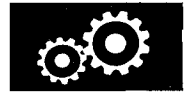


Transaxle

Rear Differential

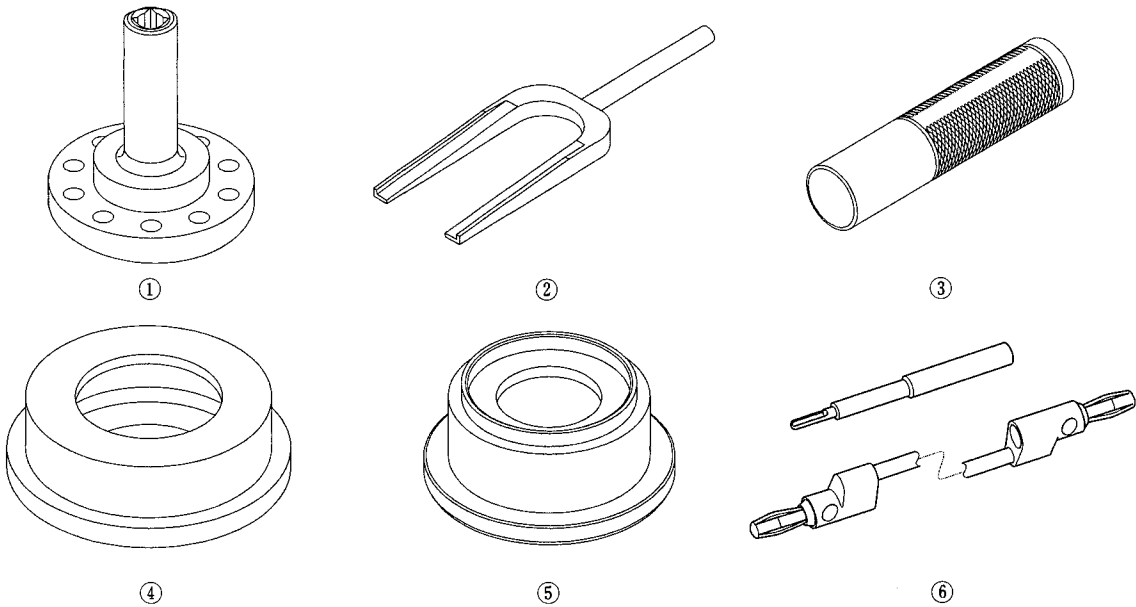
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Rear Differential

Special Tools

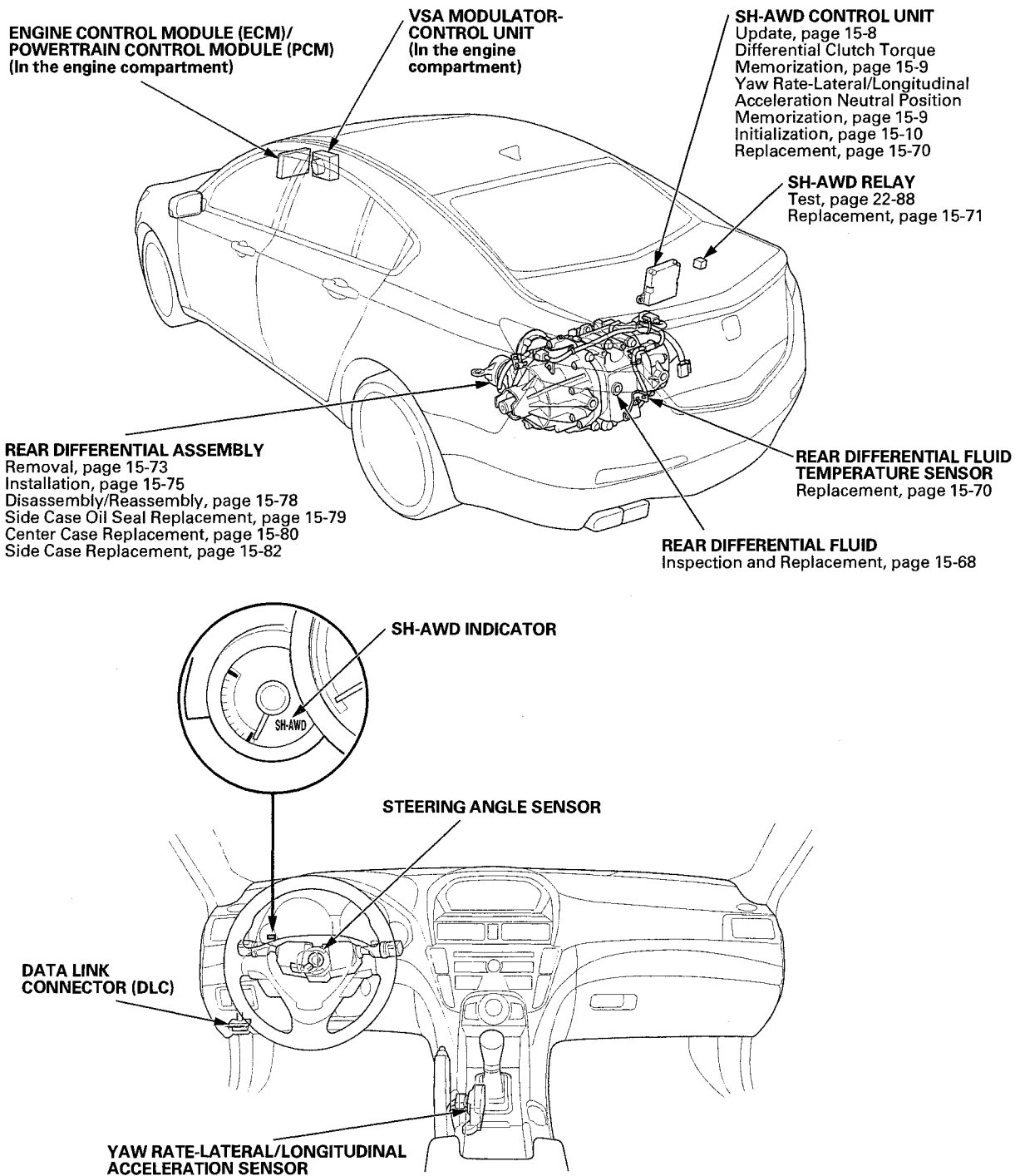
Ref.No.	Tool Number	Description	Qty
①	070AJ-SJAA101	Torque Wrench Adapter	1
②	07AAD-S3VA000	Driveshaft Remover	1
③	07AAD-STKA100	Driver Handle	1
④	07AAD-STKA111	Oil Seal Driver	1
⑤	07AAD-STKA120	Dust Seal Driver	1
⑥	07SAZ-001000A	Backprobe Set	2



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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 10 volts.

After the SH-AWD indicator comes on, it stays on until you turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.

Diagnostic Trouble Code (DTC)

- The SH-AWD control unit can memorize up to eight 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 units EEPROM (non-volatile memory). Therefore, the memorized DTCs are not cleared when the battery is disconnected or when 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

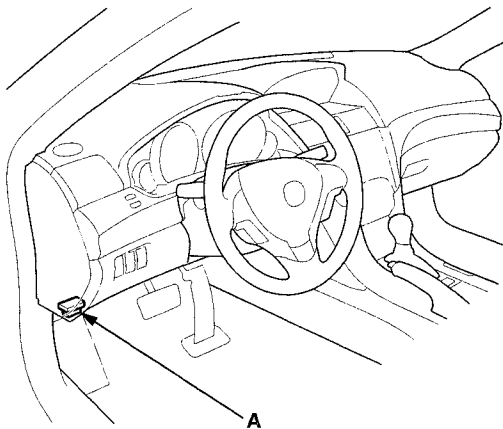
When a problem is detected during self-diagnosis, the system does the following:

- 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), or the vehicle in the OFF mode, connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.



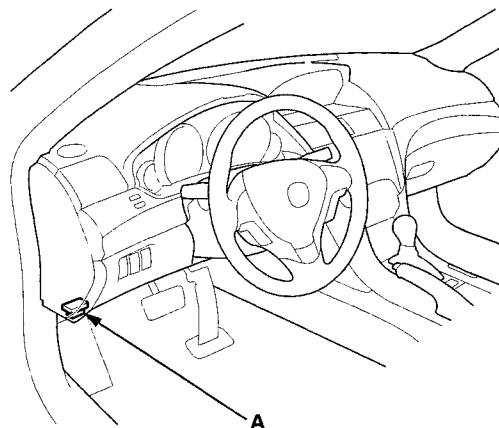
2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
3. Make sure the HDS communicates with the vehicle and the SH-AWD control unit. If it does not go to the DLC circuit troubleshooting (see page 11-258).
4. Check the diagnostic trouble code (DTC) and the 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), or the vehicle in the OFF mode, connect the HDS to the DLC (A) located under the driver's side of the dashboard.



2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
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 11-258).
4. Clear the DTC(s) by following the screen prompts on the HDS.
5. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.

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.

(cont'd)

Rear Differential

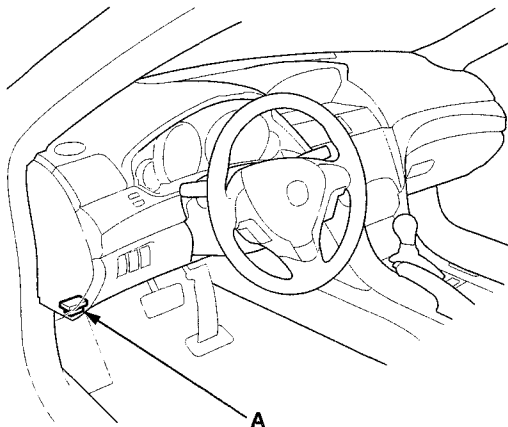
General Troubleshooting Information (cont'd)

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 in LOCK (0), or the vehicle in the OFF mode, 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), or press the engine start/stop button to select the ON mode. 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 11-258). Follow the prompts on the HDS to display the DTC(s) on the screen. Check the DTC and the 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 emissions DTCs and other system DTCs at the same time, troubleshoot the fuel and emissions 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.

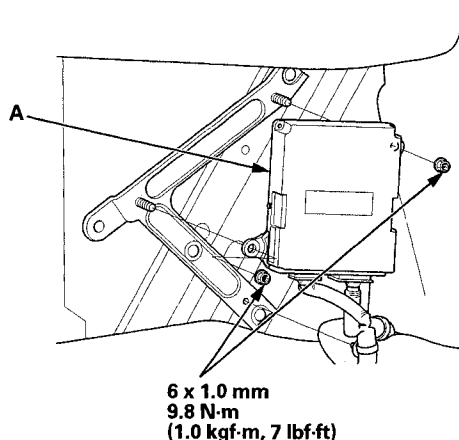


How to Troubleshoot Circuits at the SH-AWD Control Unit

Special Tools Required

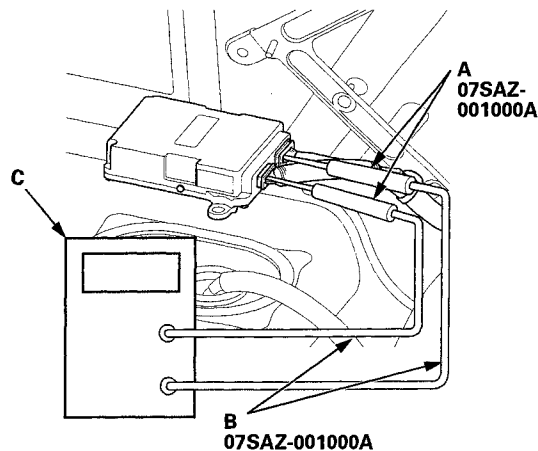
Backprobe Set 07SAZ-001000A (2)

1. Remove the trunk front trim panel (see page 20-93).
2. Remove the SH-AWD control unit (A).



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.



Rear Differential

SH-AWD Control Unit Update

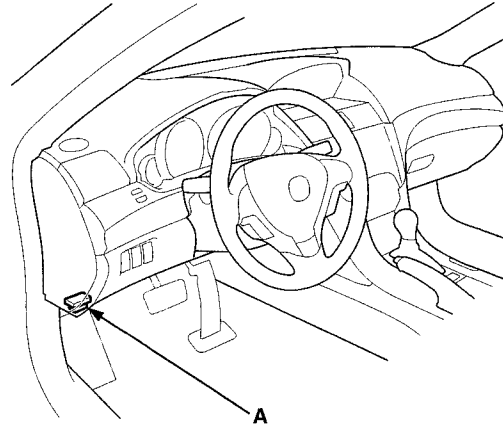
Special Tools Required

- Honda Diagnostic System (HDS)
- Honda Interface Module (HIM)
- HDS pocket tester

NOTE:

- Before you update the SH-AWD control unit, make sure the battery in the vehicle is fully charged.
- Use this procedure when you need to update the SH-AWD control unit in a troubleshooting procedure.
- Make sure the HDS/HIM has the latest software version.
- Never turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode during the update. If there is a problem with the update, leave the ignition switch in ON (II), or the vehicle in the ON mode, otherwise the control unit could be damaged, or it will set DTCs.
- To prevent SH-AWD control unit damage, do not operate anything electrical (headlights, audio system, brakes, A/C, power windows, moonroof, door locks, etc.) during the update.
- To ensure the latest program is installed, do an SH-AWD control unit update whenever the SH-AWD control unit is substituted or replaced.
- You cannot update an SH-AWD control unit with the same program it already has installed. It will only accept a new program.
- If you need to diagnose the Honda interface module (HIM) because the HIM's red (#3) light came on or was flashed during the update, leave the ignition switch in the ON (II) position, or the engine start/stop button in the ON mode, when you disconnect the HIM from the data link connector (DLC). This will prevent SH-AWD control unit damage.

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



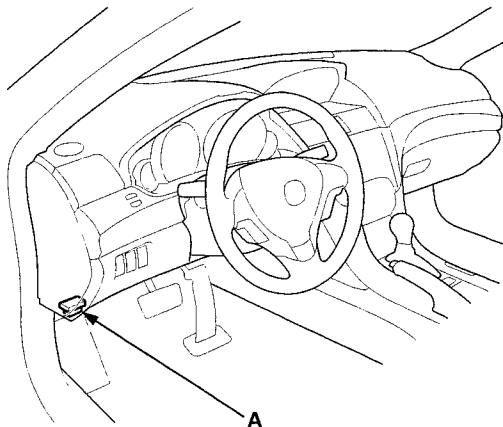
2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
3. Make sure the HDS communicates with the vehicle and the SH-AWD control unit. If it does not, go to the DLC circuit troubleshooting (see page 11-258).
4. Select the update program, and follow the screen prompts to update the SH-AWD control unit.
5. If the software in the SH-AWD control unit is the latest, disconnect the HDS/HIM from the DLC, and go back to the procedure that you were doing. If the software in the SH-AWD control unit is not the latest, follow the instructions on the screen.
6. Do the SH-AWD control unit initialization (see page 15-10).
7. Do the SH-AWD differential clutch torque memorization (see page 15-9).
8. Do the yaw rate-lateral/longitudinal acceleration neutral position memorization (see page 15-9).



SH-AWD Differential Clutch Torque Memorization

Whenever the right or left clutch side case is replaced, the differential clutch torque memorization must be done.

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



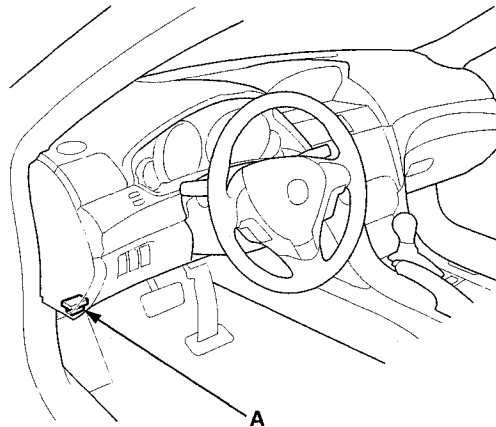
2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
3. Make sure the HDS communicates with the vehicle and the SH-AWD control unit. If it does not, go to the DLC circuit troubleshooting (see page 11-258).
4. From the mode menu, select SH-AWD, select MISCELLANEOUS TEST, select NEUTRAL MENU, then select DIFFERENTIAL TORQUE 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), or the vehicle in the OFF mode, connect the HDS to the DLC (A) located under the driver's side of the dashboard.



2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
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 11-258).
4. From the mode menu, select SH-AWD, select MISCELLANEOUS TEST, select NEUTRAL MENU, then select ALL SENSORS with the HDS, and follow the screen prompts.

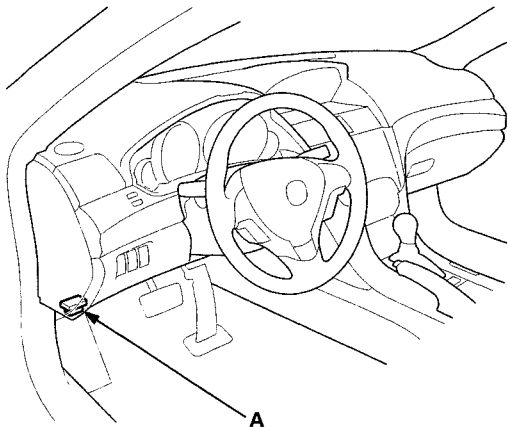
NOTE: See the HDS help menu for specific instructions.

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), or the vehicle in the OFF mode, connect the HDS to the DLC (A) located under the driver's side of the dashboard.



2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
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 11-258).
4. From the mode menu, select SH-AWD, 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

DTC ^{*1}	SH-AWD Indicator Light	Detection Item	Page
12-1	ON	Lateral Acceleration Sensor Malfunction	DTC Troubleshooting (see page 15-26)
12-2	ON	Lateral Acceleration Sensor Malfunction	DTC Troubleshooting (see page 15-26)
12-3	ON	Lateral Acceleration Sensor Malfunction	DTC Troubleshooting (see page 15-26)
15-1	ON	Longitudinal Acceleration Sensor Malfunction	DTC Troubleshooting (see page 15-27)
16-3	ON	Steering Angle Sensor Neutral Position Incorrect	DTC Troubleshooting (see page 15-28)
33-2	ON	Yaw Rate Sensor Malfunction	DTC Troubleshooting (see page 15-29)
33-3	ON	Yaw Rate Sensor Malfunction	DTC Troubleshooting (see page 15-29)
41-1	ON	F-CAN Malfunction (Lost Communication with Engine Control Module (ECM)/Powertrain Control Module (PCM))	DTC Troubleshooting (see page 15-30)
41-2	ON	F-CAN Malfunction (Lost Communication with VSA Modulator-Control Unit)	DTC Troubleshooting (see page 15-31)
41-4 ^{*2}	ON	F-CAN Malfunction (Lost Communication with A/T Control System)	DTC Troubleshooting (see page 15-32)
41-5	ON	F-CAN Malfunction (Lost Communication with Yaw Rate-Lateral/Longitudinal Acceleration Sensor)	DTC Troubleshooting (see page 15-33)
41-6	ON	F-CAN Malfunction (Lost Communication with Steering Angle Sensor)	DTC Troubleshooting (see page 15-34)
42-1	ON	Differential Fluid Temperature Sensor (Short to power)	DTC Troubleshooting (see page 15-35)
42-2	ON	Differential Fluid Temperature Sensor (Open/GND Short)	DTC Troubleshooting (see page 15-36)
43-1	ON	Differential Fluid Temperature Sensor Malfunction	DTC Troubleshooting (see page 15-39)
44-11	ON	SH-AWD Control Unit	DTC Troubleshooting (see page 15-40)
44-12	ON	SH-AWD Relay Stuck ON	DTC Troubleshooting (see page 15-40)
44-32	ON	SH-AWD Control Unit Power Supply Stuck ON	DTC Troubleshooting (see page 15-41)
44-41	ON	SH-AWD Control Unit Power Supply Stuck OFF	DTC Troubleshooting (see page 15-41)
44-50	ON	SH-AWD Control Unit Power Supply Voltage Low	DTC Troubleshooting (see page 15-42)
49-1	ON	SH-AWD Control Unit (PG Line Open)	DTC Troubleshooting (see page 15-44)
52-3	ON	Left Clutch Electromagnetic Coil Current Malfunction	DTC Troubleshooting (see page 15-44)
53-1	ON	Left Clutch Electromagnetic Coil (Open)	DTC Troubleshooting (see page 15-47)

NOTE: The "x" at the end of each DTC denotes a numeric character (0 thru 9) or an alpha character (A thru F) that you will see on the HDS display. The character is unrelated to your troubleshooting; it designates the SH-AWD control unit manufacturer and other details used for product analysis.

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

*2: A/T model

(cont'd)

Rear Differential

DTC Troubleshooting Index (cont'd)

DTC ^{*1}	SH-AWD Indicator Light	Detection Item	Page
53-2	ON	Left Clutch Electromagnetic Coil (Short)	DTC Troubleshooting (see page 15-49)
53-3	ON	Left Clutch Electromagnetic Coil (Open)	DTC Troubleshooting (see page 15-47)
56-3	ON	Right Clutch Electromagnetic Coil Current Malfunction	DTC Troubleshooting (see page 15-51)
57-1	ON	Right Clutch Electromagnetic Coil (Open)	DTC Troubleshooting (see page 15-54)
57-2	ON	Right Clutch Electromagnetic Coil (Short)	DTC Troubleshooting (see page 15-56)
57-3	ON	Right Clutch Electromagnetic Coil (Open)	DTC Troubleshooting (see page 15-54)
76-1	ON	Rear Differential Fluid Overheats	DTC Troubleshooting (see page 15-57)
77-1	ON	The Functional Abnormalities of Fuel and Emissions	DTC Troubleshooting (see page 15-58)
77-2	ON	The Functional Abnormalities of VSA Modulator-Control Unit	DTC Troubleshooting (see page 15-58)
77-4 ^{*2}	ON	The Functional Abnormalities of Automatic Transmission	DTC Troubleshooting (see page 15-59)
77-5	ON	Yaw Rate-Lateral/Longitudinal Acceleration Sensor Malfunction	DTC Troubleshooting (see page 15-58)
77-6	ON	Steering Angle Sensor Malfunction	DTC Troubleshooting (see page 15-58)
78-xx	ON	SH-AWD Control Unit Self-Diagnostic Malfunction	DTC Troubleshooting (see page 15-59)
81-1	ON	Left Search Coil Sensor Malfunction	DTC Troubleshooting (see page 15-60)
82-1	ON	Right Search Coil Sensor Malfunction	DTC Troubleshooting (see page 15-62)
91-1	ON	SH-AWD Control Unit Programming Error	DTC Troubleshooting (see page 15-65)

NOTE: The "x" at the end of each DTC denotes a numeric character (0 thru 9) or an alpha character (A thru F) that you will see on the HDS display. The character is unrelated to your troubleshooting; it designates the SH-AWD control unit manufacturer and other details used for product analysis.

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

*2: A/T model



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 15-65).	Low battery voltage
The SH-AWD indicator does not come on	Symptom troubleshooting (see page 15-66).	
Gear or bearing noises	- Inspect and/or replace the rear differential fluid (see page 15-68). - Inspect the side case clearance (see page 15-82). - Replace the rear differential carrier assembly.	- Worn or cupped tires - Tire inflation - Fluid condition - Incorrect side case clearance - Damaged or chipped gears - Incorrect tire size (rolling circumference)
Rear differential overheats	- Inspect and/or replace the rear differential fluid (see page 15-68). - Inspect the tires.	- Fluid condition - Incorrect tire size (rolling circumference)
Rear differential leaks fluid	- Inspect fluid leaks. - Inspect and/or replace the rear differential fluid (see page 15-68). - Replace the side case oil seal (see page 15-79). - Replace the center case assembly (see page 15-80).	- Fluid condition - Clogged breather hose - Worn or damaged oil seal - Damaged sealing washer - Loose mounting bolts or inadequate sealing
Rear differential screeches, whines, moans, or squeaks	- Inspect and/or replace the rear differential fluid (see page 15-68). - Inspect the tires. - Replace the rear differential carrier assembly.	- Worn or cupped tires - Tire inflation - Fluid condition - Incorrect tire size (rolling circumference) - Damaged oil pump
Noise during acceleration, or when accelerating from a full stop	- Inspect the side case clearance (see page 15-82). - Inspect the tires. - Replace the rear differential carrier assembly.	- Worn or cupped tires - Tire inflation - Incorrect side case clearance - Incorrect tire size (rolling circumference)
HDS does not communicate with the SH-AWD control unit or the vehicle	Troubleshooting the DLC circuit (see page 11-258).	

Rear Differential

System Description

SH-AWD System

Outline

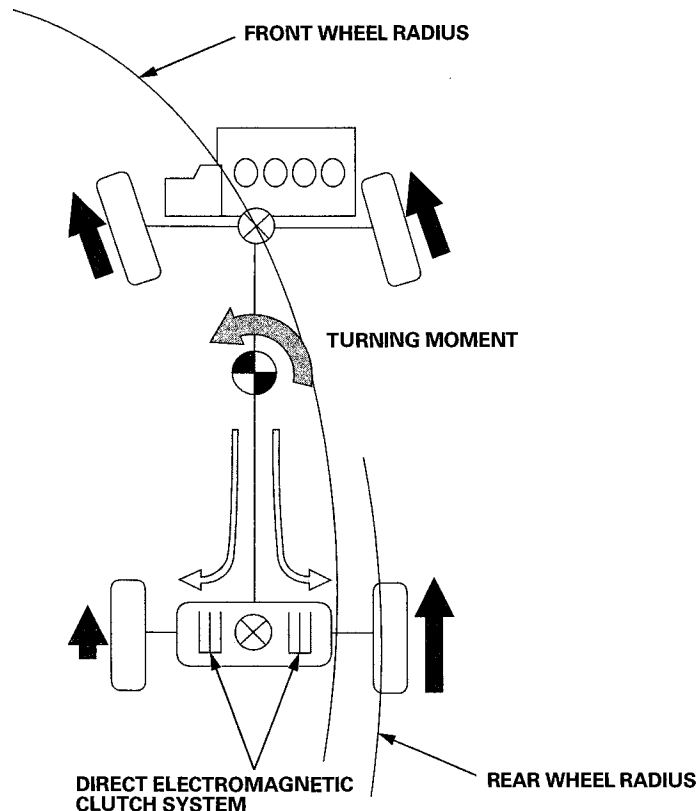
This vehicle is equipped with a Super Handling All-Wheel Drive® (SH-AWD®) rear differential system. This system uses the electromagnetic clutches and the SH-AWD control unit to control front to rear torque distribution and independent left to right rear torque distribution. This allows the system to function 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

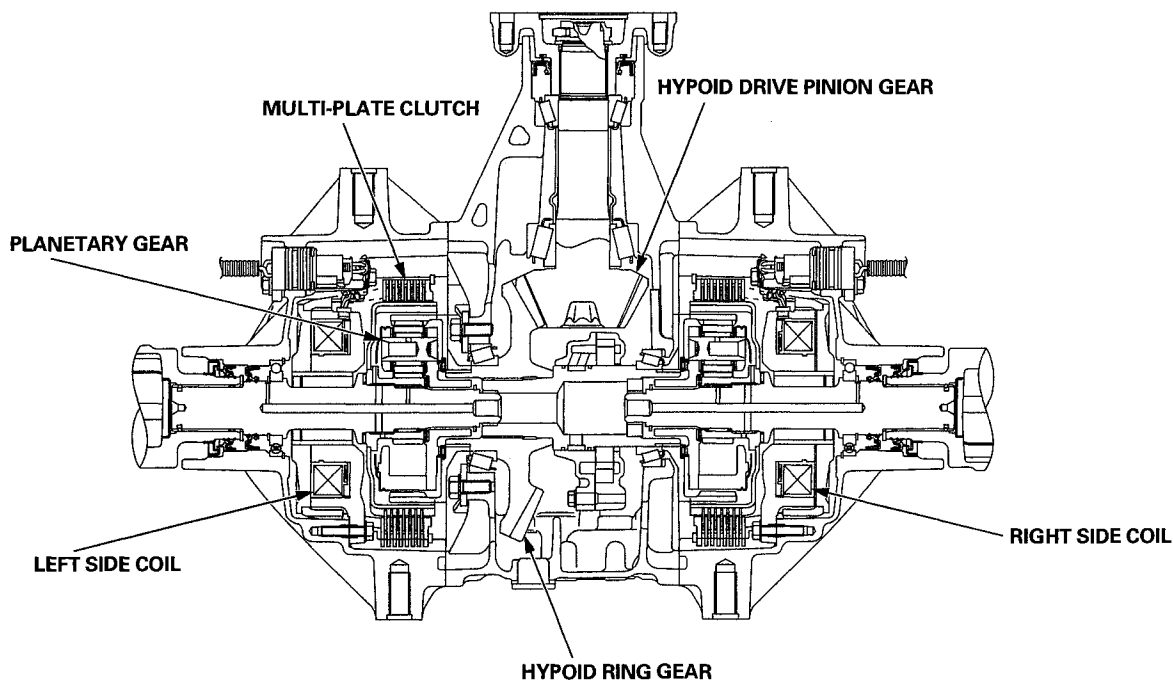
In a normal turn, the radius of the front wheels is shorter than the radius that the rear wheels travel. If the front and rear wheels are driven at the same speed, full power is not transmitted. The SH-AWD system monitors the speed of the front wheels and increases the speed of the outside rear wheel proportionally 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 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)

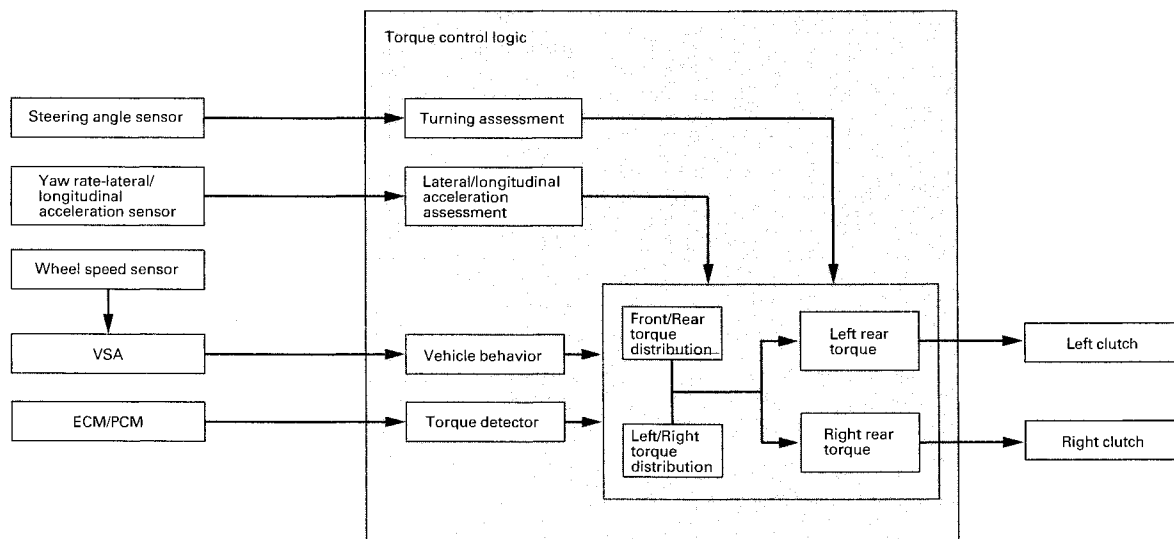
SH-AWD 4WD Control System

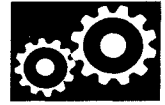
Control System

The SH-AWD control system consists of a SH-AWD control unit, the ECM/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 is 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.



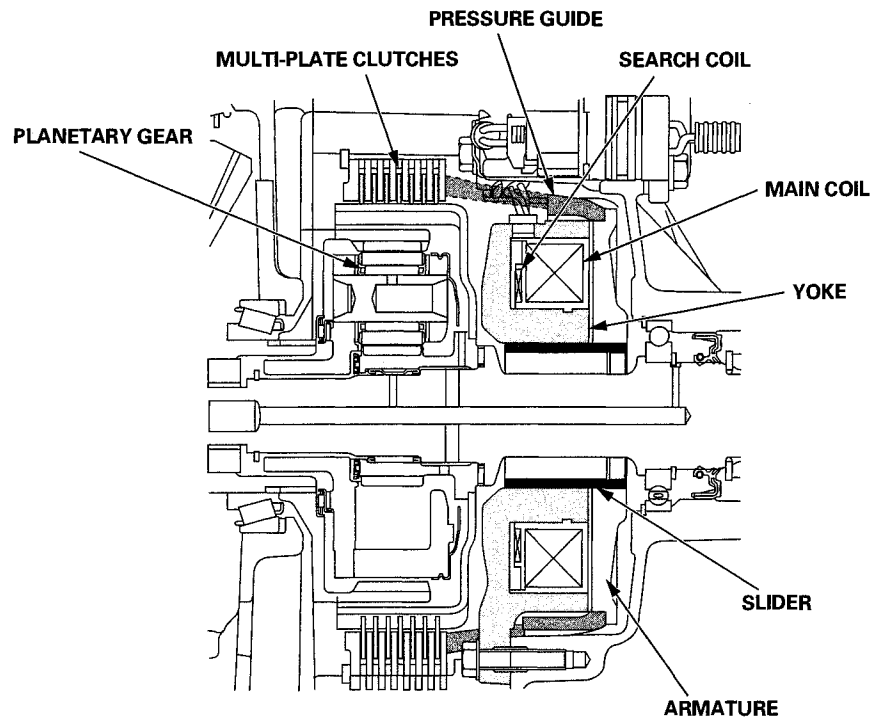


Electromagnetic Clutch System

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



(cont'd)

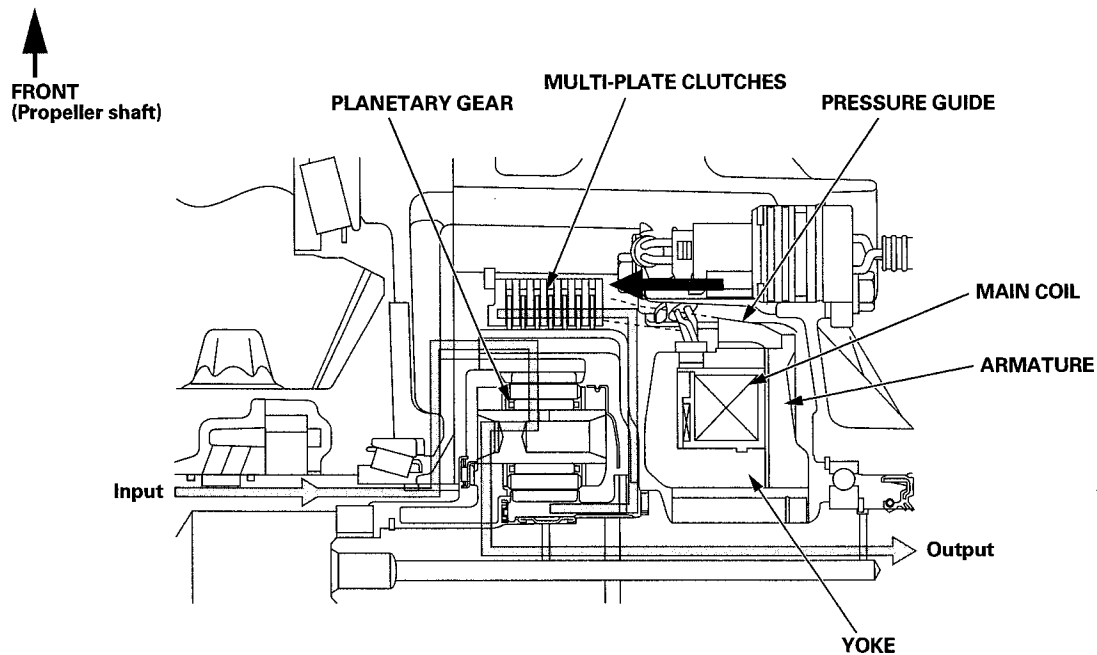
Rear Differential

System Description (cont'd)

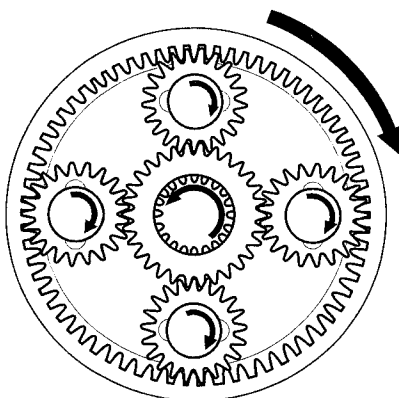
Electromagnetic Clutch System (cont'd)

Operation

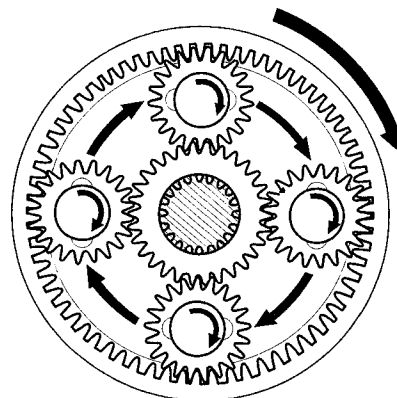
The SH-AWD control unit receives inputs from the ECM/PCM and the VSA modulator-control unit on the driving conditions via the CAN. The SH-AWD control unit sends signals to the main coils, which engage the electromagnetic clutches that connect the planetary gear set. This increases the torque applied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

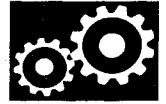


WHEN THERE IS NO THRUST



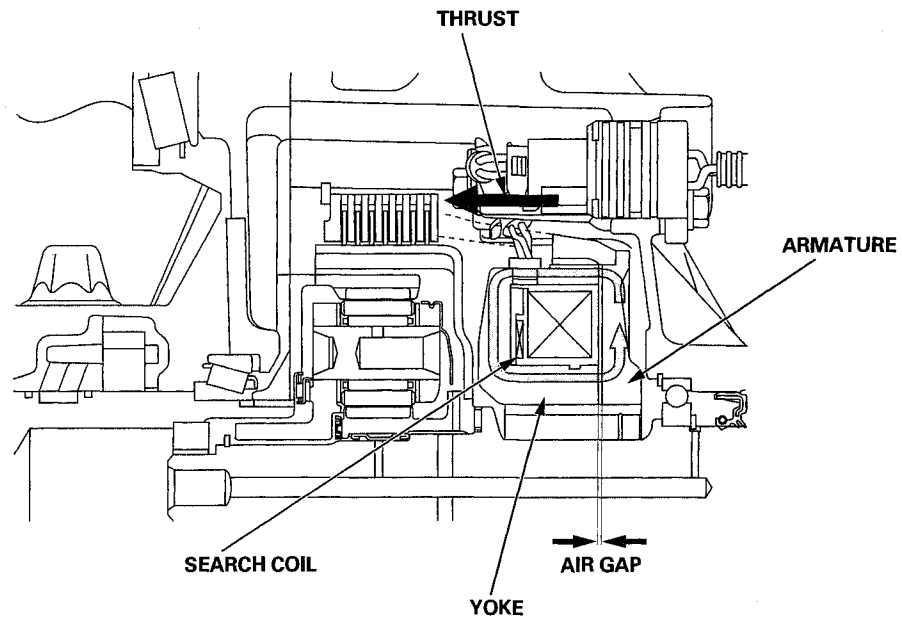
WHEN THRUST IS GENERATED





Search Coil Detection System

As the clutch discs wear, the air gap between the pressure guides and the multi-plate clutches decrease. 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.



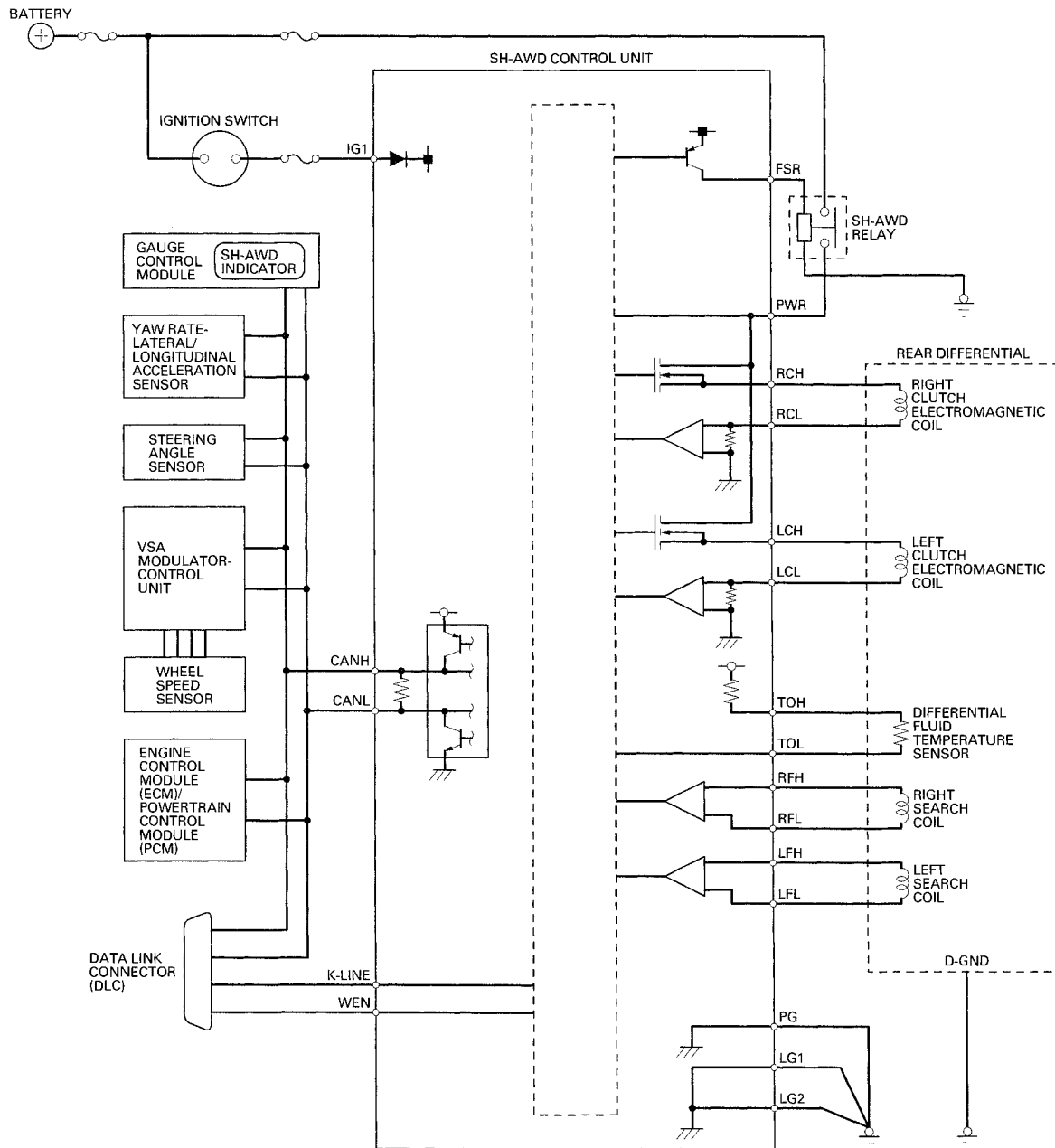
(cont'd)

Rear Differential

System Description (cont'd)

Electric Control System

SH-AWD Control Unit Electrical Connections



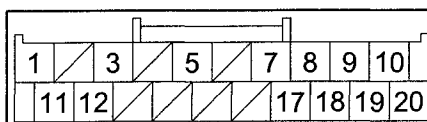
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SH-AWD Control Unit Inputs and Outputs

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 (20P) Terminal Locations



Terminal side of male terminals

Terminal number	Wire color	Signal	Description	Measuring Conditions/Terminal Voltage
A1	BLK	LFH	Detects left search coil signal (positive)	With ignition switch ON (II), or vehicle in ON mode: about 2.5 V
A3	BLU	RFH	Detects right search coil signal (positive)	With ignition switch ON (II), or vehicle in ON mode: about 2.5 V
A5	LT BLU	K-LINE	Communication line SH-AWD control unit-to-DLC	With ignition switch ON (II), or vehicle in ON mode: about 0 V or battery voltage
A7	GRY	IG1	Power supply for SH-AWD control unit	With ignition switch ON (II), or vehicle in ON mode: battery voltage
A8	GRN	TOL	Detects differential fluid temperature sensor (negative)	With ignition switch ON (II), or vehicle in ON mode: about 0.2 V to 4.7 V (Depending on rear differential fluid temperature)
A9	BLK	LG1	Unit ground	With ignition switch ON (II), or vehicle in ON mode: about 0 V
A10	WHT	CANH	F-CAN communication signal	With ignition switch ON (II), or vehicle in ON mode: about 2.5 V to 4.0 V
A11	RED	LFL	Detects left search coil signal (negative)	With ignition switch ON (II), or vehicle in ON mode: about 2.5 V
A12	RED	RFL	Detects right search coil signal (negative)	With ignition switch ON (II), or vehicle in ON mode: about 2.5 V
A17	ORN	FSR	Drives SH-AWD relay	With ignition switch ON (II), or vehicle in ON mode: about 0 V to battery voltage
A18	WHT	TOH	Power supply for differential fluid temperature sensor	With ignition switch ON (II), or vehicle in ON mode: about 4.7 V to 5.0 V
A19	RED	WEN	Detects write enable signal	With ignition switch ON (II), or vehicle in ON mode: about 0 V
A20	BLK	CANL	F-CAN communication signal	With ignition switch ON (II), or vehicle in ON mode: about 2.5 V to 1.0 V

(cont'd)

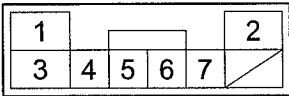
Rear Differential

System Description (cont'd)

SH-AWD Control Unit Inputs and Outputs (cont'd)

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

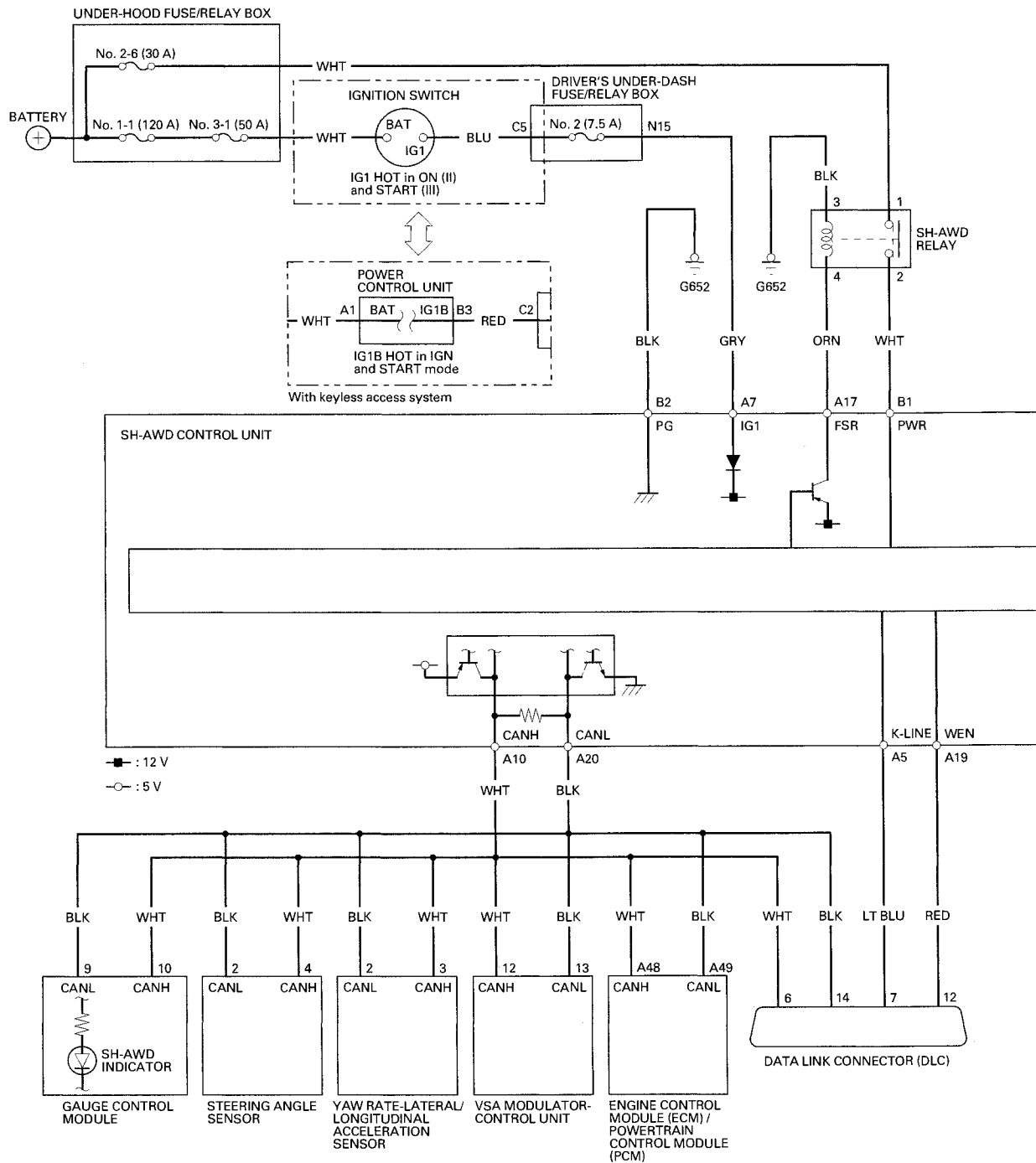
Terminal number	Wire color	Signal	Description	Measuring Conditions/Terminal Voltage
B1	WHT	PWR	Power supply for SH-AWD actuator	With engine running: battery voltage
B2	BLK	PG	Actuator ground	With ignition switch ON (II), or vehicle in ON mode: about 0 V
B3	BLK	LG2	Unit ground	With ignition switch ON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

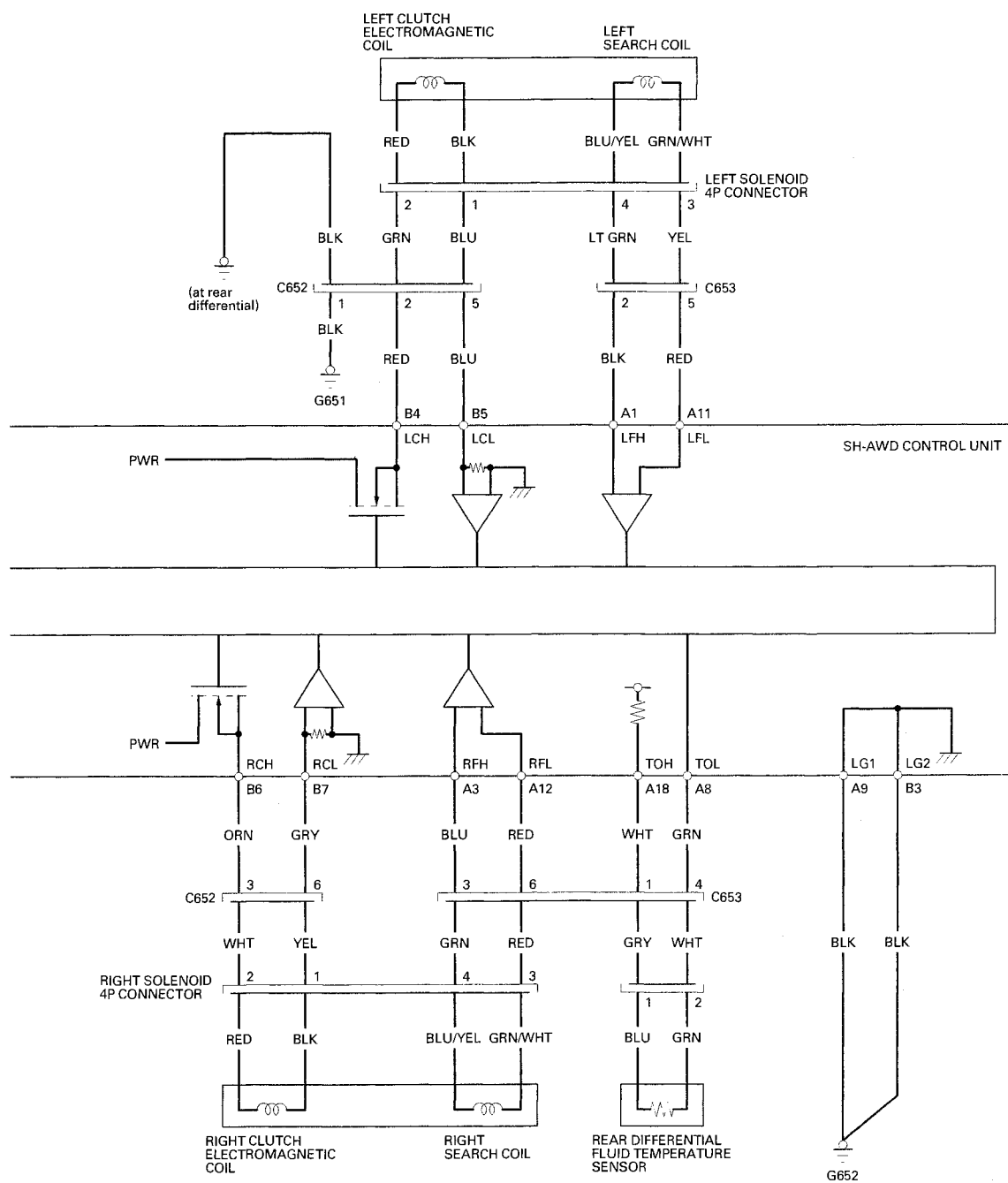
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Rear Differential

Circuit Diagram





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), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn the ignition switch back to ON (II), or select the OFF mode, then the ON mode.
4. 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 5.

5. Check for DTCs with the HDS.

Is DTC 12-1, 12-2, or 12-3 indicated?

YES—Go to step 6.

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

6. Test-drive the vehicle with an assistant. Drive in a left and right zig-zag pattern at about 13 mph (20 km/h) and check the LATERAL ACCELERATION SENSOR in the SH-AWD mode menu DATA LIST with the HDS.

Does the sensor value change when turning?

YES—Go to step 7.

NO—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

7. Park the vehicle on a level surface.

8. Check the LATERAL ACCELERATION SENSOR in the SH-AWD mode menu DATA LIST with the HDS.

Is there 0.1G or less?

YES—Go to step 9.

NO—Do the yaw rate-lateral/longitudinal acceleration neutral position memorization (see page 15-9), and recheck.

9. Check the LATERAL ACCELERATION SENSOR in the VSA DATA LIST with the HDS.

Is there 0.1G or less?

YES—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

NO—Replace the yaw rate-lateral/longitudinal acceleration sensor (see page 19-117). ■



DTC 15-1: Longitudinal Acceleration Sensor Malfunction

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

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Test-drive the vehicle for 2 minutes in a vehicle speed is kept constant at 19 mph (30 km/h).
4. Check for DTCs in the VSA system with the HDS.

Are any longitudinal acceleration sensor DTCs indicated?

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

NO—Go to step 5.

5. Check for DTCs with the HDS.

Is DTC 15-1 indicated?

YES—Go to step 6.

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

6. Test-drive the vehicle with an assistant. When accelerating, check the LONGITUDINAL ACCELERATION SENSOR in the SH-AWD mode menu DATA LIST with the HDS.

Does the sensor value change when acceleration?

YES—Go to step 7.

NO—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

7. Park the vehicle on a level surface.
8. Check the LONGITUDINAL ACCELERATION SENSOR in the SH-AWD mode menu DATA LIST with the HDS.

Is there 0.1G or less?

YES—Go to step 9.

NO—Do the yaw rate-lateral/longitudinal acceleration neutral position memorization (see page 15-9), and recheck.

9. Check the LONGITUDINAL ACCELERATION SENSOR in the VSA DATA LIST with the HDS.

Is there 0.1G or less?

YES—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

NO—Replace the yaw rate-lateral/longitudinal acceleration sensor (see page 19-117). ■

Rear Differential

DTC Troubleshooting (cont'd)

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), or press the engine start/stop button to select the ON mode.

2. Clear the DTC with the HDS.

3. Test-drive the vehicle for 2 minutes in a straight line at 19 mph (30 km/h) or more.

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. Check for DTCs with the HDS.

Is DTC 16-3 indicated?

YES—Go to step 6.

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

6. Start the engine.

7. Check the STEERING ANGLE SENSOR in the SH-AWD mode menu DATA LIST with the HDS.

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

YES—Go to step 8.

NO—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

8. Test-drive the vehicle in a straight line at 19 mph (30 km/h) or more.

9. Park the vehicle on a level surface, and center the steering wheel.

10. Check the STEERING ANGLE SENSOR in the SH-AWD mode menu DATA LIST with the HDS.

Is it within ± 25 deg of center?

YES—Go to step 11.

NO—Do the steering angle sensor center point writing (see page 19-117), and recheck.

11. Check the STEERING ANGLE SENSOR in the VSA DATA LIST with the HDS.

Is it within ± 25 deg of center?

YES—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

NO—Replace the steering angle sensor (see page 19-115). ■



DTC 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), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn the ignition switch back to ON (II), or select the OFF mode, then the ON mode.
4. 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 5.

5. Check for DTCs with the HDS.

Is DTC 33-2 or 33-3 indicated?

YES—Go to step 6.

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

6. Test-drive the vehicle with an assistant. Drive in a left and right zig-zag pattern at about 13 mph (20 km/h) and check the YAW RATE SENSOR in the SH-AWD mode menu DATA LIST with the HDS.

Does the sensor value change when turning?

YES—Go to step 7.

NO—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

7. Park the vehicle on a level surface.
8. Check the YAW RATE SENSOR in the SH-AWD mode menu DATA LIST with the HDS.

Is there 3.5 deg/s or less?

YES—Go to step 9.

NO—Do the yaw rate-lateral/longitudinal acceleration neutral position memorization (see page 15-9), and recheck.

9. Check the YAW RATE SENSOR in the VSA DATA LIST with the HDS.

Is there 3.5 deg/s or less?

YES—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

NO—Replace the yaw rate-lateral/longitudinal acceleration sensor (see page 19-117). ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 41-1: F-CAN Malfunction (Lost Communication with Engine Control Module (ECM)/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), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs in the PGM-FI system with the HDS.

Are there any PGM-FI system DTCs indicated?

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

NO—Go to step 5.

5. Check for DTCs with the HDS.

Is DTC 41-1 indicated?

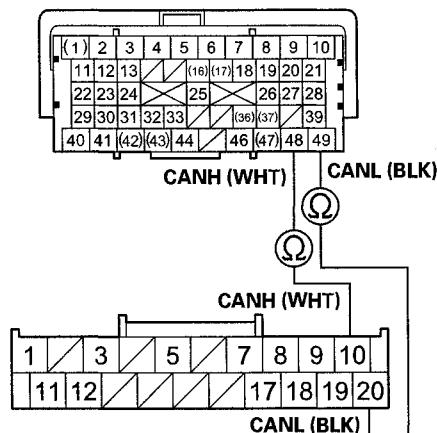
YES—Go to step 6.

NO—Intermittent failure, the system is OK at this time. Check for an intermittent open between SH-AWD control unit connector terminals A10 and A20 and ECM/PCM connector terminals A48 and A49. ■

6. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
7. Jump the SCS line with the HDS.
NOTE: This step must be done to prevent ECM/PCM damage.
8. Disconnect ECM/PCM connector A (49P).
9. Disconnect SH-AWD control unit connector A (20P).

10. Check for continuity between ECM/PCM connector terminals A48, A49 and SH-AWD control unit connector terminals A10, A20 respectively.

ECM/PCM CONNECTOR A (49P)
Terminal side of female terminals



SH-AWD CONTROL UNIT CONNECTOR A (20P)
Wire side of female terminals

Is there continuity?

YES—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

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



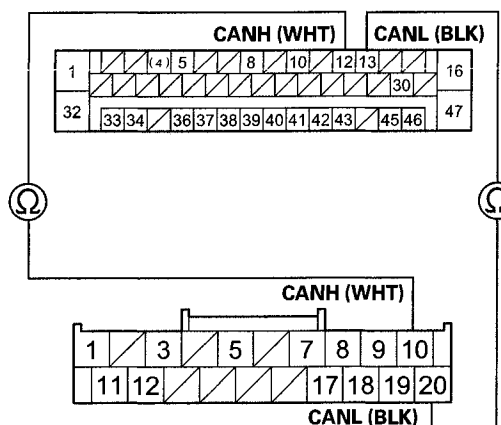
DTC 41-2: F-CAN Malfunction (Lost Communication with VSA Modulator-Control Unit)

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

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs in the PGM-FI system with the HDS.
Are there any PGM-FI system DTCs indicated?
YES—Go to the indicated DTC's troubleshooting. ■
NO—Go to step 5.
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 an intermittent open between SH-AWD control unit connector terminals A10 and A20 and VSA modulator-control unit 47P connector terminals No. 12 and No. 13. ■
6. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
7. Disconnect the VSA modulator-control unit 47P connector.
8. Disconnect SH-AWD control unit connector A (20P).

9. Check for continuity between VSA modulator-control unit 47P connector terminals No. 12, No. 13 and SH-AWD control unit connector terminals A10, A20 respectively.

VSA MODULATOR-CONTROL UNIT 47P CONNECTOR
Wire side of female terminals



SH-AWD CONTROL UNIT CONNECTOR A (20P)
Wire side of female terminals

Is there continuity?

YES—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

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 41-4: F-CAN Malfunction (Lost Communication with A/T Control System)

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

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs in the A/T system with the HDS.

Are there any A/T system DTCs indicated?

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

NO—Go to step 5.

5. Check for DTCs with the HDS.

Is DTC 41-4 indicated?

YES—Go to step 6.

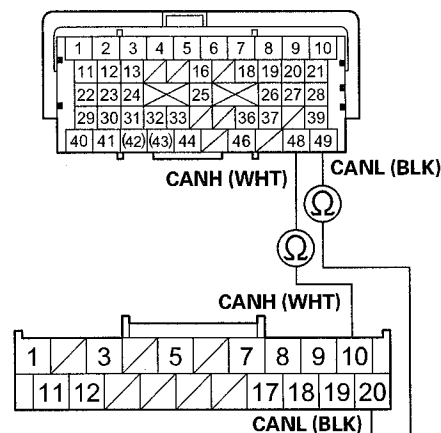
NO—Intermittent failure, the system is OK at this time. Check for an intermittent open between SH-AWD control unit connector terminals A10 and A20 and PCM connector terminals A48 and A49. ■

6. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
7. Jump the SCS line with the HDS.

NOTE: This step must be done to prevent PCM damage.
8. Disconnect PCM connector A (49P).
9. Disconnect SH-AWD control unit connector A (20P).

10. Check for continuity between PCM connector terminals A48, A49 and SH-AWD control unit connector terminals A10, A20 respectively

PCM CONNECTOR A (49P)
Terminal side of female terminals



SH-AWD CONTROL UNIT CONNECTOR A (20P)
Wire side of female terminals

Is there continuity?

YES—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

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



DTC 41-5: F-CAN Malfunction (Lost Communication with Yaw Rate-Lateral/Longitudinal Acceleration Sensor)

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

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs in the VSA system with the HDS.

Are any yaw rate-lateral/longitudinal acceleration sensor DTCs of F-CAN indicated?

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

NO—Go to step 5.

5. Check for DTCs with the HDS.

Is DTC 41-5 indicated?

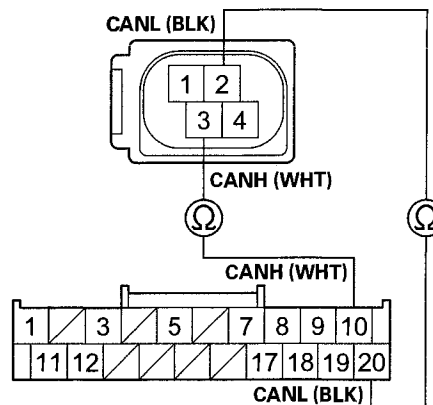
YES—Go to step 6.

NO—Intermittent failure, the system is OK at this time. Check for an intermittent open between SH-AWD control unit connector terminals A10 and A20 and yaw rate-lateral/longitudinal acceleration sensor 4P connector terminals No. 2 and No. 3. ■

6. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
7. Disconnect the yaw rate-lateral/longitudinal acceleration sensor 4P connector.
8. Disconnect SH-AWD control unit connector A (20P).

9. Check for continuity between yaw-rate lateral/longitudinal acceleration sensor 4P connector terminals No. 2, No. 3 and SH-AWD control unit connector terminals A10, A20 respectively.

YAW RATE-LATERAL/LONGITUDINAL ACCELERATION SENSOR 4P CONNECTOR
Wire side of female terminals



SH-AWD CONTROL UNIT CONNECTOR A (20P)
Wire side of female terminals

Is there continuity?

YES—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

NO—Repair an open in the wire between the SH-AWD control unit and the yaw rate-lateral/longitudinal acceleration sensor. ■

Rear Differential

DTC Troubleshooting (cont'd)

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), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Start the engine.
4. 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 5.

5. Check for DTCs with the HDS.

Is DTC 41-6 indicated?

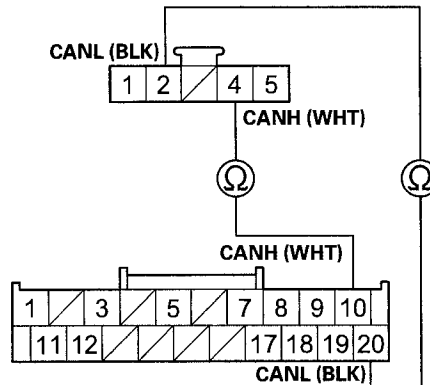
YES—Go to step 6.

NO—Intermittent failure, the system is OK at this time. Check for an intermittent open between SH-AWD control unit connector terminals A10 and A20 and steering angle sensor 5P connector terminals No. 2 and No. 4. ■

6. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
7. Disconnect the steering angle sensor 5P connector.
8. Disconnect SH-AWD control unit connector A (20P).

9. Check for continuity between steering angle sensor 5P connector terminals No. 2, No. 4 and SH-AWD control unit connector terminals A10, A20 respectively.

STEERING ANGLE SENSOR 5P CONNECTOR
Wire side of female terminals



SH-AWD CONTROL UNIT CONNECTOR A (20P)
Wire side of female terminals

Is there continuity?

YES—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

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



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), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn the ignition switch back to ON (II), or select the OFF mode, then the ON mode.
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), or press the engine start/stop button to select the OFF mode.
6. Disconnect the rear differential fluid temperature sensor 2P connector.
7. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
8. Check the REAR DIFFERENTIAL FLUID TEMPERATURE SENSOR in the DATA LIST with the HDS.

Is there -18°F (-28°C) or more?

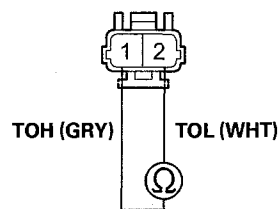
YES—Go to step 9.

NO—Replace the rear differential fluid temperature sensor (see page 15-70). ■

9. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
10. Disconnect SH-AWD control unit connector A (20P).

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 male 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—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

Rear Differential

DTC Troubleshooting (cont'd)

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

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

1. Raise the vehicle on a lift, make sure it is securely supported, and allow all four wheels to rotate freely.
2. Start the engine and turn the VSA off (the VSA OFF lamp in the gauge control module turns on). Run the engine until the vehicle speed reaches 35 mph (56 km/h) and maintain the speed for 10 minutes, then slow down and stop the wheels.
3. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
4. Clear the DTC with the HDS.
5. Turn the ignition switch to LOCK (0), then turn the ignition switch back to ON (II), or select the OFF mode, then the ON mode.
6. Check for DTCs with the HDS.

Is DTC 42-2 indicated?

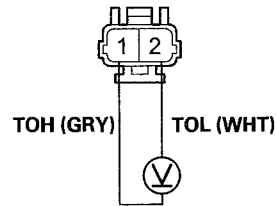
YES—Go to step 7.

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

7. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
8. Disconnect the rear differential fluid temperature sensor 2P connector.
9. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.

10. Measure the voltage between rear differential fluid temperature sensor 2P connector terminals No. 1 and No. 2.

REAR DIFFERENTIAL FLUID TEMPERATURE SENSOR 2P CONNECTOR



Wire side of male terminals

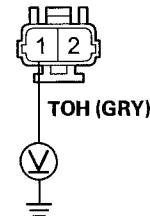
Is there about 4 V?

YES—Replace the rear differential fluid temperature sensor (see page 15-70). ■

NO—Go to step 11.

11. Measure the voltage between rear differential fluid temperature sensor 2P connector terminal No. 1 and body ground.

REAR DIFFERENTIAL FLUID TEMPERATURE SENSOR 2P CONNECTOR



Wire side of male terminals

Is there about 4 V?

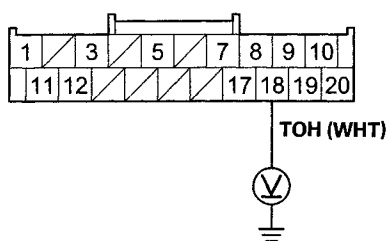
YES—Go to step 16.

NO—Go to step 12.



12. Measure the voltage between SH-AWD control unit connector terminal A18 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

Is there about 4 V?

YES—Repair an open in the wire between SH-AWD control unit connector terminal A18 and rear differential fluid temperature sensor 2P connector terminal No. 1. ■

NO—Go to step 13.

13. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
14. Disconnect SH-AWD control unit connector A (20P).

15. 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 male terminals

Is there continuity?

YES—Repair a short to body ground in the wire between SH-AWD control unit connector terminal A18 and the rear differential fluid temperature sensor 2P connector. ■

NO—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

16. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
17. Disconnect SH-AWD control unit connector A (20P).

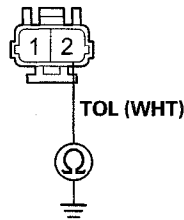
(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

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

REAR DIFFERENTIAL FLUID TEMPERATURE
SENSOR 2P CONNECTOR



Wire side of male terminals

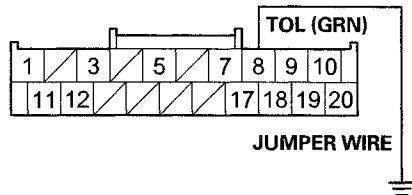
Is there continuity?

YES—Repair a short to body ground in the wire between SH-AWD control unit connector terminal A8 and the rear differential fluid temperature sensor 2P connector. ■

NO—Go to step 19.

19. Connect SH-AWD control unit connector terminal A8 to body ground with a jumper wire.

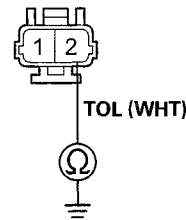
SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

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

REAR DIFFERENTIAL FLUID TEMPERATURE
SENSOR 2P CONNECTOR



Wire side of male terminals

Is there continuity?

YES—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

NO—Repair an open in the wire between SH-AWD control unit connector terminal A8 and the rear differential fluid temperature sensor 2P connector. ■



DTC 43-1: Differential Fluid Temperature Sensor Malfunction

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

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.

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, and let it idle for 1 minute.

5. Test-drive the vehicle for 5 minutes.

6. Check for DTCs with the HDS.

Is DTC 43-1 indicated?

YES—Go to step 7.

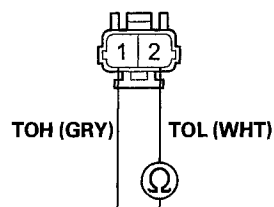
NO—Intermittent failure, the system is OK at this time. ■

7. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.

8. Disconnect SH-AWD control unit connector A (20P) and the rear differential fluid temperature sensor 2P connector.

9. 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 male terminals

Is there continuity?

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

NO—Go to step 10.

10. Reconnect all connectors.

11. Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70).

12. Start the engine, and let it idle for 1 minute.

13. Check for DTCs with the HDS.

Is DTC 43-1 indicated?

YES—Replace the rear differential fluid temperature sensor (see page 15-70). ■

NO—Replace the original SH-AWD control unit (see page 15-70). ■

Rear Differential

DTC Troubleshooting (cont'd)

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), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), then turn the ignition switch back to ON (II), or select the OFF mode, then the ON mode.
4. Check for DTCs with the HDS.

Is DTC 44-11 indicated?

YES—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70).■

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

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), or press the engine start/stop button to select the ON mode.
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), or press the engine start/stop button to select the OFF mode.
6. Remove the SH-AWD relay (see page 15-71), then test the SH-AWD relay (see page 22-88).■

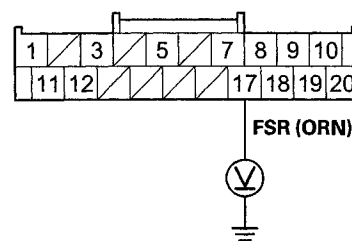
Is the SH-AWD relay OK?

YES—Go to step 7.

NO—Replace the SH-AWD relay (see page 15-71).■

7. Disconnect SH-AWD control unit connector A (20P).
8. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
9. Measure the voltage between SH-AWD control unit connector terminal A17 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

Is there battery voltage?

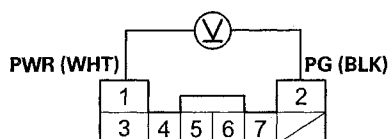
YES—Repair a short to power in the wire between the SH-AWD control unit connector terminal A17 and the SH-AWD relay (FSR line).■

NO—Go to step 10.



10. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
11. Disconnect SH-AWD control unit connector B (8P).
12. 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—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

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

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), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs with the HDS.

Is DTC 44-32 or 44-41 indicated?

YES—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

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

Rear Differential

DTC Troubleshooting (cont'd)

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 the No. 2-6 (30 A) fuse in the under-hood fuse/relay box.

Is the fuse OK?

YES—Go to step 2.

NO—Replace the blown fuse and recheck. If the No. 2-6 (30 A) fuse blows again, repair a short to ground in the wire between the No. 2-6 (30 A) fuse in the under-hood fuse/relay box and the SH-AWD relay 4P connector, then replace the fuse and recheck. ■

2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
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), or press the engine start/stop button to select the OFF mode.
7. Remove the SH-AWD relay (see page 15-71), then test the SH-AWD relay (see page 22-88).

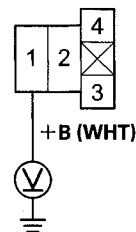
Is the SH-AWD relay OK?

YES—Go to step 8.

NO—Replace the SH-AWD relay (see page 15-71). ■

8. Measure the voltage between SH-AWD relay 4P connector terminal No. 1 and body ground.

SH-AWD RELAY 4P CONNECTOR



Wire side of female terminals

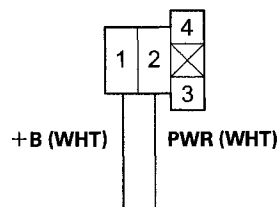
Is there battery voltage?

YES—Go to step 9.

NO—Repair an open in the wire between the No. 2-6 (30 A) fuse in the under-hood fuse/relay box and the SH-AWD relay 4P connector. ■

9. Disconnect SH-AWD control unit connector A (20P) and connector B (8P).
10. Connect SH-AWD relay 4P connector terminals No. 1 and No. 2 with a jumper wire.

SH-AWD RELAY 4P CONNECTOR



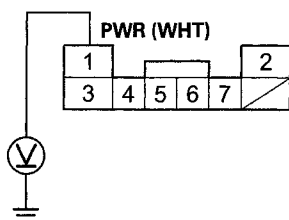
JUMPER WIRE

Wire side of female terminals



11. Measure the voltage between SH-AWD control unit connector terminal B1 and body ground.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

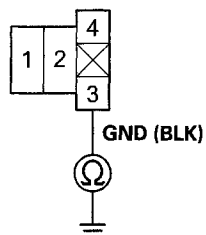
Is there voltage?

YES—Go to step 12.

NO—Repair an open in the wire between SH-AWD control unit connector terminal B1 and the SH-AWD relay 4P connector. ■

12. 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

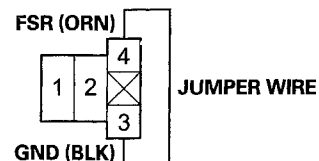
Is there continuity?

YES—Go to step 13.

NO—Repair an open in the wire between the SH-AWD relay 4P connector and body ground, or repair poor body ground at G652. ■

13. Connect SH-AWD relay 4P connector terminals No. 3 and No. 4 with a jumper wire.

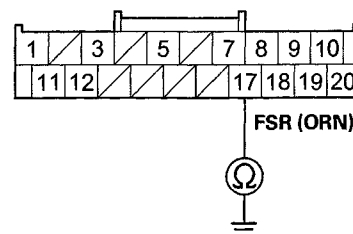
SH-AWD RELAY 4P CONNECTOR



Wire side of female terminals

14. Check for continuity between SH-AWD control unit connector terminal A17 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

Is there continuity?

YES—Check for loose connector terminals at the SH-AWD control unit. If the connections are OK, update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

NO—Repair an open in the wire between SH-AWD control unit connector terminal A17 and the SH-AWD relay 4P connector. ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 49-1: SH-AWD Control Unit (PG Line Open)

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

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs with the HDS.

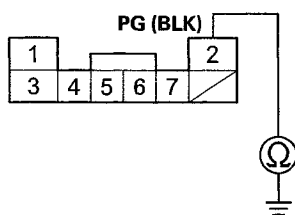
Is DTC 49-1 indicated?

YES—Go to step 5.

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

5. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
6. Disconnect SH-AWD control unit connector B (8P).
7. 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—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70).■

NO—Repair an open in the wire between SH-AWD control unit connector terminal B2 and body ground, or repair poor body ground at G652.■

DTC 52-3: Left Clutch Electromagnetic Coil Current Malfunction

NOTE:

- Before you troubleshoot, review the general troubleshooting information (see page 15-4).
- If DTC 49-1 is stored at the same time as DTC 52-3, troubleshoot DTC 49-1 first, then recheck for DTC 52-3.

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Do the clutch function test with the HDS (see page 15-67).
4. Check for DTCs with the HDS.

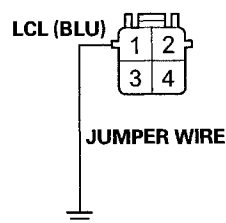
Is DTC 52-3 indicated?

YES—Go to step 5.

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

5. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
6. Disconnect SH-AWD control unit connector B (8P) and the left solenoid 4P connector.
7. Connect left solenoid 4P connector terminal No. 1 to body ground with a jumper wire.

LEFT SOLENOID 4P CONNECTOR



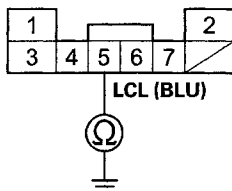
JUMPER WIRE

Wire side of female terminals



8. 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

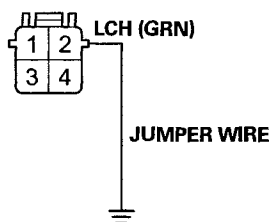
Is there continuity?

YES—Go to step 9.

NO—Repair an open in the wire between the SH-AWD control unit connector terminal B5 and the left solenoid 4P connector. ■

9. Remove the jumper wire from left solenoid 4P connector terminal No. 1.
10. Connect left solenoid 4P connector terminal No. 2 to body ground with a jumper wire.

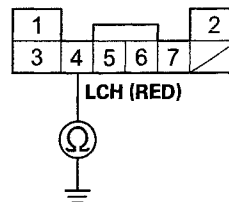
LEFT SOLENOID 4P CONNECTOR



Wire side of female terminals

11. 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

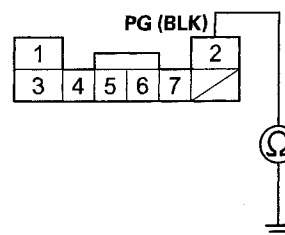
Is there continuity?

YES—Go to step 12.

NO—Repair an open in the wire between SH-AWD control unit connector terminal B4 and the left solenoid 4P connector. ■

12. Remove the jumper wire from left solenoid 4P connector terminal No. 2.
13. 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—Go to step 14.

NO—Repair an open in the wire between SH-AWD control unit connector terminal B2 and body ground (G652), or repair poor body ground (G652). ■

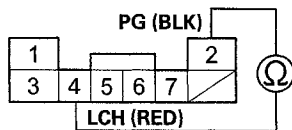
(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

14. Check for continuity between SH-AWD control unit connector terminals B2 and B4.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

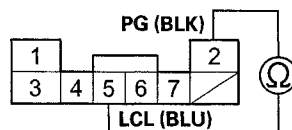
Is there continuity?

YES—Repair a short to body ground in the wire between SH-AWD control unit connector terminal B4 and the left solenoid 4P connector. ■

NO—Go to step 15.

15. 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

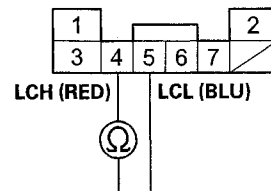
Is there continuity?

YES—Repair a short to body ground in the wire between SH-AWD control unit connector terminal B5 and the left solenoid 4P connector. ■

NO—Go to step 16.

16. 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

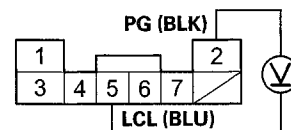
Is there continuity?

YES—Repair a short in the wires between the SH-AWD control unit and the left solenoid 4P connector. ■

NO—Go to step 17.

17. 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 voltage?

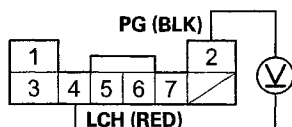
YES—Repair a short to power in the wire between SH-AWD control unit connector terminal B5 and the left solenoid 4P connector. ■

NO—Go to step 18.



18. 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 voltage?

YES—Repair a short to power in the wire between SH-AWD control unit connector terminal B4 and the left solenoid 4P connector.■

NO—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70).■

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), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Do the clutch function test with the HDS (see page 15-67).
4. Check for DTCs with the HDS.

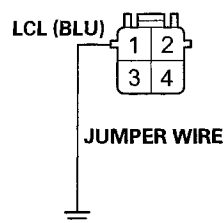
Is DTC 53-1 or 53-3 indicated?

YES—Go to step 5.

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

5. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
6. Disconnect SH-AWD control unit connector B (8P) and the left solenoid 4P connector.
7. Connect left solenoid 4P connector terminal No. 1 to body ground with a jumper wire.

LEFT SOLENOID 4P CONNECTOR



Wire side of female terminals

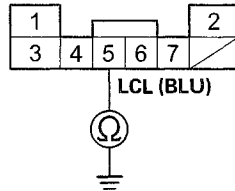
(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

8. 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

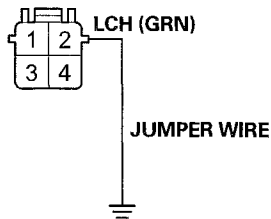
Is there continuity?

YES—Go to step 9.

NO—Repair an open in the wire between SH-AWD control unit connector terminal B5 and the left solenoid 4P connector. ■

9. Remove the jumper wire from left solenoid 4P connector terminal No. 1.
10. Connect left solenoid 4P connector terminal No. 2 to body ground with a jumper wire.

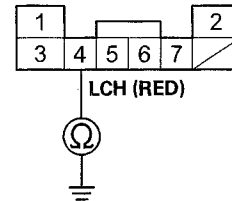
LEFT SOLENOID 4P CONNECTOR



Wire side of female terminals

11. 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 12.

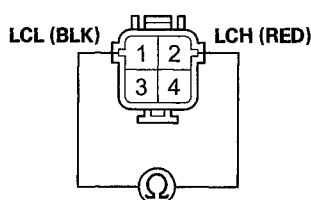
NO—Repair an open in the wire between SH-AWD control unit connector terminal B4 and the left solenoid 4P connector. ■

12. Remove the jumper wire from left solenoid 4P connector terminal No. 2.
13. Reconnect all connectors.
14. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
15. Check the REAR DIFFERENTIAL FLUID TEMPERATURE SENSOR in the SH-AWD mode menu DATA LIST. The temperature should be above 68 °F (20 °C) with the HDS before proceeding to the next step. 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).
16. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
17. Disconnect the left solenoid 4P connector.



18. Measure the resistance between left solenoid 4P connector terminals No. 1 and No. 2.

LEFT SOLENOID 4P CONNECTOR



Wire side of male terminals

Is there 1.8 Ω or more?

YES—Replace the rear differential left side case (see page 15-82). ■

NO—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

DTC 53-2: 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), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Do the clutch function test with the HDS (see page 15-67).
4. Check for DTCs with the HDS.

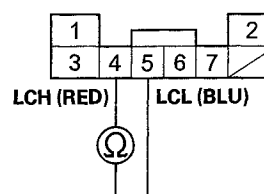
Is DTC 53-2 indicated?

YES—Go to step 5.

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

5. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
6. Disconnect SH-AWD control unit connector B (8P) and the left solenoid 4P connector.
7. 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 8.

8. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.

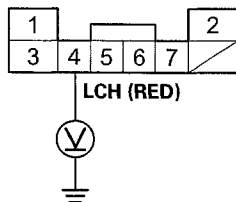
(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

9. 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 voltage?

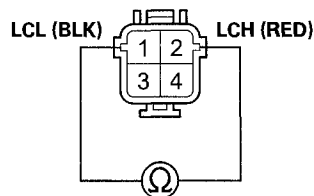
YES—Repair a short to power in the wires between SH-AWD control unit connector terminal B4 and the left solenoid 4P connector. ■

NO—Go to step 10.

10. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
11. Reconnect all connectors.
12. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
13. Check the REAR DIFFERENTIAL FLUID TEMPERATURE SENSOR in the SH-AWD mode menu DATA LIST. The temperature should be above 68 °F (20 °C) with the HDS before proceeding to the next step. 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).
14. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
15. Disconnect the left solenoid 4P connector.

16. Measure the resistance between left solenoid 4P connector terminals No. 1 and No. 2.

LEFT SOLENOID 4P CONNECTOR



Wire side of male terminals

Is there 0.45 Ω or less?

YES—Replace the rear differential left side case (see page 15-82). ■

NO—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■



DTC 56-3: Right Clutch Electromagnetic Coil Current Malfunction

NOTE:

- Before you troubleshoot, review the general troubleshooting information (see page 15-4).
- If DTC 49-1 is stored at the same time as DTC 56-3, troubleshoot DTC 49-1 first, then recheck for DTC 56-3.

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Do the clutch function test with the HDS (see page 15-67).
4. Check for DTCs with the HDS.

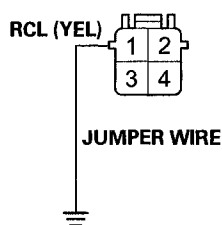
Is DTC 56-3 indicated?

YES—Go to step 5.

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

5. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
6. Disconnect SH-AWD control unit connector B (8P) and the right solenoid 4P connector.
7. Connect right solenoid 4P connector terminal No. 1 to body ground with a jumper wire.

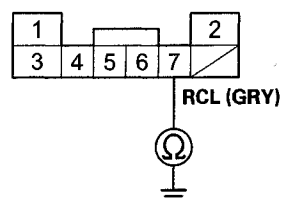
RIGHT SOLENOID 4P CONNECTOR



Wire side of female terminals

8. 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

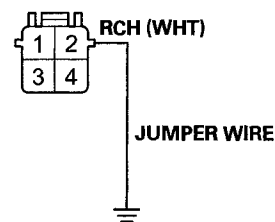
Is there continuity?

YES—Go to step 9.

NO—Repair an open in the wire between SH-AWD control unit connector terminal B7 and the right solenoid 4P connector. ■

9. Remove the jumper wire from right solenoid 4P connector terminal No. 1.
10. Connect right solenoid 4P connector terminal No. 2 to body ground with a jumper wire.

RIGHT SOLENOID 4P CONNECTOR



Wire side of female terminals

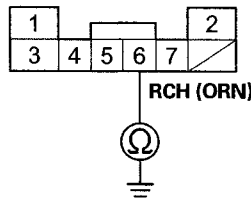
(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

11. 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

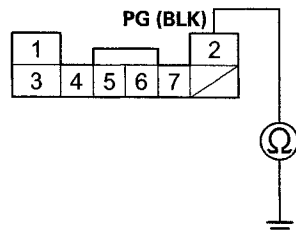
Is there continuity?

YES—Go to step 12.

NO—Repair an open in the wire between SH-AWD control unit connector terminal B6 and the right solenoid 4P connector.■

12. Remove the jumper wire from right solenoid 4P connector terminal No. 2.
13. 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

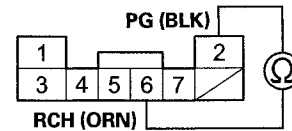
Is there continuity?

YES—Go to step 14.

NO—Repair an open in the wire between SH-AWD control unit connector terminal B2 and body ground (G652), or repair poor body ground (G652).■

14. Check for continuity between SH-AWD control unit connector terminals B2 and B6.

SH-AWD CONTROL UNIT CONNECTOR B (8P)



Wire side of female terminals

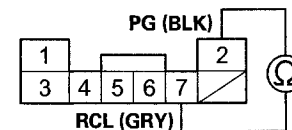
Is there continuity?

YES—Repair a short to body ground in the wire between SH-AWD control unit connector terminal B6 and the right solenoid 4P connector.■

NO—Go to step 15.

15. 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

Is there continuity?

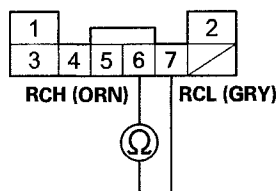
YES—Repair a short to body ground in the wire between SH-AWD control unit connector terminal B7 and the right solenoid 4P connector.■

NO—Go to step 16.



16. 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

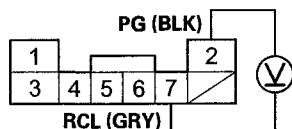
Is there continuity?

YES—Repair a short in the wires between the SH-AWD control unit and the right solenoid 4P connector. ■

NO—Go to step 17.

17. 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

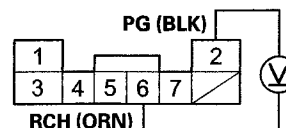
Is there voltage?

YES—Repair a short to power in the wire between the SH-AWD control unit connector terminal B7 and the right solenoid 4P connector. ■

NO—Go to step 18.

18. 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 voltage?

YES—Repair a short to power in the wire between SH-AWD control unit connector terminal B6 and the right solenoid 4P connector. ■

NO—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

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), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Do the clutch function test with the HDS (see page 15-67).
4. Check for DTCs with the HDS.

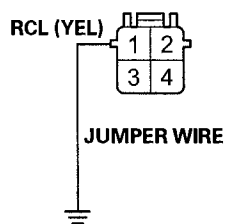
Is DTC 57-1 or 57-3 indicated?

YES—Go to step 5.

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

5. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
6. Disconnect SH-AWD control unit connector B (8P) and the right solenoid 4P connector.
7. Connect right solenoid 4P connector terminal No. 1 to body ground with a jumper wire.

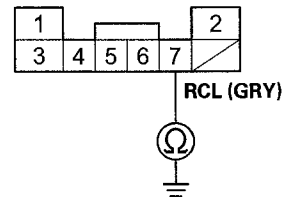
RIGHT SOLENOID 4P CONNECTOR



Wire side of female terminals

8. 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

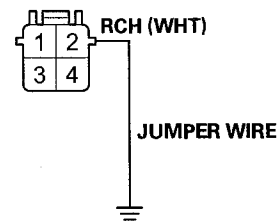
Is there continuity?

YES—Go to step 9.

NO—Repair an open in the wire between SH-AWD control unit connector terminal B7 and the right solenoid 4P connector. ■

9. Remove the jumper wire from right solenoid 4P connector terminal No. 1.
10. Connect right solenoid 4P connector terminal No. 2 to body ground with a jumper wire.

RIGHT SOLENOID 4P CONNECTOR

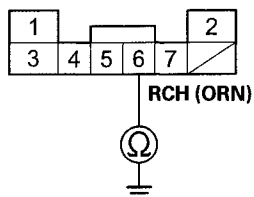


Wire side of female terminals



11. 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?

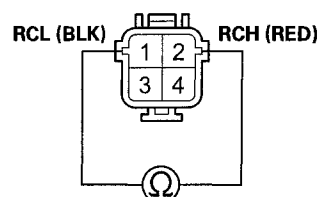
YES—Go to step 12.

NO—Repair an open in the wire between SH-AWD control unit connector terminal B6 and the right solenoid 4P connector. ■

12. Remove the jumper wire from right solenoid 4P connector terminal No. 2.
13. Reconnect all connectors.
14. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
15. Check the REAR DIFFERENTIAL FLUID TEMPERATURE SENSOR in the SH-AWD mode menu DATA LIST. The temperature should be above 68 °F (20 °C) with the HDS before proceeding to the next step. 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).
16. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
17. Disconnect the right solenoid 4P connector.

18. Measure the resistance between right solenoid 4P connector terminals No. 1 and No. 2.

RIGHT SOLENOID 4P CONNECTOR



Wire side of male terminals

Is there 1.8 Ω or more?

YES—Replace the rear differential right side case (see page 15-82). ■

NO—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

Rear Differential

DTC Troubleshooting (cont'd)

DTC 57-2: 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), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Do the clutch function test with the HDS (see page 15-67).
4. Check for DTCs with the HDS.

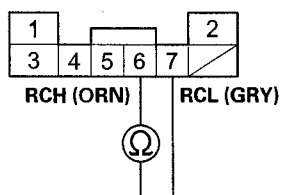
Is DTC 57-2 indicated?

YES—Go to step 5.

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

5. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
6. Disconnect SH-AWD control unit connector B (8P) and the right solenoid 4P connector.
7. 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?

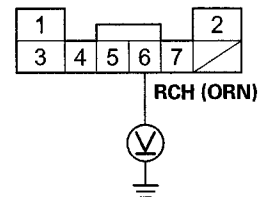
YES—Repair a short in the wires between SH-AWD control unit connector terminals B6 and B7. ■

NO—Go to step 8.

8. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.

9. 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 voltage?

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

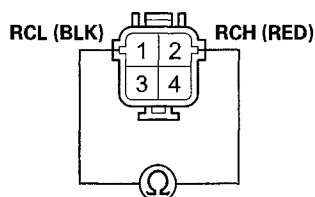
NO—Go to step 10.

10. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
11. Reconnect all connectors.
12. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
13. Check the REAR DIFFERENTIAL FLUID TEMPERATURE SENSOR in the SH-AWD mode menu DATA LIST. The temperature should be above 68 °F (20 °C) with the HDS before proceeding to the next step. 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).
14. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
15. Disconnect the right solenoid 4P connector.



16. Measure the resistance between right solenoid 4P connector terminals No. 1 and No. 2.

RIGHT SOLENOID 4P CONNECTOR



Wire side of male terminals

Is there 0.45 Ω or less?

YES—Replace the rear differential right side case (see page 15-82). ■

NO—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

DTC 76-1: Rear Differential Fluid Overheats

NOTE:

- Before you troubleshoot, review the general troubleshooting information (see page 15-4).
- 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 15-68). If it is low, refill it, clear the DTC, and recheck.

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.

2. 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 3.

3. Clear the DTC with the HDS.

4. Start the engine.

5. Test-drive the vehicle at 10 mph (15 km/h), and check for WHEEL SPEED in the DATA LIST with the HDS.

Are all wheel speed the same?

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

NO—Go to step 6.

6. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.

7. Check for rear brake drag.

Are the rear brakes OK?

YES—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

NO—Inspect and repair the rear brakes (see page 19-4).

Rear Differential

DTC Troubleshooting (cont'd)

DTC 77-1: The Functional Abnormalities of Fuel and Emissions

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

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
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 PGM-FI system with the HDS.

Are there any PGM-FI system DTCs indicated?

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

NO—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70).■

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

DTC 77-5: Yaw Rate-Lateral/Longitudinal Acceleration Sensor Malfunction

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), or press the engine start/stop button to select the ON mode.

2. Clear the DTC with the HDS.

3. Start the engine.

4. Check for DTCs with the HDS.

Is DTC 77-2, 77-5, or 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 there VSA system DTCs indicated?

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

NO—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70).■



DTC 77-4: The Functional Abnormalities of Automatic Transmission

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

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs with the HDS.

Is DTC 77-4 indicated?

YES—Go to step 5.

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

5. Check for DTCs in the A/T system with the HDS.

Are there any A/T system DTCs indicated?

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

NO—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70).■

DTC 78-xx ("x" can be 0 thru 9 or A thru F): 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), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for DTCs with the HDS.

Is DTC 78-xx indicated?

YES—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70).■

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

Rear Differential

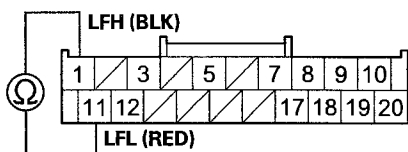
DTC Troubleshooting (cont'd)

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 LOCK (0), or press the engine start/stop button to select the OFF mode.
2. Disconnect SH-AWD control unit connector A (20P).
3. Check for continuity between SH-AWD control unit connector terminals A1 and A11.

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

Is there continuity?

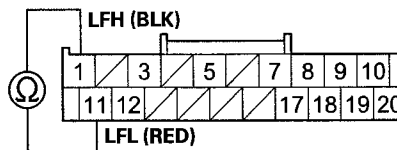
YES—Go to step 4.

NO—Go to step 12.

4. Check the REAR DIFFERENTIAL FLUID TEMPERATURE SENSOR in the SH-AWD mode menu DATA LIST. The temperature should be above 68 °F (20 °C) with the HDS before proceeding to the next step. 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).

5. Measure the resistance between SH-AWD control unit connector terminals A1 and A11.

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

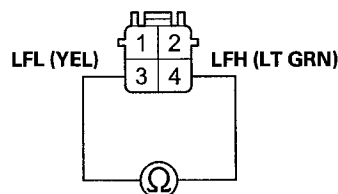
Is there about 2.0 Ω or more?

YES—Go to step 8.

NO—Go to step 6.

6. Disconnect the left solenoid 4P connector.
7. Check for continuity between left solenoid 4P connector terminals No. 3 and No. 4.

LEFT SOLENOID 4P CONNECTOR



Wire side of female terminals

Is there continuity?

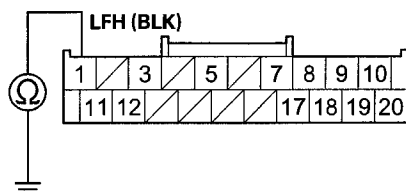
YES—Repair a short in the wires between SH-AWD control unit connector A and the left solenoid 4P connector. ■

NO—Replace the rear differential left side case (see page 15-82). ■



8. Check for continuity between SH-AWD control unit connector terminal A1 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

Is there continuity?

YES—Repair a short to body ground in the wire between SH-AWD control unit connector terminal A1 and body ground. ■

NO—Go to step 9.

9. Check the connections at the SH-AWD control unit.

Are the connections loose or poor?

YES—Repair the connections as needed, and recheck.

NO—Go to step 10.

10. Update the SH-AWD control unit with the latest software (see page 15-8), and recheck.

Does the symptom/indication go away?

YES—Troubleshooting is complete. ■

NO—Go to step 11.

11. Substitute the SH-AWD control unit with a known-good control unit, and recheck.

Does the symptom/indication go away?

YES—Replace the original SH-AWD control unit (see page 15-70). ■

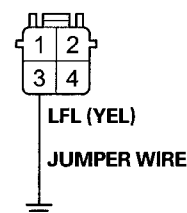
NO—Replace the rear differential left side case (see page 15-82). ■

NOTE: If a new SH-AWD control unit was used in place of the known-good control unit and the new control unit will not initialize, replace the rear differential left side case.

12. Disconnect the left solenoid 4P connector.

13. Connect left solenoid 4P connector terminal No. 3 to body ground with a jumper wire.

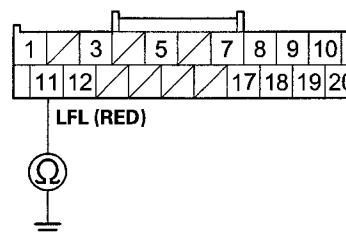
LEFT SOLENOID 4P CONNECTOR



Wire side of female terminals

14. Check for continuity between SH-AWD control unit connector terminal A11 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

Is there continuity?

YES—Go to step 15.

NO—Repair an open in the wire between SH-AWD control unit connector terminal A11 and the left solenoid 4P connector. ■

15. Remove the jumper wire from left solenoid 4P connector terminal No. 3.

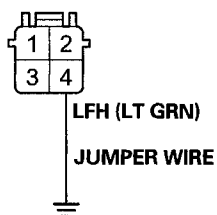
(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

16. Connect left solenoid 4P connector terminal No. 4 to body ground with a jumper wire.

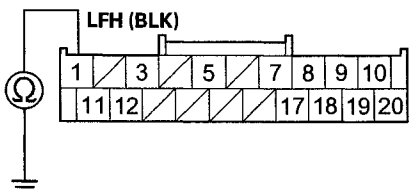
LEFT SOLENOID 4P CONNECTOR



Wire side of female terminals

17. Check for continuity between SH-AWD control unit connector terminal A1 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

Is there continuity?

YES—Replace the rear differential left side case (see page 15-82). ■

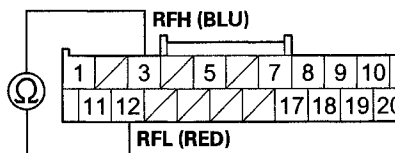
NO—Repair an open in the wire between SH-AWD control unit connector terminal A1 and the left solenoid 4P connector. ■

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 LOCK (0), or press the engine start/stop button to select the OFF mode.
2. Disconnect SH-AWD control unit connector A (20P).
3. Check for continuity between SH-AWD control unit connector terminals A3 and A12.

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

Is there continuity?

YES—Go to step 4.

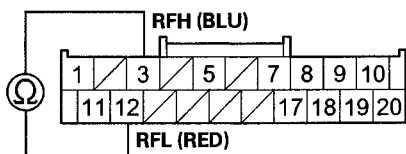
NO—Go to step 12.

4. Check the REAR DIFFERENTIAL FLUID TEMPERATURE SENSOR in the SH-AWD mode menu DATA LIST. The temperature should be above 68 °F (20 °C) with the HDS before proceeding to the next step. 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).



5. Measure the resistance between SH-AWD control unit connector terminals A3 and A12.

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

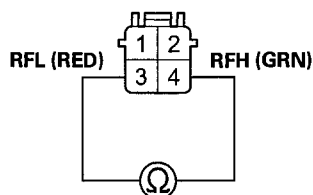
Is there about 2.0 Ω or more?

YES—Go to step 6.

NO—Go to step 10.

6. Disconnect the right solenoid 4P connector.
7. Check for continuity between right solenoid 4P connector terminals No. 3 and No. 4.

RIGHT SOLENOID 4P CONNECTOR



Wire side of female terminals

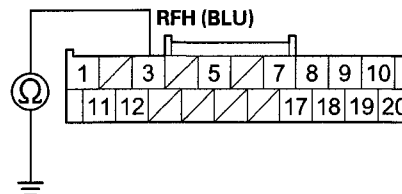
Is there continuity?

YES—Repair a short in the wires between SH-AWD control unit connector A and the right solenoid 4P connector. ■

NO—Replace the rear differential right side case (see page 15-82). ■

8. Check for continuity between SH-AWD control unit connector terminal A3 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

Is there continuity?

YES—Repair a short to body ground in the wire between SH-AWD control unit connector terminal A3 and body ground. ■

NO—Go to step 9.

9. Check the connections at the SH-AWD control unit.

Are the connections loose or poor?

YES—Repair the connections as needed, and recheck.

NO—Go to step 10.

10. Update the SH-AWD control unit with the latest software (see page 15-8), and recheck.

Does the symptom/indication go away?

YES—Troubleshooting is complete. ■

NO—Go to step 11.

11. Substitute the SH-AWD control unit with a known-good control unit, and recheck.

Does the symptom/indication go away?

YES—Replace the original SH-AWD control unit (see page 15-70). ■

NO—Replace the rear differential right side case (see page 15-82). ■

NOTE: If a new SH-AWD control unit was used in place of the known-good control unit and the new control unit will not initialize, replace the rear differential right side case.

12. Disconnect the right solenoid 4P connector.

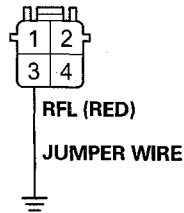
(cont'd)

Rear Differential

DTC Troubleshooting (cont'd)

13. Connect right solenoid 4P connector terminal No. 3 to body ground with a jumper wire.

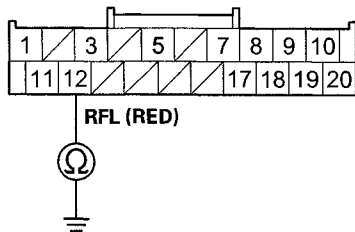
RIGHT SOLENOID 4P CONNECTOR



Wire side of female terminals

14. Check for continuity between SH-AWD control unit connector terminal A12 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

Is there continuity?

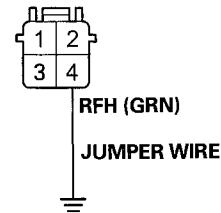
YES—Go to step 15.

NO—Repair an open in the wire between SH-AWD control unit connector terminal A12 and the right solenoid 4P connector. ■

15. Remove the jumper wire from right solenoid 4P connector terminal No. 3.

16. Connect right solenoid 4P connector terminal No. 4 to body ground with a jumper wire.

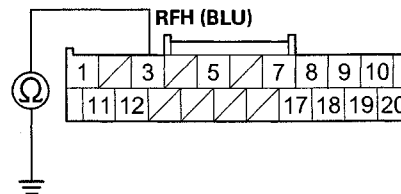
RIGHT SOLENOID 4P CONNECTOR



Wire side of female terminals

17. Check for continuity between SH-AWD control unit connector terminal A3 and body ground.

SH-AWD CONTROL UNIT CONNECTOR A (20P)



Wire side of female terminals

Is there continuity?

YES—Replace the rear differential right side case (see page 15-82). ■

NO—Repair an open in the wire between SH-AWD control unit connector terminal A3 and the right solenoid 4P connector. ■



Symptom Troubleshooting

DTC 91-1: SH-AWD Control Unit Programming Error

NOTE:

- Before you troubleshoot, review the general troubleshooting information (see page 15-4).
 - DTC 91-1 is stored when the SH-AWD system update is not completed.
 - Do not turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode while updating the SH-AWD system. If you do, the SH-AWD system can be damaged.
1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
 2. Do the SH-AWD system update procedure (see page 15-8).
 3. Check for DTCs with the HDS.

Is DTC 91-1 indicated?

YES—Substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70). ■

NO—Update is complete. ■

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. 2-6 (30 A) fuse in the 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 and the battery are OK.
 - Make sure the ECM/PCM is not in the middle of updating.
1. Test the battery (see page 22-84). Charge or replace the battery if necessary.
 2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
 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 procedure for each of the following, then go to step 4.

- SH-AWD differential clutch torque (see page 15-9)
- Yaw rate-lateral/longitudinal acceleration neutral position (see page 15-9)
- SH-AWD control unit initialization (see page 15-10)

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.

(cont'd)

Rear Differential

Symptom Troubleshooting (cont'd)

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 self-diagnostic function (see page 22-342).

NO—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70).■

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), or press the engine start/stop button to select the ON mode.

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), or press the engine start/stop button to select the OFF mode.

4. Disconnect SH-AWD control unit connector A (20P) and connector B (8P).

5. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.

6. Check the SH-AWD indicator.

Does the SH-AWD indicator come on?

YES—Update the SH-AWD control unit if it does not have the latest software (see page 15-8), or substitute a known-good SH-AWD control unit (see page 15-70), and recheck. If the symptom/indication goes away with the updated SH-AWD control unit, troubleshooting is complete. If the symptom/indication goes away with a known-good SH-AWD control unit, replace the original SH-AWD control unit (see page 15-70).■

NO—Go to the gauge control self-diagnostic function (see page 22-342).■



SH-AWD Function Test

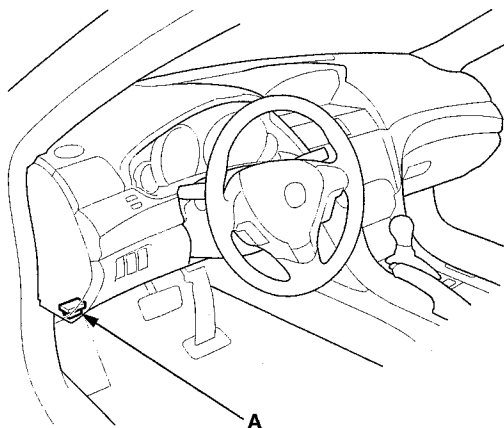
Special Tools Required

Torque Wrench Adapter 070AJ-SJAA101

Direct Electromagnetic Clutch Test

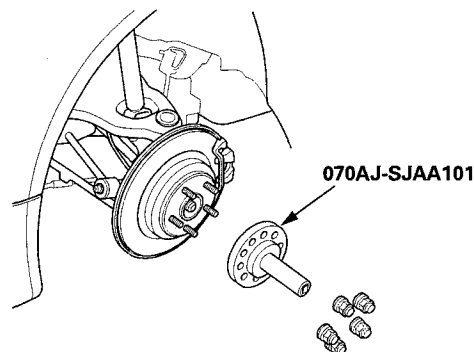
NOTE:

- No DTC was detected.
 - The transmission is in neutral (A/T in N, M/T in neutral).
 - The SH-AWD control unit had been initialized.
1. With the ignition switch in LOCK (0), or the vehicle in the OFF mode, connect the HDS to the DLC (A) located under the driver's side of the dashboard.



2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
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 11-258).
4. Check that the differential fluid temperature is over 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.

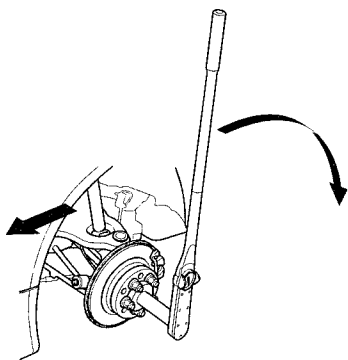
(cont'd)

Rear Differential

SH-AWD Function Test (cont'd)

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 785 N·m (80.0 kgf·m, 579 lbf·ft) such as a commercially available Snap-on torque wrench TE352FUE.

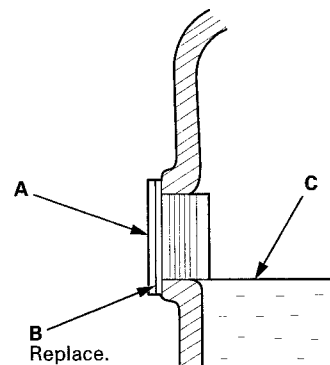


10. Enter the torque value into the HDS, and wait for the test to finish.
- If the result shows the clutch driving force is normal, the clutch assembly is OK.
 - If the result shows the clutch driving force is abnormal, replace the differential fluid, and retest. If the result still shows the clutch driving force is abnormal, replace the right and left differential side cases (see page 15-82).

Rear Differential Fluid Inspection and Replacement

Inspection

1. Park the vehicle on level ground, and turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
2. Use solvent and a brush to wash any oil and dirt off the differential fluid filler plug, and dry them with compressed air.
3. Remove the 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).

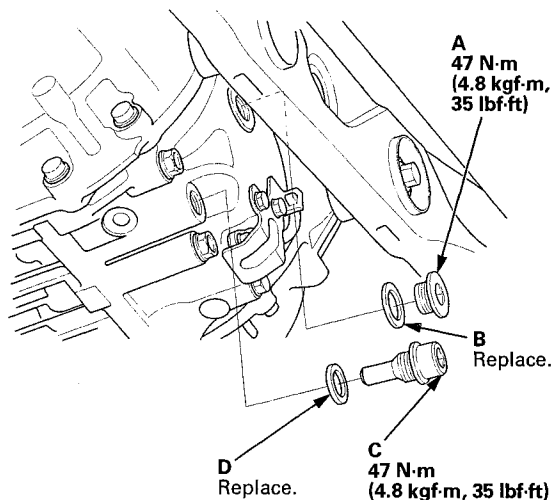


4. If the level is below the proper level, check for fluid leaks at the differential. If a problem is found, fix it before filling the differential with fluid.
5. The fluid level must reach up the bottom of the filler plug hole. If necessary, add the recommended fluid until it runs out, then reinstall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



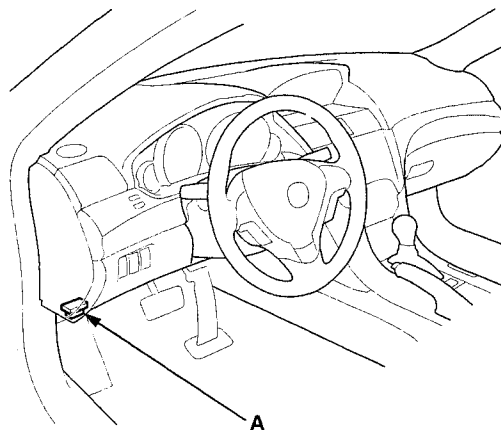
Replacement

1. Park the vehicle on level ground, and turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
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:
2.53 L (2.67 US qt) at fluid change
2.77 L (2.93 US qt) at overhaul
Recommended fluid: Acura ATF-Z1
6. Reinstall the filler plug with a new sealing washer.
7. If the maintenance minder required to replace the rear differential fluid, reset the maintenance minder (see page 3-4), and this procedure is complete. If the maintenance minder did not require to replace the rear differential fluid, go to step 8.

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

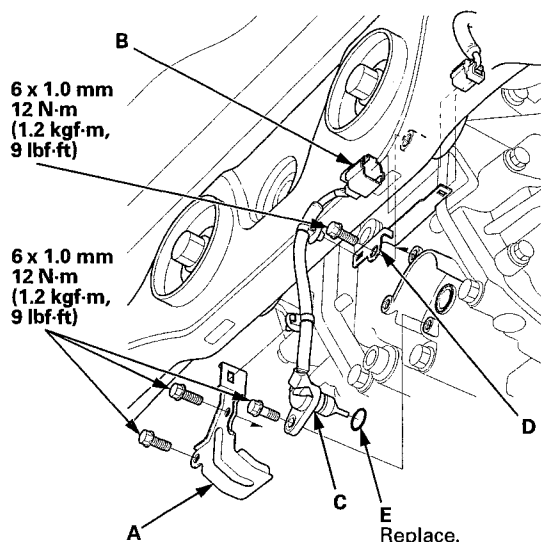


9. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
10. Make sure the HDS communicates with the vehicle and the ECM/PCM. If it does not, go to the DLC circuit troubleshooting (see page 11-258).
11. Select GAUGES in the BODY ELECTRICAL with the HDS.
12. Select ADJUSTMENT in the GAUGES with the HDS.
13. Select MAINTENANCE MINDER in the ADJUSTMENT with the HDS.
14. Select RESET in the MAINTENANCE MINDER with the HDS.
15. Select MAINTENANCE SUB ITEM 6 RESET with the HDS, and reset the rear differential fluid life.

Rear Differential

Rear Differential Fluid Temperature Sensor Replacement

1. Drain the differential fluid (see page 15-69).
2. Remove the rear differential fluid temperature sensor cover (A) and rear differential harness bracket D, then disconnect the rear differential fluid temperature sensor 2P connector (B).

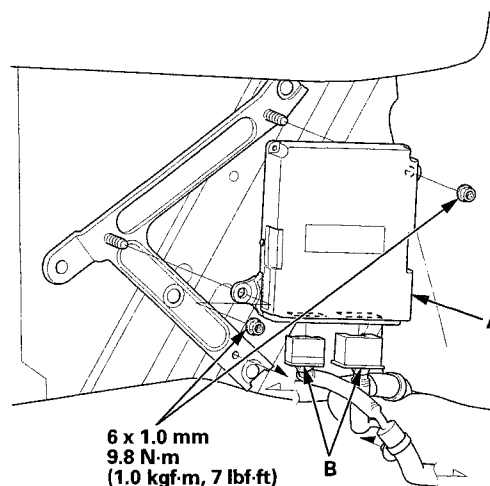


3. Remove the rear differential fluid temperature sensor (C).
4. Install the rear differential fluid temperature sensor with a new O-ring (E) in the reverse order of removal.
5. Refill the differential fluid (see page 15-69).

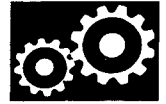
SH-AWD Control Unit Replacement

NOTE: The SH-AWD control unit must be initialized (see page 15-10) after replacement, otherwise the SH-AWD system will not function.

1. Remove the trunk front trim panel (see page 20-93).
2. Remove the SH-AWD control unit (A).

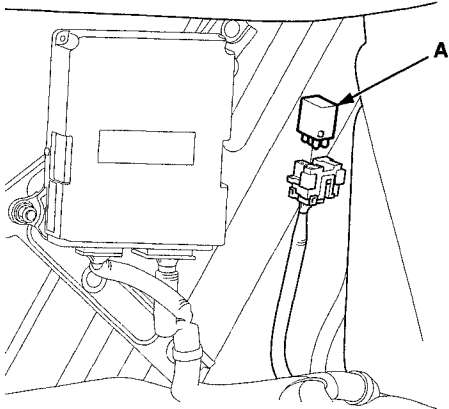


3. Disconnect the SH-AWD control unit connectors (B).
4. Install the SH-AWD control unit in the reverse order of removal.



SH-AWD Relay Replacement

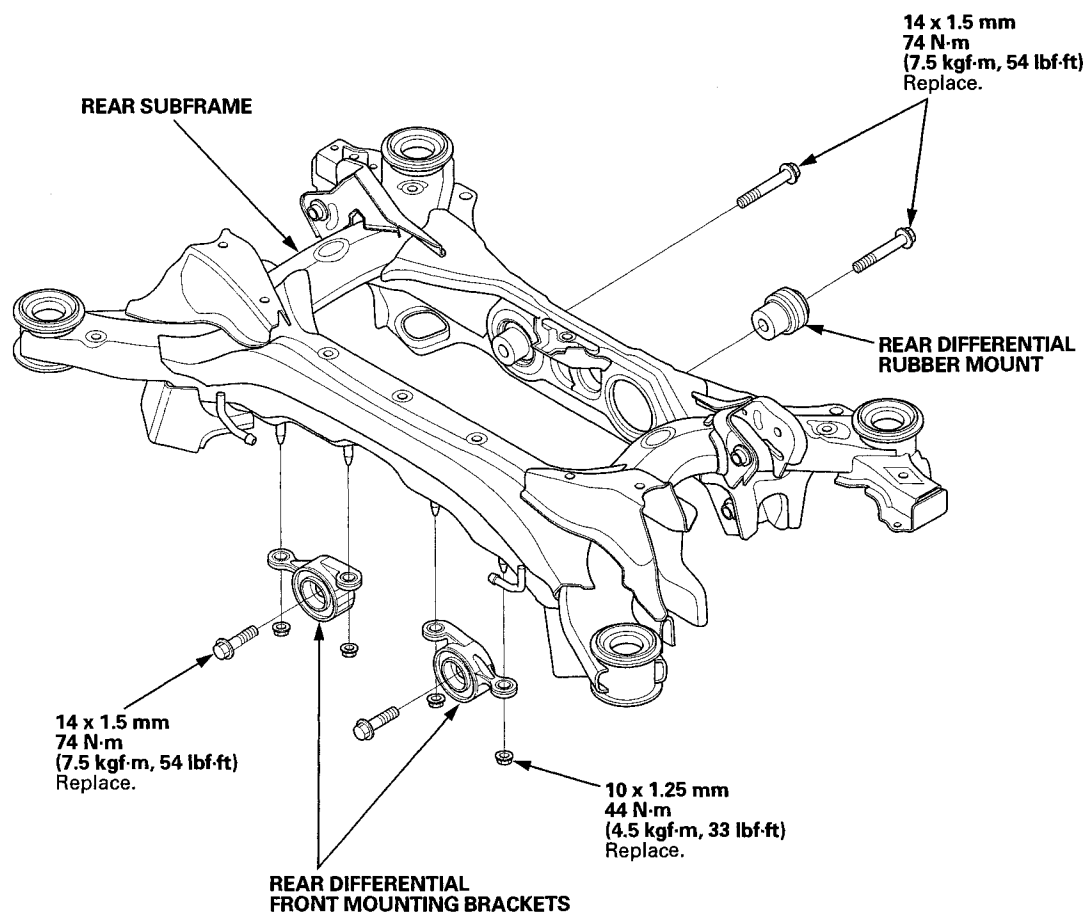
1. Remove the trunk front trim panel (see page 20-93).
2. Remove the SH-AWD relay (A).



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

Rear Differential

Rear Differential Mount Replacement



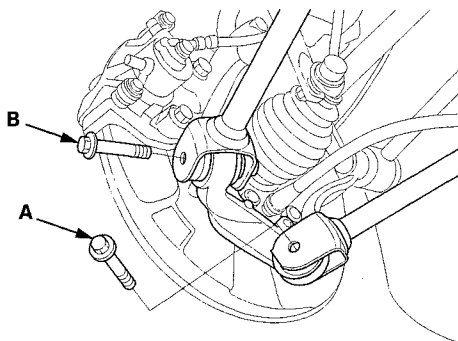


Rear Differential Removal

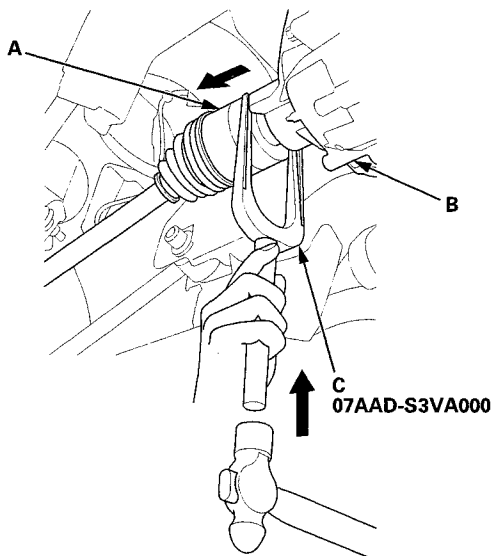
Special Tools Required

Driveshaft Remover 07AAD-S3VA000

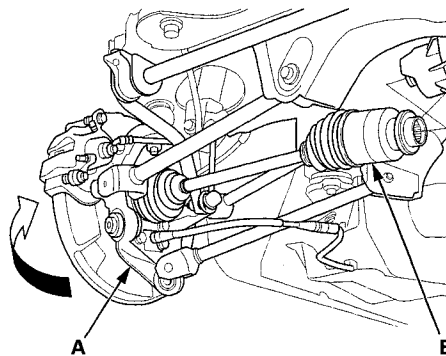
1. Raise the vehicle on a lift.
2. Drain the rear differential fluid (see page 15-69).
3. Remove the rear wheels.
4. Remove exhaust pipe B and the muffler (see page 9-10).
5. Remove the lower arm A mounting bolts (A) and the lower arm B mounting bolts (B).



6. Disconnect the inboard joints (A) from the rear differential (B) using the driveshaft remover (C) and a hammer.

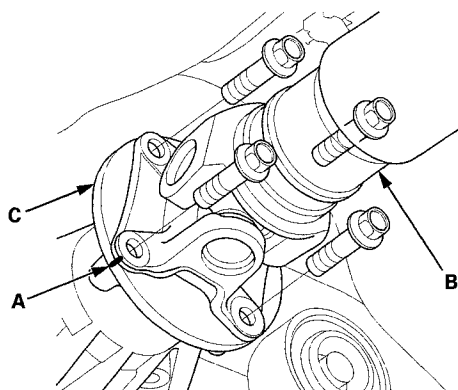


7. Pull the knuckle (A) outward, and separate the rear driveshaft inboard joints (B) from the rear differential.



8. Make reference marks (A) across the No. 3 propeller shaft (B) and the rear differential companion flange (C). Separate the No. 3 propeller shaft from the rear differential.

NOTE: Suspend the propeller shaft with an appropriate size wire.

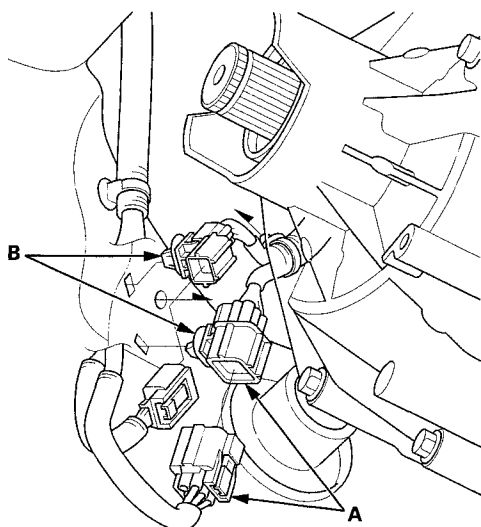


(cont'd)

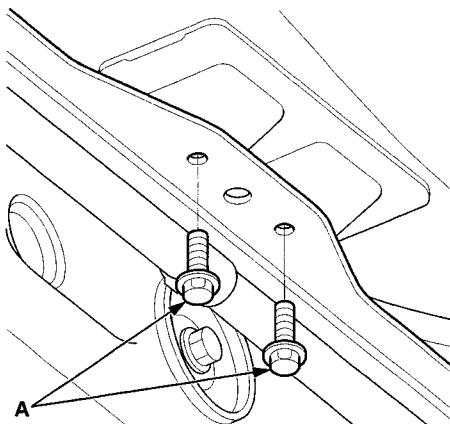
Rear Differential

Rear Differential Removal (cont'd)

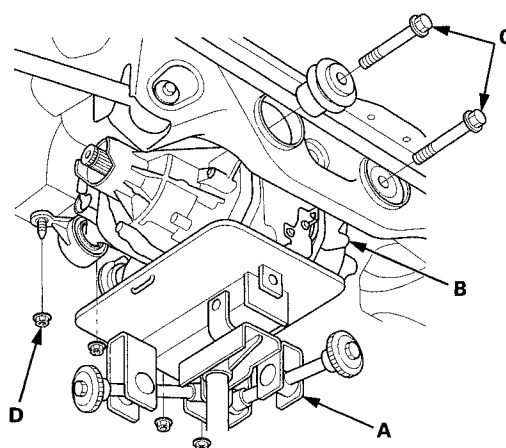
9. Disconnect the rear differential subharness connectors (A), and remove the harness clips (B).



10. Remove the rear subframe rear bracket bolts (A).

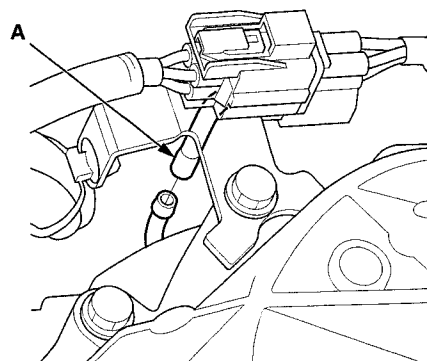


11. Place a transmission jack (A) under the rear differential (B).

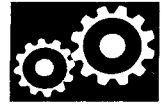


12. Remove the rear differential rear mount bolts (C) and the rear differential front mounting bracket nuts (D).

13. Lower the rear differential a little on the transmission jack, then disconnect the breather hose (A).

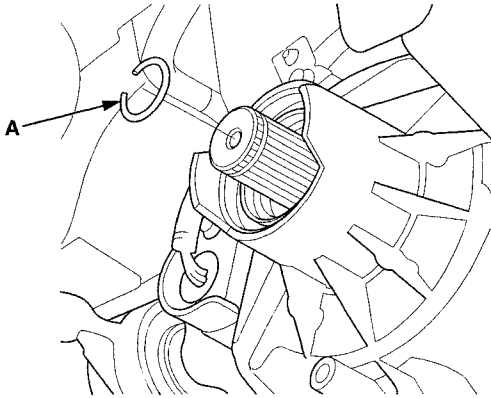


14. Lower the rear differential on the transmission jack.



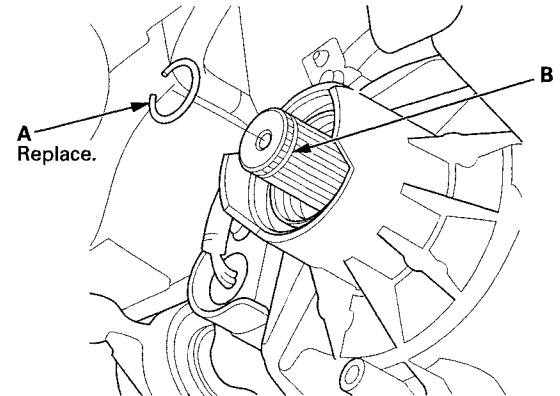
Rear Differential Installation

15. Remove the set ring (A) from the rear differential.

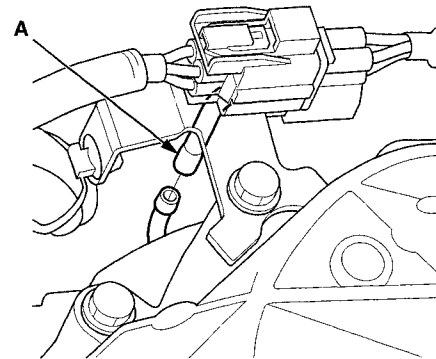


1. Place the rear differential on a transmission jack.

2. Install a new set ring (A) into the groove (B) of the rear differential.



3. Raise the rear differential to the appropriate position, then connect the breather hose (A).



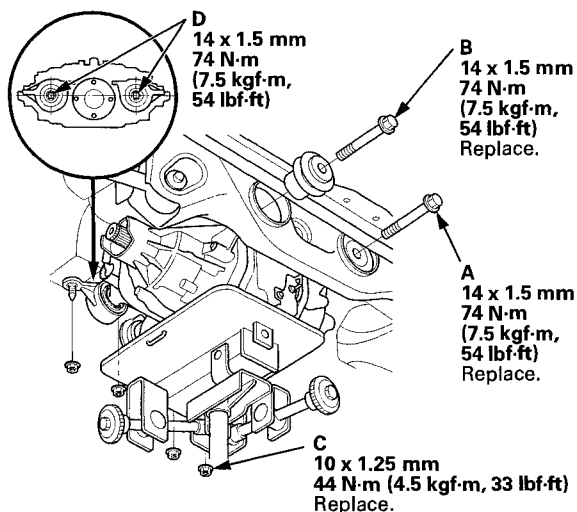
4. Raise the rear differential to the mounting level.

(cont'd)

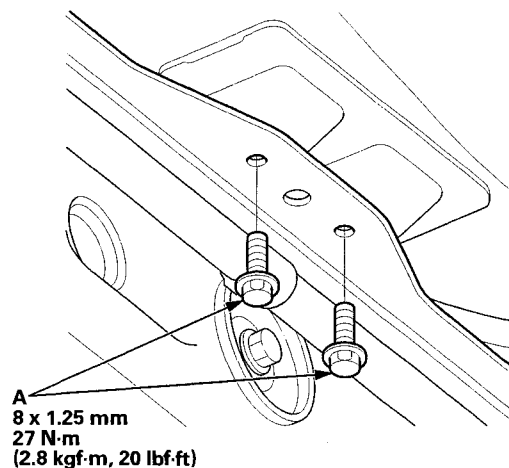
Rear Differential

Rear Differential Installation (cont'd)

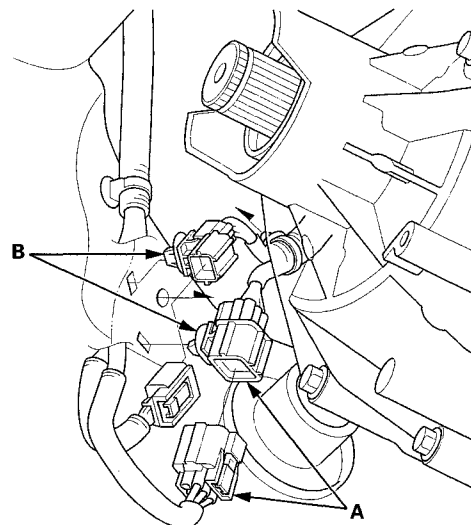
5. Loosely install new rear differential rear mount bolts (A) (B) and new rear differential front mounting bracket nuts (C).



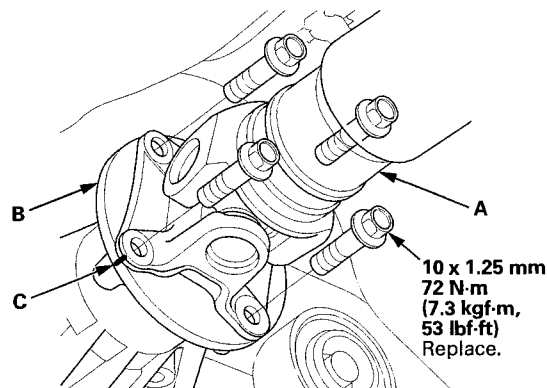
6. Loosen the rear differential front mounting bracket bolts (D).
7. Tighten the rear differential rear mount bolt (A) and the rear differential front mounting bracket nuts (C) to the specified torque.
8. Tighten the rear differential rear mount bolt (B) to the specified torque.
9. Tighten the rear differential front mounting bracket bolts (D) to the specified torque.
10. Install the rear subframe rear bracket bolts (A).



11. Connect the rear differential subharness connectors (A), and install the harness clips (B).



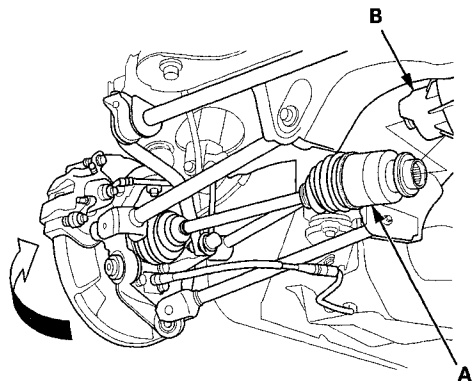
12. Attach the No. 3 propeller shaft (A) to the rear differential (B) by aligning the reference marks (C) you made during the removal procedure.



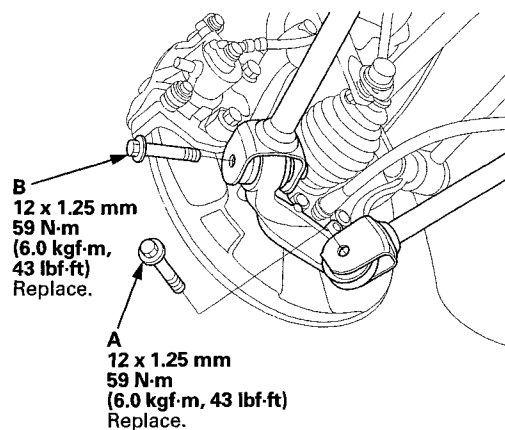
13. Apply appropriate grease to the rear driveshaft inboard joints (see step 2 on page 16-46).



14. Pull the knuckle outward, and insert the rear driveshaft inboard joints (A) into the rear differential (B).



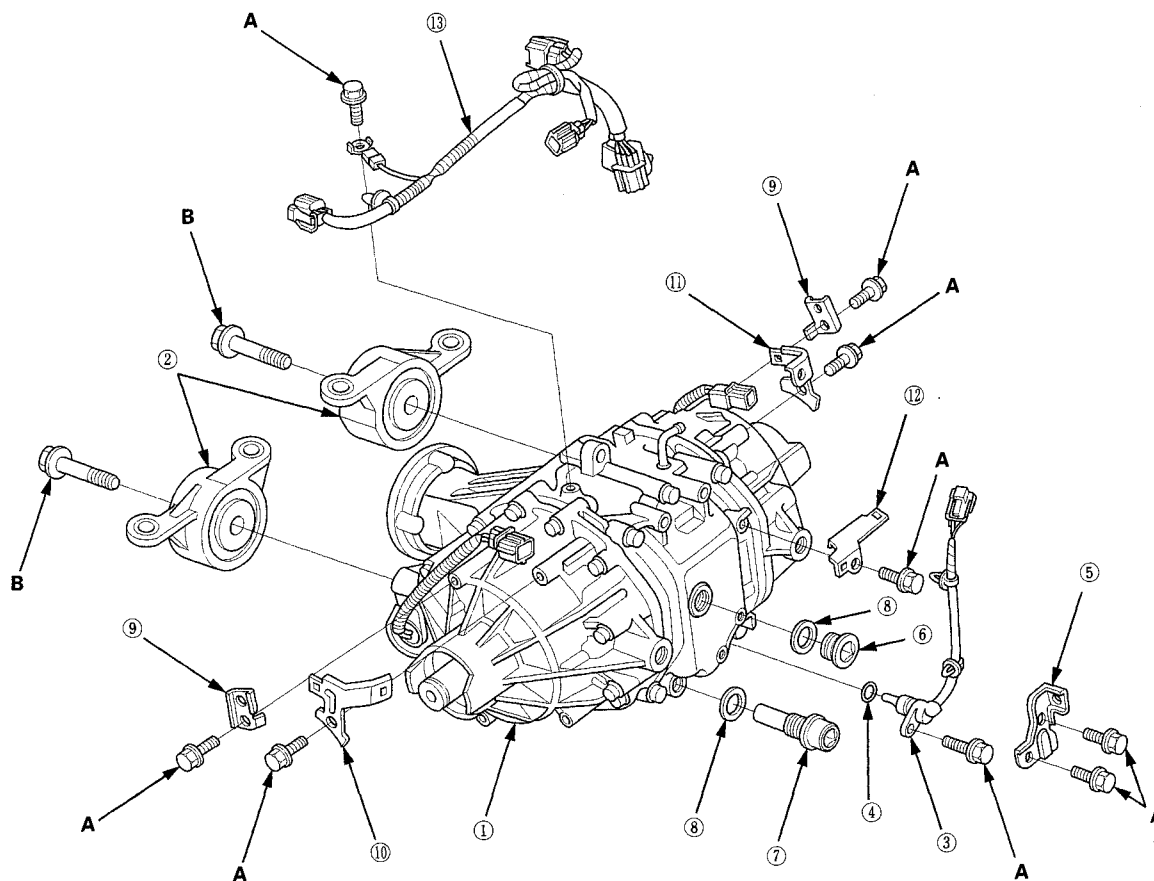
15. Loosely install new lower arm A mounting bolts (A) and new lower arm B mounting bolts (B).



16. Place a floor jack under the lower arm, and raise the suspension to load it with the vehicle's weight.
17. Tighten the lower arm A mounting bolt and the lower arm B mounting bolt to the specified torque.
18. Install exhaust pipe B and the muffler (see page 9-10).
19. Install the rear wheels.
20. Refill the rear differential with the recommended fluid (see page 15-69).
21. Test-drive the vehicle.

Rear Differential

Rear Differential Disassembly/Reassembly



- ① REAR DIFFERENTIAL CARRIER ASSEMBLY
- ② REAR DIFFERENTIAL FRONT MOUNTING BRACKETS
- ③ REAR DIFFERENTIAL FLUID TEMPERATURE SENSOR
- ④ O-RING
Replace.
- ⑤ REAR DIFFERENTIAL FLUID TEMPERATURE SENSOR COVER
- ⑥ FILLER PLUG
47 N·m (4.8 kgf·m, 35 lbf·ft)
- ⑦ DRAIN PLUG
47 N·m (4.8 kgf·m, 35 lbf·ft)
- ⑧ SEALING WASHER
Replace.

- ⑨ REAR DIFFERENTIAL HARNESS BRACKET A
- ⑩ REAR DIFFERENTIAL HARNESS BRACKET B
- ⑪ REAR DIFFERENTIAL HARNESS BRACKET C
- ⑫ REAR DIFFERENTIAL HARNESS BRACKET D
- ⑬ REAR DIFFERENTIAL SUBHARNESS

A: 6 x 1.0 mm
12 N·m (1.2 kgf·m, 9 lbf·ft)
B: 14 x 1.5 mm
74 N·m (7.5 kgf·m, 54 lbf·ft)
Replace.



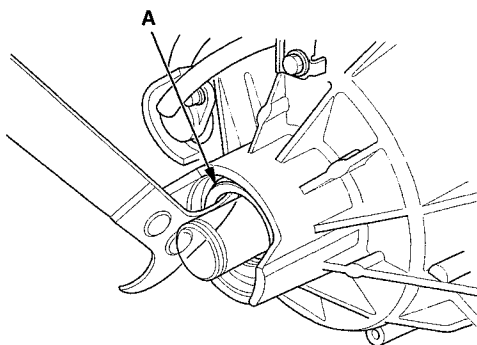
Side Case Oil Seal Replacement

Special Tools Required

- Driver Handle 07AAD-STKA100
- Oil Seal Driver 07AAD-STKA111
- Dust Seal Driver 07AAD-STKA120

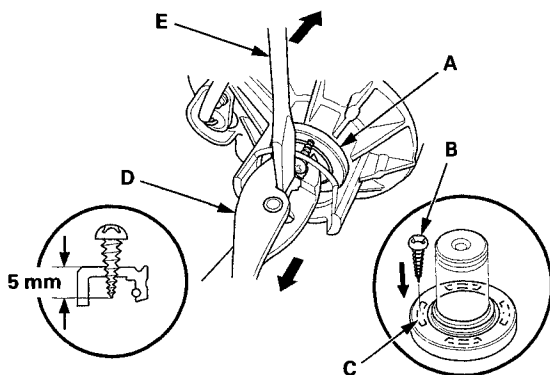
1. Remove the rear differential (see page 15-73).
2. Remove the 40 x 55 x 7.5 mm dust seal (A) using a commercially available tool.

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

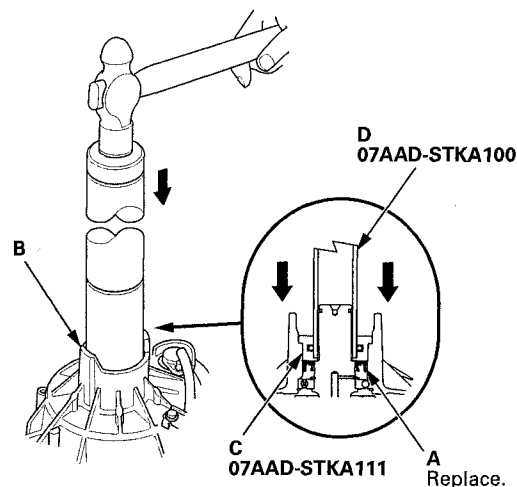


3. Remove the thrust washer.
4. To remove the 34.7 x 54 x 9 mm oil seal (A), install the 6 mm screw (B) (P/N 93901-16580) into the maintenance hole (C) of the oil seal as shown; the oil seal has four invisible places on the surface for maintenance (4 places, 90 degrees apart). Remove the oil seal using pliers (D) and a screw driver (E) as shown.

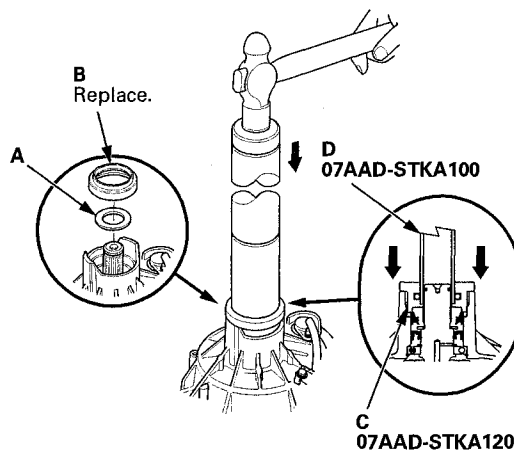
NOTE: Do not thread the 6 mm screw into the oil seal more than 5 mm (0.20 in).



5. Install a new 34.7 x 54 x 9 mm oil seal (A) into the rear differential side case (B) using the oil seal driver (C) and the driver handle (D).



6. Install the thrust washer (A), then install a new 40 x 55 x 7.5 mm dust seal (B) using the dust seal driver (C) and the driver handle (D).

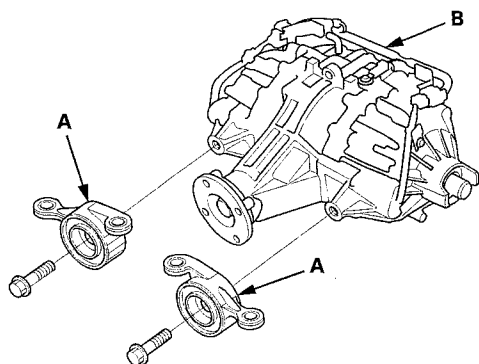


7. Install the rear differential (see page 15-75).

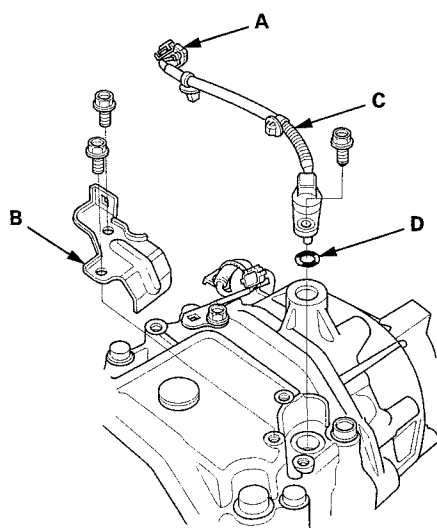
Rear Differential

Center Case Replacement

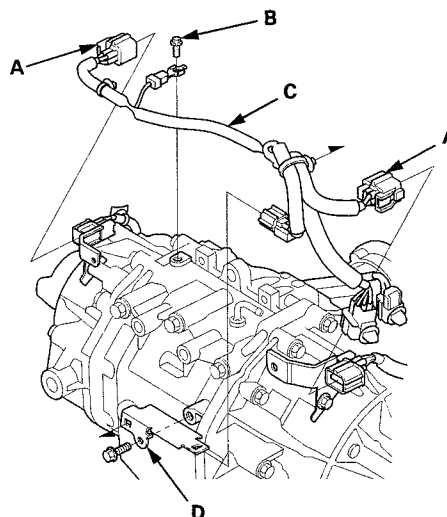
1. Remove the rear differential (see page 15-73).
2. Remove the rear differential front mounting brackets (A) from the rear differential (B).



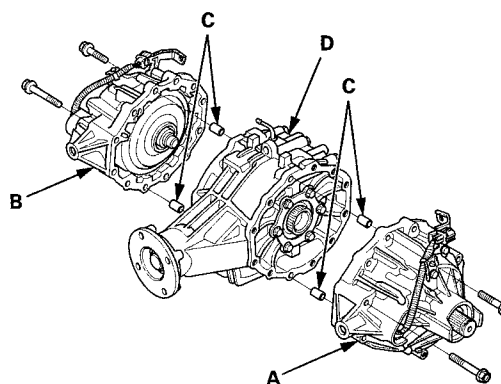
3. Disconnect the rear differential fluid temperature sensor 2P connector (A), then remove the rear differential fluid temperature sensor cover (B), the rear differential fluid temperature sensor (C), and the O-ring (D).



4. Disconnect the left and right solenoid 4P connectors (A).



5. Remove the ground cable bolt (B) and rear differential harness bracket D, then remove the rear differential subharness (C).
6. Remove the rear differential left side case (A), the rear differential right side case (B), and the 10 x 12 mm dowel pins (C) from the rear differential center case (D).



7. Replace the rear differential center case.

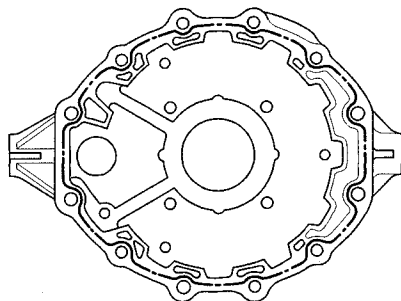


8. Remove the dirt and oil from the sealing surfaces. Apply liquid gasket (P/N 08717-0004, 08718-0001, 08718-0003, or 08718-0009) to the sealing surface. Make sure you seal up to the inside edge of the bolt holes to prevent oil leakage.

NOTE:

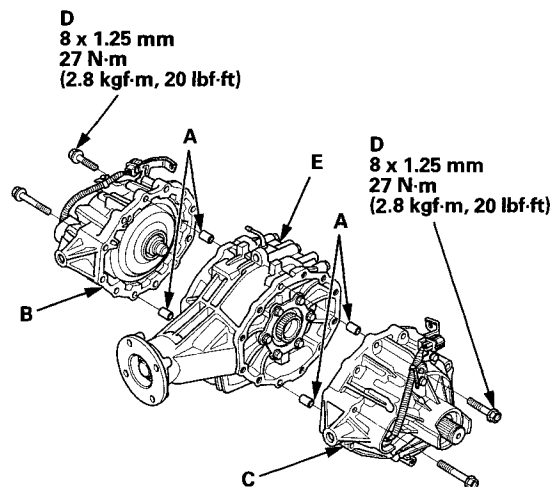
- You must assemble the housings within 5 minutes after applying the liquid gasket. If you applied liquid gasket P/N 08718-0012, the component must be installed within 4 minutes. If not, the sealing surface must be cleaned, and the liquid gasket reapplied.
- Allow the liquid gasket to cure at least 30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

Left side case/Right side case

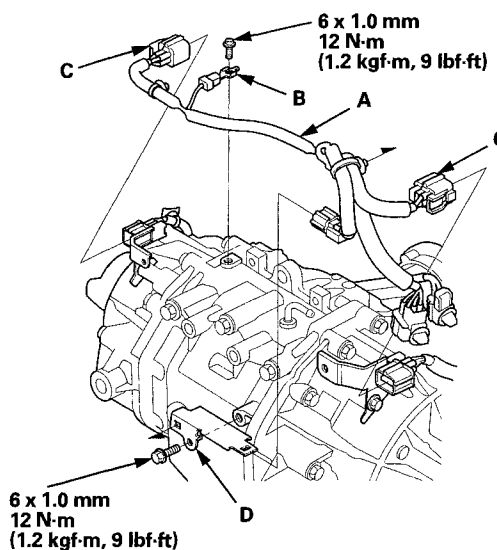


Apply liquid gasket along the broken line and around all bolt holes.

9. Install the 10 x 12 mm dowel pins (A), the rear differential right side case (B), the rear differential left side case (C), and the mounting bolts (D) onto the rear differential center case (E).



10. Tighten the mounting bolts in a crisscross pattern in several steps, then tighten the bolts to the specified torque.
11. Install the rear differential subharness (A) and rear differential harness bracket D, and install the ground cable (B).



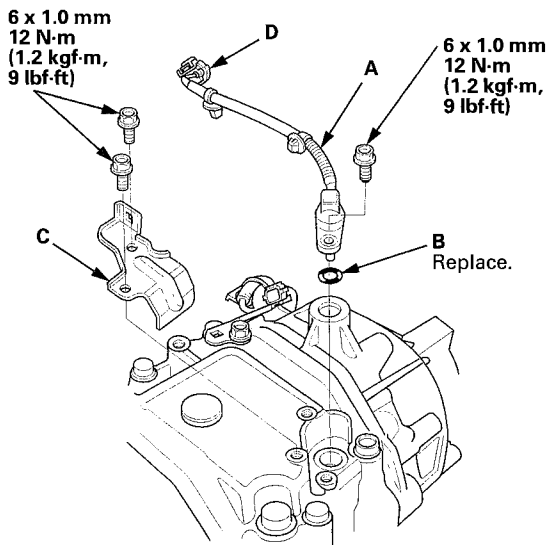
12. Connect the left and right solenoid 4P connectors (C).

(cont'd)

Rear Differential

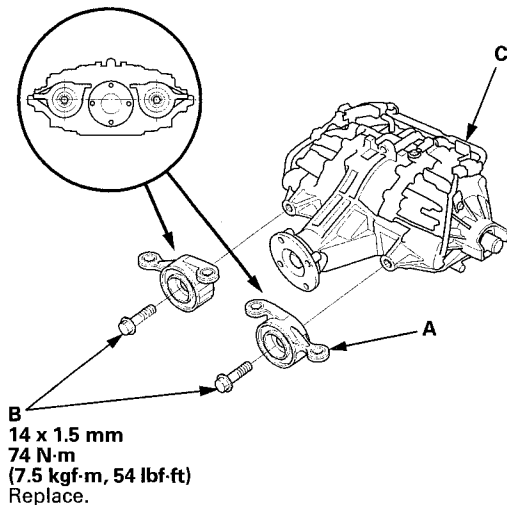
Center Case Replacement (cont'd)

13. Install the rear differential fluid temperature sensor (A) with a new O-ring (B), and install the rear differential fluid temperature sensor cover (C).



14. Connect the rear differential fluid temperature sensor 2P connector (D).

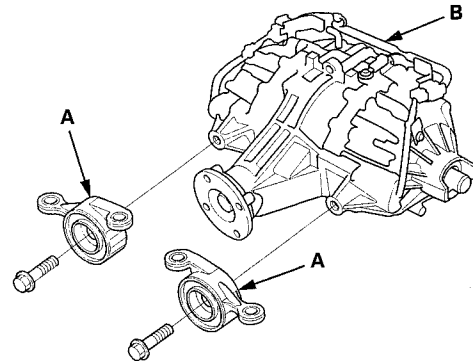
15. Install the rear differential front mounting brackets (A) with new bolts (B) on the rear differential (C).



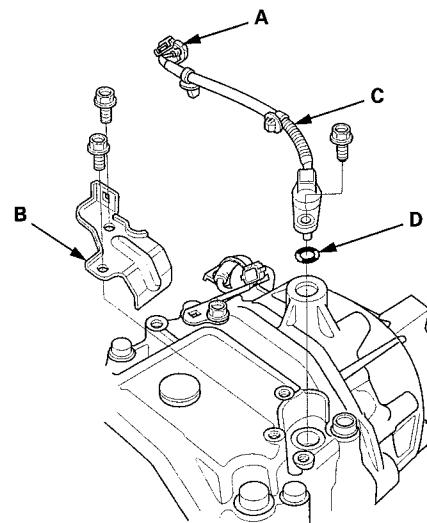
16. Install the rear differential (see page 15-75).

Side Case Replacement

1. Remove the rear differential (see page 15-73).
2. Remove the rear differential front mounting brackets (A) from the rear differential (B).

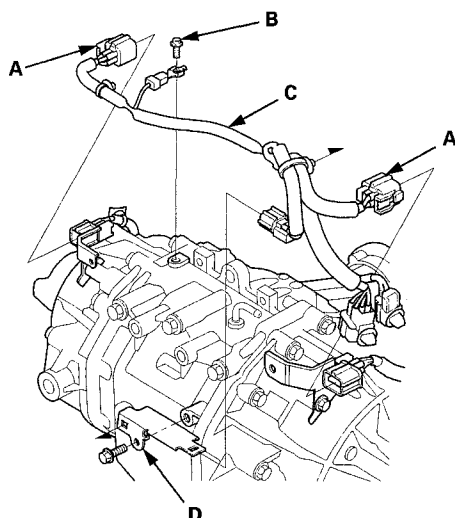


3. Disconnect the rear differential fluid temperature sensor 2P connector (A), then remove the rear differential fluid temperature sensor cover (B), the rear differential fluid temperature sensor (C), and the O-ring (D).



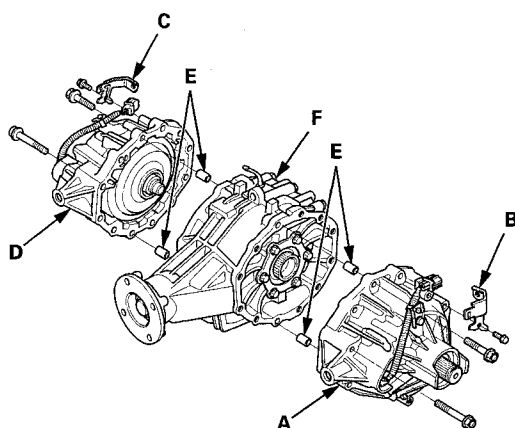


4. Disconnect the left and right solenoid 4P connectors (A).



5. Remove the ground cable bolt (B) and rear differential harness bracket D, then remove the rear differential subharness (C).

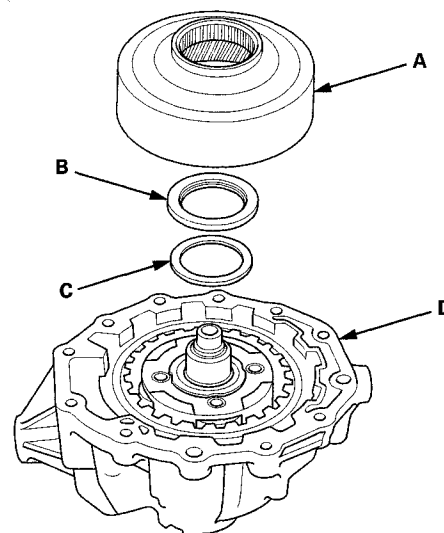
6. Remove the rear differential left side case (A) or the rear differential right side case (D), and the 10 x 12 mm dowel pins (E) from the rear differential center case (F).



7. Remove rear differential harness bracket B and rear differential harness bracket C.

8. Replace the rear differential left side case or the rear differential right side case.

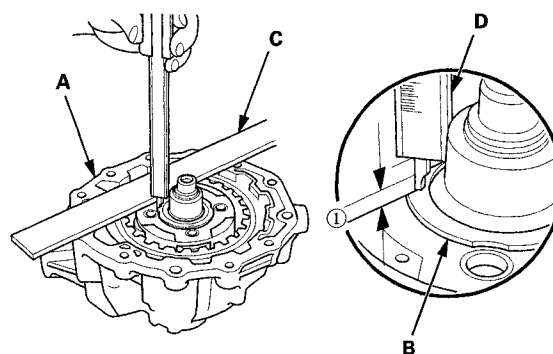
9. Remove the ring gear (A), the needle bearing (B), and the 60.2 mm shim (C) from the differential side case (D).



10. Measure the distance ① between the end of the rear differential side case (A) and the 60.2 mm shim contact area (B) of the planetary gear with a straight edge (C) and a depth gauge (D). Measure at three locations, and average the reading.

NOTE:

- Carry out the measurement at normal room temperature.
- Clean all parts thoroughly before measure.



(cont'd)

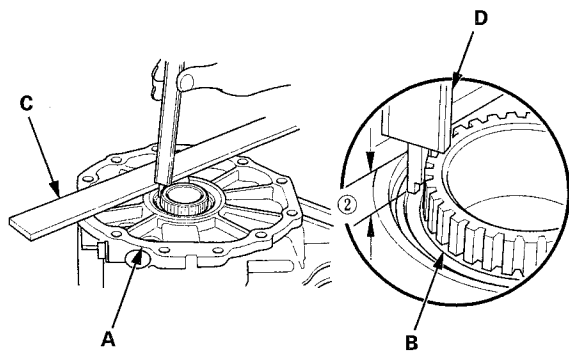
Rear Differential

Side Case Replacement (cont'd)

11. Measure the distance ② between the end of the rear differential center case (A) and the ring gear contact area (B) of the taper roller bearing with a straight edge (C) and a depth gauge (D). Measure at three locations, and average the reading.

NOTE:

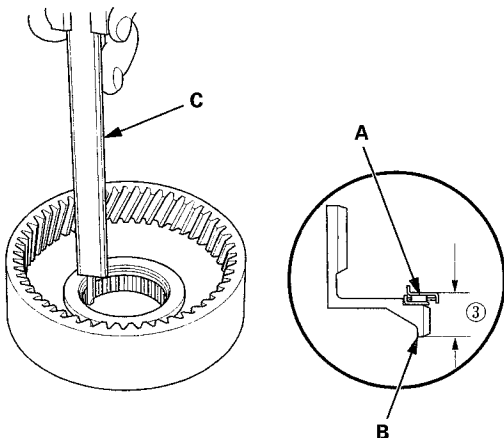
- Carry out the measurement at normal room temperature.
- Clean all parts thoroughly before measure.



12. Measure the distance ③ between the needle bearing (A) and the taper roller bearing contact area (B) of ring gear with a depth gauge (C). Measure at three locations, and average the reading.

NOTE:

- Carry out the measurement at normal room temperature.
- Clean all parts thoroughly before measure.



Shim Selection Formula

13. Select the proper 60.2 mm shim from the table. Follow the example below, and use the measurements you made in step 10 to 12.

(Basic Formula)

$① + ② - (③ + 0.19) = \text{shim thickness}$

0.19 mm (0.007 in): middle of the standard clearance.

Standard Clearance:

0.14—0.24 mm (0.006—0.009 in)

(For example)

$① = 6.12 \text{ mm (0.241 in)}$

$② = 15.3 \text{ mm (0.602 in)}$

$③ = 19.56 \text{ mm (0.770 in)}$

$6.12 + 15.3 - (19.56 + 0.19) = 1.67 \text{ mm}$

Select the 1.60 mm shim from the table.

60.2 mm shim

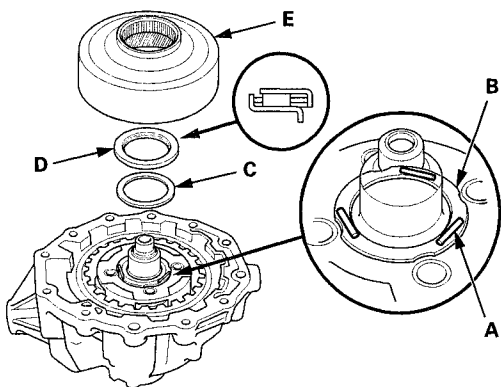
No.	Thickness
A	1.10 mm (0.043 in)
B	1.20 mm (0.047 in)
C	1.30 mm (0.051 in)
D	1.40 mm (0.055 in)
E	1.50 mm (0.059 in)
F	1.60 mm (0.063 in)
G	1.70 mm (0.067 in)
H	1.80 mm (0.071 in)
I	1.90 mm (0.075 in)
J	2.00 mm (0.079 in)
K	2.10 mm (0.083 in)
L	2.20 mm (0.087 in)



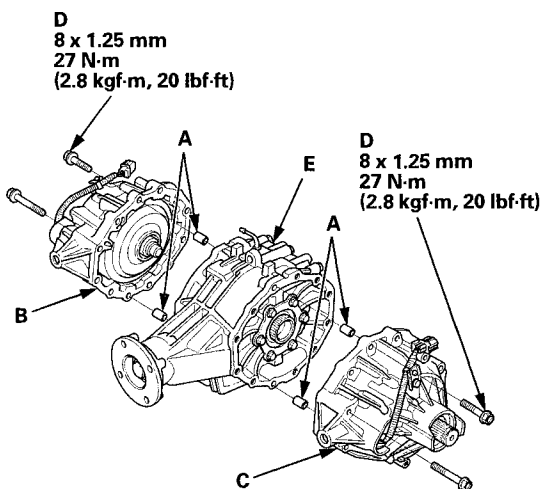
14. Place one strip of plastigage (A) on the 60.2 mm shim contact area (B) of planetary gear. Install the 60.2 mm shim (C), the needle bearing (D), and the ring gear (E). Measure at three locations as shown.

NOTE:

- Carry out the measurement at normal room temperature.
- Clean all parts thoroughly before measure.

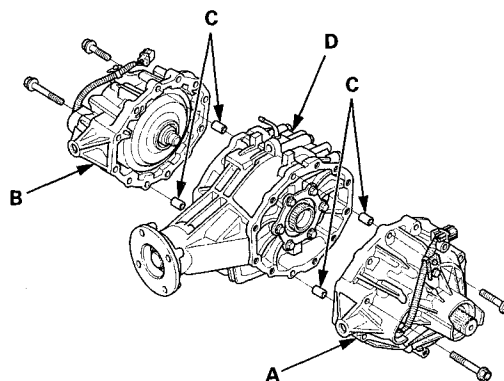


15. Install the 10 x 12 mm dowel pins (A), the rear differential right side case (B) or the rear differential left side case (C), and the mounting bolts (D) onto the rear differential center case (E).

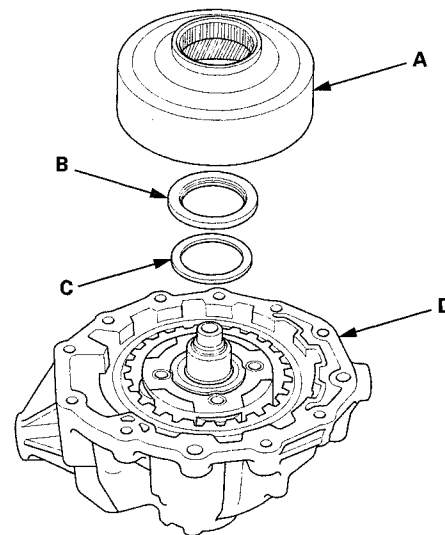


16. Tighten the mounting bolts in a crisscross pattern in several steps, then tighten the bolts to the specified torque.

17. Remove the rear differential left side case (A) or the rear differential right side case (B), and the 10 x 12 mm dowel pins (C) from the rear differential center case (D).



18. Remove the ring gear (A), the needle bearing (B), and the 60.2 mm shim (C) from the differential side case (D).



(cont'd)

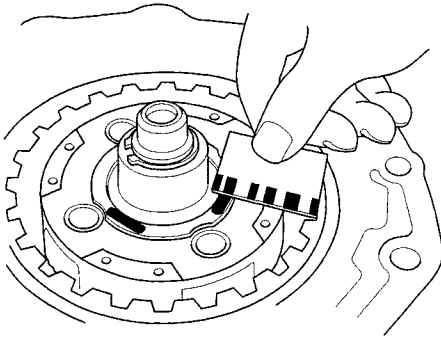
Rear Differential

Side Case Replacement (cont'd)

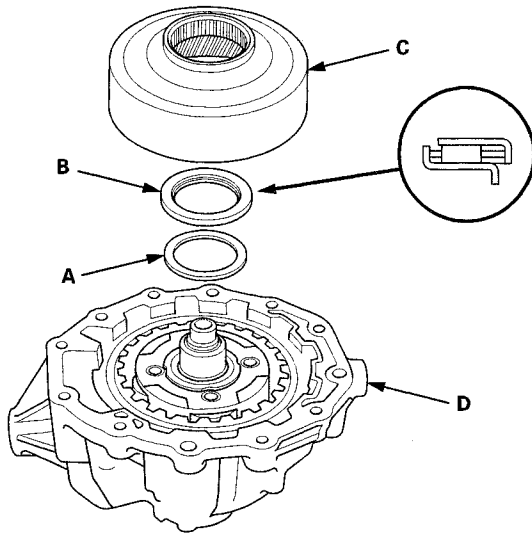
19. Measure the widest part of the plastigage.
Measure at three locations, and average the reading.
- If the clearance exceeds the standard, go to step 9.
 - If the clearance is within the standard, go to step 20.

Standard Clearance:

0.14–0.24 mm (0.006–0.009 in)



20. Install the 60.2 mm shim (A), the needle bearing (B), and the ring gear (C) onto the rear differential side case (D).

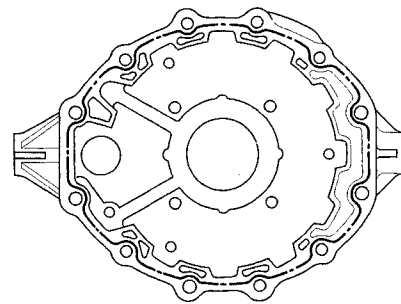


21. Remove the dirt and oil from the sealing surfaces.
Apply liquid gasket (P/N 08717-0004, 08718-0001, 08718-0003, or 08718-0009) to the sealing surface. Make sure you seal up to the inside edge of the bolt holes to prevent oil leakage.

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 the liquid gasket to cure at least 30 minutes after assembly before filling the differential with fluid.

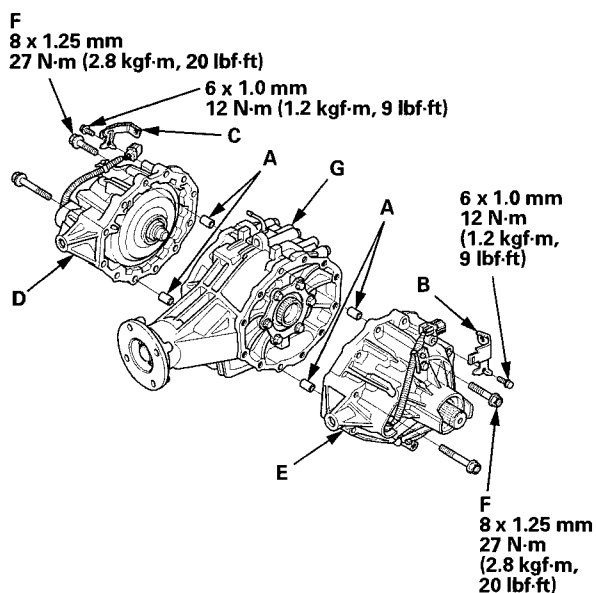
Left side case/Right side case



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

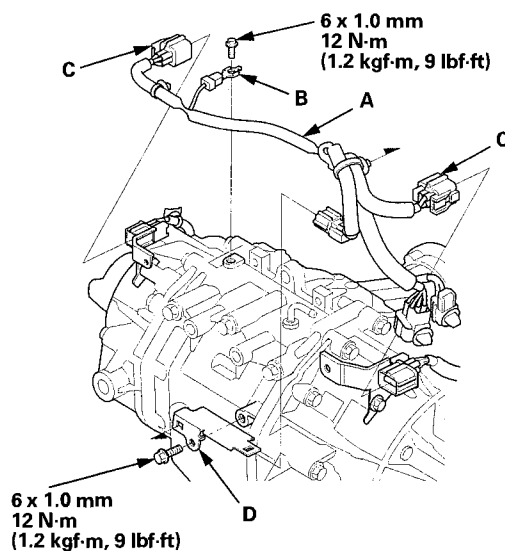


22. Install the 10 x 12 mm dowel pins (A), the rear differential right side case (D) or the rear differential left side case (E), and the mounting bolts (F) onto the rear differential center case (G).

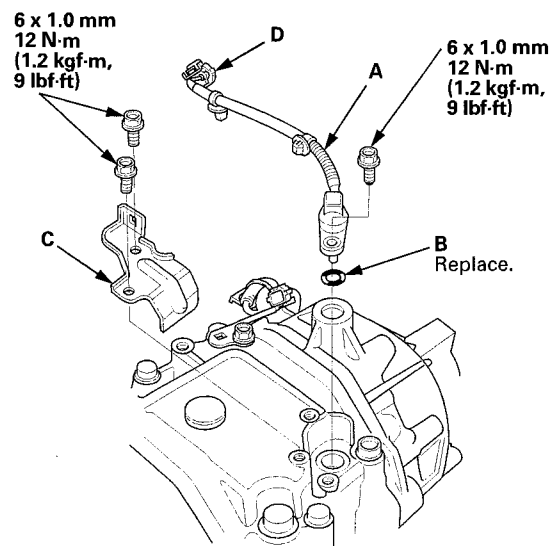


23. Install rear differential harness bracket B and rear differential harness bracket C.
24. Tighten the mounting bolts in a crisscross pattern in several steps, then tighten the bolts to the specified torque.

25. Install the rear differential subharness (A) and rear differential harness bracket D, and install the ground cable (B).



26. Connect the left and right solenoid 4P connectors (C).
27. Install the rear differential fluid temperature sensor (A) with a new O-ring (B), and install the rear differential fluid temperature sensor cover (C).



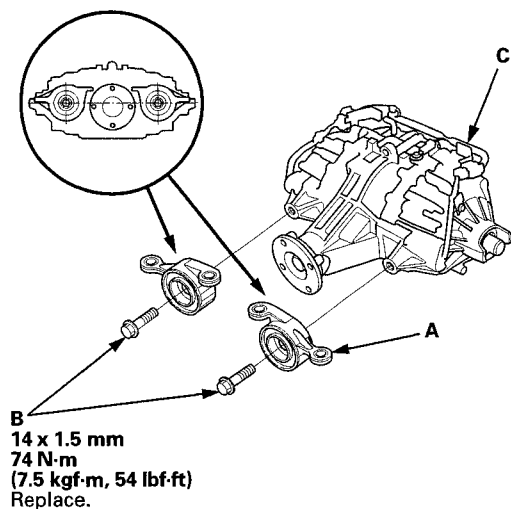
28. Connect the rear differential fluid temperature sensor 2P connector (D).

(cont'd)

Rear Differential

Side Case Replacement (cont'd)

29. Install the rear differential front mounting brackets (A) with new bolts (B) on the rear differential (C).



30. Install the rear differential (see page 15-75).

31. Do the SH-AWD differential clutch torque memorization (see page 15-9).