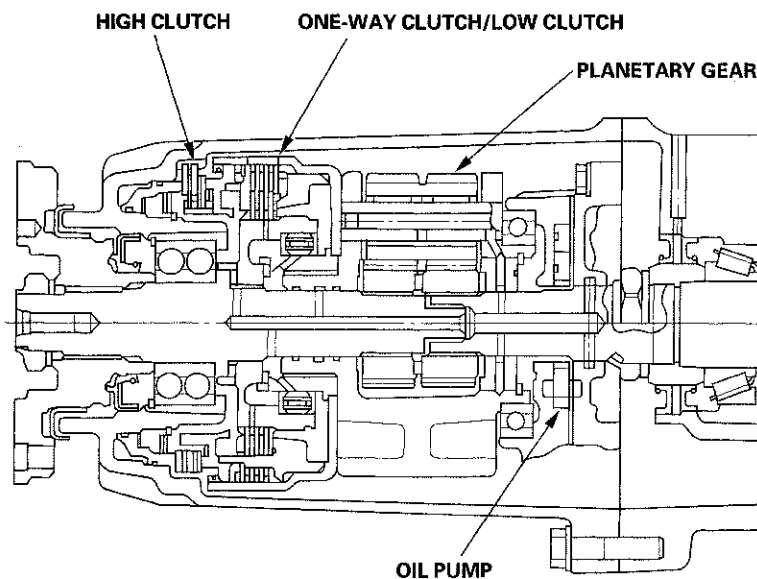




Acceleration System

Construction

The acceleration system consists of the one-way clutch/low clutch, the high clutch, the planetary gear, and the oil pump.



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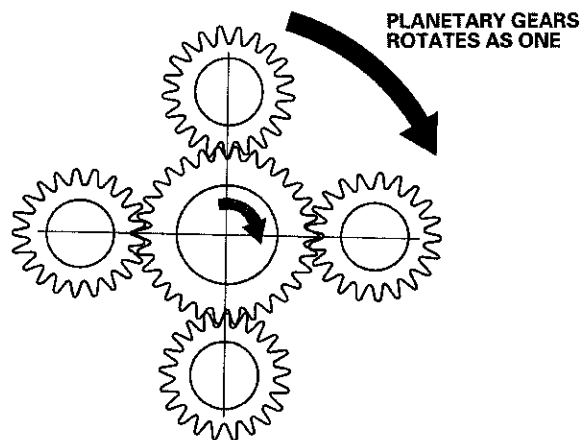
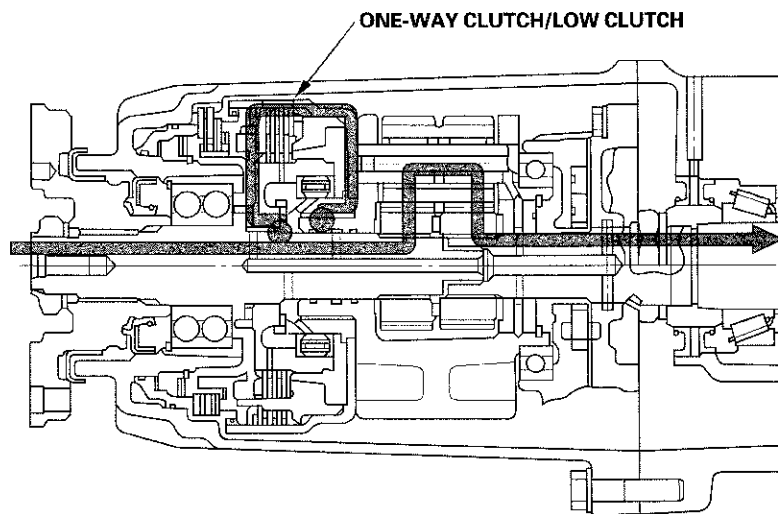
Rear Differential

System Description (cont'd)

Operation

Acceleration and deceleration in a straight line

1. The one-way clutch/low clutch connects the propeller shaft to the planetary gear carrier. The high clutch is disengaged by spring force.
2. The propeller shaft, the planetary gear carrier, and the pinion gear all rotate at the same speed.

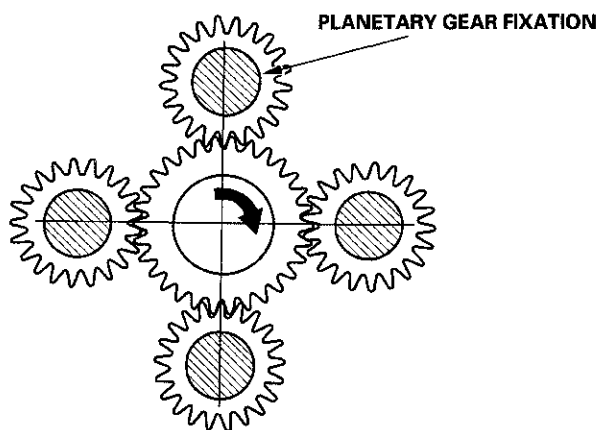
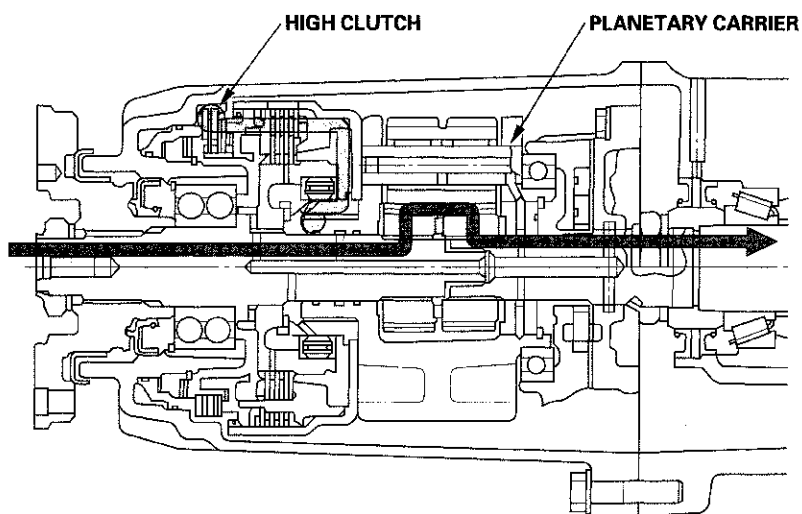




Operation

Acceleration system in a corner

1. Hydraulic pressure from the shift solenoid valve engages the high clutch.
2. The high clutch locks the planetary gears to the propeller shaft, and the driving force is increased to both rear wheels.
3. The high clutch mechanically releases the low clutch.



(cont'd)

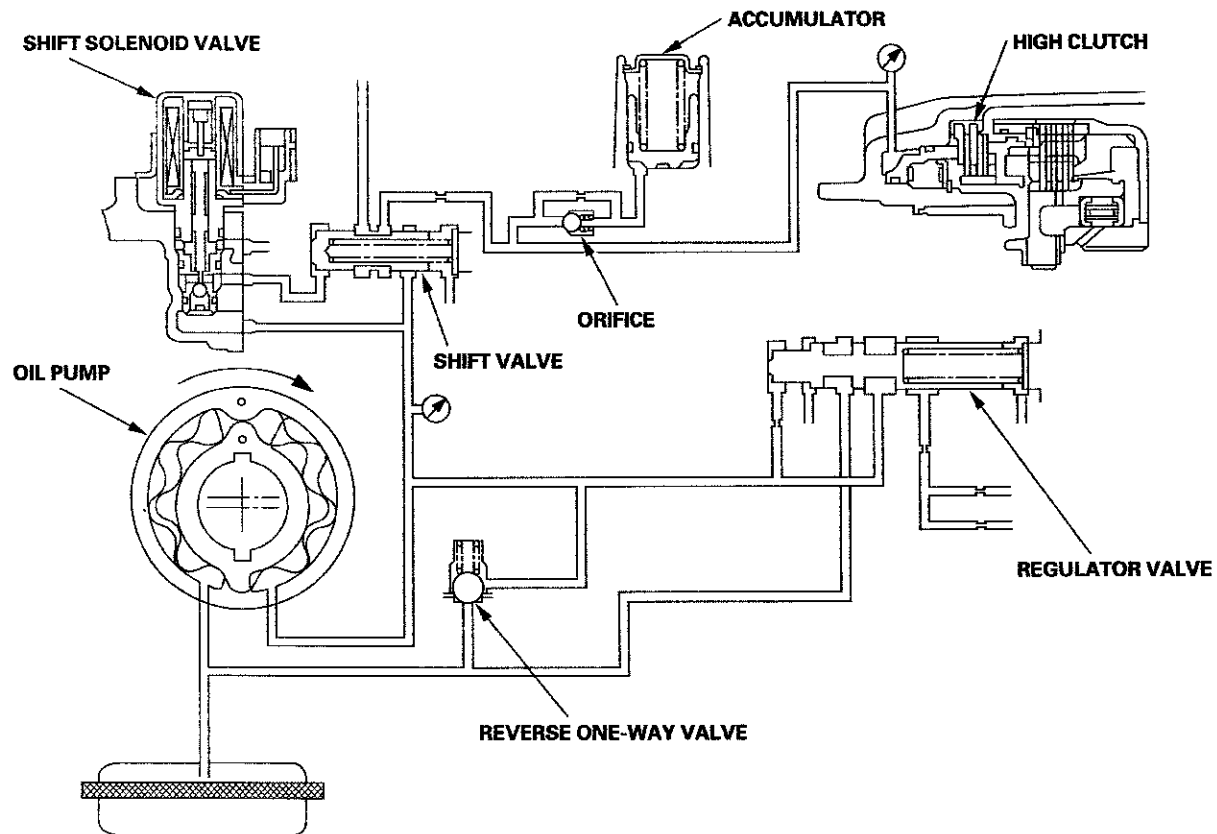
Rear Differential

System Description (cont'd)

Acceleration System Hydraulic Pressure Control

Construction

The hydraulic pressure system consists of the shift solenoid valve, the oil pump, the reverse one-way valve, the regulator valve, the shift valve, the accumulator, and the orifice.

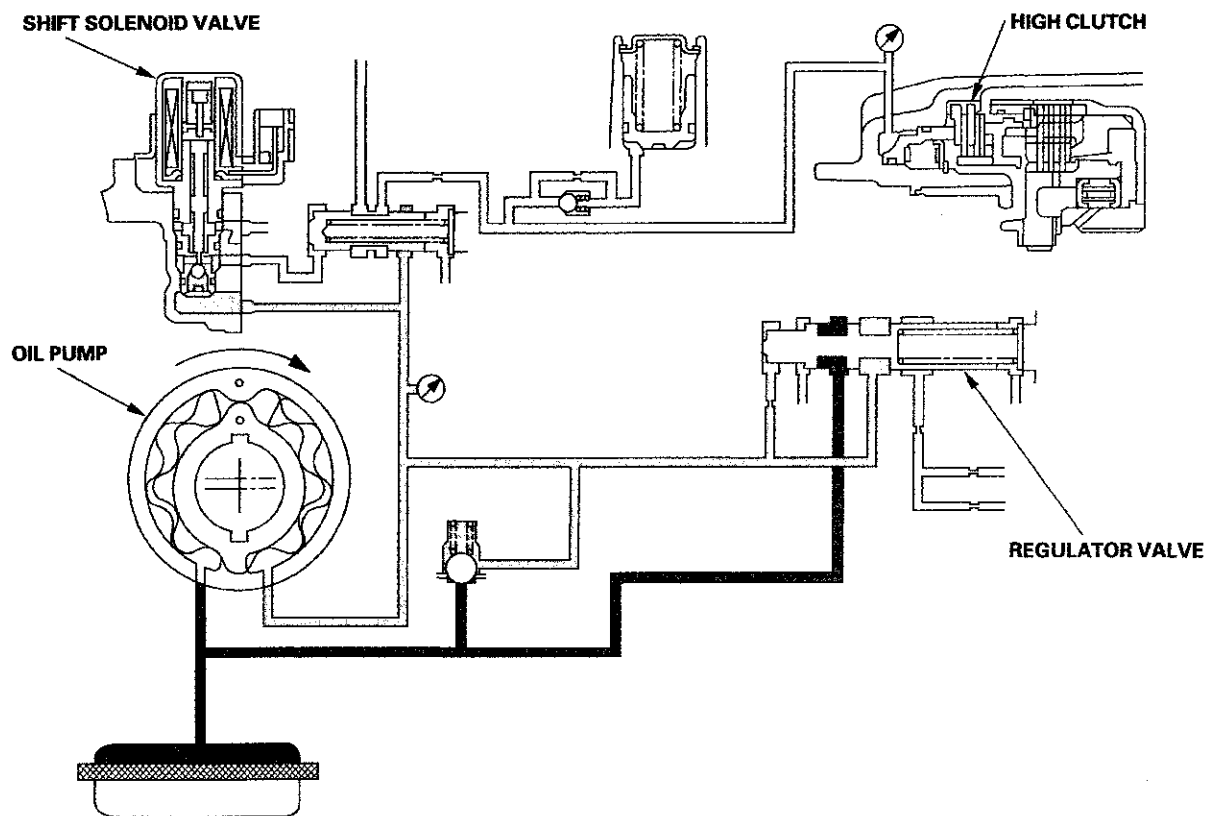




Operation

Driving in a straight line

The pressure regulator valve regulates the hydraulic pressure generated by the oil pump. Because the shift solenoid valve is off, hydraulic pressure is not applied to the high clutch piston, and it remains disengaged. If the hydraulic pressure overcomes the pressure regulator valve, the pressure is relieved from the pump circuit to reduce pump drive losses.



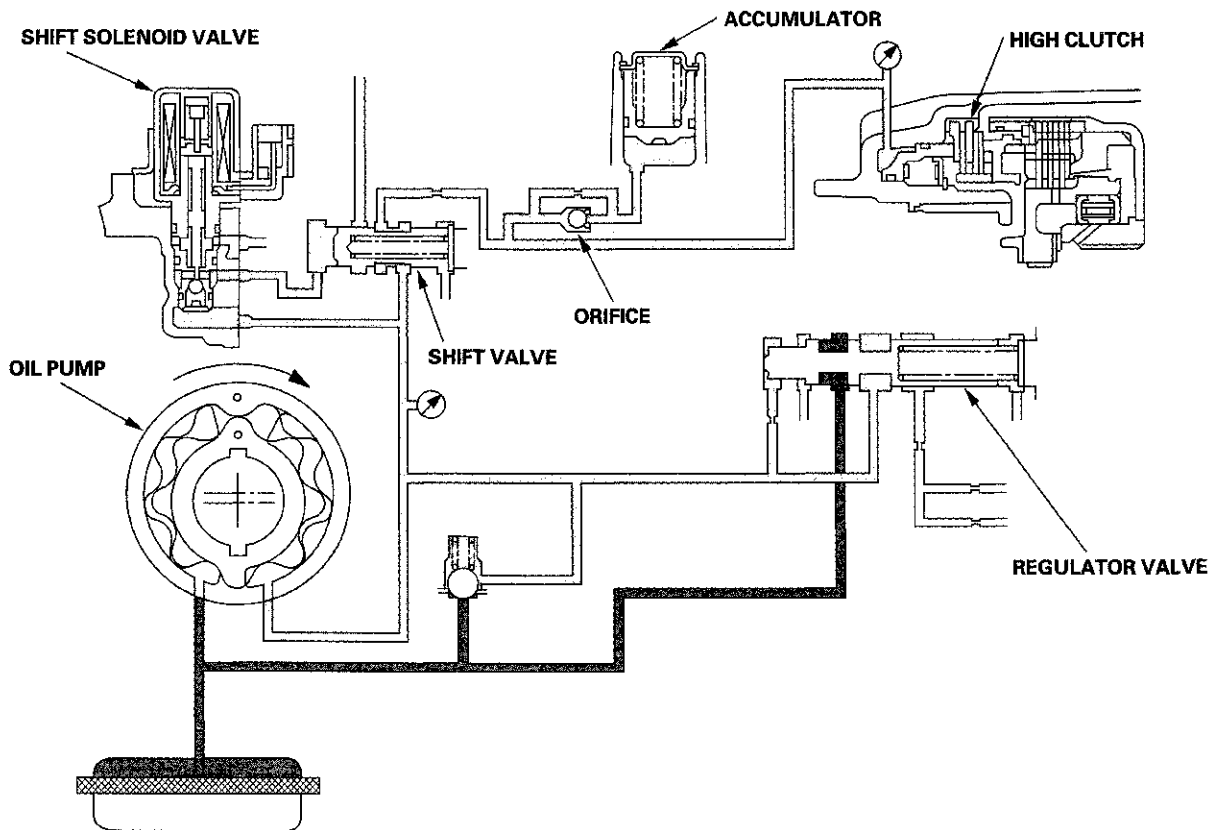
(cont'd)

Rear Differential

System Description (cont'd)

Cornering

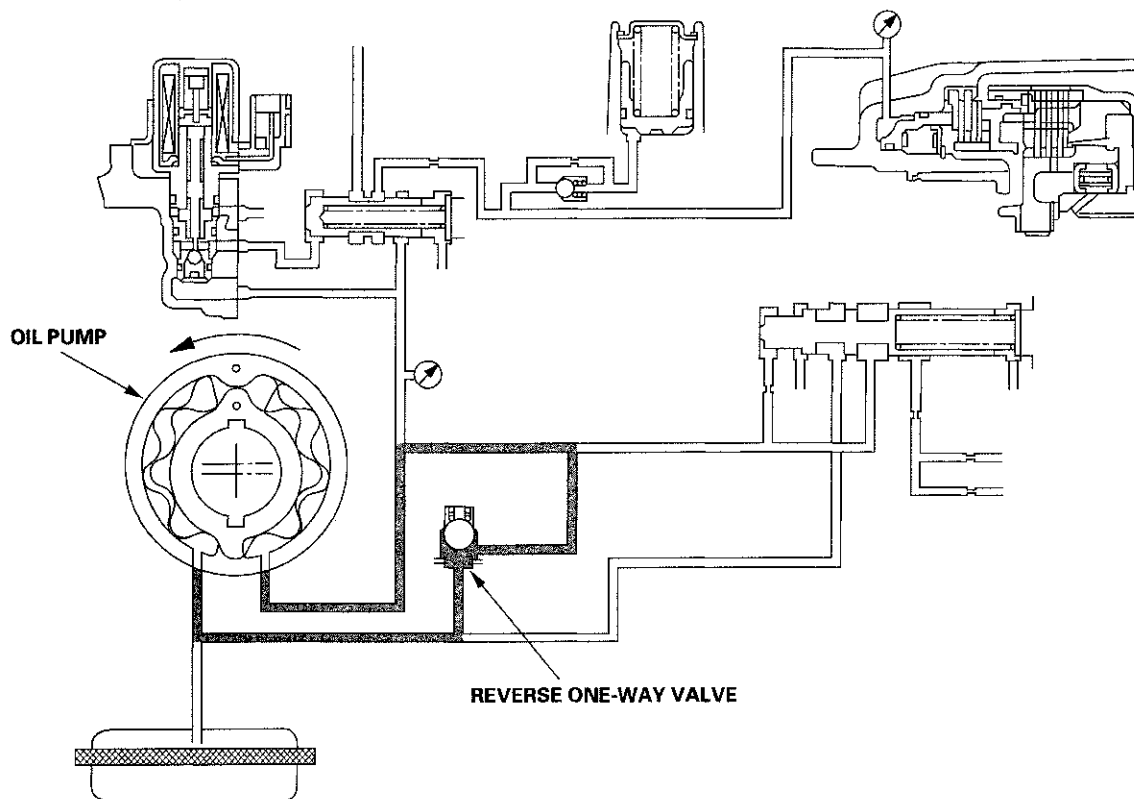
The shift solenoid valve is energized, applying hydraulic pressure to the high clutch piston via the shift valve to engage the high clutch. An accumulator and an orifice are installed between the shift valve and the high clutch piston to reduce the fluctuations in hydraulic pressure.





When backing up

The reverse rotation of the propeller shaft causes the oil pump to rotate in reverse. This opens the reverse one-way valve and allows the oil to circulate in the pump and valve body without draining the system. This prevents aeration of the oil which can delay the response of the differential.



(cont'd)

Rear Differential

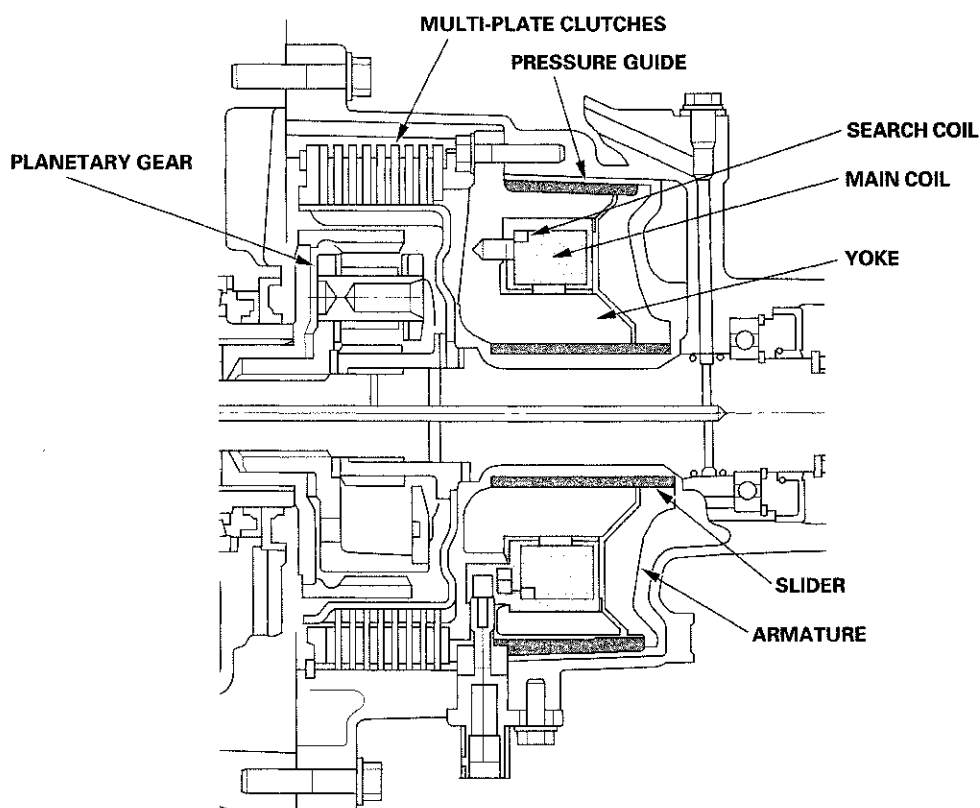
System Description (cont'd)

Electromagnetic Clutch System

Construction

The electromagnetic clutch system is incorporated into the side case assemblies on both sides of the differential case. The system consists of the multi-plate clutches, the planetary gears, the pressure guides, the solenoid coil assembly (the search coil and the main coil), the armature assembly (the slider and the armature), and the yoke.

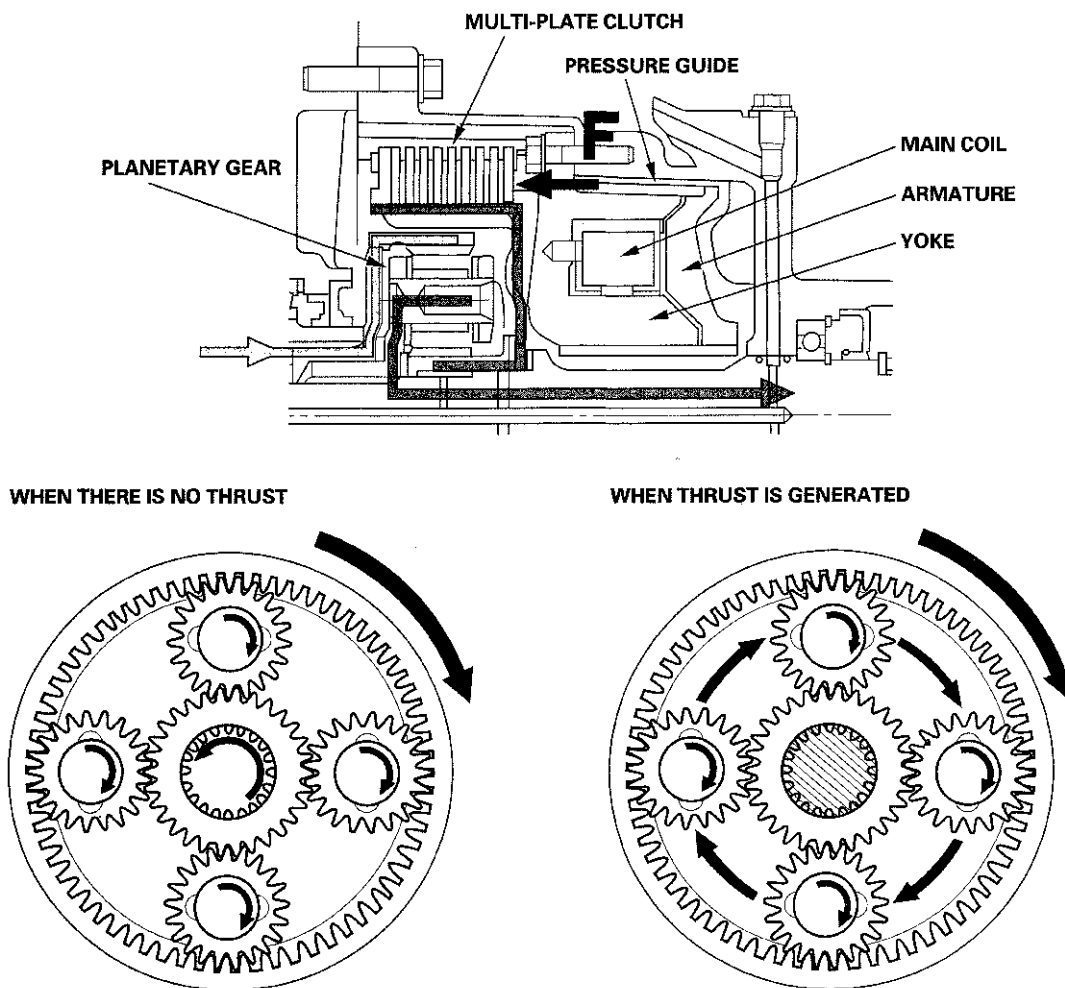
Components	Purpose
Multi-plate clutches	Convert thrust into torque, absorb wheel speed differences
Planetary gears	Magnify and convey clutch torque
Pressure guides	Reduce fluctuations in pressure
Search coils	Detect magnetic flux
Main coils	Generates magnetic fields
Slider	Centers the armature
Armature	Generates magnetic flux to generate thrust
Yoke	Generates magnetic flux to clamping force





Operation

The SH-AWD control unit receives inputs from the PCM and the VSA modulator-control unit on the driving conditions via the CAN. The SH-AWD control unit sends signals to the main coils, which engage the electromagnetic clutches that connect the planetary gear set. This increases the torque applied to the rear wheels. The amount of current sent to the clutch is continuously varied as driving conditions change.



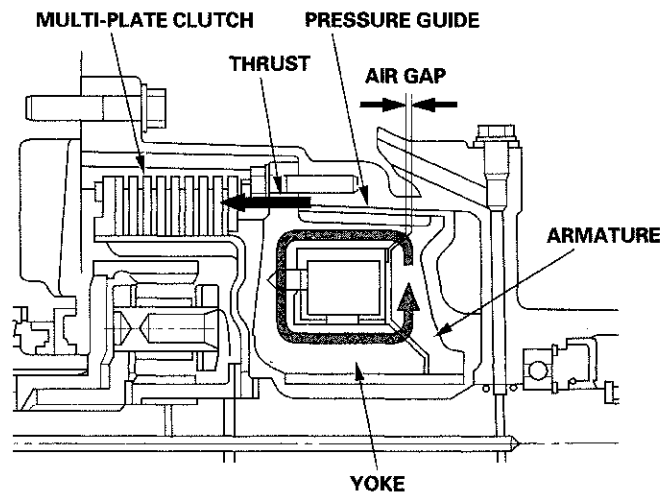
(cont'd)

Rear Differential

System Description (cont'd)

Search Coil Detection System

As the clutch discs wear, the air gap between the pressure guides and the multi-plate clutches decreases. The decrease in air gap changes the magnetic field generated by the main coil and the yoke. The search coil detects these changes in the magnetic field. The SH-AWD control unit uses predetermined maps to compensate for the changes to maintain precise control and smooth clutch engagement.



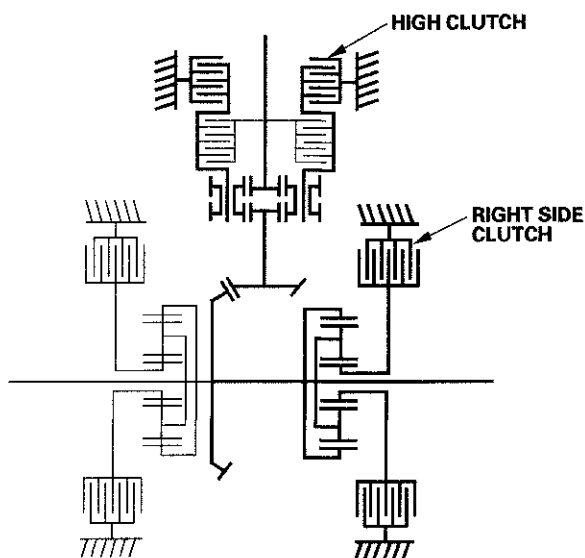


SH-AWD SYSTEM OPERATION LIST

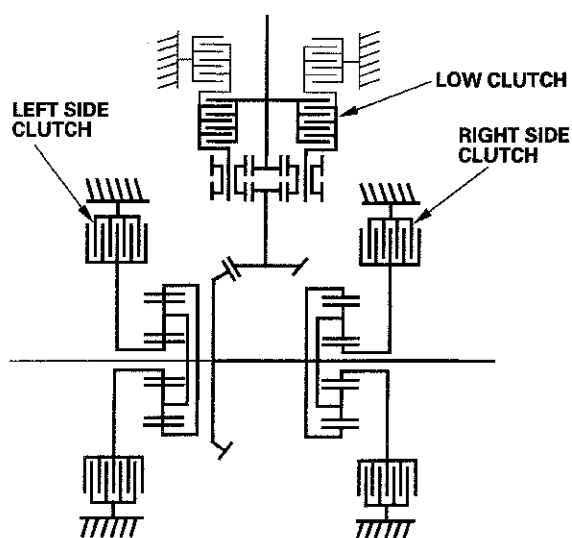
MODE ELEMENT	FORWARD								BACKWARD			
	STRAIGHT		STRAIGHT (LSD)		LEFT TURN (DIRECT)		LEFT TURN (SPEED INCREASER)		STRAIGHT		STRAIGHT (LSD)	
	ACCEL-ERATION	DECEL-ERATION	ACCEL-ERATION	DECEL-ERATION	ACCEL-ERATION	DECEL-ERATION	ACCEL-ERATION	DECEL-ERATION	ACCEL-ERATION	DECEL-ERATION	ACCEL-ERATION	DECEL-ERATION
1 HIGH CLUTCH	—	—	—	—	—	—	ON	ON	—	—	—	—
2 LOW CLUTCH	ON	ON	ON	ON	ON	ON	—	—	ON	ON	ON	ON
3 LEFT ELECTRO-MAGNETIC CLUTCH	MID	LOW	HIGH	LOW	LOW	LOW	LOW	LOW	MID	LOW	HIGH	LOW
4 RIGHT ELECTRO-MAGNETIC CLUTCH	MID	LOW	HIGH	LOW	HIGH	LOW	LOW	LOW	MID	LOW	HIGH	LOW

- When turning to the right, the magnitudes of 3 and 4 are transposed when compared with the left turn shown.
- Conditions of turn (direct coupling): For the turns with a lateral G of less than 0.075G when turning at a vehicle speed less than 16 mph (30 km/h) or over 65 mph (120 km/h).
- Conditions of turn (speed acceleration): For the turns with a lateral G of more than 0.075G when turning at a vehicle speed between 16 mph (30 km/h) to 65 mph (120 km/h).
- Soft: 0—392 N·m (0—40 kgf·m)
Medium: 392—785 N·m (40—80 kgf·m)
Hard: 785—981 N·m (80—100 kgf·m)

CORNERING ACCELERATION (LEFT TURN)



STRAIGHT AHEAD (or BACKWARD) ACCELERATION



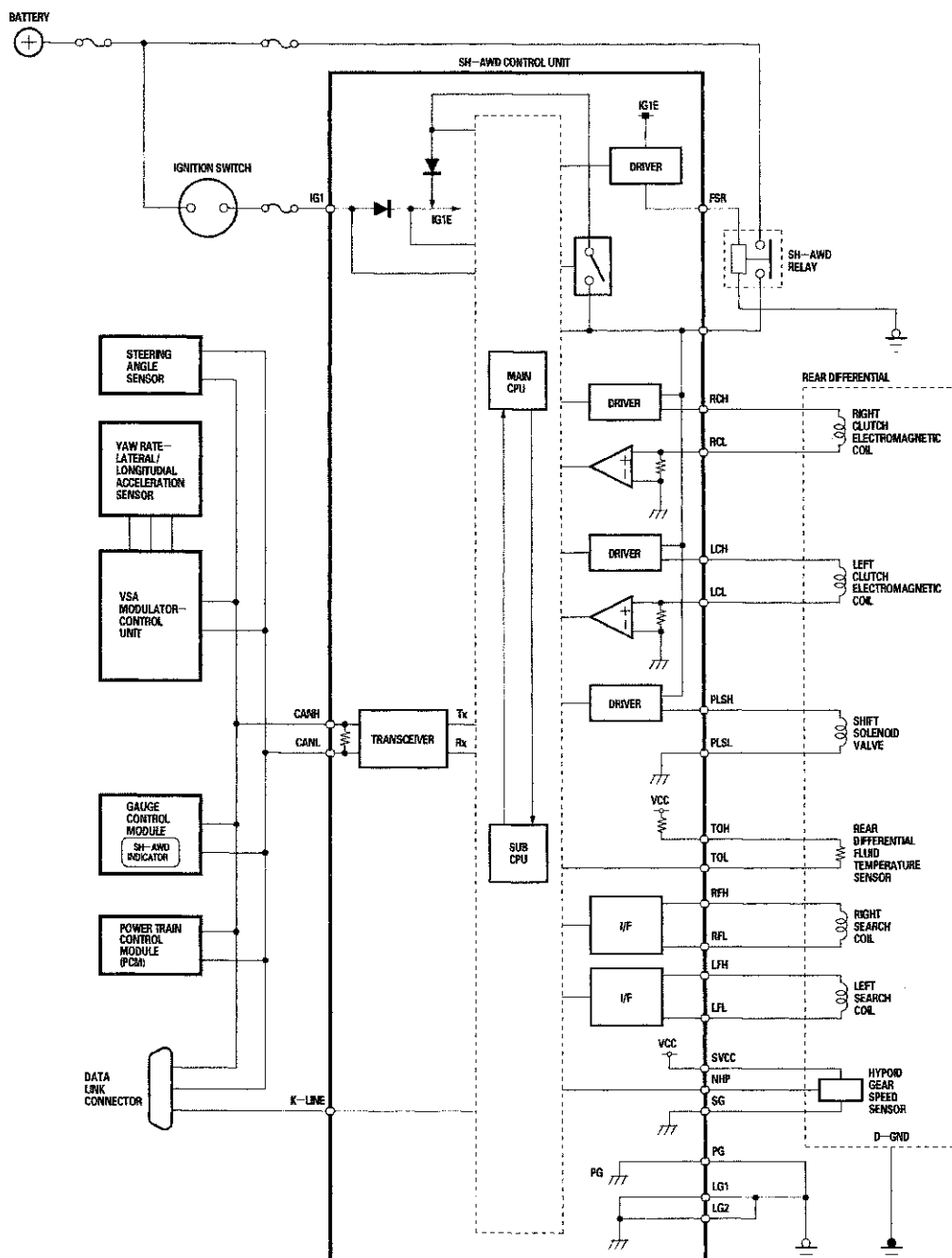
(cont'd)

Rear Differential

System Description (cont'd)

Electric Control System

SH-AWD Control Unit Electrical Connections

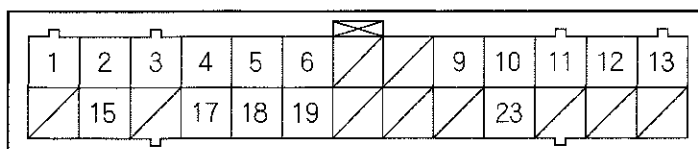




SH-AWD Control Unit Inputs and Outputs

The SH-AWD control unit terminal voltages and the measuring conditions for the SH-AWD inputs and outputs test are done with the SH-AWD connectors connected.

SH-AWD Control Unit Connector A (26P) Terminal Locations



Terminal side of male terminals

Terminal number	Wire color	Signal	Description	Measuring Conditions/Terminal Voltage
A1	RED	PLSH	Drives shift solenoid valve (positive)	With solenoid off: about 0 V With solenoid on: battery voltage
A2	WHT	NHP	Detects hypoid speed sensor signal	With ignition switch ON (II): about 0 V or about 5.0 V
A3	ORN	FSR	Drives SH-AWD relay	With ignition switch ON (II): about 0 V or battery voltage
A4	GRN	LFH	Detects left search coil signal (positive)	With ignition switch ON (II): about 2.5 V
A5	BRN	SG	Hypoid gear speed sensor ground	With ignition switch ON (II): about 0 V
A6	YEL	RFH	Detects right search coil signal (positive)	With ignition switch ON (II): about 2.5 V
A9	WHT	TOH	Power supply for differential fluid temperature sensor	With ignition switch ON (II): about 4.7 V to 5.0 V
A10	RED	CANL	F-CAN communication signal	With ignition switch ON (II): about 2.5 V or about 3.5 V
A11	WHT	CANH	F-CAN communication signal	With ignition switch ON (II): about 2.5 V or about 3.5 V
A12	BLK	LG1	Unit ground	With ignition switch ON (II): about 0 V
A13	BLU	IG1	Power supply for SH-AWD control unit	With ignition switch ON (II): battery voltage

(cont'd)

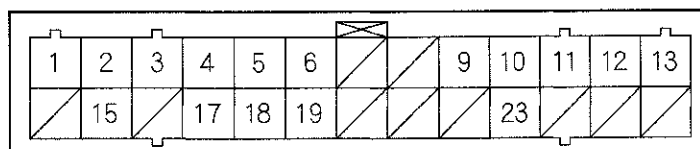
Rear Differential

System Description (cont'd)

SH-AWD Control Unit Inputs and Outputs

The SH-AWD control unit terminal voltages and the measuring conditions for the SH-AWD inputs and outputs test are done with the SH-AWD connectors connected.

SH-AWD Control Unit Connector A (26P) Terminal Locations



Terminal side of male terminals

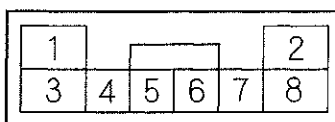
Terminal number	Wire color	Signal	Description	Measuring Conditions/Terminal Voltage
A15	LT BLU	K-LINE	Communication line SH-AWD control unit-to-DLC	With ignition switch ON (II): about 0 V or battery voltage
A17	RED	LFL	Detects left search coil signal (negative)	With ignition switch ON (II): about 0 V
A18	PNK	SVCC	Power supply for hypoid gear speed sensor	With ignition switch ON (II): about 5.0 V
A19	RED	RFL	Detects right search coil signal (negative)	With ignition switch ON (II): about 0 V
A23	BLK	TOL	Detects differential fluid temperature sensor (negative)	With ignition switch ON (II): about 0.2 V to 4.7 V (Depending on ATF temperature)



SH-AWD Control Unit inputs and Outputs

The SH-AWD control unit terminal voltages and the measuring conditions for the SH-AWD inputs and outputs test are done with the SH-AWD connectors connected.

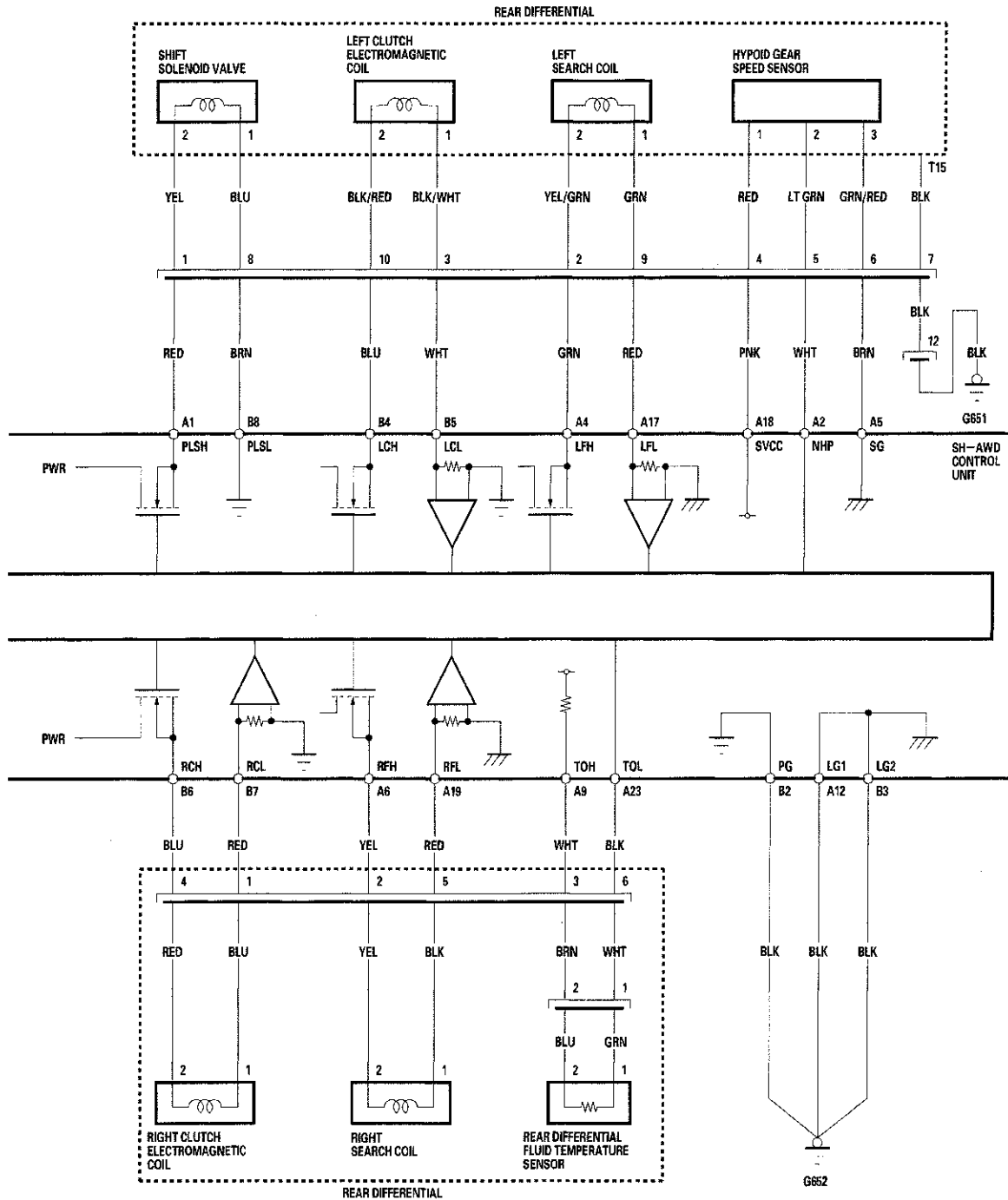
SH-AWD Control Unit Connector B (8P) Terminal Locations



Terminal side of male terminals

Terminal number	Wire color	Signal	Description	Measuring Conditions/Terminal Voltage
B1	BLU	PWR	Power supply for SH-AWD actuator	With ignition switch ON (II): battery voltage
B2	BLK	PG	Actuator ground	With ignition switch ON (II): about 0 V
B3	BLK	LG2	Unit ground	With ignition switch ON (II): about 0 V
B4	BLU	LCH	Drives left clutch electromagnetic coil (positive)	With clutch off: about 0 V With clutch on: battery voltage
B5	WHT	LCL	Drives left clutch electromagnetic coil (negative)	With ignition switch ON (II): about 0 V
B6	BLU	RCH	Drives right clutch electromagnetic coil (positive)	With clutch off: about 0 V With clutch on: battery voltage
B7	RED	RCL	Drives right clutch electromagnetic coil (negative)	With ignition switch ON (II): about 0 V
B8	BRN	PLSL	Drives shift solenoid (negative)	With ignition switch ON (II): about 0 V





Rear Differential

DTC Troubleshooting

DTC 12-1, 12-2, 12-3: Lateral Acceleration Sensor Malfunction

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Check for DTCs in the VSA system with the HDS.

Are any lateral acceleration sensor DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Go to step 3.

3. Park the vehicle on a level surface.
4. Compare the VOLTAGE OF LATERAL ACCELERATION SENSOR and the LATERAL ACCELERATION SENSOR NEUTRAL POSITION DATA in the DATA LIST with the HDS.

Is there difference between those two within 0.2 V?

YES—Replace the yaw rate-lateral/longitudinal acceleration sensor (see page 19-103). ■

NO—Do the yaw rate-lateral/longitudinal acceleration neutral position memorization (see page 15-7). ■

DTC 14-1, 14-2: Lateral Acceleration Sensor Neutral Position Incorrect

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs with the HDS.

Is DTC 14-1 and/or 14-2 indicated?

YES—Go to step 5.

NO—Intermittent failure, the system is OK at this time. ■

5. Park the vehicle on a level surface.
6. Check the VOLTAGE OF LATERAL ACCELERATION SENSOR in the DATA LIST with the HDS.

Is there about 2.2–2.8 V?

YES—Go to step 7.

NO—Check for installation of the yaw rate-lateral/longitudinal acceleration sensor (see page 19-103). ■

7. Check for yaw rate-lateral/longitudinal acceleration neutral position memorization with the HDS.

Is the yaw rate-lateral/longitudinal acceleration neutral position memorization completed?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Do the yaw rate-lateral/longitudinal acceleration neutral position memorization (see page 15-7). ■



DTC 16-1: Steering Angle Sensor Signal Malfunction

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs with the HDS.

Is DTC 16-1 indicated?

YES—Go to step 5.

NO—Intermittent failure, the system is OK at this time. ■

5. Check for DTCs in the VSA system with the HDS.

Are any steering angle sensor DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

DTC 16-3: Steering Angle Sensor Neutral Position Incorrect

NOTE:

- Before you troubleshoot, review the general troubleshooting information (see page 15-4).
- Check the wheel alignment (see page 18-5).
- Check for installation of the steering angle sensor.

1. Turn the ignition switch to ON (II).
2. Check for DTCs in the VSA system with the HDS.

Are any steering angle sensor DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Go to step 3.

3. Start the engine.
4. Check the STEERING ANGLE SENSOR in the DATA LIST with the HDS.

When the steering wheels is turned slowly, does the value change?

YES—Go to step 5.

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

5. Test-drive the vehicle in a straight line at 19 mph (30 km/h) or more.
6. Park the vehicle on a level surface, and center the steering wheel.
7. Check the STEERING ANGLE SENSOR in the DATA LIST with the HDS.

It is within ± 5 deg of center?

YES—Intermittent failure, the system is OK at this time. If the DTC returns, substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Do the steering angle sensor neutral position memorization (see page 19-104). If the DTC returns, substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

DTC 27-1: Hypoid Gear Speed Sensor (Open or Short)

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0).
4. Raise the vehicle on a lift, make sure it is securely supported, and allow all four wheels to rotate freely.
5. Start the engine.
6. Turn the VSA off (the VSA OFF lamp in the gauge control module turns on). Run the engine in D until the vehicle speed reaches 19 mph (30 km/h) and maintain the speed for 1 minute, then slow down and stop the wheels.
7. Check for DTCs with the HDS.

Is DTC 27-1 indicated?

YES—Go to step 8.

NO—Intermittent failure, the system is OK at this time. ■

8. Check for DTCs in the VSA system with the HDS.

Are any VSA System DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Go to step 9.

9. Run the engine in D until the vehicle speed reaches 19 mph (30 km/h) and maintain the speed.



10. Check the HYPOID GEAR SPEED SENSOR VALUE in the DATA LIST with the HDS.

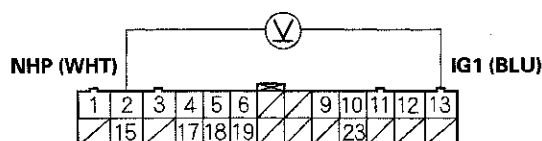
Is a hypoid gear speed sensor value shown?

YES—Check the hypoid gear speed sensor installation. If it is installed properly, substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Go to step 11.

11. Turn the ignition switch to LOCK (0), then turn the ignition switch to ON (II).
12. Measure the voltage between SH-AWD control unit connector terminals A2 and A13, then rotate the propeller shaft.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Does the voltage change?

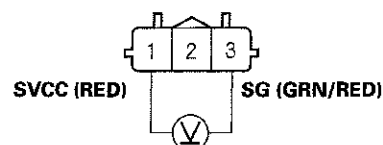
YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Go to step 13.

13. Turn the ignition switch to LOCK (0).
14. Disconnect the hypoid gear speed sensor 3P connector.
15. Turn the ignition switch to ON (II).

16. Measure the voltage between hypoid gear speed sensor 3P connector terminals No. 1 and No. 3.

HYPOID GEAR SPEED SENSOR 3P CONNECTOR



Wire side of female terminals

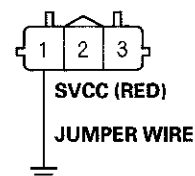
Is there 4.0 V or more?

YES—Go to step 25.

NO—Go to step 17.

17. Turn the ignition switch to LOCK (0).
18. Disconnect SH-AWD control unit connector A (26P).
19. Connect hypoid gear speed sensor 3P connector terminal No. 1 to body ground with a jumper wire.

HYPOID GEAR SPEED SENSOR 3P CONNECTOR



Wire side of female terminals

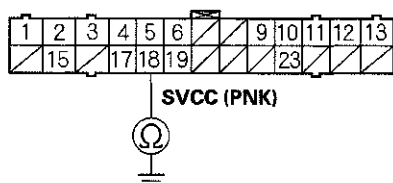
(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

20. Check for continuity between SH-AWD control unit connector terminal A18 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

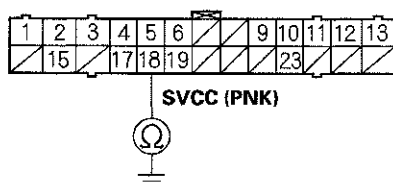
Is there continuity?

YES—Go to step 21.

NO—Repair an open in the wire between SH-AWD control unit connector A and the hypoid gear speed sensor 3P connector. ■

21. Remove the jumper wire from hypoid gear speed sensor 3P connector terminal No. 1.
22. Check for continuity between SH-AWD control unit connector terminal A18 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

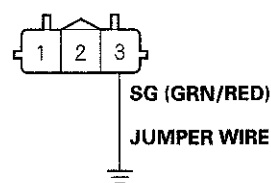
Is there continuity?

YES—Repair a short to body ground in the wire between SH-AWD control unit connector A and the hypoid gear speed sensor 3P connector. ■

NO—Go to step 23.

23. Connect hypoid gear speed sensor 3P connector terminal No. 3 to body ground with a jumper wire.

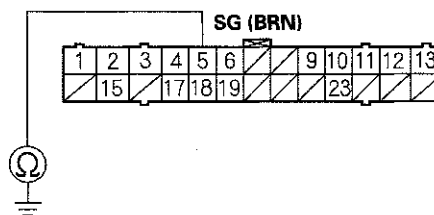
HYPOID GEAR SPEED SENSOR 3P CONNECTOR



Wire side of female terminals

24. Check for continuity between SH-AWD control unit connector terminal A5 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there continuity?

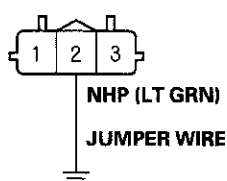
YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Repair an open in the wire between SH-AWD control unit connector A and the hypoid gear speed sensor 3P connector. ■



25. Turn the ignition switch to LOCK (0).
26. Disconnect SH-AWD control unit connector A (26P).
27. Connect hypoid gear speed sensor 3P connector terminal No. 2 to body ground with a jumper wire.

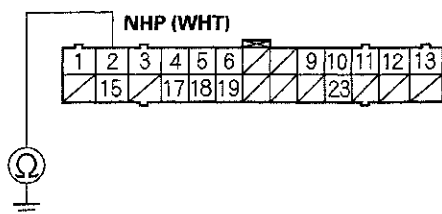
HYPOID GEAR SPEED SENSOR 3P CONNECTOR



Wire side of female terminals

28. Check for continuity between SH-AWD control unit connector terminal A2 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

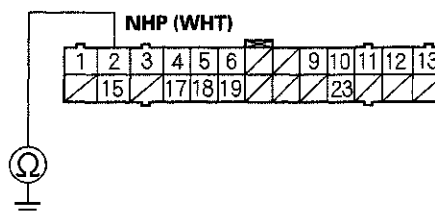
Is there continuity?

YES—Go to step 29.

NO—Repair an open in the wire between SH-AWD control unit connector A and the hypoid gear speed sensor 3P connector. ■

29. Remove the jumper wire from hypoid gear speed sensor 3P connector terminal No. 2.
30. Check for continuity between SH-AWD control unit connector terminal A2 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there continuity?

YES—Repair a short to body ground in the wire between SH-AWD control unit connector A and the hypoid gear speed sensor 3P connector. ■

NO—Replace the hypoid gear speed sensor (see page 15-98). ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 27-2: Hypoid Gear Speed Sensor Malfunction

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0).
4. Raise the vehicle on a lift, make sure it is securely supported, and allow all four wheels to rotate freely.
5. Start the engine.
6. Turn the VSA off (the VSA OFF lamp in the gauge control module turns on). Run the engine in D until the vehicle speed reaches 19 mph (30 km/h) and maintain the speed for 1 minute, then slow down and stop the wheels.
7. Check for DTCs with the HDS.

Is DTC 27-2 indicated?

YES—Go to step 8.

NO—Intermittent failure, the system is OK at this time. ■

8. Check for DTCs in the VSA system with the HDS.

Are any VSA System DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Go to step 9.

9. Run the engine in D until the vehicle speed reaches 19 mph (30 km/h) and maintain the speed.

10. Check the HYPOID GEAR SPEED SENSOR VALUE in the DATA LIST with the HDS.

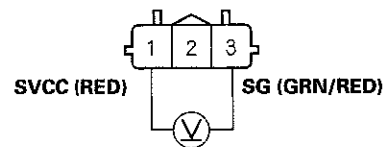
Is a hypoid gear speed sensor value shown?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Go to step 11.

11. Turn the ignition switch to LOCK (0).
12. Disconnect the hypoid gear speed sensor 3P connector.
13. Turn the ignition switch to ON (II).
14. Measure the voltage between hypoid gear speed sensor 3P connector terminals No. 1 and No. 3.

HYPOID GEAR SPEED SENSOR 3P CONNECTOR



Wire side of female terminals

Is there 4.0 V or more for at least 30 seconds?

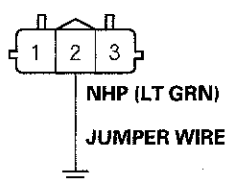
YES—Go to step 15.

NO—Go to step 19.



15. Turn the ignition switch to LOCK (0).
16. Disconnect SH-AWD control unit connector A (26P).
17. Connect hypoid gear speed sensor 3P connector terminal No. 2 to body ground with a jumper wire.

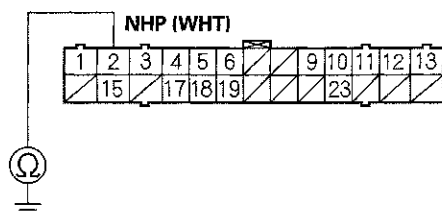
HYPOID GEAR SPEED SENSOR 3P CONNECTOR



Wire side of female terminals

18. Check for continuity between SH-AWD control unit connector terminal A2 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there continuity?

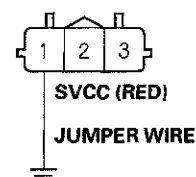
YES—Replace the hypoid gear speed sensor (see page 15-98). ■

NO—Repair an open in the wire between SH-AWD control unit connector A and the hypoid gear speed sensor 3P connector. ■

19. Turn the ignition switch to LOCK (0).
20. Disconnect SH-AWD control unit connector A (26P).

21. Connect hypoid gear speed sensor 3P connector terminal No. 1 to body ground with a jumper wire.

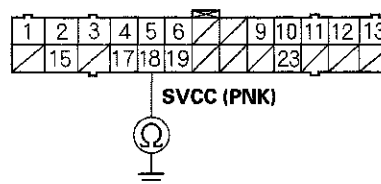
HYPOID GEAR SPEED SENSOR 3P CONNECTOR



Wire side of female terminals

22. Check for continuity between SH-AWD control unit connector terminal A18 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there continuity?

YES—Go to step 23.

NO—Repair an open in the wire between SH-AWD control unit connector A and the hypoid gear speed sensor 3P connector. ■

23. Remove the jumper wire from hypoid gear speed sensor 3P connector terminal No. 1.

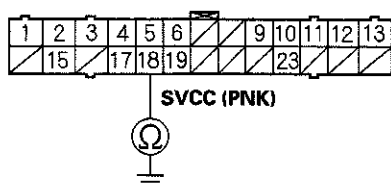
(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

24. Check for continuity between SH-AWD control unit connector terminal A18 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

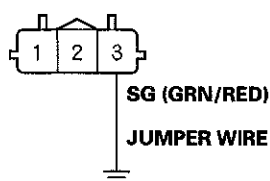
Is there continuity?

YES—Repair a short to body ground in the wire between SH-AWD control unit connector A and the hypoid gear speed sensor 3P connector. ■

NO—Go to step 25.

25. Connect hypoid gear speed sensor 3P connector terminal No. 3 to body ground with a jumper wire.

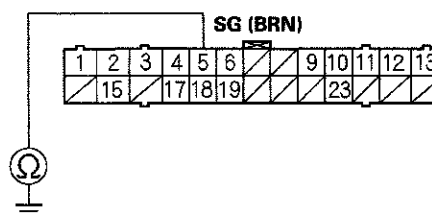
HYPOID GEAR SPEED SENSOR 3P CONNECTOR



Wire side of female terminals

26. Check for continuity between SH-AWD control unit connector terminal A5 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there continuity?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Repair an open in the wire between SH-AWD control unit connector A and the hypoid gear speed sensor 3P connector. ■



DTC 33-1, 33-2, 33-3: Yaw Rate Sensor Malfunction

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Check for DTCs in the VSA system with the HDS.

Are any yaw rate sensor DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Go to step 3.

3. Park the vehicle on a level surface.
4. Compare the VOLTAGE OF YAW RATE SENSOR and YAW RATE SENSOR NEUTRAL POSITION DATA in the DATA LIST with the HDS.

Is the difference between the two within 0.1 V?

YES—Replace the yaw rate-lateral/longitudinal acceleration sensor (see page 19-103). ■

NO—Do the yaw rate-lateral/longitudinal acceleration neutral position memorization (see page 15-7). ■

DTC 35-1, 35-2: Yaw Rate Sensor Neutral Position Incorrect

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs with the HDS.

Is DTC 35-1 and/or 35-2 indicated?

YES—Go to step 5.

NO—Intermittent failure, the system is OK at this time. ■

5. Park the vehicle on a level surface.
6. Check the VOLTAGE OF YAW RATE SENSOR in the DATA LIST with the HDS.

Is there 2.2–2.8 V?

YES—Go to step 7.

NO—Check for installation of the yaw rate-lateral/longitudinal acceleration sensor (see page 19-103). ■

7. Check for yaw rate-lateral/longitudinal acceleration neutral position memorization with the HDS.

Is the yaw rate-lateral/longitudinal acceleration neutral position memorization completed?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Do the yaw rate-lateral/longitudinal acceleration neutral position memorization (see page 15-7). ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 41-1: F-CAN Malfunction (Lost Communication with Powertrain Control Module (PCM))

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Check for DTCs in the PGM-FI system with the HDS.

Are there any PGM-FI DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Go to step 3.

3. Clear the DTC with the HDS.
4. Start the engine.
5. Check for DTCs with the HDS.

Is DTC 41-1 indicated?

YES—Go to step 6.

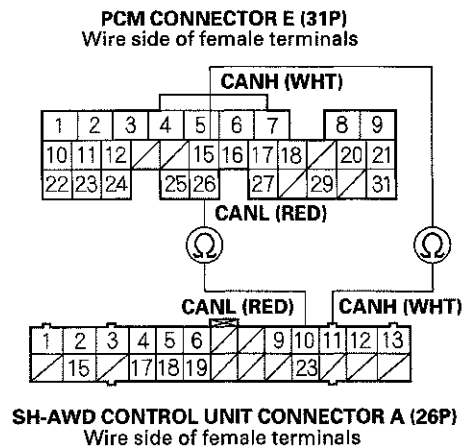
NO—Intermittent failure, the system is OK at this time. Check for intermittent open between SH-AWD control unit connector terminals A10 and A11 and PCM connector terminals E15 and E26. ■

6. Turn the ignition switch to LOCK (0).
7. Jump the SCS line with the HDS.

NOTE: This step must be done to prevent PCM damage.

8. Disconnect PCM connector E (31P).
9. Disconnect SH-AWD control unit connector A (26P).

10. Check for continuity between PCM connector terminals E15, E26 and SH-AWD control unit connector terminals A10, A11 individually.



Is there continuity?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Repair an open in the wires between the SH-AWD control unit and the PCM. ■



DTC 41-2: F-CAN Malfunction (Lost Communication with VSA Modulator-Control Unit)

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Check for DTCs in the VSA system with the HDS.

Are there any DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Go to step 3.

3. Clear the DTC with the HDS.
4. Start the engine.
5. Check for DTCs with the HDS.

Is DTC 41-2 indicated?

YES—Go to step 6.

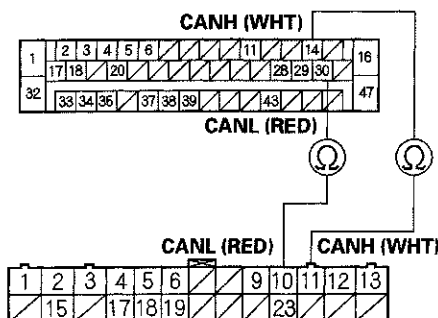
NO—Intermittent failure, the system is OK at this time. Check for intermittent open between SH-AWD control unit connector terminals A10 and A11 and VSA modulator-control unit 47P connector terminals No. 14 and No. 30. ■

6. Turn the ignition switch to LOCK (0).
7. Disconnect the VSA modulator-control unit 47P connector.
8. Disconnect SH-AWD control unit connector A (26P).

9. Check for continuity between VSA modulator-control unit 47P connector terminals No. 14, No. 30 and SH-AWD control unit connector terminals A10, A11 individually.

VSA MODULATOR-CONTROL UNIT 47P CONNECTOR

Wire side of female terminals



SH-AWD CONTROL UNIT CONNECTOR A (26P)

Wire side of female terminals

Is there continuity?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Repair an open in the wires between the SH-AWD control unit and the VSA modulator-control unit. ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 41-3: F-CAN Malfunction (Lost Communication with Gauge Control Module)

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Check for DTCs in the gauge control system with the HDS.

Are there any DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Go to step 3.
3. Clear the DTC with the HDS.
4. Start the engine.
5. Check for DTCs with the HDS.

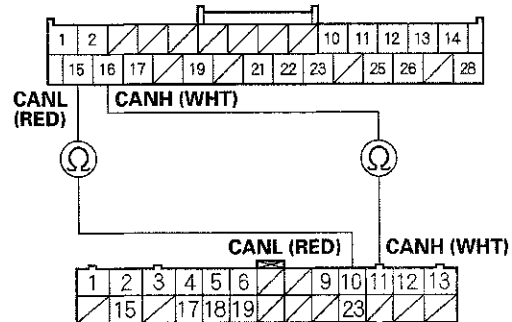
Is DTC 41-3 indicated?

YES—Go to step 6.

NO—Intermittent failure, the system is OK at this time. Check for intermittent open between SH-AWD control unit connector terminals A10 and A11 and gauge control module connector terminals B15 and B16. ■
6. Turn the ignition switch to LOCK (0).
7. Disconnect gauge control module connector B (28P).
8. Disconnect SH-AWD control unit connector A (26P).

9. Check for continuity between gauge control module connector terminals B15, B16 and SH-AWD control unit connector terminals A10, A11 individually.

GAUGE CONTROL MODULE CONNECTOR B (28P)
Wire side of female terminals



SH-AWD CONTROL UNIT CONNECTOR A (26P)
Wire side of female terminals

Is there continuity?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Repair an open in the wires between the SH-AWD control unit and the gauge control module. ■



DTC 41-6: F-CAN Malfunction (Lost Communication with Steering Angle Sensor)

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Check for DTCs in the VSA system with the HDS.

Are any steering angle sensor DTCs of F-CAN indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Go to step 3.

3. Clear the DTC with the HDS.
4. Start the engine.
5. Check for DTCs with the HDS.

Is DTC 41-6 indicated?

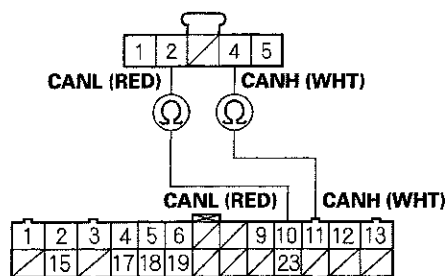
YES—Go to step 6.

NO—Intermittent failure, the system is OK at this time. ■

6. Turn the ignition switch to LOCK (0).
7. Disconnect the steering angle sensor 5P connector.
8. Disconnect SH-AWD control unit connector A (26P).

9. Check for continuity between steering angle sensor 5P connector terminals No.2, No. 4 and SH-AWD control unit connector terminals A10, A11 individually.

STEERING ANGLE SENSOR 5P CONNECTOR
Wire side of female terminals



SH-AWD CONTROL UNIT CONNECTOR A (26P)
Wire side of female terminals

Is there continuity?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Repair an open in the wires between the SH-AWD control unit and the steering angle sensor. ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 42-1: Differential Fluid Temperature Sensor (Short to Power)

NOTE:

- Before you troubleshoot, review the general troubleshooting information (see page 15-4).
- If the vehicle was driven prior to this troubleshooting procedure, allow the rear differential to cool for more than an hour before continuing.

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn the ignition switch to ON (II).
4. Check for DTCs with the HDS.

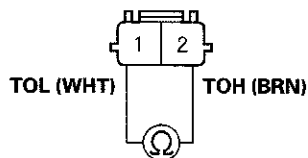
Is DTC 42-1 indicated?

YES—Go to step 5.

NO—Intermittent failure, the system is OK at this time. ■

5. Turn the ignition switch to LOCK (0).
6. Disconnect the rear differential fluid temperature sensor 2P connector and SH-AWD control unit connector A (26P).
7. Check for continuity between rear differential fluid temperature sensor 2P connector terminals No. 1 and No. 2.

REAR DIFFERENTIAL FLUID TEMPERATURE SENSOR 2P CONNECTOR



Wire side of female terminals

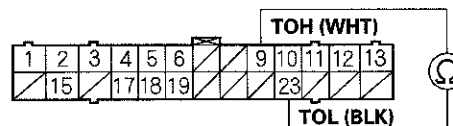
Is there continuity?

YES—Repair a short in the wire between rear differential fluid temperature sensor 2P connector terminals No. 1 and No. 2. ■

NO—Go to step 8.

8. Connect the rear differential fluid temperature sensor 2P connector.
9. Measure the differential housing temperature with an infrared temperature gauge near the mounting location of the rear differential fluid temperature sensor. The temperature should be below 176 °F (80 °C) before proceeding to the next step.
10. Measure the resistance between SH-AWD control unit connector terminals A9 and A23.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there 260 Ω or more?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Replace the rear differential fluid temperature sensor (see page 15-98). ■



DTC 42-2: Differential Fluid Temperature Sensor (Open/GND Short)

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Raise the vehicle on a lift, make sure it is securely supported, and allow all four wheels to rotate freely.
4. Start the engine and turn the VSA off (the VSA OFF lamp in the gauge control module turn on). Run the engine in D until the vehicle speed reaches 35 mph (56 km/h) and maintain the speed for 10 minutes, then slow down and stop the wheels.
5. Check for DTCs with the HDS.

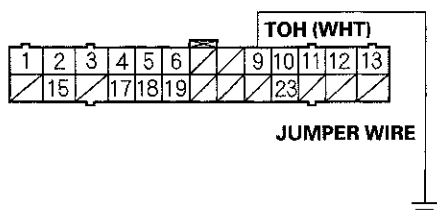
Is DTC 42-2 indicated?

YES—Go to step 6.

NO—Intermittent failure, the system is OK at this time. ■

6. Turn the ignition switch to LOCK (0).
7. Disconnect SH-AWD control unit connector A (26P).
8. Connect SH-AWD control unit connector terminal A9 to body ground with a jumper wire.

SH-AWD CONTROL UNIT CONNECTOR A (26P)

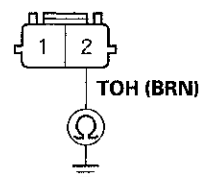


Wire side of female terminals

9. Disconnect the rear differential fluid temperature sensor 2P connector.

10. Check for continuity between rear differential fluid temperature sensor 2P connector terminal No. 2 and body ground.

REAR DIFFERENTIAL OIL TEMPERATURE SENSOR 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 11.

NO—Repair an open in the wire between SH-AWD control unit connector A and the rear differential fluid temperature sensor 2P connector. ■

11. Remove the jumper wire from SH-AWD control unit connector terminal A9.

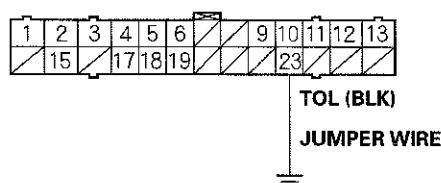
(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

12. Connect SH-AWD control unit connector terminal A23 to body ground with a jumper wire.

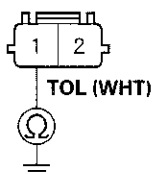
SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

13. Check for continuity between rear differential fluid temperature sensor 2P connector terminal No. 1 and body ground.

REAR DIFFERENTIAL FLUID TEMPERATURE SENSOR 2P CONNECTOR



Wire side of female terminals

Is there continuity?

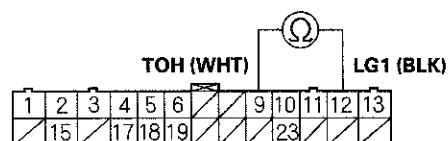
YES—Go to step 14.

NO—Repair an open in the wire between SH-AWD control unit connector A and the rear differential fluid temperature sensor 2P connector. ■

14. Remove the jumper wire from SH-AWD control unit connector terminal A23.

15. Check for continuity between SH-AWD control unit connector terminals A9 and A12.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

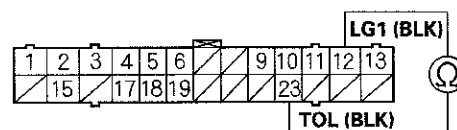
Is there continuity?

YES—Repair a short in the wire between SH-AWD control unit connector A and the rear differential fluid temperature sensor 2P connector. ■

NO—Go to step 16.

16. Check for continuity between SH-AWD control unit connector terminals A12 and A23.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there continuity?

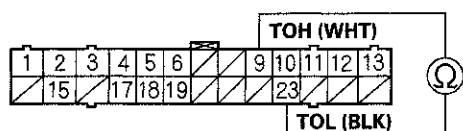
YES—Repair a short in the wire between SH-AWD control unit connector A and the rear differential fluid temperature sensor 2P connector. ■

NO—Go to step 17.



17. Reconnect the rear differential fluid temperature sensor 2P connector.
18. Measure the resistance between SH-AWD control unit connector terminals A9 and A23.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there 12.67 k Ω or less?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Replace the rear differential fluid temperature sensor (see page 15-98). ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 43-1: Differential Fluid Temperature Sensor Circuit Malfunction

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Check for DTCs with the HDS.

Is DTC 42-1 or 42-2 indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Go to step 3.

3. Clear the DTC with the HDS.
4. Start the engine.
5. Let the engine idle 1 minute.
6. Test-drive the vehicle for 5 minutes.
7. Check for DTCs with the HDS.

Is DTC 43-1 indicated?

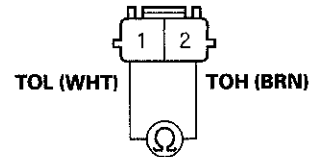
YES—Go to step 8.

NO—Intermittent failure, the system is OK at this time. ■

8. Turn the ignition switch to LOCK (0).
9. Disconnect SH-AWD control unit connector A (26P).
10. Disconnect the rear differential fluid temperature sensor 2P connector.

11. Check for continuity between rear differential fluid temperature sensor 2P connector terminals No. 1 and No. 2.

REAR DIFFERENTIAL FLUID TEMPERATURE SENSOR 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair a short in the wire between rear differential fluid temperature sensor 2P connector terminals No. 1 and No. 2. ■

NO—Go to step 12.

12. Reconnect all connectors.
13. Substitute a known-good SH-AWD control unit (see page 15-99).
14. Start the engine.
15. Let the engine idle 1 minute.
16. Check for DTCs with the HDS.

Is DTC 43-1 indicated?

YES—Replace the rear differential fluid temperature sensor (see page 15-98). ■

NO—Replace the original SH-AWD control unit (see page 15-99). ■



DTC 44-11: SH-AWD Control Unit

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn the ignition switch to ON (II).
4. Check for DTCs with the HDS.

Is DTC 44-11 indicated?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Intermittent failure, the system is OK at this time. ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 44-12: SH-AWD Relay Stuck ON

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs with the HDS.

Is DTC 44-12 indicated?

YES—Go to step 5.

NO—Intermittent failure, the system is OK at this time. ■

5. Turn the ignition switch to LOCK (0).
6. Remove the SH-AWD relay (see page 15-99), then test the SH-AWD relay (see page 22-93). ■

Is the SH-AWD relay OK?

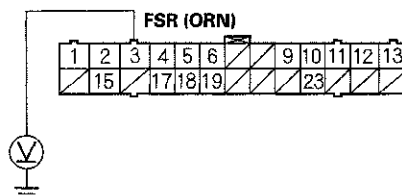
YES—Go to step 7.

NO—Replace the SH-AWD relay (see page 15-99). ■

7. Disconnect SH-AWD control unit connector A (26P).
8. Turn the ignition switch to ON (II).

9. Measure the voltage between SH-AWD control unit connector terminal A3 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

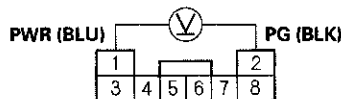
Is there battery voltage?

YES—Repair a short to power in the wire between the SH-AWD control unit and the SH-AWD relay (FSR line). ■

NO—Go to step 10.

10. Disconnect SH-AWD control unit connector B (8P).
11. Measure the voltage between SH-AWD control unit connector terminals B1 and B2.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

Is there battery voltage?

YES—Repair a short to power in the wire between the SH-AWD control unit and the SH-AWD relay (PWR line). ■

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■



DTC 44-21: SH-AWD Control Unit

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn the ignition switch to ON (II).
4. Check for DTCs with the HDS.

Is DTC 44-21 indicated?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Intermittent failure, the system is OK at this time. ■

DTC 44-31: SH-AWD Relay Stuck OFF

NOTE:

- Before you troubleshoot, review the general troubleshooting information (see page 15-4).
- Make sure the battery is fully charged and the charging system is working properly.

1. Check these fuses:

- No. 22 (AS F/B) (70 A) fuse in the under-hood fuse/relay box.
- No. 1 (30 A) fuse in the passenger's under-hood fuse/relay box.

Are the fuses OK?

YES—Go to step 2.

NO—Replace the blown fuses and recheck. If the No. 22 (70 A) and No. 1 (30 A) fuses blows again, repair a short to ground in the wire between the fuse and the SH-AWD relay, then replace the fuse and recheck. ■

2. Turn the ignition switch to ON (II).
3. Clear the DTC with the HDS.
4. Start the engine.
5. Check for DTCs with the HDS.

Is DTC 44-31 indicated?

YES—Go to step 6.

NO—Intermittent failure, the system is OK at this time. ■

6. Turn the ignition switch to LOCK (0).

(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

7. Remove the SH-AWD relay (see page 15-99), then test the SH-AWD relay (see page 22-93).

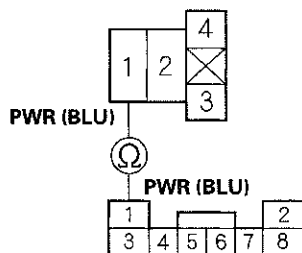
Is the SH-AWD relay OK?

YES—Go to step 8.

NO—Replace the SH-AWD relay (see page 15-99). ■

8. Disconnect SH-AWD control unit connector B (8P).
9. Check for continuity between SH-AWD relay 4P connector terminal No. 1 and SH-AWD control unit connector terminal B1.

SH-AWD RELAY 4P CONNECTOR
Wire side of female terminals



SH-AWD CONTROL UNIT CONNECTOR B (8P)
Wire side of female terminals

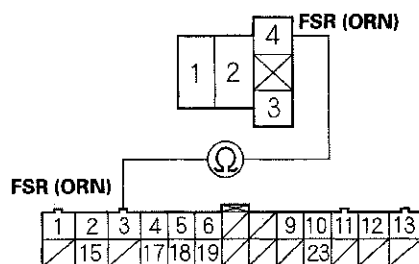
Is there continuity?

YES—Go to step 10.

NO—Repair an open in the wire between SH-AWD control unit connector A and the SH-AWD relay. ■

10. Check for continuity between SH-AWD relay 4P connector terminal No. 4 and SH-AWD control unit connector terminal A3.

SH-AWD RELAY 4P CONNECTOR
Wire side of female terminals



SH-AWD CONTROL UNIT CONNECTOR A (26P)
Wire side of female terminals

Is there continuity?

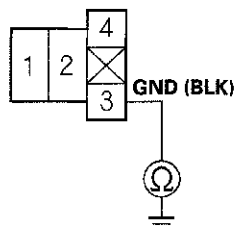
YES—Go to step 11.

NO—Repair an open in the wire between SH-AWD control unit connector A and the SH-AWD relay. ■



11. Check for continuity between SH-AWD relay 4P connector terminal No. 3 and body ground.

SH-AWD RELAY 4P CONNECTOR



Wire side of female terminals

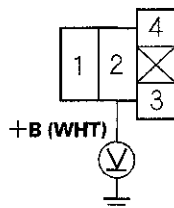
Is there continuity?

YES—Go to step 12.

NO—Repair an open in the wire between the SH-AWD relay and body ground (G652). ■

12. Measure the voltage between SH-AWD relay 4P connector terminal No. 2 and body ground.

SH-AWD RELAY 4P CONNECTOR



Wire side of female terminals

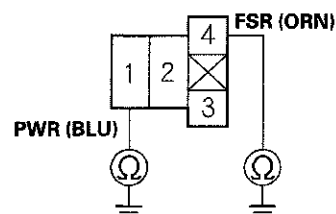
Is there battery voltage?

YES—Go to step 13.

NO—Repair an open in the wire between the No. 1 fuse in the passenger's under-dash fuse/relay box and the SH-AWD relay. ■

13. Check for continuity between SH-AWD relay 4P connector terminals No. 1 and No. 4 to body ground.

SH-AWD RELAY 4P CONNECTOR



Wire side of female terminals

Is there voltage?

YES—Repair a short in the wire between the SH-AWD relay and body ground. ■

NO—Check for loose connector terminals at the SH-AWD control unit. If the connections are OK, substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 44-32: SH-AWD Control Unit Power Supply Stuck ON

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs with the HDS.

Is DTC 44-32 indicated?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Intermittent failure, the system is OK at this time. ■

DTC 44-41: SH-AWD Control Unit Power Supply Stuck OFF

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs with the HDS.

Is DTC 44-41 indicated?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Intermittent failure, the system is OK at this time. ■



DTC 44-50: SH-AWD Control Unit Power Supply Voltage Low

NOTE:

- Before you troubleshoot, review the general troubleshooting information (see page 15-4).
- Make sure the battery is fully charged and the charging system is working properly.

1. Check these fuses:

- No. 22 (AS F/B) (70 A) fuse in the under-hood fuse/relay box.
- No. 1 (30 A) fuse in the passenger's under-hood fuse/relay box.

Are the fuses OK?

YES—Go to step 2.

NO—Replace the blown fuses and recheck. If the No. 22 (70 A) and No. 1 (30 A) fuses blows again, repair a short to ground in the wire between the fuse and the SH-AWD relay, then replace the fuse and recheck. ■

2. Turn the ignition switch to ON (II).
3. Clear the DTC with the HDS.
4. Start the engine.
5. Check for DTCs with the HDS.

Is DTC 44-50 indicated?

YES—Go to step 6.

NO—Intermittent failure, the system is OK at this time. ■

6. Turn the ignition switch to LOCK (0).

7. Remove the SH-AWD relay (see page 15-99), then test the SH-AWD relay (see page 22-93).

Is the SH-AWD relay OK?

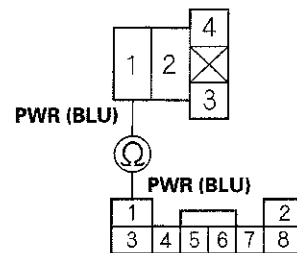
YES—Go to step 8.

NO—Replace the SH-AWD relay (see page 15-99). ■

8. Disconnect SH-AWD control unit connector B (8P).

9. Check for continuity between SH-AWD relay 4P connector terminal No. 1 and SH-AWD control unit connector terminal B1.

SH-AWD RELAY 4P CONNECTOR
Wire side of female terminals



SH-AWD CONTROL UNIT CONNECTOR B (8P)
Wire side of female terminals

Is there continuity?

YES—Go to step 10.

NO—Repair an open in the wire between SH-AWD control unit connector A and the SH-AWD relay. ■

(cont'd)

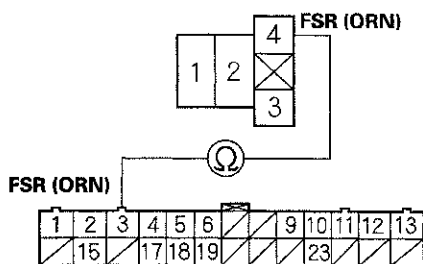
Rear Differential

DTC Troubleshooting (cont'd)

10. Check for continuity between SH-AWD relay 4P connector terminal No. 4 and SH-AWD control unit connector terminal A3.

SH-AWD RELAY 4P CONNECTOR

Wire side of female terminals



SH-AWD CONTROL UNIT CONNECTOR A (26P)

Wire side of female terminals

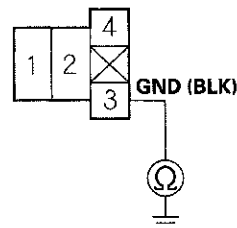
Is there continuity?

YES—Go to step 11.

NO—Repair an open in the wire between SH-AWD control unit connector A and the SH-AWD relay. ■

11. Check for continuity between SH-AWD relay 4P connector terminal No. 3 and body ground.

SH-AWD RELAY 4P CONNECTOR



Wire side of female terminals

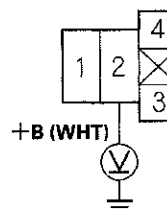
Is there continuity?

YES—Go to step 12.

NO—Repair an open in the wire between the SH-AWD relay and body ground (G652). ■

12. Measure the voltage between SH-AWD relay 4P connector terminal No. 2 and body ground.

SH-AWD RELAY 4P CONNECTOR



Wire side of female terminals

Is there battery voltage?

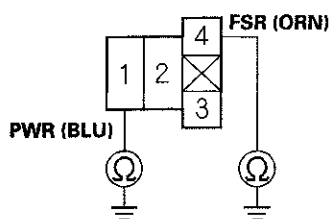
YES—Go to step 13.

NO—Repair an open in the wire between No. 1 fuse in the passenger's under-dash fuse/relay box and the SH-AWD relay. ■



13. Check for continuity between SH-AWD relay 4P connector terminals No. 1 and No. 4 to body ground.

SH-AWD RELAY 4P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair a short in the wire between the SH-AWD relay and body ground. ■

NO—Check for loose connector terminals at the SH-AWD control unit. If the connections are OK, substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

DTC 46-1: SH-AWD Control Unit Internal Power Supply Circuit (Open or Short)

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs with the HDS.

Is DTC 46-1 indicated?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Intermittent failure, the system is OK at this time. ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 52-3: Left Clutch Electromagnetic Coil Current Malfunction

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Do the direct electromagnetic clutch test (see page 15-93).
4. Check for DTCs with the HDS.

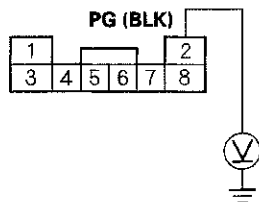
Is DTC 52-3 indicated?

YES—Go to step 5.

NO—Intermittent failure, the system is OK at this time. ■

5. Measure the voltage between SH-AWD control unit connector terminal B2 and body ground.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

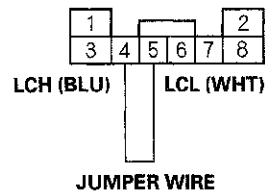
Is there less than 0.5 V?

YES—Go to step 6.

NO—Repair an open in the wire between SH-AWD control unit connector B and body ground or poor ground (G652). ■

6. Turn the ignition switch to LOCK (0).
7. Disconnect SH-AWD control unit connector B (8P).
8. Disconnect the left clutch electromagnetic coil 2P connector.
9. Connect SH-AWD control unit connector terminals B4 and B5 with a jumper wire.

SH-AWD CONTROL UNIT CONNECTOR B (8P)

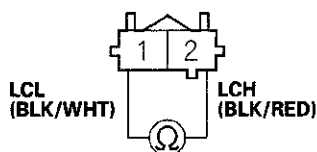


Wire side of female terminals



10. Check for continuity between left clutch electromagnetic coil 2P connector terminals No. 1 and No. 2.

LEFT CLUTCH ELECTROMAGNETIC COIL 2P CONNECTOR



Wire side of female terminals

Is there continuity?

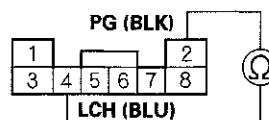
YES—Go to step 11.

NO—Repair an open in the wire between the SH-AWD control unit and the left clutch electromagnetic coil. ■

11. Remove the jumper wire from SH-AWD control unit connector terminals B4 and B5.

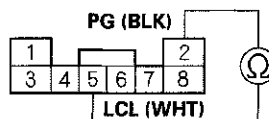
12. Check for continuity between SH-AWD control unit connector terminals B2 and B4, then check for continuity between SH-AWD control unit connector terminals B2 and B5.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

Is there continuity?

YES—Repair a short to ground or short to the ground wire between the SH-AWD control unit and the left clutch electromagnetic coil. ■

NO—Go to step 13.

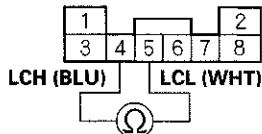
(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

13. Check for continuity between SH-AWD control unit connector terminals B4 and B5.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

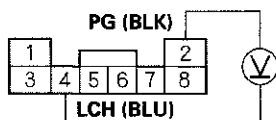
Is there continuity?

YES—Repair a short in the wires between the SH-AWD control unit and the left clutch electromagnetic coil. ■

NO—Go to step 14.

14. Turn the ignition switch to ON (II).
15. Measure the voltage between SH-AWD control unit connector terminals B2 and B4.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

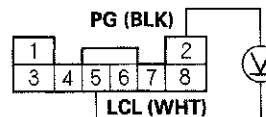
Is there more than 0.5 V?

YES—Repair a short to power in the wire between the SH-AWD control unit and the left clutch electromagnetic coil. ■

NO—Go to step 16.

16. Measure the voltage between SH-AWD control unit connector terminals B2 and B5.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

Is there more than 0.5 V?

YES—Repair a short to power in the wire between the SH-AWD control unit and the left clutch electromagnetic coil. ■

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the rear differential side case (see page 15-99). ■



DTC 53-1, 53-3: Left Clutch Electromagnetic Coil (Open)

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Do the direct electromagnetic clutch test (see page 15-93).
4. Check for DTCs with the HDS.

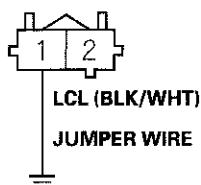
Is DTC 53-1 or 53-3 indicated?

YES—Go to step 5.

NO—Intermittent failure, the system is OK at this time. ■

5. Turn the ignition switch to LOCK (0).
6. Disconnect SH-AWD control unit connector B (8P).
7. Disconnect the left clutch electromagnetic coil 2P connector.
8. Connect between left clutch electromagnetic coil 2P connector terminal No. 1 to body ground with a jumper wire.

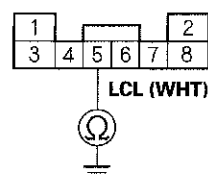
LEFT CLUTCH ELECTROMAGNETIC COIL 2P CONNECTOR



Wire side of female terminals

9. Check for continuity between SH-AWD control unit connector terminal B5 and body ground.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

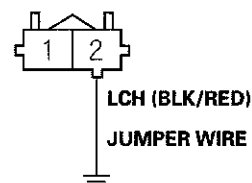
Is there continuity?

YES—Go to step 10.

NO—Repair an open in the wire between the SH-AWD control unit and the left clutch electromagnetic coil. ■

10. Remove the jumper wire from the left clutch electromagnetic coil 2P connector terminal No. 1.
11. Connect left clutch electromagnetic coil 2P connector terminal No. 2 to body ground with a jumper wire.

LEFT CLUTCH ELECTROMAGNETIC COIL 2P CONNECTOR



Wire side of female terminals

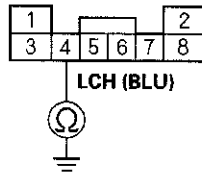
(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

12. Check for continuity between SH-AWD control unit connector terminal B4 and body ground.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

Is there continuity?

YES—Go to step 13.

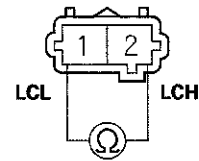
NO—Repair an open in the wire between the SH-AWD control unit and the left clutch electromagnetic coil. ■

13. Remove the jumper wire from the left clutch electromagnetic coil 2P connector terminal No. 2.
14. Reconnect all connectors.
15. Turn the ignition switch to ON (II).
16. Check the REAR DIFFERENTIAL FLUID TEMPERATURE in the DATA LIST with the HDS before proceeding to the next step. The temperature should be above 68 °F (20 °C). If the temperature is below 68 °F (20 °C), drive the vehicle to warm up the rear differential until the fluid temperature becomes above 68 °F (20 °C).
17. Turn the ignition switch to LOCK (0).

18. Disconnect the left clutch electromagnetic coil 2P connector.

19. Measure the resistance between left clutch electromagnetic coil 2P connector terminals No. 1 and No. 2.

LEFT CLUTCH ELECTROMAGNETIC COIL 2P CONNECTOR



Terminal side of male terminals

Is there 1.5 Ω or more?

YES—Replace the rear differential side case (see page 15-120). ■

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■



DTC 53-2, 53-4: Left Clutch Electromagnetic Coil (Short)

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Do the direct electromagnetic clutch test (see page 15-93).
4. Check for DTCs with the HDS.

Is DTC 53-2 or 53-4 indicated?

YES—Go to step 5.

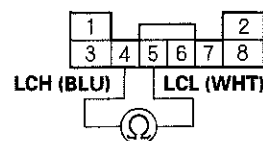
NO—Intermittent failure, the system is OK at this time. ■

5. Turn the ignition switch to LOCK (0).
6. Disconnect SH-AWD control unit connector B (8P).

7. Disconnect the left clutch electromagnetic coil 2P connector.

8. Check for continuity between SH-AWD control unit connector terminals B4 and B5.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

Is there continuity?

YES—Repair a short in the wires between SH-AWD control unit connector terminals B4 and B5. ■

NO—Go to step 9.

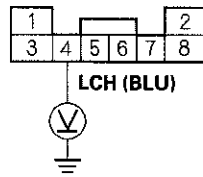
(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

9. Turn the ignition switch to ON (II).
10. Measure the voltage between SH-AWD control unit connector terminal B4 and body ground.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

Is there more than 0.5 V?

YES—Repair a short to power in the wires between SH-AWD control unit connector terminal B4 and the left clutch electromagnetic coil. ■

NO—Go to step 11.

11. Turn the ignition switch to LOCK (0).
12. Reconnect all connectors.
13. Turn the ignition switch to ON (II).

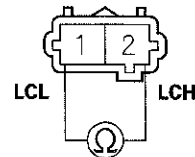
14. Check the REAR DIFFERENTIAL FLUID TEMPERATURE in the DATA LIST with the HDS before proceeding to the next step. The temperature should be above 68 °F (20 °C). If the temperature is below 68 °F (20 °C), drive the vehicle to warm up the rear differential until the fluid temperature becomes above 68 °F (20 °C).

15. Turn the ignition switch to LOCK (0).

16. Disconnect the left clutch electromagnetic coil 2P connector.

17. Measure the resistance between left clutch electromagnetic coil 2P connector terminals No. 1 and No. 2.

LEFT CLUTCH ELECTROMAGNETIC COIL 2P CONNECTOR



Terminal side of male terminals

Is there 0.45 Ω or less?

YES—Replace the rear differential side case (see page 15-120). ■

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■



DTC 56-3: Right Clutch Electromagnetic Coil Current Malfunction

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Do the direct electromagnetic clutch test (see page 15-93).
4. Check for DTCs with the HDS.

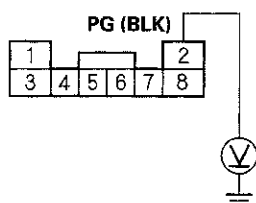
Is DTC 56-3 indicated?

YES—Go to step 5.

NO—Intermittent failure, the system is OK at this time. ■

5. Measure the voltage between SH-AWD control unit connector terminal B2 and body ground.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

Is there less than 0.5 V?

YES—Go to step 6.

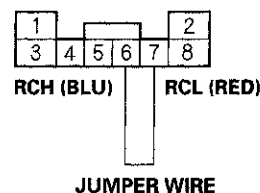
NO—Repair an open in the wire between SH-AWD control unit connector B and body ground or poor ground (G652). ■

6. Turn the ignition switch to LOCK (0).
7. Disconnect SH-AWD control unit connector B (8P).

8. Disconnect the right clutch electromagnetic coil 2P connector.

9. Connect SH-AWD control unit connector terminals B6 and B7 with a jumper wire.

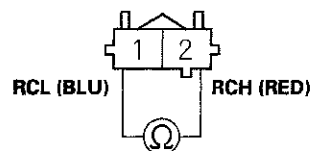
SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

10. Check for continuity between right electromagnetic coil 2P connector terminals No. 1 and No. 2.

RIGHT CLUTCH ELECTROMAGNETIC COIL 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 11.

NO—Repair an open in the wire between the SH-AWD control unit and the right clutch electromagnetic coil. ■

11. Remove the jumper wire from SH-AWD control unit connector terminals B6 and B7.

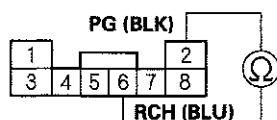
(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

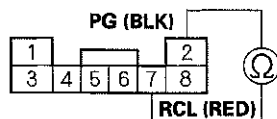
12. Check for continuity between SH-AWD control unit connector terminals B2 and B6, then check for continuity between SH-AWD control unit connector terminals B2 and B7.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

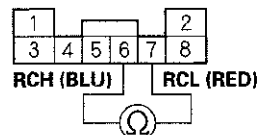
Is there continuity?

YES—Repair a short to ground or short to the ground wire between the SH-AWD control unit and the right clutch electromagnetic coil. ■

NO—Go to step 13.

13. Check for continuity between SH-AWD control unit connector terminals B6 and B7.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

Is there continuity?

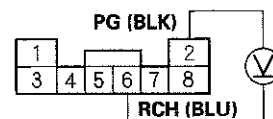
YES—Repair a short in the wires between the SH-AWD control unit and the right clutch electromagnetic coil. ■

NO—Go to step 14.

14. Turn the ignition switch to ON (II).

15. Measure the voltage between SH-AWD control unit connector terminals B2 and B6.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

Is there more than 0.5 V?

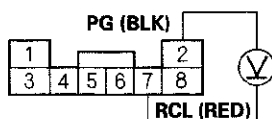
YES—Repair a short to power in the wire between SH-AWD control unit and the right clutch electromagnetic coil. ■

NO—Go to step 16.



16. Measure the voltage between SH-AWD control unit connector terminals B2 and B7.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

Is there more than 0.5 V?

YES—Repair a short to power in the wire between the SH-AWD control unit and the right clutch electromagnetic coil. ■

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 57-1, 57-3: Right Clutch Electromagnetic Coil (Open)

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Do the direct electromagnetic clutch test (see page 15-93).
4. Check for DTCs with the HDS.

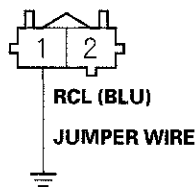
Is DTC 57-1 or 57-3 indicated?

YES—Go to step 5.

NO—Intermittent failure, the system is OK at this time. ■

5. Turn the ignition switch to LOCK (0).
6. Disconnect SH-AWD control unit connector B (8P).
7. Disconnect the right clutch electromagnetic coil 2P connector.
8. Connect right clutch electromagnetic coil 2P connector terminal No. 1 to body ground with a jumper wire.

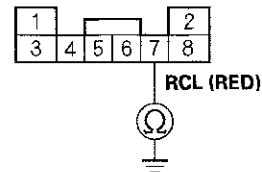
RIGHT CLUTCH ELECTROMAGNETIC COIL 2P CONNECTOR



Wire side of female terminals

9. Check for continuity between SH-AWD control unit connector terminal B7 and body ground.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

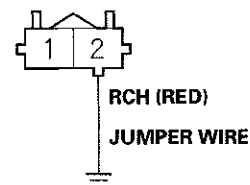
Is there continuity?

YES—Go to step 10.

NO—Repair an open in the wires between the SH-AWD control unit and the right clutch electromagnetic coil. ■

10. Remove the jumper wire from the right clutch electromagnetic coil 2P connector terminal No. 1.
11. Connect right clutch electromagnetic coil 2P connector terminal No. 2 to body ground with a jumper wire.

RIGHT CLUTCH ELECTROMAGNETIC COIL 2P CONNECTOR

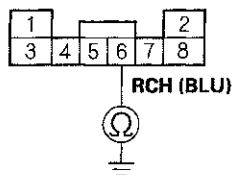


Wire side of female terminals



12. Check for continuity between SH-AWD control unit connector terminal B6 and body ground.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

Is there continuity?

YES—Go to step 13.

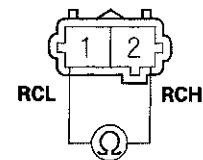
NO—Repair an open in the wire between the SH-AWD control unit and the right clutch electromagnetic coil. ■

13. Remove the jumper wire from right clutch electromagnetic coil 2P connector terminal No. 2.
14. Reconnect all connectors.
15. Turn the ignition switch to ON (II).
16. Check the REAR DIFFERENTIAL FLUID TEMPERATURE in the DATA LIST with the HDS before proceeding to the next step. The temperature should be above 68 °F (20 °C). If the temperature is below 68 °F (20 °C), drive the vehicle to warm up the rear differential until the fluid temperature becomes above 68 °F (20 °C).

17. Disconnect the right clutch electromagnetic coil 2P connector.

18. Measure the resistance between right clutch electromagnetic coil 2P connector terminals No. 1 and No. 2.

RIGHT CLUTCH ELECTROMAGNETIC COIL 2P CONNECTOR



Terminal side of male terminals

Is there 1.5 Ω or more?

YES—Replace the rear differential side case (see page 15-120). ■

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 57-2, 57-4: Right Clutch Electromagnetic Coil (Short)

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Do the direct electromagnetic clutch test (see page 15-93).
4. Check for DTCs with the HDS.

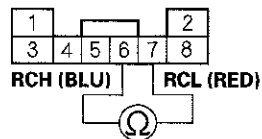
Is DTC 57-2 or 57-4 indicated?

YES—Go to step 5.

NO—Intermittent failure, the system is OK at this time. ■

5. Turn the ignition switch to LOCK (0).
6. Disconnect SH-AWD control unit connector B (8P).
7. Disconnect the right clutch electromagnetic coil 2P connector.
8. Check for continuity between SH-AWD control unit connector terminals B6 and B7.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

Is there continuity?

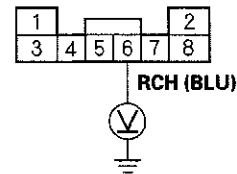
YES—Repair a short in the wires between SH-AWD control unit connector terminals B6 and B7. ■

NO—Go to step 9.

9. Turn the ignition switch to ON (II).

10. Measure the voltage between SH-AWD control unit connector terminal B6 and body ground.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

Is there more than 0.5 V?

YES—Repair a short to power in the wires between SH-AWD control unit connector terminal B6 and the right clutch electromagnetic coil. ■

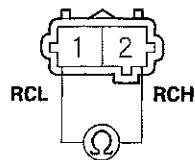
NO—Go to step 11.

11. Turn the ignition switch to LOCK (0).
12. Reconnect all connectors.
13. Turn the ignition switch to ON (II).



14. Check the REAR DIFFERENTIAL FLUID TEMPERATURE in the DATA LIST with the HDS before proceeding to the next step. The temperature should be above 68 °F (20 °C). If the temperature is below 68 °F (20 °C), drive the vehicle to warm up the rear differential until the fluid temperature becomes above 68 °F (20 °C).
15. Turn the ignition switch to LOCK (0).
16. Disconnect the right clutch electromagnetic coil 2P connector.
17. Measure the resistance between right clutch electromagnetic coil 2P connector terminals No. 1 and No. 2.

RIGHT CLUTCH ELECTROMAGNETIC COIL 2P CONNECTOR



Terminal side of male terminals

Is there 0.45 Ω or less?

YES—Replace the rear differential side case (see page 15-120). ■

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 59-1: SH-AWD Control Unit Power Supply Monitor Circuit

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs with the HDS.

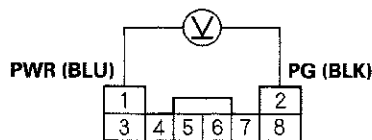
Is DTC 59-1 indicated?

YES—Go to step 5.

NO—Intermittent failure, the system is OK at this time. ■

5. Measure the voltage between SH-AWD control unit connector terminals B1 and B2.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

Is there 18 V or more?

YES—Check the charging system (see page 4-28). ■

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

DTC 61-1: Shift Solenoid Valve (Open)

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Do the SHIFT SOLENOID TEST with the HDS.
4. Check for DTCs with the HDS.

Is DTC 61-1 indicated?

YES—Go to step 5.

NO—Intermittent failure, the system is OK at this time. ■

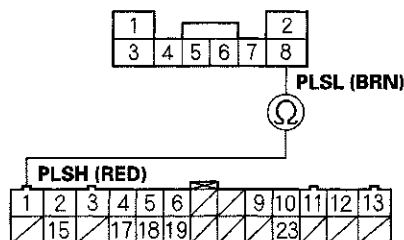
5. Turn the ignition switch to LOCK (0).
6. Disconnect SH-AWD control unit connectors A (26P) and B (8P).



7. Measure the resistance between SH-AWD control unit connector terminals A1 and B8.

SH-AWD CONTROL UNIT CONNECTOR B (8P)

Wire side of female terminals



SH-AWD CONTROL UNIT CONNECTOR A (26P)

Wire side of female terminals

Is there 20 Ω or more?

YES—Go to step 8.

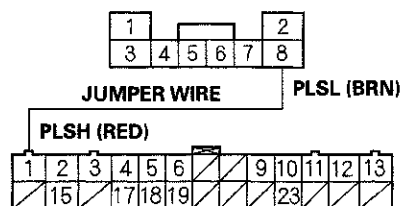
NO—Check for loose connection terminals between the SH-AWD control unit and the shift solenoid valve. If the connections are OK, substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

8. Disconnect the shift solenoid valve 2P connector.

9. Connect a jumper wire between SH-AWD control unit connector terminals A1 and B8.

SH-AWD CONTROL UNIT CONNECTOR B (8P)

Wire side of female terminals

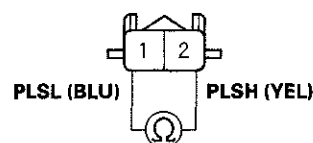


SH-AWD CONTROL UNIT CONNECTOR A (26P)

Wire side of female terminals

10. Check for continuity between shift solenoid valve 2P connector terminals No. 1 and No. 2.

SHIFT SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Replace the shift solenoid valve (see page 15-104). ■

NO—Repair an open in the wire between the SH-AWD control unit and the shift solenoid valve. ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 61-2: Shift Solenoid Valve (Short)

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Do the SHIFT SOLENOID TEST with the HDS.
4. Check for DTCs with the HDS.

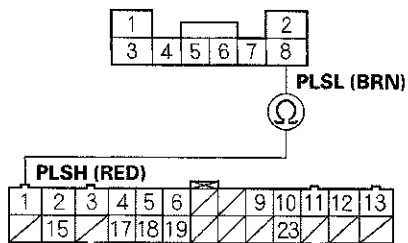
Is DTC 61-2 indicated?

YES—Go to step 5.

NO—Intermittent failure, the system is OK at this time. ■

5. Turn the ignition switch to LOCK (0).
6. Disconnect SH-AWD control unit connectors A (26P) and B (8P).
7. Measure the resistance between SH-AWD control unit connector terminals A1 and B8.

SH-AWD CONTROL UNIT CONNECTOR B (8P)
Wire side of female terminals



SH-AWD CONTROL UNIT CONNECTOR A (26P)
Wire side of female terminals

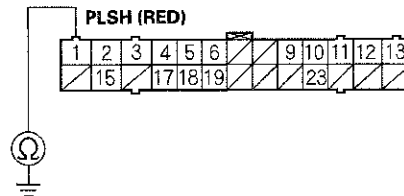
Is there 10 Ω or more?

YES—Go to step 10.

NO—Go to step 8.

8. Disconnect the shift solenoid valve 2P connector.
9. Check for continuity between SH-AWD control unit connector terminal A1 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

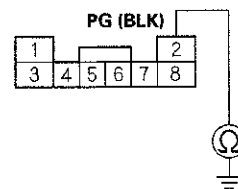
Is there continuity?

YES—Repair a short to ground in the wire between the SH-AWD control unit and the shift solenoid valve. ■

NO—Replace the shift solenoid valve (see page 15-104). ■

10. Check for continuity between SH-AWD control unit connector terminal B2 and body ground.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

Is there continuity?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Repair an open in the wire between SH-AWD control unit and body ground (see page 15-104). ■



DTC 74-1: One Way Clutch Malfunction

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Check for DTCs with the HDS.

Are DTC 27-1 and 27-2 indicated at the same time?

YES—Go to the DTC 27-1 and/or 27-2 troubleshooting first, then recheck. ■

NO—Go to step 3.

3. Check for DTCs in the VSA system with the HDS.

Are any VSA system DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Replace the rear differential center case (see page 15-119). ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 75-1: Acceleration Device Malfunction (Stuck OFF)

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Check for DTCs with the HDS.

Are DTC 27-1 and 27-2 indicated at the same time?

YES—Go to the DTC 27-1 and/or 27-2 troubleshooting first, then recheck. ■

NO—Go to step 3.

3. Check for DTCs in the VSA system with the HDS.

Are any VSA system DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Go to step 4.

4. Clear the DTC with the HDS.
5. Start the engine.
6. Do the acceleration device test (see page 15-95).
7. Check for DTCs with the HDS.

Is DTC 75-1 indicated?

YES—Go to step 8.

NO—Intermittent failure, the system is OK at this time. ■

8. Check the ACCELERATION RATIO in the DATA LIST with the HDS.

Is the acceleration ratio between 0.94 and 0.98?

YES—Go to step 9.

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

9. Check the rear differential fluid level (see page 15-96).

Is the fluid level OK?

YES—Go to step 10.

NO—Adjust the fluid to the proper level (see page 15-96). ■

10. Check the rear differential fluid pressure.

Is there pressure when it is accelerating?

YES—Replace the rear differential center case (see page 15-119). ■

NO—Replace the shift solenoid valve (see page 15-104). ■



DTC 75-2: Acceleration Device Malfunction (Stuck ON)

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Check for DTCs with the HDS.

Are DTC 27-1 and 27-2 indicated at the same time?

YES—Go to the DTC 27-1 and/or 27-2 troubleshooting first, then recheck. ■

NO—Go to step 3.

3. Check for DTCs in the VSA system with the HDS.

Are any VSA system DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Go to step 4.

4. Clear the DTC with the HDS.
5. Start the engine.
6. Do the acceleration device test (see page 15-95).
7. Check for DTCs with the HDS.

Is DTC 75-2 indicated?

YES—Go to step 8.

NO—Intermittent failure, the system is OK at this time. ■

8. Check the ACCELERATION RATIO in the DATA LIST with the HDS.

Is the acceleration ratio between 1.02 and 1.06?

YES—Go to step 9.

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

9. Check the rear differential fluid pressure.

Is there pressure when it is accelerating?

YES—Replace the rear differential center case (see page 15-119). ■

NO—Replace the shift solenoid valve (see page 15-104). ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 76-1: Rear Differential Fluid Overheats

NOTE:

- When the temperature of the rear differential fluid is abnormally high, the SH-AWD indicator comes on. This is not necessarily a problem, but DTC 76-1 will be stored.
- Check the rear differential fluid level (see page 15-96). If it's low, refill it, clear the DTC, and recheck.
- Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).

2. Clear the DTC with the HDS.

3. Start the engine.

4. Test-drive under these conditions:

- Vehicle speed at 25 mph (40 km/h) or more
- Engine speed less than 2,500 rpm for at least 30 seconds.

5. Check for DTCs with the HDS.

Is DTC 76-1 indicated?

YES—Go to step 6.

NO—Intermittent failure, the system is OK at this time. ■

6. Check for DTCs with the HDS.

Are DTC 27-1 and 27-2 indicated at the same time?

YES—Go to the DTC 27-1 and/or 27-2 troubleshooting first, then recheck. ■

NO—Go to step 7.

7. Check for DTCs in the VSA system with the HDS.

Are any VSA system DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Go to step 8.

8. Check for rear brake drag.

Do the rear brakes drag?

YES—Fix the rear brakes (see page 19-3). ■

NO—Go to step 9.

9. Raise the vehicle on a lift, make sure it is securely supported, and allow all four wheels to rotate freely.

10. Start the engine and turn the VSA off (the VSA OFF lamp in the gauge control module turn on). Run the engine in D until the vehicle speed reaches 19 mph (30 km/h) and maintain the speed for 1 minute, then slow down and stop the wheels.

11. Check the HYPOID GEAR SPEED SENSOR VALUE in the DATA LIST with the HDS.

Is the hypoid gear speed sensor value shown?

YES—Check the hypoid gear speed sensor installation. If it is installed properly, replace the rear differential center case (see page 15-119). ■

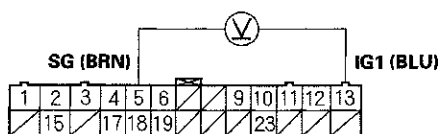
NO—Go to step 12.

12. Turn the ignition switch to LOCK (0), then turn the ignition switch to ON (II).



13. Measure the voltage between SH-AWD control unit connector terminals A5 and A13.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

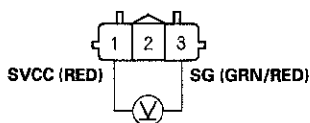
Does the voltage change when the propeller shaft is rotated?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Go to step 14.

14. Turn the ignition switch to LOCK (0).
15. Disconnect the hypoid gear speed sensor 3P connector.
16. Turn the ignition switch to ON (II).
17. Measure the voltage between hypoid gear speed sensor 3P connector terminals No. 1 and No. 3.

HYPOID GEAR SPEED SENSOR 3P CONNECTOR



Wire side of female terminals

Is there 4.0 V or more?

YES—Go to step 18.

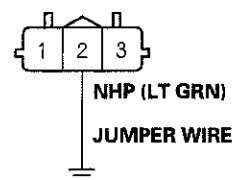
NO—Go to step 22.

18. Turn the ignition switch to LOCK (0).

19. Disconnect SH-AWD control unit connector A (26P).

20. Connect hypoid gear speed sensor 3P connector terminal No. 2 to body ground with a jumper wire.

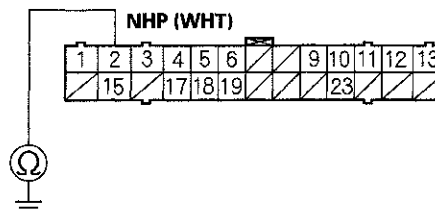
HYPOID GEAR SPEED SENSOR 3P CONNECTOR



Wire side of female terminals

21. Check for continuity between SH-AWD control unit connector terminal A2 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there continuity?

YES—Replace the hypoid gear speed sensor (see page 15-98). ■

NO—Repair an open in the wire between SH-AWD control unit and the hypoid gear speed sensor. ■

22. Turn the ignition switch to LOCK (0).
23. Disconnect SH-AWD control unit connector A (26P).

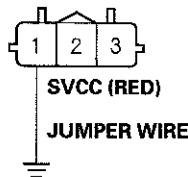
(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

24. Connect hypoid gear speed sensor 3P connector terminal No. 1 to body ground with a jumper wire.

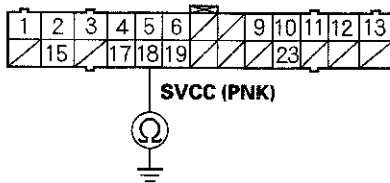
HYPOID GEAR SPEED SENSOR 3P CONNECTOR



Wire side of female terminals

25. Check for continuity between SH-AWD control unit connector terminal A18 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there continuity?

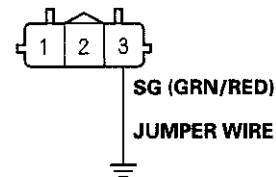
YES—Go to step 26.

NO—Repair an open in the wire between SH-AWD control unit and the hypoid gear speed sensor. ■

26. Remove the jumper wire from hypoid gear speed sensor 3P connector terminal No. 1.

27. Connect hypoid gear speed sensor 3P connector terminal No. 3 to body ground with a jumper wire.

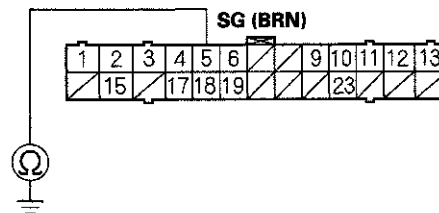
HYPOID GEAR SPEED SENSOR 3P CONNECTOR



Wire side of female terminals

28. Check for continuity between SH-AWD control unit connector terminal A5 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there continuity?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Repair an open in the wire between SH-AWD control unit and the hypoid gear speed sensor. ■



DTC 77-1: The Functional Abnormalities of Fuel Emission or Automatic Transmission

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs with the HDS.

Is DTC 77-1 indicated?

YES—Go to step 5.

NO—Intermittent failure, the system is OK at this time. ■

5. Check for DTCs in the Fuel Emission or Automatic Transmission system with the HDS.

Are any Fuel Emission or Automatic Transmission system DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

DTC 77-2: The Functional Abnormalities of VSA Modulator-Control Unit

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs with the HDS.

Is DTC 77-2 indicated?

YES—Go to step 5.

NO—Intermittent failure, the system is OK at this time. ■

5. Check for DTCs in the VSA system with the HDS.

Are any VSA system DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 77-3: The Functional Abnormalities of Gauge Control Module

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs with the HDS.

Is DTC 77-3 indicated?

YES—Go to step 5.

NO—Intermittent failure, the system is OK at this time. ■

5. Check for DTCs in the Body Electrical with the HDS.

Are any gauge control module DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

DTC 77-6: Steering Angle Sensor Malfunction

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs with the HDS.

Is DTC 77-6 indicated?

YES—Go to step 5.

NO—Intermittent failure, the system is OK at this time. ■

5. Check for DTCs in the VSA system with the HDS.

Are any steering angle sensor DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■



DTC 78-xx (78-3 to 78-23): SH-AWD Control Unit Self-Diagnostic Malfunction

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0).
4. Turn the ignition switch to ON (II).
5. Check for DTCs with the HDS.

Is DTC 78-xx indicated?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Intermittent failure, the system is OK at this time. ■

DTC 81-1: Left Search Coil Sensor Malfunction

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Do the SH-AWD differential clutch torque memorization (see page 15-7).
4. Test-drive the vehicle at a speed of more than 1 mph (2 km/h) for at least 1 second.
5. Check for DTCs with the HDS.

Is DTC 81-1 indicated?

YES—Replace the rear differential side case (see page 15-120). ■

NO—Intermittent failure, the system is OK at this time. ■

Rear Differential

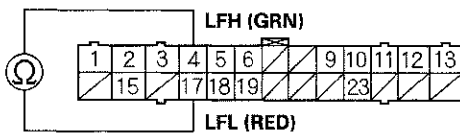
DTC Troubleshooting (cont'd)

DTC 81-2: Left Search Coil Sensor (Open or Short)

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Turn the ignition switch to LOCK (0).
3. Disconnect SH-AWD control unit connector A (26P).
4. Check for continuity between SH-AWD control unit connector terminals A4 and A17.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

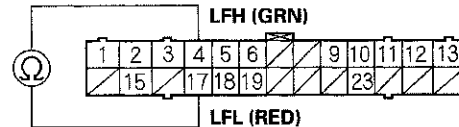
Is there continuity?

YES—Go to step 5.

NO—Go to step 7.

5. Measure the resistance between SH-AWD control unit connector terminals A4 and A17.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

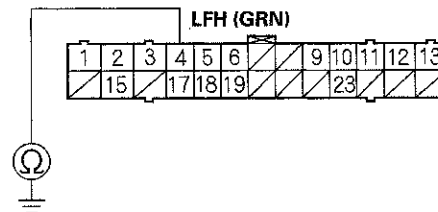
Is there 2.0 Ω or more?

YES—Go to step 6.

NO—Go to step 10.

6. Check for continuity between SH-AWD control unit connector terminal A4 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there continuity?

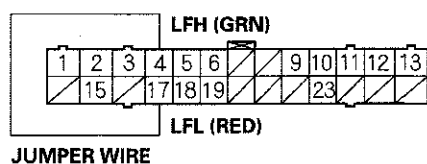
YES—Repair a short in the wire between SH-AWD control unit and body ground. ■

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■



7. Disconnect the left search coil 2P connector.
8. Connect a jumper wire between SH-AWD control unit connector terminals A4 and A17.

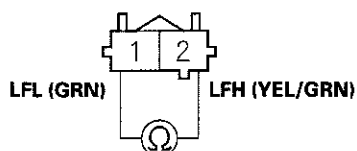
SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

9. Check for continuity between left search coil 2P connector terminals No. 1 and No. 2.

LEFT SEARCH COIL 2P CONNECTOR



Wire side of female terminals

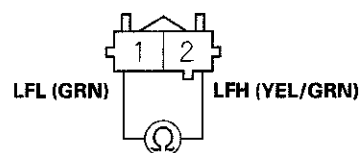
Is there continuity?

YES—Replace the rear differential side case (see page 15-120). ■

NO—Repair an open in the wire between the left search coil and the SH-AWD control unit. ■

10. Disconnect the left search coil 2P connector.
11. Check for continuity between left search coil 2P connector terminals No. 1 and No. 2.

LEFT SEARCH COIL 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair a short in the wire between the SH-AWD control unit and the left search coil. ■

NO—Replace the rear differential side case (see page 15-120). ■

Rear Differential

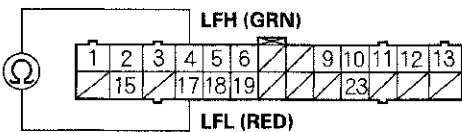
DTC Troubleshooting (cont'd)

DTC 81-3: Left Search Coil Magnetic Flux Characteristic

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

- 1. Turn the ignition switch to ON (II).
- 2. Turn the ignition switch to LOCK (0).
- 3. Disconnect SH-AWD control unit connector A (26P).
- 4. Measure the resistance between SH-AWD control unit connector terminals A4 and A17.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there 2.0 Ω or less?

YES—Replace the rear differential side case (see page 15-120). ■

NO—Go to step 5.

- 5. Clear the DTC with the HDS.
- 6. Do the SH-AWD differential clutch torque memorization (see page 15-7).
- 7. Test-drive the vehicle at a speed of more than 1 mph (2 km/h) for at least 1 second.

- 8. Check for DTCs with the HDS.

Is DTC 81-1, 81-2, 82-1, and/or 82-2 indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Intermittent failure, the system is OK at this time. ■



DTC 82-1: Right Search Coil Sensor Malfunction

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Clear the DTC with the HDS.
3. Do the SH-AWD differential clutch torque memorization (see page 15-7).
4. Test-drive the vehicle at a speed of more than 1 mph (2 km/h) for at least 1 second.
5. Check for DTCs with the HDS.

Is DTC 82-1 indicated?

YES—Replace the rear differential side case (see page 15-120). ■

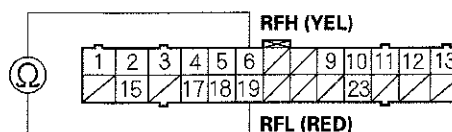
NO—Intermittent failure, the system is OK at this time. ■

DTC 82-2: Right Search Coil Sensor (Open or Short)

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Turn the ignition switch to LOCK (0).
3. Disconnect SH-AWD control unit connector A (26P).
4. Check for continuity between SH-AWD control unit connector terminals A6 and A19.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there continuity?

YES—Go to step 5.

NO—Go to step 7.

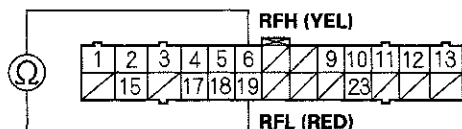
(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

5. Measure the resistance between SH-AWD control unit connector terminals A6 and A19.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

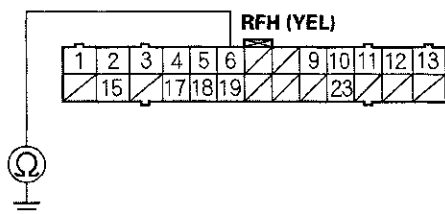
Is there 2.0 Ω or more?

YES—Go to step 6.

NO—Go to step 10.

6. Check for continuity between SH-AWD control unit connector terminal A6 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there continuity?

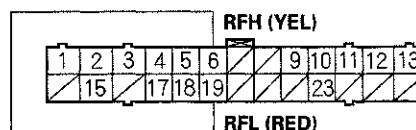
YES—Repair a short in the wire between SH-AWD control unit and body ground. ■

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

7. Disconnect the right search coil 2P connector.

8. Connect a jumper wire between SH-AWD control unit connector terminals A6 and A19.

SH-AWD CONTROL UNIT CONNECTOR A (26P)

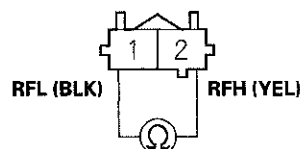


JUMPER WIRE

Wire side of female terminals

9. Check for continuity between right search coil 2P connector terminals No. 1 and No. 2.

RIGHT SEARCH COIL 2P CONNECTOR



Wire side of female terminals

Is there continuity?

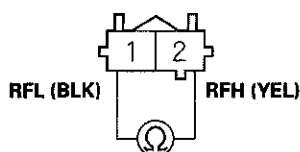
YES—Replace the rear differential side case (see page 15-120). ■

NO—Repair an open in the wire between the right search coil and the SH-AWD control unit. ■



10. Disconnect the right search coil 2P connector.
11. Check for continuity between right search coil 2P connector terminals No. 1 and No. 2.

RIGHT SEARCH COIL 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair a short to ground in the wire between SH-AWD control unit and the right search coil. ■

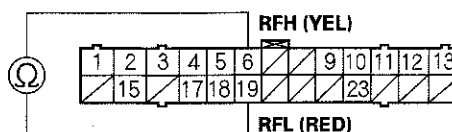
NO—Replace the rear differential side case (see page 15-120). ■

DTC 82-3: Right Search Coil Sensor Magnetic Flux Characteristic

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Turn the ignition switch to LOCK (0).
3. Disconnect SH-AWD control unit connector A (26P).
4. Measure the resistance between SH-AWD control unit connector terminals A6 and A19.

SH-AWD CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there 2.0 Ω or less?

YES—Replace the rear differential side case (see page 15-120). ■

NO—Go to step 5.

5. Clear the DTC with the HDS.
6. Do the SH-AWD differential clutch torque memorization (see page 15-7).
7. Test-drive the vehicle at a speed of more than 1 mph (2 km/h) for at least 1 second.
8. Check for DTCs with the HDS.

Is DTC 81-1, 81-2, 82-1, and/or 82-2 indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Intermittent failure, the system is OK at this time. ■

Rear Differential

Symptom Troubleshooting

The SH-AWD indicator does not go off, and no DTCs are stored

NOTE:

- Before you troubleshoot, review the general troubleshooting information (see page 15-4).
- Make sure the No. 1 (30 A) fuse in the passenger's under-hood fuse/relay box is OK.
- Make sure there are no loose connector terminals at the SH-AWD control unit.
- Make sure the charging system is OK.
- Make sure the PGM-FI system and the A/T system is not in the middle of updating.

1. Test the battery (see page 22-90). Charge or replace the battery if necessary.
2. Turn the ignition switch to ON (II).
3. Check the COMPLETE MEMORIZATION in the DATA LIST with the HDS.

Does the data list show "complete"?

YES—Go to step 4.

NO—Do the SH-AWD system memorization procedures for each of the following, then go to step 4.

- SH-AWD differential clutch torque (see page 15-7)
- Steering angle sensor neutral position (see page 19-104)
- Yaw rate-lateral/longitudinal acceleration sensor neutral position (see page 15-7)
- SH-AWD control unit initialization (see page 15-8)

4. Check for DTCs in the VSA system with the HDS.

Are any steering angle sensor DTCs indicated?

YES—Go to the indicated DTC's troubleshooting. ■

NO—Go to step 5.

5. Start the engine.

6. Check the SH-AWD indicator value with the HDS.

Is the SH-AWD indicator value OFF?

YES—Go to the gauge control module self-diagnostic function (see page 22-396).

NO—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■



The SH-AWD indicator does not come on

NOTE: Before you troubleshoot, review the general troubleshooting information (see page 15-4).

1. Turn the ignition switch to ON (II).
2. Check the SH-AWD indicator.

Does the SH-AWD indicator come on and go off?

YES—Intermittent failure, the system is OK at this time. ■

NO—Go to step 3.

3. Turn the ignition switch to LOCK (0).
4. Disconnect SH-AWD control unit connector A (26P) and connector B (8P).
5. Turn the ignition switch to ON (II).
6. Check the SH-AWD indicator.

Does the SH-AWD indicator come on?

YES—Substitute a known-good SH-AWD control unit (see page 15-99) and recheck. If the symptom/indication goes away with the known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-99). ■

NO—Go to the gauge control module self-diagnostic function (see page 22-396). ■

SH-AWD Function Test

Special Tools Required

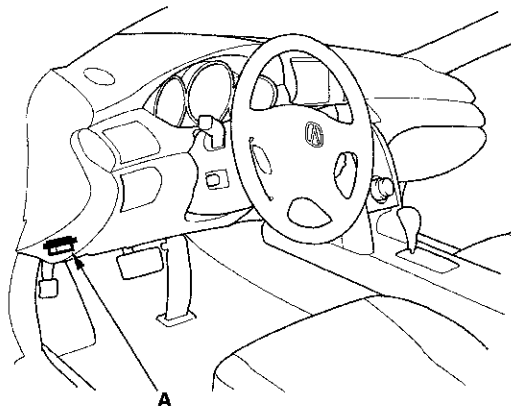
Adapter, torque wrench 070AJ-SJAA101
Oil Pressure Hose 07MAJ-PY4011A
Oil Pressure Hose Adapter 07MAJ-PY40120
Oil Pressure Gauge 07406-0070100

Direct Electromagnetic Clutch Test

NOTE:

- No DTC was detected.
- The shift lever is in N.
- The SH-AWD control unit had been initialized.
- The tire pressures are at the specified value.
- Tire size and wear are the same between the left and right tires.

1. With the ignition switch in LOCK (0), connect the HDS to the DLC (A) located under the driver's side of the dashboard.



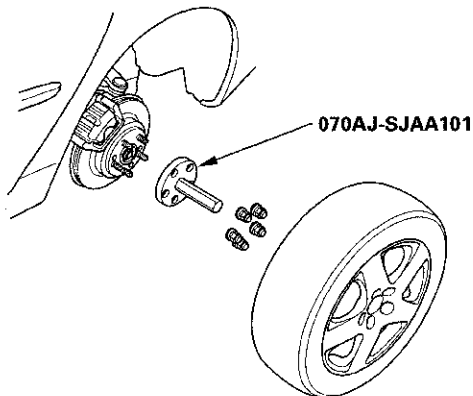
2. Turn the ignition switch to ON (II).
3. Make sure the HDS communicates with the vehicle and the SH-AWD control unit. If it does not, go to the DLC circuit troubleshooting (see page 11-211).

(cont'd)

Rear Differential

SH-AWD Function Test (cont'd)

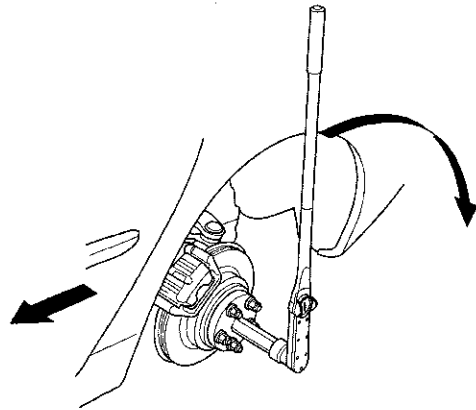
4. Check that the differential fluid temperature is above 68 °F (20 °C) with the HDS. If it is below 68 °F (20 °C), raise the temperature by driving the vehicle in circles or by constantly turning.
5. Raise the vehicle on a lift, and make sure it is securely supported.
6. Remove the rear wheels.
7. Install the torque wrench adapter on the rear wheel hub.



8. Do the DIRECT ELECTROMAGNETIC CLUTCH TEST with the HDS.

9. Install a torque wrench on the torque wrench adapter as shown. Write down the torque value with the HDS while slowly rotating the rear hub with the torque wrench as shown (Turn the hub no more than 90 degrees in 7 to 10 seconds.).

NOTE: Use a torque wrench capable of measuring up to 490 N·m (50 kgf·m, 360 lbf·ft) such as a commercially available Snap-on torque wrench TE352FUE.



10. Enter the torque value into the HDS, and wait for the test to finish.

- If the result shows the clutch driving force is normal, the clutch assembly is OK.
- If the result shows the clutch driving force is abnormal, replace the differential fluid (see page 15-96), and retest. If the result still shows the clutch driving force is abnormal, replace the rear differential side case (see page 15-120).

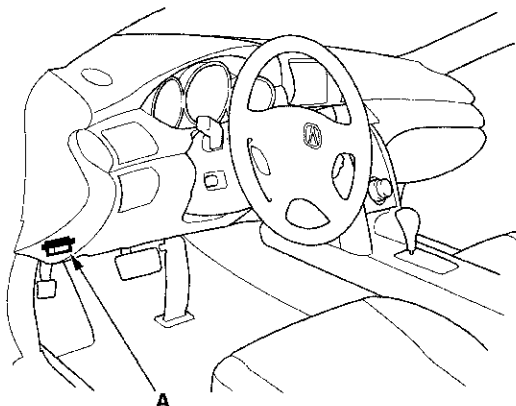


Acceleration Device Test

NOTE:

- No DTC is detected.
- The SH-AWD control unit has been initialized.
- The shift lever is in P.

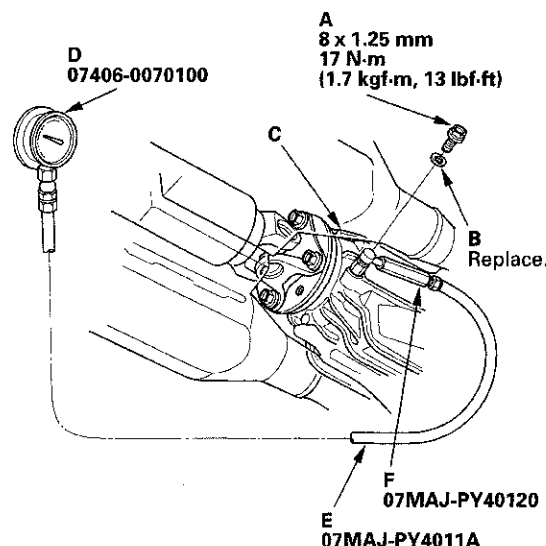
1. With the ignition switch in LOCK (0), connect the HDS to the DLC (A) located under the driver's side of the dashboard.



2. Turn the ignition switch to ON (II).
3. Make sure the HDS communicates with the vehicle and the SH-AWD control unit. If it does not, go to the DLC circuit troubleshooting (see page 11-211).
4. Raise the vehicle on a lift, and make sure it is securely supported.
5. Do the ACCELERATION DEVICE TEST with the HDS.
6. Look at the results displayed on the HDS.
 - If the acceleration ratio is lower than the normal value when decelerating is displayed, replace the rear differential center case (see page 15-119).
 - If the acceleration ratio is higher than the normal value when decelerating is displayed, go to step 7.
 - If the acceleration ratio is lower than the normal value when accelerating is displayed, go to step 12.
 - If the acceleration ratio is higher than the normal value when accelerating is displayed, replace the SH-AWD control unit (see page 15-99).

7. Remove the 8 mm bolt (A) and the sealing washer (B) from the differential (C) as shown.

NOTE: Install the parts in the reverse order of removal with a new sealing washer.



8. Connect the oil pressure gauge (D), the oil pressure hose (E) and the oil pressure hose adapter (F), then install the assembly into the differential. Route the hose under the vehicle toward the front door.
9. Do the ACCELERATION DEVICE TEST with the HDS. When you get to the "Keep the speed constant between 22 mph (41 km/h) and 28 mph (52 km/h)" screen in the test, write down the pressure indicated on the pressure gauge. Complete the test.
 - If the hydraulic pressure was above 780kpa (8.0 kgf/cm², 113 psi), go to step 10.
 - If the hydraulic pressure was below 780kpa (8.0 kgf/cm², 113 psi), replace the rear differential center case (see page 15-119).
10. Replace the shift solenoid valve (see page 15-104).
11. Do the ACCELERATION DEVICE TEST with the HDS.
 - If Normal is displayed, the problem has been fixed.
 - If the acceleration ratio is higher than the normal value when accelerating is displayed, replace the rear differential assembly.

(cont'd)

Rear Differential

SH-AWD Function Test (cont'd)

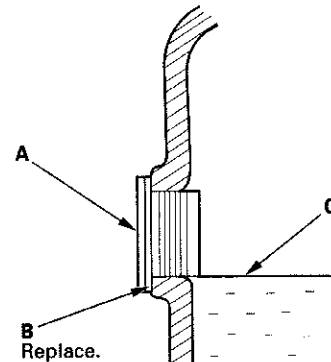
12. Check the differential fluid level (see page 15-96). If the fluid level was low, add fluid as needed, then go to step 14. If the fluid level was OK, go to step 13.
13. Do the ACCELERATION DEVICE TEST with the HDS. After the SHIFT SOLENOID TEST (a portion of the acceleration device test) is complete, continue the acceleration device test. When you get to the "Keep the speed constant between 22 mph (41 km/h) and 28 mph (52 km/h)" screen, write down the pressure indicated on the pressure gauge. Complete the test.
 - If the hydraulic pressure was less than 780 kpa (8.0 kgf/cm², 113 psi), go to step 14.
 - If the hydraulic pressure was above 780 kpa (8.0 kgf/cm², 113 psi), replace the rear differential assembly.
14. Do the ACCELERATION DEVICE TEST with the HDS.
15. Look at the results displayed on the HDS.
 - If Normal is displayed, the problem has been fixed.
 - If "Acceleration device is abnormal" is displayed, go to step 16.
16. Replace the shift solenoid valve (see page 15-104), then do the ACCELERATION DEVICE TEST with the HDS.
 - If Normal is displayed, the problem has been fixed.
 - If "Acceleration device is abnormal" is displayed, replace the rear differential center case (see page 15-119).

Rear Differential Fluid Inspection and Replacement

Inspection

Clutch and Hypoid Chambers

1. Park the vehicle on level ground, and turn the ignition switch to LOCK (0).
2. Use solvent and a brush to wash any oil and dirt off the differential fluid inspection fluid filler plugs, and dry them with compressed air.
3. Remove each filler plug (A) and the sealing washer (B), then check the condition of the fluid, and make sure the fluid is at the proper level (C).



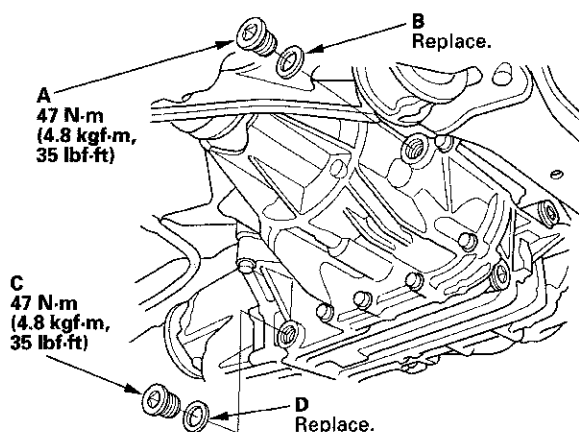
4. If the level is below the proper level, check for fluid leaks at the differential. If a problem is found, fix it before filling the differential with fluid.
5. The fluid level must reach up the bottom of the filler plug hole. If necessary, add the recommended fluid until it runs out, then reinstall the filler plug with a new sealing washer.



Replacement

Clutch Chamber

1. Park the vehicle on level ground, and turn the ignition switch to LOCK (0).
2. Remove the filler plug (A) and the sealing washer (B).



3. Remove the drain plug (C) and the sealing washer (D), and drain the fluid.
4. Reinstall the drain plug with a new sealing washer.
5. Refill the recommended fluid until it reaches the bottom of the filler plug hole.

Fluid Capacity

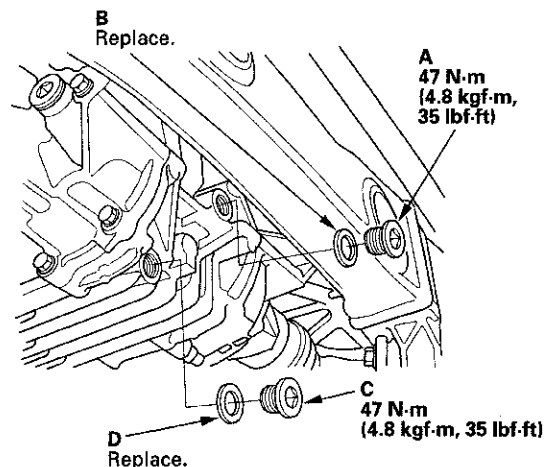
2.66 L (2.81 US qt) at fluid change
3.11 L (3.29 US qt) at overhaul

Recommended fluid: Acura ATF-Z1

6. Reinstall the filler plug with a new sealing washer.

Hypoid Chamber

7. Park the vehicle on level ground, and turn the ignition switch to LOCK (0).
8. Remove the filler plug (A) and the sealing washer (B).



9. Remove the drain plug (C) and the sealing washer (D), and drain the fluid.
10. Reinstall the drain plug with a new sealing washer.
11. Refill the recommended fluid until it reaches the bottom of the filler plug hole.

Fluid Capacity

0.73 L (0.77 US qt) at fluid change
0.75 L (0.79 US qt) at overhaul

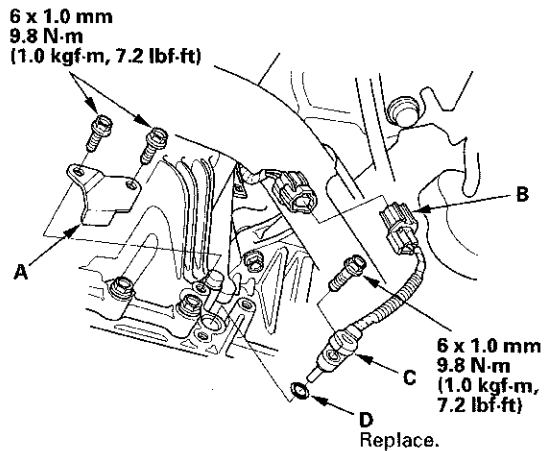
Recommended fluid: Acura ATF-Z1

12. Reinstall the filler plug with a new sealing washer.

Rear Differential

Rear Differential Fluid Temperature Sensor Replacement

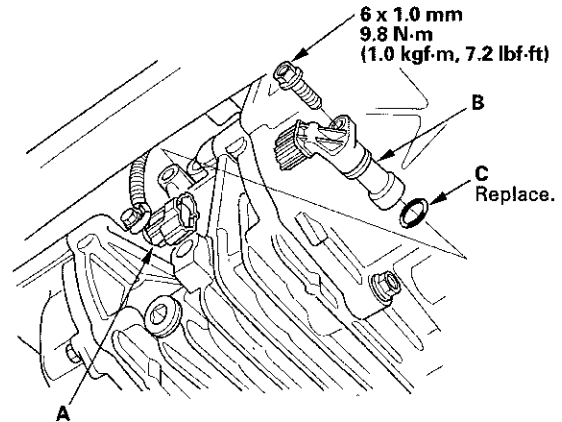
1. Drain the differential fluid (see page 15-96).
2. Remove the rear differential fluid temperature sensor cover (A), then disconnect the rear differential fluid temperature sensor 2P connector (B).



3. Remove the rear differential fluid temperature sensor (C).
4. Install the rear differential fluid temperature sensor with a new O-ring (D) in the reverse order of removal.
5. Refill the differential fluid (see page 15-96).

Hypoid Gear Speed Sensor Replacement

1. Disconnect the hypoid gear speed sensor 3P connector (A).



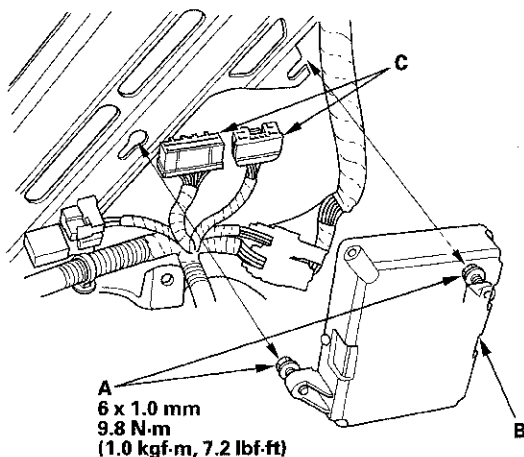
2. Remove the hypoid gear speed sensor (B).
3. Install the hypoid gear speed sensor with a new O-ring (C) in the reverse order of removal.



SH-AWD Control Unit Replacement

NOTE: The SH-AWD control unit must be initialized (see page 15-7) after replacement, otherwise the SH-AWD system will not function.

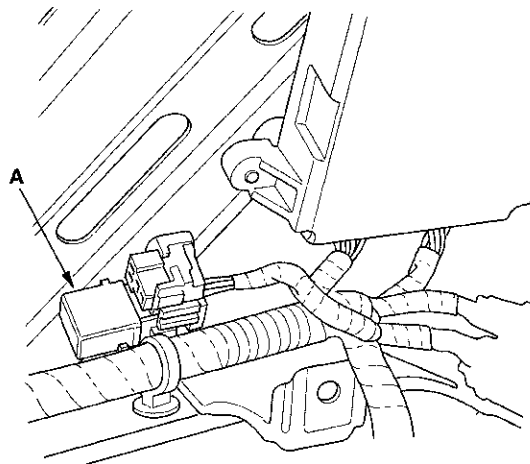
1. Remove the rear seat (see page 20-140).
2. Remove the trunk front trim panel (see page 20-83).
3. Loosen the SH-AWD control unit mounting bolts (A), then remove the SH-AWD control unit (B).



4. Disconnect the SH-AWD control unit connectors (C).
5. Install the SH-AWD control unit in the reverse order of removal.

SH-AWD Relay Replacement

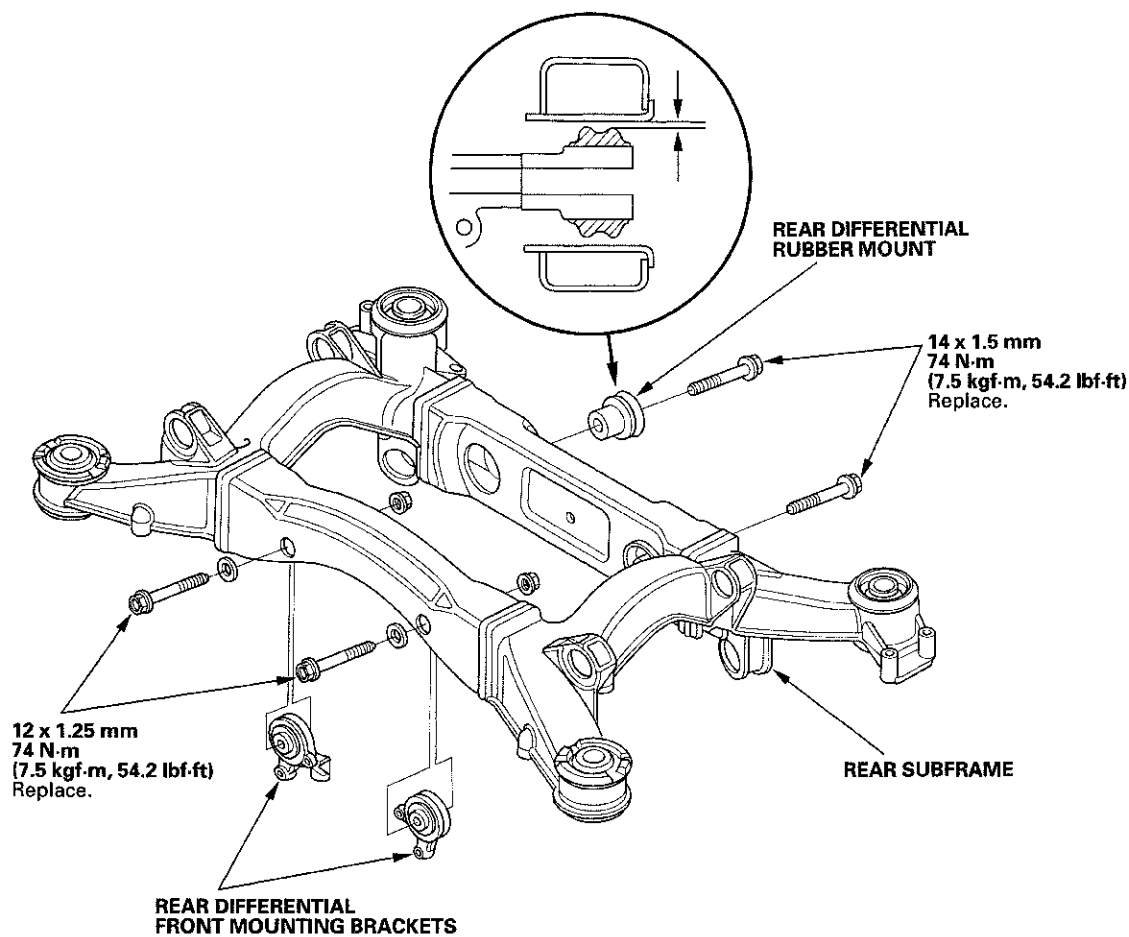
1. Remove the rear seat (see page 20-140).
2. Remove the trunk front trim panel (see page 20-83).
3. Remove the SH-AWD relay (A).



4. Install the SH-AWD relay in the reverse order of removal.

Rear Differential

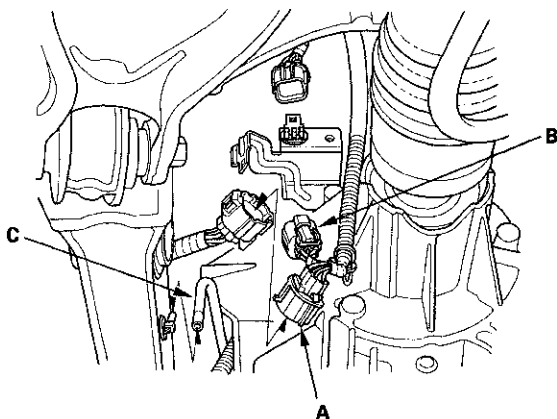
Rear Differential Mount Replacement



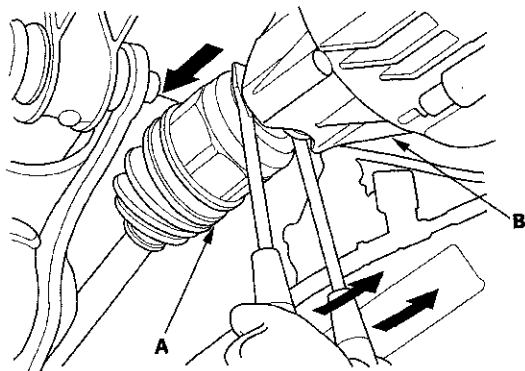


Rear Differential Removal

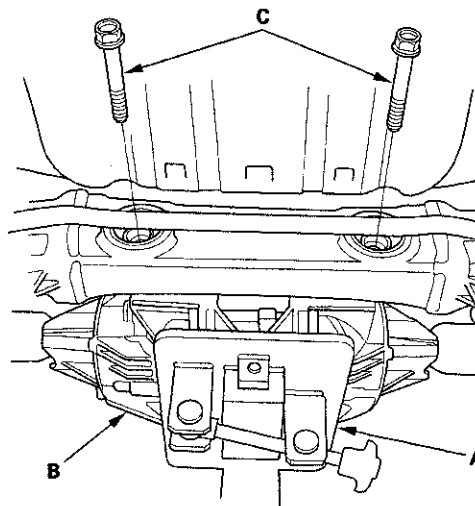
1. Raise the vehicle on a lift.
2. Drain the rear differential fluid (see page 15-96).
3. Remove the propeller shaft (see page 16-44).
4. Disconnect the rear differential harness connectors (A) and (B).



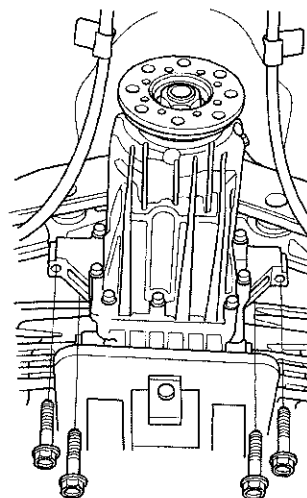
5. Disconnect the breather hose (C).
6. Disconnect the inboard joints (A) from the rear differential (B) using a pair of screwdrivers.



7. Place the transmission jack (A) under the rear differential (B).



8. Remove the rear differential rear mounting bolts (C).
9. Remove the rear differential front mounting bolts.

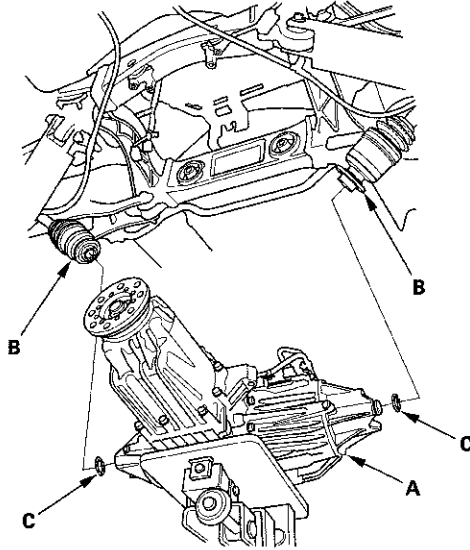


(cont'd)

Rear Differential

Rear Differential Removal (cont'd)

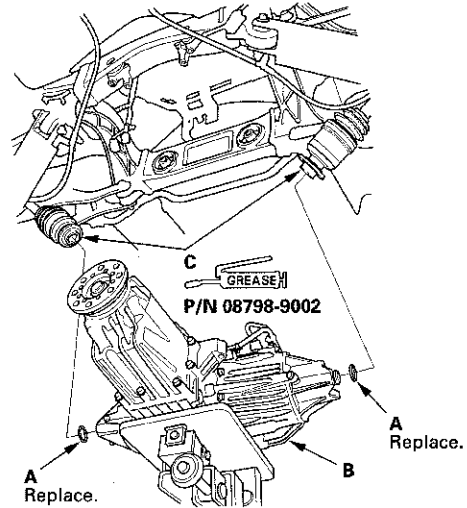
10. As you lower the rear differential (A) with the transmission jack, remove the rear driveshaft inboard joints (B) from the rear differential.



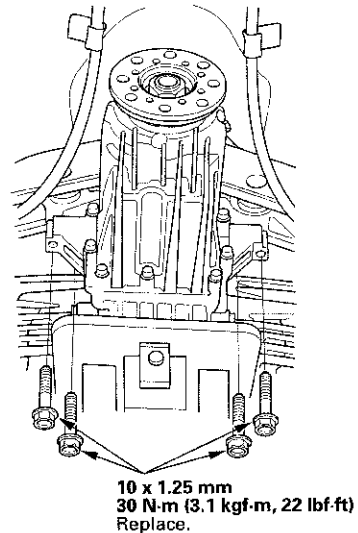
11. Remove the set rings (C) from the rear differential.

Rear Differential Installation

1. Place the rear differential on a transmission jack.
2. Install new set rings (A) into the groove of the rear differential (B).

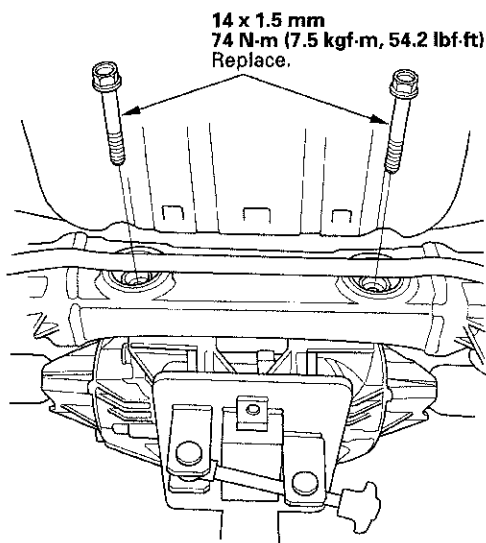


3. Apply appropriate grease to the splines of the rear driveshaft inboard joints (C) (see step 1 on page 16-41).
4. Raise the rear differential to the mounting level, then install the rear driveshaft inboard joints.
5. Install new rear differential front mounting bolts.

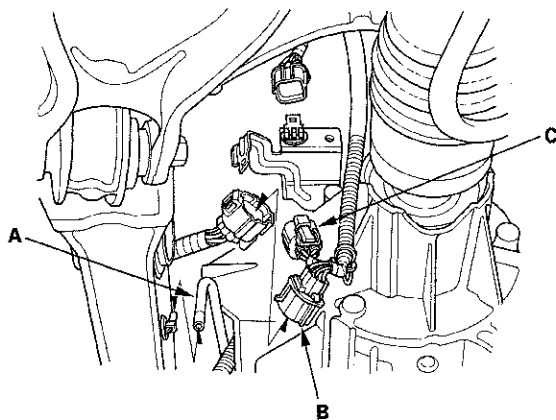




6. Install new rear differential rear mounting bolts.



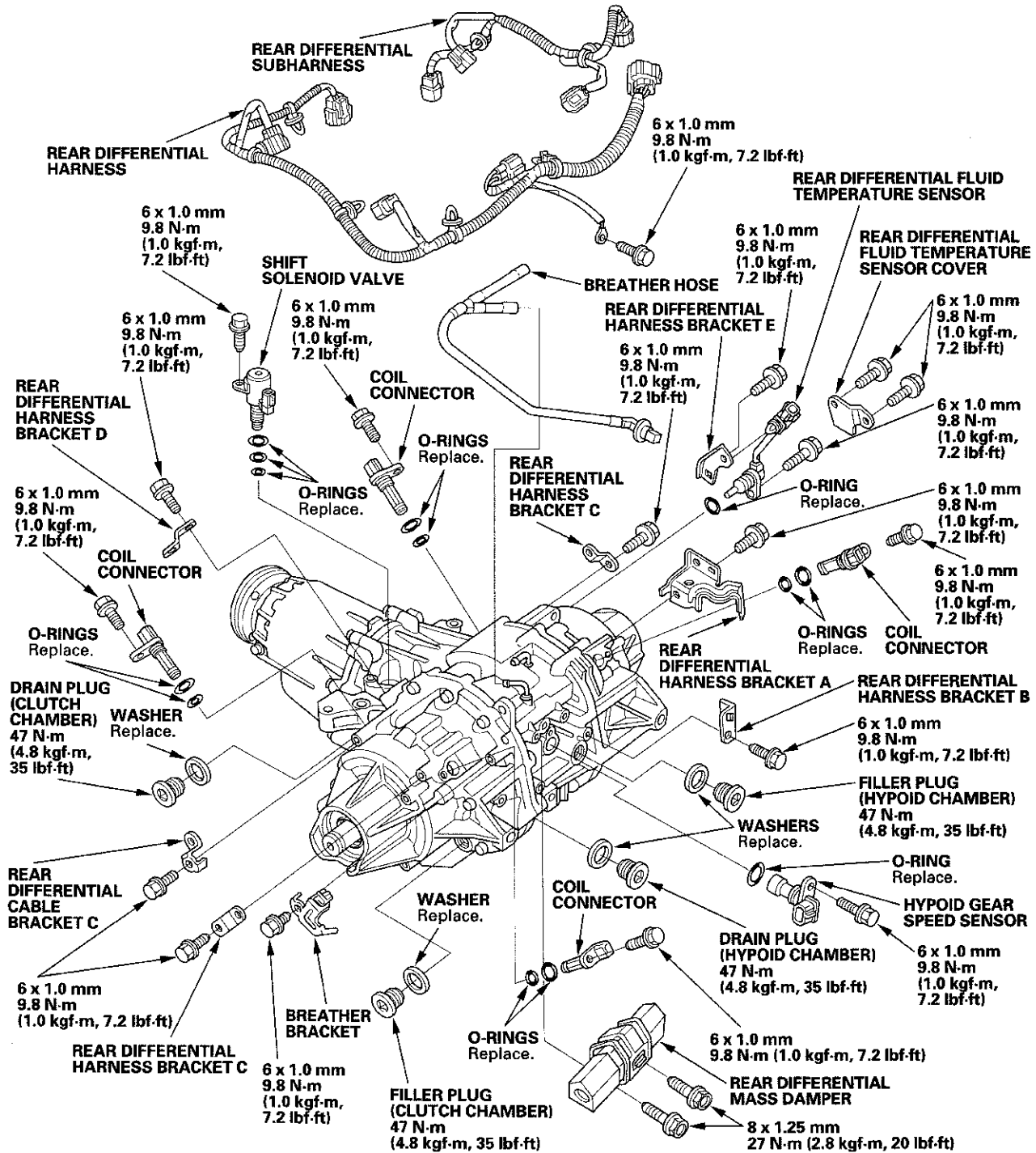
7. Connect the breather hose (A).



8. Connect the rear differential harness connectors (B) and (C).
9. Install the propeller shaft (see page 16-45).
10. Refill the rear differential fluid (see page 15-96).
11. Test-drive the vehicle.

Rear Differential

Rear Differential Disassembly/Reassembly



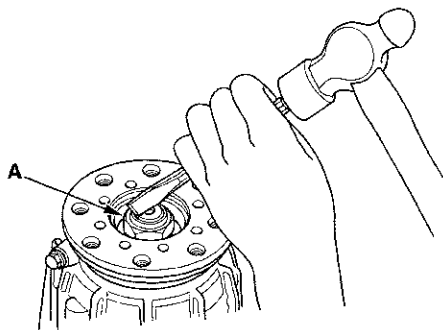


Front Case Oil Seal Replacement

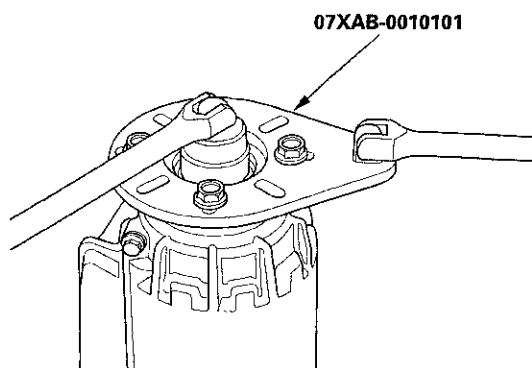
Special Tools Required

- Companion flange holder 07XAB-0010101
- Oil seal driver D 070AD-RJC0140
- Inner driver handle, 40 mm 07746-0030100
- Seal remover, commercially available
- Puller, commercially available

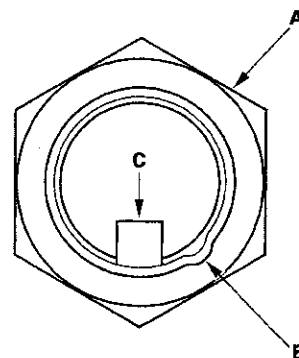
1. Remove the rear differential (see page 15-101).
2. Raise the locknut tab (A) from the groove of the input shaft, making sure that the tab completely clears the groove to prevent damaging the input shaft.



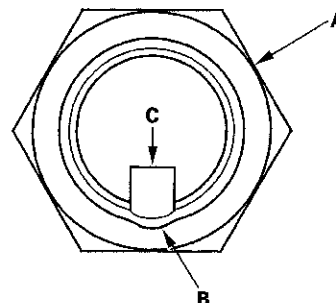
3. Install the companion flange holder on the companion flange.



4. Loosen the locknut (A) counterclockwise so that its tab (B) comes out from the groove (C) in the input shaft.



5. Tighten the locknut (A) until its tab (B) aligns with the groove (C).



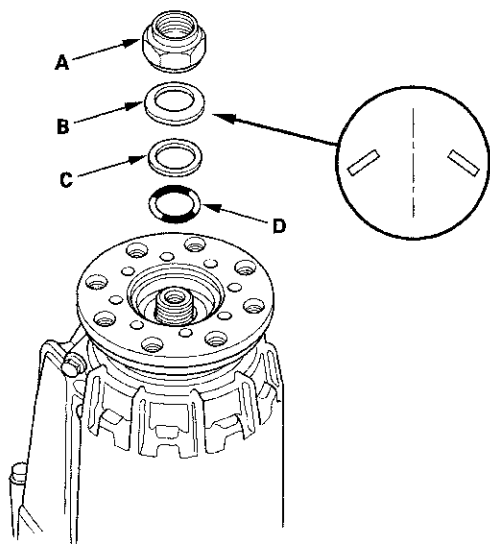
6. Remove any dirt from inside of the groove in the input shaft, then loosen the locknut.

(cont'd)

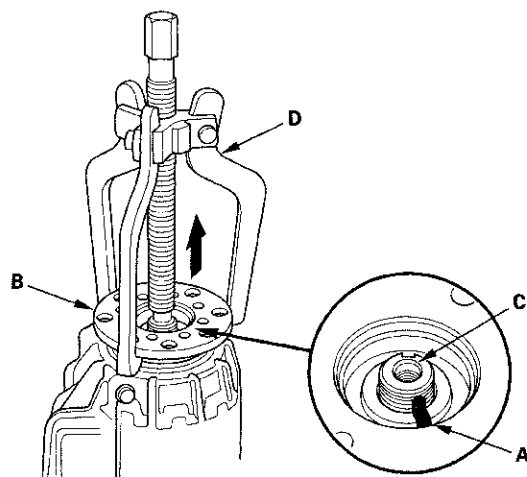
Rear Differential

Front Case Oil Seal Replacement (cont'd)

7. Remove the 22 mm locknut (A), the 22 mm spring washer (B), the 23 mm back-up ring (C), and the 23 mm O-ring (D).



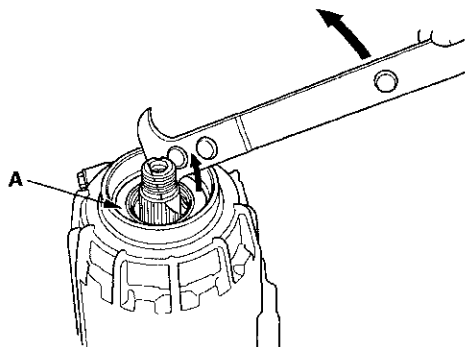
8. Make marks (A) across the companion flange (B) and the input shaft (C).



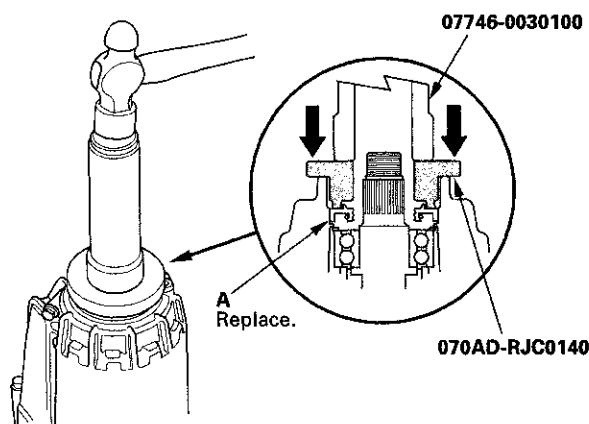
9. Remove the companion flange using a commercially available puller (D).

10. Remove the 38 x 67 x 9 mm front case oil seal (A) using a commercially available seal remover.

NOTE: Remove the oil seal with care so you do not damage the inside surface of the front case oil seal surface.

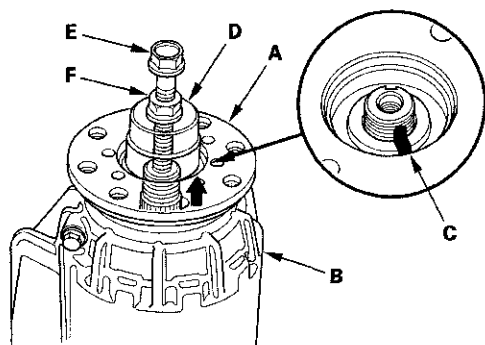


11. Install a new 38 x 67 x 9 mm front case oil seal (A) using the oil seal driver D and the 40 mm inner driver handle.



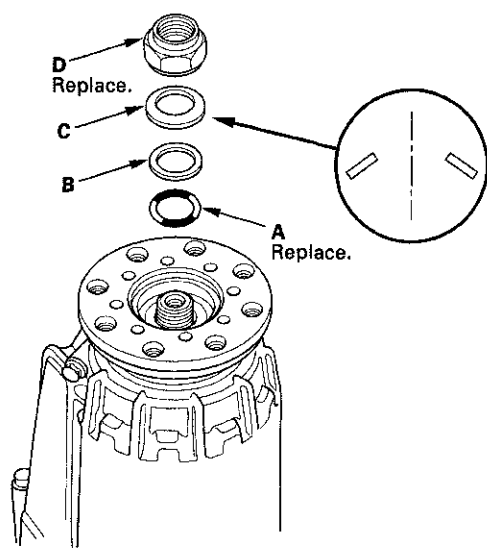


12. Set the companion flange (A) onto the front case (B) by aligning the reference mark (C), then install the 36 mm socket (D), the 8 mm flange bolt (E), and the 8 mm nut (F) as shown.



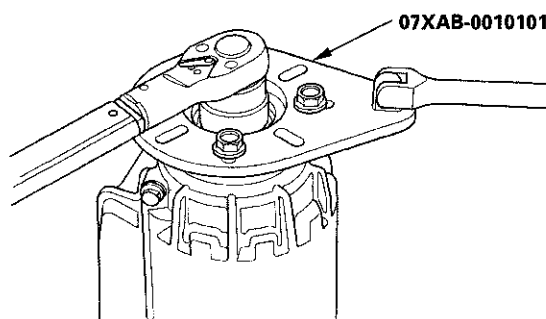
13. Tighten the 8 mm nut, then install the companion flange.
14. Install a new 23 mm O-ring (A), the 23 mm back-up ring (B), the 22 mm spring washer (C), and a new 22 mm locknut (D).

NOTE: Apply ATF to the 23 mm O-ring.

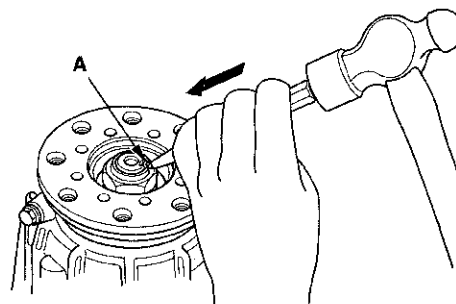


15. Install the companion flange holder to the companion flange, then tighten the 22 mm locknut to the specified torque.

TORQUE: 118 N·m (12.0 kgf-m, 87 lbf-ft)



16. Stake the locknut shoulder (A) into the groove in the input shaft.



17. Install the rear differential (see page 15-102).

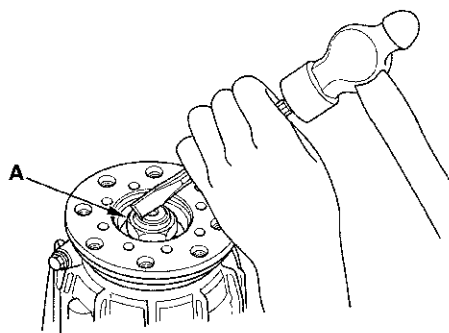
Rear Differential

Center Case Front Oil Seal Replacement

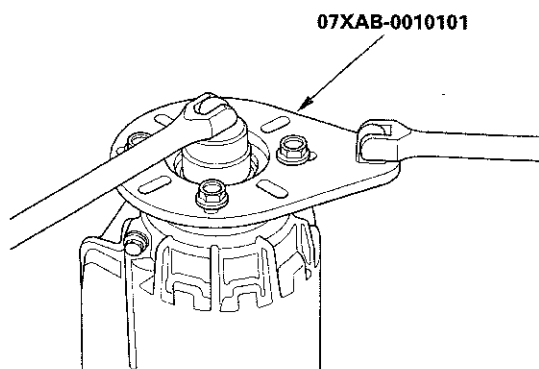
Special Tools Required

- Companion flange holder 07XAB-0010101
- Oil seal driver E 070AD-RJC0150
- Inner driver handle, 40 mm 07746-0030100
- Puller, commercially available
- Seal remover, commercially available

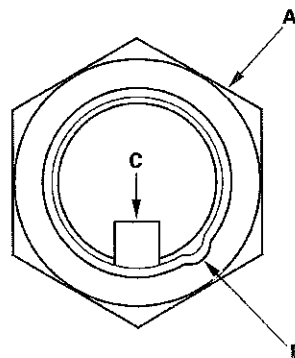
1. Remove the rear differential (see page 15-101).
2. Raise the locknut tab (A) from the groove of the input shaft, making sure that the tab completely clears the groove to prevent damaging the input shaft.



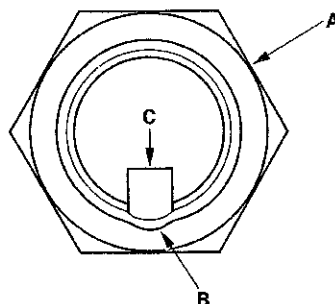
3. Install the companion flange holder on the companion flange.



4. Loosen the locknut (A) counterclockwise so that its tab (B) comes out from the groove (C) in the input shaft.



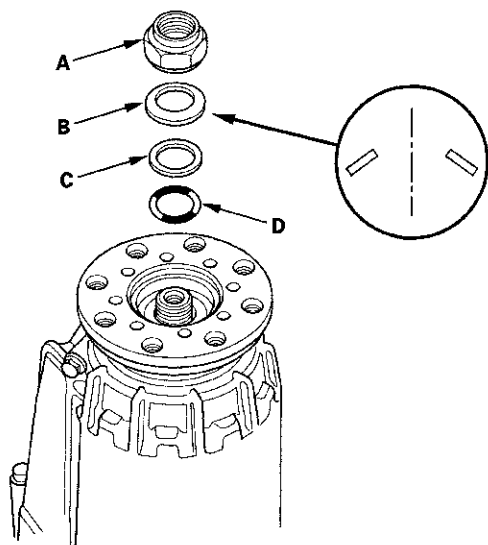
5. Tighten the locknut (A) until its tab (B) aligns with the groove (C).



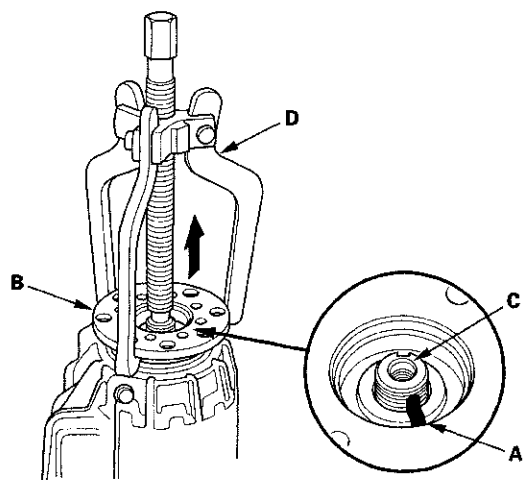
6. Remove any dirt from inside of the groove in the input shaft, then loosen the locknut.



7. Remove the 22 mm locknut (A), the 22 mm spring washer (B), the 23 mm back-up ring (C), and the 23 mm O-ring (D).

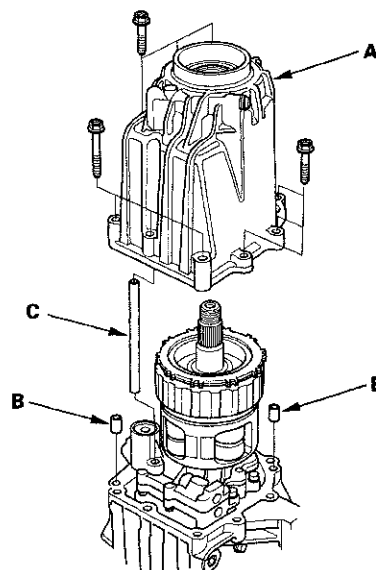


8. Make marks (A) across the companion flange (B) and the input shaft (C).

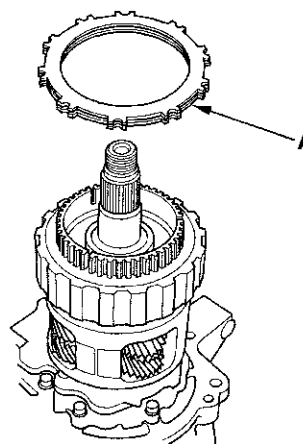


9. Remove the companion flange using a commercially available puller (D).

10. Remove the three 8 x 50 mm flange bolts and the six 8 x 35 mm flange bolts in a crisscross pattern in several steps, then remove the front case (A), the 8 x 14 mm dowel pins (B), and the 8 x 130 mm pipe (C).



11. Remove the high clutch (A).



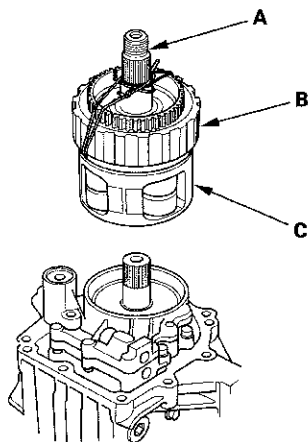
(cont'd)

Rear Differential

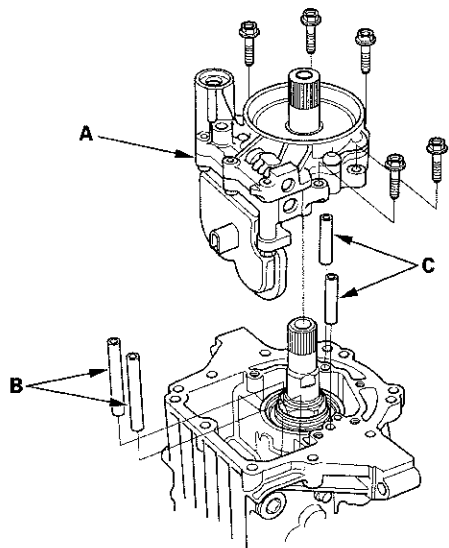
Center Case Front Oil Seal Replacement (cont'd)

12. Secure the input shaft (A), low clutch (B), and planetary carrier (C) together as an assembly with a piece of wire, then remove the assembly.

NOTE: Do not remove the input shaft from the low clutch and planetary carrier, because aligning the input shaft splines with the other components may be difficult.

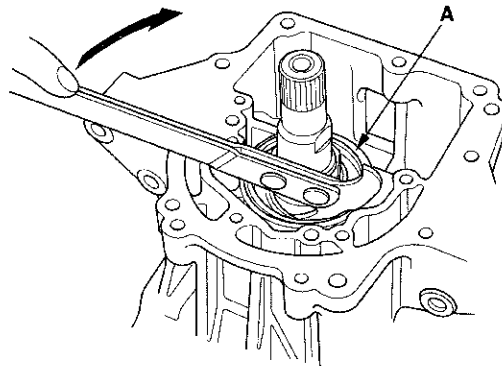


13. Remove the oil pump assembly (A), then remove the two 8 x 51.5 mm pipes (B), and the two 8 x 35 mm pipes (C).



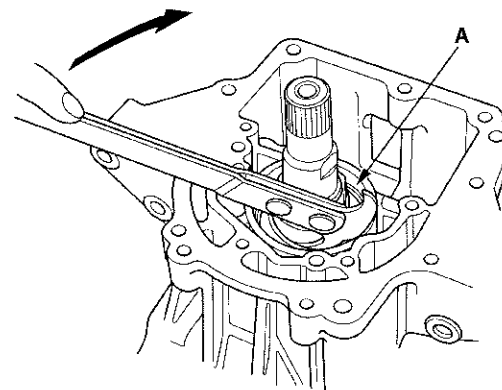
14. Remove the 45 x 67 x 6.5 mm oil seal (A) using a commercially available seal remover.

NOTE: Remove the oil seal with care so you do not damage the inside surface of the center case front oil seal surface.



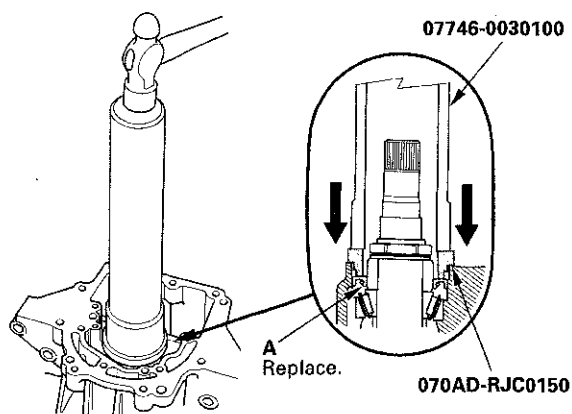
15. Remove the 45 x 65 x 6.5 mm oil seal (A) using a commercially available seal remover.

NOTE: Remove the oil seal with care so you do not damage the inside surface of the center case front oil seal surface.

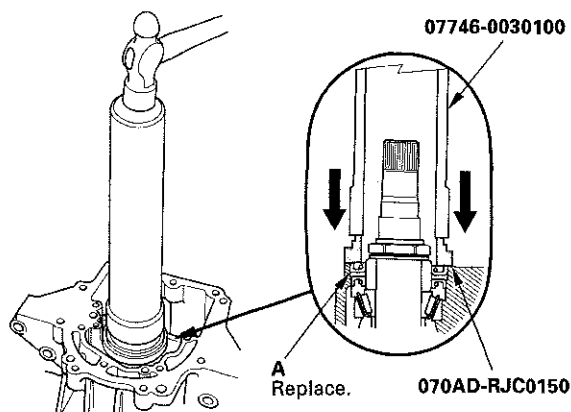




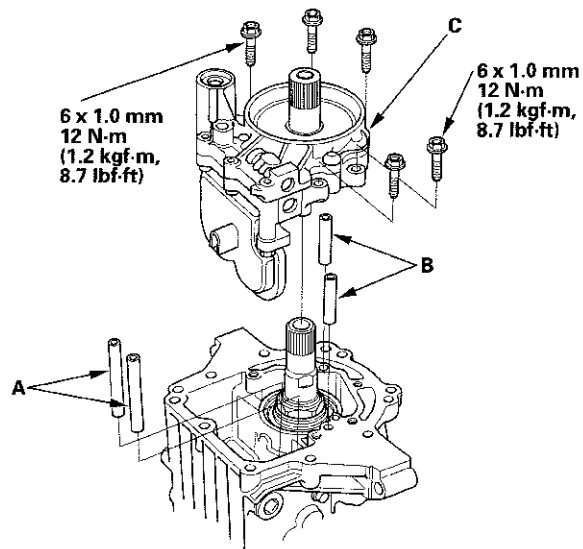
16. Install a new 45 x 65 x 6.5 mm oil seal (A) using the oil seal driver E and the 40 mm driver handle.



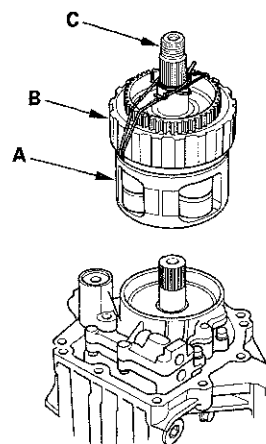
17. Install a new 45 x 67 x 6.5 mm oil seal (A) with the oil seal driver E and the 40 mm driver handle.



18. Install the two 8 x 51.5 mm pipes (A), the two 8 x 35 mm pipes (B), and the oil pump assembly (C).



19. Install the planetary carrier (A), low clutch (B) and input shaft (C) as an assembly, then remove the wire.

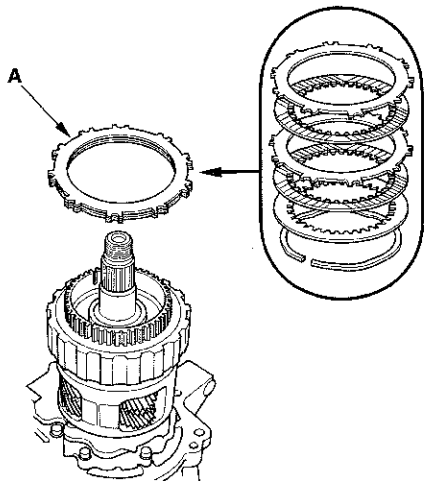


(cont'd)

Rear Differential

Center Case Front Oil Seal Replacement (cont'd)

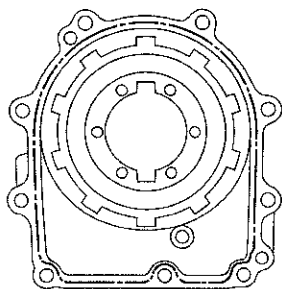
20. Install the high clutch (A).



21. Remove the dirt and oil from the sealing surface. Apply liquid gasket (P/N 08717-0004, 08718-0001, 08718-0003, or 08718-0009) to the sealing surface. Make sure you seal up to the inside edge of the bolt holes to prevent oil leakage.

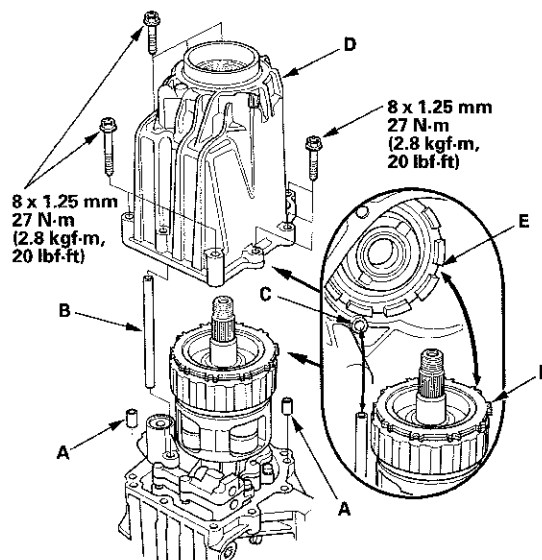
NOTE:

- You must assemble the housings within 5 minutes after applying the liquid gasket. If you applied liquid gasket P/N 08718-0012, the component must be installed within 4 minutes. If not, the sealing surface must be cleaned, and the liquid gasket reapplied.
- Allow liquid gasket to cure at least 30 minutes after assembly before filling the differential with fluid.

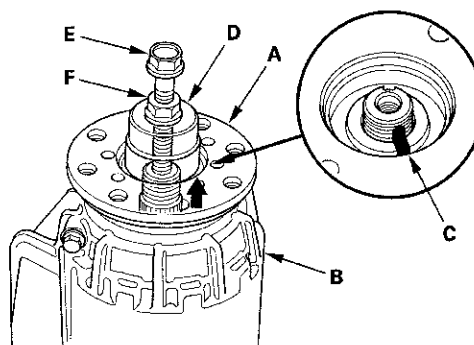


----- Apply liquid gasket along the broken line and around all bolt holes.

22. Install the two 8 x 14 mm dowel pins (A) and the 8 x 130 mm pipe (B).



23. Align the hole (C) of the front case (D) with the 8 x 130 mm pipe. Align the groove (E) of the front case with the high clutch tabs (F), then install the front case onto the center case.
24. Tighten the flange bolts in a crisscross pattern in several steps, then tighten the bolts to the specified torque.
25. Set the companion flange (A) onto the front case (B) by aligning the reference mark (C), then install the 36 mm socket (D), the 8 mm flange bolt (E), and the 8 mm nut (F) as shown.

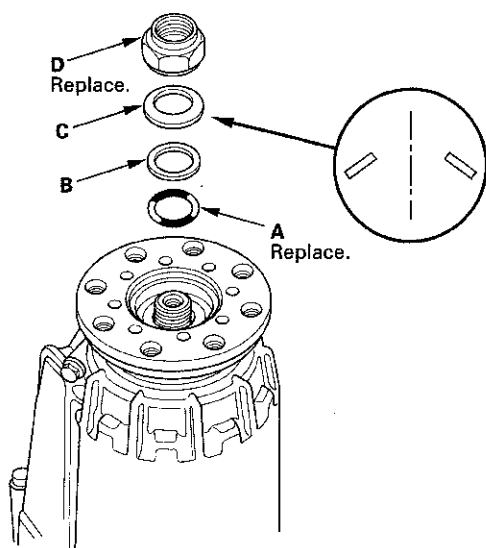




26. Tighten the 8 mm nut, then install the companion flange.

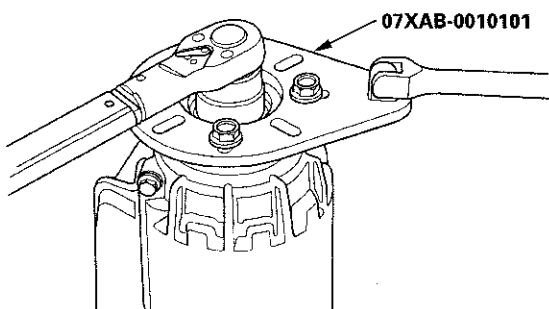
27. Install a new 23 mm O-ring (A), the 23 mm back-up ring (B), the 22 mm spring washer (C), and a new 22 mm locknut (D).

NOTE: Apply ATF to the 23 mm O-ring.

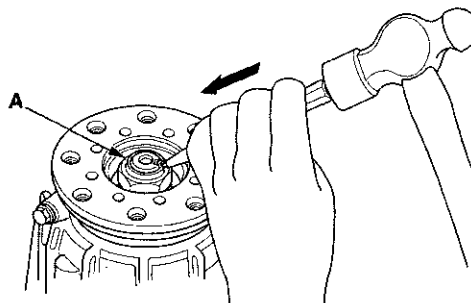


28. Install the companion flange holder to the companion flange, then tighten the 22 mm locknut to the specified torque.

TORQUE: 118 N·m (12.0 kgf·m, 87 lbf·ft)



29. Stake the locknut shoulder (A) into the groove in the input shaft.



30. Install the rear differential (see page 15-102).

Rear Differential

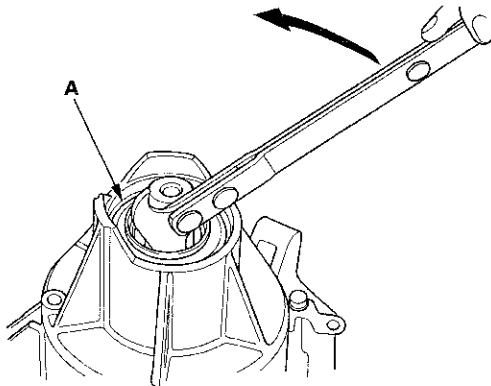
Side Case Oil Seal Replacement

Special Tools Required

- Oil seal driver C 070AD-RJC0130
- Driver, 56 x 62 mm 070AD-PYZA100
- Seal remover, commercially available

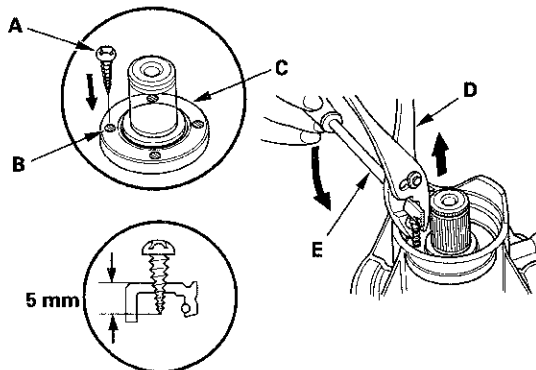
1. Remove the rear differential (see page 15-101).
2. Remove the 40 x 72 x 7.5 mm dust seal (A) using a commercially available seal remover.

NOTE: Remove the dust seal with care so you do not damage the inside surface of the side case dust seal surface.

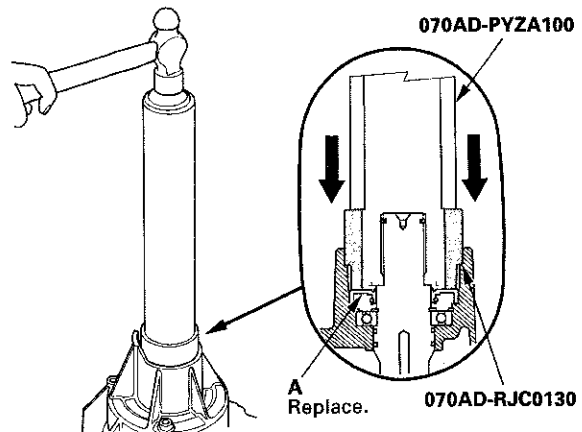


3. Remove the thrust washer.
4. Install a 6 mm screw (P/N 93901-16580) (A) at each ● mark (4 places, 90 degrees apart) (B) of 35.5 x 70 x 9 mm oil seal (C), then remove the 35.5 x 70 x 9 mm oil seal using pliers (D) and a screw driver (E) as shown.

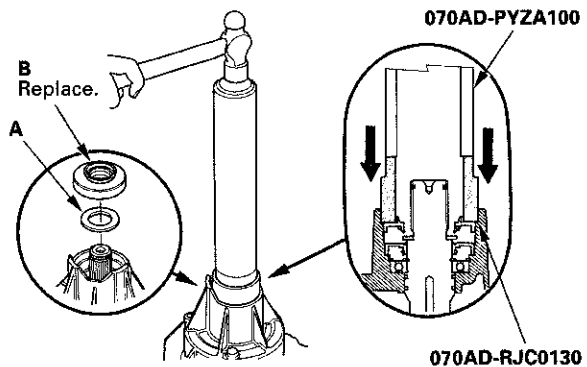
NOTE: Do not thread the 6 mm screws into the 35.5 x 70 x 9 mm oil seal more than 5 mm (0.20 in).



5. Install a new 35.5 x 70 x 9 mm oil seal (A) using the 56 x 62 mm driver and the oil seal driver C.



6. Install the thrust washer (A), then install a new 40 x 72 x 7.5 mm dust seal (B) using the 56 x 62 mm driver and the oil seal driver C.



7. Install the rear differential (see page 15-102).

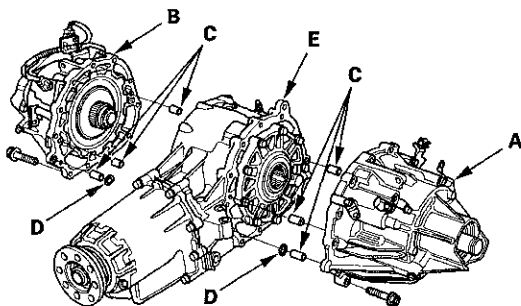


Center Case Side Oil Seal Replacement

Special Tools Required

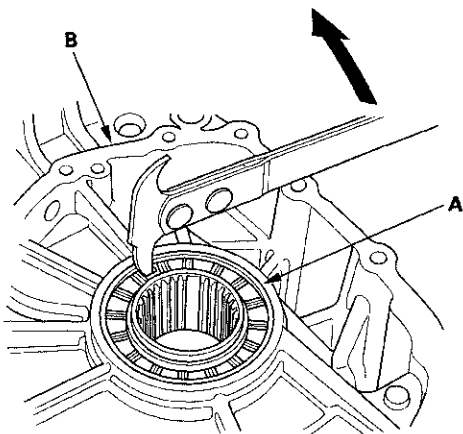
- Oil seal driver A 070AD-RJC0110
- Oil seal driver B 070AD-RJC0120
- Driver handle 15 x 135L 07749-0010000
- Attachment, 78 x 90 mm 07GAD-SD40101
- Seal remover, commercially available

1. Remove the rear differential (see page 15-101).
2. Remove the rear differential left side case (A), the rear differential right side case (B), the six 8 x 14 mm dowel pins (C), and the two O-rings (D) from the rear differential center case (E).



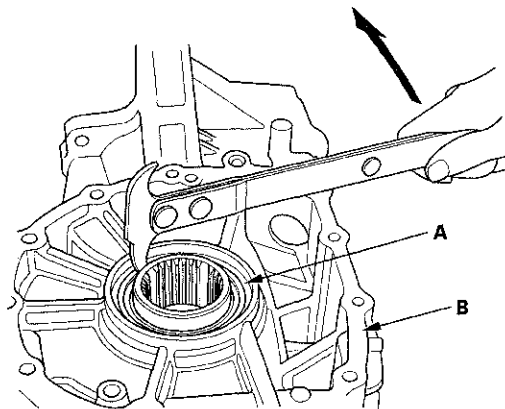
3. Remove the 60 x 89 x 6.5 mm outside oil seal (A) from the rear differential right side center case (B) using a commercially available seal remover.

NOTE: Remove the oil seal with care so you do not damage the inside surface of the center case side oil seal surface.

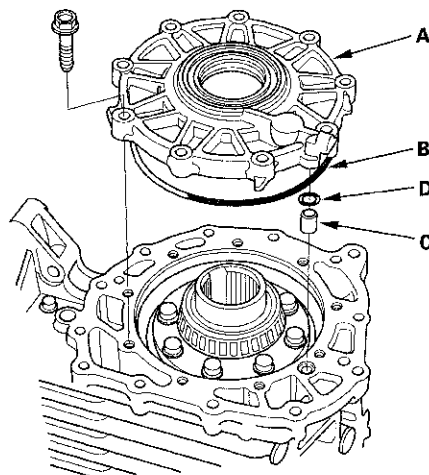


4. Remove the 60 x 80 x 6.5 mm inside oil seal (A) from the rear differential right side center case (B) using a commercially available seal remover.

NOTE: Remove the oil seal with care so you do not damage the inside surface of the center case side oil seal surface.



5. Remove the differential carrier cover (A), the 156 x 3.5 mm O-ring (B), the 8 x 14 mm dowel pin (C), and the 7.7 x 2.3 mm O-ring (D).



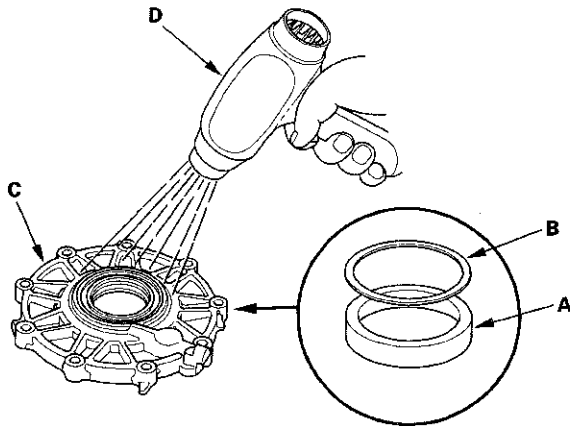
(cont'd)

Rear Differential

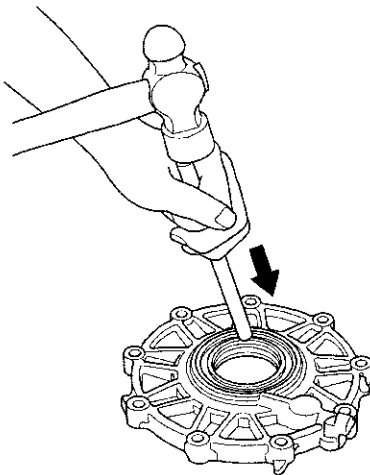
Center Case Side Oil Seal Replacement (cont'd)

6. Remove the 70 x 100 x 20 mm bearing outer race (A) and 100 mm shim (B) from the differential carrier cover (C) by heating the differential carrier cover to about 212 °F (100 °C) using a heat gun (D). Do not heat the differential carrier cover in excess of 212 °F (100 °C).

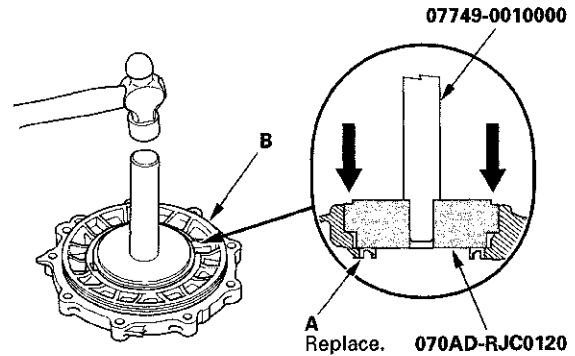
NOTE: Let the differential carrier cover cool to room temperature before installing the bearing outer race.



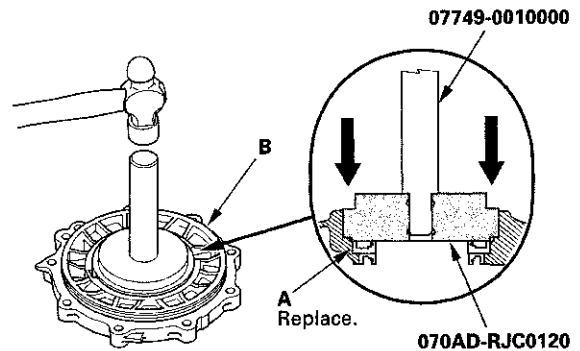
7. Remove the 60 x 89 x 6.5 mm oil seal and the 60 x 80 x 6.5 mm oil seal from the differential carrier cover.



8. Install a new 60 x 80 x 6.5 mm oil seal (A) into the differential carrier cover (B) using the oil seal driver B and the 15 x 135L driver handle.

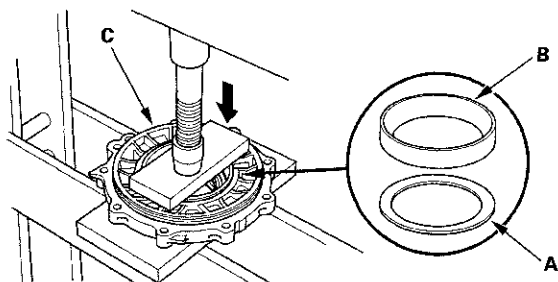


9. Install a new 60 x 89 x 6.5 mm oil seal (A) into the differential carrier cover (B) using the oil seal driver B and the 15 x 135L driver handle.



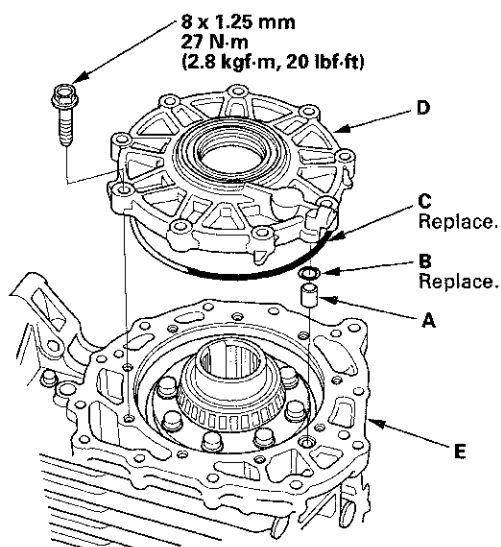


10. Install the 100 mm shim (A) and the 70 x 100 x 20 mm bearing outer race (B) into the differential carrier cover (C) with a press.

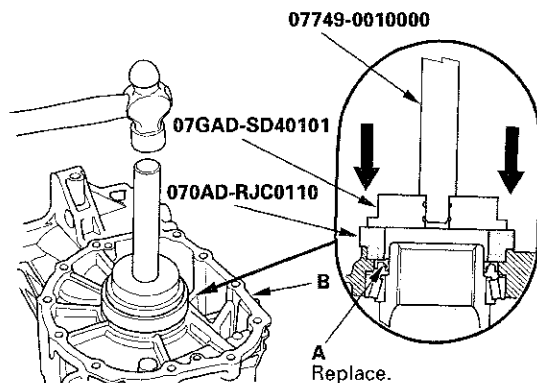


11. Install the 8 x 14 mm dowel pin (A), a new 7.7 x 2.3 mm O-ring (B), a new 156 x 3.5 mm O-ring (C), and the differential carrier cover (D) onto the center case (E).

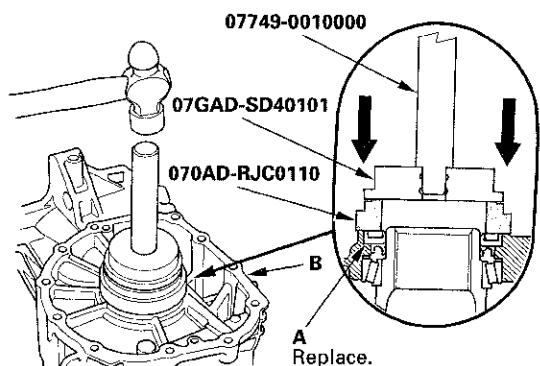
NOTE: Tighten the mounting bolts in a crisscross pattern in several steps.



12. Install a new 60 x 80 x 6.5 mm inside oil seal (A) into the rear differential right side center case (B) using the oil seal driver A and the 15 x 135L driver handle, and the 78 x 90 mm attachment.



13. Install a new 60 x 89 x 6.5 mm outside oil seal (A) into the rear differential right side center case (B) using the oil seal driver A and the 15 x 135L driver handle, and the 78 x 90 mm attachment.



(cont'd)

Rear Differential

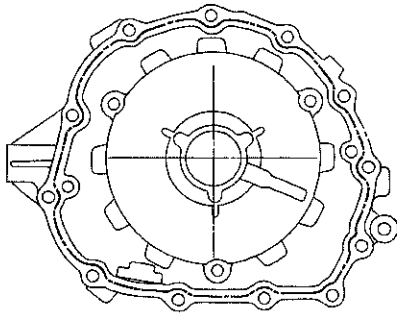
Center Case Side Oil Seal Replacement (cont'd)

14. Remove the dirt and oil from the sealing surfaces. Apply liquid gasket (P/N 08717-0004, 08718-0001 08718-0003, or 08718-0009) to the sealing surface. Make sure you seal up to the inside edge of the bolt holes to prevent oil leakage.

NOTE:

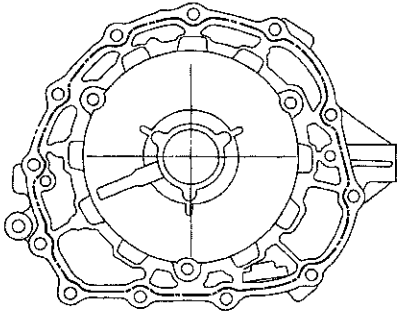
- You must assemble the housings within 5 minutes after applying the liquid gasket. If you applied liquid gasket P/N 08718-0012, the component must be installed within 4 minutes. If not, the sealing surface must be cleaned, and the liquid gasket reapplied.
- Allow liquid gasket to cure at least 30 minutes after assembly before filling the differential with fluid.

Left side case



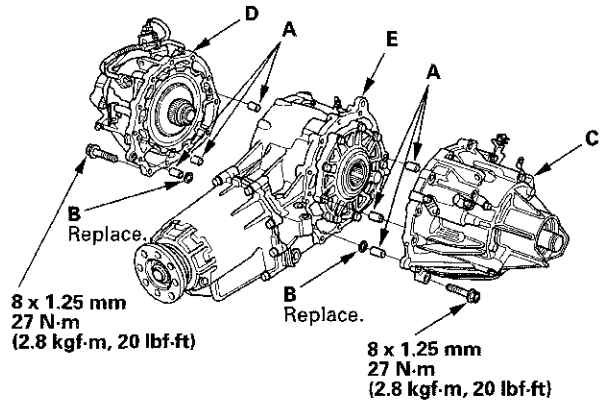
----- Apply liquid gasket along the broken line and around all bolt holes.

Right side case



----- Apply liquid gasket along the broken line and around all bolt holes.

15. Install the six 8 x 14 mm dowel pins (A), a new 7.7 x 2.3 mm O-rings (B), the rear differential left side case (C), and the rear differential right side case (D) onto the rear differential center case (E).

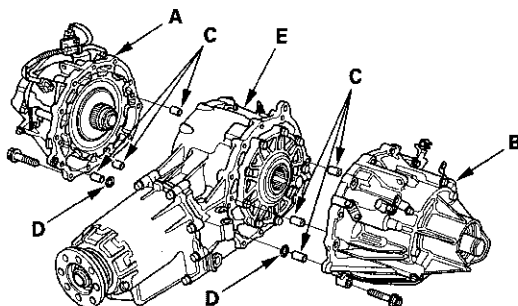


16. Tighten the mounting bolts in a crisscross pattern in several steps, then tighten the bolts to the specified torque.
17. Install the rear differential (see page 15-102).



Center Case Replacement

1. Remove the rear differential (see page 15-101).
2. Remove the rear differential right side case (A), the rear differential left side case (B), the six 8 x 14 mm dowel pins (C), and the O-rings (D) from the rear differential center case (E).



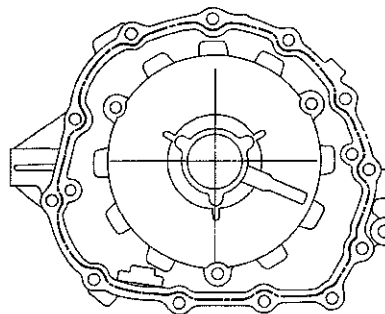
3. Replace a new rear differential center case.

4. Remove the dirt and oil from the sealing surfaces. Apply liquid gasket (P/N 08717-0004, 08718-0001, 08718-0003, or 08718-0009) to the sealing surface. Make sure you seal up to the inside edge of the bolt holes to prevent oil leakage.

NOTE:

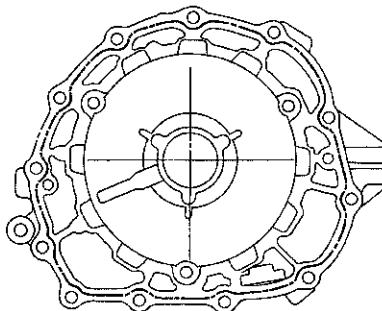
- You must assemble the housings within 5 minutes after applying the liquid gasket. If you applied liquid gasket P/N 08718-0012, the component must be installed within 4 minutes. If not, the sealing surface must be cleaned, and the liquid gasket reapplied.
- Allow liquid gasket to cure at least 30 minutes after assembly before filling the differential with fluid.

Left side case



----- Apply liquid gasket along the broken line and around all bolt holes.

Right side case



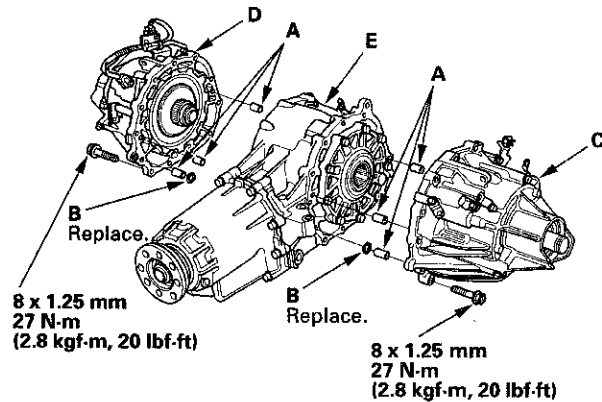
----- Apply liquid gasket along the broken line and around all bolt holes.

(cont'd)

Rear Differential

Center Case Replacement (cont'd)

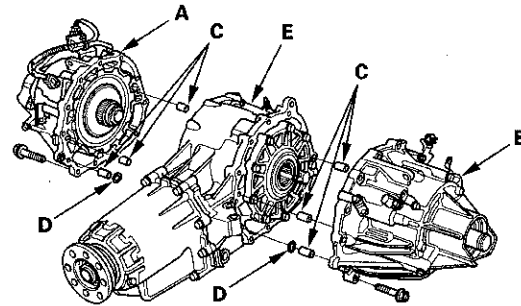
5. Install the six 8 x 14 mm dowel pins (A), a new O-rings (B), the rear differential left side case (C), and the rear differential right side case (D) onto the rear differential center case (E).



6. Tighten the mounting bolts in a crisscross pattern in several steps, then tighten the bolts to the specified torque.
7. Install the rear differential (see page 15-102).

Side Case Replacement

1. Remove the rear differential (see page 15-101).
2. Remove the rear differential right side case (A), the rear differential left side case (B), the 8 x 14 mm dowel pins (C), and the O-rings (D) from the rear differential center case (E).



3. Replace a new rear differential left side case and the new rear differential right side case.

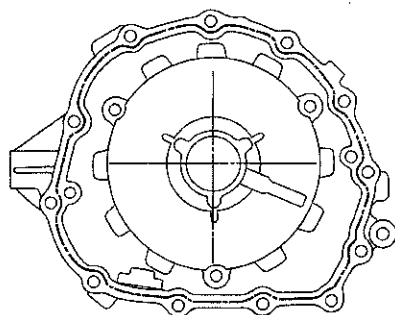


4. Remove the dirt and oil from the sealing surfaces. Apply liquid gasket (P/N 08717-0004, 08718-0001, 08718-0003, or 08718-0009) to the sealing surface. Make sure you seal up to the inside edge of the bolt holes to prevent oil leakage.

NOTE:

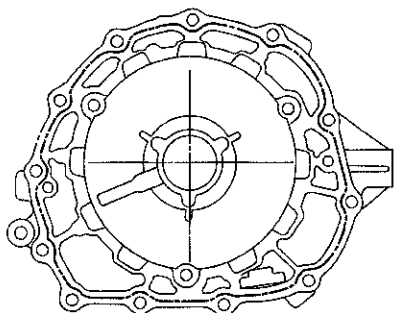
- You must assemble the housings within 5 minutes after applying the liquid gasket. If you applied liquid gasket P/N 08718-0012, the component must be installed within 4 minutes. If not, the sealing surface must be cleaned, and the liquid gasket reapplied.
- Allow liquid gasket to cure at least 30 minutes after assembly before filling the differential with fluid.

Left side case



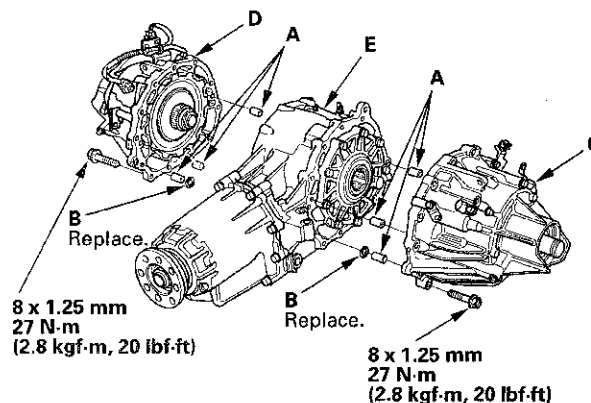
— Apply liquid gasket along the broken line and around all bolt holes.

Right side case



— Apply liquid gasket along the broken line and around all bolt holes.

5. Install the six 8 x 14 mm dowel pins (A), a new O-rings (B), the rear differential left side case (C), the rear differential right side case (D) onto the rear differential center case (E).



6. Tighten the mounting bolts in a crisscross pattern in several steps, then tighten the bolts to the specified torque.
7. Install the rear differential (see page 15-102).
8. Do the SH-AWD differential clutch torque memorization (see page 15-7).