

SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (If automatic transmission maintenance is required)

The Acura TL SRS includes a driver's airbag in the steering wheel hub, a passenger's airbag in the dashboard above the glove box, seat belt tensioners in the front seat belt retractors, side curtain airbags in the sides of the roof, and side airbags in the front seat-backs. Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (*) on the contents page include or are located near SRS components. Servicing, disassembling, or replacing these items requires special precautions and tools, and should be done by an authorized Acura dealer.

- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal or side collision, all SRS service work should be done by an authorized Acura dealer.
- Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags, side airbags, and/or side curtain airbags.
- Do not bump or impact the SRS unit, front impact sensors, side impact sensors, or rear safing sensor, especially when the ignition switch is in ON (II)/the ON mode, for at least 3 minutes after the ignition switch is turned to LOCK (0), or after the engine start/stop button is pressed to select the OFF mode; otherwise, the system may fail in a collision, or the airbags may deploy.
- SRS electrical connectors are identified by yellow color coding. Related components are located in the steering column, center console, dashboard, dashboard undercover, in the dashboard above the glove box, in the front seats, in the roof side, and around the floor. Do not use electrical test equipment on these circuits.



Transaxle

Automatic Transmission

Special Tools	14-2
General Troubleshooting Information ..	14-4
DTC Troubleshooting Index	14-9
Symptom Troubleshooting Index	14-12
Component Location Index	14-27
System Description	14-28
DTC Troubleshooting	14-85
Road Test	14-177
Stall Speed Test	14-179
Pressure Test	14-180
Shift Solenoid Valve Test, Replacement, and Shift Solenoid Wire Harness Replacement	14-184
A/T Clutch Pressure Control Solenoid Valve A and B Test	14-189
A/T Clutch Pressure Control Solenoid Valve A and B Replacement	14-192
A/T Clutch Pressure Control Solenoid Valve C Test	14-194
A/T Clutch Pressure Control Solenoid Valve C Replacement	14-197
Input Shaft (Mainshaft) Speed Sensor Replacement	14-198
Output Shaft (Countershaft) Speed Sensor Replacement	14-199
Transmission Fluid Pressure Switch A (2nd Clutch) Replacement	14-199
Transmission Fluid Pressure Switch B (3rd Clutch) Replacement	14-200
4th Clutch Transmission Fluid Pressure Switch Replacement	14-200
ATF Temperature Sensor Replacement	14-201
ATF Level Check	14-202
ATF Replacement	14-203
Transfer Assembly Fluid Replacement ..	14-205
Transfer Assembly Inspection	14-206
Transfer Assembly Removal	14-207
Transfer Assembly Installation	14-208
Transfer Breather Hose Replacement ..	14-210
* Transmission Removal	14-211
Drive Plate Removal and Installation ..	14-223
* Transmission Installation	14-223
ATF Cooler Cleaning	14-236
ATF Cooler Hose Replacement	14-239
ATF Cooler Replacement	14-241
Shift Lever Removal	14-242
Shift Lever Installation	14-243
Shift Lever Disassembly/Reassembly ..	14-247
Shift Lever Knob Replacement	14-248
Shift Lever Boot and Shift Lever Boot Base Replacement	14-249
Shift Cable Replacement	14-250
Shift Cable Adjustment	14-253

A/T Gear Position Indicator

Component Location Index	14-257
Circuit Diagram	14-258

Transmission Range Switch Test	14-259
Transmission Range Switch Replacement	14-260
* Paddle Shifter + (Upshift Switch) Circuit Troubleshooting	14-263
* Paddle Shifter - (Downshift Switch) Circuit Troubleshooting	14-265
* Paddle Shifter + (Upshift Switch) Illumination Circuit Troubleshooting ..	14-267
* Paddle Shifter - (Downshift Switch) Illumination Circuit Troubleshooting ..	14-269
* Paddle Shifter + (Upshift Switch) or Paddle Shifter - (Downshift Switch) Replacement	14-271
A/T Gear Position Indicator Replacement	14-272

A/T Interlock System

Component Location Index	14-273
Circuit Diagram	14-274
Shift Lock System Circuit Troubleshooting	14-275
Shift Lock Solenoid Test	14-279
Shift Lock Solenoid Replacement	14-280
Shift Lock Stop/Shift Lock Stop Cushion Replacement	14-281
Shift Lock Release and Release Spring Replacement	14-281
Park Pin Switch Replacement	14-282

Automatic Transmission

Transmission Disassembly	14-284
--------------------------------	--------

Transmission Housing

Reverse Idler Gear Removal/Installation	14-290
Reverse Idler Gear Disassembly/Inspection/ Reassembly	14-290
Secondary Shaft ATF Feed Pipe Cap Removal	14-291
Secondary Shaft ATF Feed Pipe Cap Installation	14-291
Secondary Shaft ATF Feed Pipe Cap, Feed Pipe Replacement	14-292
ATF Filter Removal/Inspection/Installation	14-292
Mainshaft Bearing Removal	14-293
Mainshaft Bearing Installation	14-293
Intermediary Shaft Bearing Replacement	14-294
Park Lever Shaft Bearing Replacement ..	14-294
Selector Control Shaft Bearing Replacement	14-295
Selector Control Shaft Oil Seal Replacement	14-295

Valve Body

Valve Body Repair	14-296
Valve Body Valve Installation	14-297
Main Valve Body Disassembly, Inspection, and Reassembly	14-298
ATF Pump Inspection	14-299
Secondary Valve Body Disassembly, Inspection, and Reassembly	14-300
Regulator Valve Body Disassembly, Inspection, and Reassembly	14-301
Accumulator Body Disassembly, Inspection, and Reassembly	14-302
Shift Solenoid Valve Removal and Installation	14-303

Torque Converter Housing

Mainshaft Bearing and Oil Seal Replacement	14-304
Countershaft Bearing Replacement	14-305
Secondary Shaft Bearing Replacement	14-306
Intermediary Shaft Bearing Replacement	14-308
Park Lever Shaft Bearing Replacement .	14-309

Shafts and Clutches

Mainshaft Disassembly, Inspection, and Reassembly	14-310
Mainshaft 4th Gear Replacement	14-311
Countershaft Disassembly	14-312
Countershaft Idler Gear and 4th Gear Axial Clearance Inspection	14-314
Countershaft Reassembly	14-316
Secondary Shaft Disassembly	14-319
Secondary Shaft 1st Gear Axial Clearance Inspection	14-321
1st Gear One-way Clutch Inspection ...	14-323
1st Clutch Hub Replacement	14-324
Secondary Shaft Reassembly	14-325
Secondary Shaft Installation Height Inspection/Adjustment	14-327
Intermediary Shaft Disassembly, Inspection, and Reassembly	14-329
Intermediary Shaft 4th Gear Removal ..	14-330
Intermediary Shaft 4th Gear Installation	14-331
Intermediary Shaft 3rd Gear Axial Clearance Inspection	14-331
Intermediary Shaft Installation Height Inspection/Adjustment	14-333
Clutch Disassembly	14-334
Clutch Inspection	14-339
Clutch Wave-plate Phase Difference Inspection	14-340
Clutch Clearance Inspection	14-342
Clutch Reassembly	14-346

Automatic Transmission

Transmission Reassembly	14-352
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A/T Differential

Component Location Index	14-364
Backlash Inspection	14-366
Differential Carrier, Final Driven Gear, and Transfer Drive Gear Replacement	14-366
Differential Carrier and Final Driven Gear Replacement	14-367
Carrier Bearing Replacement	14-367
Oil Seal Replacement	14-368
Carrier Bearing Outer Race Replacement	14-369
Carrier Bearing Preload Inspection	14-371

Transfer Output Shaft

Component Location Index	14-375
Transfer Output Shaft Bearing Replacement	14-376
Oil Seal Replacement	14-376
Transmission Housing Bearing Replacement	14-377
Transfer Output Shaft Installation Height Inspection/Adjustment	14-378

Transfer Assembly

Inspection	14-379
Disassembly	14-380
Transfer Hypoid Drive Gear Bearing Replacement	14-383
Transfer Output Shaft (Hypoid Gear) Bearing Removal/Installation	14-383
Transfer Housing Tapered Roller Bearing Outer Race Replacement ...	14-384
Transfer Cover Tapered Roller Bearing Outer Race Removal/Installation	14-385
Transfer Cover Oil Seal Replacement ..	14-386
Reassembly	14-387

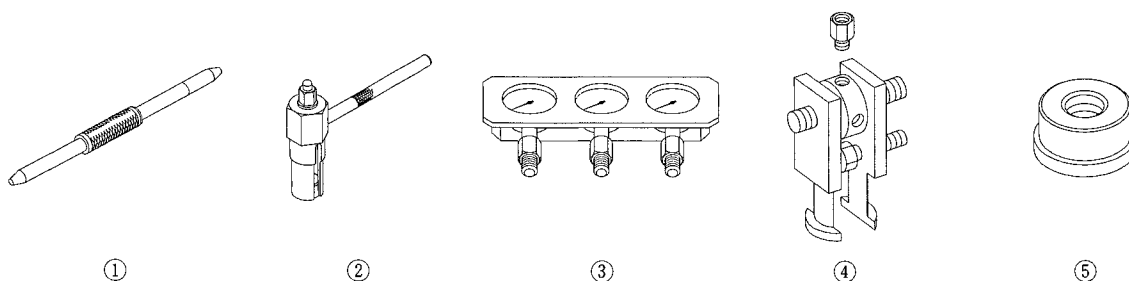


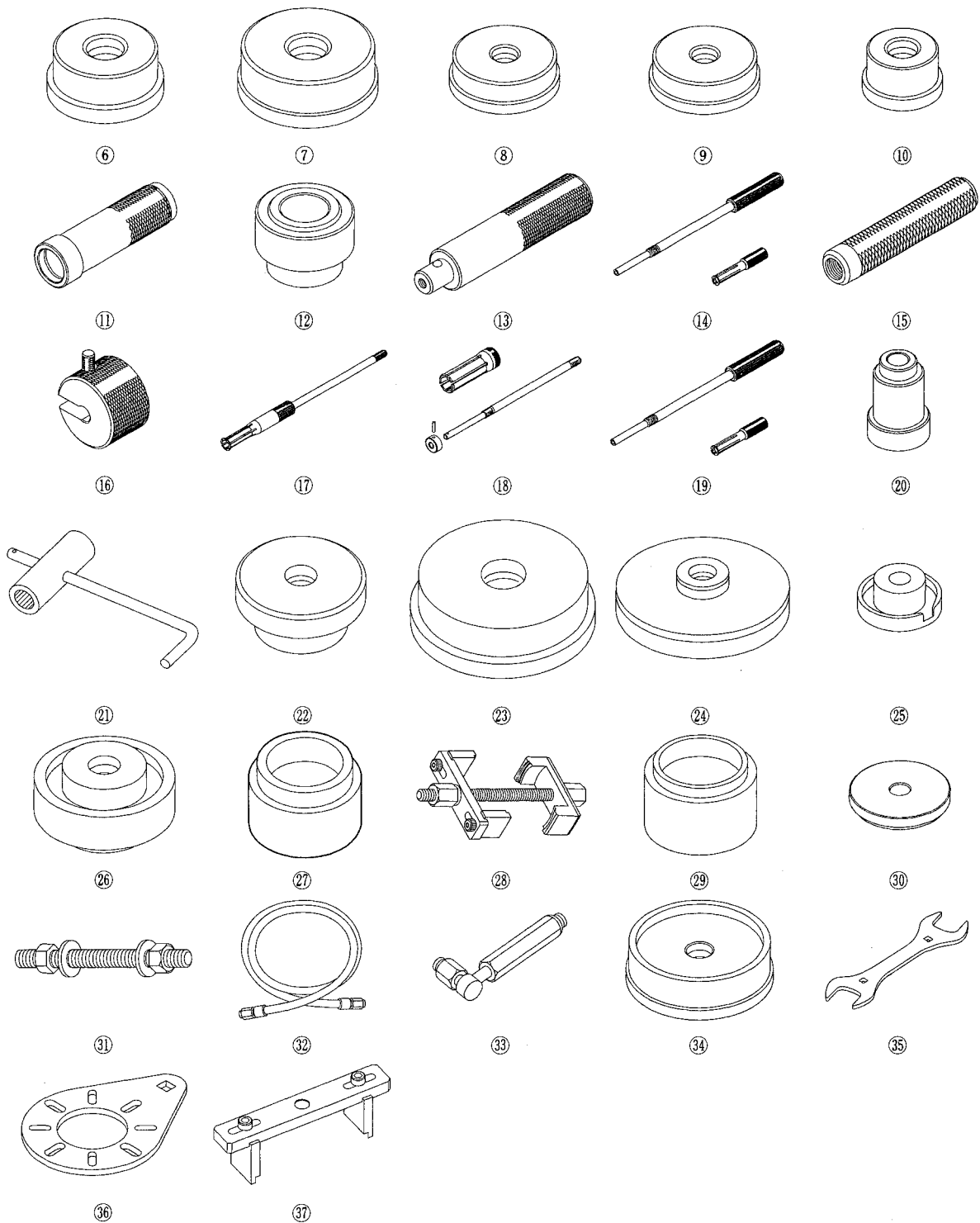
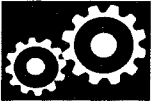
Automatic Transmission

Special Tools

Ref.No.	Tool Number	Description	Qty
①	070AG-SJAA10S	Subframe Alignment Pin	1
②	070AJ-0020101	Preload Inspection Tool	1
③	07406-0020400 or 07406-0020401	A/T Oil Pressure Gauge Set	1
④	07736-A01000B	Adjustable Bearing Puller, 25—40 mm	1
⑤	07746-0010200	Attachment, 37 x 40 mm	1
⑥	07746-0010300	Bearing Driver Attachment, 42 x 47 mm	1
⑦	07746-0010400	Attachment, 52 x 55 mm	1
⑧	07746-0010500	Attachment, 62 x 68 mm	1
⑨	07746-0010600	Attachment, 72 x 75 mm	1
⑩	07746-001A800	Attachment, 22 x 24 mm	1
⑪	07746-0030100	Driver Handle, 40 mm I.D.	1
⑫	07746-0030300	Bearing Driver Attachment, 30 mm	1
⑬	07749-0010000	Driver Handle, 15 x 135L	1
⑭	07936-166010A	Bearing Remover Shaft Set, 12 mm	1
⑮	07936-3710100	Remover Handle	1
⑯	07936-371020A	Slide Hammer	1
⑰	07936-3710600	Bearing Remover Shaft Set, 20 mm	1
⑱	07936-8890300	Bearing Remover Shaft Set, 30 mm	1
⑲	07936-GE0A000	Bearing Remover, 10 mm	1
⑳	07947-6340500	Driver Attachment, 43.5 mm	1
㉑	07GAB-PF50101	Mainshaft Holder	1
㉒	07GAD-PG40100	Oil Seal Driver Attachment	1
㉓	07GAD-SD40101	Attachment, 78 x 90 mm	1
㉔	07HAD-SG00100	Attachment, 83 mm	1
㉕	07JAD-PH80101	Oil Seal Driver Attachment, 58 mm	1
㉖	07JAD-SH30100	Attachment, 65 mm	1
㉗	07LAD-PW50601	Attachment, 40 x 50 mm	1
㉘	07LAE-PX40000	Clutch Spring Compressor Set	1
㉙	07MAD-PR90100	Attachment, 45 x 55 mm	1
㉚	07MAF-SP0011A	Tapered Bearing Race Installer A	1
㉛	07MAF-SP0013A	Installer Shaft	1
㉜	07MAJ-PY4011A	A/T Pressure Hose, 2,210 mm	3
㉝	07MAJ-PY40120	A/T Pressure Adapter	3
㉞	07NAD-PX40100	Attachment, 78 x 80 mm	1
㉟	07XAA-002010A	Wrench, 40 x 42 mm	1
㊱	07XAB-0010101	Flange Holder	1
㊲	07ZAE-PRP0100	Clutch Compressor Attachment	1

④: Must be used with commercially available 3/8"-16 slide hammer.





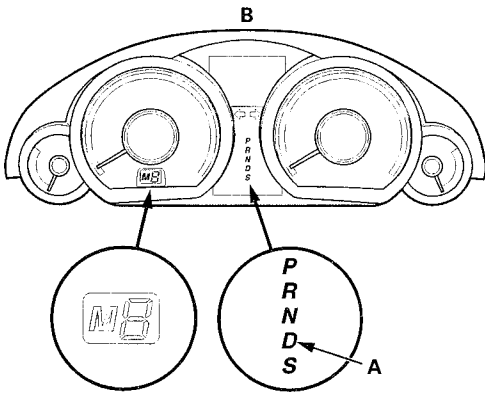
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Automatic Transmission

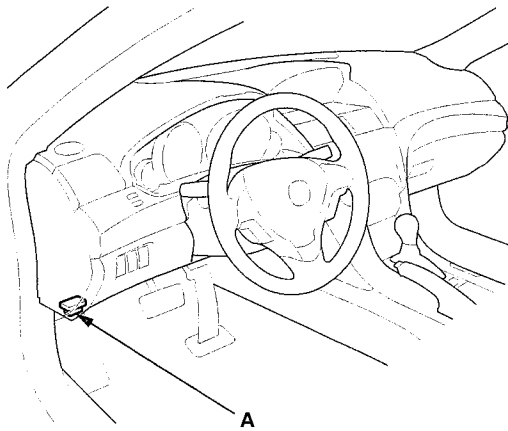
General Troubleshooting Information

How to Check for DTCs with the Honda Diagnostic System (HDS)

When the powertrain control module (PCM) senses an abnormality in the input or output system, the D indicator (A) in the gauge control module (B) will usually blink.



When the Honda Diagnostic System (HDS) is connected to the data link connector (DLC) (A) located under the driver's side of the dashboard, it will indicate the diagnostic trouble code (DTC) when the ignition switch is turned to ON (II), or the engine start/stop button is pressed to select the ON mode and the appropriate menu is selected.



If the D indicator or the malfunction indicator lamp (MIL) has been reported on, or if a driveability problem is suspected, follow this procedure:

1. Connect the HDS to the DLC. (See the HDS user's manual for specific instructions.)
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 PCM. If it does not, go to the DLC circuit troubleshooting (see page 11-258).
3. Check for Pending or Confirmed DTCs with the HDS.
4. Record the freeze data and the on-board snapshots for all fuel and emissions DTCs and A/T DTCs.
5. If there is a fuel and emissions DTC, first check the fuel and emissions system as indicated by the DTC.
6. Clear the DTC and the data.
7. Drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, and then recheck for a DTC. If the A/T DTC returns, go to the indicated DTC's troubleshooting. If the DTC does not return, there was an intermittent problem within the circuit. Make sure all pins and terminals in the circuit are tight.

Symptom Troubleshooting Versus DTC Troubleshooting

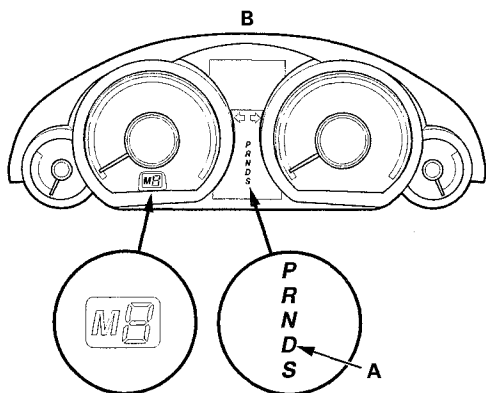
Some symptoms will not set DTCs or cause the D indicator to blink. If the MIL was reported ON or the D indicator has been blinking, check for DTCs. If the vehicle has an abnormal symptom, and there are no DTCs stored, do the symptom troubleshooting. Check the list of probable cause(s) for the symptom, in the sequence listed, until you find the problem.



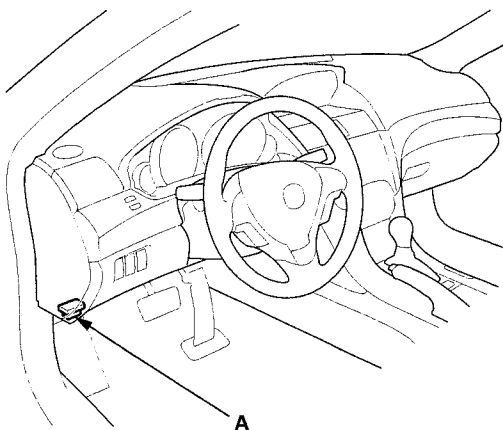
How to Check for DTCs with the SCS Mode (retrieving the flash codes)

NOTE: The preferred method is to use the HDS to retrieve the DTCs.

When the PCM senses an abnormality in the input or output system, the D indicator (A) in the gauge control module (B) will usually blink.



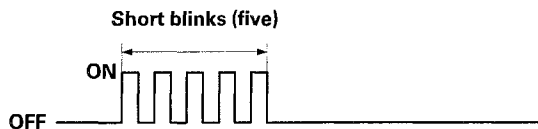
When the D indicator has been reported on, connect the HDS to the DLC (A) located under the driver's side of the dashboard. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, select SCS mode, then the D indicator will indicate (blink) the DTC.



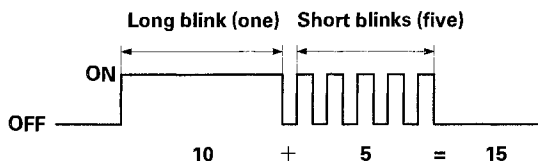
If the D indicator and the MIL come on at the same time, or if a driveability problem is suspected, follow this procedure:

1. Connect the HDS to the DLC. (See the HDS user's manual for specific instructions.)
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 PCM. If it does not, go to the DLC circuit troubleshooting (see page 11-258).
3. Select SCS mode, then observe the D indicator in the gauge control module. Codes 1 through 9 are indicated by individual short blinks. Code 10 and above are indicated by a series of long and short blinks. One long blink equals 10 short blinks. Add the long and short blinks together to determine the code.

Example: DTC P0705 (5)



Example: DTC P0717 (15)



4. Record all fuel and emissions DTCs and A/T DTCs.
5. If there is a fuel and emissions DTC, first check the fuel and emissions system as indicated by the DTC.
6. Clear the DTC and the data.
7. Drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, and then recheck for DTCs. If the A/T DTC returns, go to the indicated DTC's troubleshooting. If the DTC does not return, there was an intermittent problem within the circuit. Make sure all pins and terminals in the circuit are tight.

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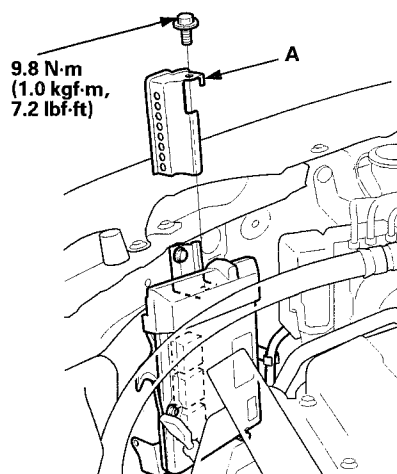
Automatic Transmission

General Troubleshooting Information (cont'd)

How to Troubleshoot Circuits at the PCM Connectors

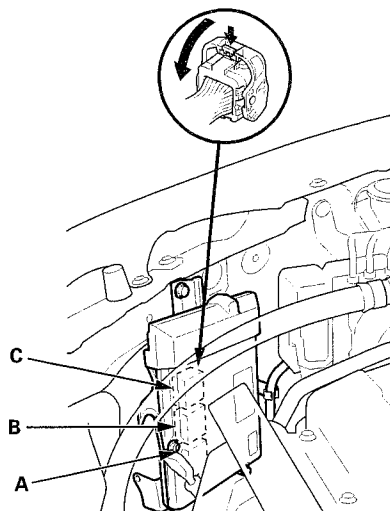
NOTE: The PCM overwrites data and monitors the EVAP system for about 40 minutes after the ignition switch is turned to LOCK (0), or the engine start/stop button is pressed to select OFF mode. Jumping the SCS line after turning the ignition switch to LOCK (0), or pressing the engine start/stop button to select OFF mode cancels this function. Disconnecting the PCM during this function, without jumping the SCS line first, can damage the PCM.

1. Jump the SCS line with the HDS.
2. Canada model: If equipped, remove the PCM connector guard (A).

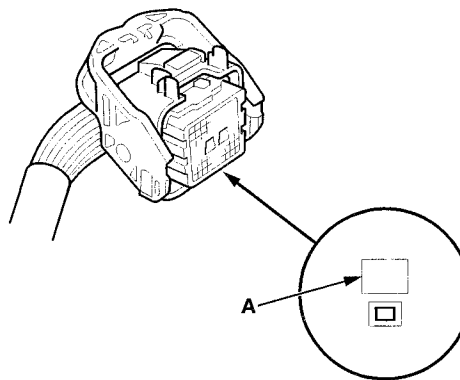


3. Disconnect PCM connectors A, B, and C.

NOTE: PCM connectors A, B, and C have symbols (A=□, B=△, C=○) embossed on them for identification.

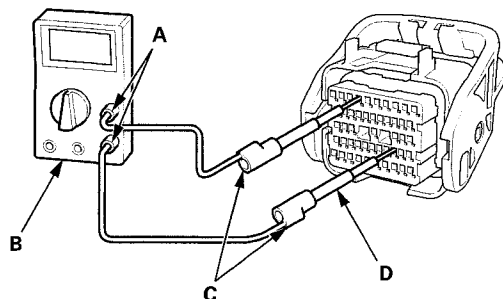


4. When diagnosis/troubleshooting is done at the PCM connector, use the terminal test port (A) above the terminal you need to check.





5. Connect one side of the patch cord's terminals (A) to a commercially available digital multimeter (B), and connect the other side of the terminals (C) to a commercially available banana jack (Pomona Electronics Tool No. 3563 or equivalent) (D).



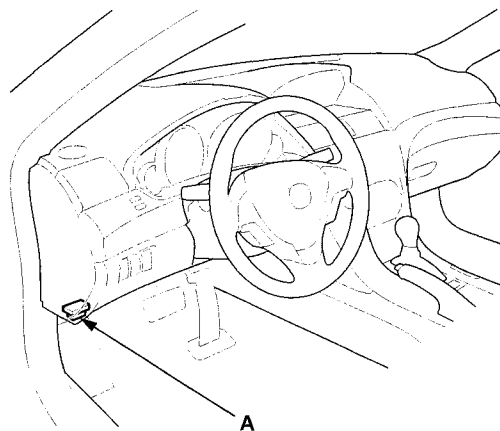
6. Gently insert the pin probe (male) into the terminal test port from the terminal side. Do not force the tips into the terminals.

NOTICE

- For accurate results, always use the pin probe (male).
- To prevent damage to the connector terminals, do not insert test equipment probes, paper clips, or other substitutes as they can damage the terminals. Damaged terminals cause a poor connection and an incorrect measurement.
- Do not puncture the insulation on a wire. Punctures can cause poor or intermittent electrical connections.

Clear A/T DTCs Procedure

1. 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 PCM. If it does not, go to the DLC circuit troubleshooting (see page 11-258).
4. Clear the DTC(s) with the HDS.

OBD Status

The OBD status shows the current system status of each DTC and all of the parameters. This function is used to see if a repair was successfully completed. The results of diagnostic tests for the DTC are displayed as:

- **PASSED:** The on-board diagnosis is successfully completed.
- **FAILED:** The on-board diagnosis has finished but failed.
- **NOT COMPLETED:** The on-board diagnosis was running but is out of the enable conditions of the DTC.

(cont'd)

Automatic Transmission

General Troubleshooting Information (cont'd)

How to End a Troubleshooting Session (required after any troubleshooting)

NOTE: Reset the PCM/TCM with the HDS while the engine is stopped.

1. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, and wait for 30 seconds.
3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode, and disconnect the HDS from the DLC.
4. Start the engine with the shift lever in P or N, and warm it up to normal operating temperature (the radiator fan comes on).
5. To verify that the problem is repaired, test-drive the vehicle for several minutes at speeds over 31 mph (50 km/h) or under the same conditions as those indicated by the freeze data.

PCM/TCM Reset

NOTE: To reset the PCM/TCM, initialize only the automatic transmission memory stored in the PCM or the TCM.

1. Select the A/T system with the HDS.
2. Reset the PCM/TCM with the HDS while the engine is stopped.
3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, and wait for 30 seconds.
5. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode, and disconnect the HDS from the DLC.

Failure Reproduction Technique

Make sure to follow these points while the vehicle is raised on a lift for the test-drive.

- Disable the VSA by pressing the VSA OFF button.
- VSA DTC(s) may come on when test-driving on a lift. If the VSA DTC(s) come on, clear the DTC(s) with the HDS.
- Use the sequential sportshift mode to manually select gears (if applicable).



DTC Troubleshooting Index

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review the General Troubleshooting Information (see page 14-4).

DTC ^{*(1)}	Two Drive Cycle Detection	D Indicator	MIL 	Detection Item	Page
P0705 (5) ^{*(2)}	—	Blinks	ON	Short in Transmission Range Switch Circuit (Multiple Shift-position Input)	DTC Troubleshooting (see page 14-85)
P0706 (6) ^{*(2)}	○	OFF	ON	Open in Transmission Range Switch Circuit	DTC Troubleshooting (see page 14-86)
P0711 (28) ^{*(2)}	○	Blinks	OFF	Problem in ATF Temperature Sensor Circuit	DTC Troubleshooting (see page 14-87)
P0712 (28) ^{*(2)}	○	Blinks	OFF	Short in ATF Temperature Sensor Circuit	DTC Troubleshooting (see page 14-89)
P0713 (28) ^{*(2)}	○	Blinks	OFF	Open in ATF Temperature Sensor Circuit	DTC Troubleshooting (see page 14-91)
P0716 (15) ^{*(2)}	—	Blinks	ON	Problem in Input Shaft (Mainshaft) Speed Sensor Circuit	DTC Troubleshooting (see page 14-94)
P0717 (15) ^{*(2)}	—	Blinks	ON	Problem in Input Shaft (Mainshaft) Speed Sensor Circuit (No Signal Input)	DTC Troubleshooting (see page 14-95)
P0718 (15) ^{*(2)}	○	Blinks	ON	Input Shaft (Mainshaft) Speed Sensor Intermittent Failure	DTC Troubleshooting (see page 14-95)
P0721 (9) ^{*(2)}	—	Blinks	ON	Problem in Output Shaft (Countershaft) Speed Sensor Circuit	DTC Troubleshooting (see page 14-94)
P0722 (9) ^{*(2)}	—	Blinks	ON	Problem in Output Shaft (Countershaft) Speed Sensor Circuit (No Signal Input)	DTC Troubleshooting (see page 14-97)
P0723 (9) ^{*(2)}	○	Blinks	ON	Output Shaft (Countershaft) Speed Sensor Intermittent Failure	DTC Troubleshooting (see page 14-97)
P0731 (64)	○	Blinks	OFF	Problem in 1st Clutch and 1st Clutch Hydraulic Circuit	DTC Troubleshooting (see page 14-100)
P0732 (64)	○	Blinks	OFF	Problem in 2nd Clutch and 2nd Clutch Hydraulic Circuit	DTC Troubleshooting (see page 14-101)
P0733 (64)	○	Blinks	OFF	Problem in 3rd Clutch and 3rd Clutch Hydraulic Circuit	DTC Troubleshooting (see page 14-102)
P0734 (64)	○	Blinks	OFF	Problem in 4th Clutch and 4th Clutch Hydraulic Circuit	DTC Troubleshooting (see page 14-103)
P0735 (64)	○	Blinks	OFF	Problem in 5th Clutch and 5th Clutch Hydraulic Circuit	DTC Troubleshooting (see page 14-104)
P0741 (40)	○	OFF	ON	Torque Converter Clutch Hydraulic Circuit Stuck OFF	DTC Troubleshooting (see page 14-105)
P0746 (76)	○	Blinks	ON	A/T Clutch Pressure Control Solenoid Valve A Stuck OFF	DTC Troubleshooting (see page 14-107)
P0747 (76)	○	Blinks	ON	A/T Clutch Pressure Control Solenoid Valve A Stuck ON	DTC Troubleshooting (see page 14-107)
P0751 (70)	○	Blinks	ON	Shift Solenoid Valve A Stuck OFF	DTC Troubleshooting (see page 14-108)
P0752 (70)	○	Blinks	ON	Shift Solenoid Valve A Stuck ON	DTC Troubleshooting (see page 14-108)
P0756 (71)	○	Blinks	ON	Shift Solenoid Valve B Stuck OFF	DTC Troubleshooting (see page 14-109)

NOTE:

*(1): The DTC in parentheses is the flash code the D indicator indicates when the data link connector (DLC) is connected to the HDS, and in the SCS mode.

*(2): This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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Automatic Transmission

DTC Troubleshooting Index (cont'd)

DTC ^{*(1)}	Two Drive Cycle Detection	D Indicator	MIL 	Detection Item	Page
P0757 (71)	○	Blinks	ON	Shift Solenoid Valve B Stuck ON	DTC Troubleshooting (see page 14-109)
P0761 (72)	○	Blinks	ON	Shift Solenoid Valve C Stuck OFF	DTC Troubleshooting (see page 14-110)
P0762 (72)	○	Blinks	ON	Shift Solenoid Valve C Stuck ON	DTC Troubleshooting (see page 14-110)
P0766 (73)	○	Blinks	ON	Shift Solenoid Valve D Stuck OFF	DTC Troubleshooting (see page 14-111)
P0767 (73)	○	Blinks	ON	Shift Solenoid Valve D Stuck ON	DTC Troubleshooting (see page 14-111)
P0776 (77)	○	Blinks	ON	A/T Clutch Pressure Control Solenoid Valve B Stuck OFF	DTC Troubleshooting (see page 14-112)
P0777 (77)	○	Blinks	ON	A/T Clutch Pressure Control Solenoid Valve B Stuck ON	DTC Troubleshooting (see page 14-112)
P0796 (78)	○	Blinks	ON	A/T Clutch Pressure Control Solenoid Valve C Stuck OFF	DTC Troubleshooting (see page 14-113)
P0797 (78)	○	Blinks	ON	A/T Clutch Pressure Control Solenoid Valve C Stuck ON	DTC Troubleshooting (see page 14-113)
P0812 (65) ^{*(2)}	○	Blinks	ON	Open in Transmission Range Switch ATPR Switch Circuit	DTC Troubleshooting (see page 14-115)
P0842 (25) ^{*(2)}	—	Blinks	ON	Short in Transmission Fluid Pressure Switch A (2nd Clutch) Circuit, or Transmission Fluid Pressure Switch A (2nd Clutch) Stuck ON	DTC Troubleshooting (see page 14-117)
P0843 (25)	—	Blinks	ON	Open in Transmission Fluid Pressure Switch A (2nd Clutch) Circuit, or Transmission Fluid Pressure Switch A (2nd Clutch) Stuck OFF	DTC Troubleshooting (see page 14-119)
P0847 (26) ^{*(2)}	—	Blinks	ON	Short in Transmission Fluid Pressure Switch B (3rd Clutch) Circuit, or Transmission Fluid Pressure Switch B (3rd Clutch) Stuck ON	DTC Troubleshooting (see page 14-122)
P0848 (26)	—	Blinks	ON	Open in Transmission Fluid Pressure Switch B (3rd Clutch) Circuit, or Transmission Fluid Pressure Switch B (3rd Clutch) Stuck OFF	DTC Troubleshooting (see page 14-124)
P0872 (27) ^{*(2)}	○	Blinks	OFF	Short in 4th Clutch Transmission Fluid Pressure Switch Circuit, or 4th Clutch Transmission Fluid Pressure Switch Stuck ON	DTC Troubleshooting (see page 14-127)
P0873 (27)	○	Blinks	OFF	Open in 4th Clutch Transmission Fluid Pressure Switch Circuit, or 4th Clutch Transmission Fluid Pressure Switch Stuck OFF	DTC Troubleshooting (see page 14-129)
P0962 (16) ^{*(2)}	—	Blinks	ON	Problem in A/T Clutch Pressure Control Solenoid Valve A Circuit	DTC Troubleshooting (see page 14-132)
P0963 (16) ^{*(2)}	—	Blinks	ON	Problem in A/T Clutch Pressure Control Solenoid Valve A	DTC Troubleshooting (see page 14-135)

NOTE:

- *(1): The DTC in parentheses is the flash code the D indicator indicates when the data link connector (DLC) is connected to the HDS, and in the SCS mode.
- *(2): This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.



DTC ^{*(1)}	Two Drive Cycle Detection	D Indicator	MIL 	Detection Item	Page
P0966 (23) ^{*(2)}	—	Blinks	ON	Problem in A/T Clutch Pressure Control Solenoid Valve B Circuit	DTC Troubleshooting (see page 14-137)
P0967 (23) ^{*(2)}	—	Blinks	ON	Problem in A/T Clutch Pressure Control Solenoid Valve B	DTC Troubleshooting (see page 14-141)
P0970 (29) ^{*(2)}	—	Blinks	ON	Problem in A/T Clutch Pressure Control Solenoid Valve C Circuit	DTC Troubleshooting (see page 14-143)
P0971 (29) ^{*(2)}	—	Blinks	ON	Problem in A/T Clutch Pressure Control Solenoid Valve C	DTC Troubleshooting (see page 14-146)
P0973 (7) ^{*(2)}	—	Blinks	ON	Short in Shift Solenoid Valve A Circuit	DTC Troubleshooting (see page 14-148)
P0974 (7) ^{*(2)}	—	Blinks	ON	Open in Shift Solenoid Valve A Circuit	DTC Troubleshooting (see page 14-151)
P0976 (8) ^{*(2)}	—	Blinks	ON	Short in Shift Solenoid Valve B Circuit	DTC Troubleshooting (see page 14-154)
P0977 (8) ^{*(2)}	—	Blinks	ON	Open in Shift Solenoid Valve B Circuit	DTC Troubleshooting (see page 14-157)
P0979 (22) ^{*(2)}	—	Blinks	ON	Short in Shift Solenoid Valve C Circuit	DTC Troubleshooting (see page 14-160)
P0980 (22) ^{*(2)}	—	Blinks	ON	Open in Shift Solenoid Valve C Circuit	DTC Troubleshooting (see page 14-163)
P0982 (60) ^{*(2)}	—	Blinks	ON	Short in Shift Solenoid Valve D Circuit	DTC Troubleshooting (see page 14-166)
P0983 (60) ^{*(2)}	—	Blinks	ON	Open in Shift Solenoid Valve D Circuit	DTC Troubleshooting (see page 14-168)
P1717 (62)	○	Blinks	ON	Open in Transmission Range Switch ATPRVS Switch Circuit	DTC Troubleshooting (see page 14-171)
P1743 (45)	○	Blinks	OFF	Problem in Shift Control System; Shift Valve E Stuck OFF	DTC Troubleshooting (see page 14-174)
P1744 (45)	○	Blinks	OFF	Problem in Shift Control System; Shift Valve E Stuck ON	DTC Troubleshooting (see page 14-174)
P1745 (45)	○	Blinks	OFF	Problem in Shift Control System; Servo Control Valve Stuck OFF or Servo Valve Stuck OFF	DTC Troubleshooting (see page 14-175)
P1780 (49)	○	Blinks	ON	Problem in Shift Control System	DTC Troubleshooting (see page 14-176)

NOTE:

- *(1): The DTC in parentheses is the flash code the D indicator indicates when the data link connector (DLC) is connected to the HDS, and in the SCS mode.
- *(2): This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

Automatic Transmission

Symptom Troubleshooting Index

NOTE: Do an all DTC check with the HDS and troubleshoot those first before do symptom troubleshooting procedures.

Symptom	Probable cause(s)	Notes
When you turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, the D indicator comes on and stays on in all shift lever positions, or it never comes on at all	- F-CAN communication line error - Gauge control module defective - PCM defective	- Check the F-CAN communication line (see page 11-243). - Check the F-CAN communication line by using the gauge control module self-diagnostic function (see page 22-344). - Check the indicator drive circuit in the gauge control module by using the gauge control module self-diagnostic function (see page 22-343).
A/T gear position indicator does not come on while the shift lever is in that position; shift indicator does not work	- F-CAN communication line error - Gauge control module defective - PCM defective - Transmission range switch defective or out of adjustment - Shift cable broken or out of adjustment - Connection between shift cable and transmission or shift lever is worn	- Check the F-CAN communication line (see page 11-243). - Check the F-CAN communication line by using the gauge control module self-diagnostic function (see page 22-344). - Check the indicator drive circuit in the gauge control module by using the gauge control module self-diagnostic function (see page 22-343). - Inspect the transmission range switch (see page 14-259). - Check for a loose shift cable at the shift lever or at the transmission.
Speedometer does not work	- F-CAN communication line error - Gauge control module defective - PCM defective - Output shaft (countershaft) speed sensor defective	- Check the F-CAN communication line (see page 11-243). - Check the F-CAN communication line by using the gauge control module self-diagnostic function (see page 22-344). - Check the speedometer drive circuit in the gauge control module using the HDS (see page 22-343). - Check the speed sensor installation. - Inspect the output shaft (countershaft) speed sensor O-ring for wear and damage.
When you press the paddle shifter + (upshift switch) in D and S, the transmission does not upshift	A problem in the paddle shifter + (upshift switch) circuit	Check the paddle shifter + (upshift switch) circuit (see page 14-263).
When you press the paddle shifter – (downshift switch) in D and S, the transmission does not downshift	A problem in the paddle shifter – (downshift switch) circuit	Check the paddle shifter – (downshift switch) circuit (see page 14-265).
M indicator does not come on even when the paddle shifter + (upshift switch) or paddle shifter – (downshift switch) is operated in sequential sportshift mode	- F-CAN communication line error - Gauge control module defective - PCM defective	- Check the F-CAN communication line (see page 11-243). - Check the F-CAN communication line by using the gauge control module self-diagnostic function (see page 22-344). - Check the A/T gear position indicator drive circuit in the gauge control module by using the gauge control module self-diagnostic function (see page 22-343).



Symptom	Probable cause(s)	Notes
Shift lever cannot be moved from P while pressing on the brake pedal	• Brake pedal position switch circuit • Brake pedal position switch defective • Shift lock solenoid defective • Shift lock solenoid control circuit • Shift lock mechanism defective • Accelerator pedal position sensor circuit • Accelerator pedal position sensor defective • Throttle body defective • Transmission range switch ATPP switch stuck OFF • Transmission range switch ATPP switch circuit open	Troubleshoot the shift lock system circuit (see page 14-275).
HDS does not communicate with the PCM	• DLC circuit • PCM defective	Troubleshoot the DLC circuit (see page 11-258).
Engine runs, but vehicle does not move in any gear	• Low ATF level • Shift cable broken or out of adjustment • Connection between shift cable and transmission or shift lever is worn • Axle disengaged • ATF pump worn or binding • Regulator valve stuck or spring worn • ATF strainer clogged • Foreign material in separator plate orifice • Mainshaft worn or damaged • Countershaft worn or damaged • Final gears worn or damaged • Park mechanism defective • Selector control shaft worn or damaged • Drive plate defective • Torque converter defective • Transmission-to-engine assembly error	• Check the ATF level, and check the ATF cooler line for leaks and loose connections. If necessary, clean the ATF cooler lines. • Check for a loose shift cable at the shift lever and the transmission control lever. • Check the stall speed (see page 14-179). • Check the line pressure (see page 14-180). • Improper alignment of the ATF pump and the torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Check the regulator valve in the regulator valve body for free movement, and check the valve springs for wear and damage. • Check the ATF strainer for debris. If the strainer is clogged, find the damaged components that caused the debris. If no cause for contamination is found, replace the torque converter. • Check for a clogged orifice in the separator plate. If the orifice is clogged, remove it and clean the separator plate orifice. • Inspect the differential pinion gears for wear. If the differential pinion gears are worn, replace the differential assembly, replace the ATF strainer, thoroughly clean the transmission, and clean the cooler and lines. • Replace the torque converter. • Be careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the main valve body. This will cause ATF pump seizure, use the proper tools. • Install the main seal flush with the torque converter housing. If you push it into the torque converter housing until it bottoms out, it will block the fluid return passage and result in damage. • Inspect the countershaft and the secondary shaft for wear and damage. • Inspect the park mechanism at the park lever link, park gear, and 2nd gears. • Check the drive plate for wear and damage, replace the drive plate if it is worn or damaged. • Check for a misinstalled transmission.

(cont'd)

Automatic Transmission

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Vehicle moves in R, but not in D or S	1st accumulator defective - Idler gears worn or damaged 1st clutch defective	- Check the 1st clutch pressure (see page 14-180). - Inspect the mainshaft, the countershaft, the secondary shaft, the intermediary shaft, and the idler gears for wear and damage. - Inspect the 1st clutch for wear and damage. - Inspect the clutch piston, the clutch piston check valve, and the O-rings. Check the spring retainer for wear and damage. Inspect the clearance between the clutch end-plate and the top disc. If the clearance is out of tolerance, inspect the clutch discs and the plates for wear and damage, and inspect the clutch wave-plate height. If the discs and the plates are worn or damaged, replace them as a set. If the clutch wave-plate height is out of the tolerance, replace the clutch wave-plate. If they are OK, adjust the clearance with the clutch end-plate. - Check the 1st accumulator piston, the O-ring, and the spring in the accumulator body for wear and damage.
Vehicle moves in S and R, but not in D	1st gear one-way clutch defective 1st gears worn or damaged 1st clutch defective	- Check the 1st clutch pressure (see page 14-180). - Inspect the mainshaft, the countershaft, 1st gears, and the one-way clutch for wear and damage. - Inspect the 1st clutch for wear and damage. - Inspect the clutch piston, the clutch piston check valve, and the O-rings. Check the spring retainer for wear and damage. Inspect the clearance between the clutch end-plate and the top disc. If the clearance is out of tolerance, inspect the clutch discs and the plates for wear and damage, and inspect the clutch wave-plate height. If the discs and the plates are worn or damaged, replace them as a set. If the clutch wave-plate height is out of the tolerance, replace the clutch wave-plate. If they are OK, adjust the clearance with the clutch end-plate.
Vehicle moves in D and R, but not in 1st in S	1st-hold clutch defective	- Check the 1st-hold clutch pressure (see page 14-180). - Inspect the 1st-hold clutch for wear and damage. - Inspect the clutch piston, the clutch piston check valve, and the O-rings. Check the spring retainer for wear and damage. Inspect the clearance between clutch plate B and the top disc. If the clearance is out of tolerance, inspect the clutch discs and the plates for wear and damage, and inspect the clutch wave-plate height. If the discs and the plates are worn or damaged, replace them as a set. If the clutch wave-plate height is out of the tolerance, replace the clutch wave-plate.
Vehicle moves in D and R, but not in 2nd in S	2nd accumulator defective 2nd clutch defective	- Check the 2nd clutch pressure (see page 14-180). - Inspect the 2nd clutch for wear and damage. - Inspect the clutch piston, the clutch piston check valve, and the O-rings. Check the spring retainer for wear and damage. Inspect the clearance between the clutch end-plate and the top disc. If the clearance is out of tolerance, inspect the clutch discs and the plates for wear and damage, and inspect the clutch wave-plate height. If the discs and the plates are worn or damaged, replace them as a set. If the clutch wave-plate height is out of the tolerance, replace the clutch wave-plate. If they are OK, adjust the clearance with the clutch end-plate. - Check the 2nd accumulator piston, the O-ring, and the spring in the accumulator body for wear and damage.



Symptom	Probable cause(s)	Notes
Vehicle moves in D and S, but not in R (or moves forward in R)	- Shift fork shaft stuck 5th accumulator defective 5th clutch defective - Reverse gears worn or damaged - Reverse idler gear shaft/holder worn or damaged - Reverse selector or reverse selector hub worn or damaged	- Check for a missing shift fork bolt on the shift fork shaft. - Check the shift fork shaft detent for wear and damage. - Check for a stuck servo valve in the regulator valve body, and check the O-ring for wear and damage. - Check the stall speed in R (see page 14-179). - Check the 5th clutch pressure (see page 14-180). - Inspect the 5th clutch for wear and damage. - Inspect the clutch piston, the clutch piston check valve, and the O-rings. Check the spring retainer for wear and damage. Inspect the clearance between the clutch end-plate and the top disc. If the clearance is out of tolerance, inspect the clutch discs and the plates for wear and damage, and inspect the clutch wave-plate height. If the discs and the plates are worn or damaged, replace them as a set. If the clutch wave-plate height is out of the tolerance, replace the clutch wave-plate. If they are OK, adjust the clearance with the clutch end-plate. - Check the 5th accumulator piston, the O-ring, and the spring in the accumulator body for wear and damage. - Inspect the reverse idler gear shaft/holder for wear and damage. - Inspect the reverse selector gear teeth chamfers, and inspect the engagement teeth chamfers of the countershaft 5th gear and the reverse gear. Replace the reverse gears and the reverse selector if they are worn or damaged. If the transmission makes clicking, grinding, or whirring noises, also replace the mainshaft 5th gear, the reverse idler gear, and the countershaft 5th gear.
Poor acceleration; flares when starting off in D, S, and R	- Low ATF level - Shift cable broken or out of adjustment - ATF pump worn or binding - Regulator valve stuck or spring worn - Stator shaft worn or damaged - ATF strainer clogged - Torque converter one-way clutch defective - Torque converter check valve defective - Shift valve E defective	- Check the ATF level, and check the ATF cooler line for leaks and loose connections. If necessary, clean the ATF cooler lines. - Check for a loose shift cable at the shift lever and the transmission control lever. - Check the stall speed (see page 14-179). - Check the line pressure (see page 14-180). - Improper alignment of ATF pump and the torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. - Check the regulator valve in the regulator valve body for free movement, and check the valve springs for wear and damage. - Check the stator shaft splines for wear and damage. - Check the ATF strainer for debris. If the strainer is clogged, find the damaged components that caused the debris. If no cause for contamination is found, replace the torque converter. - Check the torque converter check valve in the main valve body for free movement, and check the valve spring for wear and damage. - Check shift valve E in the main valve body for free movement, and check the valve spring for wear and damage. - Replace the torque converter.

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Automatic Transmission

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Poor acceleration; flares when starting off in D, S, and R; stall speed high in D	• Low ATF level • 1st accumulator defective • 1st clutch defective	• Check the ATF level, and check the ATF cooler line for leaks and loose connections. If necessary, clean the ATF cooler lines. • Check the stall speed (see page 14-179). • Check the 1st clutch pressure (see page 14-180). • Inspect the 1st clutch for wear and damage. • Inspect the clutch piston, the clutch piston check valve, and the O-rings. Check the spring retainer for wear and damage. Inspect the clearance between the clutch end-plate and the top disc. If the clearance is out of tolerance, inspect the clutch discs and the plates for wear and damage, and inspect the clutch wave-plate height. If the discs and the plates are worn or damaged, replace them as a set. If the clutch wave-plate height is out of the tolerance, replace the clutch wave-plate. If they are OK, adjust the clearance with the clutch end-plate. • Check the 1st accumulator piston, the O-ring, and the spring in the accumulator body for wear and damage.
Poor acceleration; flares when starting off in D, S, and R; stall speed high in 1st in S	• Low ATF level • 1st-hold clutch defective	• Check the ATF level, and check the ATF cooler line for leaks and loose connections. If necessary, clean the ATF cooler lines. • Check stall speed (see page 14-179). • Check the 1st-hold clutch pressure (see page 14-180). • Inspect the 1st-hold clutch for wear and damage. • Inspect the clutch piston, the clutch piston check valve, and the O-rings. Check the spring retainer for wear and damage. Inspect the clearance between clutch plate B and the top disc. If the clearance is out of tolerance, inspect the clutch discs and the plates for wear and damage, and inspect the clutch wave-plate height. If the discs and the plates are worn or damaged, replace them as a set. If the clutch wave-plate height is out of the tolerance, replace the clutch wave-plate.
Poor acceleration; flares when starting off in D, S, and R; stall speed high in 2nd in S	• Low ATF level • 2nd accumulator defective • 2nd clutch defective	• Check the ATF level, and check the ATF cooler line for leaks and loose connections. If necessary, clean the ATF cooler lines. • Check the 2nd clutch pressure (see page 14-180). • Inspect the 2nd clutch for wear and damage. • Inspect the clutch piston, the clutch piston check valve, and the O-rings. Check the spring retainer for wear and damage. Inspect the clearance between the clutch end-plate and the top disc. If the clearance is out of tolerance, inspect the clutch discs and the plates for wear and damage, and inspect the clutch wave-plate height. If the discs and the plates are worn or damaged, replace them as a set. If the clutch wave-plate height is out of the tolerance, replace the clutch wave-plate. If they are OK, adjust the clearance with the clutch end-plate. • Check the 2nd accumulator piston, the O-ring, and the spring in the accumulator body for wear and damage.



Symptom	Probable cause(s)	Notes
Poor acceleration; flares when starting off in D, S, and R; stall speed high in R	• Low ATF level • Shift cable broken or out of adjustment • 5th accumulator defective • 5th clutch defective	• Check the ATF level, and check the ATF cooler line for leaks and loose connections. If necessary, clean the ATF cooler lines. • Check for a loose shift cable at the shift lever and the selector control lever. • Check the stall speed in R (see page 14-179). • Check the 5th clutch pressure (see page 14-180). • Inspect the 5th clutch for wear and damage. • Inspect the clutch piston, the clutch piston check valve, and the O-rings. Check the spring retainer for wear and damage. Inspect the clearance between the clutch end-plate and the top disc. If the clearance is out of tolerance, inspect the clutch discs and the plates for wear and damage, and inspect the clutch wave-plate height. If the discs and the plates are worn or damaged, replace them as a set. If the clutch wave-plate height is out of the tolerance, replace the clutch wave-plate. If they are OK, adjust the clearance with the clutch end-plate. • Check the 5th accumulator piston, the O-ring, and the spring in the accumulator body for wear and damage.
Poor acceleration in D, S, and R; stall speed low; engine does not rev to high rpm; transmission does not upshift under hard acceleration	• Engine output low • VTEC rocker arms defective • Restricted intake • Restricted exhaust • Torque converter clutch piston defective • Low fuel pressure	• Check the stall speed (see page 14-179). • Check the engine control system. • Check fuel pressure (see page 11-369). • Check for exhaust restriction. • Check for intake restriction. • J35Z6 engine: Check the VTEC rocker arms (see page 6-8). • J37A4 engine: Check the VTEC rocker arms (see page 6-70). • Replace the torque converter.
Engine idle vibration; engine stalls, idles low or rough	• Worn engine or transmission mounts • Low ATF level • Engine output low • Torque converter clutch piston defective • Shift solenoid valve D defective • A/T clutch pressure control solenoid valve C defective • Lock-up control valve defective • Lock-up timing valve defective	• Check engine and transmission mounts. • Check the ATF level, and check the ATF cooler line for leaks and loose connections. If necessary, clean the ATF cooler lines. • Check the stall speed (see page 14-179). • Check the engine control system. • Check the line pressure (see page 14-180). • Improper alignment of the ATF pump and the torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Test the shift solenoid valve D function with the HDS (see page 14-184). • Test the A/T clutch pressure control solenoid valve C with the HDS (see page 14-194). • Check for a seized shift solenoid valve, and inspect the O-rings. • Replace the torque converter. • Check the lock-up shift valve and the lock-up timing valve in the main valve body for free movement, and check the valve springs for wear and damage. • Check the lock-up control valve in the regulator valve body for free movement, and check the valve spring for wear and damage.

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Automatic Transmission

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Vehicle moves in N	• Excessive ATF • ATF temperature sensor defective • Foreign material in separator plate orifice • Relief valve defective • Reverse control valve defective • Lubrication control valve defective • 1st-hold clutch defective • 1st clutch defective • 2nd clutch defective • 3rd clutch defective • 4th clutch defective • 5th clutch defective • Clearance between clutch end-plate and top disc incorrect • Needle bearing seized, worn, or damaged • Thrust washer seized, worn or damaged	• Check the ATF level, and drain the ATF if it is over-filled. • Check the ATF temperature sensor O-ring for wear and damage. • Check the stall speed (see page 14-179). • Check all clutch pressures. • Check for a clogged orifice in the separator plate. If the orifice is clogged, remove it and clean the separator plate orifice. • Check the relief valve and lubrication control valve in the main valve body for free movement, and check the valve springs for wear and damage. • Check the reverse control valve in the secondary valve body for free movement, and check the valve spring for wear and damage. • Inspect all clutches for wear and damage. • Inspect the clutch piston, the clutch piston check valve, and the O-rings. Check the spring retainer for wear and damage. Inspect the clearance between the clutch end-plate and the top disc. If the clearance is out of tolerance, inspect the clutch discs and the plates for wear and damage, and inspect the clutch wave-plate height. If the discs and the plates are worn or damaged, replace them as a set. If the clutch wave-plate height is out of the tolerance, replace the clutch wave-plate. If they are OK, adjust the clearance with the clutch end-plate. • Check the needle bearings and the thrust washers on all shafts for seizure, wear, and damage.



Symptom	Probable cause(s)	Notes
Delayed engagement after shifting from N to D or S, or excessive shock when shifting	- Worn engine or transmission mounts - Shift solenoid valve A defective - Shift solenoid valve B defective - Shift solenoid valve C defective - A/T clutch pressure control solenoid valve C defective - Shift cable broken or out of adjustment - Connection between shift cable and transmission or shift lever is worn - Transmission range switch out of adjustment - ATF temperature sensor defective - CPC valve C stuck - ATF strainer clogged - Foreign material in separator plate orifice - Shift valve A defective - Shift valve D defective - Servo control valve defective 1st accumulator defective 2nd accumulator defective 1st check ball stuck 1st clutch defective - Clearance between clutch end-plate and top disc incorrect	- Check engine and transmission mounts. - Test the shift solenoid valves with the HDS (see page 14-184). - Check for a seized shift solenoid valve, and inspect the O-rings. - Test the A/T clutch pressure control solenoid valves with the HDS (see page 14-189). - Check the stall speed (see page 14-179). - Check the line and 1st clutch pressures (see page 14-180). - Inspect the A/T clutch pressure control solenoid valve body gasket, the ATF feed pipes, and the O-rings for wear and damage. - Check for a loose shift cable at the shift lever and the transmission control lever. - Inspect the ATF temperature sensor O-ring for wear and damage. - Check for a clogged orifice in the separator plate. If the orifice is clogged, remove it and clean the separator plate orifice. - Check the ATF strainer for debris. If the strainer is clogged, find the damaged components that caused the debris. If no cause for contamination is found, replace the torque converter. - Check CPC valve C in the secondary valve body for free movement, and check the valve spring for wear and damage. - Check shift valve A in the main valve body for free movement, and check the valve spring for wear and damage. - Check shift valve D in the secondary valve body for free movement, and check the valve spring for wear and damage. - Inspect the 1st clutch for wear and damage. - Inspect the clutch piston, the clutch piston check valve, and the O-rings. Check the spring retainer for wear and damage. Inspect the clearance between the clutch end-plate and the top disc. If the clearance is out of tolerance, inspect the clutch discs and the plates for wear and damage, and inspect the clutch wave-plate height. If the discs and the plates are worn or damaged, replace them as a set. If the clutch wave-plate height is out of the tolerance, replace the clutch wave-plate. If they are OK, adjust the clearance with the clutch end-plate. - Check the 1st and 2nd accumulator pistons, the O-rings, and the springs in the accumulator body for wear and damage. - Check for a stuck 1st check ball in the secondary valve body. - Check the transmission range switch adjustment.

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Automatic Transmission

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Delayed engagement after shifting from N to R, or excessive shock when shifting	- Worn or damaged engine or transmission mounts - A/T clutch pressure control solenoid valve C defective - Shift cable broken or out of adjustment - Connection between shift cable and transmission or shift lever is worn - Transmission range switch out of adjustment - ATF temperature sensor defective - Reverse CPC valve defective - ATF strainer clogged - Foreign material in separator plate orifice 5th clutch defective	- Check engine and transmission mounts. - Test the A/T clutch pressure control solenoid valve C with the HDS (see page 14-194). - Inspect the A/T clutch pressure control solenoid valve body gasket, the ATF feed pipes, and the O-rings for wear and damage. - Check for a loose shift cable at the shift lever and the transmission control lever. - Check the stall speed (see page 14-179). - Check the line and 5th clutch pressures (see page 14-180). - Check the ATF strainer for debris. If the strainer is clogged, find the damaged components that caused the debris. If no cause for contamination is found, replace the torque converter. - Inspect the ATF temperature sensor O-ring for wear and damage. - Check for a clogged orifice in the separator plate. If the orifice is clogged, remove it and clean the separator plate orifice. - Inspect the 5th clutch for wear and damage. - Inspect the clutch piston, the clutch piston check valve, and the O-rings. Check the spring retainer for wear and damage. Inspect the clearance between the clutch end-plate and the top disc. If the clearance is out of tolerance, inspect the clutch discs and the plates for wear and damage, and inspect the clutch wave-plate height. If the discs and the plates are worn or damaged, replace them as a set. If the clutch wave-plate height is out of the tolerance, replace the clutch wave-plate. If they are OK, adjust the clearance with the clutch end-plate. - Check the transmission range switch adjustment.
Transmission does not shift	- Input shaft (mainshaft) speed sensor defective - Output shaft (countershaft) speed sensor defective - Engine output low	- Check the speed sensor installation. - Inspect the input shaft (mainshaft) speed sensor or the output shaft (countershaft) speed sensor O-ring for wear and damage. - Check for exhaust restrictions. - Check for intake restrictions. - Check fuel pressure (see page 11-369).
Excessive shock or flares on all upshifts and downshifts	- Worn or damaged engine or transmission mounts - Input shaft (mainshaft) speed sensor defective - Output shaft (countershaft) speed sensor defective - ATF temperature sensor defective - Foreign material in separator plate orifice	- Check engine and transmission mounts. - Check the speed sensor installation. - Inspect the input shaft (mainshaft) speed sensor or the output shaft (countershaft) speed sensor O-ring for wear and damage. - Inspect the ATF temperature sensor O-ring for wear and damage. - Check for a clogged orifice in the separator plate. If the orifice is clogged, remove it and clean the separator plate orifice.



Symptom	Probable cause(s)	Notes
Excessive shock or flares on 1-2 upshift or 2-1 downshift	• Worn or damaged engine or transmission mounts • Shift solenoid valve A defective • Shift solenoid valve B defective • Shift solenoid valve C defective • A/T clutch pressure control solenoid valve A defective • A/T clutch pressure control solenoid valve B defective • A/T clutch pressure control solenoid valve C defective • Transmission fluid pressure switch A (2nd clutch) defective • CPC valve A defective • CPC valve B defective • CPC valve C defective • Shift valve C defective • Shift valve D defective • Foreign material in separator plate orifice • 2nd accumulator defective • 2nd clutch defective	• Check engine and transmission mounts. • Test the transmission fluid pressure switch A (2nd clutch) operation with the HDS. • Test the shift solenoid valve function with the HDS (see page 14-184). • Check for a seized shift solenoid valve, and inspect the O-rings. • Test the A/T clutch pressure control solenoid valve A or B with the HDS (see page 14-189). • Test the A/T clutch pressure control solenoid valve C with the HDS (see page 14-194). • Check the 2nd clutch pressure (see page 14-180). • Inspect the A/T clutch pressure control solenoid valve body gasket, the ATF feed pipes, and the O-rings for wear and damage. • Check for a clogged orifice in the separator plate. If the orifice is clogged, remove it and clean the separator plate orifice. • Check CPC valve A in the main valve body for free movement, and check the valve spring for wear and damage. • Check CPC valves B and C in the secondary valve body for free movement, and check the valve springs for wear and damage. • Check shift valves C and D in the secondary valve body for free movement, and check the valve springs for wear and damage. • Inspect the 2nd clutch for wear and damage. • Inspect the clutch piston, the clutch piston check valve, and the O-rings. Check the spring retainer for wear and damage. Inspect the clearance between the clutch end-plate and the top disc. If the clearance is out of tolerance, inspect the clutch discs and the plates for wear and damage, and inspect the clutch wave-plate height. If the discs and the plates are worn or damaged, replace them as a set. If the clutch wave-plate height is out of the tolerance, replace the clutch wave-plate. If they are OK, adjust the clearance with the clutch end-plate. • Check the 2nd accumulator piston, the O-ring, and the spring in the accumulator body for wear and damage.

(cont'd)

Automatic Transmission

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Excessive shock or flares on 2-3 upshift or 3-2 downshift	• Worn or damaged engine or transmission mounts • Shift solenoid valve D defective • A/T clutch pressure control solenoid valve A defective • A/T clutch pressure control solenoid valve B defective • A/T clutch pressure control solenoid valve C defective • Transmission fluid pressure switch B (3rd clutch) defective • Shift fork shaft stuck • Servo control valve defective • CPC valve A defective • CPC valve B defective • Lock-up shift valve defective • Foreign material in separator plate orifice • 2nd accumulator defective • 3rd accumulator defective • 2nd check ball stuck • 2nd clutch defective • 3rd clutch defective • Clearance between clutch end-plate and top disc incorrect	• Check engine and transmission mounts. • Test the transmission fluid pressure switch B (3rd clutch) operation with the HDS. • Test the shift solenoid valve function with the HDS (see page 14-184). • Test the A/T clutch pressure control solenoid valve A or B with the HDS (see page 14-189). • Test the A/T clutch pressure control solenoid valve C with the HDS (see page 14-194). • Check for a seized shift solenoid valve, and inspect the O-rings. • Check the 2nd and 3rd clutch pressures (see page 14-180). • Inspect the A/T clutch pressure control solenoid valve body gasket, the ATF feed pipes, and the O-rings for wear and damage. • Check for a missing shift fork bolt on the shift fork shaft. • Check the shift fork shaft detent for wear and damage. • Check for a stuck servo valve in the regulator valve body, and check the O-ring for wear and damage. • Check the servo control valve, CPC valve A, and the lock-up shift valve in the main valve body for free movement, and check the valve springs for wear and damage. • Check for a clogged orifice in the separator plate. If the orifice is clogged, remove it and clean the separator plate orifice. • Check CPC valve B in the secondary valve body for free movement, and check the valve spring for wear and damage. • Inspect the 2nd and 3rd clutches for wear and damage. • Inspect the clutch piston, the clutch piston check valve, and the O-rings. Check the spring retainer for wear and damage. Inspect the clearance between the clutch end-plate and the top disc. If the clearance is out of tolerance, inspect the clutch discs and the plates for wear and damage, and inspect the clutch wave-plate height. If the discs and the plates are worn or damaged, replace them as a set. If the clutch wave-plate height is out of the tolerance, replace the clutch wave-plate. If they are OK, adjust the clearance with the clutch end-plate. • Check the 2nd and 3rd accumulator pistons, the O-rings, and the springs in the accumulator body for wear and damage. • Check for a stuck 2nd check ball in the secondary valve body.



Symptom	Probable cause(s)	Notes
Excessive shock or flares on 3-4 upshift or 4-3 downshift	• Worn or damaged engine or transmission mounts • A/T clutch pressure control solenoid valve A defective • A/T clutch pressure control solenoid valve B defective • A/T clutch pressure control solenoid valve C defective • 4th clutch transmission fluid pressure switch defective • Shift fork shaft stuck • Servo control valve defective • Foreign material in separator plate orifice • 3rd accumulator defective • 4th accumulator defective • 3rd clutch defective • 4th clutch defective • Clearance between clutch end-plate and top disc incorrect	• Check engine and transmission mounts. • Test the 4th clutch transmission fluid pressure switch operation with the HDS. • Test the A/T clutch pressure control solenoid valve A or B with the HDS (see page 14-189). • Test the A/T clutch pressure control solenoid valve C with the HDS (see page 14-194). • Check the 3rd and 4th clutch pressures (see page 14-180). • Inspect the A/T clutch pressure control solenoid valve body gasket, the ATF feed pipes, and the O-rings for wear and damage. • Check for a missing shift fork bolt on the shift fork shaft. • Check the shift fork shaft detent for wear and damage. • Check for a stuck servo valve in the regulator valve body, and check the O-ring for wear and damage. • Check the servo control valve in the main valve body for free movement, and check the valve spring for wear and damage. • Check for a clogged orifice in the separator plate. If the orifice is clogged, remove it and clean the separator plate orifice. • Inspect the 3rd and 4th clutches for wear and damage. • Inspect the clutch piston, the clutch piston check valve, and the O-rings. Check the spring retainer for wear and damage. Inspect the clearance between the clutch end-plate and the top disc. If the clearance is out of tolerance, inspect the clutch discs and the plates for wear and damage, and inspect the clutch wave-plate height. If the discs and the plates are worn or damaged, replace them as a set. If the clutch wave-plate height is out of the tolerance, replace the clutch wave-plate. If they are OK, adjust the clearance with the clutch end-plate. • Check the 3rd and 4th accumulator pistons, the O-rings, and the springs in the accumulator body for wear and damage.

(cont'd)

Automatic Transmission

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Excessive shock or flares on 4-5 upshift or 5-4 downshift	• A/T clutch pressure control solenoid valve A defective • A/T clutch pressure control solenoid valve B defective • A/T clutch pressure control solenoid valve C defective • Foreign material in separator plate orifice • 4th accumulator defective • 5th accumulator defective • 4th clutch defective • 5th clutch defective • Clearance between clutch end-plate and top disc incorrect	• Test the A/T clutch pressure control solenoid valve A or B with the HDS (see page 14-189). • Test the A/T clutch pressure control solenoid valve C with the HDS (see page 14-194). • Check the stall speed in R (see page 14-179). • Check the 4th and 5th clutch pressures (see page 14-180). • Inspect the A/T clutch pressure control solenoid valve body gasket, the ATF feed pipes, and the O-rings for wear and damage. • Check for a clogged orifice in the separator plate. If the orifice is clogged, remove it and clean the separator plate orifice. • Inspect the 4th and 5th clutches for wear and damage. • Inspect the clutch piston, the clutch piston check valve, and the O-rings. Check the spring retainer for wear and damage. Inspect the clearance between the clutch end-plate and the top disc. If the clearance is out of tolerance, inspect the clutch discs and the plates for wear and damage, and inspect the clutch wave-plate height. If the discs and the plates are worn or damaged, replace them as a set. If the clutch wave-plate height is out of the tolerance, replace the clutch wave-plate. If they are OK, adjust the clearance with the clutch end-plate. • Check the 4th and 5th accumulator pistons, the O-rings, and the springs in the accumulator body for wear and damage.
Noise from transmission in all shift lever positions	• ATF pump worn or binding • ATF strainer clogged • Mainshaft, countershaft, secondary shaft, and intermediary shaft bearings worn or damaged • Idler gears worn or damaged • Thrust washer seized, worn, or damaged	• Check the line pressure (see page 14-180). • Improper alignment of the ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Check the ATF strainer for debris. If the strainer is clogged, find the damaged components that caused the debris. If no cause for contamination is found, replace the torque converter. • Inspect the differential pinion gears for wear. If the differential pinion gears are worn, replace the differential assembly, replace the ATF strainer, thoroughly clean the transmission, and clean the cooler and lines. • Replace the torque converter. • Be careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the main valve body. This will cause ATF pump seizure, use the proper tools. • Install the main seal flush with the torque converter housing. If you push it into the torque converter housing until it bottoms out, it will block the fluid return passage and result in damage. • Inspect the countershaft and the secondary shaft for wear and damage. • Inspect the park mechanism at the park lever link, park gear, and 2nd gears. • Inspect the mainshaft, the countershaft, the secondary shaft, the intermediary shaft, and idler gears for wear and damage. • Check the thrust washers on all shafts for seizure, wear, and damage.



Symptom	Probable cause(s)	Notes
Vehicle does not accelerate above 31 mph (50 km/h)	Torque converter one-way clutch defective	• Check the stall speed (see page 14-179). • Replace the torque converter.
Vibration in all shift lever positions	• Drive plate defective or transmission misassembled • Torque converter defective • ATF pump worn or binding	• Check for a misassembled transmission, and check the drive plate for wear and damage. Replace the drive plate if it is worn or damaged. • Check the stall speed (see page 14-179). • Check the line pressure (see page 14-180). • Improper alignment of ATF pump and the torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Inspect the differential pinion gears for wear. If the differential pinion gears are worn, replace the differential assembly, replace the ATF strainer, thoroughly clean the transmission, and clean the cooler and lines. • Replace the torque converter. • Be careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the main valve body. This will cause ATF pump seizure, use the proper tools.
Shift lever does not operate smoothly	• Transmission range switch defective or out of adjustment • Shift cable broken, binding, or out of adjustment • Shift lever mechanism worn or defective • Connection between shift cable and transmission or shift lever is worn • Manual valve defective • Selector control shaft worn or damaged	• Inspect the transmission range switch. If the transmission range switch fails the inspection, replace the switch. If the inspection is OK, check for proper transmission range switch installation, and adjust the shift cable. • Check for a loose shift cable at the shift lever and the selector control lever. • Check the manual valve in the main valve body for wear and damage, and check the manual lever guide pin for wear and damage.
Transmission does not shift into P	• Shift cable broken, binding, or out of adjustment • Connection between shift cable and transmission or shift lever is worn • Park mechanism defective • Secondary shaft 2nd gear worn or damaged	• Check for a loose shift cable at the shift lever and the selector control lever. • Inspect the countershaft and the secondary shaft for wear and damage. • Inspect the park mechanism at the park lever link, park gear, and 2nd gears.

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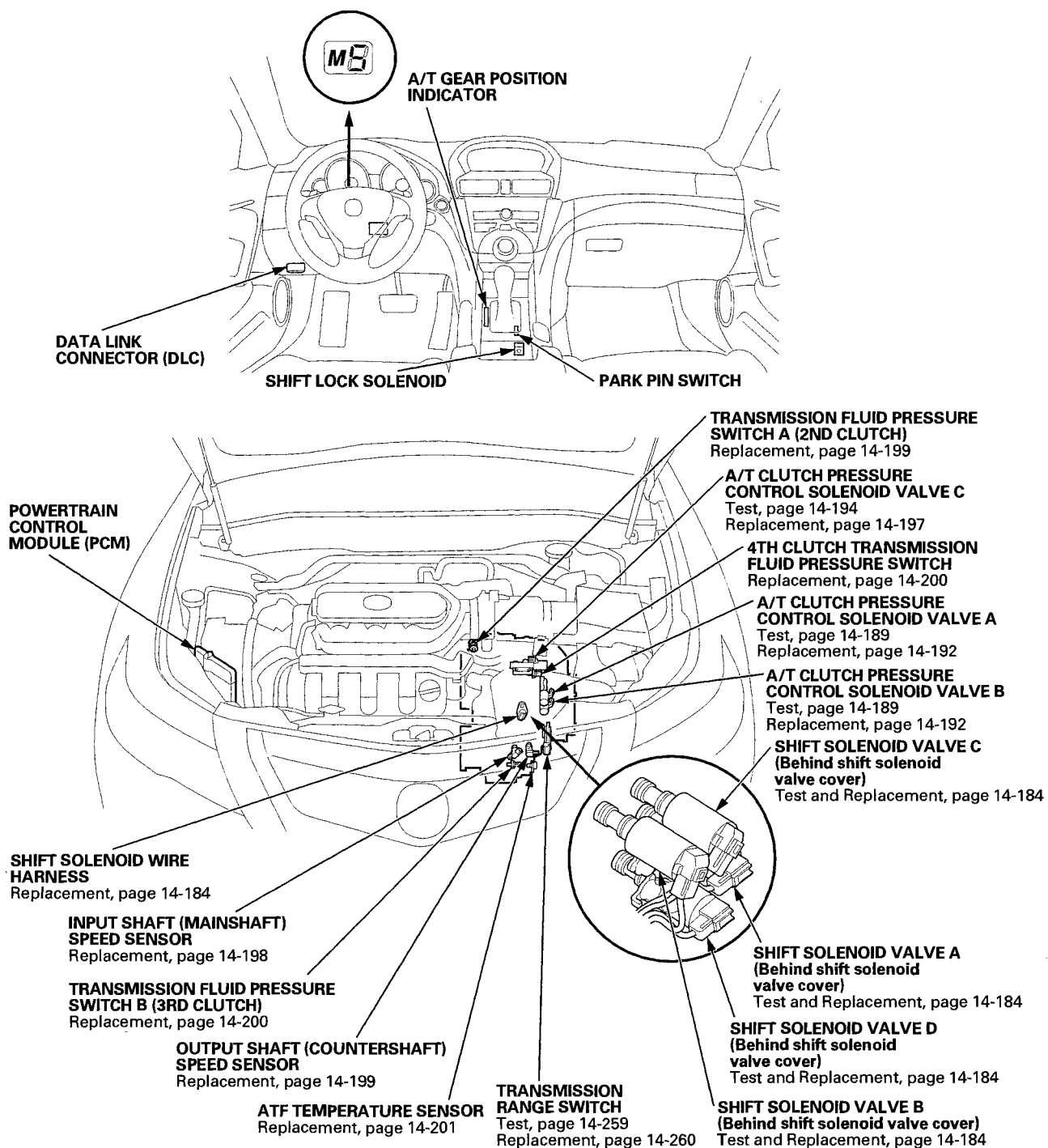
Automatic Transmission

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Torque converter clutch does not operate smoothly; torque converter clutch does not engage or disengage	• Shift solenoid valve D defective • A/T clutch pressure control solenoid valve C defective • Torque converter clutch piston defective • Torque converter check valve defective • Lock-up shift valve defective • Lock-up control valve defective • Lock-up timing valve defective • Shift cable broken or out of adjustment • Connection between shift cable and transmission or shift lever is worn • Foreign material in separator plate orifice	• Test the shift solenoid valve D function with the HDS (see page 14-184). • Test the A/T clutch pressure control solenoid valve C with the HDS (see page 14-194). • Check for a seized shift solenoid valve, and inspect the O-rings. • Check the line pressure (see page 14-180). • Inspect the A/T clutch pressure control solenoid valve body gasket, the ATF feed pipes, and the O-rings for wear and damage. • Replace the torque converter. • Check the torque converter check valve, the lock-up shift valve, and the lock-up timing valve in the main valve body for free movement, and check the valve springs for wear and damage. • Check the lock-up control valve in the regulator valve body for free movement, and check the valve spring for wear and damage. • Check for a loose shift cable at the shift lever and the transmission control lever. • Check for a clogged orifice in the separator plate. If the orifice is clogged, remove it and clean the separator plate orifice.
A/T gear position indicator does not indicate shift lever positions	• Transmission range switch defective or out of adjustment • Shift cable broken or out of adjustment • Connection between shift cable and transmission or shift lever is worn	• Inspect the transmission range switch. If the transmission range switch fails the inspection, replace the switch. If the inspection is OK, check for proper transmission range switch installation, and adjust the shift cable. • Check for a loose shift cable at the shift lever and the selector control lever.



Component Location Index



Automatic Transmission

System Description

General Operation

The automatic transmission is a transverse-mounted four-shaft design, implementing an electronically controlled hydraulic circuit that provides five forward speeds and one in reverse. Engine power is transmitted through the torque converter, a combination of shafts which hold gears and clutches and a differential that transmits power to the driving wheels. SH-AWD equipped models also have a transfer assembly which transmits power to the SH-AWD differential.

Shaft, Gears, and Clutches

Four parallel shafts hold gears and clutches. The gears on the input shaft (mainshaft), secondary shaft and intermediary shaft are in constant mesh with those on the output shaft (countershaft). When specific gears are engaged by the clutches, power is transmitted through the mainshaft, to the secondary shaft, the intermediary shaft, and/or the countershaft, then to the final drive gear of the differential to provide drive.

Shift Control Mechanism

To shift gears, the PCM controls shift solenoid valves A, B, C, and D, and automatic transmission (A/T) clutch pressure control solenoid valves A, B, and C. The shift solenoid valves change the positions of the shift valves in the valve body which open and close ports to send hydraulic pressure to the appropriate clutch. A/T clutch pressure control solenoid valves A, B, and C change the position of CPC valves A and B, and the reverse CPC valve, to control hydraulic pressure going to the clutches, which allows smooth shifts between gears.

Electronic Control

Shifting and lock-up is achieved by a system of solenoid valves driven by the PCM to control ATF flow through various valves in the valve bodies to select the appropriate gears for all driving conditions.

Hydraulic Control

The valve bodies include the main valve body, the regulator valve body, the secondary valve body, and the accumulator body. They are mounted to the torque converter housing. Fluid from the regulator valve passes through the manual valve to the various control valves. All the clutches receive fluid from the internal hydraulic circuit.

Torque Converter

The torque converter is a fluid coupling, which allows the engine to spin independently of the transmission yet connects them together as needed. It is an assembly that consists of an impeller (pump), turbine, stator and lock-up clutch, which uses automatic transmission fluid (ATF) to transmit engine power to the input shaft (mainshaft), and acts as a flywheel to help the engine run smoothly. During certain conditions the lock-up clutch is engaged by the PCM to mechanically connect the engine's crankshaft with the input shaft (mainshaft) which improves fuel economy. Around the outside of the torque converter housing is a ring gear which meshes with the starter ring gear, used by the starter to start the engine.

Lock-up Mechanism

The lock-up mechanism causes the input shaft (mainshaft) to rotate at the same speed as the engine crankshaft. Pressurized ATF is drained from between the torque converter cover and the torque converter clutch piston through a fluid passage, causing the torque converter clutch piston to be held against the torque converter housing. Together with the hydraulic control, the PCM optimizes the timing and degree of lock-up. The lock-up mechanism of the torque converter clutch operates in D (2nd, 3rd, 4th, and 5th gears) and S with sequential sportshift mode or automatic shift mode (2nd, 3rd, and 4th gears).



Gear Selection

The shift lever has five positions; P: PARK, R: REVERSE, N: NEUTRAL, D: DRIVE 1st through 5th gear ranges with automatic shift mode and D-paddle shift mode, and S: DRIVE 1st through 4th gear ranges with automatic shift mode and 1st through 5th with sequential sportshift mode.

Position		Description
P: PARK		Front wheels locked; the park pawl engaged with the park gear on the secondary shaft. All clutches are released.
R: REVERSE		Reverse; the reverse selector engaged with the countershaft reverse gear and the 5th clutch engaged.
N: NEUTRAL		All clutches are released.
D: DRIVE (1st through 5th)		General driving; starts off in 1st, shifts automatically to 2nd, 3rd, 4th, then 5th gear, depending on the vehicle speed and the throttle position. Downshifts through 4th, 3rd, 2nd, and 1st on deceleration to stop. The lock-up mechanism operates in 2nd, 3rd, 4th, and 5th gears.
S: DRIVE	Automatic shift mode (1st through 4th)	Used for rapid acceleration at highway speeds and general driving, up-hill and down-hill driving; starts off in 1st gear, shifts automatically to 2nd, 3rd then 4th, depending on vehicle speed and the accelerator pedal position. Downshifts through 3rd, 2nd and 1st on deceleration to stop. The lock-up mechanism operates in 2nd, 3rd, and 4th gears.
	Sequential sportshift mode (1st through 5th)	Manual gear shift driving; the vehicle can start off in 1st gear, and does not upshift automatically. The vehicle can also start off in 2nd gear, and does not upshift and downshift automatically. Downshifts automatically to 1st on deceleration to stop. The lock-up mechanism operates in 2nd, 3rd, 4th, and 5th gears.

Starting is possible only in P and N because of a neutral-safety switch.

Automatic Transmission (A/T) Gear Position Indicator

The A/T gear position indicator in the gauge control module shows which shift lever position has been selected.

Shift Indicator and M Indicator

When the transmission is switched into the sequential sportshift mode, the shift indicator in the gauge control module displays the gear selected, and the M indicator next to the shift indicator comes on. The shift indicator also displays the gear selected in the D-paddle shift mode, but the M indicator does not come on.

Transfer Assembly (with SH-AWD)

The transfer assembly consists of the transfer hypoid drive gear/shaft assembly, the transfer output shaft (hypoid gear), and the companion flange. The transfer assembly is on the rear side of the transmission, beside the differential. The transfer drive gear on the differential drives the transfer output shaft in the transmission. The transfer output shaft in the transmission is connected to the transfer hypoid drive gear/shaft assembly by splines. Power is transmitted from the transfer drive gear on the differential to the rear differential via the transfer assembly and the propeller shaft.

Automatic Transmission

System Description (cont'd)

Clutches and Gears

The five-speed automatic transmission uses hydraulically-actuated clutches to engage or disengage the transmission gears. When hydraulic pressure is introduced into the clutch drum, the clutch piston moves. This presses the friction discs and the steel plates together, locking them so they do not slip. Power is then transmitted through the engaged clutch pack to its hub-mounted gear. Likewise, when the hydraulic pressure is bled from the clutch pack, the piston releases the friction discs and the steel plates, and they are free to slide past each other. This allows the gear to spin independently on its shaft, transmitting no power.

1st Clutch

The 1st clutch engages/disengages 1st gear, and is located at the left end of the secondary shaft. The 1st clutch is supplied hydraulic pressure by its ATF feed pipe within the secondary shaft.

1st-hold Clutch

The 1st-hold clutch engages/disengages 1st-hold in 1st gear in S, and in the D-paddle shift mode. The 1st-hold clutch is located in the 1st clutch drum, and is supplied hydraulic pressure by its ATF feed pipe within the secondary shaft.

2nd Clutch

The 2nd clutch engages/disengages 2nd gear, and is located at the right end of the secondary shaft. The 2nd clutch is supplied hydraulic pressure through the secondary shaft by a circuit connected to the internal hydraulic circuit.

3rd Clutch

The 3rd clutch engages/disengages 3rd gear, and is located at the end of the intermediary shaft. The 3rd clutch is supplied hydraulic pressure through the intermediary shaft by a circuit connected to the internal hydraulic circuit.

4th Clutch

The 4th clutch engages/disengages 4th gear, and is located at the middle of the mainshaft. The 4th clutch is joined back-to-back to the 5th clutch. The 4th clutch is supplied hydraulic pressure through the mainshaft by a circuit connected to the internal hydraulic circuit.

5th Clutch

The 5th clutch engages/disengages 5th gear, as well as reverse gear, and is located at the middle of the mainshaft. The 5th clutch is joined back-to-back to the 4th clutch. The 5th clutch is supplied hydraulic pressure through the mainshaft by a circuit connected to the internal hydraulic circuit.

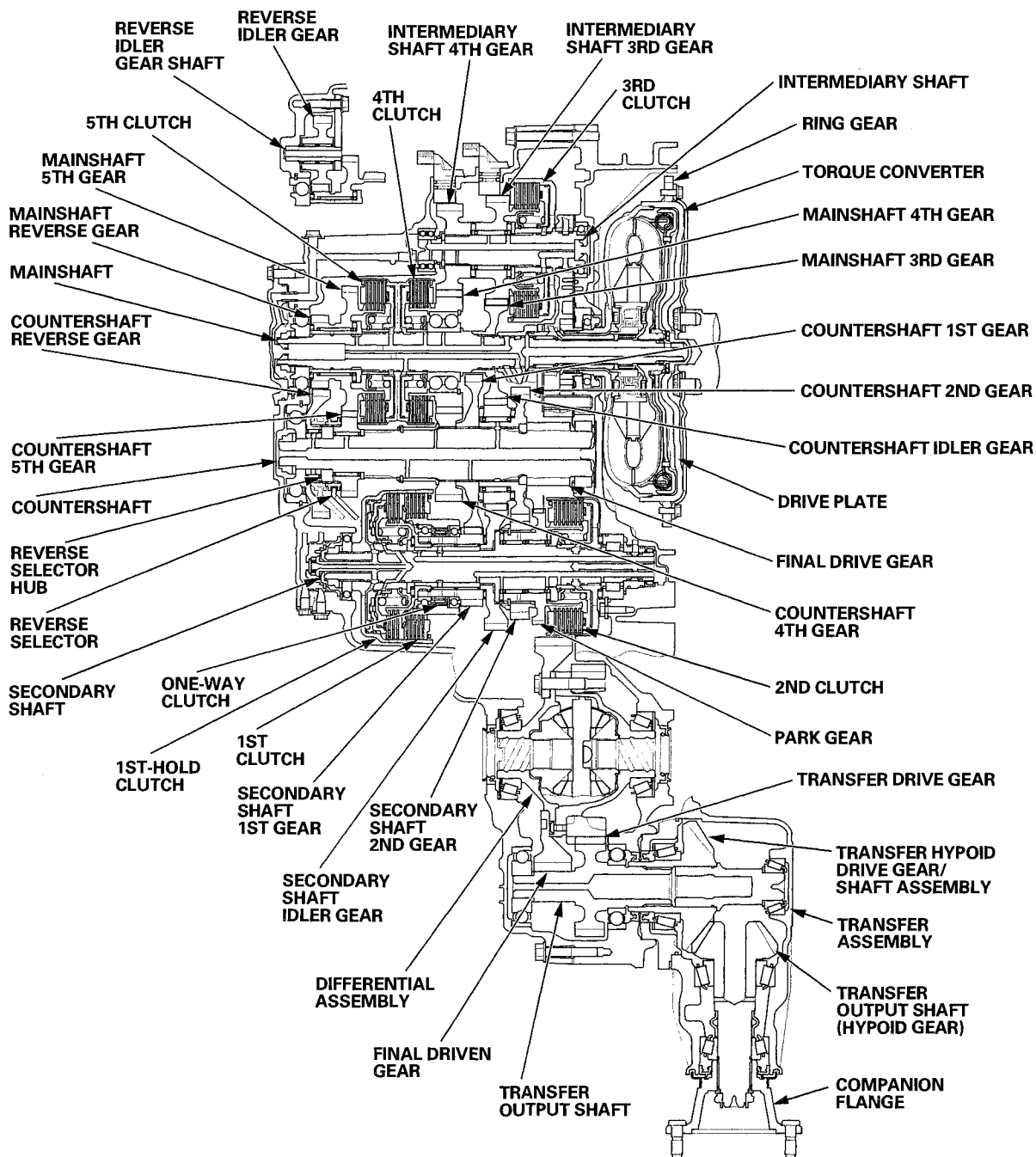
One-way Clutch

The one-way clutch is positioned between the 1st clutch hub and the secondary shaft 1st gear. The secondary shaft 1st gear is splined to the 1st-hold clutch hub, with the 1st-hold clutch hub splined to the secondary shaft. The secondary shaft 1st gear provides the outer race surface, and the 1st clutch hub provides the inner race surface. The one-way clutch locks when power is transmitted from the secondary shaft 1st gear to the countershaft 1st gear. The 1st clutch and gears remain engaged in 1st, 2nd, 3rd, 4th, and 5th gear ranges in D or S.

However, the one-way clutch disengages when the 2nd, 3rd, 4th, or 5th clutches and gears are applied in D or S. This is because the increased rotational speed of the gears on the secondary shaft causes the one-way clutch to free-wheel with the 1st clutch still engaged.



Transmission Cutaway View



NOTE: This illustration shows the SH-AWD transfer assembly that is not available on all models.

(cont'd)

Automatic Transmission

System Description (cont'd)

Clutches and Gears (cont'd)

Gear Operation

Gears on the mainshaft:

- 4th gear is engaged/disengaged with the mainshaft by the 4th clutch.
- 5th gear is engaged/disengages with the mainshaft by the 5th clutch.
- Reverse gear is engaged/disengaged with the mainshaft by the 5th clutch.
- 3rd gear is splined with the mainshaft and rotates with the mainshaft.

Gears on the countershaft:

- Final drive gear is integral with the countershaft.
- 1st gear, 2nd gear, and 4th gear are splined with the countershaft, and rotate with the countershaft.
- 5th gear and reverse gear rotate freely from the countershaft. The reverse selector engages 5th gear and reverse gear with the reverse selector hub. The reverse selector hub is splined to the countershaft so 5th gear and reverse gear engage with the countershaft.
- Idler gear is located over 2nd gear, and rotates freely from the countershaft.

Gears on the secondary shaft:

- 1st gear is engaged with the secondary shaft by the 1st clutch and the one-way clutch when accelerating, and 1st gear is disengaged from the 1st clutch at the one-way clutch when decelerating. 1st gear is engaged with the secondary shaft by the 1st-hold clutch when decelerating for engine braking.
- 2nd gear is engaged/disengaged with the secondary shaft by the 2nd clutch.
- Idler gear is splined with the secondary shaft, and rotates with the secondary shaft.
- Park gear is integral with the 2nd gear.

Gears on the intermediary shaft:

- 3rd gear is engaged/disengaged with the intermediary shaft by the 3rd clutch.
- 4th gear is splined with the intermediary shaft.



Power Flow

P Position

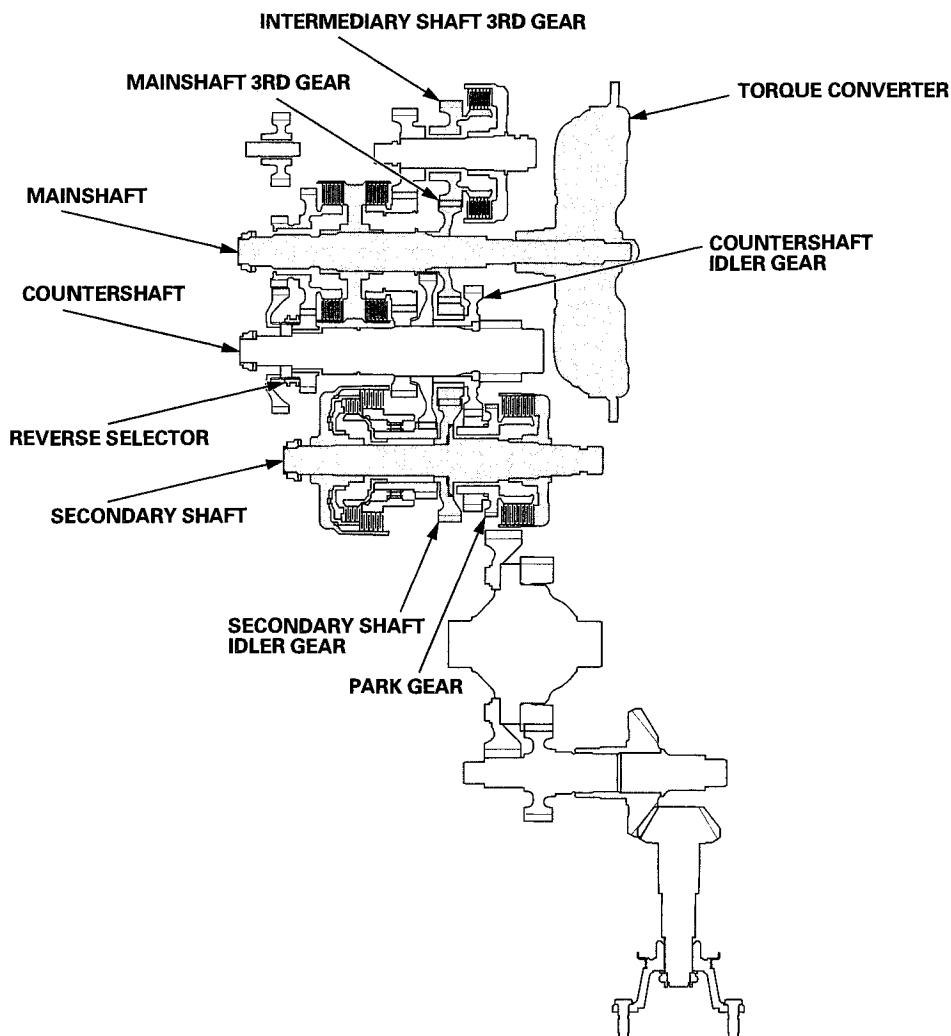
Hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft. The countershaft is locked by the park pawl interlocking the park gear.

N Position

Engine power transmitted from the mainshaft drives the mainshaft 3rd gear, the intermediary shaft 3rd gear, but hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft. In this position, the position of the reverse selector differs according to whether the shift lever shifted from D or R:

- When shifted from D, the reverse selector engages with the countershaft 5th gear and the reverse selector hub, and the 5th gear engages with the countershaft.
- When shifted from R, the reverse selector engages with the countershaft reverse gear and the reverse selector hub, and the reverse gear engages with the countershaft.

NOTE: The illustration shows the SH-AWD transfer assembly that is not available on all models.



(cont'd)

Automatic Transmission

System Description (cont'd)

Power Flow (cont'd)

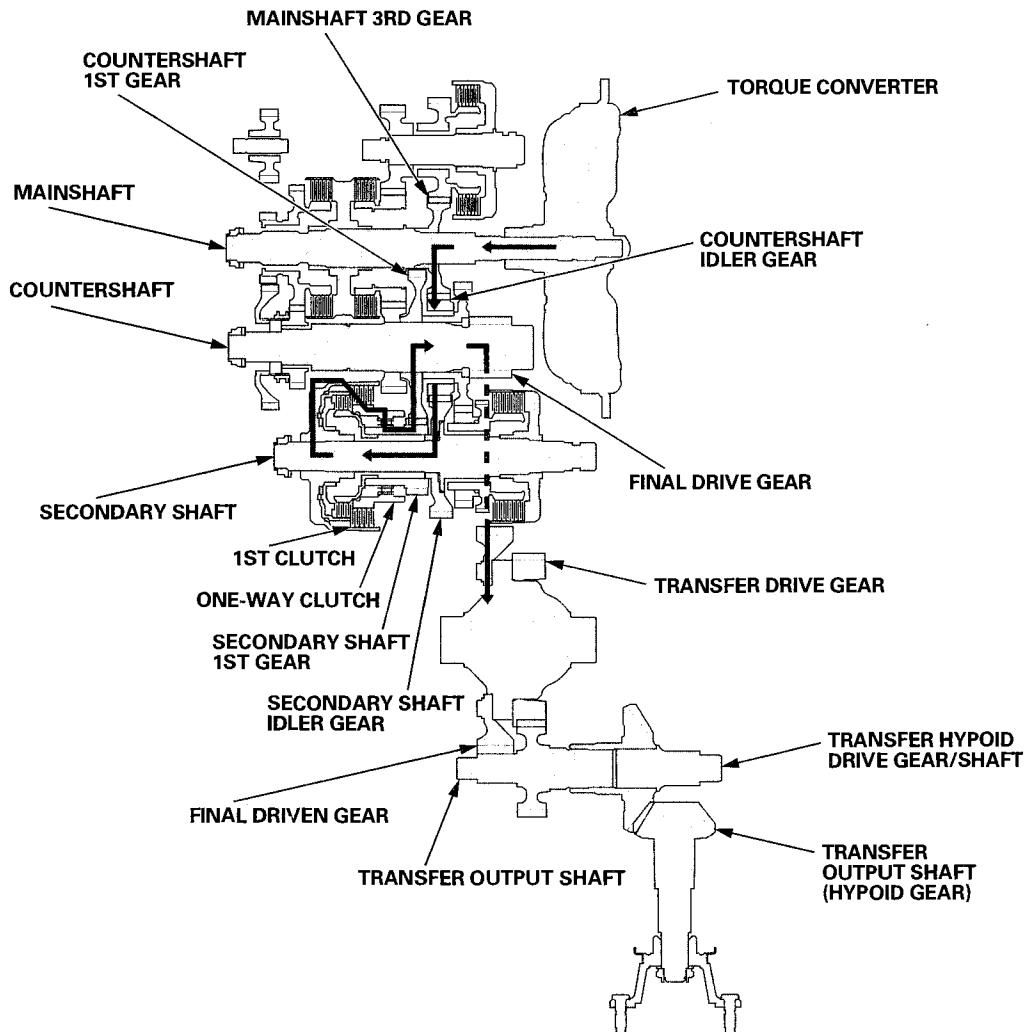
D Position and S Position with Automatic Shift Mode

In D, the optimum gear is automatically selected from 1st, 2nd, 3rd, 4th, and 5th gears; and 1st, 2nd, 3rd, and 4th gears in S with automatic shift mode according to conditions such as the balance between the accelerator pedal opening (engine loading) and vehicle speed.

In 1st gear

- Hydraulic pressure is applied to the 1st clutch, then the 1st clutch engages the secondary shaft 1st gear with the secondary shaft by the one-way clutch.
- The mainshaft 3rd gear drives the secondary shaft via the countershaft idler gear and secondary shaft idler gear.
- The secondary shaft 1st gear drives the countershaft 1st gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and front differential.
- With SH-AWD: As the final driven gear turns the front differential, power is transmitted through the transfer drive gear to the transfer output shaft that drives the transfer hypoid drive gear/shaft and the transfer output shaft (hypoid gear).

NOTE: The illustration shows the SH-AWD transfer assembly that is not available on all models.

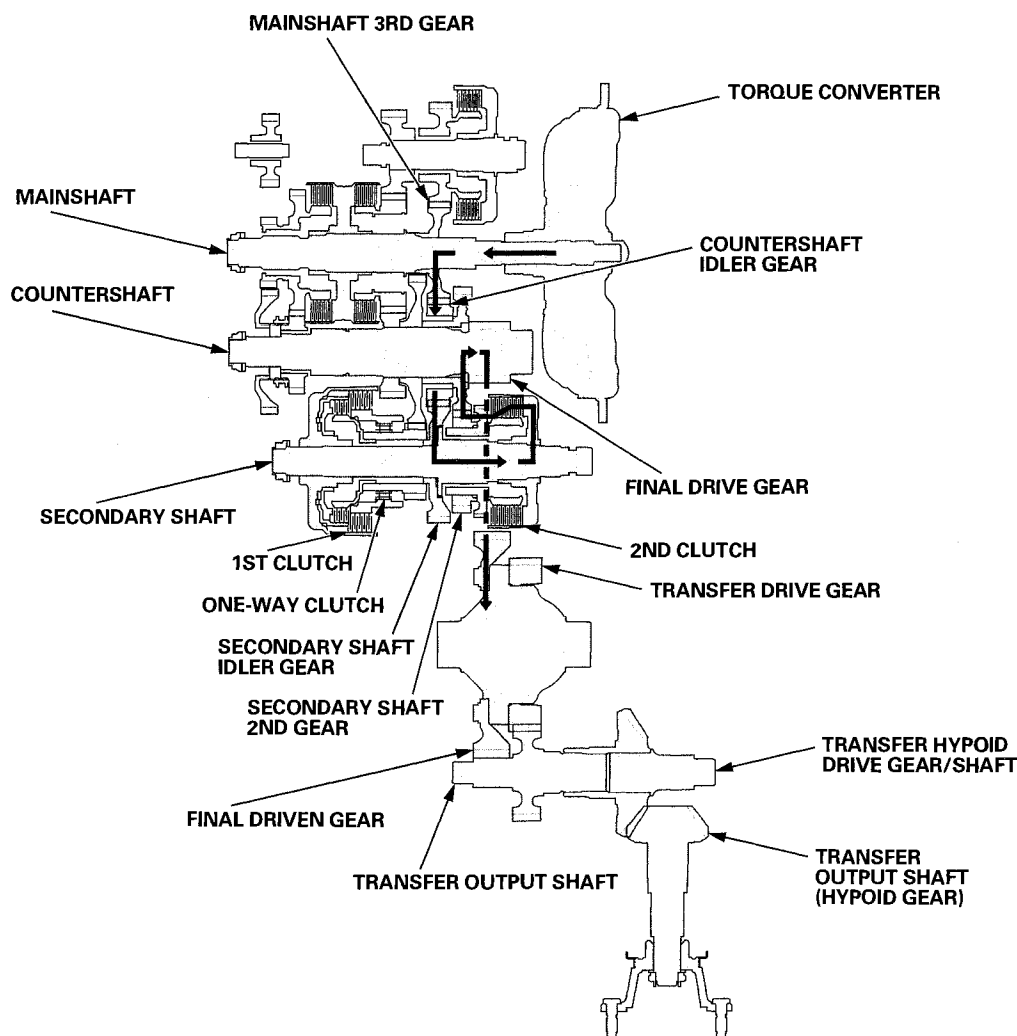




In 2nd gear

- Hydraulic pressure is applied to the 2nd clutch, then the 2nd clutch engages the secondary shaft 2nd gear with the secondary shaft.
- The mainshaft 3rd gear drives the secondary shaft via the countershaft idler gear and secondary shaft idler gear.
- The secondary shaft 2nd gear drives the countershaft 2nd gear and the countershaft.
- With SH-AWD: Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and front differential.
- With SH-AWD: As the final driven gear turns the front differential, power is transmitted through the transfer drive gear to the transfer output shaft that drives the transfer hypoid drive gear/shaft and the transfer output shaft (hypoid gear).
- Hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 2nd gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.

NOTE: The illustration shows the SH-AWD transfer assembly that is not available on all models.



(cont'd)

Automatic Transmission

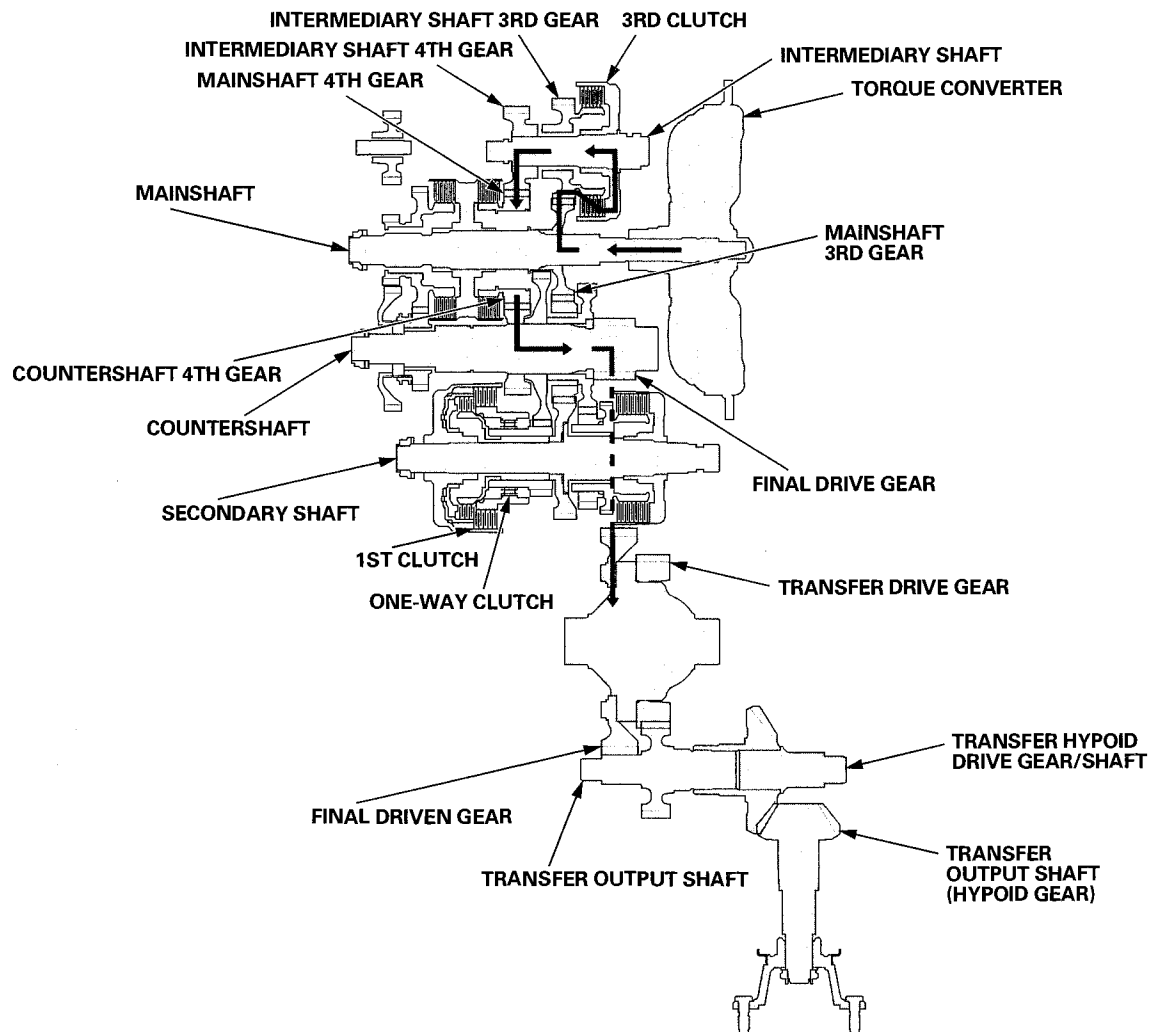
System Description (cont'd)

Power Flow (cont'd)

In 3rd gear

- Hydraulic pressure is applied to the 3rd clutch, then the 3rd clutch engages the intermediary shaft 3rd gear with the intermediary shaft.
- The mainshaft 3rd gear drives the intermediary shaft 4th gear via the intermediary shaft 3rd gear and the 3rd clutch.
- The intermediary shaft 4th gear drives the countershaft 4th gear and the countershaft via the mainshaft 4th gear.
- With SH-AWD: Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and front differential.
- With SH-AWD: As the final driven gear turns the front differential, power is transmitted through the transfer drive gear to the transfer output shaft that drives the transfer hypoid drive gear/shaft and the transfer output shaft (hypoid gear).
- Hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 3rd gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.

NOTE: The illustration shows the SH-AWD transfer assembly that is not available on all models.

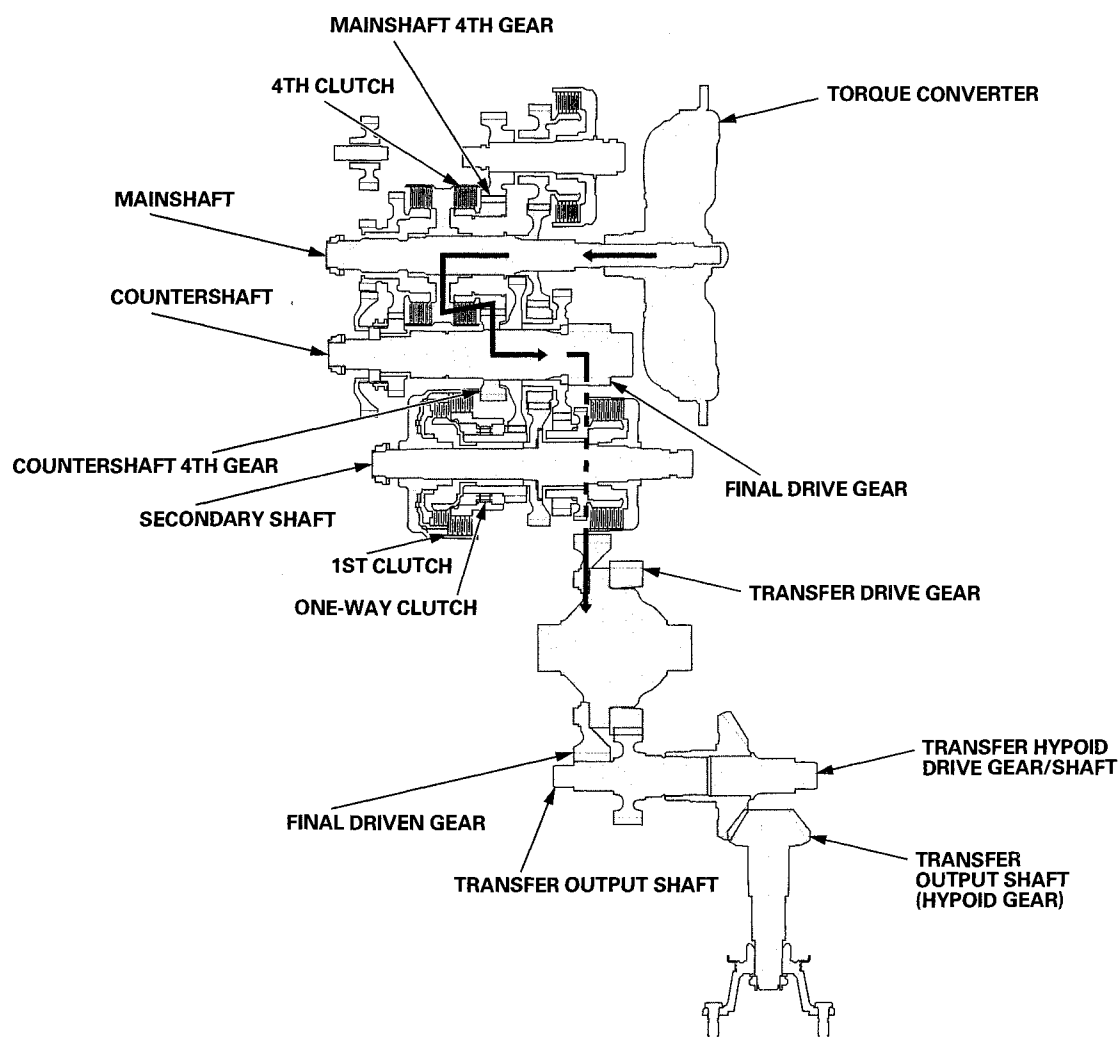




In 4th gear

- Hydraulic pressure is applied to the 4th clutch, then the 4th clutch engages the mainshaft 4th gear with the mainshaft.
- The mainshaft 4th gear drives the countershaft 4th gear and the countershaft.
- With SH-AWD: Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and front differential.
- With SH-AWD: As the final driven gear turns the front differential, power is transmitted through the transfer drive gear to the transfer output shaft that drives the transfer hypoid drive gear/shaft and the transfer output shaft (hypoid gear).
- Hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 4th gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.

NOTE: The illustration shows the SH-AWD transfer assembly that is not available on all models.



(cont'd)

Automatic Transmission

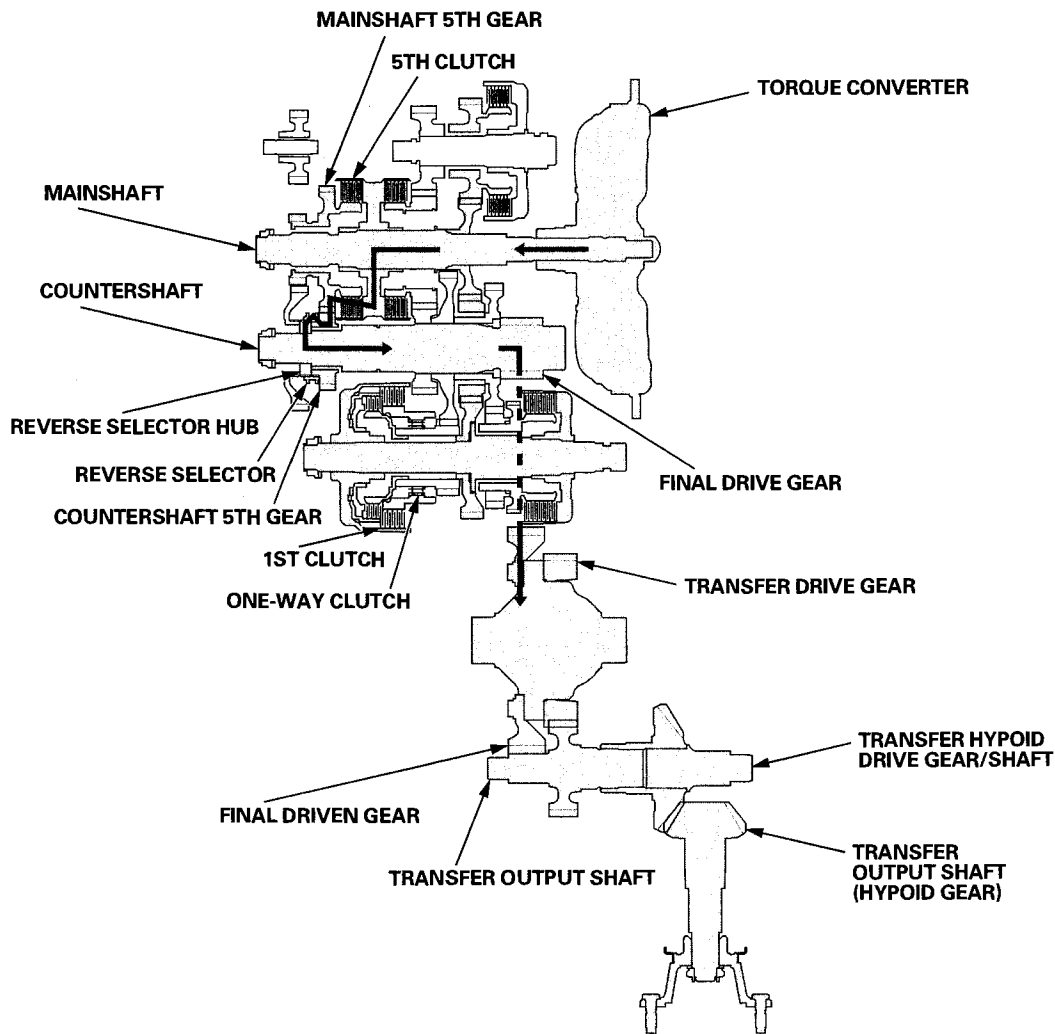
System Description (cont'd)

Power Flow (cont'd)

In 5th gear

- Hydraulic pressure is applied to the servo valve to engage the reverse selector with the countershaft 5th gear while the shift lever is in the forward range (D and S).
- Hydraulic pressure is applied to the 5th clutch, then the 5th clutch engages the mainshaft 5th gear with the mainshaft.
- The mainshaft 5th gear drives the countershaft 5th gear, which drives the reverse selector hub and the countershaft.
- With SH-AWD: Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and front differential.
- With SH-AWD: As the final driven gear turns the front differential, power is transmitted through the transfer drive gear to the transfer output shaft that drives the transfer hypoid drive gear/shaft and the transfer output shaft (hypoid gear).
- Hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 5th gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.

NOTE: The illustration shows the SH-AWD transfer assembly that is not available on all models.



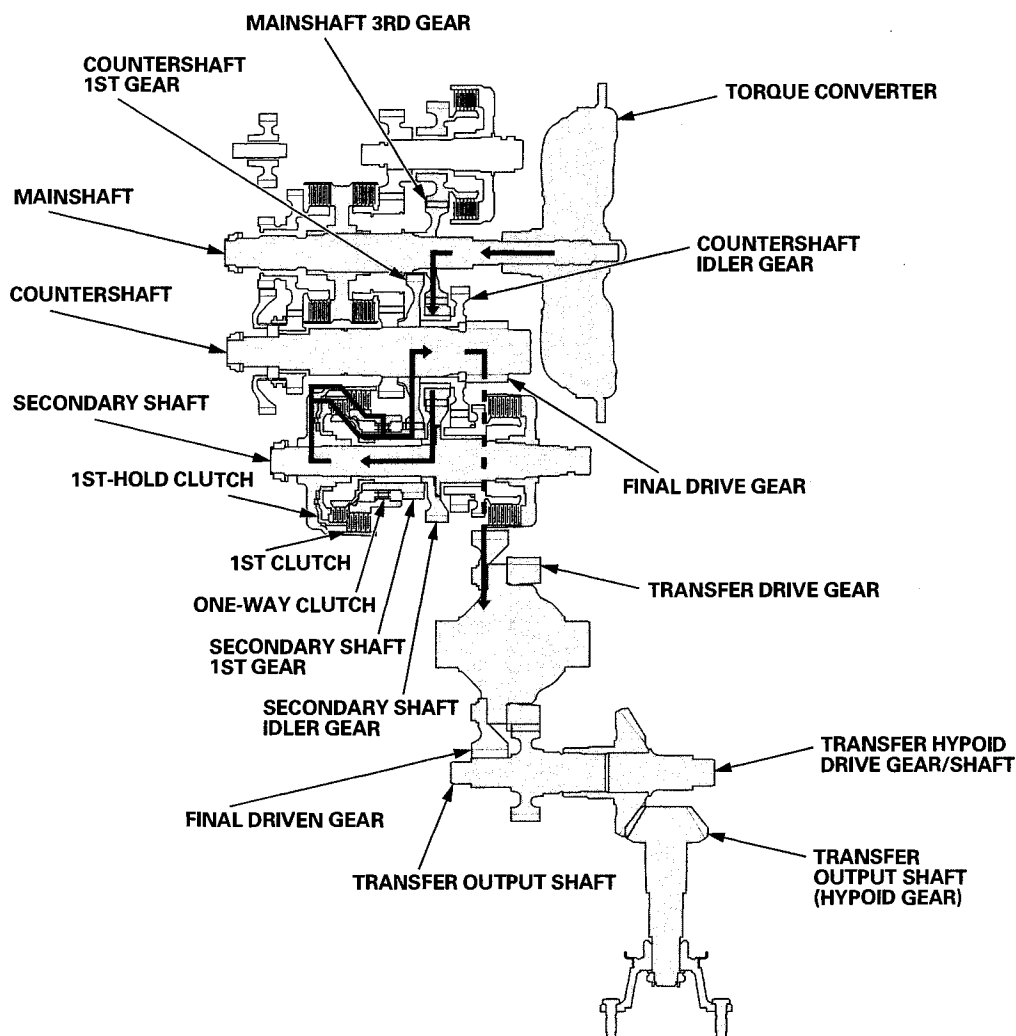


Acceleration in 1st gear in S with sequential sportshift mode, and in D with D-paddle shift mode

In S with sequential sportshift mode, and in D with D-paddle shift mode under an acceleration, hydraulic pressure is applied to the 1st clutch and the 1st-hold clutch. The power flow when accelerating is as follows:

- Hydraulic pressure is applied to the 1st clutch, then the 1st clutch engages the secondary shaft 1st gear with the secondary shaft by the one-way clutch.
- The mainshaft 3rd gear drives the secondary shaft via the countershaft idler gear and secondary shaft idler gear.
- The secondary shaft 1st gear drives the countershaft 1st gear and the countershaft.
- Hydraulic pressure is also applied to the 1st-hold clutch, and the 1st-hold clutch engages the secondary shaft 1st gear with the secondary shaft.
- With SH-AWD: Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and front differential.
- With SH-AWD: As the final driven gear turns the front differential, power is transmitted through the transfer drive gear to the transfer output shaft that drives the transfer hypoid drive gear/shaft and the transfer output shaft (hypoid gear).

NOTE: The illustration shows the SH-AWD transfer assembly that is not available on all models.



(cont'd)

Automatic Transmission

System Description (cont'd)

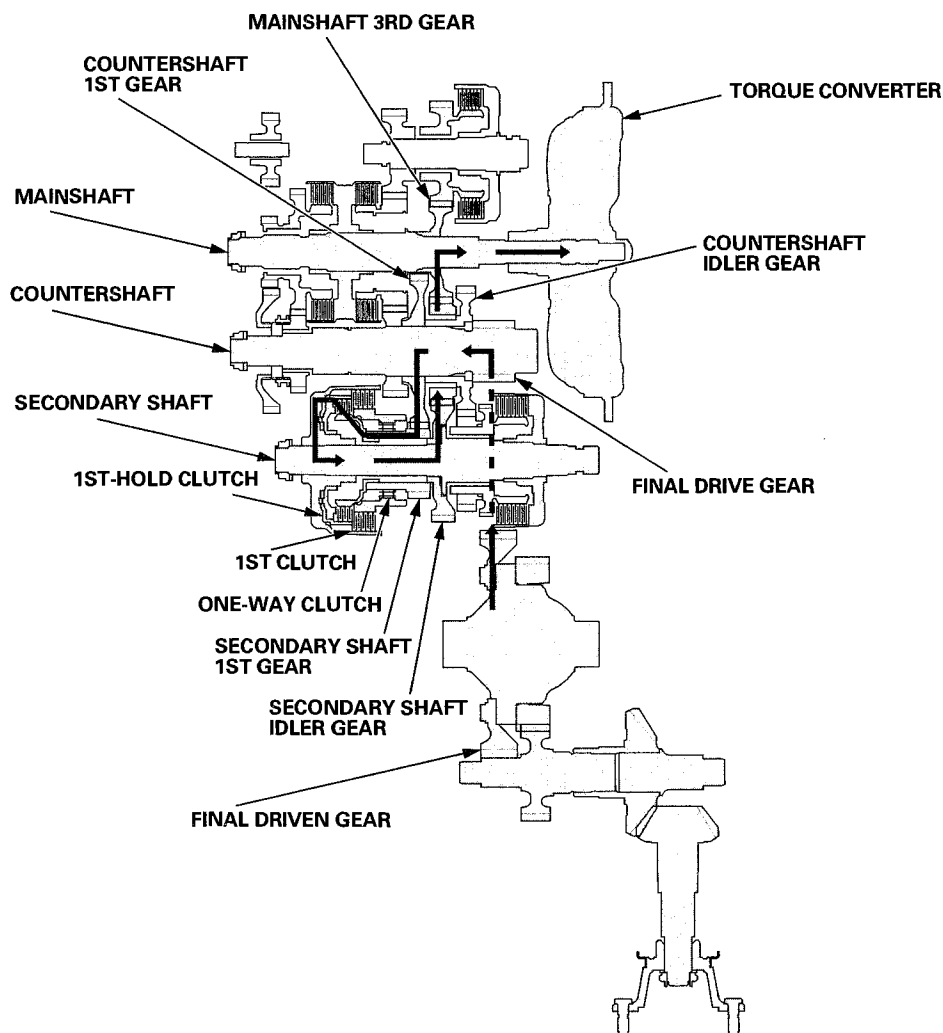
Power Flow (cont'd)

Deceleration in 1st gear in S with sequential sportshift mode, and in D with D-paddle shift mode

The power flow in 1st gear in S with sequential sportshift mode, and in D with D-paddle shift mode when decelerating is as follows:

- Hydraulic pressure is applied to the 1st clutch and the 1st-hold clutch.
- Rolling resistance from the road surface goes through the front wheels to the final driven gear, then to the countershaft idler gear.
- The one-way clutch disengages because the application of torque is reversed.
- The force conveyed to the secondary shaft idler gear turns the mainshaft 3rd gear via the countershaft idler gear. As a result, engine braking can be obtained with 1st gear.

NOTE: The illustration shows the SH-AWD transfer assembly that is not available on all models.

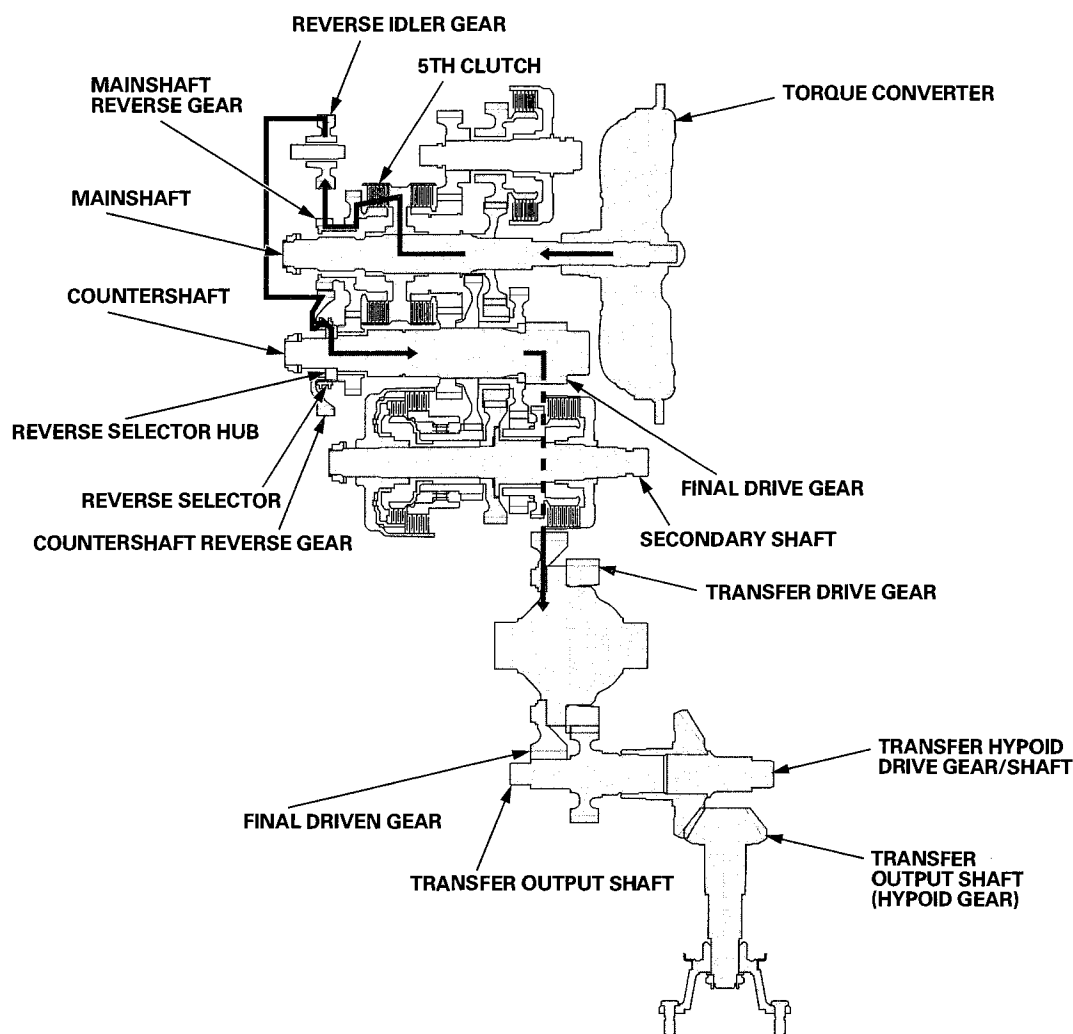




R Position

- Hydraulic pressure is applied to the servo valve to engage the reverse selector with the countershaft reverse gear while the shift lever is in R.
- Hydraulic pressure is applied to the 5th clutch, then the 5th clutch engages the mainshaft reverse gear with the mainshaft.
- The mainshaft reverse gear drives the countershaft reverse gear via the reverse idler gear.
- The countershaft reverse gear drives the countershaft via the reverse selector which drives the reverse selector hub.
- The rotation direction of the countershaft is changed by the reverse idler gear.
- With SH-AWD: Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and front differential.
- With SH-AWD: As the final driven gear turns the front differential, power is transmitted through the transfer drive gear to the transfer output shaft that drives the transfer hypoid drive gear/shaft and the transfer output shaft (hypoid gear).

NOTE: The illustration shows the SH-AWD transfer assembly that is not available on all models.



Automatic Transmission

System Description (cont'd)

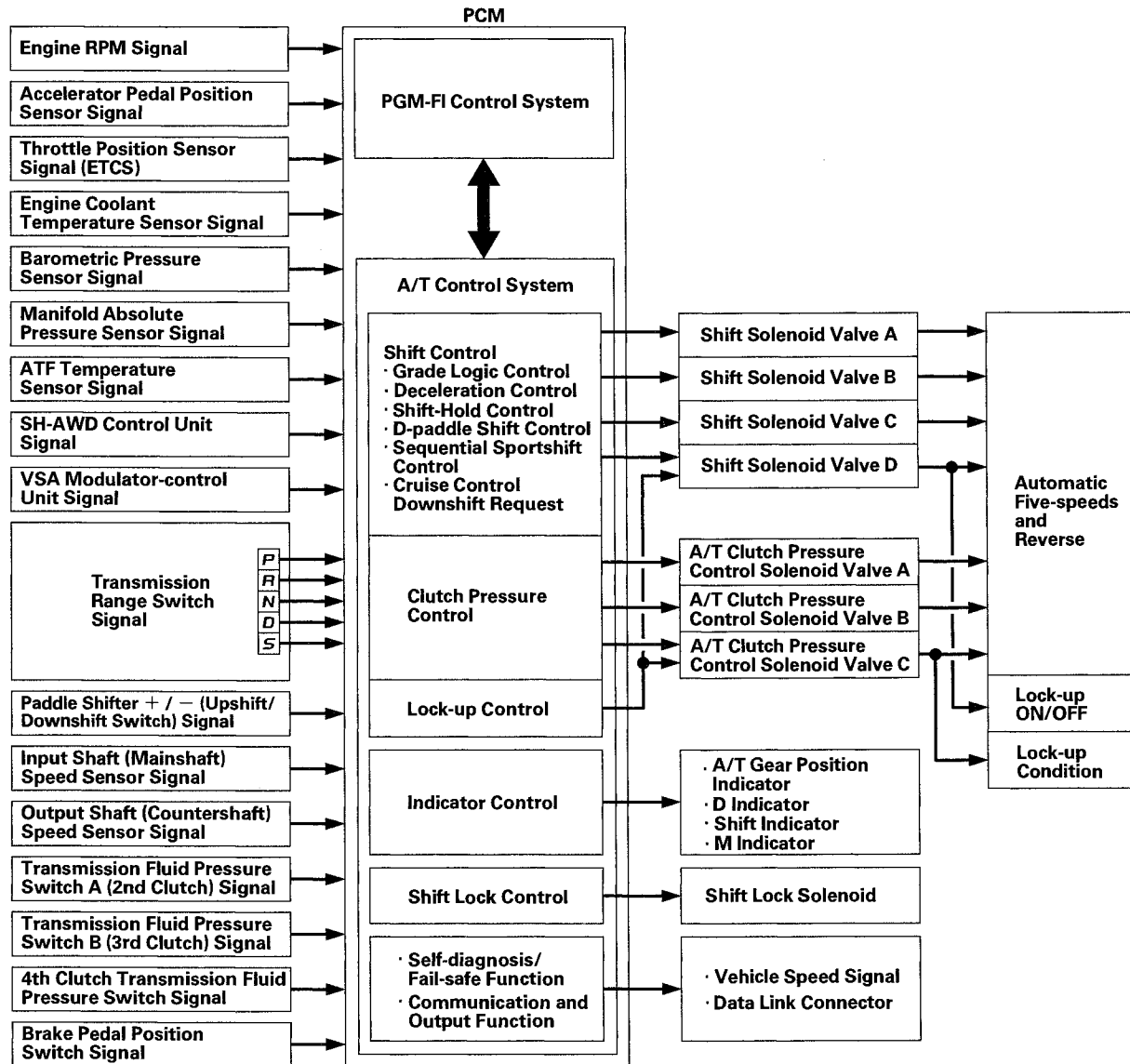
Electronic Control System

Electronic Control

The electronic control system consists of the powertrain control module (PCM), sensors, and seven solenoid valves.

Functional Diagram

The PCM receives input signals from the sensors, switches, and other control units, processes data, and outputs signals for the engine control system and A/T control system. The A/T control system includes shift control, clutch pressure control, and lock-up control. The PCM switches the shift solenoid valves and the A/T clutch pressure control solenoid valves on and off in a specific sequence to control gear selection and torque converter clutch lock-up.





Shift Control

The PCM instantly determines which gear should be selected by various signals sent from sensors and switches, and it actuates the shift solenoid valves A, B, C, and D to control gear selection.

There are two types of shift solenoid valves:

- Shift solenoid valves A and D are normally closed (ON-OPEN/OFF-CLOSE); The normally closed shift solenoid valve port open to allow ATF to pass through when the PCM turns it ON, and the port closes, blocking fluid flow when turned OFF.
- Shift solenoid valves B and C are normally open (ON-CLOSE/OFF-OPEN); The normally closed shift solenoid valve port closes, blocking ATF from passing through when the PCM turns it ON, and the port opens, allowing fluid flow when turned OFF.

The combination of driving signals to shift solenoid valves A, B, C, and D for each gear are in the following table.

Position	Gear Position	Shift Solenoid Valves			
		A	B	C	D
D and S	Shifting from N	OFF	ON	OFF	OFF
	Stays in 1st	OFF	ON	ON	OFF
	Shifting gears between 1st and 2nd	ON	ON	ON	OFF or ON
	Stays in 2nd	ON	ON	OFF	OFF or ON
	Shifting gears between 2nd and 3rd	ON	ON	ON	OFF or ON
	Stays in 3rd	ON	OFF	ON	OFF or ON
	Shifting gears between 3rd and 4th	ON	OFF	OFF	OFF or ON
	Stays in 4th	OFF	OFF	OFF	OFF or ON
D	Shifting gears between 4th and 5th	OFF	OFF	ON	OFF or ON
	Stays in 5th	OFF	ON	ON	OFF or ON
N	Neutral	OFF	ON	OFF	OFF
R	Shifting from P and N	OFF	ON	OFF	ON
	Stays in reverse	ON	ON	OFF	ON
	Reverse inhibit control	OFF	ON	OFF	OFF
P	Park	OFF	ON	OFF	ON

(cont'd)

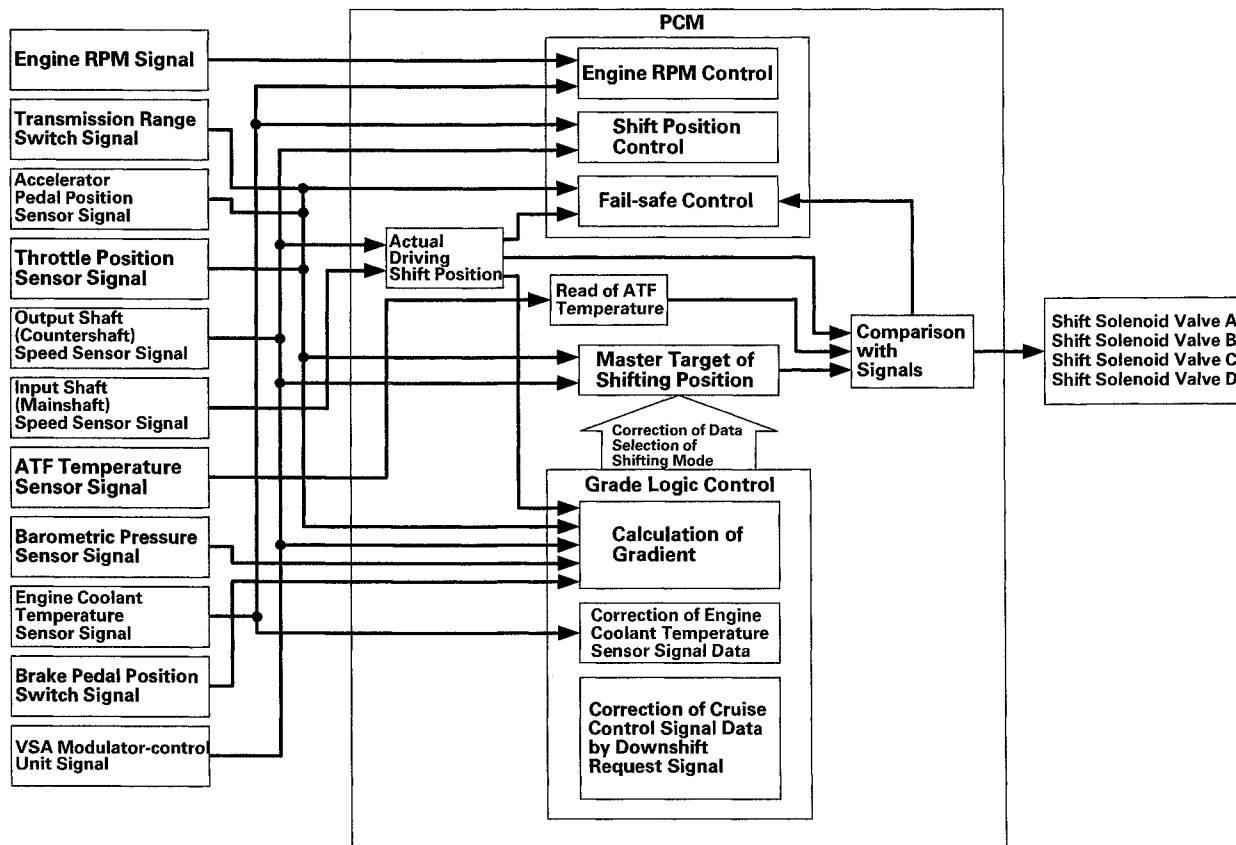
Automatic Transmission

System Description (cont'd)

Electronic Control System (cont'd)

Shift Control - Grade Logic Control

The grade logic control system is used to control shifting in D, and in S with automatic shift mode. The PCM compares actual driving conditions with programmed driving conditions, based on the input from the throttle position sensor, the engine coolant temperature sensor, the barometric pressure sensor, the brake pedal position switch signal, and the shift lever position signal, to improve shifting control while the vehicle is ascending or descending a slope.

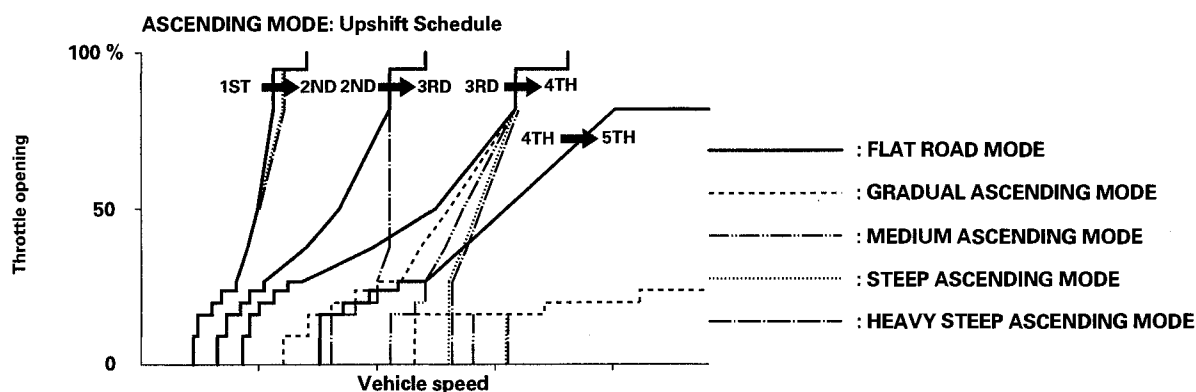




Grade Logic Control: Ascending Control

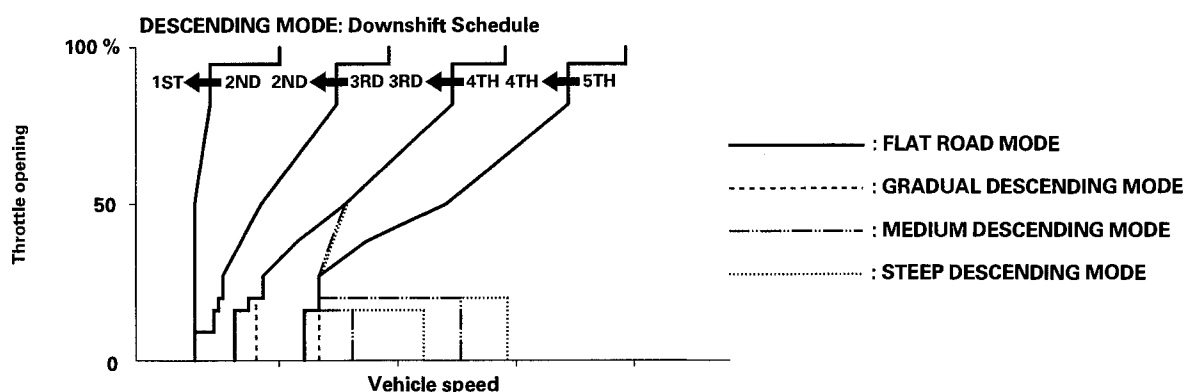
When the PCM determines that the vehicle is climbing a hill in D, and in S with automatic shift mode, the system extends the engagement area of 2nd gear, 3rd gear, and 4th gear to prevent the transmission from frequently shifting between 2nd and 3rd gears, between 3rd and 4th gears, and between 4th and 5th gears, so the vehicle can run smoothly and have more power when needed.

NOTE: Shift commands stored in the PCM between 2nd and 3rd gears, between 3rd and 4th gears, and between 4th and 5th gears, enable the PCM to automatically select the most suitable gear based on the steepness of the grade.



Grade Logic Control: Descending Control

When the PCM determines that the vehicle is going down a hill in D, and in S with automatic shift mode, the upshift speed from 4th to 5th gear, 3rd to 4th gear, and from 2nd to 3rd (when the throttle is closed) becomes higher than the set speed for flat road driving to extend the 4th gear, 3rd gear, and 2nd gear driving areas. This, in combination with engine braking from the deceleration lock-up, achieves smooth driving when the vehicle is descending. There are three descending modes stored in the PCM with different 4th gear, 3rd gear and, 2nd gear driving areas based on the steepness of the grade. When the vehicle is in 5th or 4th gear and the vehicle is decelerating while applying the brakes on a steep hill, the transmission downshifts to a lower gear. When you accelerate, the transmission then returns to a higher gear.



(cont'd)

Automatic Transmission

System Description (cont'd)

Electronic Control System (cont'd)

Deceleration Control

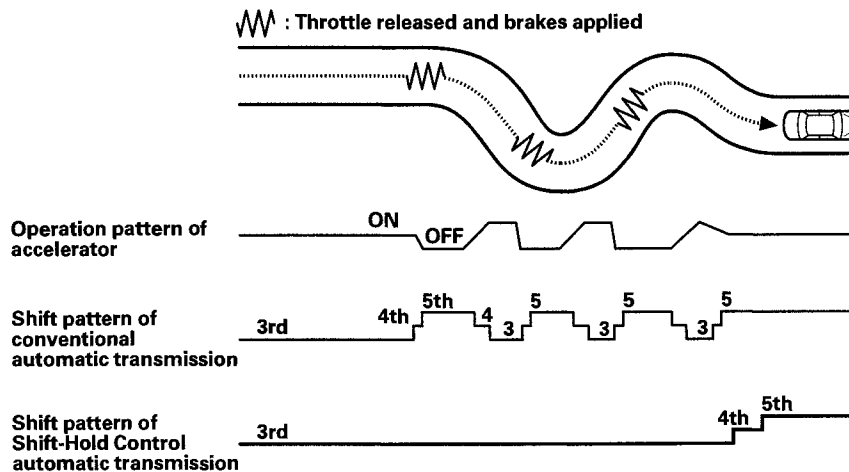
When the vehicle goes around a corner and needs to decelerate first and then accelerate, the PCM goes into the deceleration control mode to reduce the number of times the transmission shifts. When the vehicle is decelerating from speeds above 27 mph (43 km/h), the PCM anticipates upcoming acceleration, and shifts the transmission from 4th to 3rd earlier than normal.

Shift-Hold Control

When driving on winding roads, the throttle is suddenly released and the brakes are applied, as is the case when decelerating at the entrance of a corner, Shift-Hold Control keeps the transmission in its current (lower) gear as it negotiates the corner and accelerates out.

When the vehicle is driven aggressively on a winding road, the PCM extends the engagement time of 3rd gear and 4th gear to prevent the transmission from frequently shifting between 3rd, 4th, and 5th gears.

The PCM monitors the average change in vehicle speed and throttle over time. When these values exceed those for normal driving conditions, the shift-up from 3rd to 4th gear and 4th to 5th gear is delayed. This gives more control over power, and engine braking. The transmission resumes the normal shift-up pattern after the PCM determines that normal driving has resumed.





Shift Control - Manual Shift Mode

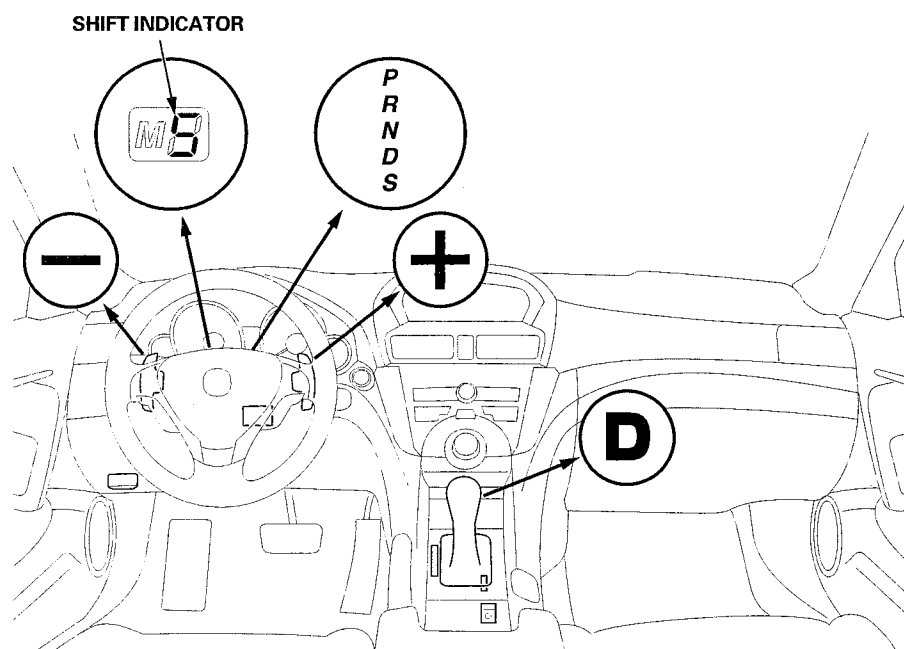
The transmission is provided with a D-paddle shift mode in D, and with a sequential sportshift mode in S. Either mode can be activated by pressing the paddle shifter + (upshift switch) or paddle shifter - (downshift switch) while driving with the shift lever in D and S.

D-Paddle Shift Mode

To engage the D-paddle shift mode, press back on either of the steering wheel mounted paddle shifters while driving in the D position. In this mode, the transmission can downshift by pressing the paddle shifter - (downshift switch), or upshift by pressing the paddle shifter + (upshift switch). There are seven speeds, so each time the transmission is shifted using the paddles, the shift indicator in the gauge control module displays the current position. The display turns off when the transmission upshifts or downshifts automatically.

The transmission stays in 5th gear if the paddle shifter + is pressed when driving in 5th gear, and the shift indicator displays "5" for 2 seconds, then goes off. The transmission stays in 1st gear if the paddle shifter - is pressed when driving in 1st gear, and the shift indicator displays "1" for 2 seconds, then goes off.

The transmission stays in the current gear and does not upshift to the next higher gear if the paddle shifter + is pressed while driving below the minimum allowable speed, and the shift indicator blinks the number of the next higher gear several times, then returns to the number of the current gear.



(cont'd)

Automatic Transmission

System Description (cont'd)

Electronic Control System (cont'd)

S Position Automatic Shift Mode and Sequential Sportshift Mode

The S position has two shifting modes; the automatic shift mode and the sequential sportshift mode. In the S position automatic shift mode, the transmission upshifts and downshifts automatically from 1st through 4th gear, if the paddle shifters are not pressed. In the automatic shift mode, the shift indicator and the M indicator in the gauge control module do not come on.

When the paddle shifter + (upshift switch) or paddle shifter - (downshift switch) is pressed, the automatic shift mode is canceled and the sequential sportshift mode comes into operation. The shift indicator displays the number of the selected gear, and the M indicator comes on. In the sequential sportshift mode, the driver can shift up and down manually from 1st through 5th gear by using the paddle shifters, much like a manual transmission. The paddle shifters are installed on the back of the steering wheel, and the driver can shift gears by pressing the paddle shifters without taking either hand off the steering wheel.

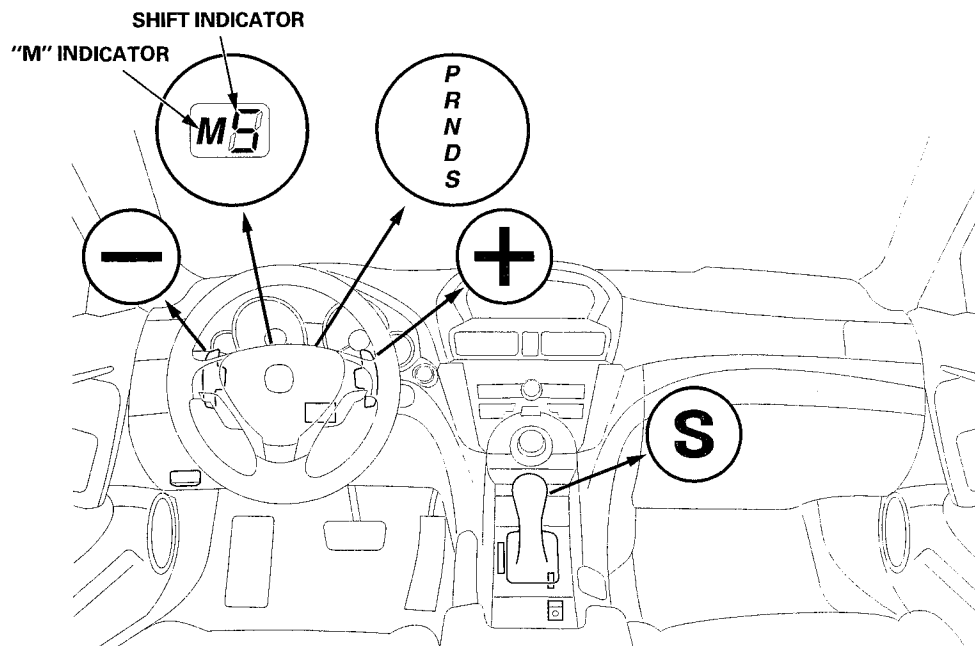
In the sequential sportshift mode, the transmission must be shifted up and down by pressing the paddle shifters.

However, if the vehicle is coasting at a speed that would cause the engine to over-rev by downshifting, the transmission will not shift when the paddle shifter - (downshift switch) is pressed. The shift indicator blinks the number of the selected gear position several times, then returns to the current gear. If the vehicle speed reaches an appropriate speed while the shift indicator is blinking, the transmission downshifts and the shift indicator displays the selected gear. Likewise, if the vehicle speed is below an appropriate speed to upshift when the paddle shifter + (upshift switch) is pressed, the transmission will not shift. The shift indicator blinks the number of the selected gear several times, and then returns to the number of the current gear. If the vehicle speed reaches an appropriate upshift speed while the shift indicator is blinking, the transmission upshifts and the shift indicator displays the selected gear.

This mode has automatic downshifting areas so the vehicle can run smoothly with more power to cope with upcoming acceleration. When coasting in 5th gear or 4th gear, the transmission downshifts to the next lower gear if the vehicle slows down to the programmed speed, or by pressing the brake pedal.

When the transmission decelerates to a stop, the transmission shifts to 1st gear automatically. The transmission can be shifted to 2nd gear by pressing the paddle shifter + while the vehicle is stopped, and the vehicle can start off in 2nd gear.

The sequential sportshift mode is canceled when moving the shift lever to any position other than S.

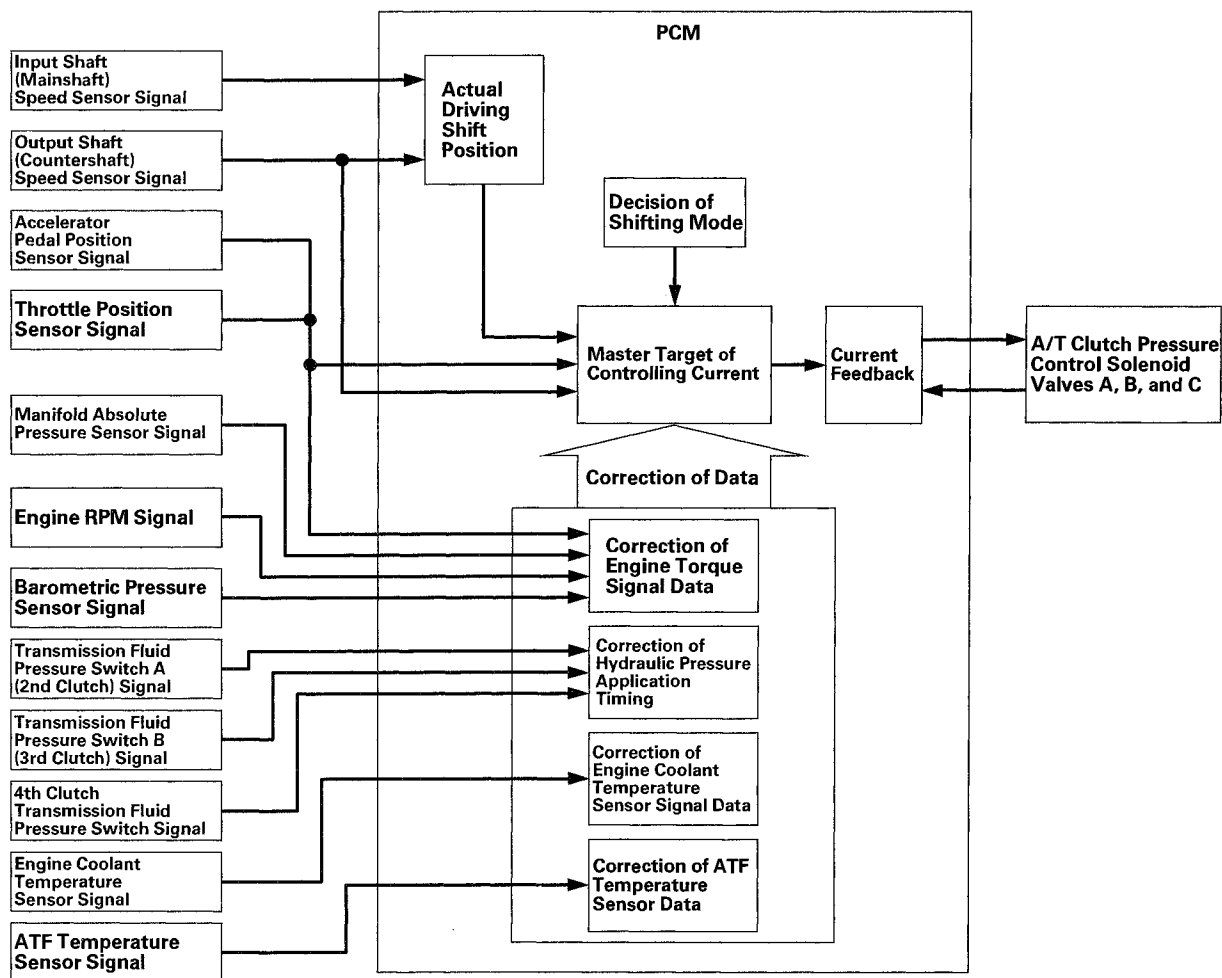




Clutch Pressure Control

The PCM actuates A/T clutch pressure control solenoid valves A, B, and C to control the clutch pressure. When shifting between gears, the clutch pressure regulated by A/T clutch pressure control solenoid valves A, B, and C engages and disengages the clutch smoothly.

The PCM receives input signals from the various sensors and switches, then processes the data, and outputs current to A/T clutch pressure control solenoid valves A, B, and C.



(cont'd)

Automatic Transmission

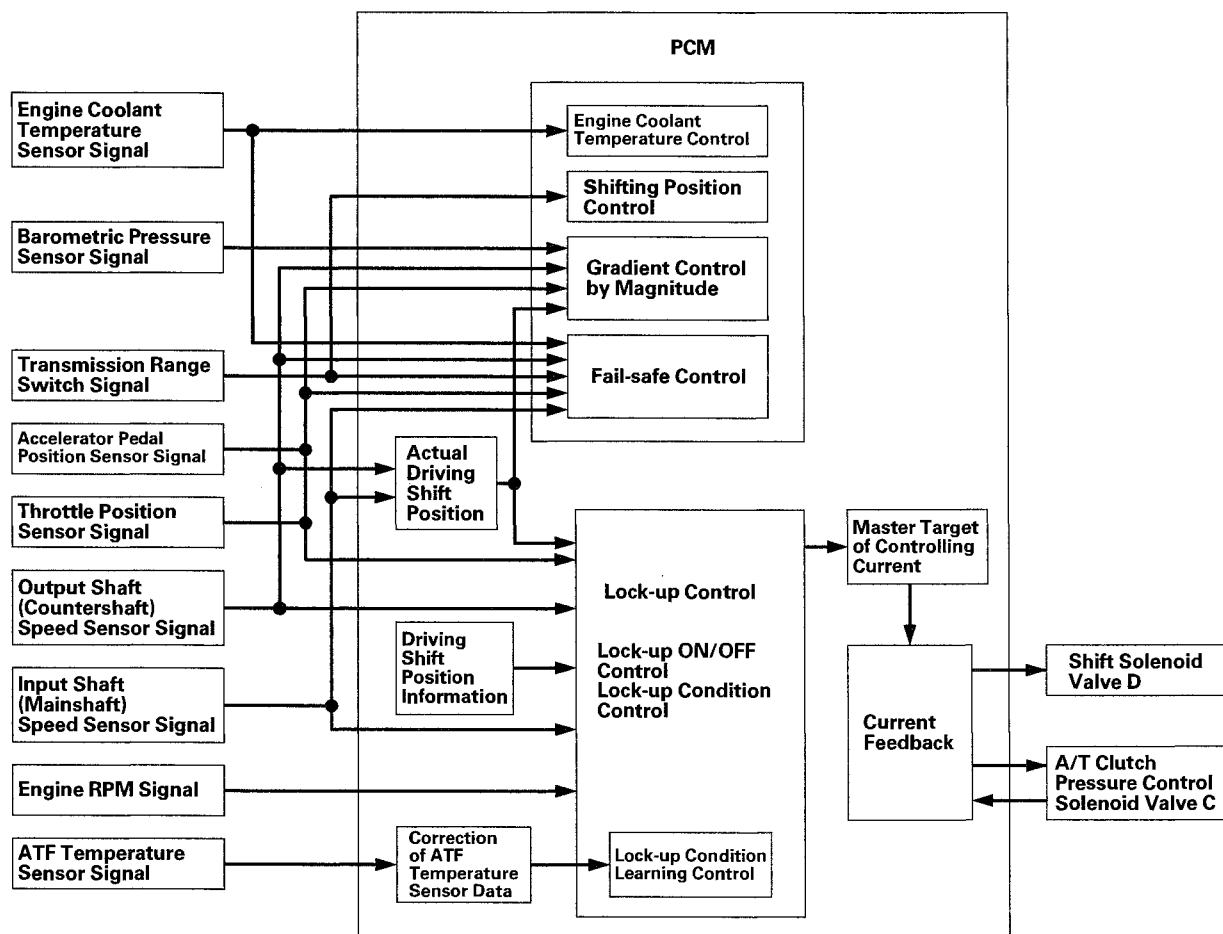
System Description (cont'd)

Electronic Control System (cont'd)

Lock-up Control

Shift solenoid valve D controls the hydraulic pressure to switch the lock-up shift valve and lock-up ON and OFF. When the PCM actuates shift solenoid valve D and A/T clutch pressure control solenoid valve C ON, lock-up starts. A/T clutch pressure control solenoid valve C applies and regulates hydraulic pressure to the lock-up control valve to control the amount of lock-up.

The lock-up mechanism of the torque converter clutch operates in D (2nd, 3rd, 4th, and 5th gears) and S with sequential sportshift or automatic shift models (2nd, 3rd, and 4th gears).





Self-diagnosis

If the PCM detects the failure of a signal from a sensor, a switch, a solenoid valve, or from another control unit, it stores a Pending or Confirmed DTC. Depending on the failure, a DTC is stored in either the first or the second drive cycle. When a Confirmed DTC is stored, the PCM blinks the D indicator and/or turns on the malfunction indicator lamp (MIL) by a signal sent to the gauge control module via F-CAN.

- **One Drive Cycle Detection Method:**

When an abnormality occurs in the signal from a sensor, a switch, a solenoid valve, or from another control unit, the PCM stores a Pending or Confirmed DTC for the failure and blinks the D indicator and/or turns on the MIL immediately.

- **Two Drive Cycle Detection Method:**

When an abnormality occurs in the signal from a sensor, a switch, a solenoid valve, or from another control unit in the first drive cycle, the PCM stores a Pending DTC. The D indicator and the MIL do not turn on at this time. If the failure continues in the second drive cycle, the PCM stores a Confirmed DTC and blinks the D indicator and/or turns on the MIL.

Fail-safe Function

When an abnormality occurs in the signal from a sensor, a switch, a solenoid valve, or from another control unit, the PCM ignores that signal and substitutes a pre-programmed value for that signal to allow the automatic transmission to continue operating. This causes a DTC to be stored and the D indicator to blink and/or the MIL to come on. The transmission may not shift normally during fail-safe operation. Do not test driving diagnosis when the MIL is ON, or when the D indicator is blinking.

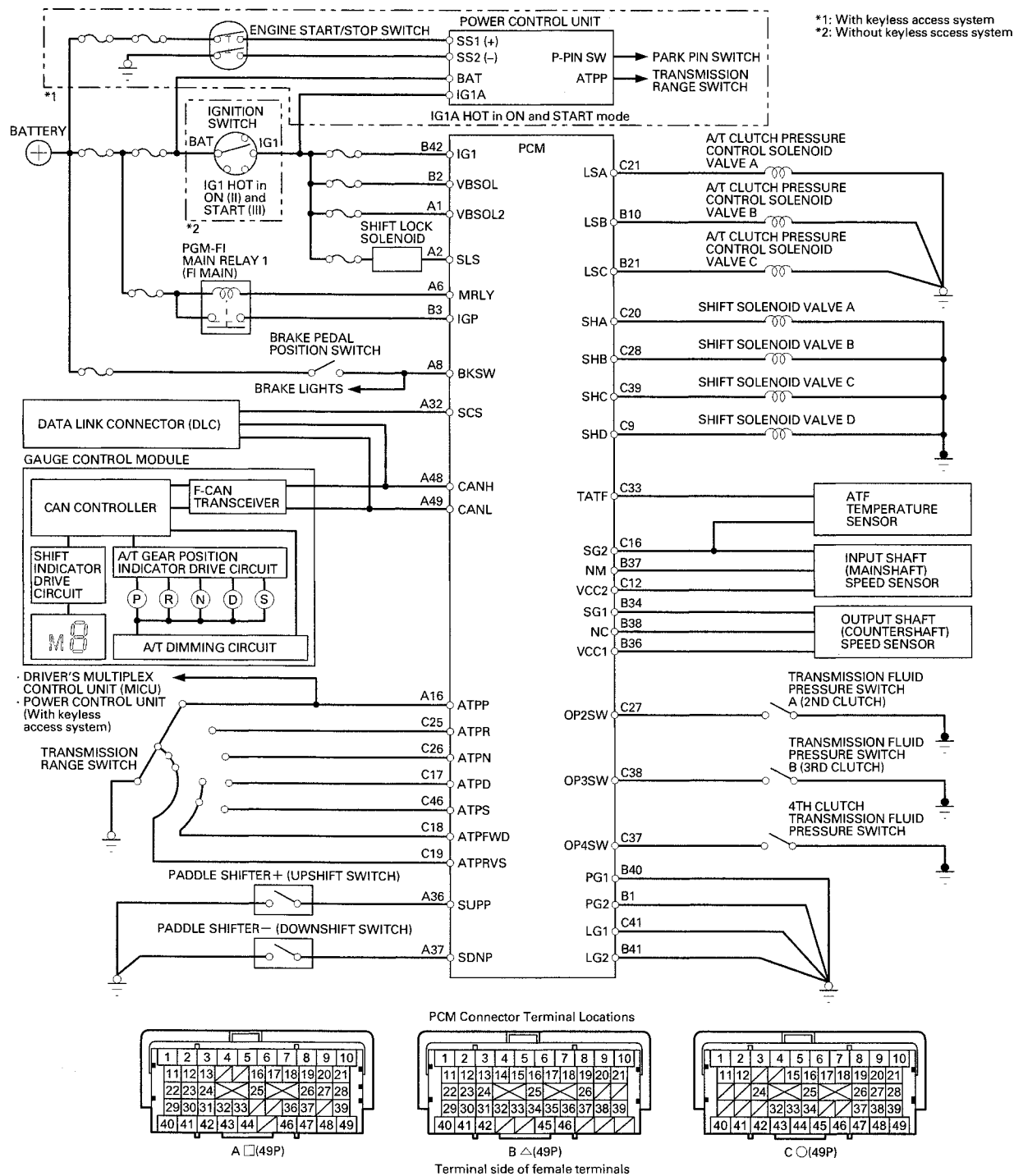
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Automatic Transmission

System Description (cont'd)

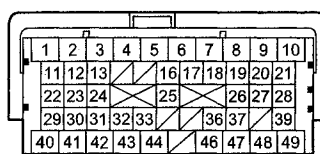
Electronic Control System (cont'd)

PCM A/T Control System Electrical Connections





PCM A/T Control System Inputs and Outputs at Connector A □ (49P)



Terminal side of female terminals

Terminal Number	Wire Color	Terminal Name	Description	Signal
A1	PUR	VBSOL2 (POWER SOURCE FOR SOLENOID VALVES)	Power source for solenoid valves	With ignition switch ON (II)/vehicle in ON mode: battery voltage
A2	PNK	SLS (SHIFT LOCK SOLENOID)	Drives shift lock solenoid	With ignition switch ON (II)/vehicle in ON mode, in P, brake pedal pressed, and accelerator released: about 0 V
A6	RED	MRLY (PGM-FI MAIN RELAY 1)	Drives PGM-FI main relay 1 power source for the DTC memory	With ignition switch ON (II)/vehicle in ON mode: about 0 V With ignition switch LOCK (0)/vehicle in OFF mode: battery voltage
A8	LT GRN	BKSW (BRAKE PEDAL POSITION SWITCH)	Detects brake pedal position switch signal	With brake pedal released: about 0 V With brake pedal pressed: battery voltage
A16	RED	ATPP (TRANSMISSION RANGE SWITCH P POSITION)	Detects transmission range switch P position signal	In P: about 0 V In any position other than P: more than 5.0 V
A23	YEL	VBUM (VOLTAGE BACK UP)	Power source for PCM memory	Battery voltage at all times
A32	ORN	SCS (SERVICE CHECK SIGNAL)	Detects service check signal	With service check signal shorted using the HDS: about 0 V With service check signal opened: about 5.0 V
A36	BRN	SUPP (PADDLE SHIFTER + (UPSHIFT SWITCH))	Detects paddle shifter + (upshift switch) signal	With paddle shifter + (upshift switch) pressed: about 0 V With paddle shifter + (upshift switch) released: battery voltage
A37	PUR	SDNP (PADDLE SHIFTER - (DOWNSHIFT SWITCH))	Detects paddle shifter - (downshift switch) signal	With paddle shifter - (downshift switch) pressed: about 0 V With paddle shifter - (downshift switch) released: battery voltage
A48	WHT	CANH (CAN COMMUNICATION SIGNAL HIGH)	Sends and receives communication signal	With ignition switch ON (II)/vehicle in ON mode: about 2.5 V (pulses)
A49	BLK	CANL (CAN COMMUNICATION SIGNAL LOW)	Sends and receives communication signal	With ignition switch ON (II)/vehicle in ON mode: about 2.5 V (pulses)

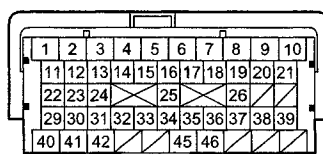
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Automatic Transmission

System Description (cont'd)

Electronic Control System (cont'd)

PCM A/T Control System Inputs and Outputs at Connector B △ (49P)

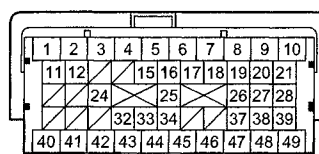


Terminal side of female terminals

Terminal Number	Wire Color	Terminal Name	Description	Signal
B1	BLK	PG2 (POWER GROUND)	Ground circuit for PCM circuit	Less than 0.2 V at all times
B2	BLK/YEL	VBSOL (POWER SOURCE FOR SOLENOID VALVES)	Power source for solenoid valves	With ignition switch ON (II)/vehicle in ON mode: battery voltage
B3	YEL/BLK	IGP (POWER SOURCE)	Power source for PCM circuit	With ignition switch ON (II)/vehicle in ON mode: battery voltage
B10	BRN/WHT	LSB (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B)	Drives A/T clutch pressure control solenoid valve B	With ignition switch ON (II)/vehicle in ON mode: current controlled
B21	GRN/RED	LSC (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C)	Drives A/T clutch pressure control solenoid valve C	With ignition switch ON (II)/vehicle in ON mode: current controlled
B34	GRN/WHT	SG1 (SENSOR GROUND)	Sensor ground	Less than 0.2 V at all times
B36	YEL/RED	VCC1 (SENSOR VOLTAGE)	Provides sensor reference voltage	With ignition switch ON (II)/vehicle in ON mode: about 5.0 V
B37	RED	NM (INPUT SHAFT (MAINSHAFT) SPEED SENSOR)	Detects input shaft (mainshaft) speed sensor signals	With ignition switch ON (II)/vehicle in ON mode: about 0 V or about 5.0 V With engine at idling in N: about 2.5 V
B38	BLU	NC (OUTPUT SHAFT (COUNTERSHAFT) SPEED SENSOR)	Detects output shaft (countershaft) speed sensor signal	With ignition switch ON (II)/vehicle in ON mode: about 0 V or about 5.0 V with driving: pulses
B40	BLK	PG1 (POWER GROUND)	Ground circuit for PCM circuit	Less than 0.2 V at all times
B41	BRN/YEL	LG2 (LOGIC GROUND)	Ground circuit for PCM circuit	Less than 0.2 V at all times
B42	BLK/YEL	IG1 (IGNITION SIGNAL)	Detects ignition signal	With ignition switch ON (II)/vehicle in ON mode: battery voltage



PCM A/T Control System Inputs and Outputs at Connector C ○ (49P)



Terminal side of female terminals

Terminal Number	Wire Color	Terminal Name	Description	Signal
C9	GRN/RED	SHD (SHIFT SOLENOID VALVE D)	Drives shift solenoid valve D	With engine running in N, D, and S during no lock-up condition: about 0 V With engine running in P and R, and in D during lock-up condition: battery voltage
C12	YEL/BUL	VCC2 (SENSOR VOLTAGE)	Provides sensor reference voltage	With ignition switch ON (II)/vehicle in ON mode: about 5.0 V
C16	GRN/YEL	SG2 (SENSOR GROUND)	Sensor ground	Less than 0.2 V at all times
C17	YEL/GRN	ATPD (TRANSMISSION RANGE SWITCH D)	Detects transmission range switch D position signal input	In D: about 0 V In any position other than D: about 5.0 V
C18	BLU/YEL	ATPFW (TRANSMISSION RANGE SWITCH FWD)	Detects transmission range switch FWD position signal input	In D and S: about 0 V In any position other than D and S: about 5.0 V
C19	RED/WHT	ATPRVS (TRANSMISSION RANGE SWITCH R)	Detects transmission range switch RVS position signal input	In P, R, and N: about 0 V In any position other than P, R, and N: about 5.0 V
C20	BLU/YEL	SHA (SHIFT SOLENOID VALVE A)	Drives shift solenoid valve A	With engine running in D, S (in 2nd and 3rd gears), and R: battery voltage With engine running in P, N, and D (in 1st, 4th, and 5th gears), and S (in 1st and 4th gears): about 0 V
C21	RED	LSA (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A)	Drives A/T clutch pressure control solenoid valve A	With ignition switch ON (II)/vehicle in ON mode: current controlled
C25	WHT	ATPR (TRANSMISSION RANGE SWITCH R)	Detects transmission range switch R position signal input	In R: about 0 V In any position other than R: more than 5.0 V
C26	RED/BLK	ATPN (TRANSMISSION RANGE SWITCH N)	Detects transmission range switch N position signal input	In N: about 0 V In any position other than N: battery voltage
C27	BLU/BLK	OP2SW (TRANSMISSION FLUID PRESSURE SWITCH A (2ND CLUTCH))	Detects transmission fluid pressure switch A (2nd clutch) signal input	With ignition switch ON (II)/vehicle in ON mode: • Without 2nd clutch pressure: battery voltage • With 2nd clutch pressure: about 0 V

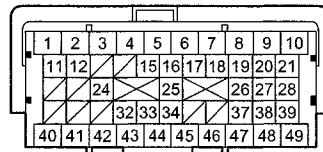
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Automatic Transmission

System Description (cont'd)

Electronic Control System (cont'd)

PCM A/T Control System Inputs and Outputs at Connector C ○ (49P)



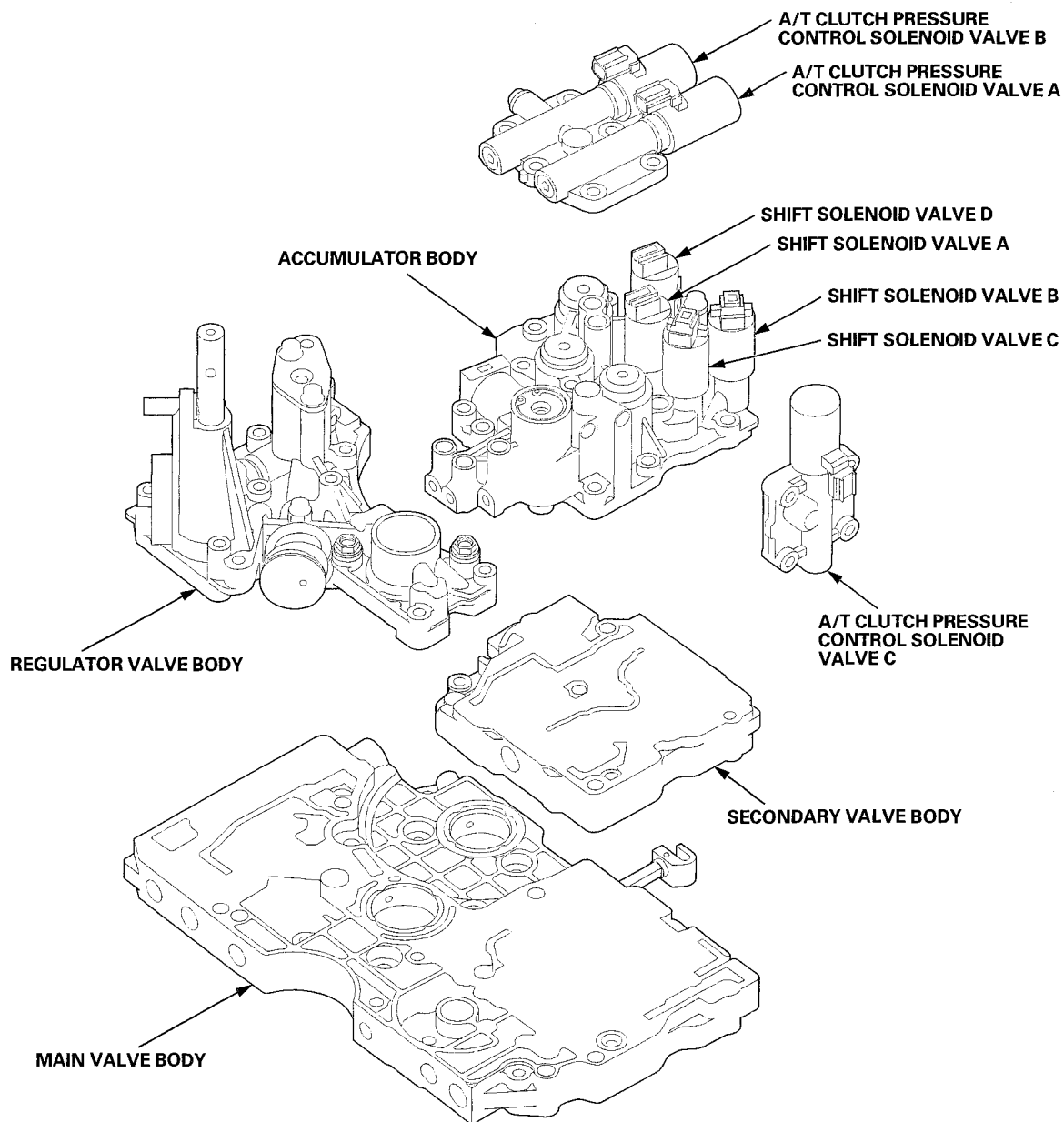
Terminal side of female terminals

Terminal Number	Wire Color	Terminal Name	Description	Signal
C28	GRN/WHT	SHB (SHIFT SOLENOID VALVE B)	Drives shift solenoid valve B	With engine running in P, R, N, D (in 1st, 2nd, and 5th gears), and S (in 1st and 2nd gears): battery voltage With engine running in D and S (in 3rd and 4th gears): about 0 V
C33	BLU/YEL	TATF (ATF TEMPERATURE SENSOR)	Detects ATF temperature signal input	With ignition switch ON (II)/vehicle in ON mode: about 0.2—4.0 V (about 1.8 V at operating temperature, depending on ATF temperature)
C37	BLU/YEL	OP4SW (4TH CLUTCH TRANSMISSION FLUID PRESSURE SWITCH)	Detects 4th clutch transmission fluid pressure switch signal input	With ignition switch ON (II)/vehicle in ON mode: • Without 4th clutch pressure: battery voltage • With 4th clutch pressure: about 0 V
C38	BLU/WHT	OP3SW (TRANSMISSION FLUID PRESSURE SWITCH B (3RD CLUTCH))	Detects transmission fluid pressure switch B (3rd clutch) signal input	With ignition switch ON (II)/vehicle in ON mode: • Without 3rd clutch pressure: battery voltage • With 3rd clutch pressure: about 0 V
C39	GRN	SHC (SHIFT SOLENOID VALVE C)	Drives shift solenoid valve C	With engine running in D (in 1st, 3rd, and 5th gears), and S (in 1st and 3rd gears): battery voltage With engine running in P, R, N, D, and S (in 2nd and 4th gears): about 0 V
C41	BRN/YEL	LG1 (LOGIC GROUND)	Ground circuit for PCM circuit	Less than 0.2 V at all times
C46	RED	ATPS (TRANSMISSION RANGE SWITCH S)	Detects transmission range switch S position signal input	In S: about 0 V In any position other than S: about 5.0 V



Hydraulic Controls

The valve body includes the main valve body, the regulator valve body, the secondary valve body, and the accumulator body. The ATF pump is driven by splines on the end of the torque converter which is attached to the engine. Fluid flows through the regulator valve to maintain specified pressure through the main valve body to the manual valve, directing pressure to each of the clutches. Shift solenoid valves A, B, C, and D are mounted on the accumulator body. A/T clutch pressure control solenoid valves A, B, and C are mounted on the transmission housing.



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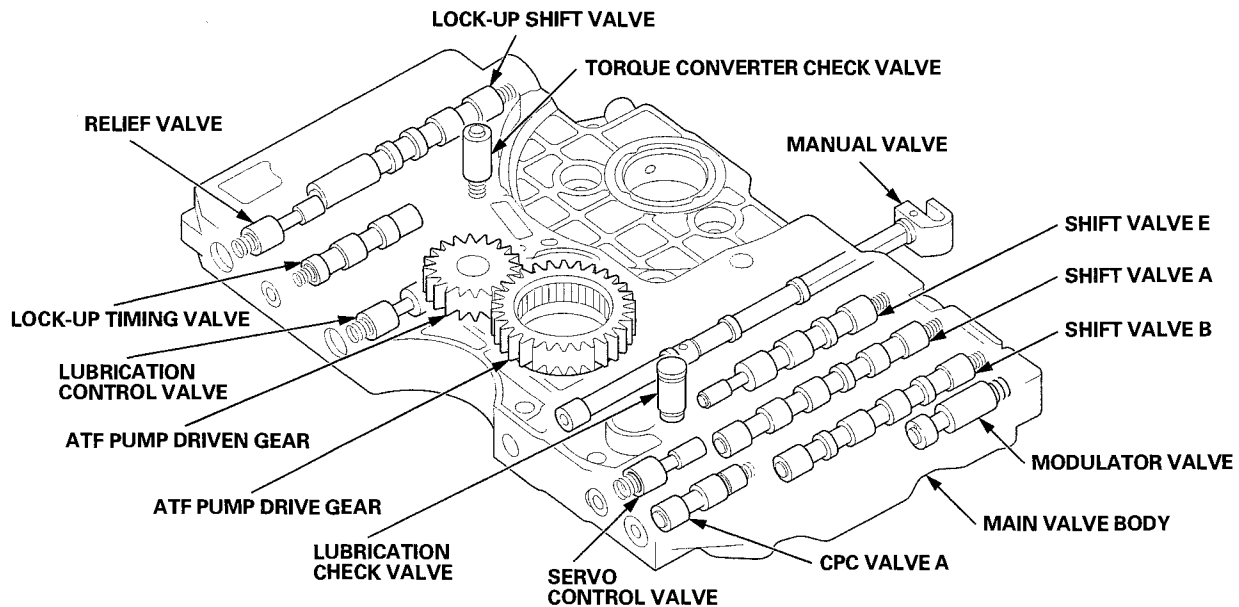
Automatic Transmission

System Description (cont'd)

Hydraulic Controls (cont'd)

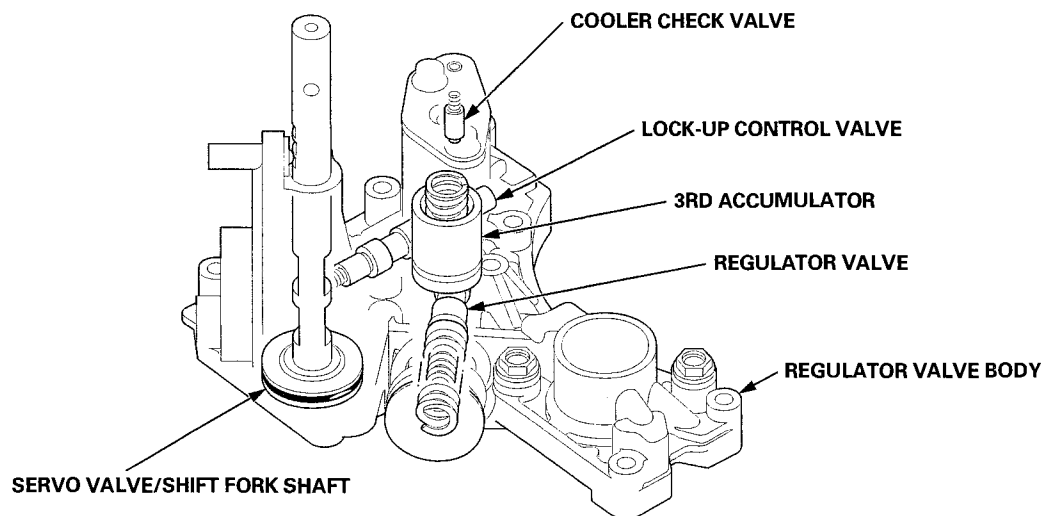
Main Valve Body

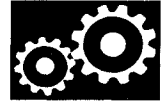
The main valve body contains the manual valve, the modulator valve, the torque converter check valves, shift valve A, B, and E, CPC valve A, the servo control valve, the relief valve, the lock-up shift valve, the lock-up timing valve, the lubrication control valve, the lubrication check valve, the ATF pump drive gear, and the ATF pump driven gear. The primary function of the main valve body is to switch fluid pressure on and off to control hydraulic pressure going to the hydraulic control system.



Regulator Valve Body

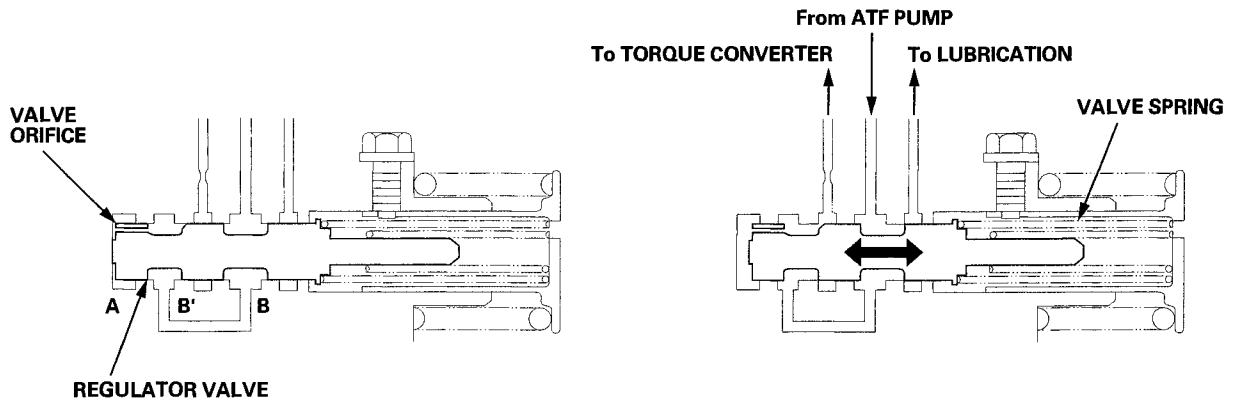
The regulator valve body is located on the main valve body. The regulator valve body contains the regulator valve, the cooler check valve, the lock-up control valve, the servo valve/shift fork shaft, and the 3rd accumulator.



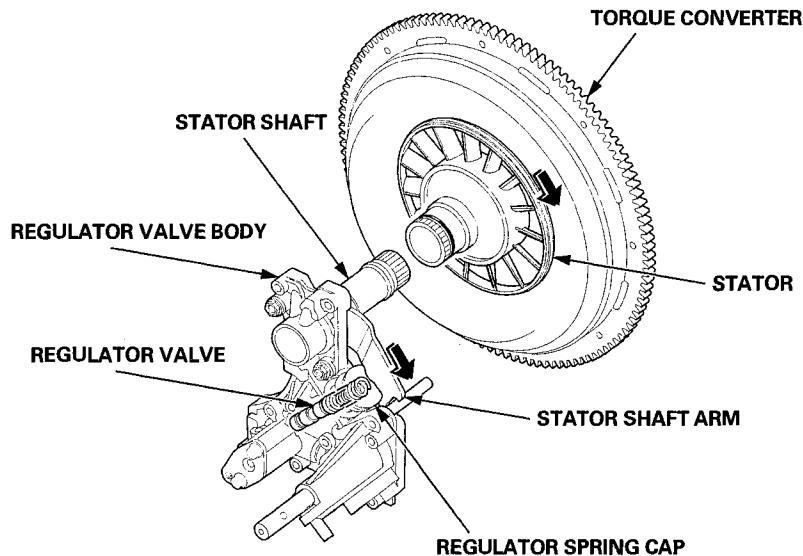


Regulator Valve

The regulator valve maintains constant hydraulic pressure from the ATF pump to the hydraulic control system, while also providing fluid to the lubrication system and the torque converter. Fluid from the ATF pump flows through B and B'. Fluid entering from B flows through the valve orifice to the A cavity. This pressure of the A cavity pushes the regulator valve to the spring side, and this movement of the regulator valve uncovers the fluid port to the torque converter and the relief valve. The fluid flows out to the torque converter and the relief valve, and the regulator valve returns under spring force. According to the level of the hydraulic pressure through B, the position of the regulator valve changes, and the amount of fluid from B' through the torque converter changes. This operation is continued, maintaining the line pressure.



Increases in hydraulic pressure according to torque are regulated by the regulator valve using stator torque reaction. The stator shaft is splined to the stator in the torque converter, and the stator shaft arm end contacts the regulator spring cap. When the vehicle is accelerating or climbing (torque converter range), stator torque reaction acts on the stator shaft, and the stator shaft arm pushes the regulator spring cap in the direction of the arrow in proportion to the reaction. The stator reaction spring compresses, and the regulator valve moves to increase the line pressure which is regulated by the regulator valve. The line pressure reaches its maximum when the stator torque reaction reaches its maximum.



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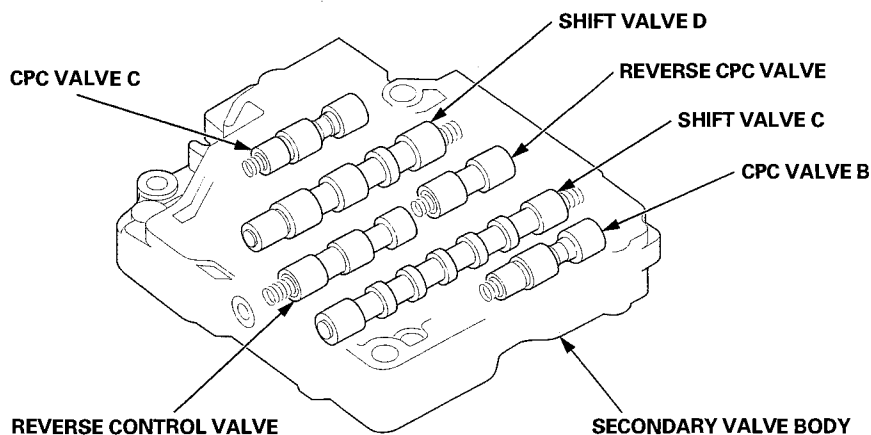
Automatic Transmission

System Description (cont'd)

Hydraulic Controls (cont'd)

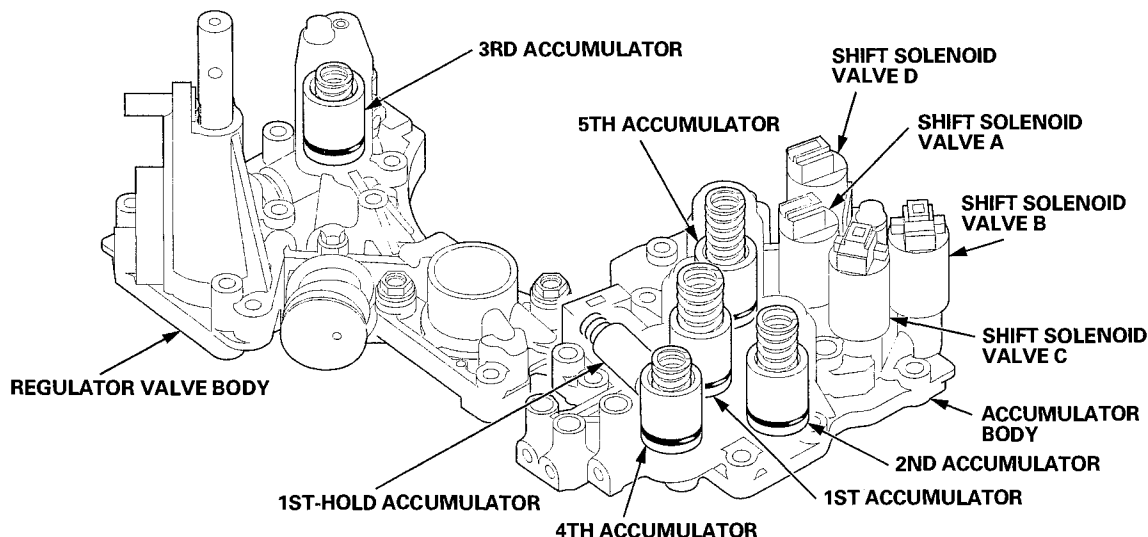
Secondary Valve Body

The secondary valve body is on the main valve body. The secondary valve body contains shift valves C and D, CPC valves B and C, the reverse control valve, and the reverse CPC valve.



Accumulator Body/Regulator Valve Body

The accumulator body is on the secondary valve body, and contains the 1st, 1st-hold, 2nd, 4th, 5th accumulators, and shift solenoid valve A, B, C, and D. The 3rd accumulator is in the regulator valve body.





Hydraulic Flow

Distribution of Hydraulic Pressure

As the engine turns, the ATF pump starts to operate. Automatic transmission fluid (ATF) is drawn through the ATF strainer (filter) and discharged into the hydraulic circuit. Then, ATF flowing from the ATF pump becomes line pressure that is regulated by the regulator valve. Torque converter pressure from the regulator valve enters the torque converter through the lock-up shift valve and lock-up control valve, and it is discharged from the torque converter. The torque converter check valve prevents torque converter pressure from rising.

The PCM switches shift solenoid valves ON and OFF, and the shift solenoid valves control shift solenoid pressure to the shift valves. Applying shift solenoid pressure to the shift valves moves the position of the shift valve, and switches the port of hydraulic pressure. The PCM also controls A/T clutch pressure control solenoid valves A, B, and C. The A/T clutch pressure control solenoid valves regulate hydraulic pressure, and applies the pressure to CPC valves A, B, and C.

When shifting between gears, the clutches are engaged by pressure from the CPC pressure mode. The PCM actuates one of the shift solenoid valves to move the position of the shift valve. This movement switches the port of CPC pressure and line pressure. Line pressure is then applied to the clutch, and CPC pressure is released. The clutch is engaged with line pressure after shifting is completed.

Hydraulic Pressure at the Port for use in the hydraulic circuit:

Port No.	Hydraulic Pressure	Port No.	Hydraulic Pressure
1	Line	SC	Shift solenoid valve C
2	Line	SC'	Shift solenoid valve C
3	Line	SD	Shift solenoid valve D
3'	Line	10	1st clutch
3''	Reverse CPC or Line	15	1st-hold clutch
3A	Line	20	2nd clutch
3B	Reverse CPC	30	3rd clutch
4	Line	40	4th clutch
4'	Line	50	5th clutch
4''	Line	51	5th clutch
4A	CPC A	56	A/T clutch pressure control solenoid valve A
4B	CPC B	57	A/T clutch pressure control solenoid valve B
4C	CPC C	5R	A/T clutch pressure control solenoid valve B
5A	CPC A	58	A/T clutch pressure control solenoid valve C
5B	CPC A or Line	90	Torque converter
5C	CPC B or Line	90'	Torque converter
5D	CPC B	91	Torque converter
5E	CPC C	91'	Torque converter
5F	CPC C	92	Torque converter
5G	CPC C	93	ATF cooler
5H	CPC B or Line	94	Torque converter
5J	CPC B or Line	95	Lubrication
5K	CPC A or Line	95'	Lubrication
5L	CPC A or Line	96	Torque converter
5M	Line	99	Suction
5N	CPC C	X	Drain
6	Modulator	HX	High position drain
SA	Shift solenoid valve A	AX	Air drain
SB	Shift solenoid valve B	—	—

(cont'd)

Automatic Transmission

System Description (cont'd)

Hydraulic Flow (cont'd)

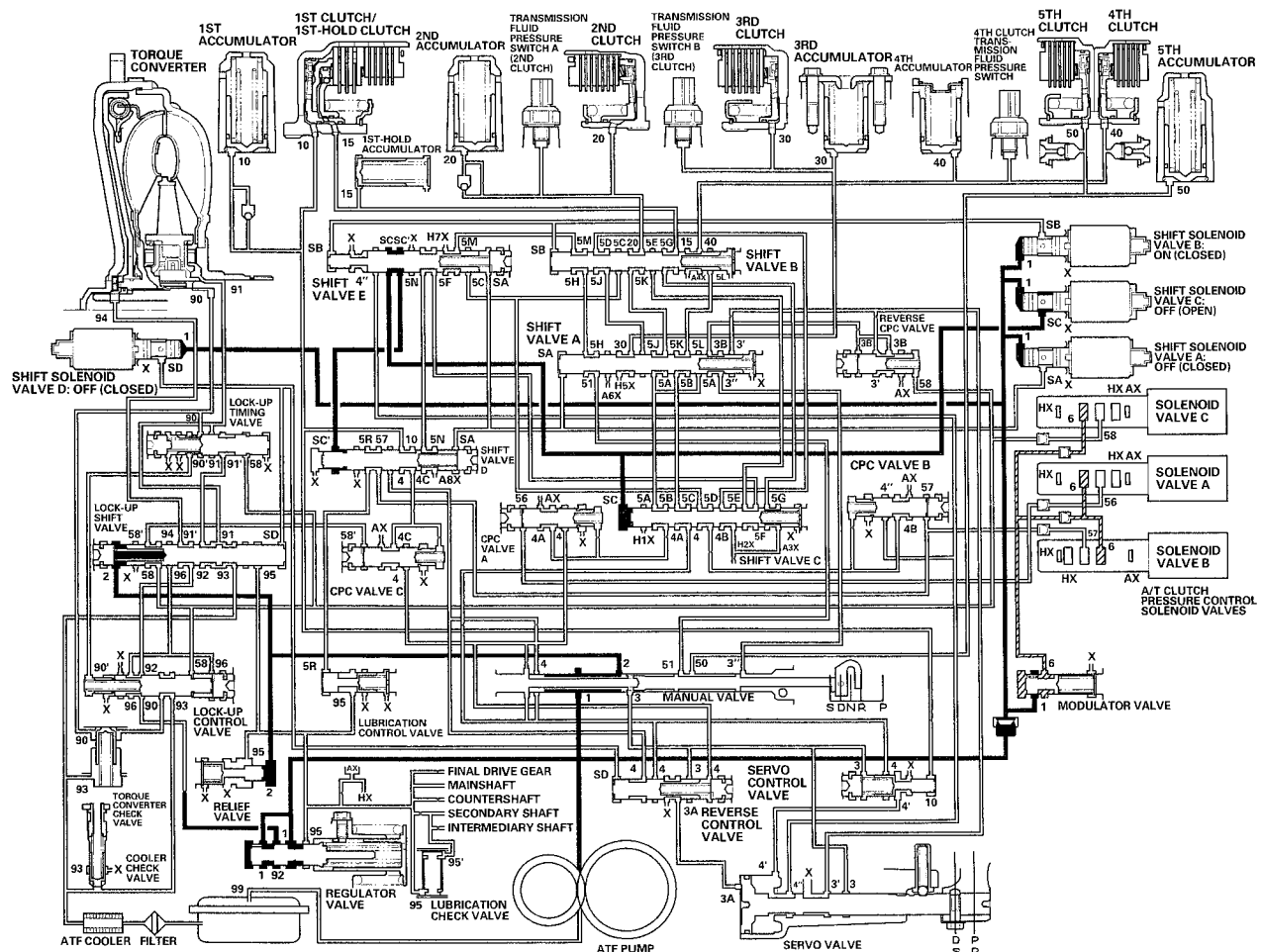
N Position

Line pressure (1) regulated by the regulator valve flows to the shift solenoid valves. The PCM switches the shift solenoid valves ON and OFF. The conditions of the shift solenoid valves and the positions of the shift valves are as follows:

- Shift solenoid valve A is OFF, and closes shift solenoid valve A pressure port (SA); shift valve A remains on the left side.
- Shift solenoid valve B is turned ON, and closes shift solenoid valve B pressure port (SB); shift valves B and E remain on the left side.
- Shift solenoid valve C is OFF, and opens shift solenoid valve C pressure port (SC); shift valves C and D move to the right side.
- Shift solenoid valve D is OFF, and closes shift solenoid valve D pressure port (SD).

Line pressure (1) also flows to the modulator valve and becomes modulator pressure (6). Modulator pressure (6) flows to the A/T clutch pressure control solenoid valves. The manual valve covers the port leading pressure to the clutches, and hydraulic pressure is not applied to the clutches.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



Automatic Transmission

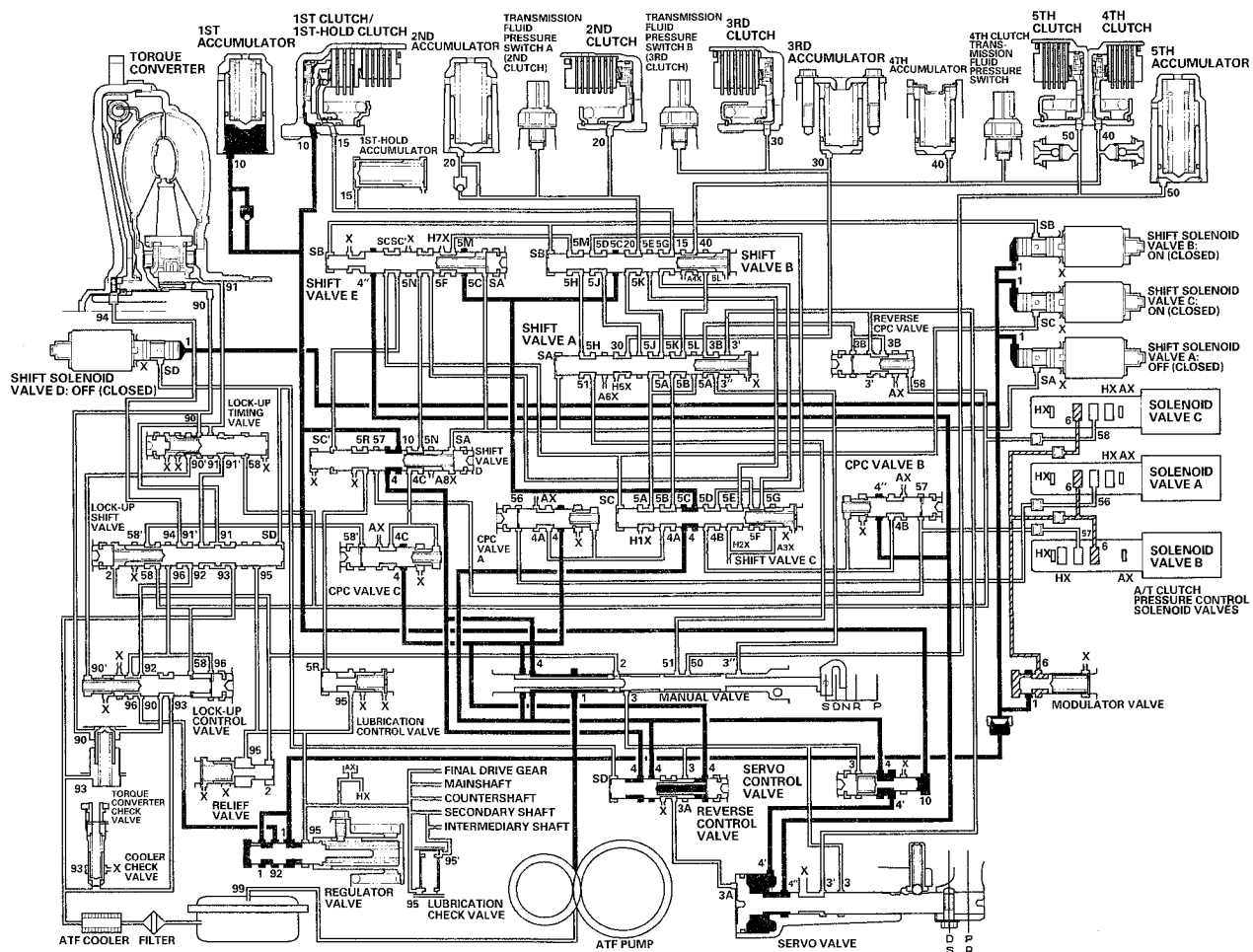
System Description (cont'd)

Hydraulic Flow (cont'd)

Driving in 1st gear in D and S with automatic shift mode

The PCM turns shift solenoid valve C ON, and shift solenoid valve C covers shift solenoid valve C pressure port (SC) to shift valve C, and shift valve D via shift valve E. Shift solenoid valve A remains OFF, and shift solenoid valve B remains ON. Shift valves C and D are moved to the left side, shift valve D switches the line pressure port (4) and CPC C pressure port (4C) leading to the 1st clutch, and shift valve C switches the CPC A pressure port (5A) releasing 2nd clutch pressure. Line pressure (4) becomes 1st clutch pressure (10) at shift valve D, and flows to the 1st clutch. The 1st clutch is engaged securely by the line pressure.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.

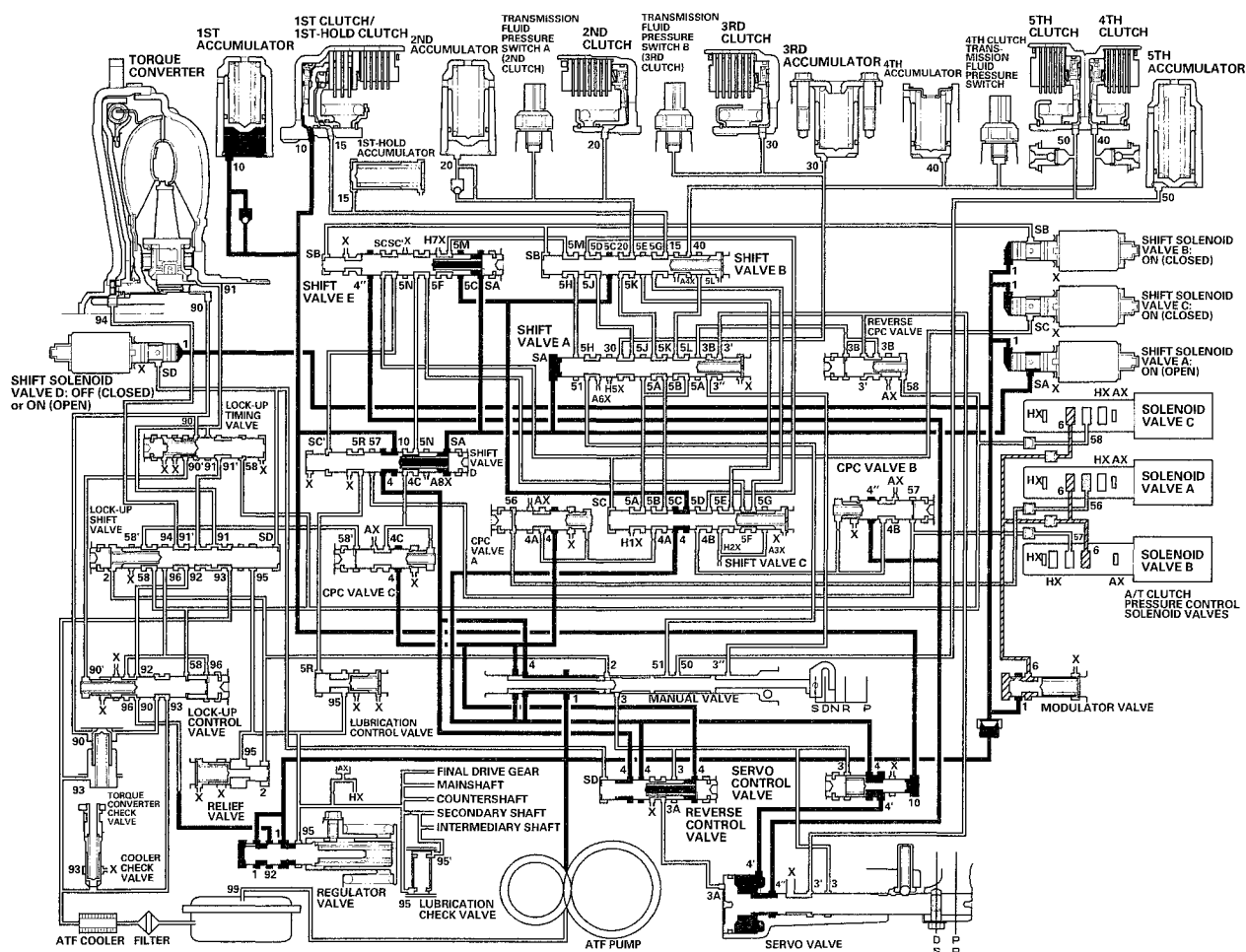




Shifting between 1st gear and 2nd gear in D and S with automatic shift mode

As the speed of the vehicle reaches the programmed value, the PCM turns shift solenoid valve A ON, and shift solenoid valve A uncovers shift solenoid valve A pressure port (SA) to shift valve A. Shift solenoid valves B and C remain ON. Shift valve A is moved to the right side to uncover the CPC A pressure port (4A) leading to the 2nd clutch. The PCM actuates A/T clutch pressure control solenoid valve A, and A/T clutch pressure control solenoid valve A pressure (56) is applied to CPC valve A. CPC valve A regulates line pressure (4), and line pressure (4) becomes CPC A pressure (4A). CPC A pressure (4A) flows to shift valve B via shift valves C and A, and becomes 2nd clutch pressure (20) at shift valve B. The 2nd clutch is engaged by the CPC pressure. The 1st clutch is also engaged, but no power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Automatic Transmission

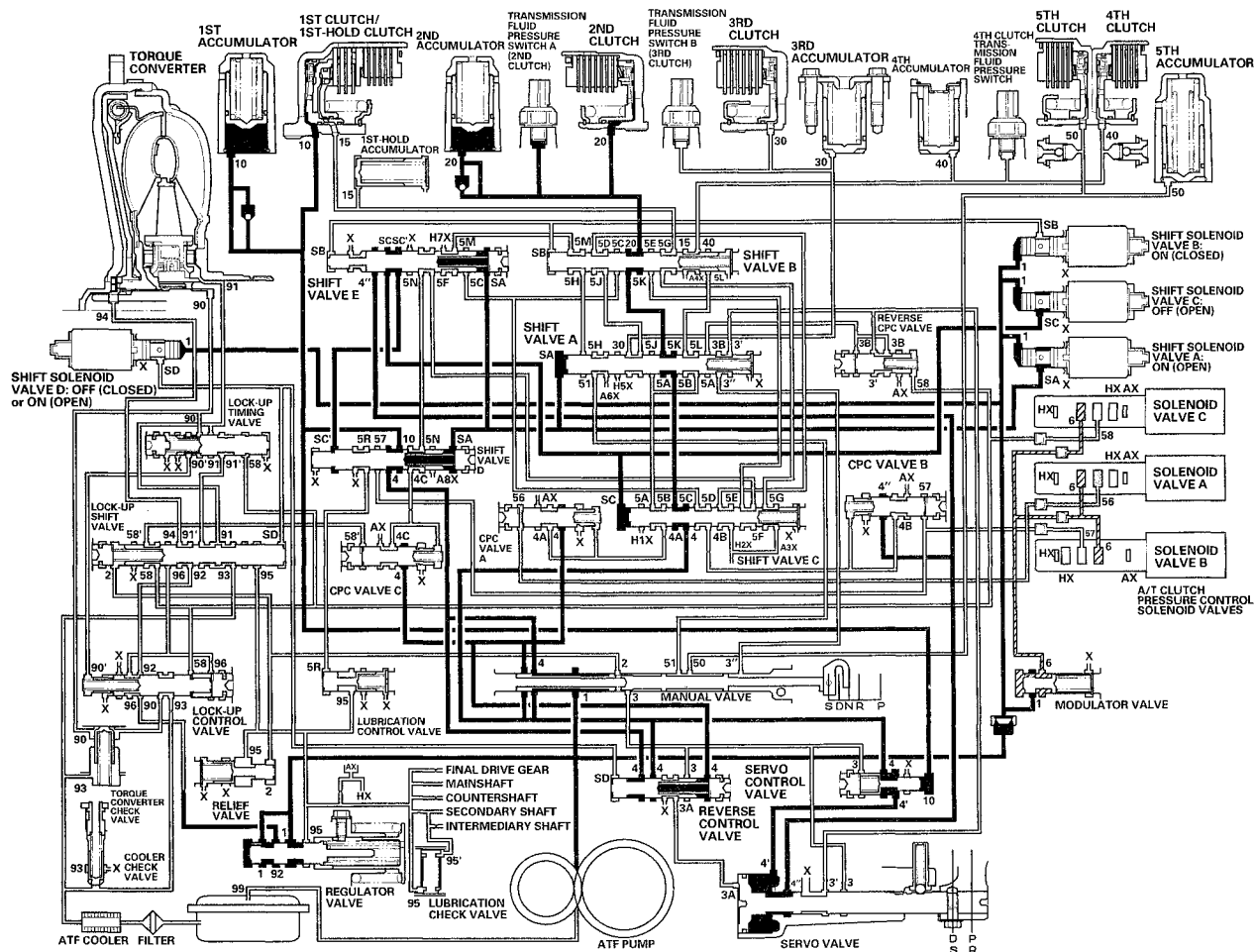
System Description (cont'd)

Hydraulic Flow (cont'd)

Driving in 2nd gear in D and S with automatic shift mode

The PCM turns shift solenoid valve C OFF, and shift solenoid valve C uncovers shift solenoid valve C pressure port (SC) to shift valve C. Shift solenoid valves A and B remain ON. Shift valve C is moved to the right side to switch the line pressure port (4) and CPC A pressure port (4A) leading to the 2nd clutch. CPC A pressure (5B) (5K) changes to line pressure (5B) (5K) and 2nd clutch pressure (20) is changed to line pressure mode, and the 2nd clutch is engaged by the line pressure. The 1st clutch is also engaged, but no power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.

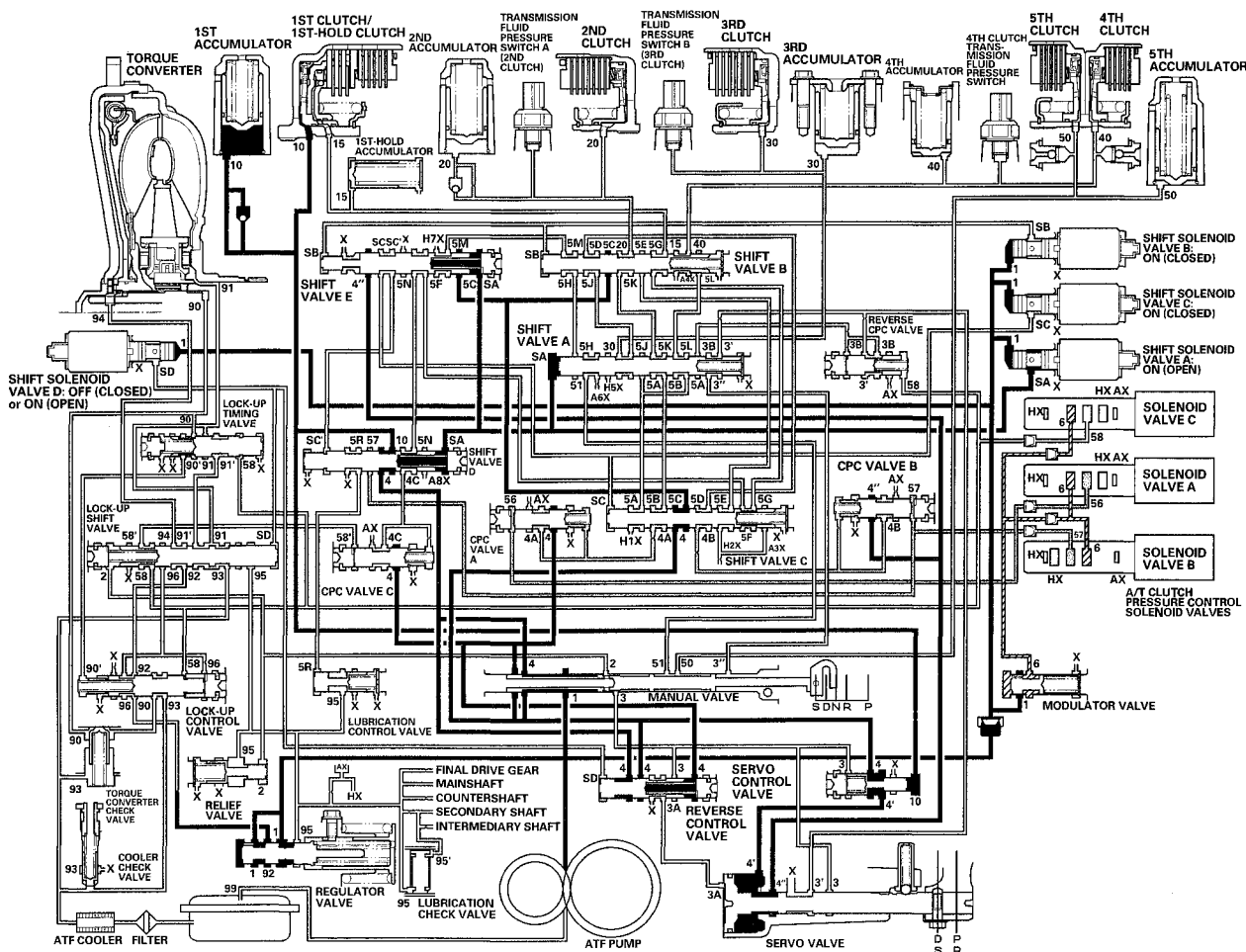




Shifting between 2nd gear and 3rd gear in D and S with automatic shift mode

As the speed of the vehicle reaches the programmed value, the PCM turns shift solenoid valve C ON, and shift solenoid valve C covers shift solenoid valve C pressure port (SC) to shift valve C. Shift solenoid valves A and B remain ON. Shift valve C is moved to the left side to switch the line pressure port (4) and CPC A pressure port (4A) leading to the 2nd clutch. Shift valve C also uncovers the CPC B pressure port (4B) leading to the 3rd clutch. The PCM actuates A/T clutch pressure control solenoid valves A and B. A/T clutch pressure control solenoid valve A pressure (56) is applied to CPC valve A, and A/T clutch pressure control solenoid valve B pressure (57) is applied to CPC valve B. CPC valve B regulates line pressure (4''), and line pressure (4'') becomes CPC B pressure (4B). CPC B pressure flows to shift valve A via shift valves C and B, and becomes 3rd clutch pressure (30) at shift valve A. The 2nd clutch pressure (20) is changed to CPC pressure mode, and the 3rd clutch is engaged by the CPC pressure. The 1st clutch is also engaged, but no power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



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Automatic Transmission

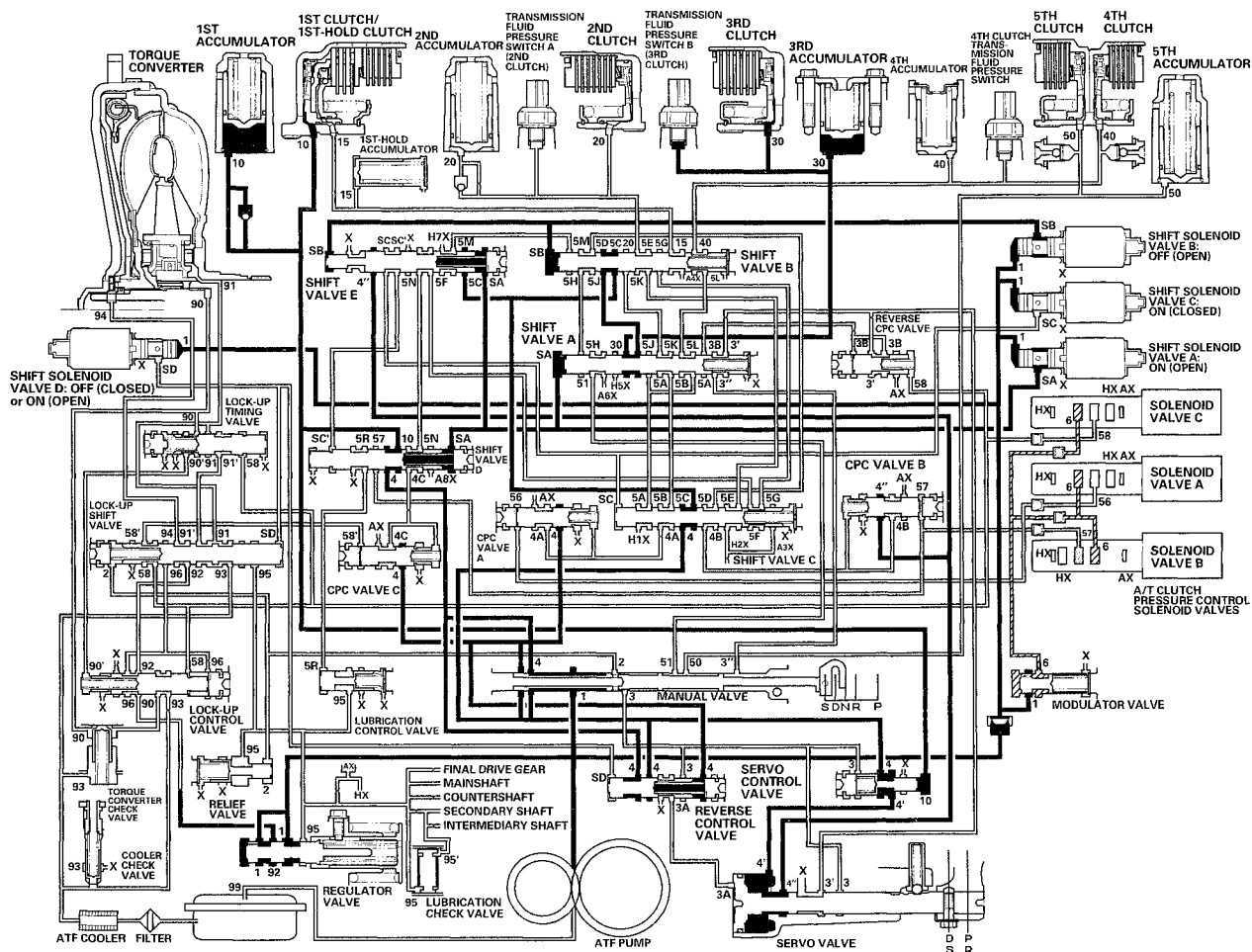
System Description (cont'd)

Hydraulic Flow (cont'd)

Driving in 3rd gear in D and S with automatic shift mode

The PCM turns shift solenoid valve B OFF, and shift solenoid valve B uncovers shift solenoid valve B pressure port (SB) to shift valve B. Shift solenoid valves A and C remain ON. Shift valve B is moved to the right side to switch the line pressure port (5C), CPC B pressure port (5J) leading to the 3rd clutch, and 2nd clutch pressure port (20) releasing 2nd clutch pressure. CPC B pressure (5J) changes to line pressure (5J) and 3rd clutch pressure (30) is changed to line pressure mode, and the 3rd clutch is engaged by the line pressure. The 1st clutch is also engaged, but no power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.

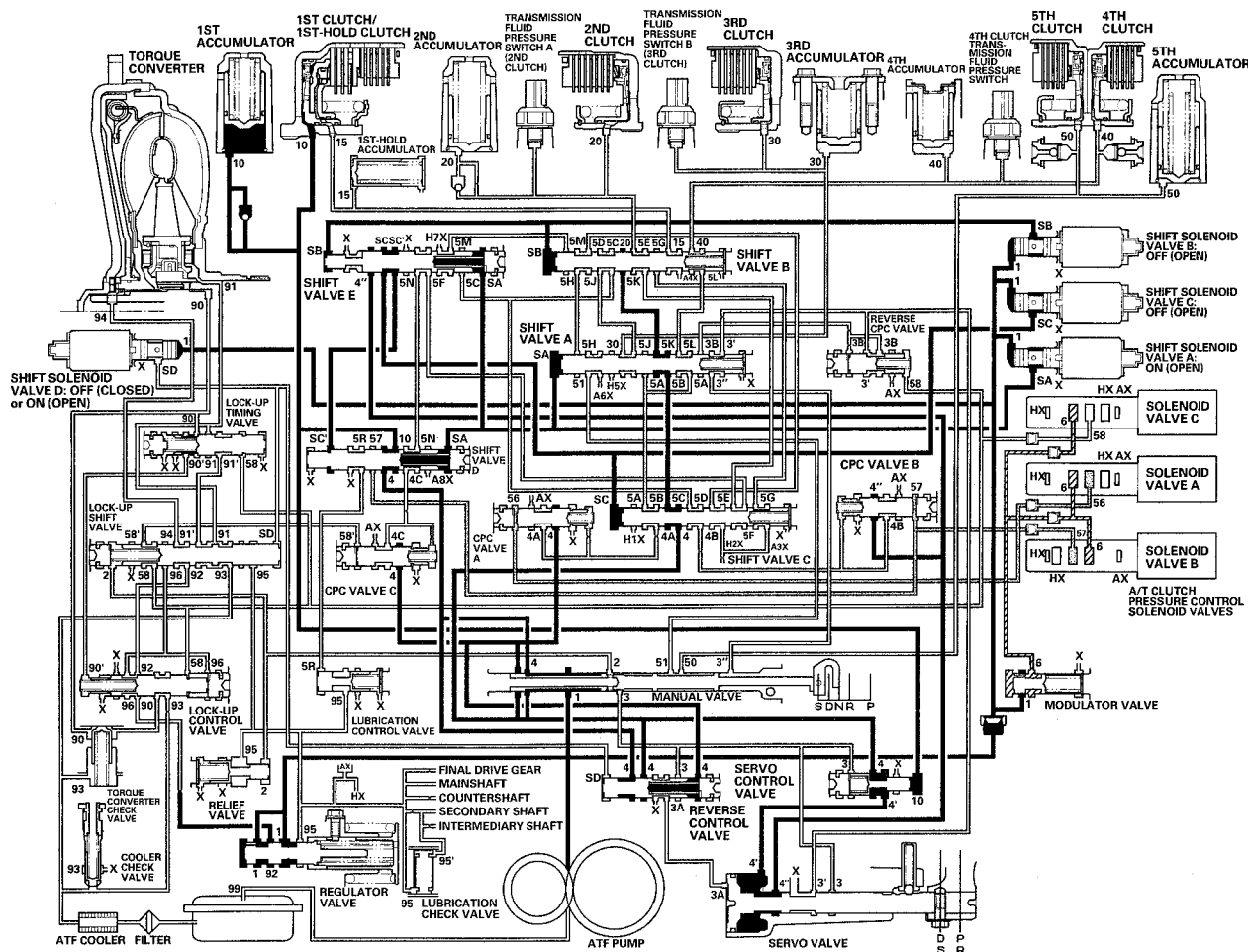




Shifting between 3rd gear and 4th gear in D and S with automatic shift mode

As the speed of the vehicle reaches the programmed value, the PCM turns shift solenoid valve C OFF, and shift solenoid valve C uncovers shift solenoid valve C pressure port (SC) to shift valve C. Shift solenoid valve A remains ON, and shift solenoid valve B remains OFF. Shift valve C is moved to the right side to switch the line pressure port (4) and CPC B pressure port (4B) leading to the 3rd clutch. Shift valve C also uncovers the CPC A pressure port (4A) leading to the 4th clutch. The PCM actuates A/T clutch pressure control solenoid valves A and B. A/T clutch pressure control solenoid valve A pressure (56) is applied to CPC valve A, and A/T clutch pressure control solenoid valve B pressure (57) is applied to CPC valve B. CPC valve A regulates line pressure (4), and line pressure (4) becomes CPC A pressure (4A). CPC A pressure (4A) flows to shift valve B via shift valves C and A, and becomes 4th clutch pressure (40) at shift valve B. The 3rd clutch pressure (30) is changed to CPC pressure mode, and the 4th clutch is engaged by the CPC pressure. The 1st clutch is also engaged, but no power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Automatic Transmission

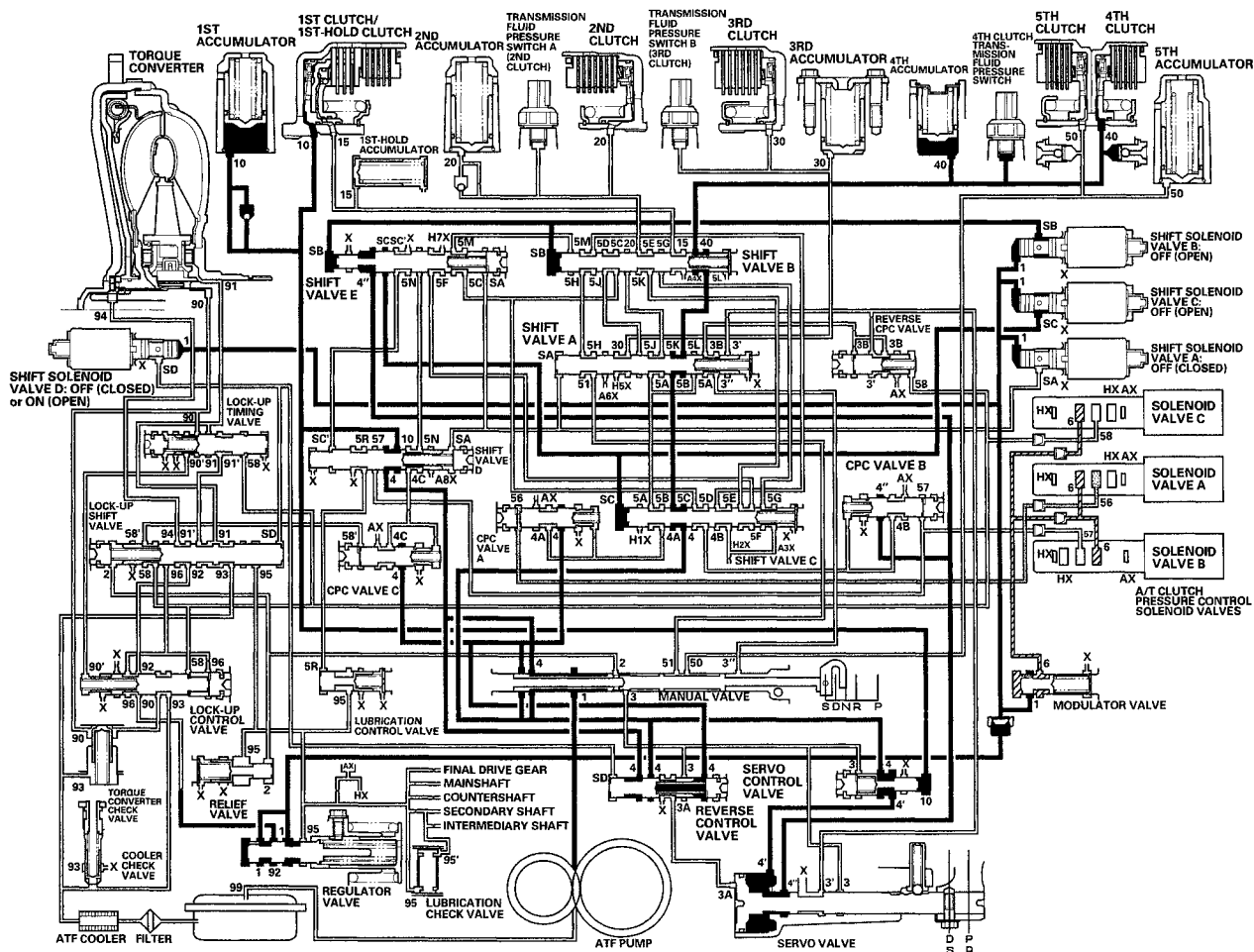
System Description (cont'd)

Hydraulic Flow (cont'd)

Driving in 4th gear in D and S with automatic shift mode

The PCM turns shift solenoid valve A OFF, and shift solenoid valve A covers shift solenoid valve A pressure port (SA) to shift valve A. Shift solenoid valves B and C remain OFF. Shift valve A is moved to the left side to switch the pressure port (5B), CPC A pressure ports (5A) (5L) leading to the 4th clutch, and 3rd clutch pressure port (30) releasing 3rd clutch pressure. CPC A pressure (5L) changes to line pressure (5L) and 4th clutch pressure (40) is changed to line pressure mode, and the 4th clutch is engaged by the line pressure. The 1st clutch is also engaged, but no power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



Automatic Transmission

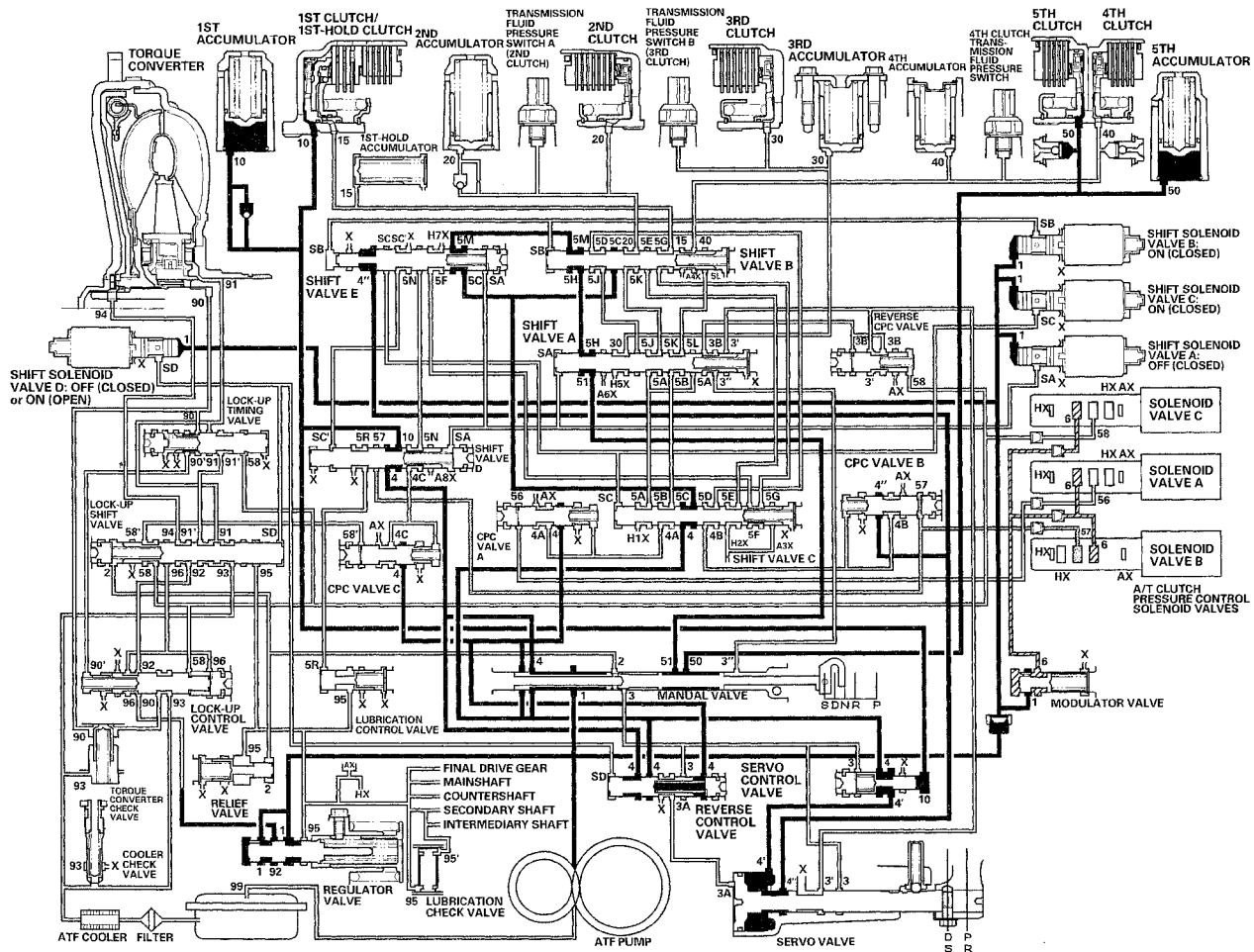
System Description (cont'd)

Hydraulic Flow (cont'd)

Driving in 5th gear in D

The PCM turns shift solenoid valve B ON, and shift solenoid valve B covers shift solenoid valve B pressure port (SB) to shift valve B. Shift solenoid valve A remains OFF, and shift solenoid valve C remains ON. Shift valve B is moved to the left side to switch the line pressure port (5H), CPC B pressure port (5D) leading to the 5th clutch, and 4th clutch pressure port (40) which releases the 4th clutch pressure. CPC B pressure (5H) changes to line pressure (5H) and 5th clutch pressure (51) (50) is changed to line pressure mode, and the 5th clutch is engaged by the line pressure. The 1st clutch is also engaged, but no power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.





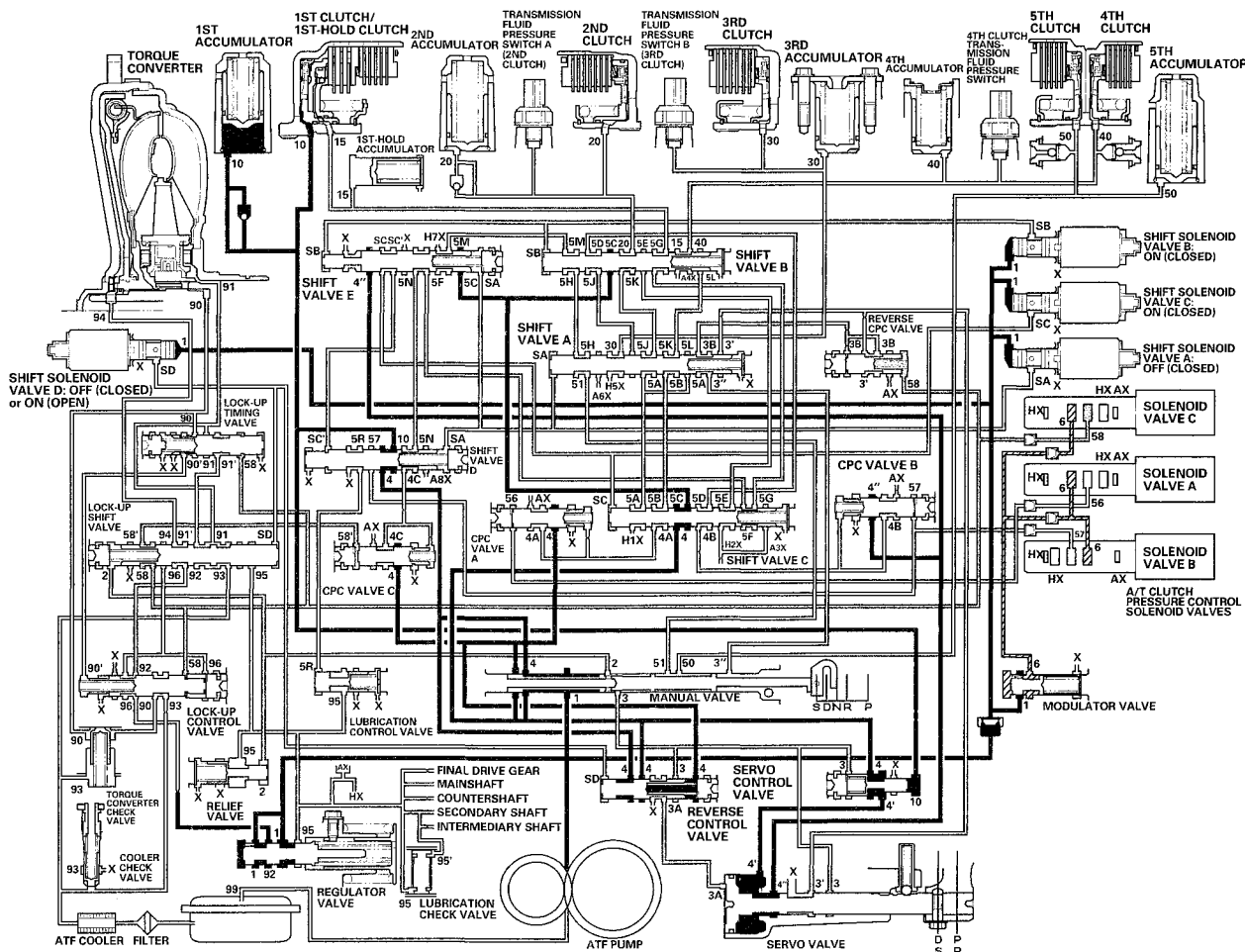
Driving in 1st gear (engaged with 1st and 1st-hold clutches) in the sequential sportshift mode, and the D-paddle shift mode

Line pressure (1) regulated by the regulator valve flows to shift solenoid valves. The PCM switches the shift solenoid valves ON and OFF. The conditions of the shift solenoid valves and the positions of the shift valves are as follows:

- Shift solenoid valve A is OFF, and closes shift solenoid valve A pressure port (SA); shift valve A remains on the left side.
- Shift solenoid valve B is turned ON, and closes shift solenoid valve B pressure port (SB); shift valve B and shift valve E remain on the left side.
- Shift solenoid valve C is turned ON, and closes shift solenoid valve C pressure port (SC); shift valve C and shift valve D remain on the left side.
- Shift solenoid valve D is OFF, and closes shift solenoid valve D pressure port (SD).

Line pressure (4) becomes 1st clutch pressure (10) at shift valve D, and flows to the 1st clutch. The 1st clutch is engaged. The PCM actuates A/T clutch pressure control solenoid valve C, and A/T clutch pressure control solenoid valve C pressure (58) is applied to CPC valve C via the lock-up shift valve. CPC valve C regulates line pressure (4), and line pressure (4) becomes CPC C pressure (4C). CPC C pressure (4C) flows to shift valve B via shift valves D, E, and C, and becomes 1st-hold clutch pressure (15) at shift valve B. 1st-hold clutch pressure (15) is applied to the 1st-hold clutch, and the 1st-hold clutch is engaged.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Automatic Transmission

System Description (cont'd)

Hydraulic Flow (cont'd)

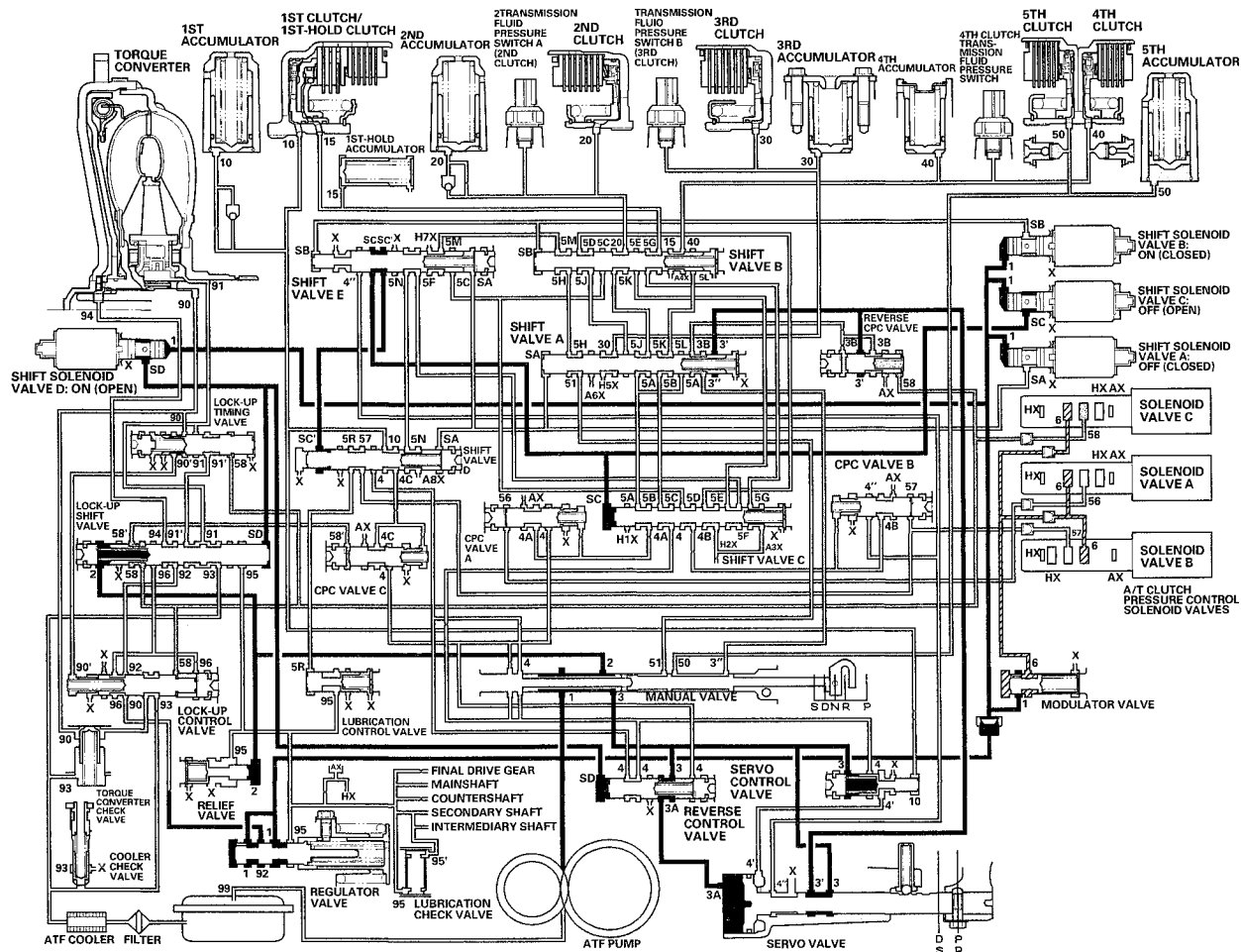
Shifting to R from P or N

The PCM switches the shift solenoid valves ON and OFF. The conditions of the shift solenoid valves and the positions of the shift valves are as follows:

- Shift solenoid valve A is OFF, and closes shift solenoid valve A pressure port (SA); shift valve A remains on the left side.
- Shift solenoid valve B is turned ON, and closes shift solenoid valve B pressure port (SB); shift valve B and shift valve E remain on the left side.
- Shift solenoid valve C is OFF, and opens shift solenoid valve C pressure port (SC); shift valve C and shift valve D move to the right side.
- Shift solenoid valve D is turned ON, and opens shift solenoid valve D pressure port (SD); reverse control valve moves to the right side.

The manual valve is moved to the R position, and line pressure (1) becomes line pressure (3) at the manual valve. Line pressure (3) passes through the reverse control valve, and becomes line pressure (3A), then flows to the servo valve. Line pressure (3A) pushes the servo valve to the reverse position. Line pressure (3) also flows to the reverse CPC valve, and becomes reverse CPC pressure (3B) (3''). Reverse CPC pressure (3'') becomes 5th clutch pressure (50) at the manual valve, and 5th clutch pressure (50) flows to the 5th clutch. The 5th clutch is engaged with reverse CPC pressure mode.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.





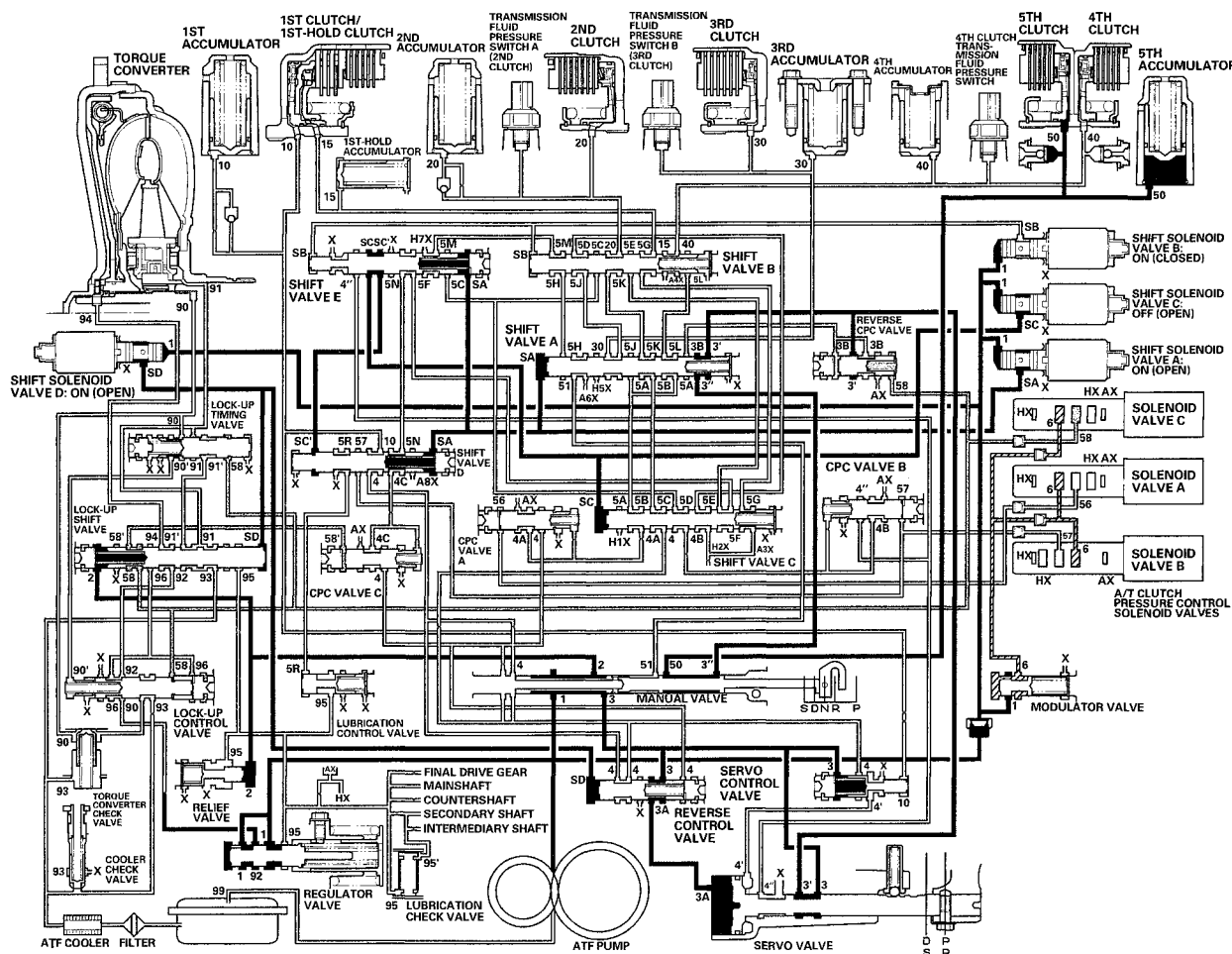
Driving in reverse gear in R

As the speed of the vehicle reaches the programmed value, the PCM turns shift solenoid valve A ON, and shift solenoid valve A uncovers shift solenoid valve A pressure port (SA) to shift valve A. Shift valve A is moved to the right side to switch the line pressure port (3') and reverse CPC pressure port (3B) leading to the 5th clutch. Line pressure (3) flows to the manual valve via the servo valve and shift valve A, and becomes 5th clutch pressure (50) at the manual valve. The 5th clutch pressure (50) flows to the 5th clutch, and the 5th clutch is engaged by the line pressure.

Reverse Inhibitor Control

When R is selected while the vehicle is moving forward at speeds over 6 mph (10 km/h), the PCM commands shift solenoid valve D to remain OFF so that shift solenoid valve D pressure (SD) is not applied to the reverse control valve. Line pressure (3) stops at the reverse control valve, and is not applied to the servo valve. No power is transmitted to the reverse direction.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Automatic Transmission

System Description (cont'd)

Hydraulic Flow (cont'd)

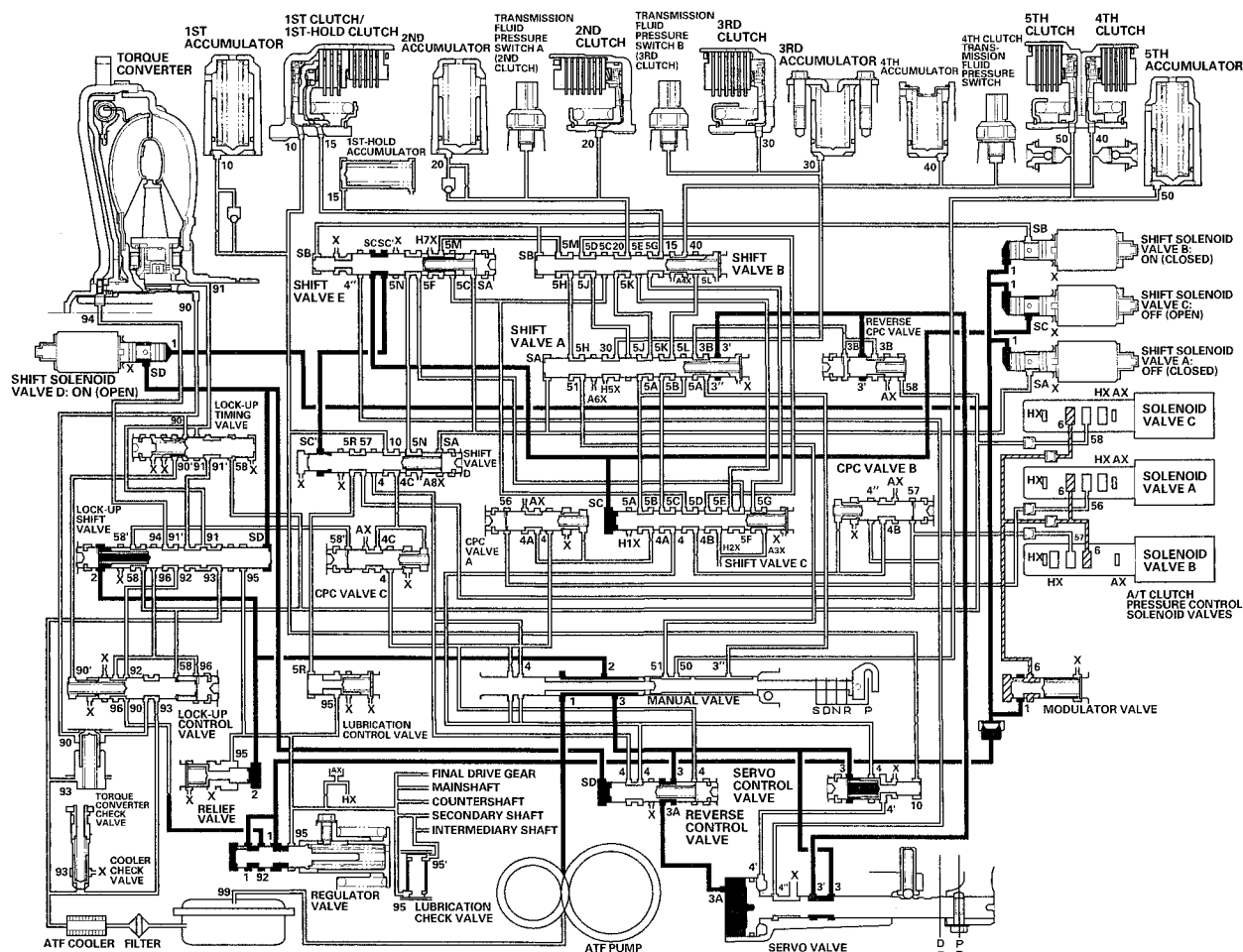
P Position

The PCM switch the shift solenoid valves ON and OFF. The conditions of the shift solenoid valves and the positions of the shift valves are as follows:

- Shift solenoid valve A is OFF, and closes shift solenoid valve A pressure port (SA); shift valve A remains on the left side.
- Shift solenoid valve B is turned ON, and closes shift solenoid valve B pressure port (SB); shift valve B and shift valve E remain on the left side.
- Shift solenoid valve C is OFF, and opens shift solenoid valve C pressure port (SC); shift valve C and shift valve D move to the right side.
- Shift solenoid valve D is turned ON, and opens shift solenoid valve D pressure port (SD); reverse control valve moves to the right side.

The manual valve is moved to the P position, and line pressure (1) becomes line pressure (3) at the manual valve. Line pressure (3) passes through the reverse control valve, and becomes line pressure (3A), then flows to the servo valve. Line pressure (3A) pushes the servo valve to the reverse position. Line pressure (3) flows to the manual valve via the reverse CPC valve and shift valve A, and stops at the manual valve. Hydraulic pressure is not applied the clutches.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.





Lock-up System

The lock-up mechanism of the torque converter clutch operates in D (2nd, 3rd, 4th, and 5th gears) and S with sequential sportshift mode or automatic shift mode (2nd, 3rd, and 4th gears). The pressurized fluid is drained from the back of the torque converter through a fluid passage, causing the torque converter clutch piston to be held against the torque converter cover. As this takes place, the mainshaft rotates at the same speed as the engine crankshaft. Together with the hydraulic control, the PCM optimizes the timing and amount of the lock-up mechanism. When shift solenoid valve D is turned on by the PCM, shift solenoid valve D pressure switches the lock-up shift valve lock-up on and off. The A/T clutch pressure control solenoid valve C, the lock-up control valve, and lock-up timing valve control the degree of lock-up.

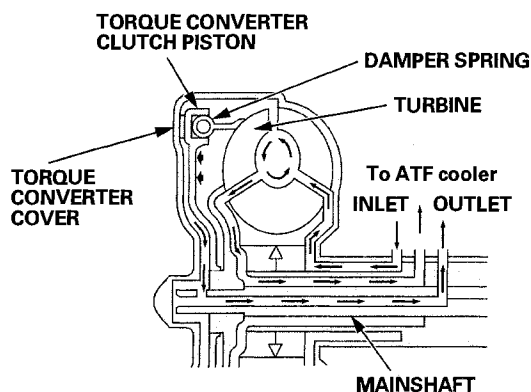
Torque Converter Clutch Lock-up ON (Engaging Torque Converter Clutch)

Fluid in the chamber between the torque converter cover and the torque converter clutch piston is drained off, and fluid entering from the chamber between the pump and stator exerts pressure through the torque converter clutch piston against the torque converter cover. The torque converter clutch piston engages with the torque converter cover; torque converter clutch lock-up ON, and the mainshaft rotates at the same as the engine.

Power flow

The power flows by way of:

Engine
↓
Drive plate
↓
Torque converter cover
↓
Torque converter clutch piston
↓
Damper spring
↓
Turbine
↓
Mainshaft



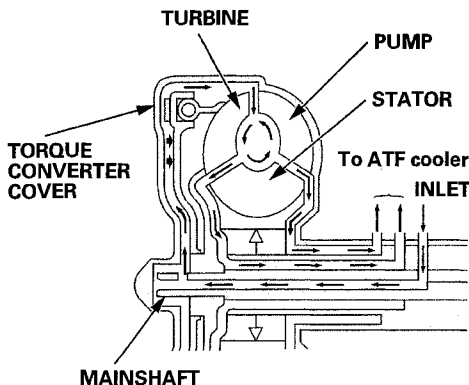
Torque Converter Clutch Lock-up OFF (Disengaging Torque Converter Clutch)

Fluid entered from the chamber between the torque converter cover and the torque converter clutch piston passes through the torque converter and goes out from the chambers between the turbine and the stator, and between the pump and the stator. As a result, the torque converter clutch piston moves away from the torque converter cover, and the torque converter clutch lock-up is released; torque converter clutch lock-up OFF.

Power flow

The power flows by way of:

Engine
↓
Drive plate
↓
Torque converter cover
↓
Pump
↓
Turbine
↓
Mainshaft



(cont'd)

Automatic Transmission

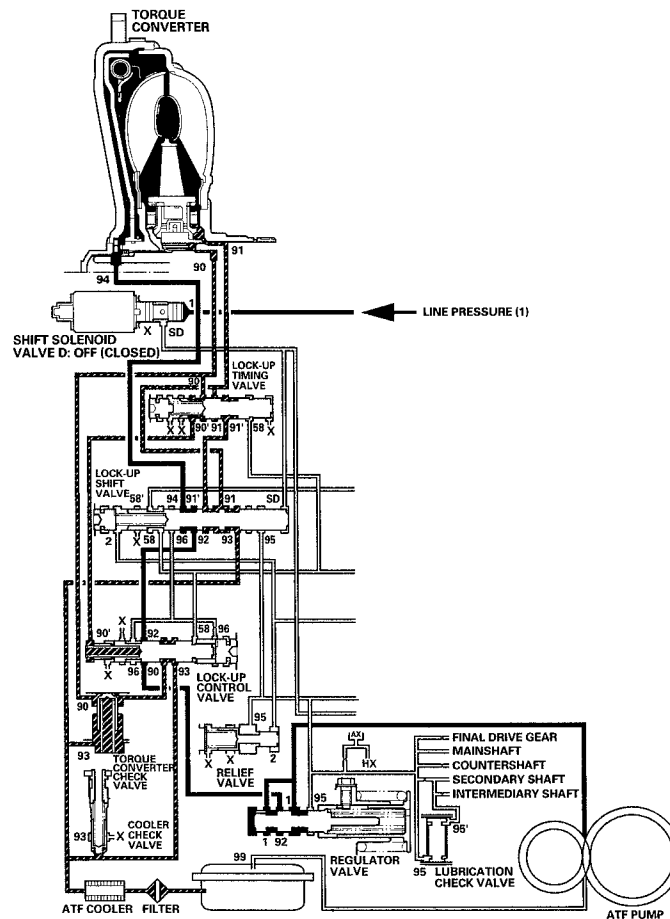
System Description (cont'd)

Lock-up System (cont'd)

No Lock-up

The PCM commands shift solenoid valve D to remain OFF, and shift solenoid valve D covers shift solenoid valve D pressure port (SD) to the lock-up shift valve. The lock-up shift valve is in the right side, and uncovers the port leading torque converter pressure (92) to the left side of the torque converter. Torque converter pressure (92) from regulator valve becomes torque converter pressure (94) at the lock-up shift valve, and enters into the left side of the torque converter to disengage the torque converter clutch. The torque converter clutch is OFF.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



Automatic Transmission

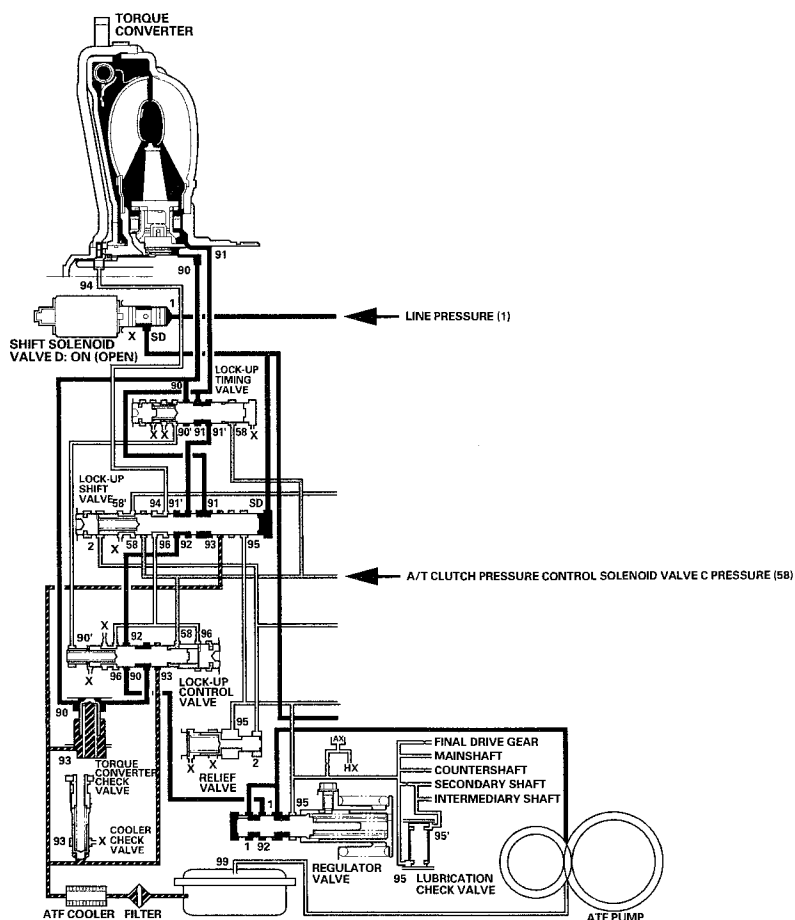
System Description (cont'd)

Lock-up System (cont'd)

Full Lock-up

When the vehicle speed further increases, the PCM actuates A/T clutch pressure control solenoid valve C to increase A/T clutch pressure control solenoid valve C pressure (58). A/T clutch pressure control solenoid valve C pressure (58) is applied to the lock-up control valve and lock-up timing valve, and the lock-up control valve and lock-up timing valve are moved to the left side. Torque converter pressure (94) from the left side of the torque converter releases at the lock-up control valve, and lock-up timing valve uncovers the torque converter pressure port (91) leading to the right side of the torque converter. Torque converter back pressure is released fully, and torque converter clutch is engaged fully.

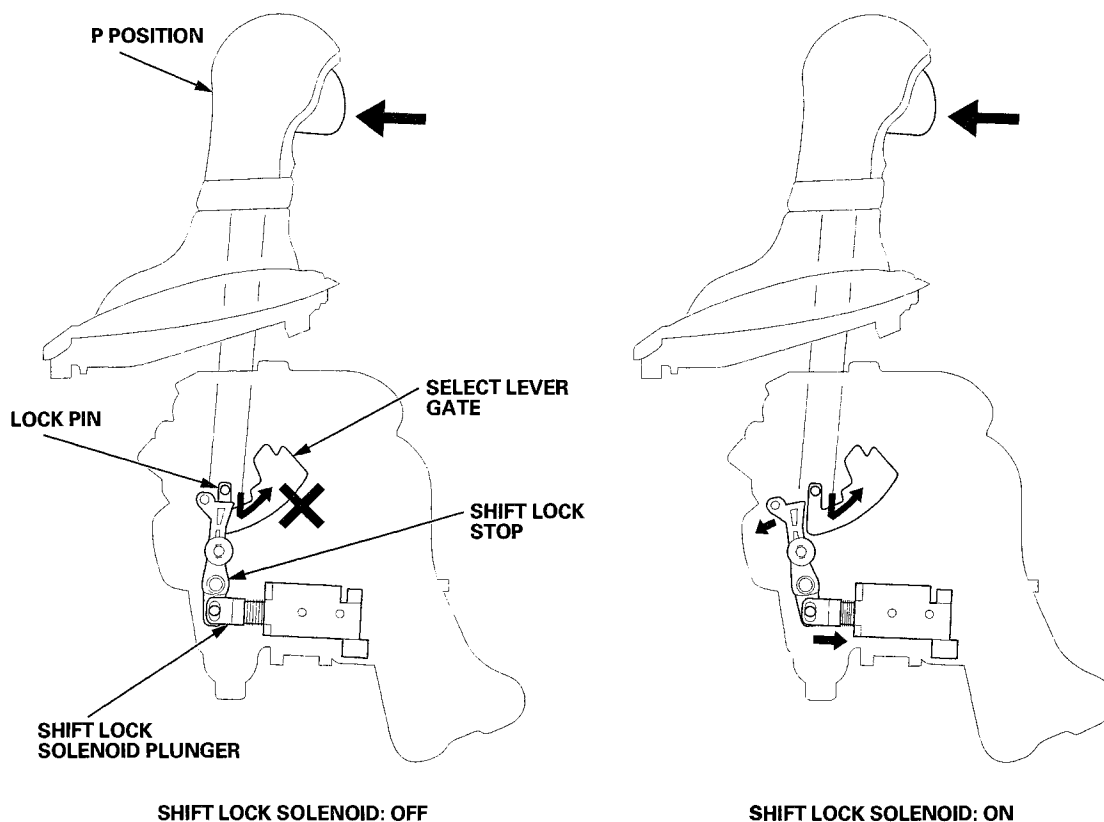
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.





Shift Lock System

The shift lock system prevents the shift lever from moving unless certain conditions are met. The shift lock solenoid is normally OFF. After starting the engine in P, the shift lever cannot move to any other position from P because the shift lock stop stops the lock pin. When the brake pedal is pressed and the accelerator pedal is not pressed, the PCM commands the shift lock solenoid ON; the shift lock solenoid plunger in the shift lock solenoid pulls the shift lock stop to release the lock pin. Pressing the shift lever button allows the shift lever to move to any other position. When the brake pedal and the accelerator pedal are pressed at the same time, the PCM commands the solenoid OFF and the shift lock system is locked.



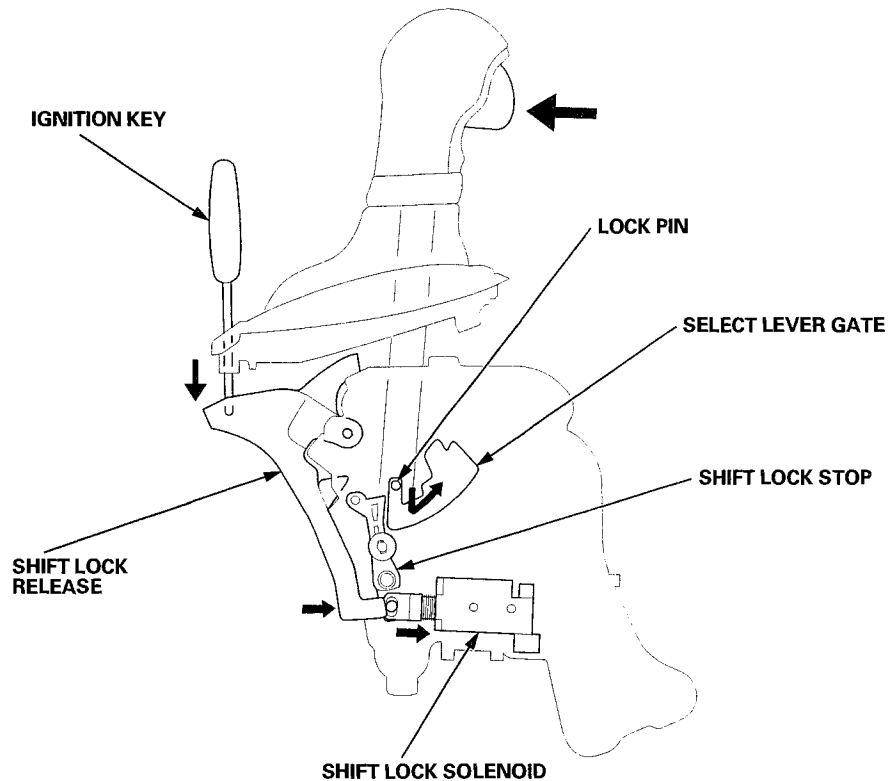
(cont'd)

Automatic Transmission

System Description (cont'd)

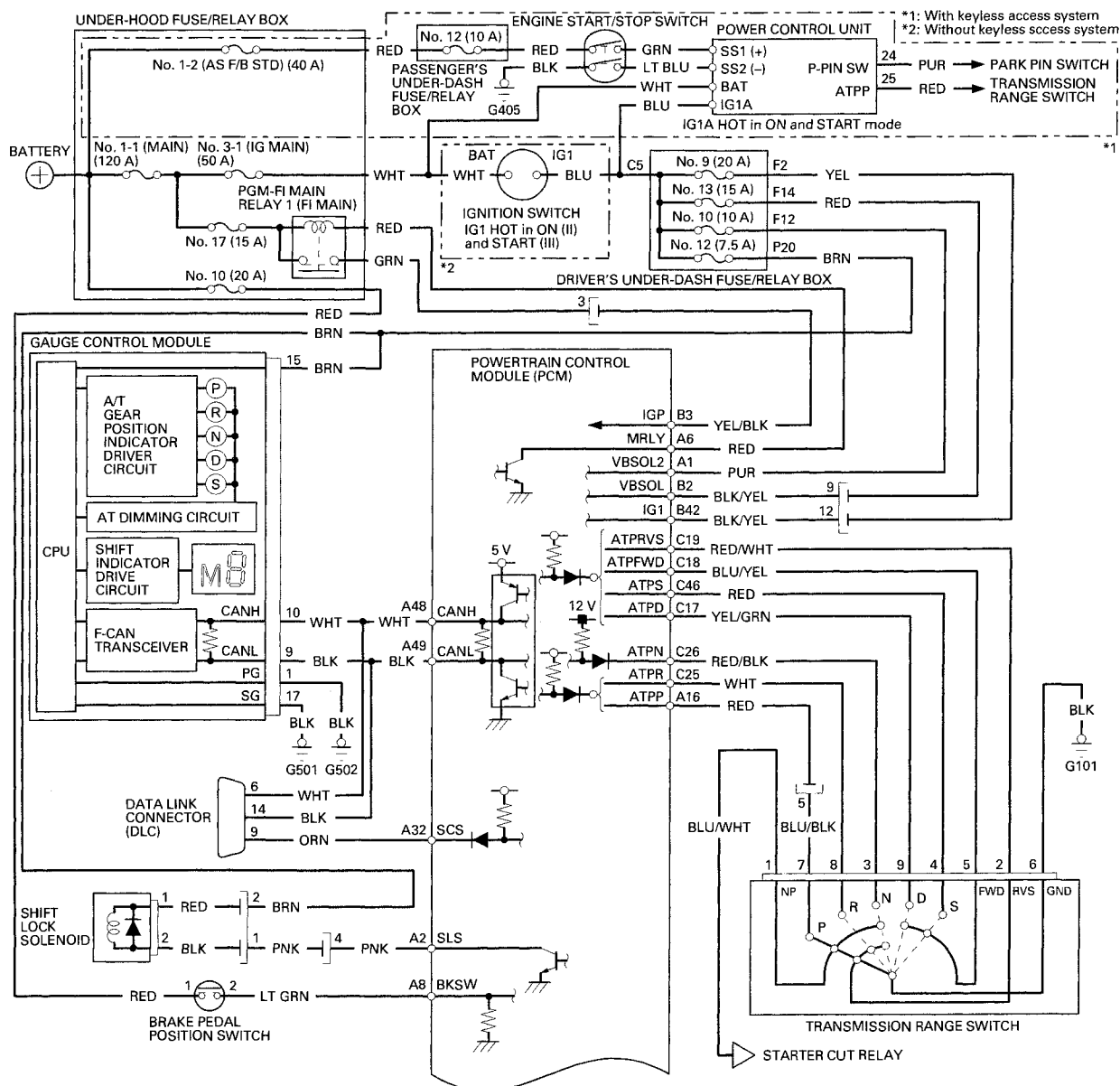
Shift Lock System (cont'd)

When the shift lock system does not operate due to a mechanical or electrical problem, you can unlock the shift lock temporarily by inserting the ignition key into the shift lock release hole and pressing the shift lock release. When the shift lock release is pressed, the shift lock stop releases the lock pin, and the shift lever can move to any other position.

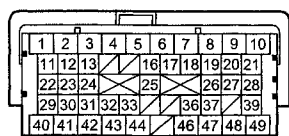




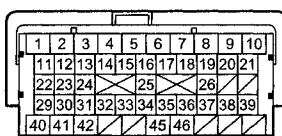
Circuit Diagram - PCM A/T Control System



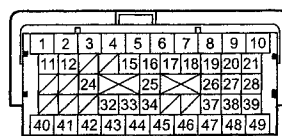
PCM Connector Terminal Locations



A (49P)



B (49P)



C (49P)

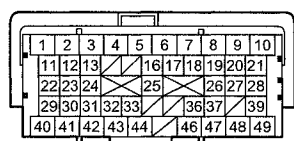
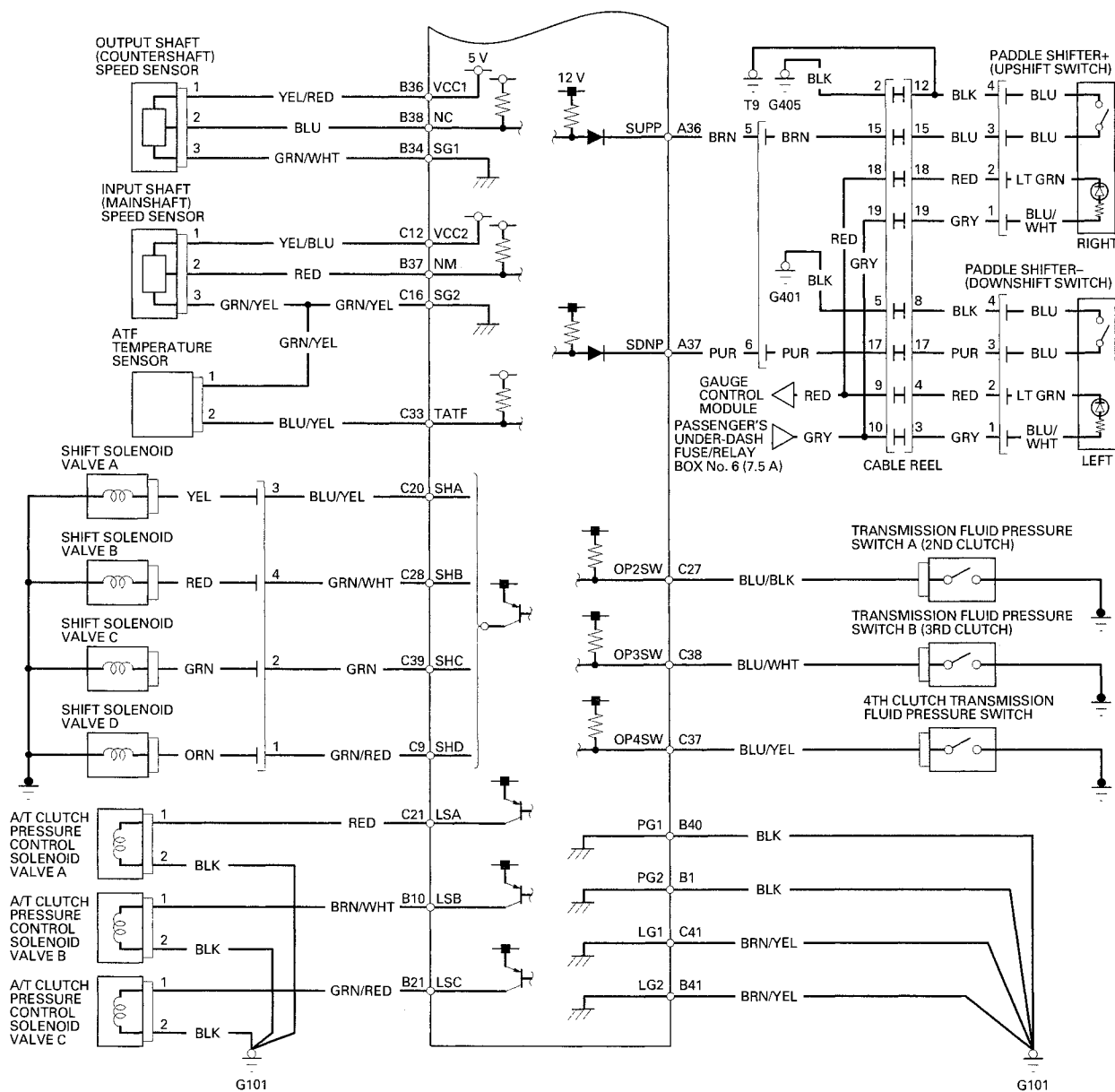
Terminal side of female terminals

(cont'd)

Automatic Transmission

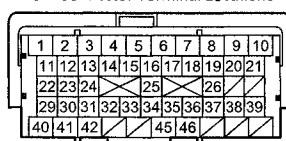
System Description (cont'd)

Circuit Diagram - PCM A/T Control System (cont'd)



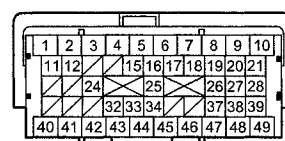
A □ (49P)

PCM Connector Terminal Locations



B △ (49P)

Terminal side of female terminals



C ○ (49P)



DTC Troubleshooting

DTC P0705: Short in Transmission Range Switch Circuit (Multiple Shift-position Input)

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Compare the ATPP, ATPR, ATPN, ATPD, ATPS, ATPFWD, and ATPRVS inputs with the HDS to the following table, in each shift lever position.

	ATP P	ATP R	ATP N	ATP D	ATP S	ATP FWD	ATP RVS
P	○	×	×	×	×	×	○
R	×	○	×	×	×	×	○
N	×	×	○	×	×	×	○
D	×	×	×	○	×	○	×
S	×	×	×	×	○	○	×

○: ON ×: OFF

Do the transmission range switch signals match?

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

NO—Go to step 3.

3. Compare the ATPP, ATPR, ATPN, ATPD, ATPS, ATPFWD, and ATPRVS inputs with the HDS to the table in step 2, in each shift lever position.

Are any transmission range switch signals ON in all shift lever position?

YES—Go to step 9.

NO—Go to step 4.

4. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
5. Disconnect the transmission range switch connector.
6. Connect the transmission range switch connector terminal that incorrectly indicates ON in step 3 to body ground with a jumper wire.

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

8. Compare the ATPP, ATPR, ATPN, ATPD, ATPS, ATPFWD, and ATPRVS inputs with the HDS to the table in step 2.

Do multiple transmission range switch signals indicate ON?

YES—Repair short in the wires between the transmission range switch and the PCM, refer to the following table. ■

	ATP P	ATP R	ATP N	ATP D	ATP S	ATP FWD	ATP RVS
PCM	A16	C25	C26	C17	C46	C18	C19
Range switch	7	8	3	9	4	5	2

NO—Replace the transmission range switch (see page 14-260). ■

9. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
10. Disconnect the transmission range switch connector.
11. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
12. Check the abnormal transmission range switch signal that remained on with the HDS.

Do any transmission range switch signals remain ON?

YES—Go to step 13.

NO—Replace the transmission range switch (see page 14-260). ■

13. Check for continuity to body ground in the circuit which remained ON, see table in step 2.

Does the circuit that indicated ON have continuity to ground?

YES—Repair short to body ground in the wire between the transmission range switch and the PCM. ■

NO—Replace the PCM (see page 11-282). ■

Automatic Transmission

DTC Troubleshooting (cont'd)

DTC P0706: Open in Transmission Range Switch Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Make sure the shift cable is adjusted properly (see page 14-253).
2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
3. Compare the ATPP, ATPR, ATPN, ATPD, ATPS, ATPFWD, and ATPRVS inputs with the HDS to the following table, in each shift lever position.

	ATP P	ATP R	ATP N	ATP D	ATP S	ATP FWD	ATP RVS
P	○	×	×	×	×	×	○
R	×	○	×	×	×	×	○
N	×	×	○	×	×	×	○
D	×	×	×	○	×	○	×
S	×	×	×	×	○	○	×

○: ON ×: OFF

Do the transmission range switch signals match?

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

NO—Go to step 4.

4. Compare the ATPP, ATPR, ATPN, ATPD, ATPS, ATPFWD, and ATPRVS inputs with the HDS to the table in step 3, in each shift lever position.

Do all shift positions remain OFF?

YES—Go to step 14.

NO—Go to step 5.

5. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
6. Disconnect the transmission range switch connector.
7. Connect the transmission range switch connector terminal which did not indicate ON in step 4 to body ground with a jumper wire.
8. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.

9. Check the transmission range switch signals that did not indicate ON with the HDS.

Does the transmission range switch indicate ON?

YES—Replace the transmission range switch (see page 14-260).■

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. Jump the SCS line with the HDS.
12. Disconnect PCM connectors A (49P) and C (49P).
13. Check for continuity between the transmission range switch circuit terminal and the PCM terminal of the input which indicated OFF, refer to the following table.

	ATP P	ATP R	ATP N	ATP D	ATP S	ATP FWD	ATP RVS
PCM	A16	C25	C26	C17	C46	C18	C19
Range switch	7	8	3	9	4	5	2

Is there continuity?

YES—Replace the PCM (see page 11-282).■

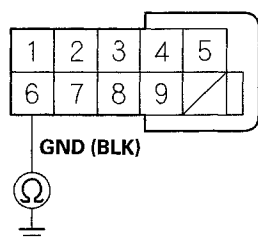
NO—Repair open in the wire between the transmission range switch and the PCM.■

14. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
15. Disconnect the transmission range switch connector.



16. Check for continuity between transmission range switch connector terminal No. 6 and body ground.

TRANSMISSION RANGE SWITCH CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Replace the transmission range switch (see page 14-260).■

NO—Repair open in the wire between the transmission range switch and body ground (G101), or repair poor body ground (G101).■

DTC P0711: Problem in ATF Temperature Sensor Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, and wait for 20 seconds.

2. Check the ATF temperature with the HDS in the A/T Data List.

Does the ATF Temperature with indicate -4°F (-20°C) or below?

YES—Go to step 3.

NO—Go to step 5.

3. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).

4. Check the ATF Temperature with the HDS in the A/T Data List.

Does the ATF Temperature remain -4°F (-20°C) or below?

YES—Replace the ATF temperature sensor (see page 14-201), then go to step 8.

NO—Intermittent failure, the system is OK at this time. If there is an abnormal temperature rise in the ATF temperature sensor, go to step 16.

5. Check the ATF Temperature with the HDS in the A/T Data List.

Does the ATF temperature exceed 230°F (110°C)?

YES—Go to step 6.

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

6. Leave the engine off until the Engine Coolant Temperature reads 122°F (50°C) with the HDS in the A/T Data List.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

7. Check the ATF Temperature with the HDS in the A/T Data List.

Does the ATF temperature remain 230 °F (110 °C) or higher?

YES—Replace the ATF temperature sensor (see page 14-201), then go to step 8.

NO—Intermittent failure, the system is OK at this time. If there is an abnormal temperature rise in the ATF temperature sensor, go to step 16.

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

9. Clear the DTC with the HDS.

10. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).

11. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode, and allow the engine to coolant cool to the outside air temperature (the Engine Coolant Temperature reads the same as the outside air temperature).

12. With SH-AWD: Raise the vehicle on a lift, make sure it is securely supported, and allow all four wheels to rotate freely.

Without SH-AWD: Block the rear wheels, and raise the front of the vehicle, make sure it is securely supported, and allow the front vehicles to rotate freely, or raise the vehicle on a lift.

13. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, and wait for 20 seconds, then start the engine. Warm the engine up to normal operating temperature (the radiator fan comes on). Start off in D, accelerate with the throttle opened at least 4 degrees, and run the vehicle at speeds over 19 mph (30 km/h) for at least 5 minutes. Or test-drive the vehicle for at least 20 seconds while the ATF temperature reads —4 °F to 230 °F (—20 °C to 110 °C) by monitoring with the HDS. Slow down, and stop the wheels.

14. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0711 indicated?

YES—Check for poor connections or loose terminals between the ATF temperature sensor and the PCM, then go to step 1.

NO—Go to step 15.

15. Monitor the OBD status for P0711 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 14, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections and loose terminals at the ATF temperature sensor and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 10.

16. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).

17. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode. Start the engine, and warm the engine up to normal operating temperature (the radiator fan comes on).

18. Turn the ignition switch to LOCK (0), and allow the engine to coolant cool to the ambient air temperature (the ECT SENSOR reads the same as the ambient air temperature).

19. With SH-AWD: Raise the vehicle on a lift, make sure it is securely supported, and allow all four wheels to rotate freely.

Without SH-AWD: Block the rear wheels, and raise the front of the vehicle, make sure it is securely supported, and allow the front vehicles to rotate freely, or raise the vehicle on a lift.

20. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, and wait for 20 seconds, then start the engine. Warm the engine up to normal operating temperature (the radiator fan comes on). Start off in D, accelerate with the throttle opened at least 4 degrees, and run the vehicle at speeds over 19 mph (30 km/h) for at least 5 minutes. Or test-drive the vehicle for at least 20 seconds while the ATF temperature reads —4 °F to 230 °F (—20 °C to 110 °C) by monitoring with the HDS. Slow down, and stop the wheels.



21. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0711 indicated?

YES—Check for poor connections or loose terminals between the ATF temperature sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 20. If the PCM was substituted, go to step 1.

NO—Go to step 22.

22. Monitor the OBD status for P0711 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 21, go to the indicated DTC's troubleshooting.■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between the ATF temperature sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 17. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 17.

DTC P0712: Short in ATF Temperature Sensor Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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

2. Check the ATF Temp Sensor (V) with the HDS in the A/T Data List.

Is the ATF Temp Sensor (V) 0.07 V or less?

YES—Go to step 3.

NO—Intermittent failure, the system is OK at this time. Check for an intermittent short to body ground in the ATFT wire between the ATF temperature sensor and the PCM.■

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

4. Disconnect the ATF temperature sensor connector at the transmission end cover.

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

6. Check the ATF Temp Sensor (V) with the HDS.

Is the ATF Temp Sensor (V) 0.07 V or less?

YES—Go to step 7.

NO—Replace ATF temperature sensor (see page 14-201), then go to step 11.

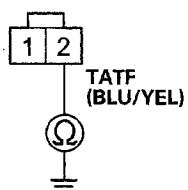
(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

7. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connector C (49P).
10. Check for continuity between ATF temperature sensor connector terminal No. 2 and body ground.

ATF TEMPERATURE SENSOR CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between PCM connector terminal C33 and ATF temperature sensor connector terminal No. 2, then go to step 11.

NO—Go to step 17.

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. Clear the DTC with the HDS.
14. Start the engine in P, and wait for at least 20 seconds.
15. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0712 indicated?

YES—Check for intermittent short to body ground in the wire between the ATF temperature sensor and the PCM, then go to step 1.

NO—Go to step 16.

16. Monitor the OBD status for P0712 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 15, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for intermittent short to body ground in the wire between the ATF temperature sensor and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 14.



17. Reconnect all connectors.
18. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
19. Start the engine in P, and wait for at least 20 seconds.
20. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0712 indicated?

YES—Check for intermittent short to body ground in the wire between the ATF temperature sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 19. If the PCM was substituted, go to step 1.

NO—Go to step 21.

21. Monitor the OBD status for P0712 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed were indicated in step 20, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for intermittent short to body ground in the wire between the ATF temperature sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 19. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 19.

DTC P0713: Open in ATF Temperature Sensor Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Check the ATF temperature sensor voltage with the HDS in the A/T Data List.

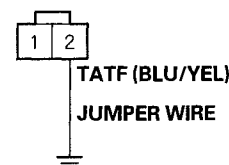
Does the ATF Temp Sensor (V) exceed 4.93 V?

YES—Go to step 3.

NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the ATF temperature sensor and the PCM. ■

3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Disconnect the ATF temperature sensor connector at the transmission end cover.
5. Connect ATF temperature sensor connector terminal No. 2 to body ground with a jumper wire.

ATF TEMPERATURE SENSOR CONNECTOR



Wire side of female terminals

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

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

7. Check the ATF temperature sensor voltage with the HDS in the A/T Data List.

Does the ATF Temp Sensor (V) drop to 0.07 V or below?

YES—Go to step 8.

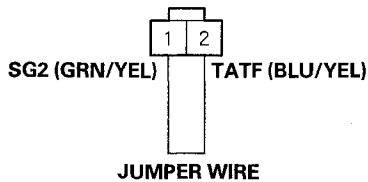
NO—Go to step 13.

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

9. Remove the jumper wire.

10. Connect ATF temperature sensor connector terminals No. 1 and No. 2 with a jumper wire.

ATF TEMPERATURE SENSOR CONNECTOR



Wire side of female terminals

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

12. Check the ATF temperature sensor voltage with the HDS in the A/T Data List.

Does the ATF Temp Sensor (V) remain 0.07 V or below?

YES—Replace the ATF temperature sensor (see page 14-201), then go to step 17.

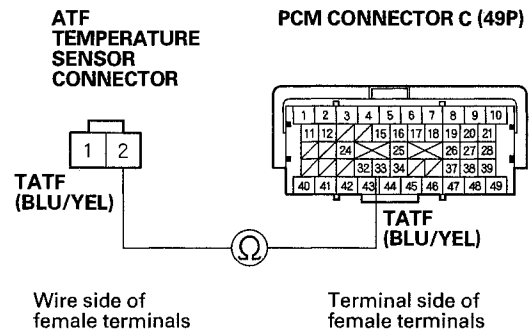
NO—Repair open in the wire between PCM connector terminal C16 and the ATF temperature sensor connector terminal No. 1, then go to step 17.

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

14. Jump the SCS line with the HDS.

15. Disconnect PCM connector C (49P).

16. Check for continuity between PCM connector terminal C33 and ATF temperature sensor connector terminal No. 2.



Is there continuity?

YES—Check for poor connections or loose terminals between the ATF temperature sensor and the PCM. If the connections are OK, go to step 23.

NO—Repair open in the wire between PCM connector terminal C33 and the ATF temperature sensor connector terminal No. 2, then go to step 17.



17. Reconnect all connectors.
18. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
19. Clear the DTC with the HDS.
20. Start the engine in P, and wait for at least 20 seconds.
21. Check for Pending or Confirmed DTC with the HDS.

Is DTC P0713 indicated?

YES—Check for poor connections or loose terminals between the ATF temperature sensor and the PCM, then go to step 1.

NO—Go to step 22.

22. Monitor the OBD status for P0713 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTC were indicated in step 21, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between the ATF temperature sensor and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 20.

23. Reconnect all connectors.
24. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
25. Start the engine in P, and wait for at least 20 seconds.
26. Check for Pending or Confirmed DTC with the HDS.

Is DTC P0713 indicated?

YES—Check for poor connections or loose terminals between the ATF temperature sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 25. If the PCM was substituted, go to step 1.

NO—Go to step 27.

27. Monitor the OBD status for P0713 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTC were indicated in step 26, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between the ATF temperature sensor and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 25. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 25.

Automatic Transmission

DTC Troubleshooting (cont'd)

DTC P0716: Problem in Input Shaft (Mainshaft) Speed Sensor Circuit

DTC P0721: Problem in Output Shaft (Countershaft) Speed Sensor Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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. With SH-AWD: Raise the vehicle on a lift, make sure it is securely supported, and allow all four wheels to rotate freely.

Without SH-AWD: Block the rear wheels, and raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely, or raise the vehicle on a lift.

4. Start the engine, disable the VSA by pressing the VSA OFF button, run the vehicle with the shift lever in D, and at speeds over 12 mph (20 km/h) for at least 10 seconds. Slow down, and stop the wheels.

5. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0718 or P0723 indicated?

YES—Go to the DTC P0718 troubleshooting (see page 14-95) or the DTC P0723 troubleshooting (see page 14-97). ■

NO—Go to step 6.

6. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0716 or P0721 indicated?

YES—Go to step 7.

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

7. Check the input shaft (mainshaft) speed sensor or the output shaft (countershaft) speed sensor for poor connection and proper installation.

Is the connection and installation OK?

YES—Replace the input shaft (mainshaft) speed sensor (see page 14-198) or the output shaft (countershaft) speed sensor (see page 14-199), then go to step 8.

NO—Connect the speed sensor connector and reinstall the speed sensor, then 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. Clear the DTC with the HDS.

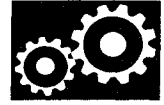
10. Start the engine, disable the VSA by pressing the VSA OFF button, run the vehicle with the shift lever in D, and at speeds over 12 mph (20 km/h) for at least 10 seconds. Slow down, and stop the wheels.

11. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0716 or P0721 indicated?

YES—Go to step 1.

NO—Troubleshooting is complete. ■



DTC P0717: Problem in Input Shaft (Mainshaft) Speed Sensor Circuit (No Signal Input)

DTC P0718: Input Shaft (Mainshaft) Speed Sensor Intermittent Failure

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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. With SH-AWD: Raise the vehicle on a lift, make sure it is securely supported, and allow all four wheels to rotate freely.

Without SH-AWD: Block the rear wheels, and raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely, or raise the vehicle on a lift.

4. Start the engine, disable the VSA by pressing the VSA OFF button, run the vehicle with the shift lever in D, and at speeds over 12 mph (20 km/h) for at least 10 seconds. Compare the Input Shaft (Mainshaft) Speed and the Output Shaft (Countershaft) Speed in the Data List with the HDS. Slow down, and stop the wheels.

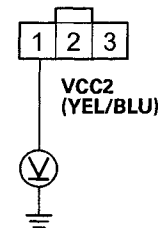
Are the speeds about the same?

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

NO—Go to step 5.

5. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
6. Disconnect the input shaft (mainshaft) speed sensor connector.
7. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
8. Measure the voltage between input shaft (mainshaft) speed sensor connector terminal No. 1 and body ground.

INPUT SHAFT (MAINSHAFT) SPEED SENSOR CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES—Go to step 9.

NO—Repair open in the wire between PCM connector terminal C12 and the input shaft (mainshaft) speed sensor, then go to step 16.

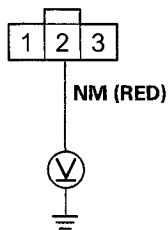
(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

9. Measure the voltage between input shaft (mainshaft) speed sensor connector terminal No. 2 and body ground.

INPUT SHAFT (MAINSHAFT)
SPEED SENSOR CONNECTOR



Wire side of female terminals

Is there about 5 V?

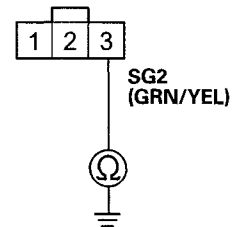
YES—Go to step 10.

NO—Go to step 12.

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

11. Check for continuity between input shaft (mainshaft) speed sensor connector terminal No. 3 and body ground.

INPUT SHAFT (MAINSHAFT)
SPEED SENSOR CONNECTOR



Wire side of female terminals

Is there continuity?

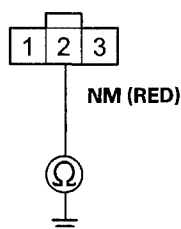
YES—Replace the input shaft (mainshaft) speed sensor (see page 14-198), then go to step 19.

NO—Repair open in the wire between the input shaft (mainshaft) speed sensor connector and the PCM connector terminal C16, then go to step 16.



12. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
13. Jump the SCS line with the HDS.
14. Disconnect PCM connector B (49P).
15. Check for continuity between input shaft (mainshaft) speed sensor connector terminal No. 2 and body ground.

**INPUT SHAFT (MAINSHAFT)
SPEED SENSOR CONNECTOR**



Wire side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between PCM connector terminal B37 and the input shaft (mainshaft) speed sensor connector, then go to step 16.

NO—Repair open in the wire between PCM connector terminal B37 and the input shaft (mainshaft) speed sensor, then go to step 16.

16. Reconnect all connectors.
 17. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
 18. Clear the DTC with the HDS.
 19. Start the engine, disable the VSA by pressing the VSA OFF button, run the vehicle with the shift lever in D, and at speeds over 12 mph (20 km/h) for at least 10 seconds. Compare the Input Shaft (Mainshaft) Speed and the Output Shaft (Countershaft) Speed in the Data List with the HDS. Slow down, and stop the wheels.
- Are the speeds about the same?*
- YES**—Troubleshooting is complete. ■
- NO**—Replace the PCM (see page 11-282).

DTC P0722: Problem in Output Shaft (Countershaft) Speed Sensor Circuit (No Signal Input)

DTC P0723: Output Shaft (Countershaft) Speed Sensor Intermittent Failure

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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. With SH-AWD: Raise the vehicle on a lift, make sure it is securely supported, and allow all four wheels to rotate freely.

Without SH-AWD: Block the rear wheels, and raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely, or raise the vehicle on a lift.

4. Start the engine, disable the VSA by pressing the VSA OFF button, run the vehicle with the shift lever in D, with the engine speed above 2,000 rpm for at least 10 seconds. Compare the Output Shaft (Countershaft) Speed and the Input Shaft (Mainshaft) Speed in the Data List with the HDS. Slow down, and stop the wheels.

Are the speeds about the same?

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

NO—Go to step 5.

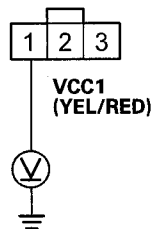
(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

5. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
6. Disconnect the output shaft (countershaft) speed sensor connector.
7. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
8. Measure the voltage between output shaft (countershaft) speed sensor connector terminal No. 1 and body ground.

**OUTPUT SHAFT (MAINSHAFT)
SPEED SENSOR CONNECTOR**



Wire side of female terminals

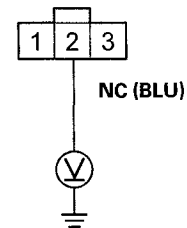
Is there about 5 V?

YES—Go to step 9.

NO—Repair open in the wire between PCM connector terminal B36 and the output shaft (countershaft) speed sensor, then go to step 16.

9. Measure the voltage between output shaft (countershaft) speed sensor connector terminal No. 2 and body ground.

**OUTPUT SHAFT (MAINSHAFT)
SPEED SENSOR CONNECTOR**



Wire side of female terminals

Is there about 5 V?

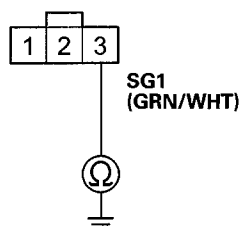
YES—Go to step 10.

NO—Go to step 12.



10. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
11. Check for continuity between output shaft (countershaft) speed sensor connector terminal No. 3 and body ground.

**OUTPUT SHAFT (MAINSHAFT)
SPEED SENSOR CONNECTOR**



Wire side of female terminals

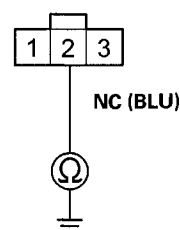
Is there continuity?

YES—Replace the output shaft (countershaft) speed sensor (see page 14-199), then go to step 19.

NO—Repair open in the wire between the PCM connector terminal B34 and the output shaft (countershaft) speed sensor, then go to step 16.

12. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
13. Jump the SCS line with the HDS.
14. Disconnect PCM connector B (49P).
15. Check for continuity between output shaft (countershaft) speed sensor connector terminal No. 2 and body ground.

**OUTPUT SHAFT (MAINSHAFT)
SPEED SENSOR CONNECTOR**



Wire side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between PCM connector terminal B38 and the output shaft (countershaft) speed sensor connector, then go to step 16.

NO—Repair open in the wire between PCM connector terminal B38 and output shaft (countershaft) speed sensor, then go to step 16.

16. Reconnect all connectors.
 17. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
 18. Clear the DTC with the HDS.
 19. Start the engine, disable the VSA by pressing the VSA OFF button, run the vehicle with the shift lever in D, with the engine speed above 2,000 rpm for at least 10 seconds. Compare the Output Shaft (Countershaft) Speed and the Input Shaft (Mainshaft) Speed in the Data List with the HDS. Slow down, and stop the wheels.
- Are the speeds about the same?*
- YES**—Troubleshooting is complete. ■
- NO**—Replace the PCM (see page 11-282).

Automatic Transmission

DTC Troubleshooting (cont'd)

DTC P0731: Problem in 1st Clutch and 1st Clutch Hydraulic Circuit

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see step 3 on page 14-203) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

Does the strainer have metal debris or excessive clutch material?

YES—Replace the transmission, then go to step 11.

NO—Replace the ATF (see step 5 on page 14-204), then go to step 4.

4. Measure the line pressure (see page 14-180).

Is the line pressure within the service limits?

YES—Go to step 5.

NO—Repair the ATF pump and the regulator valve, or replace the transmission, then go to step 11.

5. Measure the 1st clutch pressure (see page 14-180).

Is the 1st clutch pressure within the service limits?

YES—Go to step 6.

NO—Shift valves B and C are stuck. Repair these valves and the related hydraulic circuit, or replace the transmission, then go to step 11.

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

7. Clear the DTC with the HDS.

8. Test-drive the vehicle in 1st gear in D, at speeds over 7 mph (12 km/h), and for at least 12 seconds.

If the vehicle does not accelerate from a stop in 1st gear:

With the brake pedal pressed, press the accelerator pedal for 5 seconds at about 3 % opened-throttle, then release the accelerator until the engine speed comes down below 1,000 rpm. Release the brake pedal, and test-drive the vehicle 1st gear for at least 1 second, then press the accelerator pedal so that the transmission upshifts to 2nd gear, then 3rd gear. Slow down, and stop the wheels.

9. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0731 indicated?

YES—Repair the 1st clutch, or replace the transmission, then go to step 11.

NO—Go to step 10.

10. Monitor the OBD status for P0731 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Intermittent failure, the system is OK at this time. If any other Pending or Confirmed DTCs were indicated in step 9, go to the indicated DTC's troubleshooting.■

NO—If the HDS indicates FAILED, repair the 1st clutch, or replace the transmission, then go to step 11. If the HDS indicates NOT COMPLETED, go to step 8.



11. Test-drive the vehicle in 1st gear in D, at speeds over 7 mph (12 km/h), and for at least 12 seconds. If the vehicle does not accelerate from a stop in 1st gear: With the brake pedal pressed, press the accelerator pedal for 5 seconds at about 3 % opened-throttle, then release the accelerator until the engine speed comes down below 1,000 rpm. Release the brake pedal, and test-drive the vehicle 1st gear for at least 1 second, then press the accelerator pedal so that the transmission upshifts to 2nd gear, then 3rd gear. Slow down, and stop the wheels.

12. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0731 indicated?

YES—Check for poor connections or loose terminals between the input shaft (mainshaft) speed sensor, the output shaft (countershaft) speed sensor, and the PCM, then go to step 1.

NO—Go to step 13.

13. Monitor the OBD status for P0731 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 12, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between the input shaft (mainshaft) speed sensor, the output shaft (countershaft) speed sensor, and the PCM, then go to step 4. If the HDS indicates NOT COMPLETED, go to step 11.

DTC P0732: Problem in 2nd Clutch and 2nd Clutch Hydraulic Circuit

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see step 3 on page 14-203) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

Does the strainer have metal debris or excessive clutch material?

YES—Replace the transmission, then go to step 11.

NO—Replace the ATF (see step 5 on page 14-204), then go to step 4.

4. Measure the line pressure (see page 14-180).

Is the line pressure within the service limits?

YES—Go to step 5.

NO—Repair the ATF pump and the regulator valve, or replace the transmission, then go to step 11.

5. Measure the 2nd clutch pressure (see page 14-180).

Is the 2nd clutch pressure within the service limits?

YES—Go to step 6.

NO—Shift valves A, B, and C are stuck. Repair these valves and the related hydraulic circuit, or replace the transmission, then go to step 11.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

6. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
7. Clear the DTC with the HDS.
8. Test-drive the vehicle in 2nd gear in D, at speeds over 7 mph (12 km/h), and for at least 12 seconds. Slow down, and stop the wheels.
9. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0732 indicated?

YES—Repair the 2nd clutch, or replace the transmission, then go to step 11.

NO—Go to step 10.

10. Monitor the OBD status for P0732 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Intermittent failure, the system is OK at this time. If any other Pending or Confirmed DTCs were indicated in step 9, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, repair the 2nd clutch, or replace the transmission, then go to step 11. If the HDS indicates NOT COMPLETED, go to step 8.

11. Test-drive the vehicle in 2nd gear in D, at speeds over 7 mph (12 km/h), and for at least 12 seconds. Slow down, and stop the wheels.
12. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0732 indicated?

YES—Check for poor connections or loose terminals between the input shaft (mainshaft) speed sensor, the output shaft (countershaft) speed sensor, and the PCM, then go to step 1.

NO—Go to step 13.

13. Monitor the OBD status for P0732 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 12, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between the input shaft (mainshaft) speed sensor, the output shaft (countershaft) speed sensor, and the PCM, then go to step 4. If the HDS indicates NOT COMPLETED, go to step 11.

DTC P0733: Problem in 3rd Clutch and 3rd Clutch Hydraulic Circuit

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see step 3 on page 14-203) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

Does the strainer have metal debris or excessive clutch material?

YES—Replace the transmission, then go to step 11.

NO—Replace the ATF (see step 5 on page 14-204), then go to step 4.

4. Measure the line pressure (see page 14-180).

Is the line pressure within the service limits?

YES—Go to step 5.

NO—Repair the ATF pump and the regulator valve, or replace the transmission, then go to step 11.

5. Measure the 3rd clutch pressure (see page 14-180).

Is the 3rd clutch pressure within the service limits?

YES—Go to step 6.

NO—Shift valves A, B, and C are stuck. Repair these valves and the related hydraulic circuit, or replace the transmission, then go to step 11.



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

7. Clear the DTC with the HDS.

8. Test-drive the vehicle in 3rd gear in D, at speeds over 7 mph (12 km/h), and for at least 12 seconds. Slow down, and stop the wheels.

9. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0733 indicated?

YES—Repair the 3rd clutch, or replace the transmission, then go to step 11.

NO—Go to step 10.

10. Monitor the OBD status for P0733 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Intermittent failure, the system is OK at this time. If any other Pending or Confirmed DTCs were indicated in step 9, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, repair the 3rd clutch, or replace the transmission, then go to step 11. If the HDS indicates NOT COMPLETED, go to step 8.

11. Test-drive the vehicle in 3rd gear in D, at speeds over 7 mph (12 km/h), and for at least 12 seconds. Slow down, and stop the wheels.

12. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0733 indicated?

YES—Check for poor connections or loose terminals between the input shaft (mainshaft) speed sensor, the output shaft (countershaft) speed sensor, and the PCM, then go to step 1.

NO—Go to step 13.

13. Monitor the OBD status for P0733 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 12, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between the input shaft (mainshaft) speed sensor, the output shaft (countershaft) speed sensor, and the PCM, then go to step 4. If the HDS indicates NOT COMPLETED, go to step 11.

DTC P0734: Problem in 4th Clutch and 4th Clutch Hydraulic Circuit

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

1. Warm up the engine to normal operating temperature (the radiator fan comes on).

2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.

3. Drain the ATF (see step 3 on page 14-203) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

Does the strainer have metal debris or excessive clutch material?

YES—Replace the transmission, then go to step 11.

NO—Replace the ATF (see step 5 on page 14-204), then go to step 4.

4. Measure the line pressure (see page 14-180).

Is the line pressure within the service limits?

YES—Go to step 5.

NO—Repair the ATF pump and the regulator valve, or replace the transmission, then go to step 11.

5. Measure the 4th clutch pressure (see page 14-180).

Is the 4th clutch pressure within the service limits?

YES—Go to step 6.

NO—Shift valves A, B, C, and D are stuck. Repair these valves and the related hydraulic circuit, or replace the transmission, then go to step 11.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

6. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
7. Clear the DTC with the HDS.
8. Test-drive the vehicle in 4th gear in D, at speeds over 7 mph (12 km/h), and for at least 12 seconds. Slow down, and stop the wheels.
9. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0734 indicated?

YES—Repair the 4th clutch, or replace the transmission, then go to step 11.

NO—Go to step 10.

10. Monitor the OBD status for P0734 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Intermittent failure, the system is OK at this time. If any other Pending or Confirmed DTCs were indicated in step 9, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, repair the 4th clutch, or replace the transmission, then go to step 11. If the HDS indicates NOT COMPLETED, go to step 8.

11. Test-drive the vehicle in 4th gear in D, at speeds over 7 mph (12 km/h), and for at least 12 seconds. Slow down, and stop the wheels.
12. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0734 indicated?

YES—Check for poor connections or loose terminals between the input shaft (mainshaft) speed sensor, the output shaft (countershaft) speed sensor, and the PCM, then go to step 1.

NO—Go to step 13.

13. Monitor the OBD status for P0734 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 12, go to the indicated DTC's troubleshooting. ■

NO—Check for poor connections or loose terminals between the input shaft (mainshaft) speed sensor, the output shaft (countershaft) speed sensor, and the PCM, then go to step 4. If the HDS indicates NOT COMPLETED, go to step 11.

DTC P0735: Problem in 5th Clutch and 5th Clutch Hydraulic Circuit

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see step 3 on page 14-203) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

Does the strainer have metal debris or excessive clutch material?

YES—Replace the transmission, then go to step 11.

NO—Replace the ATF (see step 5 on page 14-204), then go to step 4.

4. Measure the line pressure (see page 14-180).

Is the line pressure within the service limits?

YES—Go to step 5.

NO—Repair the ATF pump and the regulator valve, or replace the transmission, then go to step 11.

5. Measure the 5th clutch pressure (see page 14-180).

Is the 5th clutch pressure within the service limits?

YES—Go to step 6.

NO—Shift valves A, B, C, and D are stuck. Repair these valves and the related hydraulic circuit, replace the transmission, then go to step 11.



6. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
7. Clear the DTC with the HDS.
8. Test-drive the vehicle in 5th gear in D, at speeds over 7 mph (12 km/h), and for at least 12 seconds. Slow down, and stop the wheels.
9. Check for Pending or Confirmed DTCs with the HDS.
Is DTC P0735 indicated?
YES—Repair the 5th clutch, or replace the transmission, then go to step 11.
NO—Go to step 10.
10. Monitor the OBD status for P0735 in the DTCs MENU with the HDS.
Does the HDS indicate PASSED?
YES—Intermittent failure, the system is OK at this time. If any other Pending or Confirmed DTCs were indicated in step 9, go to the indicated DTC's troubleshooting. ■
NO—If the HDS indicates FAILED, repair the 5th clutch, or replace the transmission, then go to step 11. If the HDS indicates NOT COMPLETED, go to step 8.
11. Test-drive the vehicle in 5th gear in D, at speeds over 7 mph (12 km/h), and for at least 12 seconds. Slow down, and stop the wheels.
12. Check for Pending or Confirmed DTCs with the HDS.
Is DTC P0735 indicated?
YES—Check for poor connections or loose terminals between the input shaft (mainshaft) speed sensor, the output shaft (countershaft) speed sensor, and the PCM, then go to step 1.
NO—Go to step 13.
13. Monitor the OBD status for P0735 in the DTCs MENU with the HDS.
Does the HDS indicate PASSED?
YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 12, go to the indicated DTC's troubleshooting. ■
NO—If the HDS indicates FAILED, check for poor connections or loose terminals between the input shaft (mainshaft) speed sensor, the output shaft (countershaft) speed sensor, and the PCM, then go to step 4. If the HDS indicates NOT COMPLETED, go to step 11.

DTC P0741: Torque Converter Clutch Hydraulic Circuit Stuck OFF

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see step 3 on page 14-203) through a strainer. Inspect the strainer for metal debris or excessive clutch material.
Does the strainer have metal debris or excessive clutch material?
YES—Replace the transmission, then go to step 14.
NO—Replace the ATF (see step 5 on page 14-204), then go to step 14.
4. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
5. Clear the DTC with the HDS.
6. Select Shift Solenoid Valve D in the Miscellaneous Test Menu, and check that the shift solenoid valve D operates with the HDS.

Is a clicking sound heard?

YES—Go to step 7.

NO—Replace shift solenoid valve D (see page 14-184), then go to step 14.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

7. Run the engine until the engine coolant temperature reaches 176 °F (80 °C).

8. Select Clutch Pressure Control (Linear) Solenoid Valve C in the Miscellaneous Test Menu, and test A/T clutch pressure control solenoid valve C with the HDS.

Does the HDS indicate NORMAL?

YES—Go to step 9.

NO—Follow the instructions indicated on the HDS for the test result. If the HDS has not determined the cause of the failure, go to step 11. If any part is replaced, go to step 12.

9. Test-drive the vehicle on a level road with a steady throttle at 60 mph (96 km/h) for at least 22 seconds, or test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data.

10. Monitor the OBD status for P0741 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Repair the torque converter clutch hydraulic circuit, the lock-up shift valve, or the lock-up control valve, or replace the torque converter, then go to step 14.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. If the HDS indicates NOT COMPLETED, go to step 9.

11. Inspect A/T clutch pressure control solenoid valve C (see page 14-194).

Does A/T clutch pressure control solenoid valve C work properly?

YES—Repair the hydraulic system related to the lock-up shift valve, the lock-up control valve, and the lock-up timing valve, or replace the transmission, then go to step 14.

NO—Replace A/T clutch pressure control solenoid valve C (see page 14-197), then go to step 12.

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

13. Clear the DTC with the HDS.

14. Test-drive the vehicle on a level road with a steady throttle at 60 mph (96 km/h) for at least 22 seconds, or test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data.

15. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0741 indicated?

YES—Go to step 8.

NO—Go to step 16.

16. Monitor the OBD status for P0741 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 15, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, go to step 8. If the HDS indicates NOT COMPLETED, go to step 14.



DTC P0746: A/T Clutch Pressure Control Solenoid Valve A Stuck OFF

DTC P0747: A/T Clutch Pressure Control Solenoid Valve A Stuck ON

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see step 3 on page 14-203) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

Does the strainer have metal debris or excessive clutch material?

YES—Replace the transmission, then go to step 13.

NO—Replace the ATF (see step 5 on page 14-204), then go to step 4.

4. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
5. Clear the DTC with the HDS.
6. Test-drive the vehicle with the shift lever in D for at least 20 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.

7. Monitor the OBD status for P0746 or P0747 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. If the HDS indicates NOT COMPLETED, go to step 6.

8. Clear the DTC with the HDS.

9. Select Clutch Pressure Control (Linear) Solenoid Valve A in the Miscellaneous Test Menu, and test A/T clutch pressure control solenoid valve A with the HDS.

Does the HDS indicate NORMAL?

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

NO—Follow the instructions indicated on the HDS according to the test result. If the HDS has not determined the cause of the failure, go to step 10. If any part is replaced, go to step 11.

10. Inspect A/T clutch pressure control solenoid valve A (see page 14-189).

Does A/T clutch pressure control solenoid valve A work properly?

YES—Repair the hydraulic system related with shift valve A, or replace the transmission, then go to step 13.

NO—Replace A/T clutch pressure control solenoid valve A (see page 14-192), then go to step 13.

11. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
12. Clear the DTC with the HDS.
13. Test-drive the vehicle with the shift lever in D for at least 20 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

14. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0746 or P0747 indicated?

YES—Go to step 8.

NO—Go to step 15.

15. Monitor the OBD STATUS for P0746 or P0747 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 14, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, go to step 8. If the HDS indicates NOT COMPLETED, go to step 13.

DTC P0751: Shift Solenoid Valve A Stuck OFF

DTC P0752: Shift Solenoid Valve A Stuck ON

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see step 3 on page 14-203) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

Does the strainer have metal debris or excessive clutch material?

YES—Replace the transmission, then go to step 12.

NO—Replace the ATF (see step 5 on page 14-204), then go to step 4.

4. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
5. Clear the DTC with the HDS.
6. Test-drive the vehicle with the shift lever in D for at least 11 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.
7. Monitor the OBD status for P0751 or P0752 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. If the HDS indicates NOT COMPLETED, go to step 6.



8. Clear the DTC with the HDS.

9. Select Shift Solenoid Valve A in the Miscellaneous Test Menu, and check that shift solenoid valve A operates with the HDS.

Is a clicking sound heard?

YES—Go to step 10.

NO—Replace the shift solenoid valve A (see page 14-184), then go to step 12.

10. Test-drive the vehicle with the shift lever in D for at least 11 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.

11. Monitor the OBD status for P0751 or P0752 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Repair shift valve A, or replace the transmission, then go to step 12.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. If the HDS indicates NOT COMPLETED, go to step 10.

12. Test-drive the vehicle with the shift lever in D for at least 11 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.

13. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0751 or P0752 indicated?

YES—Go to step 8.

NO—Go to step 14.

14. Monitor the OBD STATUS for P0751 or P0752 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 13, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, go to step 8. If the HDS indicates NOT COMPLETED, go to step 12.

DTC P0756: Shift Solenoid Valve B Stuck OFF

DTC P0757: Shift Solenoid Valve B Stuck ON

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

1. Warm up the engine to normal operating temperature (the radiator fan comes on).

2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.

3. Drain the ATF (see step 3 on page 14-203) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

Does the strainer have metal debris or excessive clutch material?

YES—Replace the transmission, then go to step 12.

NO—Replace the ATF (see step 5 on page 14-204), then go to step 4.

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

5. Clear the DTC with the HDS.

6. Test-drive the vehicle with the shift lever in D for at least 11 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.

7. Monitor the OBD status for P0756 or P0757 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. If the HDS indicates NOT COMPLETED, go to step 6.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

8. Clear the DTC with the HDS.
9. Select Shift Solenoid Valve B in the Miscellaneous Test Menu, and check that shift solenoid valve B operates with the HDS.
Is a clicking sound heard?
YES—Go to step 10.
NO—Replace shift solenoid valve B (see page 14-184), then go to step 12.
10. Test-drive the vehicle with the shift lever in D for at least 11 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.
11. Monitor the OBD status for P0756 or P0757 in the DTCs MENU with the HDS.
Does the HDS indicate FAILED?
YES—Repair shift valve B, or replace the transmission, then go to step 12.
NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. If the HDS indicates NOT COMPLETED, go to step 10.
12. Test-drive the vehicle with the shift lever in D for at least 11 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.
13. Check for Pending or Confirmed DTCs with the HDS.
Is DTC P0756 or P0757 indicated?
YES—Go to step 8.
NO—Go to step 14.
14. Monitor the OBD STATUS for P0756 or P0757 in the DTCs MENU with the HDS.
Does the HDS indicate PASSED?
YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 13, go to the indicated DTC's troubleshooting. ■
NO—If the HDS indicates FAILED, go to step 8. If the HDS indicates NOT COMPLETED, go to step 12.

DTC P0761: Shift Solenoid Valve C Stuck OFF

DTC P0762: Shift Solenoid Valve C Stuck ON

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see step 3 on page 14-203) through a strainer. Inspect the strainer for metal debris or excessive clutch material.
Does the strainer have metal debris or excessive clutch material?
YES—Replace the transmission, then go to step 12.
NO—Replace the ATF (see step 5 on page 14-204), then go to step 4.
4. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
5. Clear the DTC with the HDS.
6. Test-drive the vehicle with the shift lever in D for at least 20 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.
7. Monitor the OBD status for P0761 or P0762 in the DTCs MENU with the HDS.
Does the HDS indicate FAILED?
YES—Go to step 8.
NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. If the HDS indicates NOT COMPLETED, go to step 6.



8. Clear the DTC with the HDS.

9. Select Shift Solenoid Valve C in the Miscellaneous Test Menu, and check that shift solenoid valve C operates with the HDS.

Is a clicking sound heard?

YES—Go to step 10.

NO—Replace shift solenoid valve C (see page 14-184), then go to step 12.

10. Test-drive the vehicle with the shift lever in D for at least 20 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.

11. Monitor the OBD status for P0761 or P0762 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Repair shift valve C, or replace the transmission, then go to step 12.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. If the HDS indicates NOT COMPLETED, go to step 10.

12. Test-drive the vehicle with the shift lever in D for at least 20 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.

13. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0761 or P0762 indicated?

YES—Go to step 8.

NO—Go to step 14.

14. Monitor the OBD STATUS for P0761 or P0762 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 13, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, go to step 8. If the HDS indicates NOT COMPLETED, go to step 12.

DTC P0766: Shift Solenoid Valve D Stuck OFF

DTC P0767: Shift Solenoid Valve D Stuck ON

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

1. Warm up the engine to normal operating temperature (the radiator fan comes on).

2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.

3. Drain the ATF (see step 3 on page 14-203) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

Does the strainer have metal debris or excessive clutch material?

YES—Replace the transmission, then go to step 12.

NO—Replace the ATF (see step 5 on page 14-204), then go to step 4.

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

5. Clear the DTC with the HDS.

6. Test-drive the vehicle with the shift lever in D for at least 11 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.

7. Monitor the OBD status for P0766 or P0767 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. If the HDS indicates NOT COMPLETED, go to step 6.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

8. Clear the DTC with the HDS.

9. Select Shift Solenoid Valve D in the Miscellaneous Test Menu, and check that shift solenoid valve D operates with the HDS.

Is a clicking sound heard?

YES—Go to step 10.

NO—Replace shift solenoid valve D (see page 14-184), then go to step 12.

10. Test-drive the vehicle with the shift lever in D for at least 11 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.

11. Monitor the OBD status for P0766 or P0767 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Repair shift valve D, or replace the transmission, then go to step 12.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. If the HDS indicates NOT COMPLETED, go to step 10.

12. Test-drive the vehicle with the shift lever in D for at least 11 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.

13. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0766 or P0767 indicated?

YES—Go to step 8.

NO—Go to step 14.

14. Monitor the OBD STATUS for P0766 or P0767 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 13, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, go to step 8. If the HDS indicates NOT COMPLETED, go to step 12.

DTC P0776: A/T Clutch Pressure Control Solenoid Valve B Stuck OFF

DTC P0777: A/T Clutch Pressure Control Solenoid Valve B Stuck ON

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

1. Warm up the engine to normal operating temperature (the radiator fan comes on).

2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.

3. Drain the ATF (see step 3 on page 14-203) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

Does the strainer have metal debris or excessive clutch material?

YES—Replace the transmission, then go to step 13.

NO—Replace the ATF (see step 5 on page 14-204), then go to step 4.

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

5. Clear the DTC with the HDS.

6. Test-drive the vehicle with the shift lever in D for at least 20 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.

7. Monitor the OBD status for P0776 or P0777 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. If the HDS indicates NOT COMPLETED, go to step 6.



8. Clear the DTC with the HDS.

9. Select Clutch Pressure Control (Linear) Solenoid Valve B in the Miscellaneous Test Menu, and test A/T clutch pressure control solenoid valve B with the HDS.

Does the HDS indicate NORMAL?

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

NO—Follow the instructions indicated on the HDS according to the test result. If the HDS has not determined the cause of the failure, go to step 10. If any part is replaced, go to step 11.

10. Inspect A/T clutch pressure control solenoid valve B (see page 14-189).

Does A/T clutch pressure control solenoid valve B work properly?

YES—Repair the hydraulic system related with shift valve B, or replace the transmission, then go to step 13.

NO—Replace A/T clutch pressure control solenoid valve B (see page 14-192), then go to step 13.

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

12. Clear the DTC with the HDS.

13. Test-drive the vehicle with the shift lever in D for at least 20 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.

14. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0776 or P0777 indicated?

YES—Go to step 8.

NO—Go to step 15.

15. Monitor the OBD STATUS for P0776 or P0777 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 14, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, go to step 8. If the HDS indicates NOT COMPLETED, go to step 13.

DTC P0796: A/T Clutch Pressure Control Solenoid Valve C Stuck OFF

DTCP0797: A/T Clutch Pressure Control Solenoid Valve C Stuck ON

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

1. Warm up the engine to normal operating temperature (the radiator fan comes on).

2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.

3. Drain the ATF (see step 3 on page 14-203) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

Does the strainer have metal debris or excessive clutch material?

YES—Replace the transmission, then go to step 13.

NO—Replace the ATF (see step 5 on page 14-204), then go to step 4.

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

5. Clear the DTC with the HDS.

6. P0796: Start the engine. With the brake pedal pressed, shift to D, and wait for at least 3 seconds, then shift to R. Drive the vehicle for at least 3 seconds. Slow down, and stop the wheels.

P0797: Test-drive the vehicle with the shift lever in D for at least 11 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.

7. Monitor the OBD status for P0796 or P0797 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. If the HDS indicates NOT COMPLETED, go to step 6.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

8. Clear the DTC with the HDS.

9. Select Clutch Pressure Control (Linear) Solenoid Valve C in the Miscellaneous Test Menu, and test A/T clutch pressure control solenoid valve C with the HDS.

Does the HDS indicate NORMAL?

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

NO—Follow the instructions indicated on the HDS according to the test result. If the HDS has not determined the cause of the failure, go to step 10. If any part is replaced, go to step 11.

10. Inspect A/T clutch pressure control solenoid valve C (see page 14-194).

Does A/T clutch pressure control solenoid valve C work properly?

YES—Repair the hydraulic system related with shift valve C, or replace the transmission, then go to step 13.

NO—Replace A/T clutch pressure control solenoid valve C (see page 14-197), then go to step 13.

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

12. Clear the DTC with the HDS.

13. P0796: Test-drive the vehicle with the shift lever in D, and let the transmission shift through all five gears. Slow down, and stop the wheels.

P0797: Test-drive the vehicle with the shift lever in D for at least 11 seconds, and let the transmission shift through all five gears. Slow down, and stop the wheels.

14. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0796 or P0797 indicated?

YES—Go to step 8.

NO—Go to step 15.

15. Monitor the OBD STATUS for P0796 or P0797 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 14, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, go to step 8. If the HDS indicates NOT COMPLETED, go to step 13.



DTC P0812: Open in Transmission Range Switch ATPR Switch Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Shift to R, and verify the A/T R Switch signal with the HDS in the A/T Data List.

Is the A/T R Switch ON?

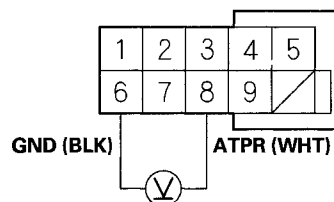
YES—Intermittent failure, the system is OK at this time. ■

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

6. Measure the voltage between transmission range switch connector terminals No. 6 and No. 8.

TRANSMISSION RANGE SWITCH CONNECTOR



Wire side of female terminals

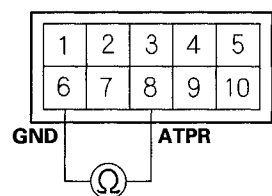
Is there more than 5.0 V?

YES—Go to step 7.

NO—Repair open in the wire between the transmission range switch and PCM connector terminal C25, then go to step 8.

7. Check for continuity between transmission range switch connector terminals No. 6 and No. 8 while the shift lever is in R, and when the shift lever is shifted to any position other than R.

TRANSMISSION RANGE SWITCH CONNECTOR



Terminal side of male terminals

Is there continuity when the shift lever is in R, and no continuity when the shift lever is shifted to any position other than R?

YES—Go to step 14.

NO—Replace the transmission range switch (see page 14-260), then go to step 11.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

8. Reconnect all connectors.
9. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
10. Clear the DTC with the HDS.
11. Test-drive the vehicle in R at speeds below 3 mph (5 km/h) for at least 2 seconds, then increase the speed and test-drive at speeds over 3 mph (5 km/h) for at least 2 seconds. Slow down, and stop the wheels.
12. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0812 indicated?

YES—Check for poor connections or loose terminals between the transmission range switch and the PCM, then go to step 1.

NO—Go to step 13.

13. Monitor the OBD status for P0812 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 12, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between the transmission range switch and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 11.

14. Reconnect all connectors.
15. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
16. Test-drive the vehicle in R at speeds below 3 mph (5 km/h) for at least 2 seconds, then increase the speed and test-drive at speeds over 3 mph (5 km/h) for at least 2 seconds. Slow down, and stop the wheels.
17. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0812 indicated?

YES—Check for poor connections or loose terminals between the transmission range switch and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 16. If the PCM was substituted, go to step 1.

NO—Go to step 18.

18. Monitor the OBD status for P0812 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 17, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between the transmission range switch and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 16. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 16. ■



DTC P0842: Short in Transmission Fluid Pressure Switch A (2nd Clutch) Circuit, or Transmission Fluid Pressure Switch A (2nd Clutch) Stuck ON

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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. Check the 2nd Pressure Switch signal with the HDS in the A/T Data List when not in 2nd gear.

Is the 2nd Pressure Switch OFF?

YES—Go to step 4.

NO—Go to step 7.

4. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).
5. Test-drive the vehicle in 3rd gear in D for at least 2 seconds. Slow down, and stop the wheels.
6. Monitor the OBD status for P0842 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Go to step 7.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check the OP2SW wire for an intermittent short to body ground in the wire between the transmission fluid pressure switch A (2nd clutch) and the PCM. If the HDS indicates NOT COMPLETED, go to step 5.

7. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
8. Disconnect the transmission fluid pressure switch A (2nd clutch) connector.

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

10. Check the 2nd Pressure Switch signal with the HDS in the A/T Data List.

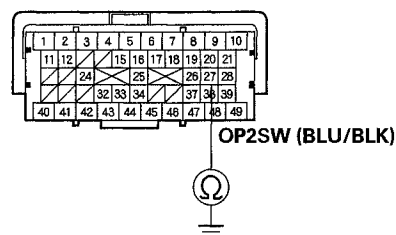
Is the 2nd Pressure Switch OFF?

YES—Replace the transmission fluid pressure switch A (2nd clutch) (see page 14-199), then go to step 15.

NO—Go to step 11.

11. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
12. Jump the SCS line with the HDS.
13. Disconnect PCM connector C (49P).
14. Check for continuity between PCM connector terminal C27 and body ground.

PCM CONNECTOR C (49P)



Terminal side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between PCM connector terminal C27 and the transmission fluid pressure switch A (2nd clutch), then go to step 15.

NO—Go to step 22.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

15. Reconnect all connectors.
16. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
17. Clear the DTC with the HDS.
18. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).
19. Test-drive the vehicle in 2nd gear in D for at least 2 seconds, then press the accelerator pedal so that the transmission upshifts to 3rd gear, then 4th gear. Drive for at least 2 seconds in each gear. Slow down, and stop the wheels.
20. Check for Pending or Confirmed DTCs with the HDS.
Is DTC P0842 indicated?
YES—Check for intermittent short to body ground in the wire between the transmission fluid pressure switch A (2nd clutch) and the PCM, then go to step 1.
NO—Go to step 21.
21. Monitor the OBD status for P0842 in the DTCs MENU with the HDS.
Does the HDS indicate PASSED?
YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 20, go to the indicated DTC's troubleshooting. ■
NO—If the HDS indicates FAILED, check for intermittent short to body ground in the wire between the transmission fluid pressure switch A (2nd clutch) and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 18.

22. Reconnect all connectors.
23. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
24. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).
25. Test-drive the vehicle in 2nd gear in D for at least 2 seconds, then press the accelerator pedal so that the transmission upshifts to 3rd gear, then 4th gear. Drive for at least 2 seconds in each gear. Slow down, and stop the wheels.
26. Check for Pending or Confirmed DTCs with the HDS.
Is DTC P0842 indicated?
YES—Check for intermittent short to body ground in the wire between the transmission fluid pressure switch A (2nd clutch) and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 24. If the PCM was substituted, go to step 1.
NO—Go to step 27.
27. Monitor the OBD status for P0842 in the DTCs MENU with the HDS.
Does the HDS indicate PASSED?
YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 26, go to the indicated DTC's troubleshooting. ■
NO—If the HDS indicates FAILED, check for intermittent short to body ground in the wire between the transmission fluid pressure switch A (2nd clutch) and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 24. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 24.



DTC P0843: Open in Transmission Fluid Pressure Switch A (2nd Clutch) Circuit, or Transmission Fluid Pressure Switch A (2nd Clutch) Stuck OFF

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

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, and warm it up to normal operating temperature (the radiator fan comes on).
4. Test-drive the vehicle in 2nd gear in D, and verify with the HDS in the A/T Data List that the Shift Control indicates 2nd.
5. Check the 2nd Pressure Switch signal with the HDS in the A/T Data List.

Is the 2nd Pressure Switch ON?

YES—Go to step 6.

NO—Go to step 8.

6. Test-drive the vehicle in 2nd gear in D for at least 2 seconds. Slow down, and stop the wheels.
7. Monitor the OBD status for P0843 in the DTCs MENU with the HDS.

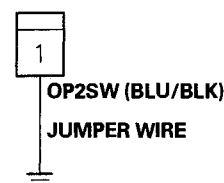
Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections and loose terminals at the transmission fluid pressure switch A (2nd clutch) and the PCM. If the HDS indicates NOT COMPLETED, go to step 6.

8. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
9. Disconnect the transmission fluid pressure switch A (2nd clutch) connector.
10. Connect a jumper wire between the transmission fluid pressure switch A (2nd clutch) connector terminal and body ground.

TRANSMISSION FLUID PRESSURE SWITCH A (2ND CLUTCH) CONNECTOR



Wire side of female terminals

11. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
12. Check the 2nd Pressure Switch signal with the HDS in the A/T Data List.

Is the 2nd Pressure Switch ON?

YES—Go to step 13.

NO—Go to step 16.
13. Reconnect the transmission fluid pressure switch A (2nd clutch) connector.
14. Clear the DTC with the HDS.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

15. Measure the 2nd clutch pressure (see page 14-180).

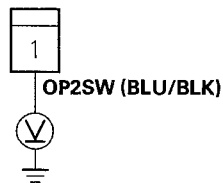
Is the 2nd clutch pressure within the service limits?

YES—Replace the transmission fluid pressure switch A (2nd clutch) (see page 14-199), then go to step 21.

NO—Replace shift valves A, B, and C, and related hydraulic circuit, or replace the transmission, then go to step 24.

16. Remove the jumper wire, then measure the voltage between the transmission fluid pressure switch A (2nd clutch) connector terminal and body ground.

TRANSMISSION FLUID PRESSURE SWITCH A (2ND CLUTCH) CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 28.

NO—Go to step 17.

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

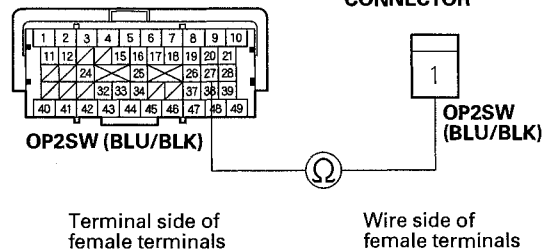
18. Jump the SCS line with the HDS.

19. Disconnect PCM connector C (49P).

20. Check for continuity between PCM connector terminal C27 and the transmission fluid pressure switch A (2nd clutch) connector terminal.

PCM CONNECTOR C (49P)

TRANSMISSION FLUID PRESSURE SWITCH A (2ND CLUTCH) CONNECTOR



Is there continuity?

YES—Go to step 28.

NO—Repair open in the wire between PCM connector terminal C27 and the transmission fluid pressure switch A (2nd clutch), then go to step 21.



21. Reconnect all connectors.
22. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
23. Clear the DTC with the HDS.
24. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).
25. Test-drive the vehicle in 2nd gear in D for at least 2 seconds, then press the accelerator pedal so that the transmission upshifts to 3rd gear, then 4th gear. Drive for at least 2 seconds in each gear. Slow down, and stop the wheels.
26. Check for Pending or Confirmed DTCs with the HDS.
Is DTC P0843 indicated?
YES—Check for poor connections or loose terminals between the transmission fluid pressure switch A (2nd clutch) and the PCM, then go to step 1.
NO—Go to step 27.
27. Monitor the OBD status for P0843 in the DTCs MENU with the HDS.
Does the HDS indicate PASSED?
YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 26, go to the indicated DTC's troubleshooting.■
NO—If the HDS indicates FAILED, check for poor connections or loose terminals between the transmission fluid pressure switch A (2nd clutch) and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 24.

28. Reconnect all connectors.
29. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
30. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).
31. Test-drive the vehicle in 2nd gear in D for at least 2 seconds, then press the accelerator pedal so that the transmission upshifts to 3rd gear, then 4th gear. Drive for at least 2 seconds in each gear. Slow down, and stop the wheels.
32. Check for Pending or Confirmed DTCs with the HDS.
Is DTC P0843 indicated?
YES—Check for poor connections or loose terminals between the transmission fluid pressure switch A (2nd clutch) and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 30. If the PCM was substituted, go to step 1.
NO—Go to step 33.
33. Monitor the OBD status for P0843 in the DTCs MENU with the HDS.
Does the HDS indicate PASSED?
YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 32, go to the indicated DTC's troubleshooting.■
NO—If the HDS indicates FAILED, check for poor connections or loose terminals between the transmission fluid pressure switch A (2nd clutch) and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 30. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 30.

Automatic Transmission

DTC Troubleshooting (cont'd)

DTC P0847: Short in Transmission Fluid Pressure Switch B (3rd Clutch) Circuit, or Transmission Fluid Pressure Switch B (3rd Clutch) Stuck ON

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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. Check the 3rd Pressure Switch signal with the HDS in the A/T Data List when not in 3rd gear.

Is the 3rd Pressure Switch OFF?

YES—Go to step 4.

NO—Go to step 7.

4. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).
5. Test-drive the vehicle in 4th gear in D for at least 2 seconds. Slow down, and stop the wheels.
6. Monitor the OBD status for P0847 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Go to step 7.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check the OP3SW wire for an intermittent short to body ground in the wire between the transmission fluid pressure switch B (3rd clutch) and the PCM. If the HDS indicates NOT COMPLETED, go to step 5.

7. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
8. Disconnect the transmission fluid pressure switch B (3rd clutch) connector.

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

10. Check the 3rd Pressure Switch signal with the HDS in the A/T Data List.

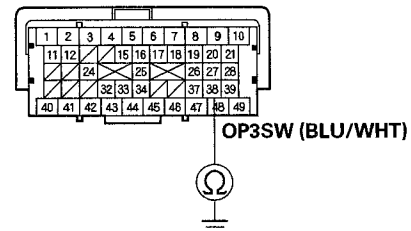
Is the 3rd Pressure Switch OFF?

YES—Replace the transmission fluid pressure switch B (3rd clutch) (see page 14-200), then go to step 15.

NO—Go to step 11.

11. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
12. Jump the SCS line with the HDS.
13. Disconnect PCM connector C (49P).
14. Check for continuity between PCM connector terminal C38 and body ground.

PCM CONNECTOR C (49P)



Terminal side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between PCM connector terminal C38 and the transmission fluid pressure switch B (3rd clutch), then go to step 15.

NO—Go to step 22.



15. Reconnect all connectors.
16. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
17. Clear the DTC with the HDS.
18. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).
19. Test-drive the vehicle in 3rd gear in D for at least 2 seconds, then press the accelerator pedal so that the transmission upshifts to 4th gear, and drive for at least 2 seconds. Slow down, and stop the wheels.
20. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0847 indicated?

YES—Check for intermittent short to body ground in the wire between the transmission fluid pressure switch B (3rd clutch) and the PCM, then go to step 1.

NO—Go to step 21.

21. Monitor the OBD status for P0847 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 20, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for intermittent short to body ground in the wire between the transmission fluid pressure switch B (3rd clutch) and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 18.

22. Reconnect all connectors.

23. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).

24. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).

25. Test-drive the vehicle in 3rd gear in D for at least 2 seconds, then press the accelerator pedal so that the transmission upshifts to 4th gear, and drive for at least 2 seconds. Slow down, and stop the wheels.

26. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0847 indicated?

YES—Check for intermittent short to body ground in the wire between the transmission fluid pressure switch B (3rd clutch) and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 24. If the PCM was substituted, go to step 1.

NO—Go to step 27.

27. Monitor the OBD status for P0847 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 26, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for intermittent short to body ground in the wire between the transmission fluid pressure switch B (3rd clutch) and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 24. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 24.

Automatic Transmission

DTC Troubleshooting (cont'd)

DTC P0848: Open in Transmission Fluid Pressure Switch B (3rd Clutch) Circuit, or Transmission Fluid Pressure Switch B (3rd Clutch) Stuck OFF

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

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, and warm it up to normal operating temperature (the radiator fan comes on).
4. Test-drive the vehicle in 3rd gear in D, and verify with the HDS in the A/T Data List that the Shift Control indicates 3rd.
5. Check the 3rd Pressure Switch signal with the HDS in the A/T Data List.

Is the 3rd Pressure Switch ON?

YES—Go to step 6.

NO—Go to step 8.

6. Test-drive the vehicle in 3rd gear in D for at least 2 seconds. Slow down, and stop the wheels.
7. Monitor the OBD status for P0848 in the DTCs MENU with the HDS.

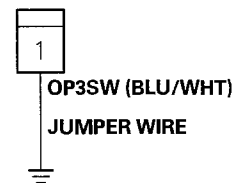
Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the transmission fluid pressure switch B (3rd clutch) and the PCM. If the HDS indicates NOT COMPLETED, go to step 6.

8. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
9. Disconnect the transmission fluid pressure switch B (3rd clutch) connector.
10. Connect a jumper wire between the transmission fluid pressure switch B (3rd clutch) connector terminal and body ground.

TRANSMISSION FLUID PRESSURE SWITCH B (3RD CLUTCH) CONNECTOR



Wire side of female terminals

11. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
12. Check the 3rd Pressure Switch signal with the HDS in the A/T Data List.

Is the 3rd Pressure Switch ON?

YES—Go to step 13.

NO—Go to step 16.
13. Reconnect the transmission fluid pressure switch B (3rd clutch) connector.
14. Clear the DTC with the HDS.



15. Measure the 3rd clutch pressure (see page 14-180).

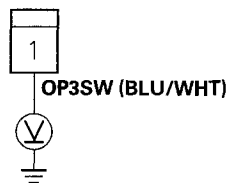
Is the 3rd clutch pressure within the service limits?

YES—Replace the transmission fluid pressure switch B (3rd clutch) (see page 14-200), then go to step 21.

NO—Replace shift valves A, B, and C, and the related hydraulic circuit, or replace the transmission, then go to step 24.

16. Remove the jumper wire, then measure the voltage between the transmission fluid pressure switch B (3rd clutch) connector terminal and body ground.

TRANSMISSION FLUID PRESSURE SWITCH B (3RD CLUTCH) CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 28.

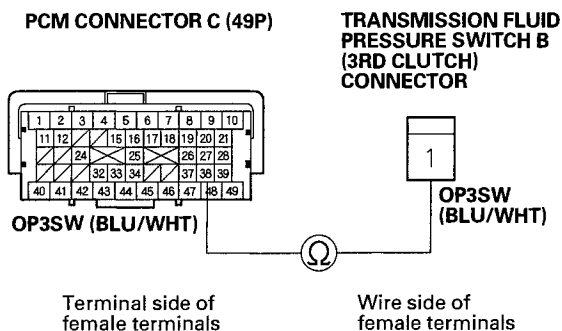
NO—Go to step 17

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

18. Jump the SCS line with the HDS.

19. Disconnect PCM connector C (49P).

20. Check for continuity between PCM connector terminal C38 and the transmission fluid pressure switch B (3rd clutch) connector terminal.



Is there continuity?

YES—Go to step 28.

NO—Repair open in the wire between PCM connector terminal C38 and the transmission fluid pressure switch B (3rd clutch), then go to step 21.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

21. Reconnect all connectors.
22. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
23. Clear the DTC with the HDS.
24. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).
25. Test-drive the vehicle in 3rd gear in D for at least 2 seconds, then press the accelerator pedal so that the transmission upshifts to 4th gear, and drive for at least 2 seconds. Slow down, and stop the wheels.
26. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0848 indicated?

YES—Check for poor connections or loose terminals between the transmission fluid pressure switch B (3rd clutch) and the PCM, then go to step 1.

NO—Go to step 27.

27. Monitor the OBD status for P0848 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 26, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between the transmission fluid pressure switch B (3rd clutch) and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 24.

28. Reconnect all connectors.
29. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
30. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).
31. Test-drive the vehicle in 3rd gear in D for at least 2 seconds, then press the accelerator pedal so that the transmission upshifts to 4th gear, and drive for at least 2 seconds. Slow down, and stop the wheels.
32. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0848 indicated?

YES—Check for poor connections or loose terminals between the transmission fluid pressure switch B (3rd clutch) and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 30. If the PCM was substituted, go to step 1.

NO—Go to step 33.

33. Monitor the OBD status for P0848 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 32, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between the transmission fluid pressure switch B (3rd clutch) and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 30. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 30.



DTC P0872: Short in 4th Clutch Transmission Fluid Pressure Switch Circuit, or 4th Clutch Transmission Fluid Pressure Switch Stuck ON

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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. Check the 4th Pressure Switch signal with the HDS in the A/T Data List when not in 4th gear.

Is the 4th Pressure Switch OFF?

YES—Go to step 4.

NO—Go to step 7.

4. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).

5. Test-drive the vehicle in 5th gear in D for at least 2 seconds. Slow down, and stop the wheels.

6. Monitor the OBD status for P0872 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Go to step 7.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check the OP4SW wire for an intermittent short to body ground in the wire between the 4th clutch transmission fluid pressure switch and the PCM. If the HDS indicates NOT COMPLETED, go to step 5.

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

8. Disconnect the 4th clutch transmission fluid pressure switch connector.

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

10. Check the 4th Pressure Switch signal with the HDS in the A/T Data List.

Is the 4th Pressure Switch OFF?

YES—Replace the 4th clutch transmission fluid pressure switch (see page 14-200), then go to step 19.

NO—Go to step 11.

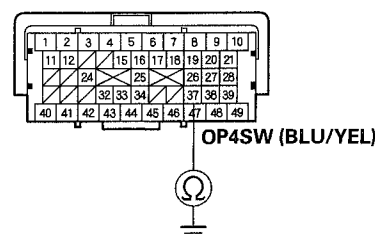
11. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.

12. Jump the SCS line with the HDS.

13. Disconnect PCM connector C (49P).

14. Check for continuity between PCM connector terminal C37 and body ground.

PCM CONNECTOR C (49P)



Terminal side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between PCM connector terminal C37 and the 4th clutch transmission fluid pressure switch, then go to step 15.

NO—Go to step 22.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

15. Reconnect all connectors.
16. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
17. Clear the DTC with the HDS.
18. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).
19. Test-drive the vehicle in 4th gear in D for at least 2 seconds, then press the accelerator pedal so that the transmission upshifts to 5th gear, and drive for at least 2 seconds. Slow down, and stop the wheels.
20. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0872 indicated?

YES—Check for intermittent short to body ground in the wire between the 4th clutch transmission fluid pressure switch and the PCM, then go to step 1.

NO—Go to step 21.

21. Monitor the OBD status for P0872 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 20, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for intermittent short to body ground in the wire between the 4th clutch transmission fluid pressure switch and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 18.

22. Reconnect all connectors.
23. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
24. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).
25. Test-drive the vehicle in 4th gear in D for at least 2 seconds, then press the accelerator pedal so that the transmission upshifts to 5th gear, and drive for at least 2 seconds. Slow down, and stop the wheels.
26. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0872 indicated?

YES—Check for intermittent short to body ground in the wire between the 4th clutch transmission fluid pressure switch and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 24. If the PCM was substituted, go to step 1.

NO—Go to step 27.

27. Monitor the OBD status for P0872 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 26, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for intermittent short to body ground in the wire between the 4th clutch transmission fluid pressure switch and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 24. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 24.



DTC P0873: Open in 4th Clutch Transmission Fluid Pressure Switch Circuit, or 4th Clutch Transmission Fluid Pressure Switch Stuck OFF

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

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, and warm it up to normal operating temperature (the radiator fan comes on).
4. Test-drive the vehicle in 5th gear in D, and verify with the HDS in the A/T Data List that the Shift Control indicates 4th.
5. Check the 4th Pressure Switch signal with the HDS in the A/T Data List.

Is the 4th Pressure Switch ON?

YES—Go to step 6.

NO—Go to step 8.

6. Test-drive the vehicle in 4th gear in D for at least 2 seconds. Slow down, and stop the wheels.
7. Monitor the OBD status for P0873 in the DTCs MENU with the HDS.

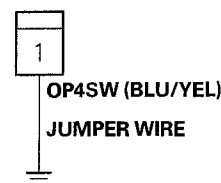
Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the 4th clutch transmission fluid pressure switch and the PCM. If the HDS indicates NOT COMPLETED, go to step 6.

8. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
9. Disconnect the 4th clutch transmission fluid pressure switch connector.
10. Connect a jumper wire between the 4th clutch transmission fluid pressure switch connector terminal and body ground.

4TH CLUTCH TRANSMISSION FLUID PRESSURE SWITCH CONNECTOR



Wire side of female terminals

11. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
12. Check the 4th Pressure Switch signal with the HDS in the A/T Data List.

Is the 4th Pressure Switch ON?

YES—Go to step 13.

NO—Go to step 16.
13. Reconnect the 4th clutch transmission fluid pressure switch connector.
14. Clear the DTC with the HDS.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

15. Measure the 4th clutch pressure (see page 14-180).

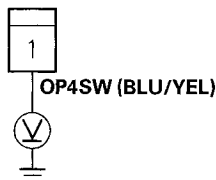
Is the 4th clutch pressure within the service limits?

YES—Replace the 4th clutch transmission fluid pressure switch (see page 14-200), then go to step 21.

NO—Repair shift valves A, B, C, and D, and the related hydraulic circuit, or replace the transmission, then go to step 24.

16. Remove the jumper wire, then measure the voltage between the 4th clutch transmission fluid pressure switch connector terminal and body ground.

4TH CLUTCH TRANSMISSION FLUID PRESSURE SWITCH CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 28.

NO—Go to step 17.

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

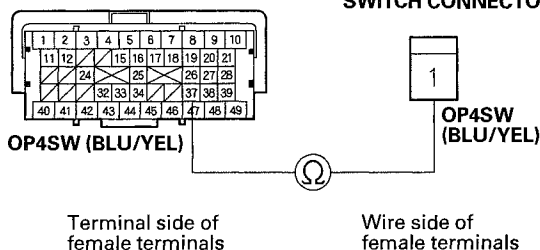
18. Jump the SCS line with the HDS.

19. Disconnect PCM connector C (49P).

20. Check for continuity between PCM connector terminal C37 and the 4th clutch transmission fluid pressure switch connector terminal.

PCM CONNECTOR C (49P)

4TH CLUTCH TRANSMISSION FLUID PRESSURE SWITCH CONNECTOR



Is there continuity?

YES—Go to step 28.

NO—Repair open in the wire between PCM connector terminal C37 and the 4th clutch transmission fluid pressure switch, then go to step 21.



21. Reconnect all connectors.
22. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
23. Clear the DTC with the HDS.
24. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).
25. Test-drive the vehicle in 4th gear in D for at least 2 seconds, then press the accelerator pedal so that the transmission upshifts to 5th gear, and drive for at least 2 seconds. Slow down, and stop the wheels.
26. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0873 indicated?

YES—Check for poor connections or loose terminals between the 4th clutch transmission fluid pressure switch and the PCM, then go to step 1.

NO—Go to step 27.

27. Monitor the OBD status for P0873 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 26, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between the 4th clutch transmission fluid pressure switch and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 24.

28. Reconnect all connectors.
29. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
30. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).
31. Test-drive the vehicle in 4th gear in D for at least 2 seconds, then press the accelerator pedal so that the transmission upshifts to 5th gear, and drive for at least 2 seconds. Slow down, and stop the wheels.
32. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0873 indicated?

YES—Check for poor connections or loose terminals between the 4th clutch transmission fluid pressure switch and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 30. If the PCM was substituted, go to step 1.

NO—Go to step 33.

33. Monitor the OBD status for P0873 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 32, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between the 4th clutch transmission fluid pressure switch and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 30. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 30.

Automatic Transmission

DTC Troubleshooting (cont'd)

DTC P0962: Problem in A/T Clutch Pressure Control Solenoid Valve A Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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, and wait for at least 1 second.
4. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0962 indicated?

YES—Go to step 8.

NO—Go to step 5.

5. Select Clutch Pressure Control (Linear) Solenoid Valve A in the Miscellaneous Test Menu, and test A/T clutch pressure control solenoid valve A with the HDS.

Does the HDS indicate NORMAL?

YES—Go to step 6.

NO—Go to step 8.

6. In the Clutch Pressure Control Solenoid Valve Control menu, select A/T Clutch Pressure Control Solenoid Valve A at 1.0 A.

7. Monitor the OBD status for P0962 in the DTCs MENU with the HDS.

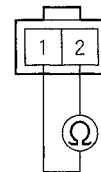
Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve A and the PCM. If the HDS indicates NOT COMPLETED, go to step 5.

8. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
9. Disconnect the A/T clutch pressure control solenoid valve A connector.
10. Measure the resistance between A/T clutch pressure control solenoid valve A connector terminals No. 1 and No. 2.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A CONNECTOR



Terminal side of male terminals

Is there 3—10 Ω?

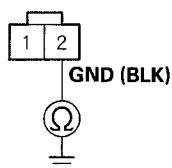
YES—Go to step 11.

NO—Replace A/T clutch pressure control solenoid valve A (see page 14-192), then go to step 22.



11. Check for continuity between A/T clutch pressure control solenoid valve A connector terminal No. 2 and body ground.

**A/T CLUTCH PRESSURE CONTROL
SOLENOID VALVE A CONNECTOR**



Wire side of female terminals

Is there continuity?

YES—Go to step 12.

NO—Repair open in the wire between A/T clutch pressure control solenoid valve A and body ground (G101), or repair poor body ground (G101), then go to step 19.

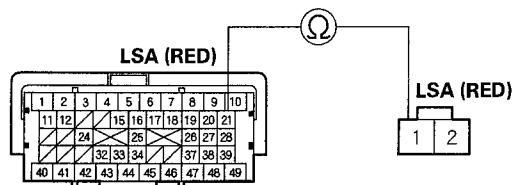
12. Jump the SCS line with the HDS.

13. Disconnect PCM connector C (49P).

14. Check for continuity between PCM connector terminal C21 and A/T clutch pressure control solenoid valve A connector terminal No. 1.

PCM CONNECTOR C (49P)

**A/T CLUTCH PRESSURE
CONTROL SOLENOID
VALVE A CONNECTOR**



Terminal side of
female terminals

Wire side of
female terminals

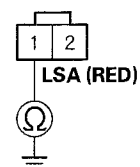
Is there continuity?

YES—Go to step 15.

NO—Repair open in the wire between A/T clutch pressure control solenoid valve A connector terminal No. 1 and PCM connector terminal C21, then go to step 19.

15. Check for continuity between A/T clutch pressure control solenoid valve A connector terminal No. 1 and body ground.

**A/T CLUTCH PRESSURE CONTROL
SOLENOID VALVE A CONNECTOR**



Wire side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between PCM connector terminal C21 and A/T clutch pressure control solenoid valve A, then go to step 19.

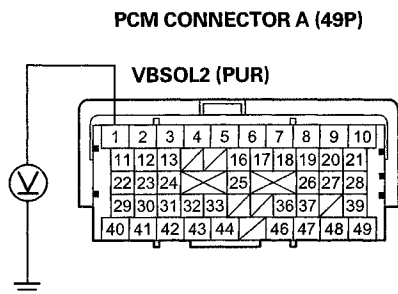
NO—Go to step 16.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

16. Disconnect PCM connector A (49P).
17. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
18. Measure the voltage between PCM connector terminal A1 and body ground.



Terminal side of female terminals

Is there battery voltage?

YES—Go to step 25.

NO—Check for a blown No. 10 (10 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal A1 and the driver's under-dash fuse/relay box, then go to step 19.

19. Reconnect all connectors.
20. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
21. Clear the DTC with the HDS.
22. Start the engine, and wait for at least 1 second.
23. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0962 indicated?

YES—Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve A and the PCM, then go to step 1.

NO—Go to step 24.

24. Monitor the OBD status for P0962 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 23, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between A/T clutch pressure control solenoid valve A and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 22.



25. Reconnect all connectors.
26. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
27. Start the engine, and wait for at least 1 second.
28. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0962 indicated?

YES—Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve A and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 27. If the PCM was substituted, go to step 1.

NO—Go to step 29.

29. Monitor the OBD status for P0962 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 28, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between A/T clutch pressure control solenoid valve A and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 27. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 27.

DTC P0963: Problem in A/T Clutch Pressure Control Solenoid Valve A

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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, and wait for at least 1 second.
4. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0963 indicated?

YES—Go to step 8.

NO—Go to step 5.

5. Select Clutch Pressure Control (Linear) Solenoid Valve A in the Miscellaneous Test Menu, and test A/T clutch pressure control solenoid valve A with the HDS.

Does the HDS indicate NORMAL?

YES—Go to step 6.

NO—Go to step 8.

6. In the Clutch Pressure Control Solenoid Valve Control menu, select A/T Clutch Pressure Control Solenoid Valve A at 0.2 A.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

7. Monitor the OBD status for P0963 in the DTCs MENU with the HDS.

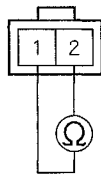
Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve A and the PCM. If the HDS indicates NOT COMPLETED, go to step 5.

8. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
9. Disconnect the A/T clutch pressure control solenoid valve A connector.
10. Measure the resistance between A/T clutch pressure control solenoid valve A connector terminals No. 1 and No. 2.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A CONNECTOR



Terminal side of male terminals

Is there 3—10 Ω ?

YES—Go to step 14.

NO—Replace A/T clutch pressure control solenoid valve A (see page 14-192), then go to step 11.

11. Start the engine, and wait for at least 1 second.

12. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0963 indicated?

YES—Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve A and the PCM, then go to step 1.

NO—Go to step 13.

13. Monitor the OBD status for P0963 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 12, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between A/T clutch pressure control solenoid valve A and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 11.



14. Reconnect all connectors.
15. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
16. Start the engine, and wait for at least 1 second.
17. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0963 indicated?

YES—Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve A and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 16. If the PCM was substituted, go to step 1.

NO—Go to step 18.

18. Monitor the OBD status for P0963 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 17, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between A/T clutch pressure control solenoid valve A and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 16. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 16.

DTC P0966: Problem in A/T Clutch Pressure Control Solenoid Valve B Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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, and wait for at least 1 second.
4. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0966 indicated?

YES—Go to step 8.

NO—Go to step 5.

5. Select Clutch Pressure Control (Linear) Solenoid Valve B in the Miscellaneous Test Menu, and test A/T clutch pressure control solenoid valve B with the HDS.

Does the HDS indicate NORMAL?

YES—Go to step 6.

NO—Go to step 8.

6. In the Clutch Pressure Control Solenoid Valve Control menu, select A/T Clutch Pressure Control Solenoid Valve B at 1.0 A.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

7. Monitor the OBD status for P0966 in the DTCs MENU with the HDS.

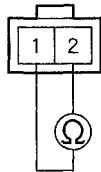
Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve B and the PCM. If the HDS indicates NOT COMPLETED, go to step 5.

8. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
9. Disconnect the A/T clutch pressure control solenoid valve B connector.
10. Measure the resistance between A/T clutch pressure control solenoid valve B connector terminals No. 1 and No. 2.

**A/T CLUTCH PRESSURE CONTROL
SOLENOID VALVE B CONNECTOR**



Terminal side of male terminals

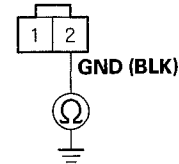
Is there 3—10 Ω ?

YES—Go to step 11.

NO—Replace A/T clutch pressure control solenoid valve B (see page 14-192), then go to step 22.

11. Check for continuity between A/T clutch pressure control solenoid valve B connector terminal No. 2 and body ground.

**A/T CLUTCH PRESSURE CONTROL
SOLENOID VALVE B CONNECTOR**



Wire side of female terminals

Is there continuity?

YES—Go to step 12.

NO—Repair open in the wire between A/T clutch pressure control solenoid valve B and body ground (G101), or repair poor body ground (G101), then go to step 19.

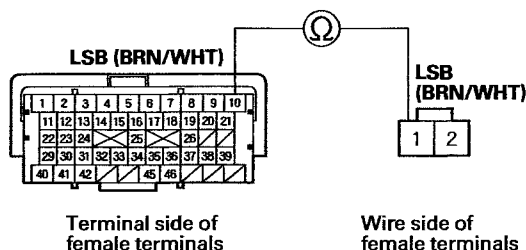
12. Jump the SCS line with the HDS.
13. Disconnect PCM connector B (49P).



14. Check for continuity between PCM connector terminal B10 and A/T clutch pressure control solenoid valve B connector terminal No. 1.

PCM CONNECTOR B (49P)

A/T CLUTCH PRESSURE
CONTROL SOLENOID
VALVE B CONNECTOR



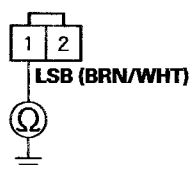
Is there continuity?

YES—Go to step 15.

NO—Repair open in the wire between A/T clutch pressure control solenoid valve B connector terminal No. 1 and PCM connector terminal B10, then go to step 19.

15. Check for continuity between A/T clutch pressure control solenoid valve B connector terminal No. 1 and body ground.

A/T CLUTCH PRESSURE CONTROL
SOLENOID VALVE B CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between PCM connector terminal B10 and A/T clutch pressure control solenoid valve B, then go to step 19.

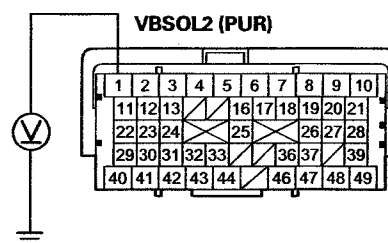
NO—Go to step 16.

16. Disconnect PCM connector A (49P).

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

18. Measure the voltage between PCM connector terminal A1 and body ground.

PCM CONNECTOR A (49P)



Terminal side of female terminals

Is there battery voltage?

YES—Go to step 25.

NO—Check for a blown No. 10 (10 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal A1 and the driver's under-dash fuse/relay box, then go to step 19.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

19. Reconnect all connectors.
20. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
21. Clear the DTC with the HDS.
22. Start the engine, and wait for at least 1 second.
23. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0966 indicated?

YES—Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve B and the PCM, then go to step 1.

NO—Go to step 24.

24. Monitor the OBD status for P0966 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 23, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between A/T clutch pressure control solenoid valve B and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 22.

25. Reconnect all connectors.
26. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
27. Start the engine, and wait for at least 1 second.
28. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0966 indicated?

YES—Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve B and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 27. If the PCM was substituted, go to step 1.

NO—Go to step 29.

29. Monitor the OBD status for P0966 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 28, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between A/T clutch pressure control solenoid valve B and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 27. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 27.



DTC P0967: Problem in A/T Clutch Pressure Control Solenoid Valve B

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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, and wait for at least 1 second.
4. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0967 indicated?

YES—Go to step 8.

NO—Go to step 5.

5. Select Clutch Pressure Control (Linear) Solenoid Valve B in the Miscellaneous Test Menu, and test A/T clutch pressure control solenoid valve B with the HDS.

Does the HDS indicate NORMAL?

YES—Go to step 6.

NO—Go to step 8.

6. In the Clutch Pressure Control Solenoid Valve Control menu, select A/T Clutch Pressure Control Solenoid Valve B at 0.2 A.

7. Monitor the OBD status for P0967 in the DTCs MENU with the HDS.

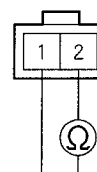
Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve B and the PCM. If the HDS indicates NOT COMPLETED, go to step 5.

8. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
9. Disconnect the A/T clutch pressure control solenoid valve B connector.
10. Measure the resistance between A/T clutch pressure control solenoid valve B connector terminals No. 1 and No. 2.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B CONNECTOR



Terminal side of male terminals

Is there 3—10 Ω?

YES—Go to step 14.

NO—Replace A/T clutch pressure control solenoid valve B (see page 14-192), then go to step 11.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

11. Start the engine, and wait for at least 1 second.

12. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0967 indicated?

YES—Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve B and the PCM, then go to step 1.

NO—Go to step 13.

13. Monitor the OBD status for P0967 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 12, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between A/T clutch pressure control solenoid valve B and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 11.

14. Reconnect all connectors.

15. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).

16. Start the engine, and wait for at least 1 second.

17. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0967 indicated?

YES—Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve B and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 16. If the PCM was substituted, go to step 1.

NO—Go to step 18.

18. Monitor the OBD status for P0967 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 17, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between A/T clutch pressure control solenoid valve B and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 16. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 16.



DTC P0970: Problem in A/T Clutch Pressure Control Solenoid Valve C Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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, and wait for at least 1 second.
4. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0970 indicated?

YES—Go to step 8.

NO—Go to step 5.

5. Select Clutch Pressure Control (Linear) Solenoid Valve C in the Miscellaneous Test Menu, and test A/T clutch pressure control solenoid valve C with the HDS.

Does the HDS indicate NORMAL?

YES—Go to step 6.

NO—Go to step 8.

6. In the Clutch Pressure Control Solenoid Valve Control menu, select A/T Clutch Pressure Control Solenoid Valve C at 1.0 A.

7. Monitor the OBD status for P0970 in the DTCs MENU with the HDS.

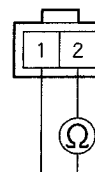
Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve C and the PCM. If the HDS indicates NOT COMPLETED, go to step 5.

8. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
9. Disconnect the A/T clutch pressure control solenoid valve C connector.
10. Measure the resistance between A/T clutch pressure control solenoid valve C connector terminals No. 1 and No. 2.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C CONNECTOR



Terminal side of male terminals

Is there 3—10 Ω ?

YES—Go to step 11.

NO—Replace A/T clutch pressure control solenoid valve C (see page 14-197), then go to step 22.

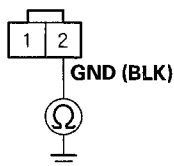
(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

11. Check for continuity between A/T clutch pressure control solenoid valve C connector terminal No. 2 and body ground.

A/T CLUTCH PRESSURE CONTROL
SOLENOID VALVE C CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 12.

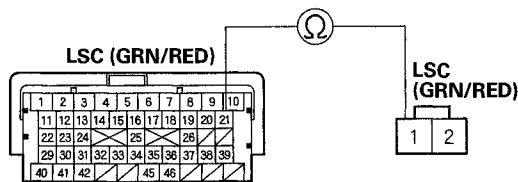
NO—Repair open in the wire between A/T clutch pressure control solenoid valve C and body ground (G101), or repair poor body ground (G101), then go to step 19.

12. Jump the SCS line with the HDS.
13. Disconnect PCM connector B (49P).

14. Check for continuity between PCM connector terminal B21 and A/T clutch pressure control solenoid valve C connector terminal No. 1.

PCM CONNECTOR B (49P)

A/T CLUTCH PRESSURE
CONTROL SOLENOID
VALVE C CONNECTOR



Terminal side of
female terminals

Wire side of
female terminals

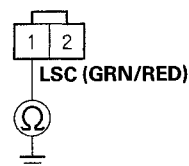
Is there continuity?

YES—Go to step 15.

NO—Repair open in the wire between A/T clutch pressure control solenoid valve C connector terminal No. 1 and PCM connector terminal B21, then go to step 19.

15. Check for continuity between A/T clutch pressure control solenoid valve C connector terminal No. 1 and body ground.

A/T CLUTCH PRESSURE CONTROL
SOLENOID VALVE C CONNECTOR



Wire side of female terminals

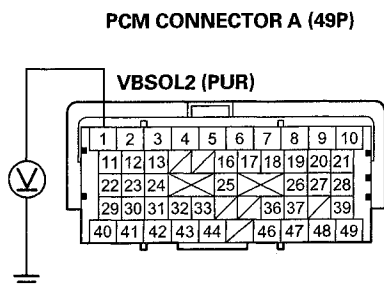
Is there continuity?

YES—Repair short to body ground in the wire between PCM connector terminal B21 and A/T clutch pressure control solenoid valve C, then go to step 19.

NO—Go to step 16.



16. Disconnect PCM connector A (49P).
17. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
18. Measure the voltage between PCM connector terminal A1 and body ground.



Terminal side of female terminals

Is there battery voltage?

YES—Go to step 25.

NO—Check for a blown No. 10 (10 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal A1 and the driver's under-dash fuse/relay box, then go to step 19.

19. Reconnect all connectors.
20. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
21. Clear the DTC with the HDS.
22. Start the engine, and wait for at least 1 second.
23. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0970 indicated?

YES—Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve C and the PCM, then go to step 1.

NO—Go to step 24.

24. Monitor the OBD status for P0970 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 23, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between A/T clutch pressure control solenoid valve C and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 22.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

25. Reconnect all connectors.
26. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
27. Start the engine, and wait for at least 1 second.
28. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0970 indicated?

YES—Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve C and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 27. If the PCM was substituted, go to step 1.

NO—Go to step 29.

29. Monitor the OBD status for P0970 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 28, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between A/T clutch pressure control solenoid valve C and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 27. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 27.

DTC P0971: Problem in A/T Clutch Pressure Control Solenoid Valve C

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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, and wait for at least 1 second.
4. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0971 indicated?

YES—Go to step 8.

NO—Go to step 5.

5. Select Clutch Pressure Control (Linear) Solenoid Valve C in the Miscellaneous Test Menu, and test A/T clutch pressure control solenoid valve C with the HDS.

Does the HDS indicate NORMAL?

YES—Go to step 6.

NO—Go to step 8.

6. In the Clutch Pressure Control Solenoid Valve Control menu, select A/T Clutch Pressure Control Solenoid Valve C at 0.2 A.



7. Monitor the OBD status for P0971 in the DTCs MENU with the HDS.

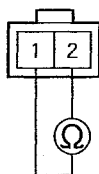
Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve C and the PCM. If the HDS indicates NOT COMPLETED, go to step 5.

8. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
9. Disconnect the A/T clutch pressure control solenoid valve C connector.
10. Measure the resistance between A/T clutch pressure control solenoid valve C connector terminals No. 1 and No. 2.

**A/T CLUTCH PRESSURE CONTROL
SOLENOID VALVE C CONNECTOR**



Terminal side of male terminals

Is there 3—10 Ω?

YES—Go to step 14.

NO—Replace A/T clutch pressure control solenoid valve C (see page 14-197), then go to step 11.

11. Start the engine, and wait for at least 1 second.

12. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0971 indicated?

YES—Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve C and the PCM, then go to step 1.

NO—Go to step 13.

13. Monitor the OBD status for P0971 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 12, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between A/T clutch pressure control solenoid valve C and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 11.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

14. Reconnect all connectors.
15. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
16. Start the engine, and wait for at least 1 second.
17. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0971 indicated?

YES—Check for poor connections or loose terminals between A/T clutch pressure control solenoid valve C and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 16. If the PCM was substituted, go to step 1.

NO—Go to step 18.

18. Monitor the OBD status for P0971 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 17, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between A/T clutch pressure control solenoid valve C and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 16. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 16.

DTC P0973: Short in Shift Solenoid Valve A Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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. With the brake pedal pressed, shift to R, and wait for at least 1 second.
4. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0973 indicated?

YES—Go to step 6.

NO—Go to step 5.

5. Select Shift Solenoid Valve A in the Miscellaneous Test Menu, and test the shift solenoid valve A with the HDS.

Is a clicking sound heard?

YES—Go to step 6.

NO—Go to step 8.

6. Start the engine. With the brake pedal pressed, shift to R, and wait for at least 1 second.
7. Monitor the OBD status for P0973 in the DTCs MENU with the HDS.

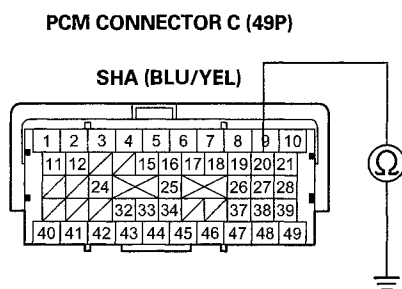
Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check for intermittent short to body ground in the wire between shift solenoid valve A and the PCM. If the HDS indicates NOT COMPLETED, go to step 6.



8. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
9. Jump the SCS line with the HDS.
10. Disconnect PCM connector C (49P).
11. Measure the resistance between PCM connector terminal C20 and body ground.

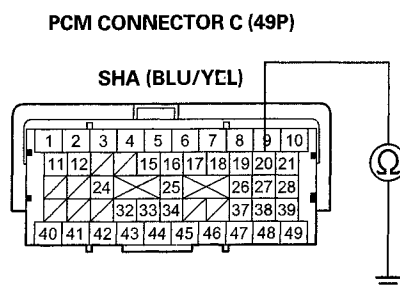


Is there less than 12 Ω ?

YES—Go to step 12.

NO—Go to step 21.

12. Disconnect the shift solenoid wire harness connector.
13. Check for continuity between PCM connector terminal C20 and body ground.



Is there continuity?

YES—Repair short to body ground in the wire between PCM connector terminal C20 and the shift solenoid wire harness connector, then go to step 18.

NO—Go to step 14.

14. Inspect shift solenoid valve A (see page 14-184).

Is shift solenoid valve A OK?

YES—Go to step 21.

NO—Replace shift solenoid valve A or the shift solenoid wire harness (see page 14-184), then go to step 18.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

15. Reconnect all connectors.

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

17. Clear the DTC with the HDS.

18. Start the engine in P, and wait for at least 1 second. With the brake pedal pressed, shift to the R, and wait for at least 1 second, then move the shift lever back into P.

19. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0973 indicated?

YES—Check for intermittent short to body ground in the wire between shift solenoid valve A and the PCM, then go to step 1.

NO—Go to step 20.

20. Monitor the OBD status for P0973 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 19, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for intermittent short to body ground in the wire between shift solenoid valve A and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 18.

21. Reconnect all connectors.

22. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).

23. Start the engine in P, and wait for at least 1 second. With the brake pedal pressed, shift to the R, and wait for at least 1 second, then move the shift lever back into P.

24. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0973 indicated?

YES—Check for intermittent short to body ground in the wire between shift solenoid valve A and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 23. If the PCM was substituted, go to step 1.

NO—Go to step 25.

25. Monitor the OBD status for P0973 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 24, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for intermittent short to body ground in the wire between shift solenoid valve A and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 23. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 23.



DTC P0974: Open in Shift Solenoid Valve A Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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 in P, and wait for at least 1 second.
4. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0974 indicated?

YES—Go to step 8.

NO—Go to step 5.

5. Select Shift Solenoid Valve A in the Miscellaneous Test Menu, and test shift solenoid valve A with the HDS.

Is a clicking sound heard?

YES—Go to step 6.

NO—Go to step 8.

6. Start the engine in P, and wait for at least 1 second.
7. Monitor the OBD status for P0974 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals between shift solenoid valve A and the PCM. If the HDS indicates NOT COMPLETED, go to step 5.

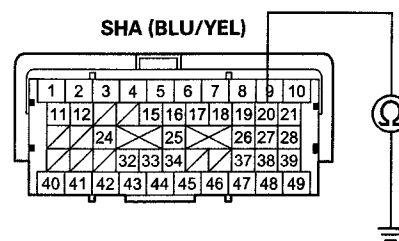
8. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.

9. Jump the SCS line with the HDS.

10. Disconnect PCM connector C (49P).

11. Measure the resistance between PCM connector terminal C20 and body ground.

PCM CONNECTOR C (49P)



Terminal side of female terminals

Is there 12—25 Ω?

YES—Go to step 22.

NO—Go to step 12.

(cont'd)

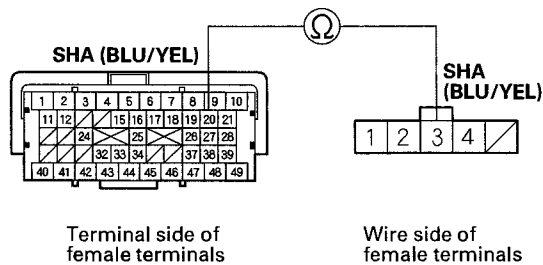
Automatic Transmission

DTC Troubleshooting (cont'd)

12. Disconnect the shift solenoid wire harness connector.
13. Check for continuity between PCM connector terminal C20 and shift solenoid wire harness connector terminal No. 3.

PCM CONNECTOR C (49P)

SHIFT SOLENOID WIRE HARNESS CONNECTOR



Is there continuity?

YES—Go to step 14.

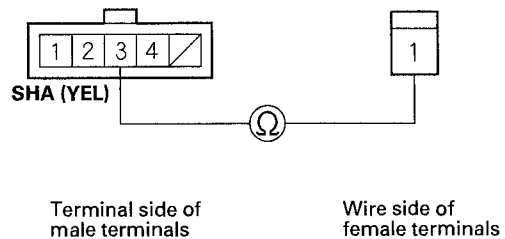
NO—Repair open in the wire between PCM connector terminal C20 and the shift solenoid wire harness connector, then go to step 16.

14. Remove the shift solenoid wire harness (see page 14-184).

15. Check for continuity between shift solenoid wire harness connector terminal No. 3 and the shift solenoid valve A connector terminal.

SHIFT SOLENOID WIRE HARNESS CONNECTOR

SHIFT SOLENOID VALVE A CONNECTOR



Is there continuity?

YES—Replace shift solenoid valve A (see page 14-184), then go to step 19.

NO—Replace the shift solenoid wire harness (see page 14-184), then go to step 19.



16. Reconnect all connectors.
17. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
18. Clear the DTC with the HDS.
19. Start the engine in P, and wait for at least 1 second. With the brake pedal pressed, shift to R, and wait for at least 1 second, then move the shift lever back into P.
20. Check for Pending or Confirmed DTCs with the HDS.
Is DTC P0974 indicated?
YES—Check for poor connections or loose terminals between shift solenoid valve A and the PCM, then go to step 1.
NO—Go to step 21.
21. Monitor the OBD status for P0974 in the DTCs MENU with the HDS.
Does the HDS indicate PASSED?
YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 20, go to the indicated DTC's troubleshooting. ■
NO—If the HDS indicates FAILED, check for poor connections or loose terminals between shift solenoid valve A and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 19.

22. Reconnect all connectors.
23. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
24. Start the engine in P, and wait for at least 1 second. With the brake pedal pressed, shift to R, and wait for at least 1 second, then move the shift lever back into P.
25. Check for Pending or Confirmed DTCs with the HDS.
Is DTC P0974 indicated?
YES—Check for poor connections or loose terminals between shift solenoid valve A and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 24. If the PCM was substituted, go to step 1.
NO—Go to step 26.
26. Monitor the OBD status for P0974 in the DTCs MENU with the HDS.
Does the HDS indicate PASSED?
YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 25, go to the indicated DTC's troubleshooting. ■
NO—If the HDS indicates FAILED, check for poor connections or loose terminals between shift solenoid valve A and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 24. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 24.

Automatic Transmission

DTC Troubleshooting (cont'd)

DTC P0976: Short in Shift Solenoid Valve B Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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 in P, and wait for at least 1 second.
4. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0976 indicated?

YES—Go to step 8.

NO—Go to step 5.

5. Select Shift Solenoid Valve B in the Miscellaneous Test Menu, and test shift solenoid valve B with the HDS.

Is a clicking sound heard?

YES—Go to step 6.

NO—Go to step 8.

6. Start the engine in P, and wait for at least 1 second.
7. Monitor the OBD status for P0976 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check for intermittent short to body ground in the wire between shift solenoid valve B and the PCM. If the HDS indicates NOT COMPLETED, go to step 5.

8. Check for a blown No. 13 (15 A) fuse in the driver's under-dash fuse/relay box.

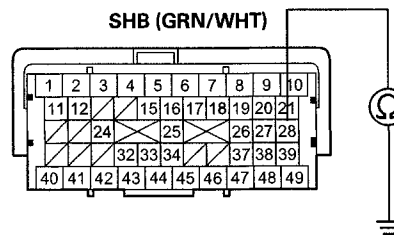
Is the No. 13 (15 A) fuse OK?

YES—Go to step 9.

NO—Replace the fuse, then go to step 20. If the fuse blows again, repair short in the No. 13 (15 A) fuse circuit. Then go to step 9.

9. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
10. Jump the SCS line with the HDS.
11. Disconnect PCM connector C (49P).
12. Measure the resistance between PCM connector terminal C28 and body ground.

PCM CONNECTOR C (49P)



Terminal side of female terminals

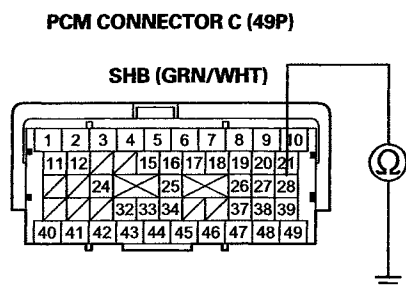
Is there less than 12 Ω ?

YES—Go to step 13.

NO—Go to step 25.



13. Disconnect the shift solenoid wire harness connector.
14. Check for continuity between PCM connector terminal C28 and body ground.



Terminal side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between PCM connector terminal C28 and the shift solenoid wire harness connector, then go to step 20.

NO—Go to step 15.

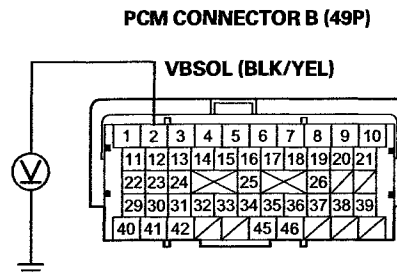
15. Inspect shift solenoid valve B (see page 14-184).

Is shift solenoid valve B OK?

YES—Go to step 16.

NO—Replace shift solenoid valve B or the shift solenoid wire harness (see page 14-184), then go to step 22.

16. Disconnect PCM connector B (49P).
17. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
18. Measure the voltage between PCM connector terminal B2 and body ground.



Terminal side of female terminals

Is there battery voltage?

YES—Go to step 25.

NO—Repair open in the wire between PCM connector terminal B2 and the driver's under-dash fuse/relay box, then go to step 19.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

19. Reconnect all connectors.

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

21. Clear the DTC with the HDS.

22. Start the engine in P, wait for at least 1 second, then test-drive the vehicle in D. Drive the vehicle in 3rd or 4th gear for at least 1 second. Slow down, and stop the wheels.

23. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0976 indicated?

YES—Check for intermittent short to body ground in the wire between shift solenoid valve B and the PCM, then go to step 1.

NO—Go to step 24.

24. Monitor the OBD status for P0976 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 23, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for intermittent short to body ground in the wire between shift solenoid valve B and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 22.

25. Reconnect all connectors.

26. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).

27. Start the engine in P, wait for at least 1 second, then test-drive the vehicle in D. Drive the vehicle in 3rd or 4th gear for at least 1 second. Slow down, and stop the wheels.

28. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0976 indicated?

YES—Check for intermittent short to body ground in the wire between shift solenoid valve B and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 27. If the PCM was substituted, go to step 1.

NO—Go to step 29.

29. Monitor the OBD status for P0976 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 28, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for intermittent short to body ground in the wire between shift solenoid valve B and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 27. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 27.



DTC P0977: Open in Shift Solenoid Valve B Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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 in 3rd or 4th gear in D for at least 1 second. Slow down, and stop the wheels.
4. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0977 indicated?

YES—Go to step 8.

NO—Go to step 5.

5. Select Shift Solenoid Valve B in the Miscellaneous Test Menu, and test shift solenoid valve B with the HDS.

Is a clicking sound heard?

YES—Go to step 6.

NO—Go to step 8.

6. Test-drive the vehicle in 3rd or 4th gear in D for at least 1 second. Slow down, and stop the wheels.
7. Monitor the OBD status for P0977 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals between shift solenoid valve B and the PCM. If the HDS indicates NOT COMPLETED, go to step 5.

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

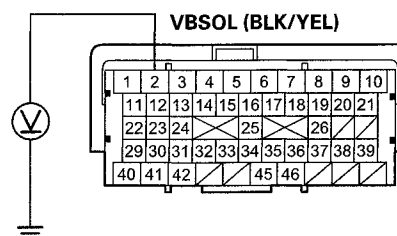
9. Jump the SCS line with the HDS.

10. Disconnect PCM connectors B (49P) and C (49P).

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

12. Measure the voltage between PCM connector terminal B2 and body ground.

PCM CONNECTOR B (49P)



Terminal side of female terminals

Is there battery voltage?

YES—Go to step 13.

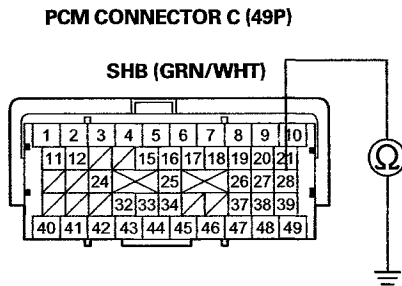
NO—Check for a blown No.13 (15 A) fuse in the driver's under-dash fuse/relay box. If the fuse is blown, replace it. If it blows again, repair short in the No. 13 (15A) driver's under-dash fuse circuit. If the fuse OK, repair open in the wires between PCM connector terminal B2 and the driver's under-dash fuse/relay box, then go to step 19.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

13. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
14. Measure the resistance between PCM connector terminal C28 and body ground.



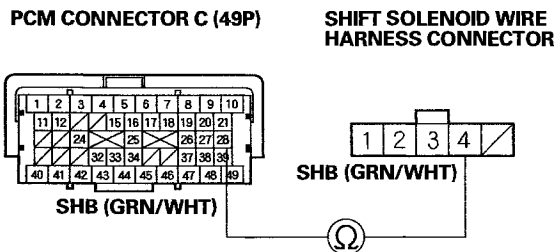
Terminal side of female terminals

Is there 12–25 Ω?

YES—Go to step 25.

NO—Go to step 15.

15. Disconnect the shift solenoid wire harness connector.
16. Check for continuity between PCM connector terminal C28 and shift solenoid wire harness connector terminal No. 4.



Terminal side of female terminals

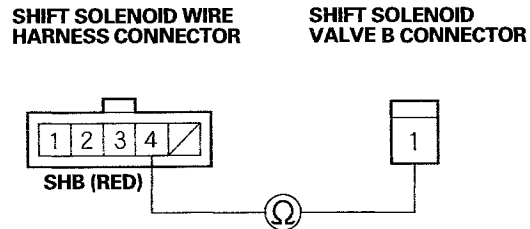
Wire side of female terminals

Is there continuity?

YES—Go to step 17.

NO—Repair open in the wire between PCM connector terminal C28 and the shift solenoid wire harness connector, then go to step 19.

17. Remove the shift solenoid wire harness (see page 14-184).
18. Check for continuity between shift solenoid wire harness connector terminal No. 4 and the shift solenoid valve B connector terminal.



Terminal side of male terminals

Wire side of female terminals

Is there continuity?

YES—Replace shift solenoid valve B (see page 14-184), then go to step 22.

NO—Replace the shift solenoid wire harness (see page 14-184), then go to step 22.



19. Reconnect all connectors.
20. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
21. Clear the DTC with the HDS.
22. Start the engine in P, wait for at least 1 second, then test-drive the vehicle in D. Drive the vehicle in 3rd or 4th gear for at least 1 second. Slow down, and stop the wheels.
23. Check for Pending or Confirmed DTCs with the HDS.
Is DTC P0977 indicated?
YES—Check for poor connections or loose terminals between shift solenoid valve B and the PCM, then go to step 1.
NO—Go to step 24.
24. Monitor the OBD status for P0977 in the DTCs MENU with the HDS.
Does the HDS indicate PASSED?
YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 23, go to the indicated DTC's troubleshooting. ■
NO—If the HDS indicates FAILED, check for poor connections or loose terminals between shift solenoid valve B and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 22.

25. Reconnect all connectors.
26. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
27. Start the engine in P, wait for at least 1 second, then test-drive the vehicle in D. Drive the vehicle in 3rd or 4th gear for at least 1 second. Slow down, and stop the wheels.
28. Check for Pending or Confirmed DTCs with the HDS.
Is DTC P0977 indicated?
YES—Check for poor connections or loose terminals between shift solenoid valve B and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 27. If the PCM was substituted, go to step 1.
NO—Go to step 29.
29. Monitor the OBD status for P0977 in the DTCs MENU with the HDS.
Does the HDS indicate PASSED?
YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 28, go to the indicated DTC's troubleshooting. ■
NO—If the HDS indicates FAILED, check for poor connections or loose terminals between shift solenoid valve B and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 27. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 27.

Automatic Transmission

DTC Troubleshooting (cont'd)

DTC P0979: Short in Shift Solenoid Valve C Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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, and test-drive the vehicle in 1st gear in D for at least 1 second.
4. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0979 indicated?

YES—Go to step 8.

NO—Go to step 5.

5. Select Shift Solenoid Valve C in the Miscellaneous Test Menu, and test shift solenoid valve C with the HDS.

Is a clicking sound heard?

YES—Go to step 6.

NO—Go to step 8.

6. Start the engine, and test-drive the vehicle in 1st gear in D for at least 1 second.
7. Monitor the OBD status for P0979 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check for intermittent short to body ground in the wire between shift solenoid valve C and the PCM. If the HDS indicates NOT COMPLETED, go to step 5.

8. Check for a blown No. 13 (15 A) fuse in the driver's under-dash fuse/relay box.

Is the No. 13 (15 A) fuse OK?

YES—Go to step 9.

NO—Replace the fuse, then go to step 20. If the fuse blows again, repair short in the No. 13 (15 A) fuse circuit. Then go to step 9.

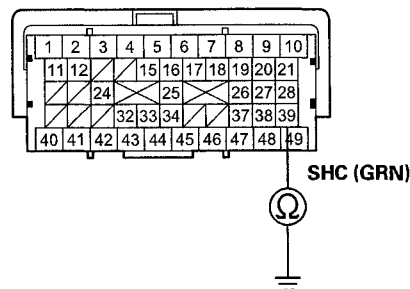
9. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.

10. Jump the SCS line with the HDS.

11. Disconnect PCM connector C (49P).

12. Measure the resistance between PCM connector terminal C39 and body ground.

PCM CONNECTOR C (49P)



Terminal side of female terminals

Is there less than 12 Ω ?

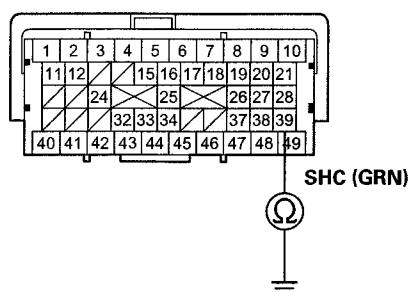
YES—Go to step 13.

NO—Go to step 25.



13. Disconnect the shift solenoid wire harness connector.
14. Check for continuity between PCM connector terminal C39 and body ground.

PCM CONNECTOR C (49P)



Terminal side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between PCM connector terminal C39 and the shift solenoid wire harness connector, then go to step 20.

NO—Go to step 15.

15. Inspect shift solenoid valve C (see page 14-184).

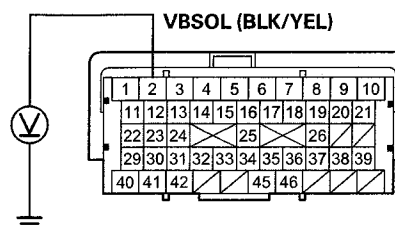
Is shift solenoid valve C OK?

YES—Go to step 16.

NO—Replace shift solenoid valve C or the shift solenoid wire harness (see page 14-184), then go to step 22.

16. Disconnect PCM connector B (49P).
17. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
18. Measure the voltage between PCM connector terminal B2 and body ground.

PCM CONNECTOR B (49P)



Terminal side of female terminals

Is there battery voltage?

YES—Go to step 25.

NO—Repair open in the wire between PCM connector terminal B2 and the driver's under-dash fuse/relay box, then go to step 19.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

19. Reconnect all connectors.

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

21. Clear the DTC with the HDS.

22. Start the engine in P, wait for at least 1 second, then test-drive the vehicle in D. Drive the vehicle in 1st gear for at least 1 second. Slow down, and stop the wheels.

23. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0979 indicated?

YES—Check for intermittent short to body ground in the wire between shift solenoid valve C and the PCM, then go to step 1.

NO—Go to step 24.

24. Monitor the OBD status for P0979 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 23, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for intermittent short to body ground in the wire between shift solenoid valve C and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 22.

25. Reconnect all connectors.

26. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).

27. Start the engine in P, wait for at least 1 second, then test-drive the vehicle in D. Drive the vehicle in 1st gear for at least 1 second. Slow down, and stop the wheels.

28. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0979 indicated?

YES—Check for intermittent short to body ground in the wire between shift solenoid valve C and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 27. If the PCM was substituted, go to step 1.

NO—Go to step 29.

29. Monitor the OBD status for P0979 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 28, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for shift solenoid valve C and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 27. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 27.



DTC P0980: Open in Shift Solenoid Valve C Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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 in P, and wait for at least 1 second.
4. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0980 indicated?

YES—Go to step 8.

NO—Go to step 5.

5. Select Shift Solenoid Valve C in the Miscellaneous Test Menu, and test shift solenoid valve C with the HDS.

Is a clicking sound heard?

YES—Go to step 6.

NO—Go to step 8.

6. Start the engine in P, and wait for at least 1 second.
7. Monitor the OBD status for P0980 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals between shift solenoid valve C and the PCM. If the HDS indicates NOT COMPLETED, go to step 5.

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

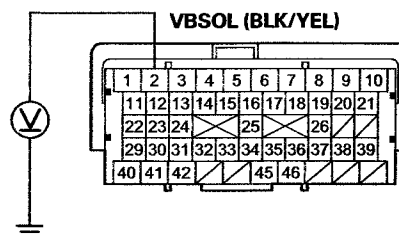
9. Jump the SCS line with the HDS.

10. Disconnect PCM connectors B (49P) and C (49P).

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

12. Measure the voltage between PCM connector terminal B2 and body ground.

PCM CONNECTOR B (49P)



Terminal side of female terminals

Is there battery voltage?

YES—Go to step 13.

NO—Check for a blown No.13 (15 A) fuse in the driver's under-dash fuse/relay box. If the fuse is blown, replace it. If it blows again, repair short in the No. 13 (15A) driver's under-dash fuse circuit. If the fuse OK, repair open in the wires between PCM connector terminal B2 and the driver's under-dash fuse/relay box, then go to step 19.

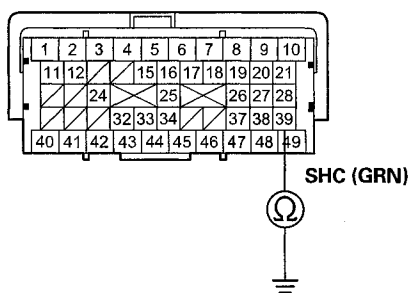
(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

13. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
14. Measure the resistance between PCM connector terminals C39 and B41 or C41.

PCM CONNECTOR C (49P)



Terminal side of female terminals

Is there 12—25 Ω ?

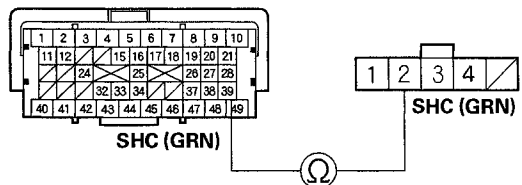
YES—Go to step 25.

NO—Go to step 15.

15. Disconnect the shift solenoid wire harness connector.
16. Check for continuity between PCM connector terminal C39 and shift solenoid wire harness connector terminal No. 2.

PCM CONNECTOR C (49P)

SHIFT SOLENOID WIRE HARNESS CONNECTOR



Terminal side of female terminals

Wire side of female terminals

Is there continuity?

YES—Go to step 17.

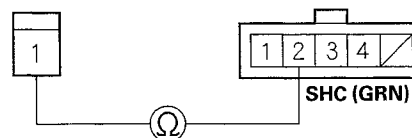
NO—Repair open in the wire between PCM connector terminal C39 and the shift solenoid wire harness connector, then go to step 19.

17. Remove the shift solenoid wire harness (see page 14-184).

18. Check for continuity between shift solenoid wire harness connector terminal No. 2 and the shift solenoid valve C connector terminal.

SHIFT SOLENOID VALVE C CONNECTOR

SHIFT SOLENOID WIRE HARNESS CONNECTOR



Wire side of female terminals

Terminal side of male terminals

Is there continuity?

YES—Replace shift solenoid valve C (see page 14-184), then go to step 22.

NO—Replace the shift solenoid wire harness (see page 14-184), then go to step 22.



19. Reconnect all connectors.
20. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
21. Clear the DTC with the HDS.
22. Start the engine in P, wait for at least 1 second, then test-drive the vehicle in D. Drive the vehicle in 1st gear for at least 1 second. Slow down, and stop the wheels.
23. Check for Pending or Confirmed DTCs with the HDS.
Is DTC P0980 indicated?
YES—Check for poor connections or loose terminals between shift solenoid valve C and the PCM, then go to step 1.
NO—Go to step 24.
24. Monitor the OBD status for P0980 in the DTC MENU with the HDS.
Does the HDS indicate PASSED?
YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 23, go to the indicated DTC's troubleshooting. ■
NO—If the HDS indicates FAILED, check for poor connections or loose terminals between shift solenoid valve C and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 22.

25. Reconnect all connectors.
26. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
27. Start the engine in P, wait for at least 1 second, then test-drive the vehicle in D. Drive the vehicle in 1st gear for at least 1 second. Slow down, and stop the wheels.
28. Check for Pending or Confirmed DTCs with the HDS.
Is DTC P0980 indicated?
YES—Check for poor connections or loose terminals between shift solenoid valve C and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 27. If the PCM was substituted, go to step 1.
NO—Go to step 29.
29. Monitor the OBD status for P0980 in the DTCs MENU with the HDS.
Does the HDS indicate PASSED?
YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 28, go to the indicated DTC's troubleshooting. ■
NO—If the HDS indicates FAILED, check for poor connections or loose terminals between shift solenoid valve C and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 27. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 27.

Automatic Transmission

DTC Troubleshooting (cont'd)

DTC P0982: Short in Shift Solenoid Valve D Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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 in P, and wait for at least 1 second.
4. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0982 indicated?

YES—Go to step 8.

NO—Go to step 5.

5. Select Shift Solenoid Valve D in the Miscellaneous Test Menu, and test shift solenoid valve D with the HDS.

Is a clicking sound heard?

YES—Go to step 6.

NO—Go to step 8.

6. Start the engine in P, and wait for at least 1 second.
7. Monitor the OBD status for P0982 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check for intermittent short to body ground in the wire between shift solenoid valve E and the PCM. If the HDS indicates NOT COMPLETED, go to step 5.

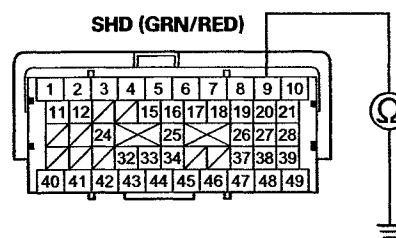
8. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.

9. Jump the SCS line with the HDS.

10. Disconnect PCM connector C (49P).

11. Measure the resistance between PCM connector terminal C9 and body ground.

PCM CONNECTOR C (49P)



Terminal side of female terminals

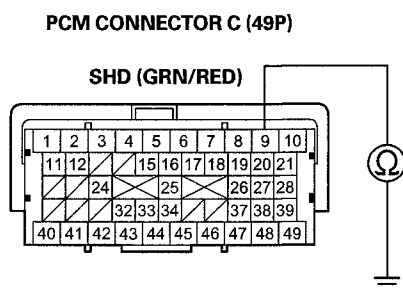
Is there less than 12 Ω?

YES—Go to step 12.

NO—Go to step 21.



12. Disconnect the shift solenoid wire harness connector.
13. Check for continuity between PCM connector terminal C9 and body ground.



Is there continuity?

YES—Repair short to body ground in the wire between PCM connector terminal C9 and the shift solenoid wire harness connector, then go to step 15.

NO—Go to step 14.

14. Inspect shift solenoid valve D (see page 14-184).

Is shift solenoid valve D OK?

YES—Go to step 21.

NO—Replace shift solenoid valve D or the shift solenoid wire harness (see page 14-184), then go to step 18.

15. Reconnect all connectors.

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

17. Clear the DTC with the HDS.

18. Start the engine in P, and wait for at least 1 second.
With the brake pedal pressed, shift to the N, and wait for at least 1 second.

19. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0982 indicated?

YES—Check for intermittent short to body ground in the wire between shift solenoid valve D and the PCM, then go to step 1.

NO—Go to step 20.

20. Monitor the OBD status for P0982 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 19, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for intermittent short to body ground in the wire between shift solenoid valve D and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 18.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

21. Reconnect all connectors.
22. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
23. Start the engine in P, and wait for at least 1 second. With the brake pedal pressed, shift to the N, and wait for at least 1 second.
24. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0982 indicated?

YES—Check for intermittent short to body ground in the wire between shift solenoid valve D and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 23. If the PCM was substituted, go to step 1.

NO—Go to step 25.

25. Monitor the OBD status for P0982 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 24, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for intermittent short to body ground in the wire between shift solenoid valve D and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 23. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 23.

DTC P0983: Open in Shift Solenoid Valve D Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

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 in P. With the brake pedal pressed, shift to N, and wait for at least 1 second.
4. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0983 indicated?

YES—Go to step 8.

NO—Go to step 5.

5. Select Shift Solenoid Valve D in the Miscellaneous Test Menu, and test shift solenoid valve D with the HDS.

Is a clicking sound heard?

YES—Go to step 6.

NO—Go to step 8.

6. Start the engine in P. With the brake pedal pressed, shift to N, and wait for at least 1 second.
7. Monitor the OBD status for P0983 in the DTCs MENU with the HDS.

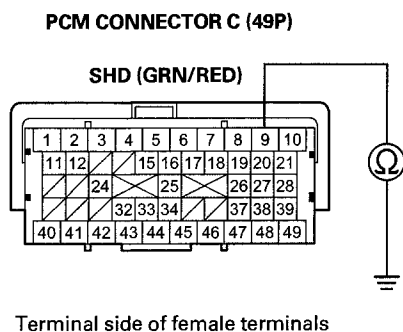
Does the HDS indicate FAILED?

YES—Go to step 8.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. Check for poor connections or loose terminals between shift solenoid valve D and the PCM. If the HDS indicates NOT COMPLETED, go to step 5.



8. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
9. Jump the SCS line with the HDS.
10. Disconnect PCM connector C (49P).
11. Measure the resistance between PCM connector terminal C9 and body ground.



Is there 12–25 Ω?

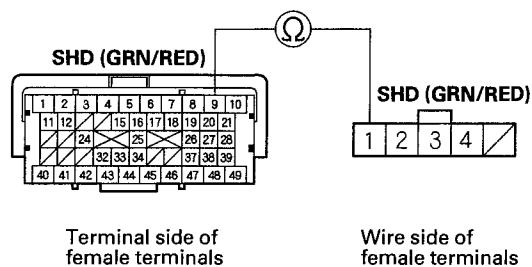
YES—Go to step 22.

NO—Go to step 12.

12. Disconnect the shift solenoid wire harness connector.
13. Check for continuity between PCM connector terminal C9 and shift solenoid wire harness connector terminal No. 1.

PCM CONNECTOR C (49P)

SHIFT SOLENOID WIRE HARNESS CONNECTOR



Is there continuity?

YES—Go to step 14.

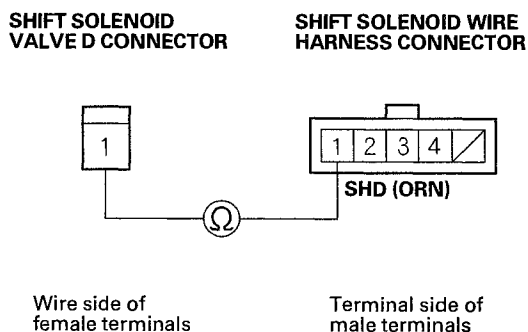
NO—Repair open in the wire between PCM connector terminal C9 and the shift solenoid wire harness connector, then go to step 16.

(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

14. Remove the shift solenoid wire harness (see page 14-184).
15. Check for continuity between shift solenoid wire harness connector terminal No. 1 and the shift solenoid valve D connector terminal.



Is there continuity?

YES—Replace shift solenoid valve D (see page 14-184), then go to step 19.

NO—Replace the shift solenoid wire harness (see page 14-184), then go to step 19.

16. Reconnect all connectors.
17. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
18. Clear the DTC with the HDS.
19. Start the engine in P, and wait for at least 1 second. With the brake pedal pressed, shift to the N, and wait for at least 1 second.
20. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0983 indicated?

YES—Check for poor connections or loose terminals between shift solenoid valve D and the PCM, then go to step 1.

NO—Go to step 21.

21. Monitor the OBD status for P0983 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 20, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between shift solenoid valve D and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 19.



22. Reconnect all connectors.
23. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
24. Start the engine in P, and wait for at least 1 second. With the brake pedal pressed, shift to the N, and wait for at least 1 second.
25. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P0983 indicated?

YES—Check for poor connections or loose terminals between shift solenoid valve D and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 24. If the PCM was substituted, go to step 1.

NO—Go to step 26.

26. Monitor the OBD status for P0983 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 25, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between shift solenoid valve D and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 24. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 24.

DTC P1717: Open in Transmission Range Switch ATPRVS Switch Circuit

NOTE:

- Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Shift to R, and verify the A/T R Switch signal with the HDS in the A/T Data List.

Is the A/T R Switch ON?

YES—Go to step 3.

NO—Check for proper transmission range switch installation (see page 14-260), adjust the shift cable (see page 14-253), then recheck. ■

3. Check the Reverse Switch (ATPRVS) signal with the HDS.

Is the Reverse Switch (ATPRVS) ON?

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

NO—Go to step 4.

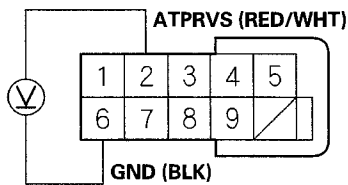
(cont'd)

Automatic Transmission

DTC Troubleshooting (cont'd)

4. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
5. Disconnect the transmission range switch connector.
6. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
7. Measure the voltage between transmission range switch connector terminals No. 2 and No. 6.

TRANSMISSION RANGE SWITCH CONNECTOR



Wire side of female terminals

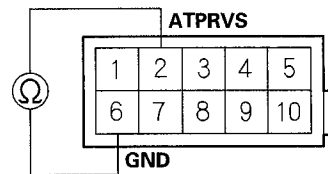
Is there more than 5.0 V?

YES—Go to step 8.

NO—Repair open in the wire between PCM connector terminal C19 and the transmission range switch, then go to step 9.

8. Check for continuity between the No. 2 and No. 6 terminals at the transmission range switch, when the shift lever is in P, R, and N, and no continuity when the shift lever is in D and S.

TRANSMISSION RANGE SWITCH CONNECTOR



Terminal side of male terminals

Is there continuity when the shift lever is in P, R, and N, and no continuity when the shift lever is in D and S?

YES—Go to step 15.

NO—Replace the transmission range switch (see page 14-260), then go to step 12.



9. Reconnect all connectors.
10. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
11. Clear the DTC with the HDS.
12. Start the engine in P. With the brake pedal pressed, shift to R, and wait for at least 2 seconds in R, then shift to N.
13. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P1717 indicated?

YES—Check for poor connections or loose terminals between the transmission range switch and the PCM, then go to step 1.

NO—Go to step 14.
14. Monitor the OBD status for P1717 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. If any other Pending or Confirmed DTCs were indicated in step 13, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between the transmission range switch and the PCM, then go to step 1. If the HDS indicates NOT COMPLETED, go to step 12.

15. Reconnect all connectors.
16. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
17. Start the engine in P. With the brake pedal pressed, shift to R, and wait for at least 2 seconds in R, then shift to N.
18. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P1717 indicated?

YES—Check for poor connections or loose terminals between the transmission range switch and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 17. If the PCM was substituted, go to step 1.

NO—Go to step 19.
19. Monitor the OBD status for P1717 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other Pending or Confirmed DTCs were indicated in step 18, go to the indicated DTC's troubleshooting. ■

NO—If the HDS indicates FAILED, check for poor connections or loose terminals between the transmission range switch and the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 17. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 17.

Automatic Transmission

DTC Troubleshooting (cont'd)

DTC P1743: Problem in Shift Control System;
Shift Valve E Stuck OFF

DTC P1744: Problem in Shift Control System;
Shift Valve E Stuck ON

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see step 3 on page 14-203) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

Does the strainer have metal debris or excessive clutch material?

YES—Replace the transmission, then go to step 9.

NO—Replace the ATF (see step 5 on page 14-204), then go to step 4.

4. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
5. Clear the DTC with the HDS.
6. Test-drive the vehicle with the shift lever in D, and let the transmission shift through all five gears. Slow down, and stop the wheels.
7. Monitor the OBD status for P1743 or P1744 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Repair shift valve E in the main valve body (see page 14-298), replace the main valve body, or replace the transmission, then go to step 9.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. If the HDS indicates NOT COMPLETED, go to step 6.

8. Clear the DTC with the HDS.

9. Test-drive the vehicle with the shift lever in D, and let the transmission shift through all five gears. Slow down, and stop the wheels.

10. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P1743 or P1744 indicated?

YES—Go to step 5.

NO—Go to step 11.

11. Monitor the OBD status for P1743 or P1744 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. ■

NO—If the HDS indicates FAILED, go to step 8. If the HDS indicates NOT COMPLETED, go to step 9.



DTC P1745: Problem in Shift Control System; Servo Control Valve Stuck OFF or Servo Valve Stuck OFF

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see step 3 on page 14-203) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

Does the strainer have metal debris or excessive clutch material?

YES—Replace the transmission, then go to step 9.

NO—Replace the ATF (see step 5 on page 14-204), then go to step 4.

4. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
5. Clear the DTC with the HDS.
6. Test-drive the vehicle with the shift lever in D, and let the transmission shift through all five gears. Slow down, and stop the wheels.
7. Monitor the OBD status for P1745 in the DTCs MENU with the HDS.

Does the HDS indicate FAILED?

YES—Repair the servo control valve in the main valve body (see page 14-298), the servo valve in the regulator valve body (see page 14-301), or replace the main valve body, the regulator valve body, or replace the transmission, then go to step 9.

NO—If the HDS indicates PASSED, intermittent failure, the system is OK at this time. If the HDS indicates NOT COMPLETED, go to step 4.

8. Clear the DTC with the HDS.

9. Test-drive the vehicle with the shift lever in D, and let the transmission shift through all five gears. Slow down, and stop the wheels.

10. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P1745 indicated?

YES—Go to step 5.

NO—Go to step 11.

11. Monitor the OBD status for P1745 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—Troubleshooting is complete. ■

NO—If the HDS indicates FAILED, go to step 8. If the HDS indicates NOT COMPLETED, go to step 9.

Automatic Transmission

DTC Troubleshooting (cont'd)

DTC P1780: Problem in Shift Control System

NOTE: Before you troubleshoot, record all freeze data and any on-board snapshot with the HDS, and review General Troubleshooting Information (see page 14-4).

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 with the shift lever in D, and let the transmission shift through all five gears. Slow down, and stop the wheels.

4. Check for Pending or Confirmed DTCs with the HDS.

NOTE: DTC P1780 means there is one or more A/T DTCs stored for the shift control system.

Are there other DTCs?

YES—Refer to the troubleshooting as indicated by the DTC.■

NO—Go to step 5.

5. Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7).
6. Test-drive the vehicle with the shift lever in D, and let the transmission shift through all five gears. Slow down, and stop the wheels.

7. Check for Pending or Confirmed DTCs with the HDS.

Is DTC P1780 indicated?

YES—If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 6. If the PCM was substituted, go to step 1.

NO—Go to step 8.

8. Monitor the OBD status for P1780 in the DTCs MENU with the HDS.

Does the HDS indicate PASSED?

YES—If the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-282). If any other DTCs were indicated in step 7, go to the indicated DTC's troubleshooting.■

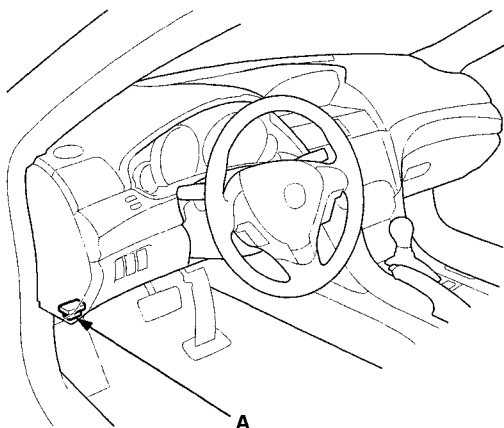
NO—If the HDS indicates FAILED, check for poor connections and loose terminals at the PCM. If the PCM was updated, substitute a known-good PCM (see page 11-7), then go to step 6. If the PCM was substituted, go to step 1. If the HDS indicates NOT COMPLETED, go to step 6.



Road Test

1. With SH-AWD: Apply the parking brake, and block all four wheels.

Without SH-AWD: Apply the parking brake, and block both rear wheels.
2. Warm up the engine to normal operating temperature (the radiator fan comes on).
3. Shift to the D while pressing the brake pedal. Press the accelerator pedal, and release it suddenly; the engine should not stall.
4. Repeat step 3 in all shift lever positions.
5. Connect the HDS to the DLC (A) located under the driver's side of the dashboard.



6. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
7. Make sure the HDS communicates with the PCM, and go to the A/T Data List. If it does not, go to the DLC circuit troubleshooting (see page 11-258).

8. Prepare the HDS to take a HIGH SPEED SNAPSHOT (refer to the HDS user's guide for more details if needed):

- Select High Speed icon.
- Select these parameters:
 - Vehicle Speed
 - Output Shaft (Countershaft) Speed (rpm)
 - Input Shaft (Mainshaft) Speed (rpm)
 - Engine Speed
 - TP Sensor
 - APP Sensor A (V)
 - ETR
 - Battery Voltage
 - Shift Control
 - Brake Switch
- Set the Trigger Type to Parameter.
- Adjust the Parameter setting to APP Sensor A above 1.65 V (with SH-AWD), 1.4 V (without SH-AWD).
- Set the recording time to 60 seconds.
- Set the trigger point to -30 seconds.

9. Find a suitable level road. When you are ready to do the test, press OK with the HDS.
10. Monitor the HDS, and accelerate quickly until APP Sensor A reads 1.75 V (with SH-AWD), 1.5 V (without SH-AWD). Maintain a steady throttle until the transmission shifts to 5th gear, then slow the vehicle and come to a stop.
11. Save the snapshot if the entire event was recorded, or increase the recording time setting as necessary, and repeat step 10.
12. Adjust the parameter setting to 2.4 V (with SH-AWD), 2.6 V (without SH-AWD). Test-drive the vehicle again. While monitoring the HDS, accelerate quickly until APP Sensor A reads 2.5 V (with SH-AWD), 2.7 V (without SH-AWD). Maintain a steady throttle until the transmission shifts to 5th gear (or a reasonable speed), then slow the vehicle and come to a stop.
13. Save the snapshot if the entire event was recorded, or increase the recording time setting as necessary, and repeat step 12.
14. Accelerate quickly until the accelerator pedal is to the floor. Maintain a steady pedal until the transmission shifts to 4th gear, then slow to a stop, and save the snapshot.

(cont'd)

Automatic Transmission

Road Test (cont'd)

15. Review each snapshot individually, and compare the Shift Command, the APP Sensor A voltage, and the Vehicle Speed to following the table:

Upshift: D Position (with SH-AWD)

APP Sensor A voltage: 1.75 V	
1st → 2nd	7–11 mph (13–17 km/h)
2nd → 3rd	13–17 mph (21–27 km/h)
3rd → 4th	22–28 mph (36–44 km/h)
4th → 5th	41–49 mph (67–77 km/h)
Lock-up ON	47–53 mph (76–84 km/h)
APP Sensor A voltage: 2.5 V	
1st → 2nd	31–35 mph (50–56 km/h)
2nd → 3rd	39–47 mph (63–73 km/h)
3rd → 4th	69–77 mph (110–122 km/h)
4th → 5th	69–77 mph (110–122 km/h)
Lock-up ON	65–73 mph (154–170 km/h)
Fully-opened throttle	
APP Sensor A voltage: 4.5 V	
1st → 2nd	33–39 mph (53–63 km/h)
2nd → 3rd	62–70 mph (99–111 km/h)
3rd → 4th	95–105 mph (153–167 km/h)
Lock-up ON	114–124 mph (192–208 km/h)

Downshift: D Position (with SH-AWD)

APP Sensor A voltage: 1.75 V	
Lock-up OFF	44–50 mph (71–79 km/h)
5th → 4th	35–41 mph (55–65 km/h)
4th → 3rd	15–19 mph (24–30 km/h)
3rd → 1st	5–9 mph (8–14 km/h)
APP Sensor A voltage: 2.5 V	
Lock-up OFF	65–73 mph (104–116 km/h)
Fully-opened throttle	
APP Sensor A voltage: 4.5 V	
Lock-up OFF	114–124 mph (182–198 km/h)
5th → 4th	128–140 mph (206–224 km/h)
4th → 3rd	81–91 mph (131–145 km/h)
3rd → 2nd	51–59 mph (82–94 km/h)
2nd → 1st	25–31 mph (40–50 km/h)

Upshift: D Position (without SH-AWD)

APP Sensor A voltage: 1.5 V	
1st → 2nd	7–11 mph (13–17 km/h)
2nd → 3rd	14–18 mph (22–28 km/h)
3rd → 4th	22–28 mph (36–44 km/h)
4th → 5th	40–48 mph (66–76 km/h)
Lock-up ON	44–50 mph (71–79 km/h)
APP Sensor A voltage: 2.7 V	
1st → 2nd	19–23 mph (30–36 km/h)
2nd → 3rd	35–41 mph (55–65 km/h)
3rd → 4th	50–58 mph (81–93 km/h)
4th → 5th	71–79 mph (114–126 km/h)
Lock-up ON	84–94 mph (135–149 km/h)
Fully-opened throttle	
APP Sensor A voltage: 4.5 V	
1st → 2nd	35–41 mph (56–66 km/h)
2nd → 3rd	63–71 mph (101–113 km/h)
3rd → 4th	95–105 mph (153–167 km/h)
Lock-up ON	119–131 mph (192–208 km/h)

Downshift: D Position (without SH-AWD)

APP Sensor A voltage: 1.5 V	
Lock-up OFF	42–48 mph (68–76 km/h)
5th → 4th	35–41 mph (55–65 km/h)
4th → 3rd	16–20 mph (26–32 km/h)
3rd → 1st	6–10 mph (10–16 km/h)
APP Sensor A voltage: 2.7 V	
Lock-up OFF	62–70 mph (100–112 km/h)
Fully-opened throttle	
APP Sensor A voltage: 4.5 V	
Lock-up OFF	114–124 mph (182–198 km/h)
5th → 4th	125–137 mph (200–218 km/h)
4th → 3rd	81–91 mph (130–144 km/h)
3rd → 2nd	52–60 mph (84–96 km/h)
2nd → 1st	26–32 mph (42–52 km/h)

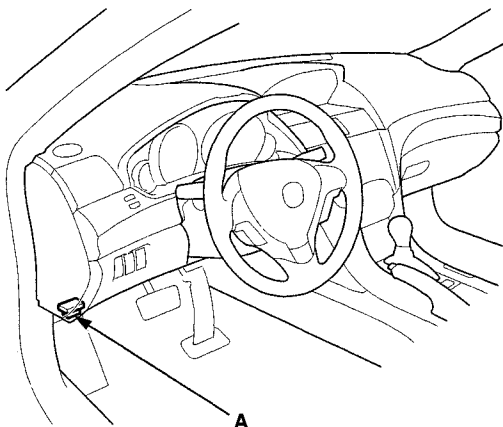
16. Drive the vehicle in 4th or 5th gear in S with the sequential sportshift mode, then decelerate and downshift to 2nd gear. The vehicle should immediately begin to slow down from the engine braking, then slow to a stop.
17. Shift to R, accelerate from a stop at full throttle momentarily, and check for abnormal noise and clutch slippage.
18. Park the vehicle on an upward slope (about 16 degrees), apply the parking brake, and shift into P. Release the brake; the vehicle should not move.

NOTE: Always use the parking brake to hold the vehicle when stopped on an incline in gear. Depending on the grade of the incline, the vehicle could roll if the brake is released.



Stall Speed Test

1. Make sure the transmission fluid is filled to the proper level (see page 14-202).
2. Apply the parking brake, and block all four wheels.
3. Connect the HDS to the DLC (A) located under the driver's side of the dashboard.



4. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
5. Make sure the HDS communicates with the PCM, and go to the A/T Data List. If it does not, go to the DLC circuit troubleshooting (see page 11-258).
6. Make sure the A/C switch is OFF.
7. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).
8. Shift to D while pressing the brake pedal firmly, then press the accelerator pedal for 6 to 8 seconds, and note the engine speed. Do not move the shift lever or remove your foot off the brake pedal, while raising the engine speed.

9. Allow 2 minutes for cooling, then repeat the test with the shift lever in S and R.

NOTE:

- Do not test stall speed for more than 10 seconds at a time.
- Record the engine speed at 6–8 seconds after pressing the accelerator pedal. Higher engine speed will be indicated for 5 seconds.
- Stall speed tests should be used for diagnostic purposes only.
- The stall speed should be the same in D, S, and R.
- Do not test stall speed with the A/T oil pressure gauges installed.

Stall Speed rpm

Specification: 1,850 rpm

Service Limit: 1,700–2,000 rpm

10. If any of the stall speeds are out of the service limit, refer to the problems and probable causes listed in the table.

Problem	Probable causes
Stall speed rpm high in D, S, and R	• ATF pump output low • Clogged ATF strainer • Regulator valve stuck • Slipping clutch
Stall speed rpm high in R	Slippage of 5th clutch
Stall speed rpm low in D, S, and R	• Engine output low • Engine throttle valve closed • Torque converter one-way clutch slipping

Automatic Transmission

Pressure Test

Special Tools Required

- A/T Oil Pressure Gauge Set 07406-0020400 or 07406-0020401
- A/T Pressure Hose, 2,210 mm 07MAJ-PY4011A
- A/T Pressure Adapter 07MAJ-PY40120

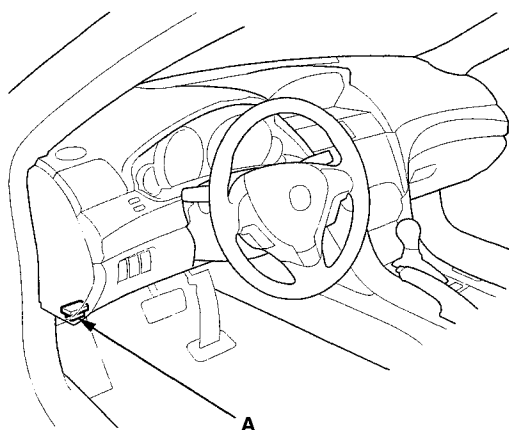
NOTE:

- Disable the VSA by pressing the VSA OFF button.
- VSA DTC(s) may come on during the test-drive. If the VSA DTC(s) come on, clear the DTC(s) with the HDS.

1. Make sure the transmission fluid is filled to the proper level (see page 14-202).
2. With SH-AWD: Raise the vehicle on a lift, make sure it is securely supported, and allow all four wheels to rotate freely.

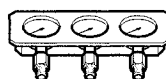
Without SH-AWD: Block the rear wheels and raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely, or raise the vehicle on a lift.

3. Allow the front wheels to rotate freely.
4. Remove the splash shield.
5. Connect the HDS to the DLC (A) located under the driver's side of the dashboard.

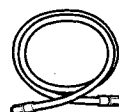


6. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
7. Make sure the HDS communicates with the PCM, and go to the A/T Data List. If it does not, go to DLC circuit troubleshooting (see page 11-258).
8. Connect the A/T oil pressure gauge to the line pressure inspection port (A). Do not allow dust or other foreign particles to enter the hole while connecting the A/T oil pressure gauge.

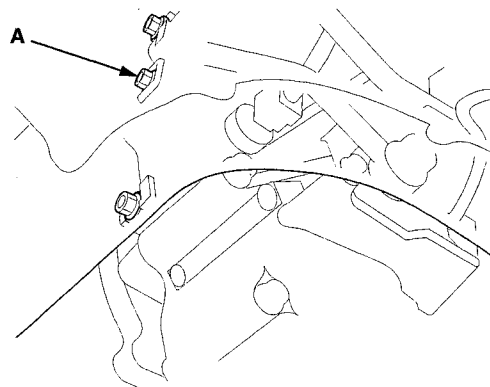
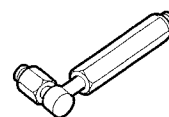
**A/T OIL PRESSURE
GAUGE SET**
07406-0020400 or
07406-0020401



**A/T PRESSURE
HOSE, 2,210 mm**
07MAJ-PY4011A



**A/T PRESSURE
ADAPTER**
07MAJ-PY40120





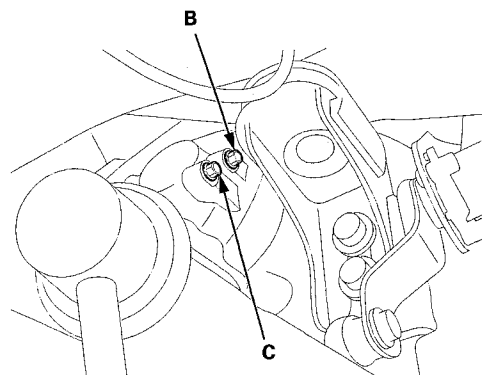
9. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on).
10. Measure the line pressure at the line pressure inspection port (A) while holding the engine speed at 2,000 rpm with the shift lever in P or N.

NOTE: Higher pressure may be noticed if measurements are taken with the shift lever in any position other than P or N.

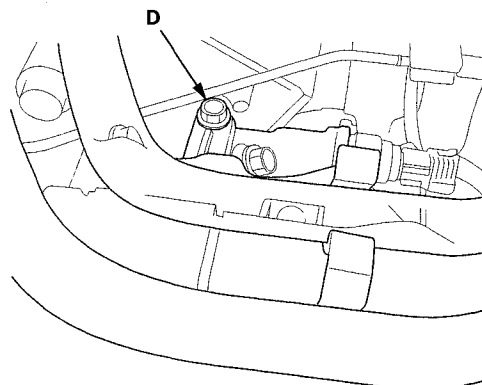
Pressure	Fluid Pressure	
	Standard	Service Limit
Line (A)	950—1,010 kPa (9.7—10.3 kgf/cm ² , 140—146 psi)	900 kPa (9.2 kgf/cm ² , 130 psi)

11. Turn the engine off, then disconnect the oil pressure gauge from the line pressure inspection port.
12. Install the sealing bolt to the line pressure inspection port with a new sealing washer, and tighten the bolt to 18 N·m (1.8 kgf·m, 13 lbf·ft). Do not reuse the old sealing washer.

13. Connect the A/T oil pressure gauge to the 1st clutch pressure inspection port (B) and the 1st-hold clutch pressure inspection port (C).



14. Remove the air cleaner (see page 11-421), and connect the oil pressure gauge to the 2nd clutch pressure inspection port (D), then temporarily install the air cleaner.



(cont'd)

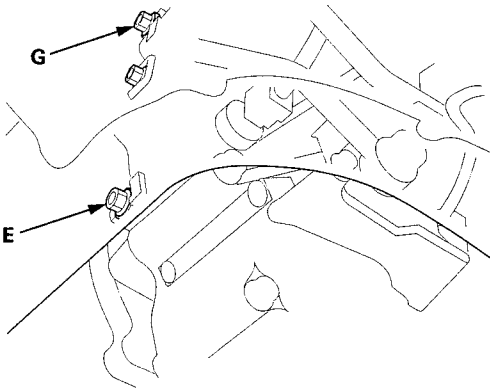
Automatic Transmission

Pressure Test (cont'd)

- 15. Start the engine, and shift to S.
- 16. Shift to 1st gear by pressing the paddle shifter – (downshift switch) if needed, and measure the 1st clutch pressure at the 1st clutch pressure inspection port (B) and the 1st-hold clutch pressure at the 1st-hold clutch pressure inspection port (C) while holding the engine speed at 2,000 rpm.
- 17. Upshift to 2nd gear by pressing the paddle shifter + (upshift switch), and measure the 2nd clutch pressure at the 2nd clutch pressure inspection port (D) while holding the engine speed at 2,000 rpm.

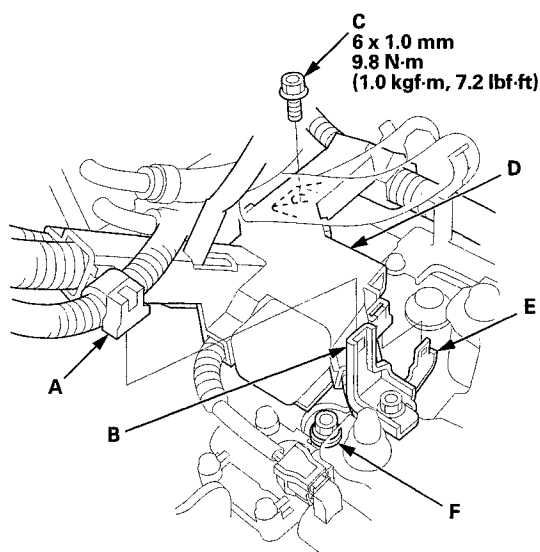
Pressure	Fluid Pressure	
	Standard	Service Limit
1st clutch (B) 2nd clutch (D)	940—1,020 kPa (9.6—10.4 kgf/cm ² , 140—148 psi)	890 kPa (9.1 kgf/cm ² , 130 psi)
1st-hold clutch (C)	680—760 kPa (6.9—7.7 kgf/cm ² , 100—110 psi)	630 kPa (6.4 kgf/cm ² , 91 psi)

- 18. Turn the engine off, remove the air cleaner assembly, then disconnect the A/T oil pressure gauge from the 2nd clutch pressure inspection port.
- 19. Disconnect the A/T oil pressure gauge from the 1st clutch pressure and the 1st-hold clutch pressure inspection ports.
- 20. Install the sealing bolts in the 1st clutch pressure, the 1st-hold clutch pressure, and the 2nd clutch pressure inspection ports with new sealing washers, and tighten the bolts to 18 N·m (1.8 kgf·m, 13 lbf·ft). Do not reuse the old sealing washers.
- 21. Connect the A/T oil pressure gauge to the 3rd clutch pressure inspection port (E) and the 5th clutch pressure inspection port (G).





22. Remove the air cleaner (see page 11-421), then remove the harness clamp (A) from its bracket (B).



23. Remove the bolt (C) securing the harness cover (D), and remove the harness cover from its bracket (E), then temporarily install the air cleaner.
24. Connect the A/T oil pressure gauge to the 4th clutch pressure inspection port (F).

25. Start the engine, and shift to S.

26. Upshift to 3rd gear by pressing the paddle shifter + (upshift switch), and measure the 3rd clutch pressure at the 3rd clutch pressure inspection port (E) while holding the engine speed at 2,000 rpm.

27. Upshift to 4th gear by pressing the paddle shifter + (upshift switch), and measure the 4th clutch pressure at the 4th clutch pressure inspection port (F) while holding the engine speed at 2,000 rpm.

28. Upshift to 5th gear by pressing the paddle shifter + (upshift switch), and measure the 5th clutch pressure at the 5th clutch pressure inspection port (G) while holding the engine speed at 2,000 rpm.

Pressure	Fluid Pressure	
	Standard	Service Limit
3rd clutch (E)	940—1,020 kPa (9.6—10.4 kgf/cm ² , 140—148 psi)	890 kPa (9.1 kgf/cm ² , 130 psi)
4th clutch (F)		
5th clutch (G)		

29. Bring the engine back to an idle, then apply the brake pedal to stop the wheels from rotating.

30. Shift to R, then release the brake pedal. Measure the 5th clutch pressure at the 5th clutch pressure inspection port while holding the engine speed at 2,000 rpm.

Pressure	Fluid Pressure	
	Standard	Service Limit
5th clutch (G) in R	940—1,020 kPa (9.6—10.4 kgf/cm ² , 140—148 psi)	890 kPa (9.1 kgf/cm ² , 130 psi)

31. Turn the engine off, then disconnect the A/T oil pressure gauge from the 3rd, 4th, and 5th clutch pressure inspection ports.

32. Install the sealing bolts in the 3rd, 4th, and 5th clutch pressure inspection ports with new sealing washers, and tighten the bolts to 18 N·m (1.8 kgf·m, 13 lbf·ft). Do not reuse the old sealing washers.

(cont'd)

Automatic Transmission

Pressure Test (cont'd)

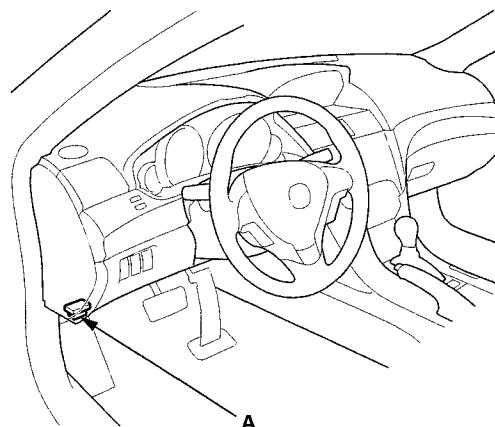
33. If any of the pressures are out of the service limit, refer to the problems and probable causes listed in the table.

Problem	Probable causes
No or low line pressure	• Torque converter • ATF pump • Regulator valve • Torque converter check valve • Clogged ATF strainer
No or low 1st clutch pressure	• 1st clutch • O-rings
No or low 2nd clutch pressure	• 2nd clutch • O-rings
No or low 3rd clutch pressure	• 3rd clutch • O-rings
No or low 4th clutch pressure	• 4th clutch • O-rings
No or low 5th clutch pressure	• 5th clutch • O-rings
No or low 5th clutch pressure in R	• Servo valve • 5th clutch • O-rings
No or low 1st-hold clutch pressure	• 1st-hold clutch • O-rings

34. Install the harness cover on its bracket, and secure it with the bolt.
35. Install the harness clamp on its bracket.
36. Install the air clamp housing (see page 11-421).
37. Install the splash shield.
38. Check the ATF level (see page 14-202).

Shift Solenoid Valve Test, Replacement, and Shift Solenoid Wire Harness Replacement

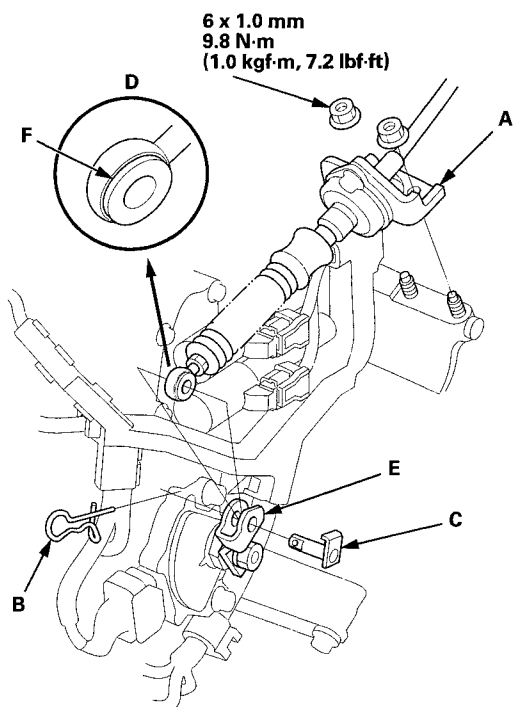
1. Connect the HDS to the DLC (A) located under the driver's side of the dashboard.



2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode. Make sure the HDS communicates with the PCM. If it does not, go to the DLC circuit troubleshooting (see page 11-258).
3. Select Shift Solenoid Valves A, B, C, and D in the Miscellaneous Test Menu with the HDS.
4. Check that shift solenoid valves A, B, C, and D operate with the HDS. A clicking sound should be heard.
- If a clicking sound is heard, the valves are OK. The test is complete, disconnect the HDS.
 - If no clicking sound is heard, go to step 5, and test the solenoid valves.
5. Do the battery removal procedure (see page 22-87).
6. Remove the air cleaner housing (see page 11-421).
7. Remove the battery base (see step 7 on page 14-211).



8. Remove the nuts securing the shift cable bracket (A).

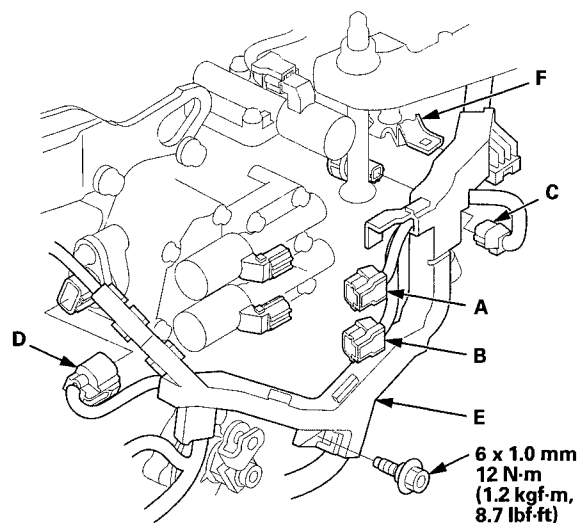


9. Remove the spring clip (B) and the control pin (C), then separate the shift cable end (D) from the selector control lever (E).

10. Check the bushing (F) in the shift cable end for proper fit and wear. If the bushing is loose or worn, replace the shift cable (see page 14-250).

11. Disconnect these connectors:

- A/T clutch pressure control solenoid valve A connector (A)
- A/T clutch pressure control solenoid valve B connector (B)
- 4th clutch transmission fluid pressure switch connector (C)
- Shift solenoid wire harness connector (D)



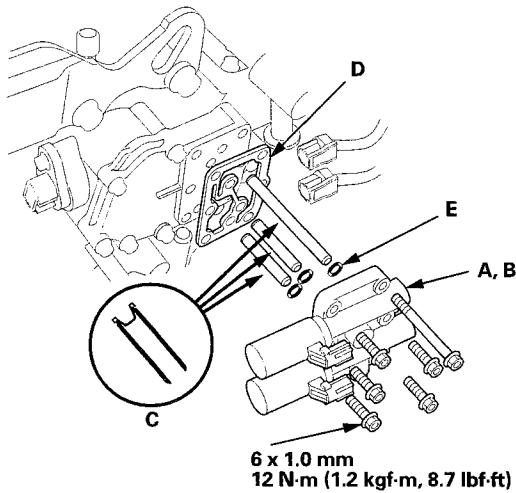
12. Remove the bolt securing the harness cover (E), and remove the harness cover from its bracket (F).

(cont'd)

Automatic Transmission

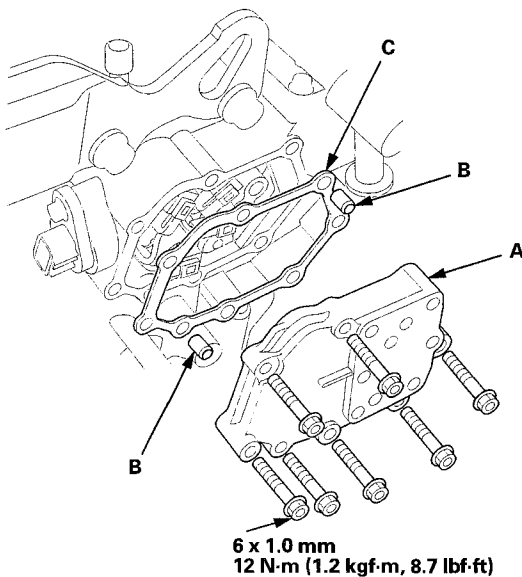
Shift Solenoid Valve Test, Replacement, and Shift Solenoid Wire Harness Replacement (cont'd)

13. Remove A/T clutch pressure control solenoid valves A and B, the ATF pipes (C), and the gasket (D).



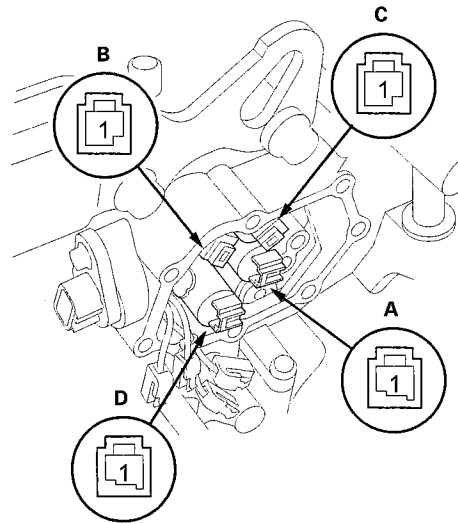
14. Replace the gasket and the O-rings (E) with new ones when installing A/T clutch pressure control solenoid valves A and B.

15. Remove the solenoid valve cover (A), the dowel pins (B), and the gasket (C).



16. Replace the gasket with a new one when installing the solenoid valve cover.

17. Disconnect the connectors from the shift solenoid valve(s) that did not click.



18. Measure the resistance of each shift solenoid valve between the connector terminal and the body ground.

Standard: 12–25 Ω

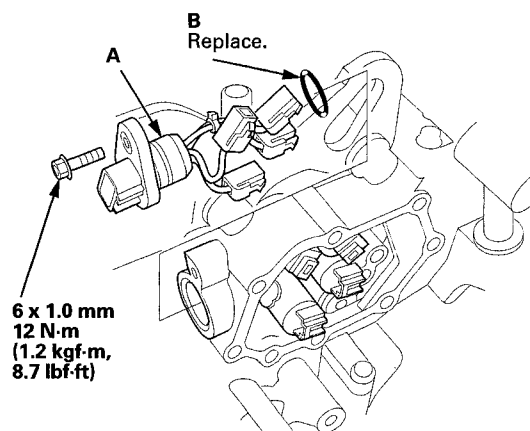
- If the resistance is out of standard, go to step 21 and replace the shift solenoid valve.
- If the resistance is within the standard, go to step 19 and check the solenoid valve for a clicking sound.

19. Connect a jumper wire from the negative battery terminal to the body ground, and connect another jumper wire from the positive battery terminal to each solenoid valve terminal individually. A clicking sound should be heard.

- If a clicking sound is heard, go to step 20 and replace the shift solenoid wire harness.
- If no clicking sound is heard, go to step 21 and replace the defective shift solenoid valve.

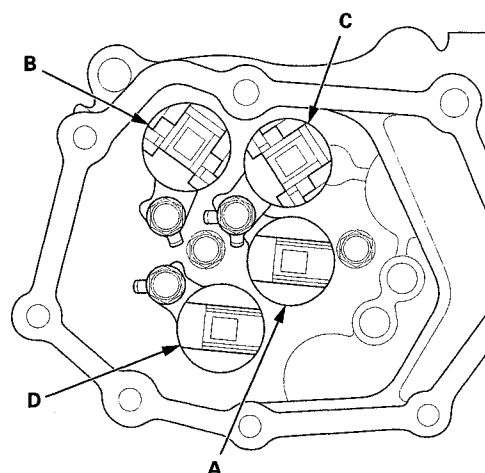
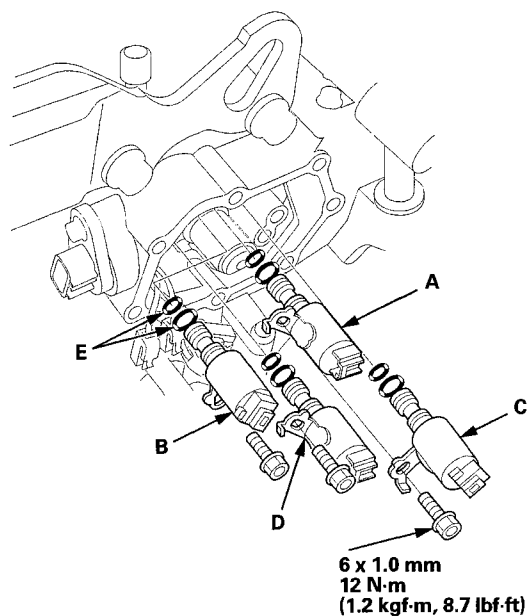


20. Remove the shift solenoid wire harness (A), and replace it. Install a new O-ring (B) on the shift solenoid wire harness, and install the shift solenoid wire harness in the transmission housing, then go to step 28.



21. Remove the necessary shift solenoid valve mounting bolts, then remove the affected shift solenoid valves by holding the solenoid valve body.

NOTE: Do not hold the shift solenoid valve connector to remove the shift solenoid valve.



(cont'd)

Automatic Transmission

Shift Solenoid Valve Test, Replacement, and Shift Solenoid Wire Harness Replacement (cont'd)

22. Install new O-rings (two O-rings per shift solenoid valve) (E) on the reused shift solenoid valves.

NOTE: A new shift solenoid valve comes with new O-rings. If you install a new shift solenoid valve, use the O-rings provided with it.

23. If shift solenoid valve D was replacement, install shift solenoid valve D (black connector) by holding the shift solenoid valve body; make sure the mounting bracket contacts the accumulator body.

NOTE: Do not hold the solenoid valve by the connector when installing the solenoid valve. Be sure to hold the solenoid valve body.

24. If shift solenoid valve A was replacement, install shift solenoid valve A (black connector) by holding the shift solenoid valve body; make sure the mounting bracket contacts the accumulator body.

25. If shift solenoid valve C was replacement, install shift solenoid valve C (brown connector) by holding the shift solenoid valve body; make sure the mounting bracket contacts the bracket of shift solenoid valve A.

NOTE: Do not install shift solenoid valve C before installing shift solenoid valve A. If shift solenoid valve C is installed before installing shift solenoid valve A, it may damage the hydraulic control system.

26. If shift solenoid valve B was replacement, install shift solenoid valve B (brown connector) by holding the shift solenoid valve body; make sure the mounting bracket contacts the accumulator body.

27. Install the shift solenoid valve mounting bolts.

28. Connect the shift solenoid valve connector to the solenoid valve:

- YEL wire connector to shift solenoid valve A.
- RED wire connector to shift solenoid valve B.
- GRN wire connector to shift solenoid valve C.
- ORN wire connector to shift solenoid valve D.

29. Install the shift solenoid valve cover, the dowel pins, and a new gasket.

30. Install a new gasket on the solenoid valve cover, and install the ATF pipes with their filter side into the transmission housing. Install new O-rings over the ATF pipes.

31. Install A/T clutch pressure control solenoid valves A and B.

32. Install the harness cover on its bracket, and secure it with the bolt.

33. Check the connectors for rust, dirt, or oil, clean or repair if necessary, then connect the connectors securely.

34. Apply molybdenum grease to the hole in the bushing in the shift cable end. Attach the shift cable end to the selector control lever, then insert the control pin into the selector control lever hole through the shift cable end, and secure the control pin with the spring clip.

35. Secure the shift cable bracket with the nuts.

36. Install the battery base (see step 72 on page 14-235).

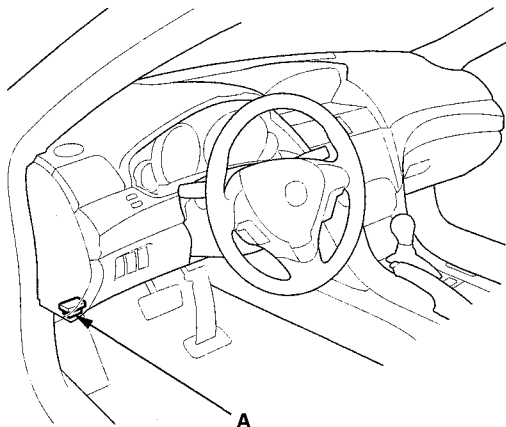
37. Install the air cleaner housing (see page 11-421).

38. Do the battery installation procedure (see page 22-87).



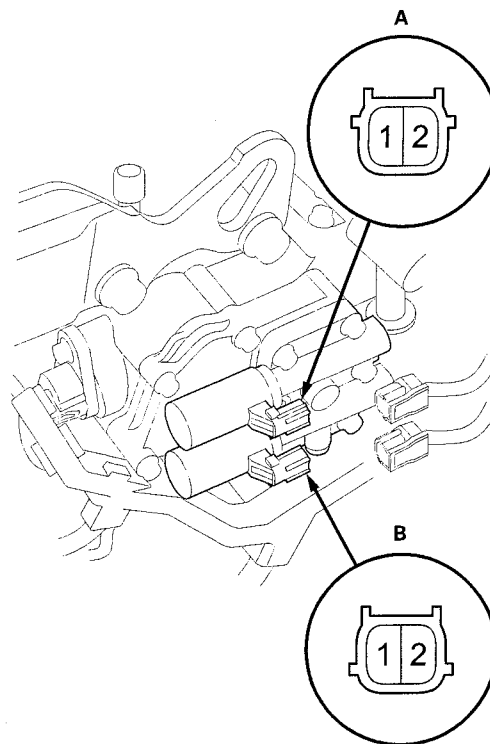
A/T Clutch Pressure Control Solenoid Valve A and B Test

1. 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. Make sure the HDS communicates with the PCM. If it does not, go to the DLC circuit troubleshooting (see page 11-258).
3. Select Clutch Pressure Control (Linear) Solenoid Valve A or Clutch Pressure Control (Linear) Solenoid Valve B in the Miscellaneous Test Menu with the HDS.
4. Test A/T clutch pressure control solenoid valve A or B with the HDS.
 - If the valve tests OK, the test is complete. Disconnect the HDS.
 - If the valve does not test OK, follow the instructions on the HDS.
 - If the valve does not test OK, and the HDS does not determine the cause, go to step 5.
5. Do the battery removal procedure (see page 22-87).
6. Remove the air cleaner housing (see page 11-421).
7. Remove the battery base (see step 7 on page 14-211).

8. Disconnect the A/T clutch pressure control solenoid valve A and B connectors.



9. Measure the A/T clutch pressure control solenoid valve A or B resistance at the connector terminals.

Standard: 3—10 Ω

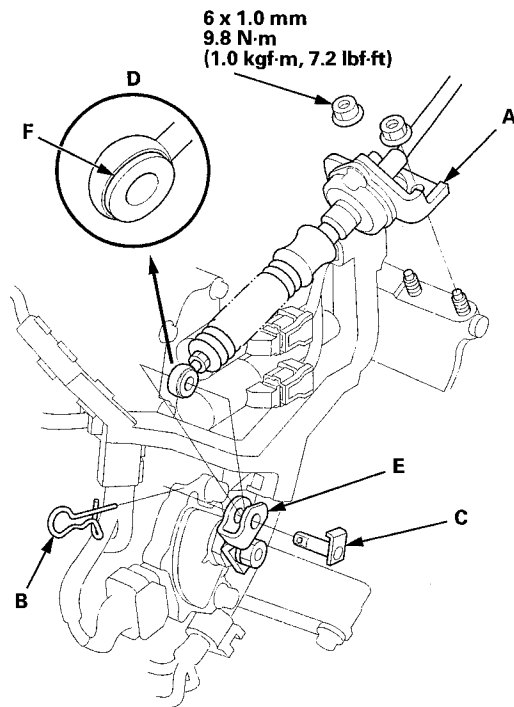
- If the resistance is out of standard, replace A/T clutch pressure control solenoid valve A and B (see page 14-192).
 - If the resistance is within the standard, go to step 10.
10. Connect a jumper wire from the negative battery terminal to solenoid valve A or B connector terminal No. 2, and connect another jumper wire from the positive battery terminal to connector terminal No. 1.
 - If a clicking sound is heard, the valve is OK, and the test is complete, go to step 24.
 - If no clicking sound is heard, go to step 11.

(cont'd)

Automatic Transmission

A/T Clutch Pressure Control Solenoid Valve A and B Test (cont'd)

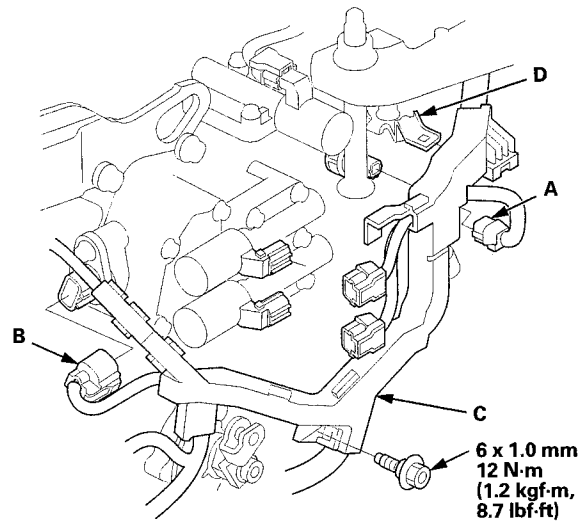
11. Remove the nuts securing the shift cable bracket (A).



12. Remove the spring clip (B) and the control pin (C), then separate the shift cable end (D) from the selector control lever (E).

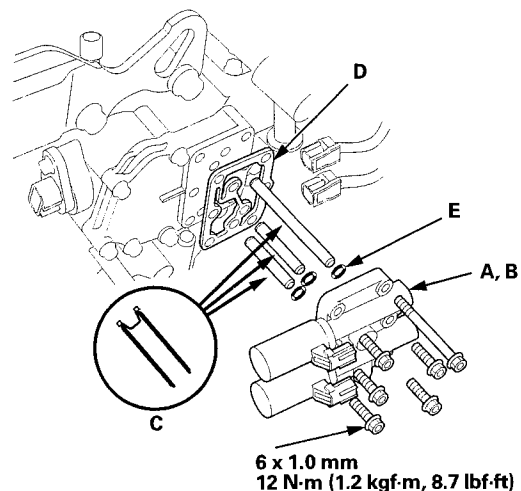
13. Check the bushing (F) in the shift cable end for proper fit and wear. If the bushing is loose or worn, replace the shift cable (see page 14-250).

14. Disconnect the 4th clutch transmission fluid pressure switch connector (A) and the shift solenoid wire harness connector (B).



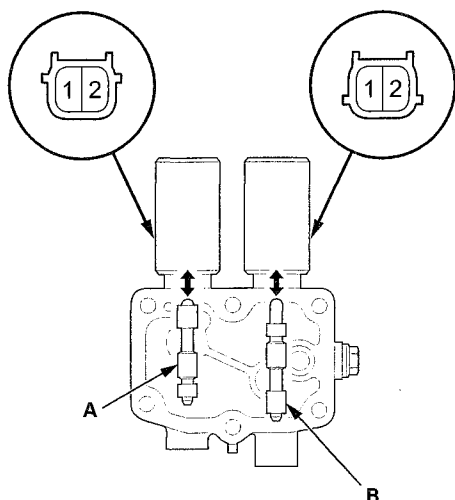
15. Remove the bolt securing the harness cover (C), and remove the harness cover from its bracket (D).

16. Remove A/T clutch pressure control solenoid valves A and B, the ATF pipes (C), the gasket (D), and the O-rings (E).





17. Check the fluid passage of the solenoid valve for contamination.
18. Connect a jumper wire from the negative battery terminal to A/T clutch pressure control solenoid valve A or B connector terminal No. 2, and connect another jumper wire from the positive battery terminal to connector terminal No. 1. Make sure A/T clutch pressure control solenoid valve A or B moves.



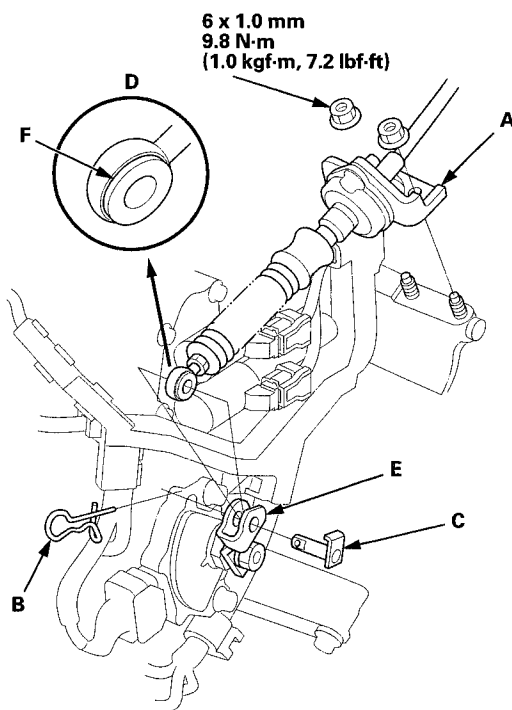
19. Disconnect one of the jumper wires, and check valve movement at the fluid passage in the valve body mounting surface. If the valve binds or moves sluggishly, or if the solenoid valve does not operate, replace A/T clutch pressure control solenoid valves A and B.
20. Clean the mounting surface and fluid passage of the solenoid valve body and the solenoid valve cover.

21. Install a new gasket on the solenoid valve cover, and install the ATF pipes with the filter end in the transmission housing. Install new O-rings over the ATF pipes.
22. Install A/T clutch pressure control solenoid valves A and B.
23. Install the harness cover on its bracket, and secure it with the bolt.
24. Check the connectors for rust, dirt, or oil, and clean or repair if necessary, then connect the connectors securely.
25. Apply molybdenum grease to the hole in the bushing in the shift cable end. Attach the shift cable end to the selector control lever, then insert the control pin into the selector control lever hole through the shift cable end, and secure the control pin with the spring clip.
26. Secure the shift cable bracket with the nuts.
27. Install the battery base (see step 72 on page 14-235).
28. Install the air cleaner housing (see page 11-421).
29. Do the battery installation procedure (see page 22-87).

Automatic Transmission

A/T Clutch Pressure Control Solenoid Valve A and B Replacement

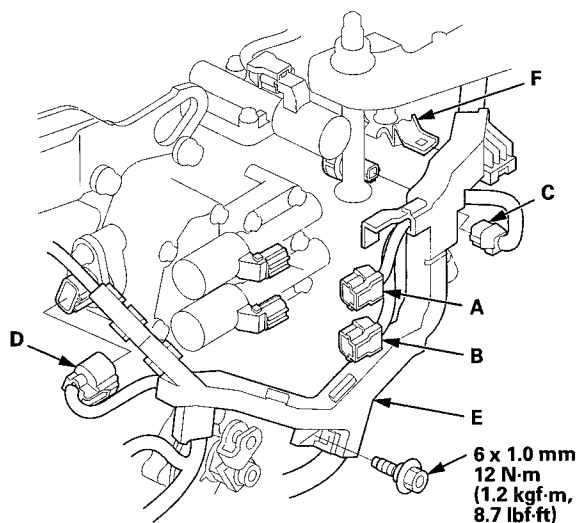
1. Do the battery removal procedure (see page 22-87).
2. Remove the air cleaner housing (see page 11-421).
3. Remove the battery base (see step 7 on page 14-211).
4. Remove the nuts securing the shift cable bracket (A).



5. Remove the spring clip (B) and the control pin (C), then separate the shift cable end (D) from the selector control lever (E).
6. Check the bushing (F) in the shift cable end for proper fit and wear. If the bushing is loose or worn, replace the shift cable (see page 14-250).

7. Disconnect these connectors:

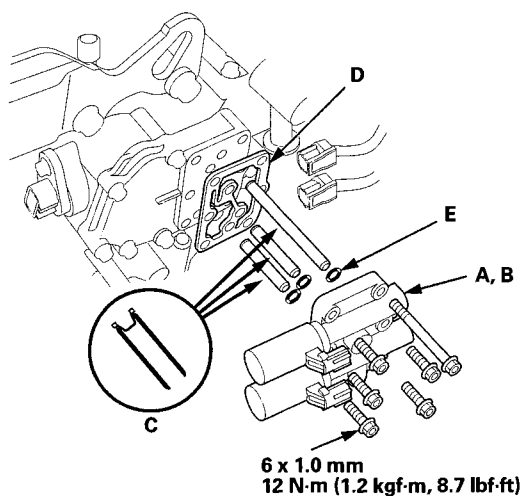
- A/T clutch pressure control solenoid valve A connector (A)
- A/T clutch pressure control solenoid valve B connector (B)
- 4th clutch transmission fluid pressure switch connector (C)
- Shift solenoid wire harness connector (D)



8. Remove the bolt securing the harness cover (E), and remove the harness cover from its bracket (F).



9. Remove A/T clutch pressure control solenoid valves A and B, the ATF pipes (C), the gasket (D), and the O-rings (E).



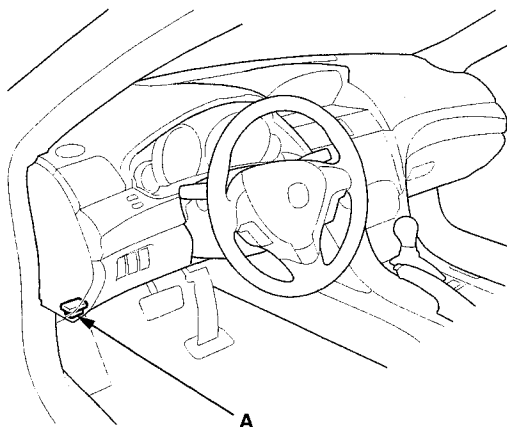
10. Clean the mounting surfaces and the fluid passage of the solenoid valve cover.
11. Install a new gasket on the solenoid valve cover, and install the ATF pipes with the filter end in the transmission housing. Install new O-rings over the ATF pipes.
12. Install A/T clutch pressure control solenoid valves A and B.
13. Install the harness cover on its bracket, and secure it with the bolt.

14. Check the connectors for rust, dirt, or oil, and clean or repair if necessary, then connect the connectors securely.
15. Apply molybdenum grease to the hole in the bushing in the shift cable end. Attach the shift cable end to the selector control lever, then insert the control pin into the selector control lever hole through the shift cable end, and secure the control pin with the spring clip.
16. Secure the shift cable bracket with the nuts.
17. Install the battery base (see step 72 on page 14-235).
18. Install the air cleaner housing (see page 11-421).
19. Do the battery installation procedure (see page 22-87).

Automatic Transmission

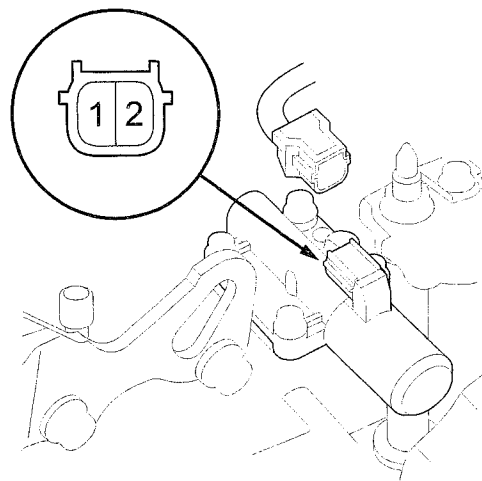
A/T Clutch Pressure Control Solenoid Valve C Test

1. 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. Make sure the HDS communicates with the PCM. If it does not, go to the DLC circuit troubleshooting (see page 11-258).
3. Select Clutch Pressure Control (Linear) Solenoid Valve C in the Miscellaneous Test Menu with the HDS.
4. Test A/T clutch pressure control solenoid valve C with the HDS.
 - If the valve tests OK, the test is complete. Disconnect the HDS.
 - If the valve does not test OK, follow the instructions on the HDS.
 - If the valve does not test OK, and the HDS does not determine the cause, go to step 5.
5. Do the battery removal procedure (see page 22-87).
6. Remove the air cleaner housing (see page 11-421).

7. Disconnect the A/T clutch pressure control solenoid valve C connector.



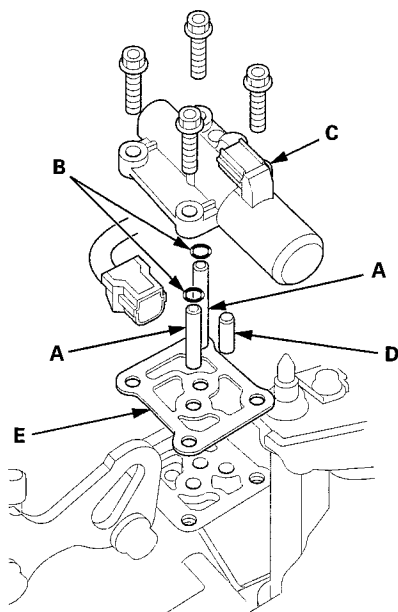
8. Measure the A/T clutch pressure control solenoid valve C resistance at the connector terminals.

Standard: 3—10 Ω

- If the resistance is out of standard, replace A/T clutch pressure control solenoid valve C (see page 14-197).
 - If the resistance is within the standard, go to step 9.
9. Connect a jumper wire from the negative battery terminal to A/T clutch pressure control solenoid valve C connector terminal No. 2, and connect another jumper wire from the positive battery terminal to connector terminal No. 1.
 - If a clicking sound is heard, the valve is OK, and the test is complete, go to step 20.
 - If no clicking sound is heard, go to step 10.

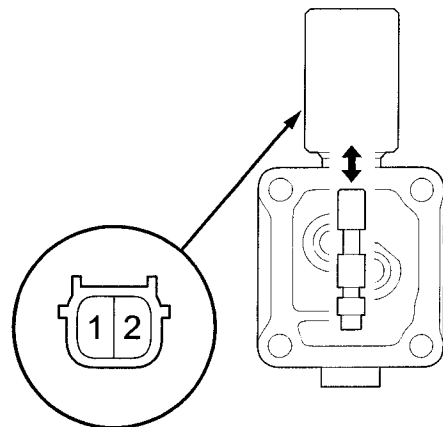


10. Remove A/T clutch pressure control solenoid valve C, the ATF feed pipes (A), the O-rings (B), the ATF pipe (D), and the gasket (E).



11. Check the fluid passage of A/T clutch pressure control solenoid valve C for contamination.

12. Connect a jumper wire from the negative battery terminal to A/T clutch pressure control solenoid valve C connector terminal No. 2, and connect another jumper wire from the positive battery terminal to connector terminal No. 1. Make sure A/T clutch pressure control solenoid valve C moves.



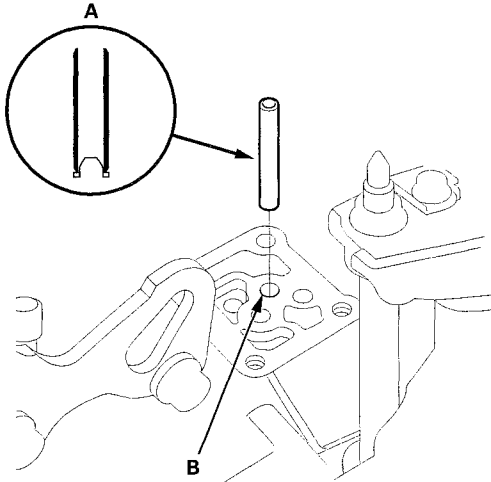
13. Disconnect one of the jumper wires, and check valve movement at the fluid passage in the valve body mounting surface. If the valve binds or moves sluggishly, or if the solenoid valve does not operate, replace A/T clutch pressure control solenoid valve C.
14. Clean the mounting surfaces and the fluid passages of the A/T clutch pressure control solenoid valve C body and the transmission housing.

(cont'd)

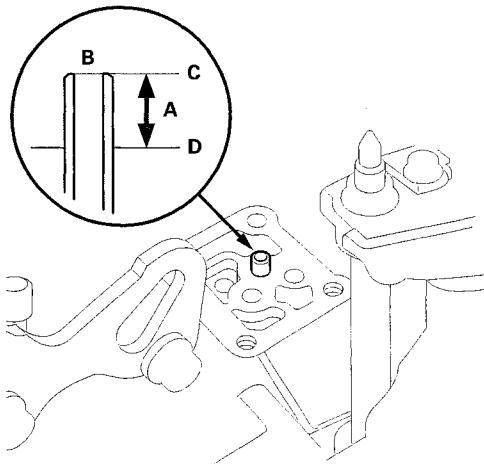
Automatic Transmission

A/T Clutch Pressure Control Solenoid Valve C Test (cont'd)

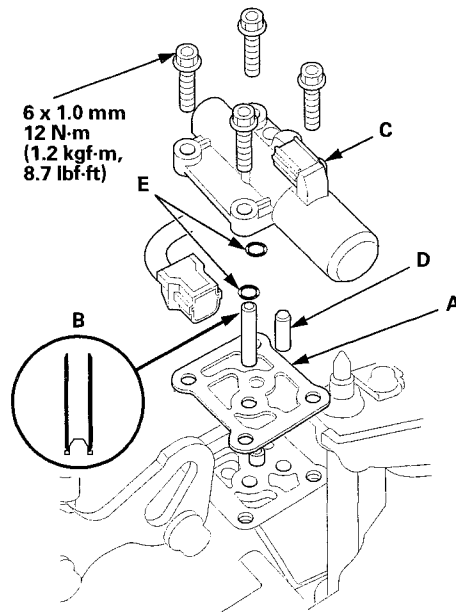
15. Install the 8 x 53 mm ATF joint pipe (A) with the filter end into its mounting hole (B).



16. Check the height (A) of the 8 x 53 mm ATF joint pipe (B) between the top (C) of the pipe and the solenoid valve body mounting surface (D). The height is about 7.0 mm (0.28 in). If the height is over 7.0 mm (0.28 in), push the pipe until it bottoms in the accumulator body.



17. Install a new gasket (A) on the transmission housing, and install the 8 x 36 mm ATF joint pipe (B) with the filter end into the transmission housing and the 8 x 25.2 mm ATF pipe (D).

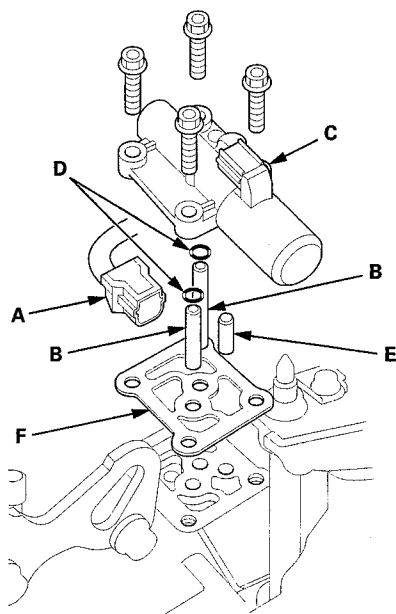


18. Install new O-rings (E) over the ATF joint pipes.
19. Install A/T clutch pressure control solenoid valve C.
20. Check the connector for rust, dirt, or oil, and clean or repair if necessary, then connect the connector securely.
21. Install the air cleaner housing (see page 11-421).
22. Do the battery installation procedure (see page 22-87).



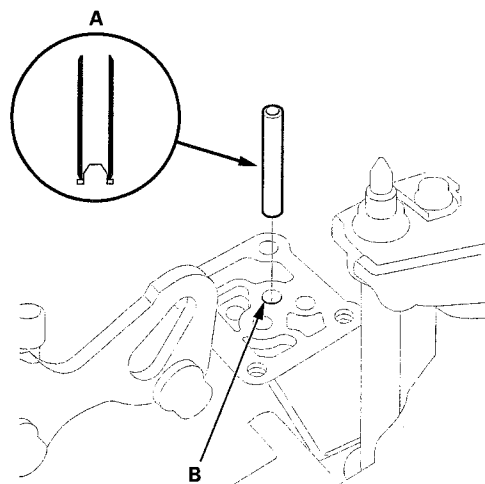
A/T Clutch Pressure Control Solenoid Valve C Replacement

1. Do the battery removal procedure (see page 22-87).
2. Remove the air cleaner housing (see page 11-421).
3. Disconnect the A/T clutch pressure control solenoid valve C connector (A).

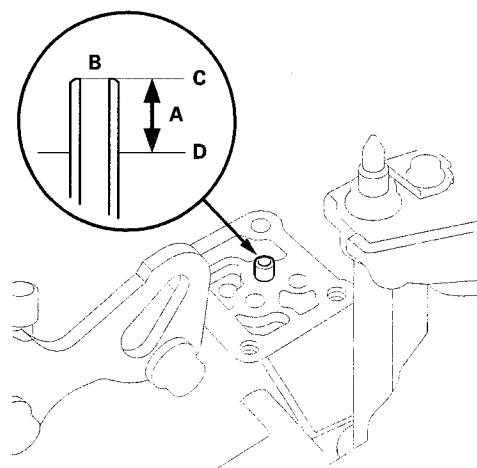


4. Remove A/T clutch pressure control solenoid valve C, the ATF joint pipes (B), the O-rings (D), the ATF pipe (E), and the gasket (F).
5. Clean the mounting surfaces and the fluid passages of the transmission housing.

6. Install the 8 x 53 mm ATF joint pipe (A) with the filter end into its mounting hole (B).



7. Check the height (A) of the 8 x 53 mm ATF joint pipe (B) between the top (C) of the pipe and the solenoid valve body mounting surface (D). The height is about 7.0 mm (0.28 in). If the height is over 7.0 mm (0.28 in), push the pipe until it bottoms in the accumulator body.

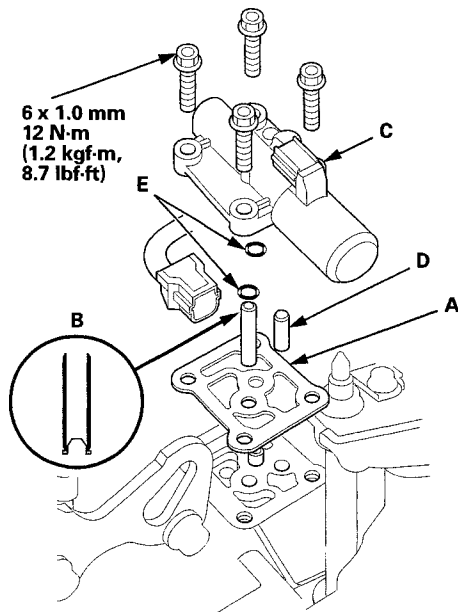


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Automatic Transmission

A/T Clutch Pressure Control Solenoid Valve C Replacement (cont'd)

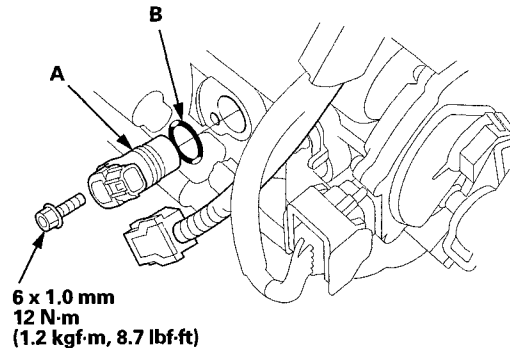
8. Install a new gasket (A) on the transmission housing, and install the 8 x 36 mm ATF joint pipe (B) with the filter end into the transmission housing and the 8 x 25.2 mm ATF pipe (D).



9. Install new O-rings (E) over the ATF joint pipes.
10. Install A/T clutch pressure control solenoid valve C.
11. Check the connector for rust, dirt, or oil, and clean or repair if necessary, then connect the connector securely.
12. Install the air cleaner housing (see page 11-421).
13. Do the battery installation procedure (see page 22-87).

Input Shaft (Mainshaft) Speed Sensor Replacement

1. Do the battery removal procedure (see page 22-87).
2. Disconnect the input shaft (mainshaft) speed sensor connector, and remove the input shaft (mainshaft) speed sensor (A).

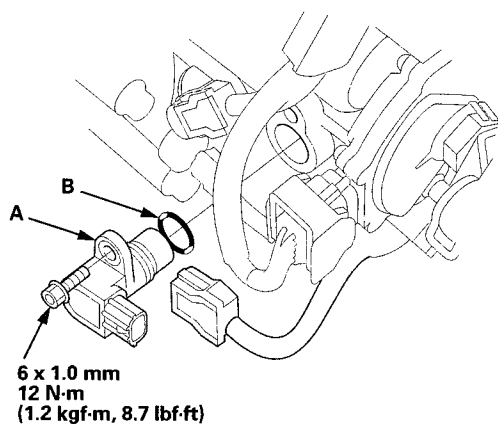


3. Install a new O-ring (B) on a new input shaft (mainshaft) speed sensor, then install the input shaft (mainshaft) speed sensor.
4. Check the connector for rust, dirt, or oil, and clean or repair if necessary, then connect the connector securely.
5. Do the battery installation procedure (see page 22-87).



Output Shaft (Countershaft) Speed Sensor Replacement

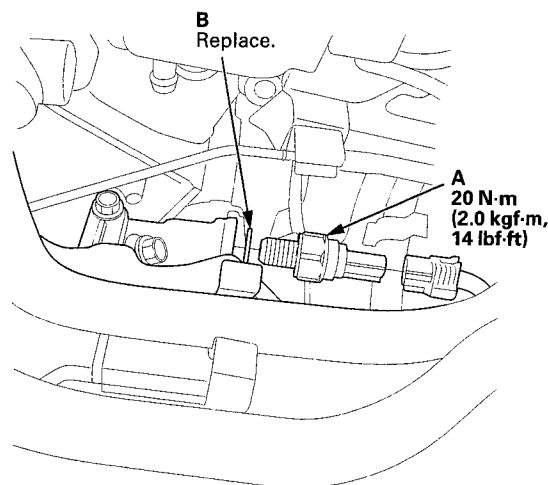
1. Do the battery removal procedure (see page 22-87).
2. Disconnect the output shaft (countershaft) speed sensor connector, and remove the output shaft (countershaft) speed sensor (A).



3. Install a new O-ring (B) on a new output shaft (countershaft) speed sensor, then install the output shaft (countershaft) speed sensor and the sensor washer.
4. Check the connector for rust, dirt, or oil, and clean or repair if necessary, then connect the connector securely.
5. Do the battery installation procedure (see page 22-87).

Transmission Fluid Pressure Switch A (2nd Clutch) Replacement

1. Disconnect the transmission fluid pressure switch A (2nd clutch) connector, and remove the transmission fluid pressure switch A (2nd clutch) (A).

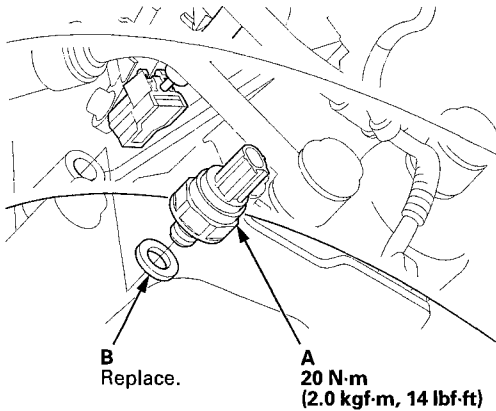


2. Install a new transmission fluid pressure switch A (2nd clutch) and a new sealing washer (B), and tighten the switch.
3. Check the connectors for rust, dirt, or oil, and clean or repair if necessary, then connect the connectors securely.
4. Connect the connector securely.

Automatic Transmission

Transmission Fluid Pressure Switch B (3rd Clutch) Replacement

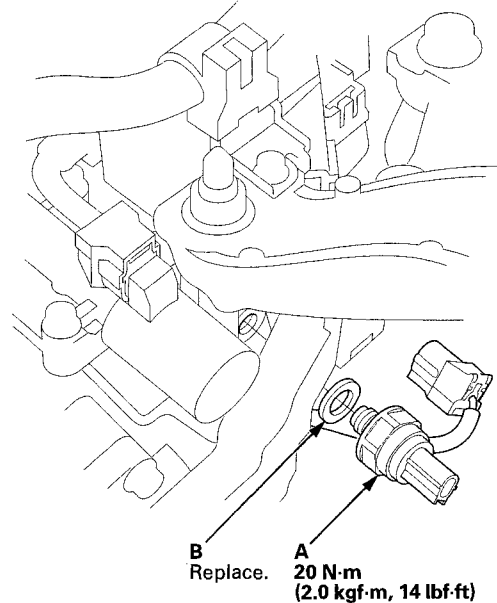
1. Raise the vehicle on a lift, or apply the parking brake, block both rear wheels, and raise the front of the vehicle. Make sure it is securely supported.
2. Remove the splash shield.
3. Disconnect the transmission fluid pressure switch B (3rd clutch) connector, and remove the transmission fluid pressure switch B (3rd clutch) (A).



4. Install a new transmission fluid pressure switch B (3rd clutch) and a new sealing washer (B), and tighten the switch.
5. Check the connectors for rust, dirt, or oil, and clean or repair if necessary, then connect the connectors securely.
6. Install the splash shield.

4th Clutch Transmission Fluid Pressure Switch Replacement

1. Do the battery removal procedure (see page 22-87).
2. Remove the air cleaner housing (see page 11-421).
3. Disconnect the 4th clutch transmission fluid pressure switch connector, and remove the 4th clutch transmission fluid pressure switch (A).



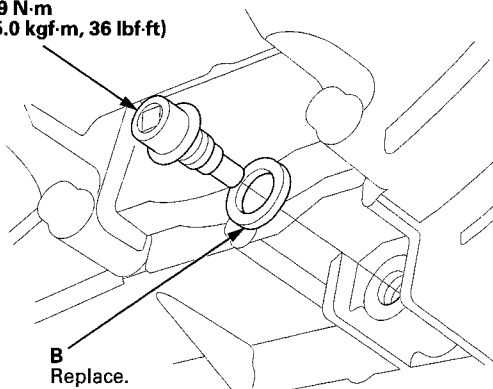
4. Install a new 4th clutch transmission fluid pressure switch and a new sealing washer (B), and tighten the switch.
5. Check the connectors for rust, dirt, or oil, and clean or repair if necessary, then connect the connectors securely.
6. Install the air cleaner housing (see page 11-421).
7. Do the battery installation procedure (see page 22-87).



ATF Temperature Sensor Replacement

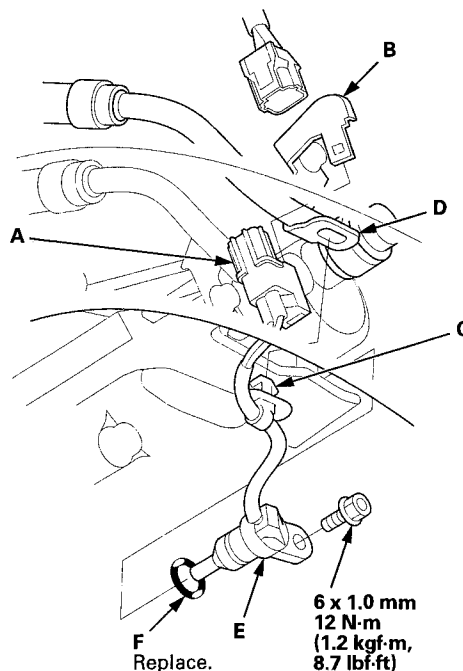
1. Raise the vehicle on a lift, or apply the parking brake, block both rear wheels, and raise the front of the vehicle. Make sure it is securely supported.
2. Remove the splash shield.
3. Remove the drain plug (A), and drain the automatic transmission fluid (ATF).

A
18 x 1.5 mm
49 N·m
(5.0 kgf·m, 36 lbf·ft)



4. Reinstall the drain plug with a new sealing washer (B).

5. Disconnect the ATF temperature sensor connector (A), then remove the connector from the connector bracket (B).



6. Remove the harness clamp (C) from its bracket (D).
7. Remove the ATF temperature sensor (E), and replace the sensor.
8. Install a new O-ring (F) on a new ATF temperature sensor, and install the ATF temperature sensor.
9. Check the connector for rust, dirt, or oil, and clean or repair if necessary, then connect the connector securely, and install it on its bracket.
10. Install the harness clamp on its bracket.
11. Refill the transmission with ATF (see step 5 on page 14-204).
12. Install the splash shield.

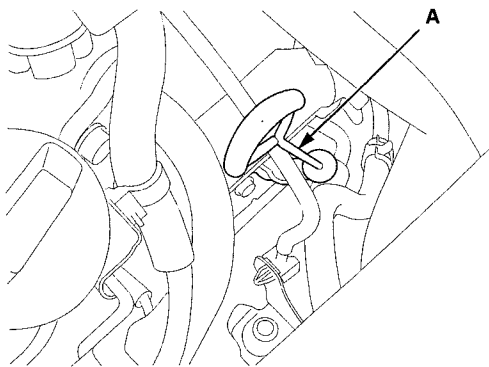
Automatic Transmission

ATF Level Check

NOTE:

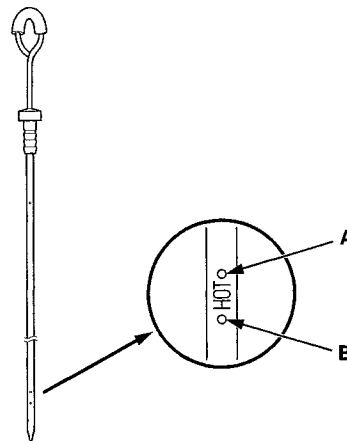
- Keep all foreign particles out of the transmission.
- Check the fluid level within 60—90 seconds after turning the engine off.
- Higher fluid level may be indicated if the radiator fan comes on twice or more.

1. Park the vehicle on the level ground.
2. Warm up the engine to normal operating temperature (the radiator fan comes on), and turn the engine off. Do not allow the engine to warm up longer than the time it takes for the radiator fan to come on twice.
3. Remove the dipstick (yellow loop) (A) from the dipstick guide tube, and wipe it with a clean cloth.



4. Insert the dipstick into the guide tube.

5. Remove the dipstick, and check the ATF level. It should be between the upper mark (A) and the lower mark (B).



6. If the ATF level is below the lower mark, check for fluid leaks at the transmission, and the ATF hoses and the line joints. If a problem is found, fix it before filling the transmission with ATF.

NOTE: If the vehicle is driven when the ATF level is below the lower mark, one or more of these symptoms may occur:

- Transmission damage.
- Vehicle does not move in any gear.
- Vehicle accelerates poorly, and flares when starting off in D and R.
- The engine vibrates at idle.

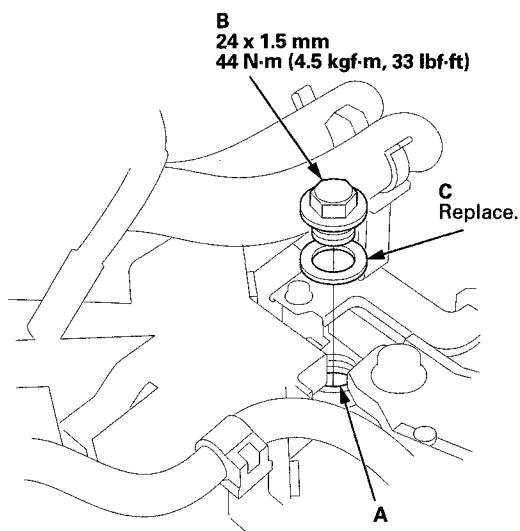


ATF Replacement

7. If the ATF level is above the upper mark, drain the ATF to the proper level (see step 3 on page 14-203).

NOTE: If the vehicle is driven when the ATF level is above the upper mark, the vehicle may creep forward while in N, or have shifting problems.

8. If necessary, fill the transmission with the ATF through the filler hole (A) to bring the fluid level between the upper mark and the lower mark of the dipstick. Do not fill past the upper mark. Always use Acura ATF-Z1 Automatic Transmission Fluid (ATF). Using a non-Acura ATF can affect shift quality.

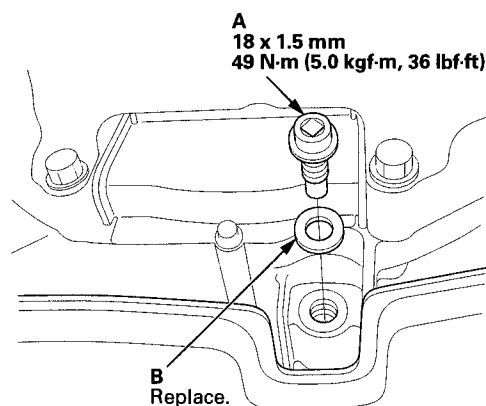


9. Insert the dipstick back into the dipstick guide tube.

NOTE: Keep all foreign particles out of the transmission.

1. Warm up the engine to normal operating temperature (the radiator fan comes on), and turn the engine off.
2. Raise the vehicle on a lift, or apply the parking brake, block both rear wheels, and raise the front of the vehicle. Make sure it is securely supported.
3. Remove the ATF filler bolt and drain plug (A), and drain the automatic transmission fluid (ATF).

NOTE: If ATF cooler cleaning is necessary, refer to ATF Cooler Cleaning (see page 14-236).



4. Reinstall the drain plug with a new sealing washer (B).

(cont'd)

Automatic Transmission

ATF Replacement (cont'd)

5. Refill the transmission with the recommended fluid through the filler hole (A). Always use Acura ATF-Z1 Automatic Transmission Fluid (ATF). Using a non-Acura ATF can affect shift quality.

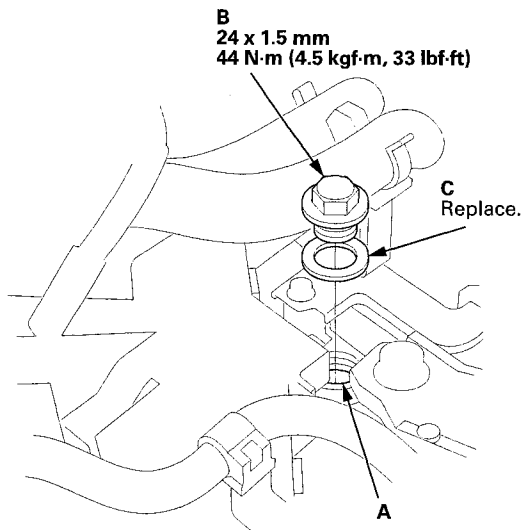
Automatic Transmission Fluid Capacity

With SH-AWD:

- 2.8 L (3.0 US qt) at change
- 7.7 L (8.2 US qt) at overhaul

Without SH-AWD:

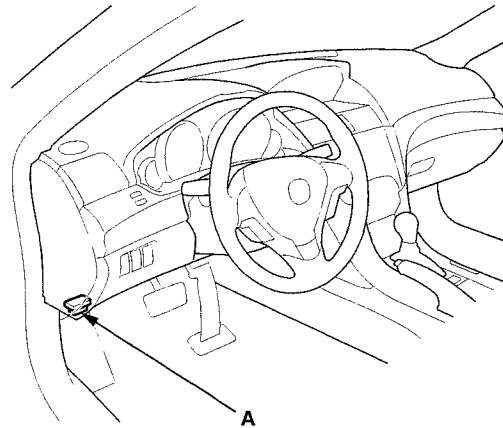
- 3.3 L (3.5 US qt) at change
- 7.5 L (7.9 US qt) at overhaul



6. Install the ATF filler bolt (B) and a new sealing washer (C).
7. Check the ATF level (see page 14-202).

8. If the maintenance minder recommends replacing the ATF, reset the maintenance minder (see page 3-7), and this procedure is complete. If the maintenance minder did not recommend you to replace the ATF, go to step 9.

9. Connect the HDS to the DLC (A) located under the driver's side of the dashboard.

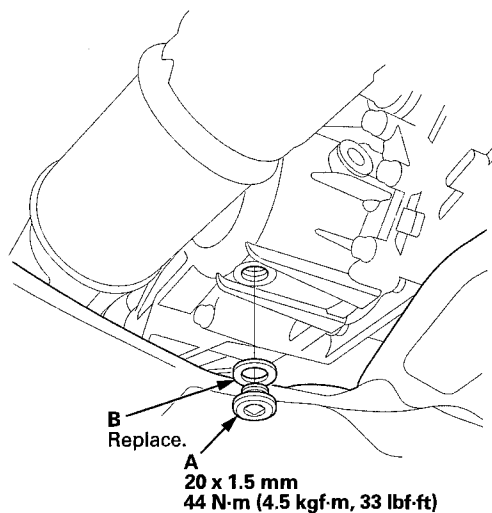


10. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode. Make sure the HDS communicates with the PCM. If it does not, go to the DLC circuit troubleshooting (see page 11-258).
11. Select BODY ELECTRICAL with the HDS.
12. Select ADJUSTMENT in the GAUGE MENU with the HDS.
13. Select RESET in the MAINTENANCE MINDER with the HDS.
14. Select MAINTENANCE SUB ITEM 3 RESET, and reset the ATF life with the HDS.



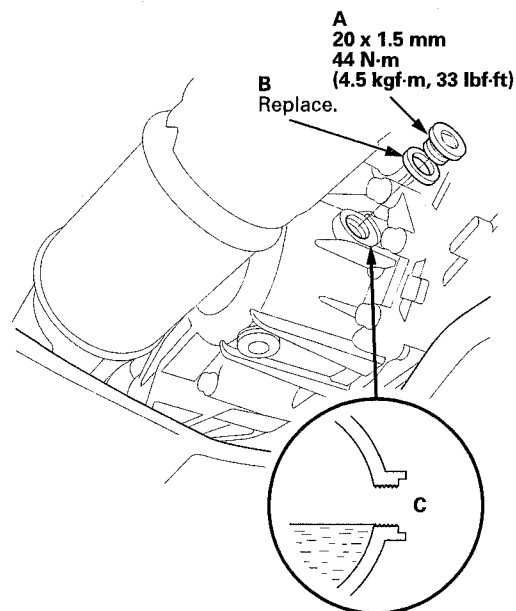
Transfer Assembly Fluid Replacement

1. Warm up the engine to normal operating temperature (the radiator fan comes on), then turn the engine off.
2. Raise the vehicle on a lift, and make sure it is securely supported.
3. Remove the drain plug (A), and drain the transfer fluid (hypoid gear oil).



4. Reinstall the drain plug with a new sealing washer (B).

5. Remove the filler plug (A) and sealing washer (B).



6. Refill the transfer assembly with the recommended fluid (hypoid gear oil) through the filler hole (C) until the fluid flows out. Use a SAE 90 viscosity hypoid gear oil, API classified GL4 or GL5 only.

Viscosity:

SAE 90: Above 0 °F (–18 °C)

Transfer Fluid (Hypoid Gear Oil) Capacity:

0.43 L (0.45 US qt) at change

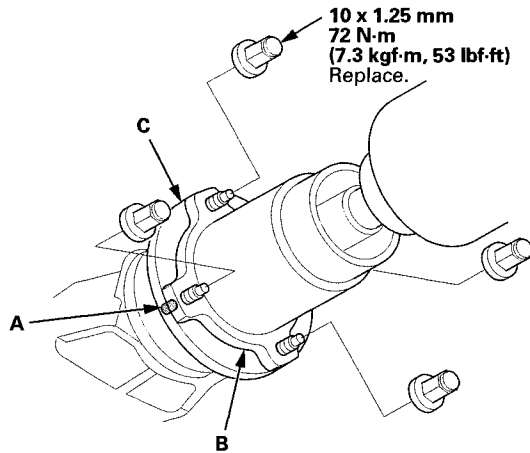
0.45 L (0.48 US qt) at overhaul

7. Install the filler plug with a new sealing washer.

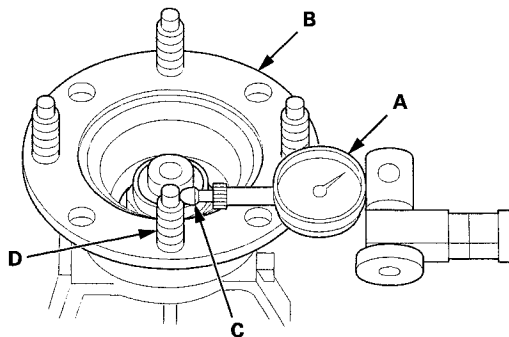
Automatic Transmission

Transfer Assembly Inspection

1. Raise the vehicle on a lift, and make sure it is supported securely.
2. Shift the transmission into N.
3. Make a reference mark (A) across the No. 1 propeller shaft (B) and the transfer companion flange (C).



4. Separate the propeller shaft from the transfer companion flange.
5. Set a dial indicator (A) on the transfer companion flange (B); position the dial indicator tip (C) on the top of the bolt (D).



6. Measure the transfer gear backlash.
Standard: 0.06—0.16 mm (0.002—0.006 in)

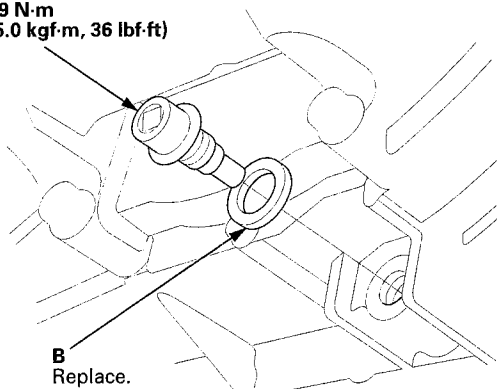
7. If the backlash is out of standard, remove the transfer assembly, and adjust the transfer gear backlash (see page 14-379).
8. Check for fluid leaks between the mating surfaces of the transfer assembly and the transmission.
9. If there is a leak, remove the transfer assembly, remove the transfer cover, and replace the O-ring.
10. Check for fluid leaks between the transfer companion flange and the transfer oil seal.
11. If there is a leak, remove the transfer assembly from the transmission, and replace the transfer oil seal and O-ring on the transfer output shaft (hypoid gear). If an oil seal and O-ring replacement is required, you will need to check and adjust the transfer gear tooth contact, the transfer gear backlash, the tapered roller bearing starting torque, and the total starting torque (see page 14-387). Do not replace the oil seal with the transfer assembly on the transmission.



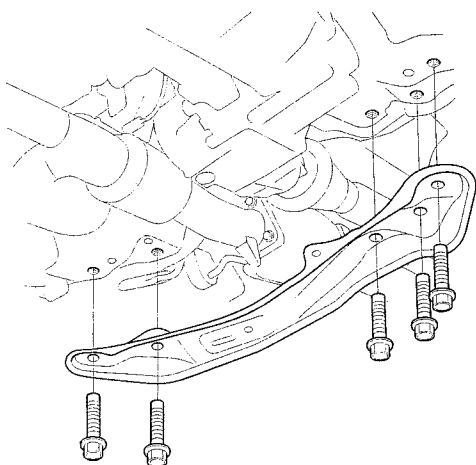
Transfer Assembly Removal

1. Raise the vehicle on a lift, and make sure it is supported securely.
2. Move the shift lever to N.
3. Remove the drain plug (A), and drain the automatic transmission fluid (ATF).

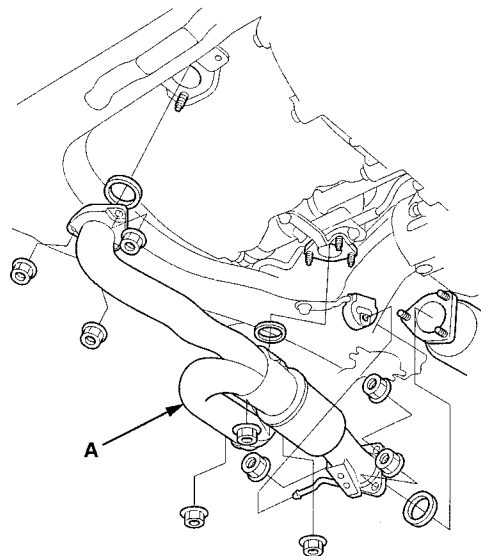
A
18 x 1.5 mm
49 N·m
(5.0 kgf·m, 36 lbf·ft)



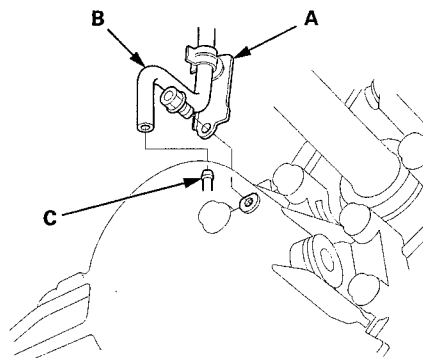
4. Reinstall the drain plug with a new sealing washer (B).
5. Remove the front subframe stiffener.



6. Remove the exhaust pipe A.



7. Remove the bolt securing the transfer breather hose bracket (A), and disconnect the breather hose (B) from the breather pipe (C) on the transfer assembly.

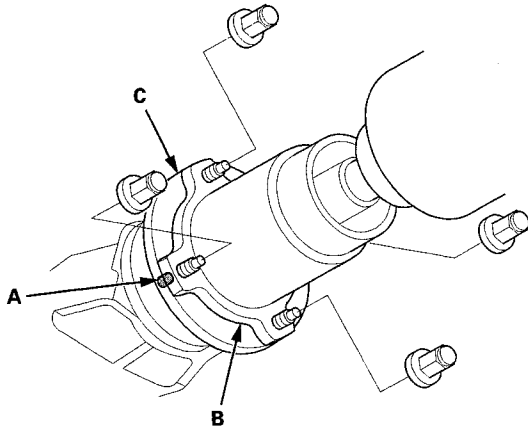


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Automatic Transmission

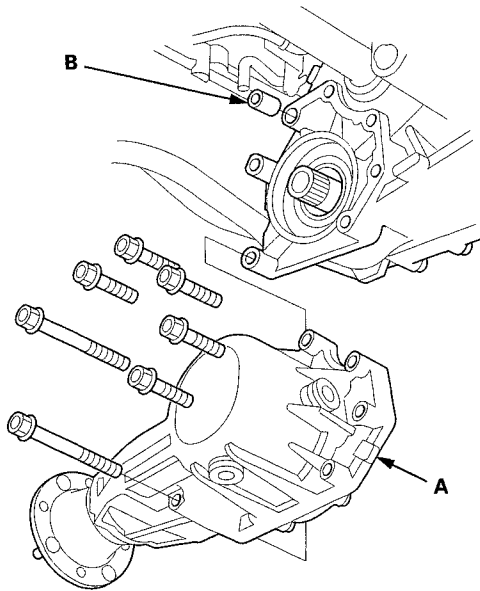
Transfer Assembly Removal (cont'd)

8. Make a reference mark (A) across the No. 1 propeller shaft (B) and the transfer companion flange (C).



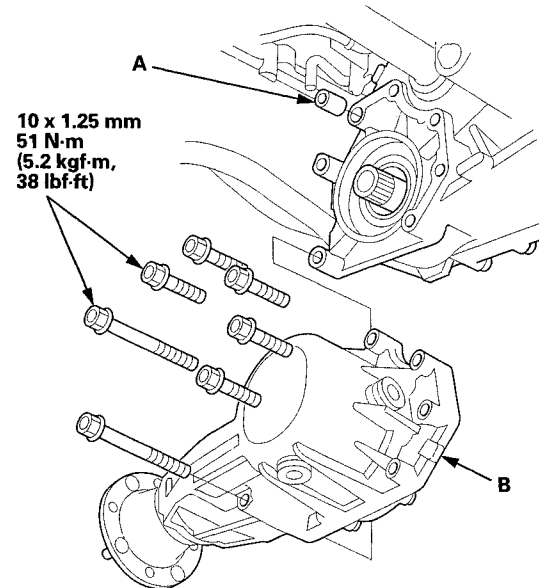
9. Separate the No. 1 propeller shaft from the transfer companion flange.

10. Remove the transfer assembly (A) and the dowel pin (B) from the transmission.

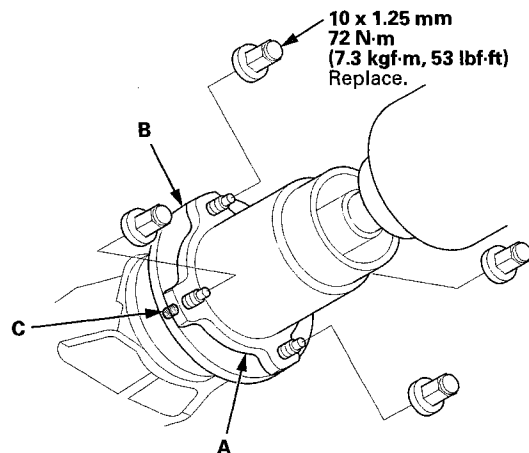


Transfer Assembly Installation

1. Clean the areas where the transfer assembly contacts the transmission with solvent, and dry with compressed air. Then apply transmission fluid to the contact area.
2. Install the dowel pin (A) in the transmission, and install the transfer assembly (B) on the transmission.

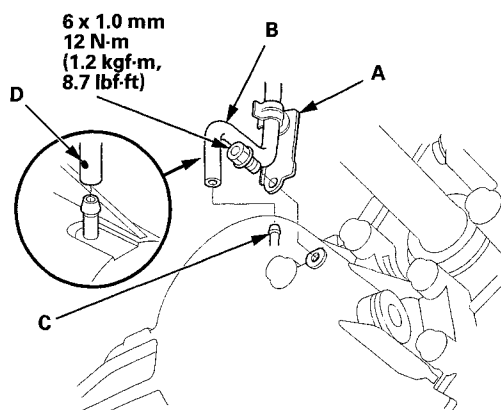


3. Install the No. 1 propeller shaft (A) to the transfer companion flange (B) by aligning the reference mark (C).

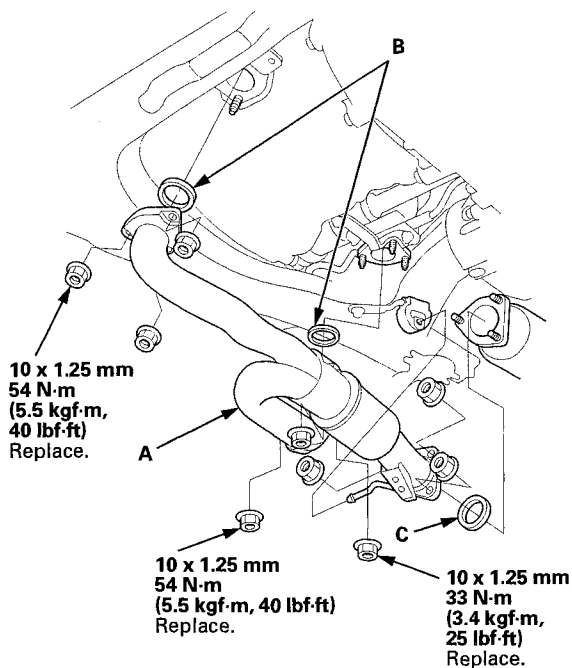




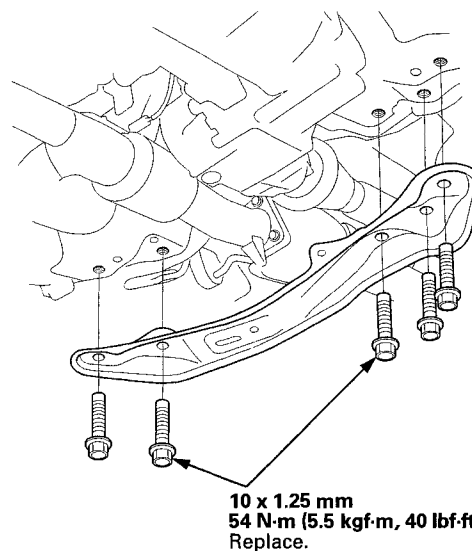
4. Secure the transfer breather tube bracket (A) on the transfer assembly with the bolt, and install the breather tube (B) over the breather pipe (C). Align the tube at the dot mark (D) in the direction shown.



5. Install the exhaust pipe A with the new self-locking nuts and new gaskets (B) (C).



6. Install the front subframe stiffener with new mounting bolts.

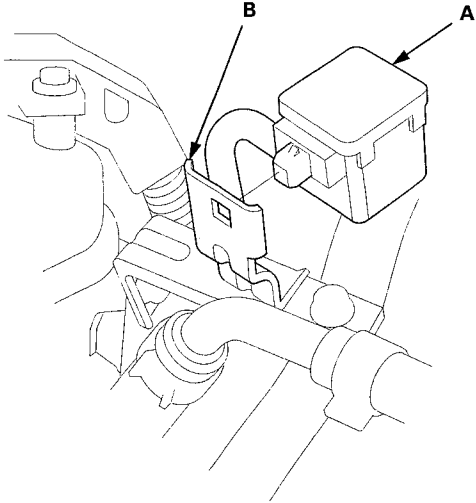


7. Refill the transfer assembly with the transfer fluid (hypoid gear oil), if necessary (see page 14-205).
8. Move the shift lever to N.
9. Refill the transmission with ATF (see step 5 on page 14-204).

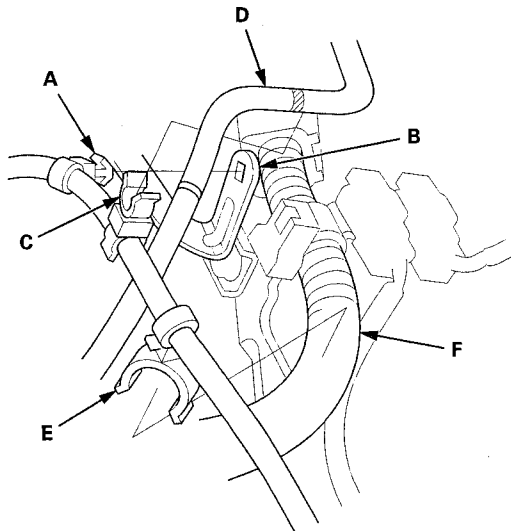
Automatic Transmission

Transfer Breather Hose Replacement

1. Raise the vehicle on a lift, and make sure it is supported securely.
2. Remove the transfer breather (A) from its bracket (B).

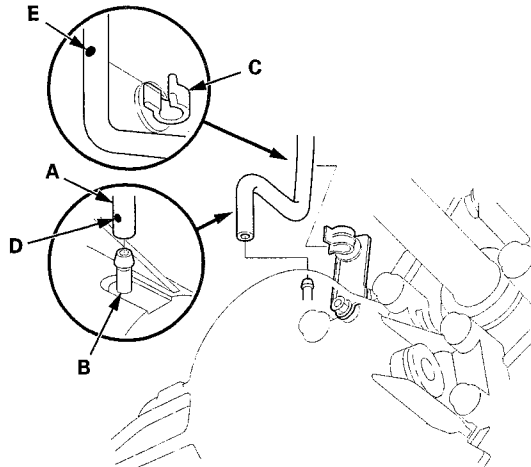


3. Remove the breather hose clamp (A) from the hose clamp bracket (B), and remove the hose clamp (C) from the vacuum hose (D).



4. Remove the harness clamp (E) on the breather hose from the engine harness (F).

5. Disconnect the breather hose (A) from the transfer breather pipe (B), and remove the breather hose from the hose clamp (C).



6. Install the breather hose over the breather pipe with the dot (D) as shown, and install the hose on the hose clamp at the dot (E).
7. Install the breather hose clamp on the hose clamp, and install the hose clamp on the vacuum hose at the mark.
8. Install the harness clamp on the engine harness.
9. Install the transfer breather on its bracket.



Transmission Removal

Special Tools Required

- Engine Support Hanger, A and Reds AAR-T1256*
- 2008 V6 Attachment Arm SIL02C000033*
- Engine Hanger Balance Bar VSB02C000019*
- Subframe Adapter VSB02C000016*

*: Available through the Acura Tool and Equipment Program 888-424-6857.

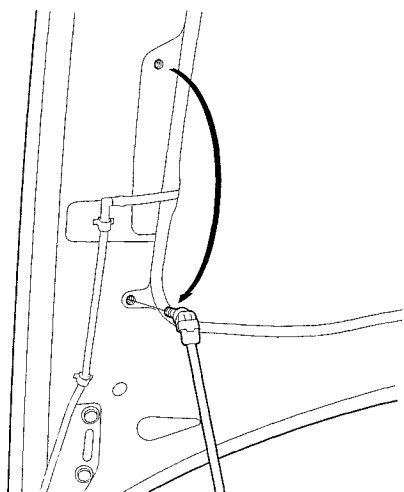
SRS components are located in this area. Review the SRS component locations (see page 24-11) and the precautions and procedures (see page 24-13) before doing repair or service.

NOTE:

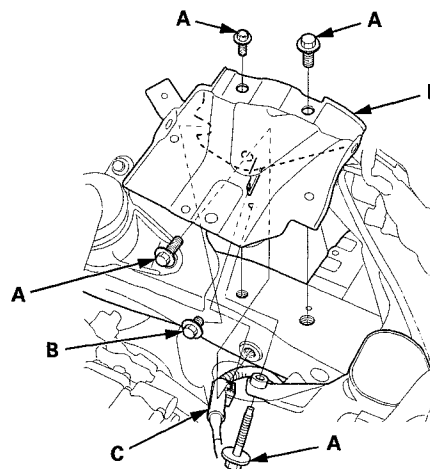
- Use fender covers to avoid damaging painted surfaces.
- Special tool Reds engine support hanger AAR-T1256 must be used with the side engine mount installed.

1. Remove the engine compartment covers (see page 20-186).
2. Remove the steering wheel (see page 17-6).
3. Disconnect the steering joint from the steering gearbox pinion shaft (see step 6 on page 17-9).
4. Disconnect the support strut from the pivot ball on both sides (bolted to the hood). Raise and secure the hood in a vertical position. Remove the passenger's side pivot ball and install it into the lower threaded hole, then reattach the support strut.

NOTE: Do not attempt to close the hood with the support strut in the vertical position; it will damage the support strut and the hood.



5. Do the battery removal procedure (see page 22-87).
6. Remove the air cleaner housing (see page 11-421).
7. Remove the four mounting bolts (A), and loosen the mounting bolt (B), then remove the harness clamp (C) and the battery base (D).



8. Raise the vehicle on a lift, and make sure it is supported securely.
9. Remove the wheels.
10. Remove the splash shield.

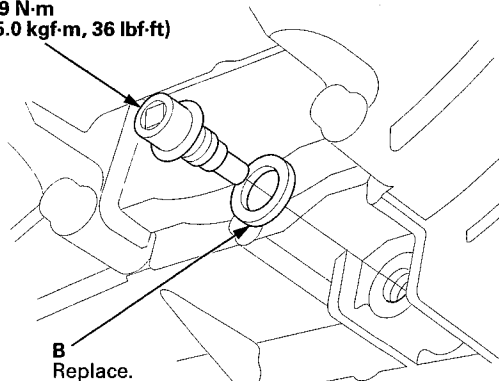
(cont'd)

Automatic Transmission

Transmission Removal (cont'd)

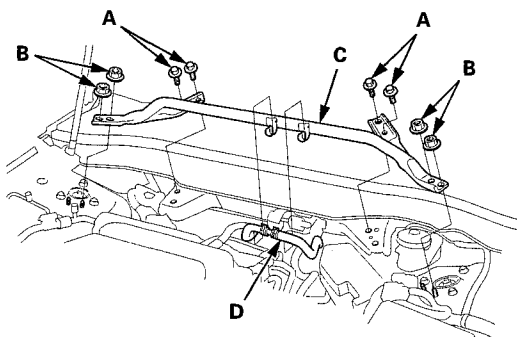
11. Remove the drain plug (A), and drain the automatic transmission fluid (ATF).

A
18 x 1.5 mm
49 N·m
(5.0 kgf-m, 36 lbf-ft)



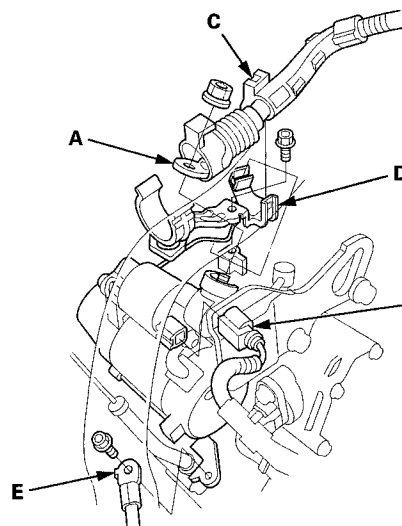
12. Reinstall the drain plug with a new sealing washer (B).

13. Remove the bolts (A) and nuts (B) securing the strut brace (C).



14. Remove the vacuum hose (D), then remove the strut brace.

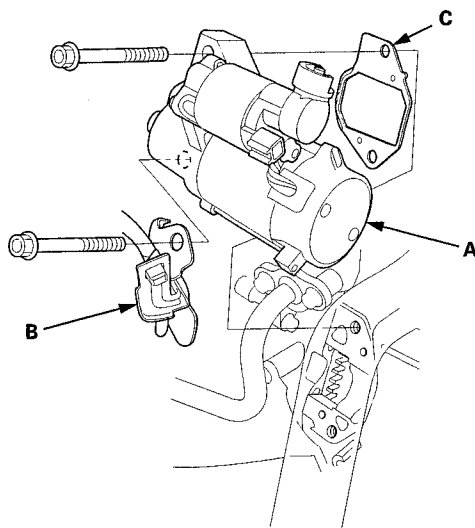
15. Remove the positive starter cable (A) and the S terminal connector (B) from the starter.



16. Remove the harness clamp (C) from the harness clamp bracket (D), and remove the clamp bracket.

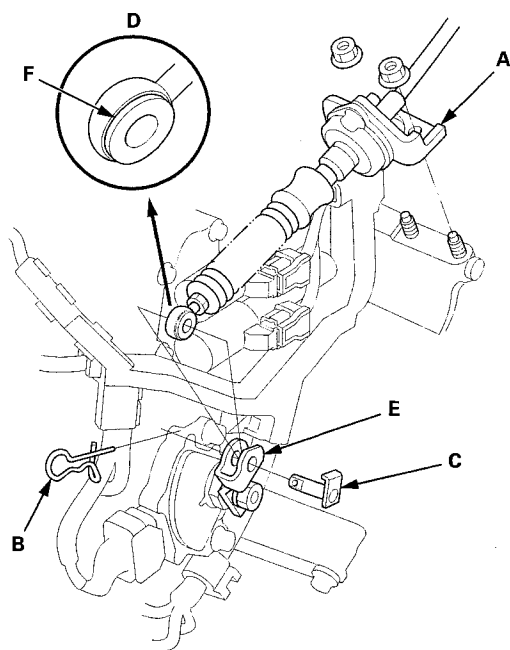
17. Remove the transmission ground terminal (E).

18. Remove the starter (A) with the harness clamp bracket (B) and the gasket (C) from the transmission.





19. Remove the nuts securing the shift cable bracket (A).

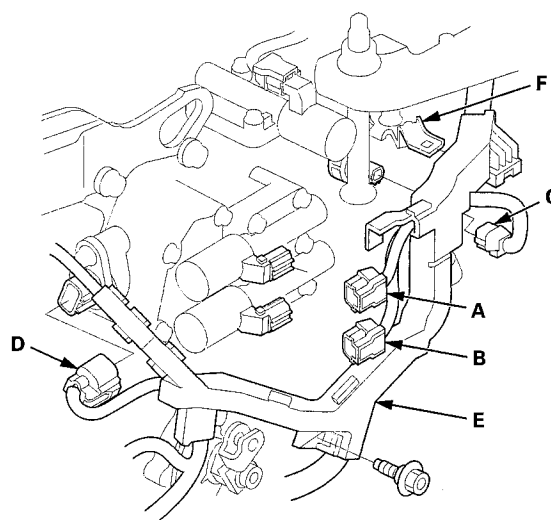


20. Remove the spring clip (B) and the control pin (C), then separate the shift cable end (D) from the selector control lever (E).

21. Check the bushing (F) in the shift cable end for proper fit and wear. If the bushing is loose or worn, replace the shift cable (see page 14-250).

22. Disconnect these connectors:

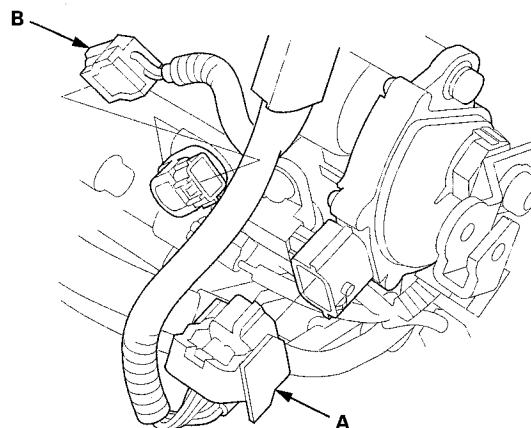
- A/T clutch pressure control solenoid valve A connector (A)
- A/T clutch pressure control solenoid valve B connector (B)
- 4th clutch transmission fluid pressure switch connector (C)
- shift solenoid wire harness connector (D)



23. Remove the bolt securing the harness cover (E), and remove the harness cover from its bracket (F).

24. Disconnect these connectors:

- Transmission range switch connector (A)
- Input shaft (mainshaft) speed sensor connector (B)

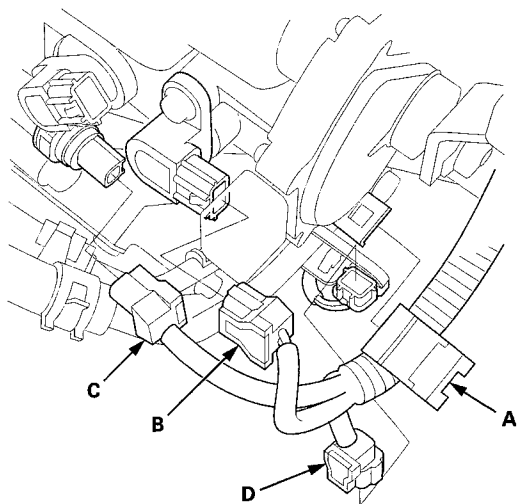


(cont'd)

Automatic Transmission

Transmission Removal (cont'd)

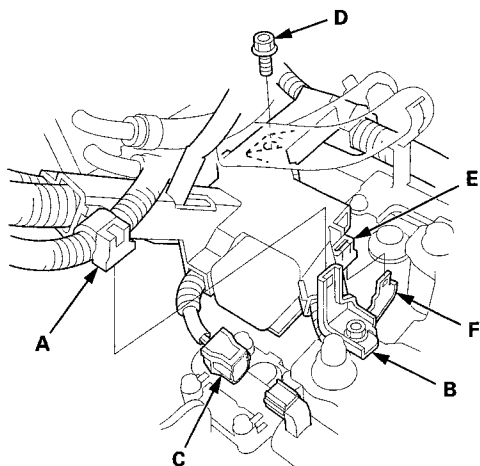
25. Remove the harness clamp (A) from its bracket.



26. Disconnect these connectors:

- Output shaft (countershaft) speed sensor connector (B)
- Transmission fluid pressure switch B (3rd clutch) connector (C)
- ATF temperature sensor connector (D)

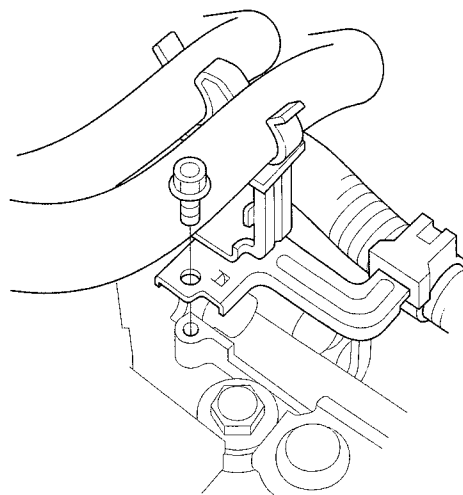
27. Remove the harness clamp (A) from its bracket (B).



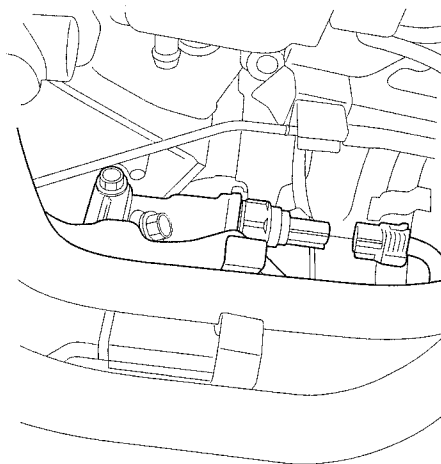
28. Disconnect the A/T clutch pressure control solenoid valve C connector (C).

29. Remove the harness cover mounting bolt (D), and remove the harness cover (E) from its bracket (F).

30. Remove the bolt securing the harness clamp bracket.

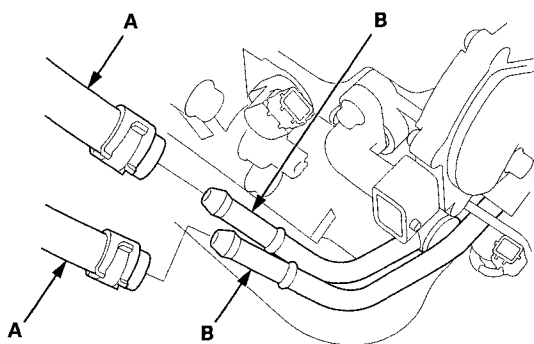


31. Disconnect the transmission fluid pressure switch A (2nd clutch) connector.

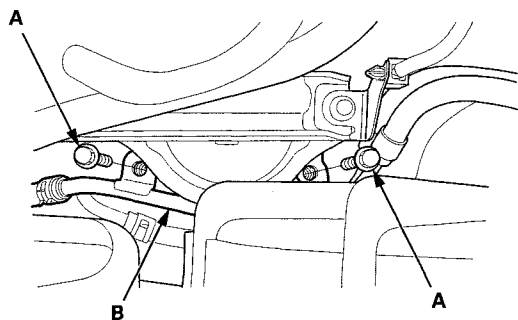




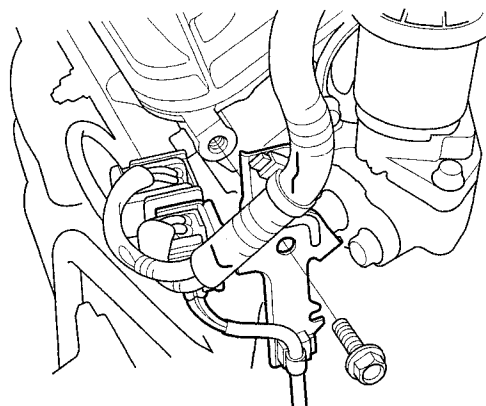
32. Remove the ATF cooler hoses (A) from the ATF cooler lines (B). Turn the ends of the cooler hoses up to prevent ATF from flowing out, then plug the cooler hoses and lines.



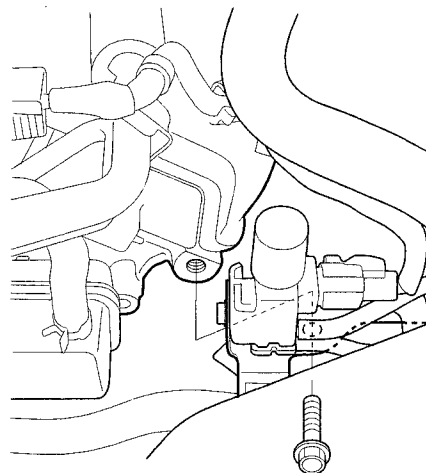
33. Check for any signs of leakage at the hose joints.
34. Remove the bolts (A) securing the ATF cooler line bracket (B).



35. Remove the connector bracket from the front cylinder head; use the bracket bolt hole to attach the engine hanger balance bar front arm.



36. Remove the harness clamp bracket from the rear cylinder head; use the bracket bolt hole to attach the 2008 V6 attachment arm.



(cont'd)

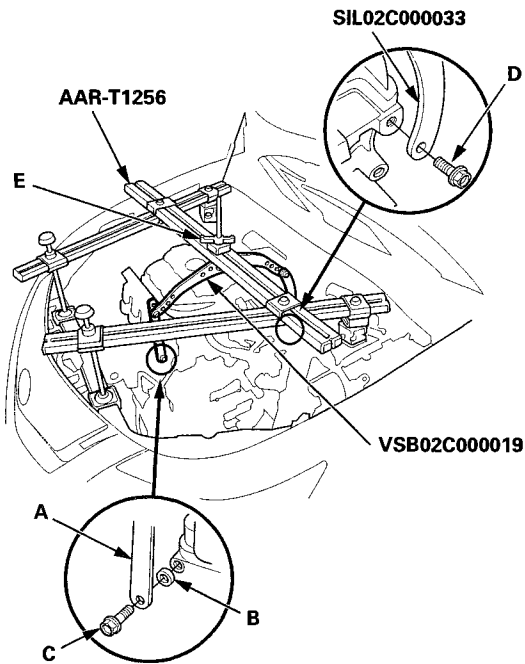
Automatic Transmission

Transmission Removal (cont'd)

37. Install the engine hanger balance bar (VSB02C000019). Attach the front arm (A) to the front cylinder head with a spacer (B) and the bolt (10 x 1.25 mm) (C). Attach the 2008 V6 attachment arm (SIL02C000033) to the rear cylinder head and the bolt (8 x 1.25 mm) (D), then attach the 2008 V6 attachment arm to the engine hanger balance bar.

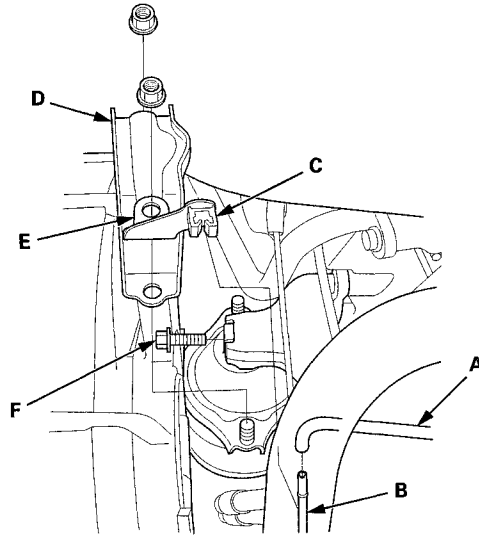
NOTE:

- Be careful when working around the windshield.
- Be careful not to damage the hood opener cable when installing the engine support hanger at the front bulkhead.



38. Install the engine support hanger (AAR-T1256) to the vehicle, and attach the hook to the engine balancer bar slot. Tighten the wing nut (E) by hand, and lift and support the engine.

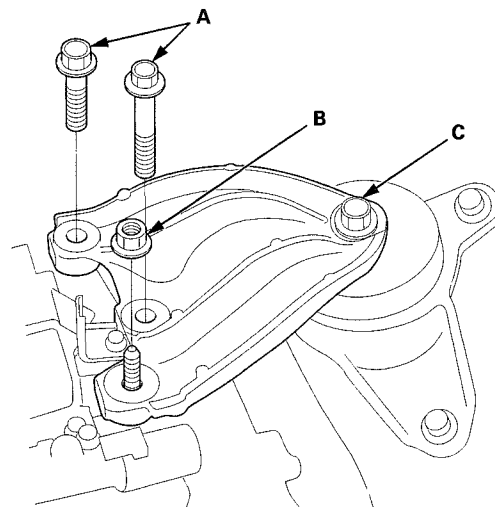
39. Remove the vacuum hose (A) from the vacuum pipe (B), and remove the vacuum pipe from its clamp (C).



40. Remove the front engine mount stop (D) and the clamp bracket (E), and remove the front engine mount bolt (F).

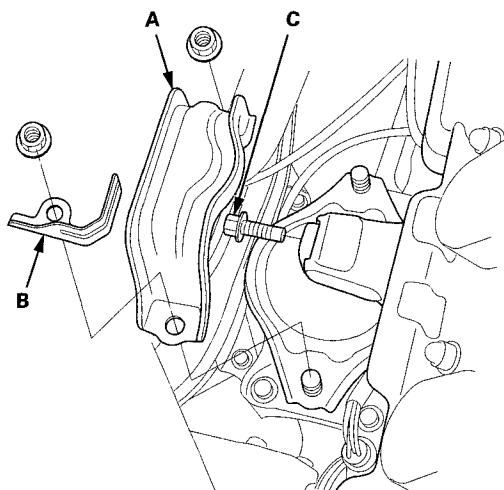
41. Remove the upper transmission mount bracket bolts (A) and the nut (B).

NOTE: Do not remove the bolt (C) from the upper transmission mount. If the bolt is removed, the upper transmission mount must be replaced as an assembly.

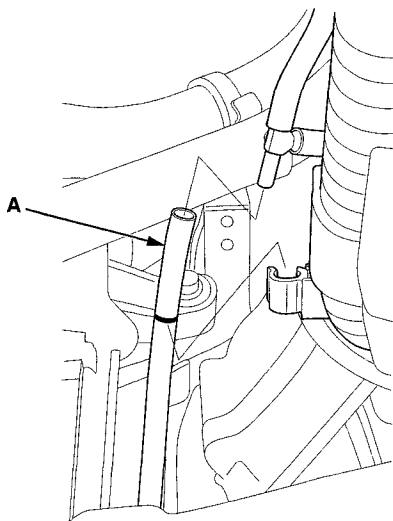




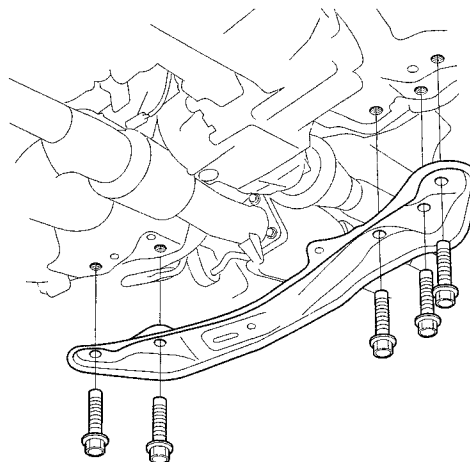
42. Remove the rear engine mount stop (A) and the heat shield (B), and remove the rear engine mount bolt (C).



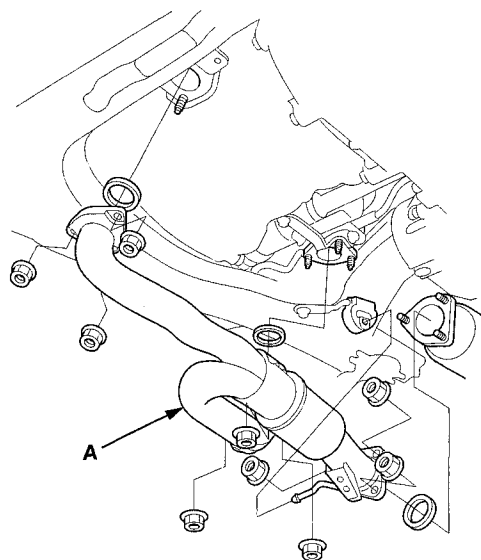
43. Remove the vacuum hose (A) from the clamp, and remove the vacuum hose from the joint.



44. Remove the front subframe stiffener.



45. Remove exhaust pipe A.

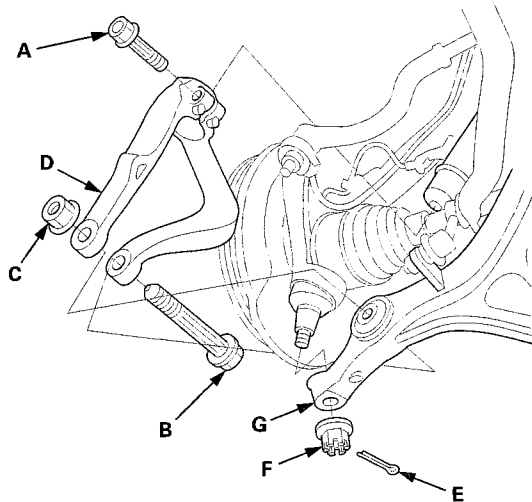


(cont'd)

Automatic Transmission

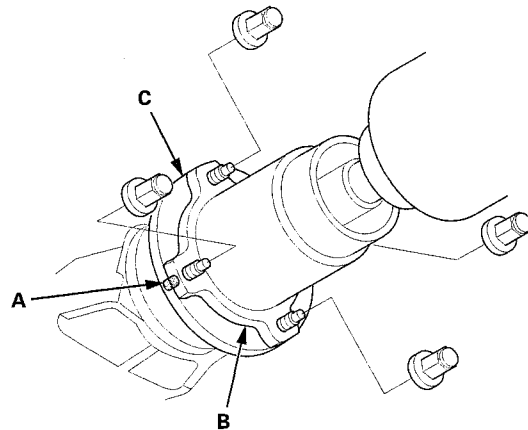
Transmission Removal (cont'd)

46. Remove the damper pinch bolts (A), the damper fork bolts (B) and the self-locking nuts (C), and remove the damper forks (D).

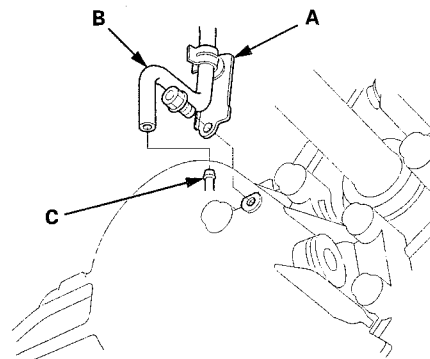


47. Remove the cotter pins (E) and the castle nuts (F), and separate the lower arms (G) from the knuckle (see step 7 on page 18-21).

48. With SH-AWD: Make a reference mark (A) across the No. 1 propeller shaft (B) and the transfer companion flange (C), and separate the No. 1 propeller shaft from the transfer companion flange.

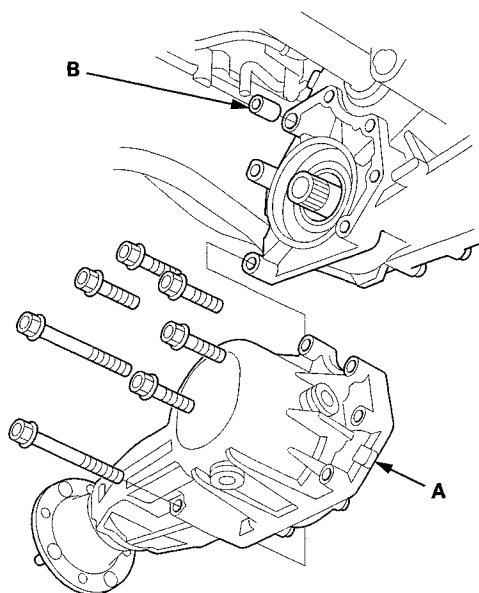


49. With SH-AWD: Remove the bolt securing the transfer breather tube bracket (A), and disconnect the breather tube (B) from the breather pipe (C) on the transfer assembly.

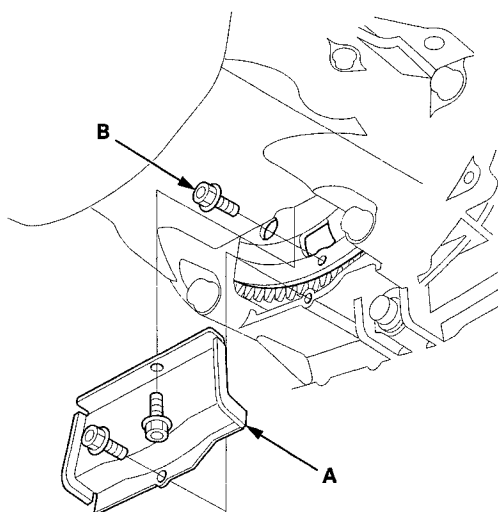




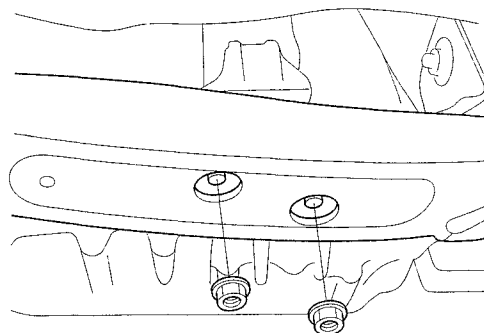
50. With SH-AWD: Remove the transfer assembly (A) and dowel pin (B) from the transmission.



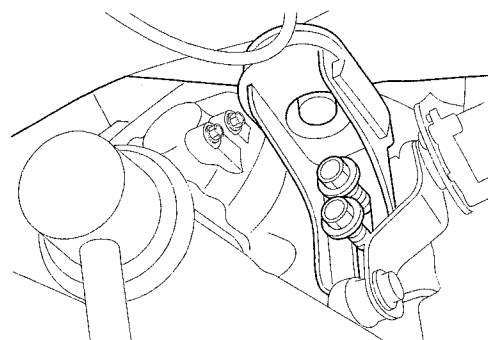
51. Remove the torque converter cover (A), and remove the drive plate bolts (B) (8) while rotating the crankshaft pulley.



52. Remove the transmission lower mount nuts.



53. Loosen both front subframe middle mount bolts.

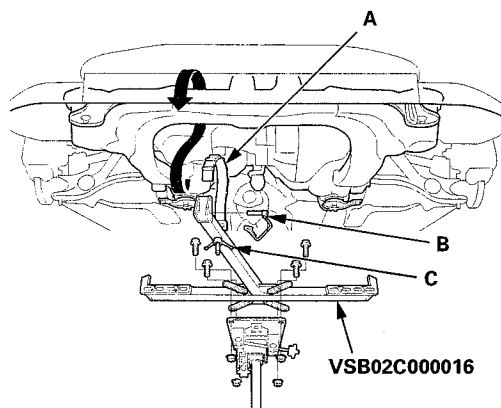


(cont'd)

Automatic Transmission

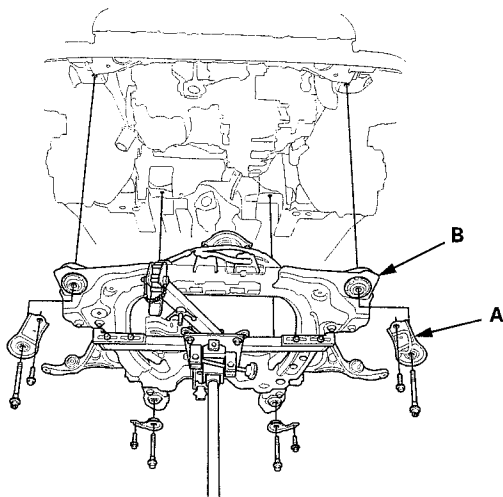
Transmission Removal (cont'd)

54. Attach the subframe adapter (VSB02C000016) to the front subframe by looping the strap (A) over the front of the front subframe, then secure the strap with the stop (B), then tighten the wing nut (C).

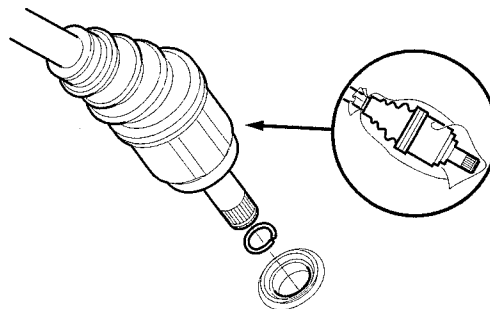


55. Raise the jack and line up the slots in the arms with the bolt holes on the corner of the jack base, then tighten the bolts.
56. Remove the four bolts securing the stiffeners (A) and the four bolts securing the front subframe (B), then lower the front subframe.

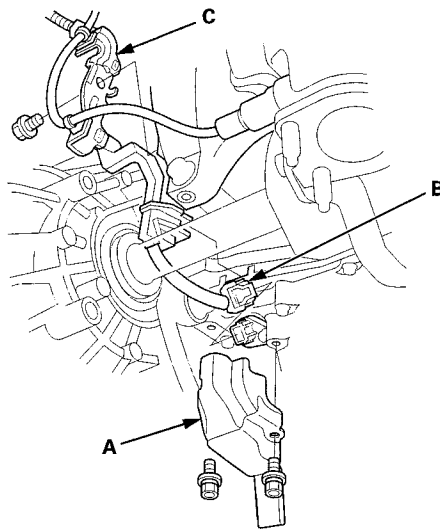
NOTE: Check that the front subframe is free of the ATF cooler hoses and the electrical wiring.



57. Remove the left side driveshaft from the differential and the right side driveshaft from the intermediate shaft. Coat all precision machined surfaces with clean engine oil, then put plastic bags over the driveshaft ends. Support the driveshafts on both sides with nylon straps.



58. Remove the crankshaft position (CKP) sensor cover (A), and disconnect the CKP sensor connector (B).

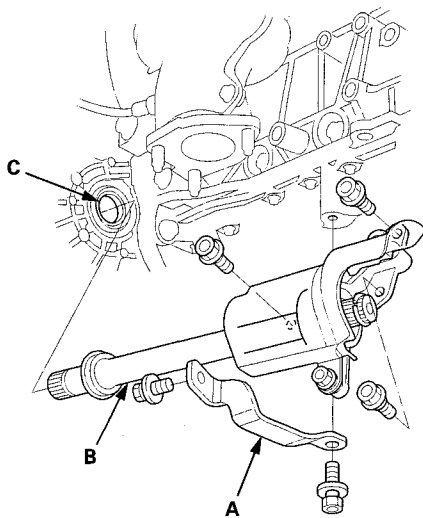


59. Remove the bolt securing the sensor harness clamp bracket (C).



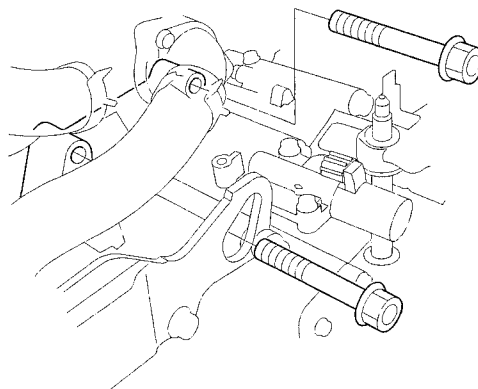
60. Remove the rear warm up three way catalytic converter (WU-TWC) bracket (A), and remove the intermediate shaft (B).

NOTE: Plug the intermediate shaft hole (C) to prevent dirt and solvent from entering the transmission.



61. Coat all precision finished surfaces with clean engine oil, then put plastic bags over intermediate shaft ends.

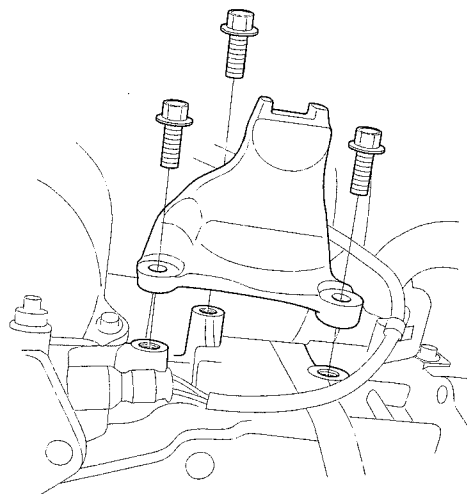
62. Remove the upper transmission housing mounting bolts.



63. Lower the transmission by loosening the wing nut on the engine support hanger, and tilt the engine just enough for the end of the transmission to clear the side frame.

64. Place a jack under the transmission.

65. Remove the front engine mount bracket.

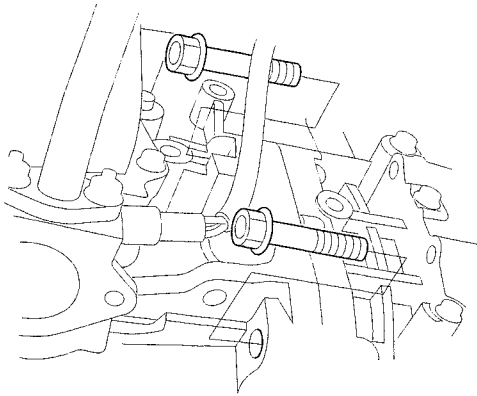


(cont'd)

Automatic Transmission

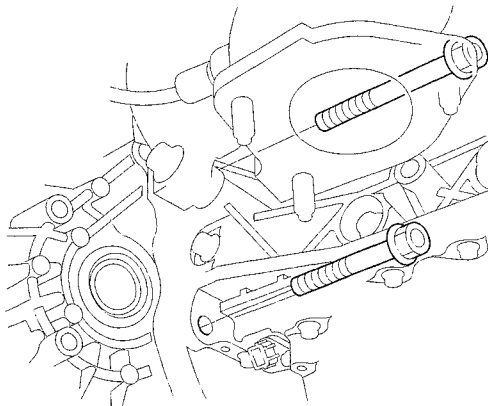
Transmission Removal (cont'd)

66. Remove the front transmission housing mounting bolts.

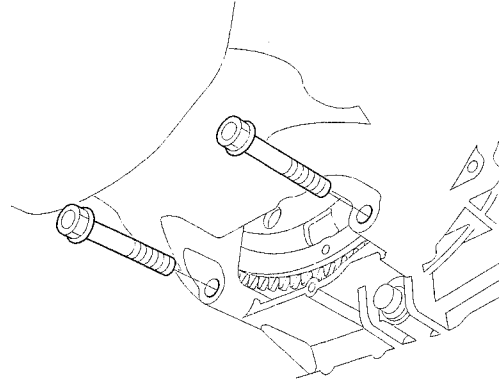


67. Remove the rear transmission housing mounting bolts.

NOTE: Be careful not to damage the CKP sensor.



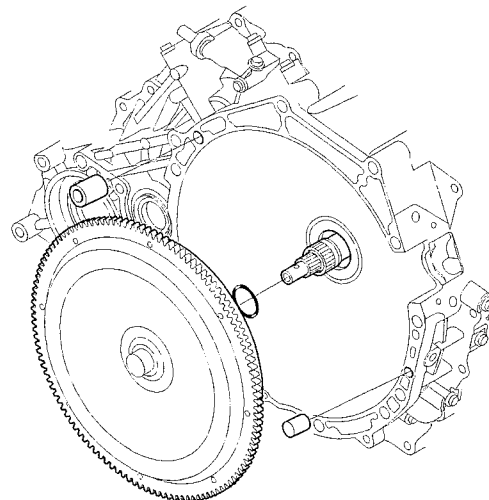
68. Remove the lower transmission housing mounting bolts.



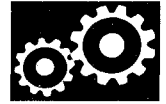
69. Check once again that the transmission is free of vacuum hoses, ATF and coolant hoses, and electrical wiring.

70. Slide the transmission away from the engine to remove it from the vehicle.

71. Remove the torque converter, the O-ring, and the dowel pins.



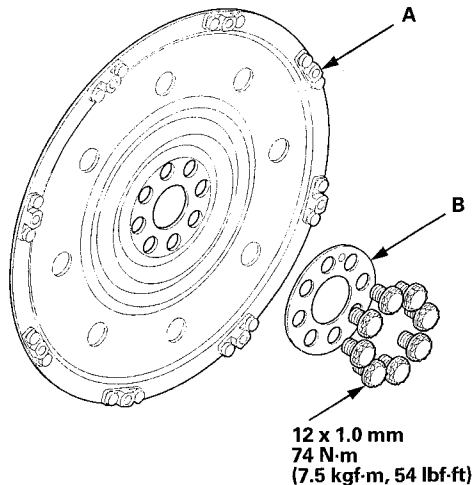
72. Inspect the drive plate, and replace it if it is damaged (see page 14-223).



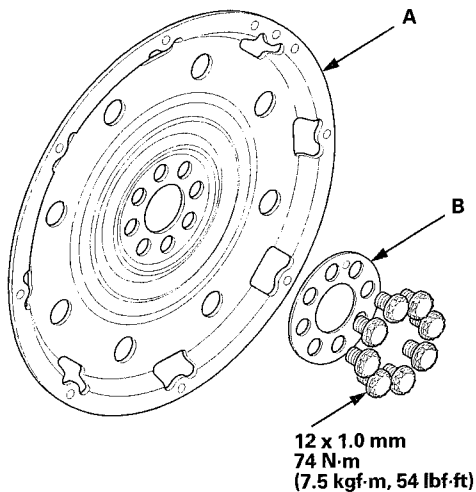
Drive Plate Removal and Installation

1. Remove the transmission assembly (see page 14-211).
2. Remove the drive plate (A) and the washer (B) from the engine crankshaft.

With SH-AWD



Without SH-AWD



3. Install the drive plate and the washer on the engine crankshaft, and tighten the eight bolts in a crisscross pattern in at least two steps.
4. Install the transmission assembly (see page 14-223).

Transmission Installation

Special Tools Required

- Subframe Alignment Pin 070AG-SJAA10S
- 2008 V6 Attachment Arm SIL02C000033*
- Engine Support Hanger, A and Reds AAR-T1256*
- Engine Hanger Balance Bar VSB02C000019*
- Subframe Adapter VSB02C000016*

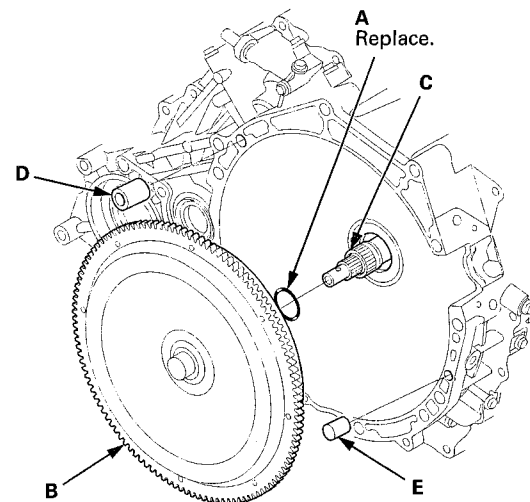
*: Available through the Acura Tool and Equipment Program 888-424-6857.

SRS components are located in this area. Review the SRS component locations (see page 24-11) and the precautions and procedures (see page 24-13) before doing repair or service.

NOTE: Use fender covers to avoid damaging painted surfaces.

1. If you did not clean the ATF cooler when you removed the transmission, and you are installing an overhauled or remanufactured transmission, clean the ATF cooler (see page 14-236).
2. Install a new O-ring (A) on the torque converter (B), then install the torque converter on the mainshaft (C).

NOTE: Make sure the torque converter is fully engaged on the mainshaft starter shaft and the ATF pump gear. Failure to do so will result in severe transmission or engine damage.



3. Install the 14 x 20 mm dowel pin (D) and the 10 x 20 mm dowel pin (E) in the torque converter housing.

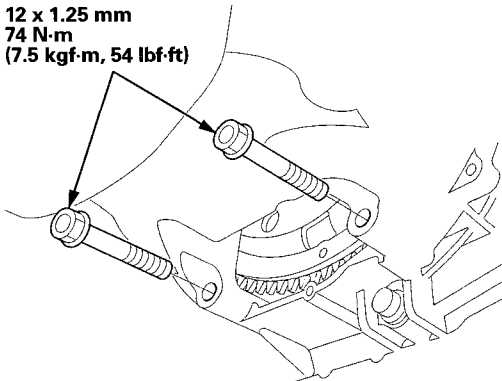
(cont'd)

Automatic Transmission

Transmission Installation (cont'd)

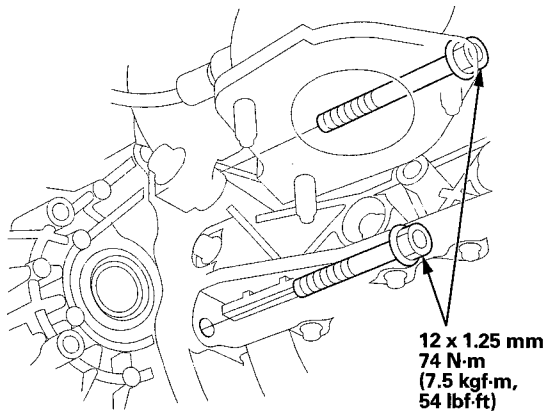
4. Place the transmission on a jack, and raise the transmission to the engine level, then fit the transmission to the engine.
5. Install the lower transmission housing mounting bolts.

12 x 1.25 mm
74 N·m
(7.5 kgf·m, 54 lbf·ft)



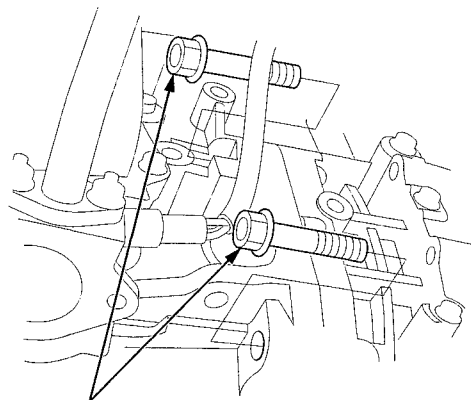
6. Install the rear transmission housing mounting bolts.

NOTE: Be careful not to damage the CKP sensor.



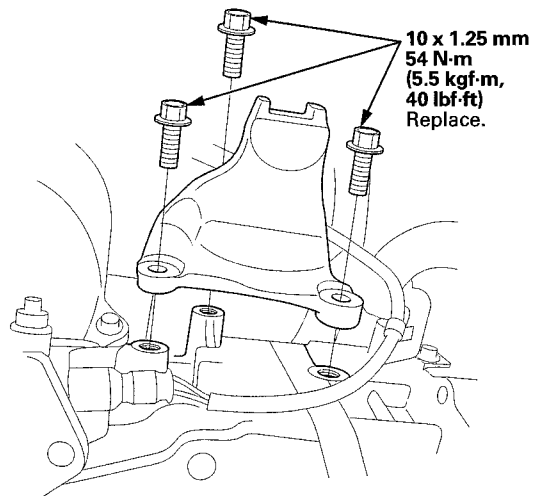
12 x 1.25 mm
74 N·m
(7.5 kgf·m, 54 lbf·ft)

7. Install the front transmission housing mounting bolt.



12 x 1.25 mm
74 N·m (7.5 kgf·m, 54 lbf·ft)

8. Install the front engine mount bracket with new bolts.

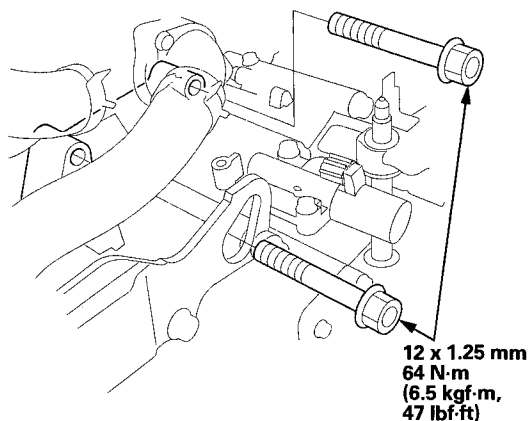


10 x 1.25 mm
54 N·m
(5.5 kgf·m, 40 lbf·ft)
Replace.

9. Remove the jack.



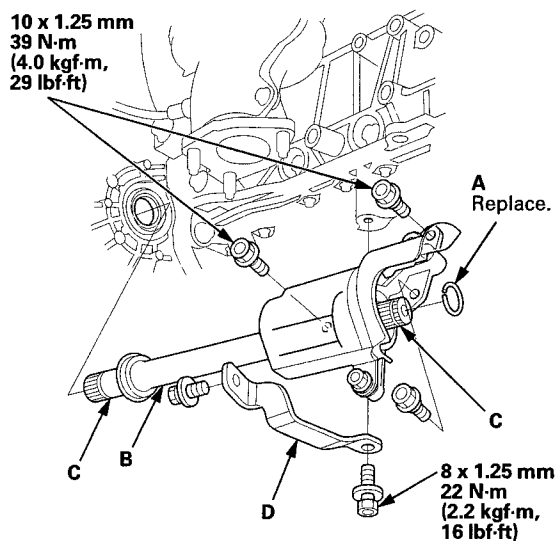
10. Install the upper transmission housing mounting bolts.



11. Plug the driveshaft hole to prevent dirt and solvent from entering the transmission. Clean the areas where the intermediate shaft contacts the transmission (differential) with solvent, and dry with compressed air.

NOTE: Do not wash the rubber parts with solvent.

12. Install a new set ring (A) on the intermediate shaft (B).



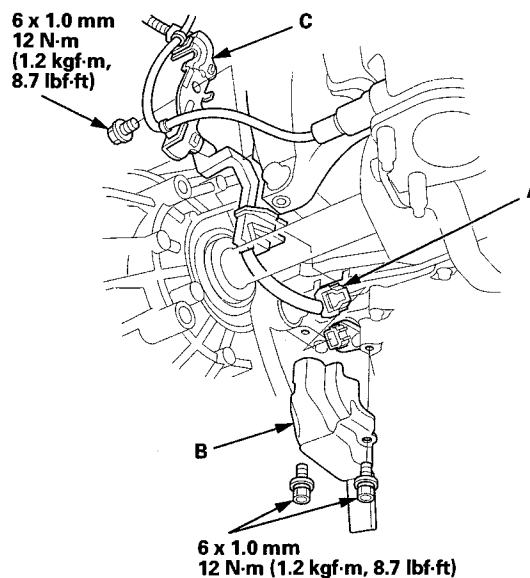
13. Apply ATF to the intermediate shaft splines, then install the intermediate shaft; be sure not to allow dust or other foreign particles to enter the transmission.

NOTE: Insert the intermediate shaft carefully to prevent, damaging the oil seal (C).

14. Install the heat shield with the mounting bolts.

15. Install the rear warm up three way catalytic converter (WU-TWC) bracket (D).

16. Connect the crankshaft position (CKP) sensor connector (A), and install the CKP sensor cover (B) and the sensor harness clamp bracket (C).



(cont'd)

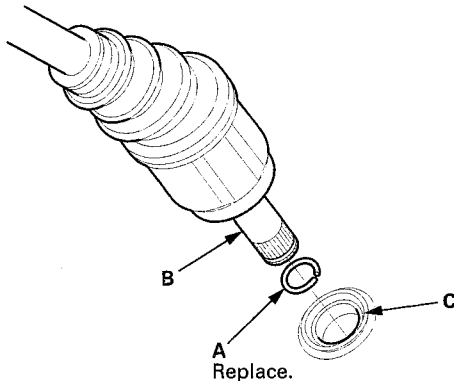
Automatic Transmission

Transmission Installation (cont'd)

17. Clean the areas where the left driveshaft contacts the transmission (differential) with solvent, and dry with compressed air.

NOTE: Do not wash the rubber part with solvent.

18. Install a new set ring (A) on the left driveshaft (B).



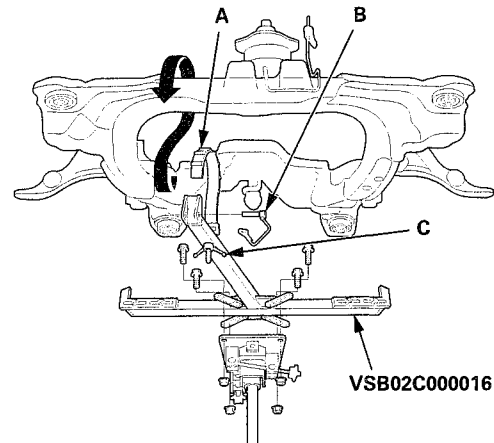
19. Install the left driveshaft; be sure not to allow dust or other foreign particles to enter the transmission. Turn the steering knuckle fully outward, and slide the driveshaft into the differential until you feel its set ring fully engage the side gear.

NOTE: Insert the left driveshaft horizontally to prevent damaging the oil seal (C).

20. Apply right driveshaft inboard joint splines with the recommended grease (see step 4 on page 16-21).

21. Slide the right driveshaft over the intermediate shaft splines until you feel the driveshaft fully engage the intermediate shaft set ring.

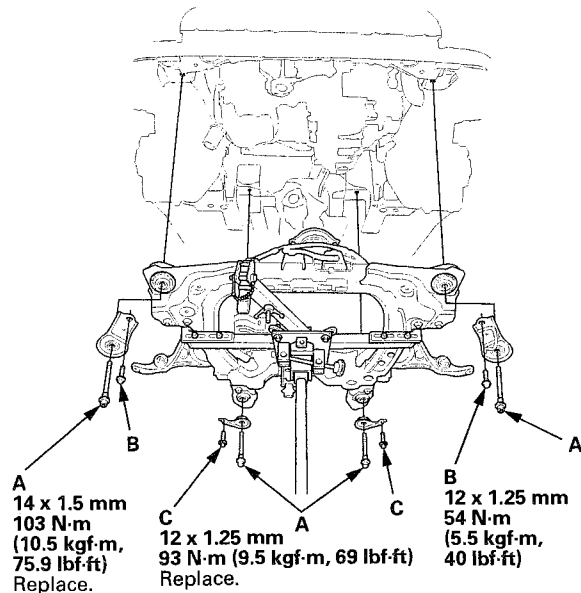
22. Set the subframe adapter (VSB02C000016) to the front subframe by looping the strap (A) over the front of the front subframe, then secure the strap with the stop (B), then tighten the wing nut (C).



23. Raise the front subframe up to the body, then loosely install new front subframe mounting bolts (A), the front stiffener mounting bolts (B), and new rear stiffener mounting bolts (C).

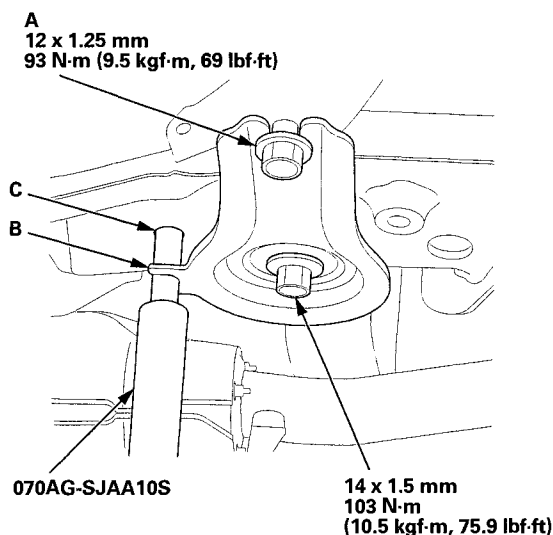
NOTE: Be careful when connecting these items:

- Front engine mount and its bracket
- Transmission lower mount and front subframe
- Damper forks and lower arms





24. Loosely tighten the front subframe mounting bolt (A) in the right rear stiffener until the front subframe insulator contacts the body; insert the subframe alignment pin (070AG-SJAA10S) through the positioning slot (B) on the right rear stiffener, through the positioning hole (C) on the front subframe, and into the positioning hole on the body.



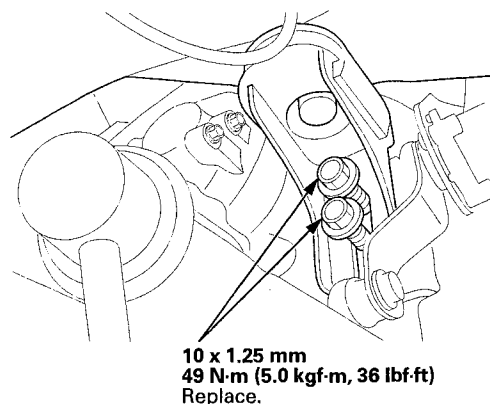
25. Loosely tighten the front subframe mounting bolt in the left rear stiffener in the same manner as in step 24.
26. Reinsert the subframe alignment pin through the positioning slot on the right rear stiffener, through the positioning hole on the front subframe, and into the positioning hole on the body, then tighten the front subframe mounting bolt to the specified torque.
27. Tighten the front subframe mounting bolt in the left rear stiffener in the same manner as in step 26.
28. Tighten the front subframe mounting bolts in the right front stiffener and the left front stiffener to the specified torque.

29. Check that the positioning holes and slots are aligned using the subframe alignment pin.

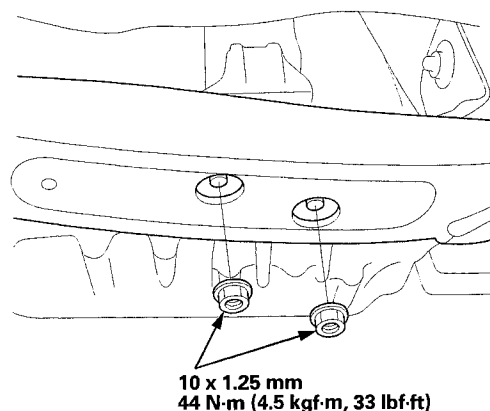
30. Tighten the rear and front stiffener mounting bolts to the specified torque.

31. Remove the jack and the front subframe adapter.

32. Replace the front subframe middle mount bolts, then tighten the bolts to the specified torque.



33. Install the transmission lower mount nuts.

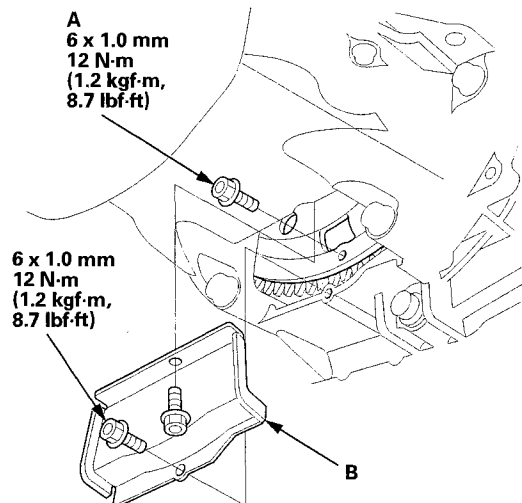


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Automatic Transmission

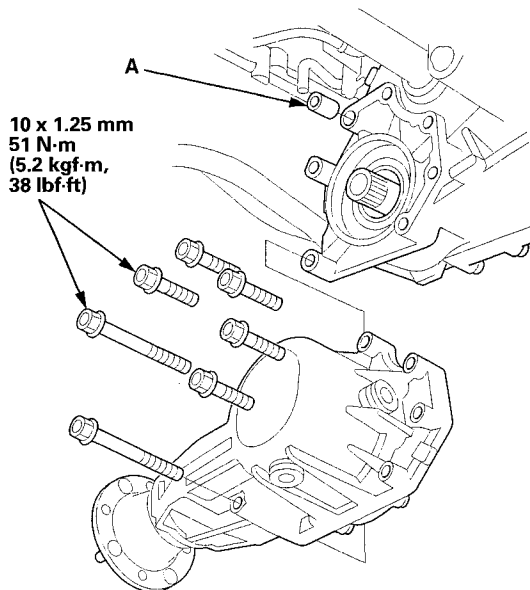
Transmission Installation (cont'd)

34. Attach the torque converter to the drive plate with eight bolts (A). Rotate the crankshaft pulley as necessary to tighten the bolts to half of the specified torque, then to the final torque, in a crisscross pattern. After tightening the last bolt, check that the crankshaft rotates freely.

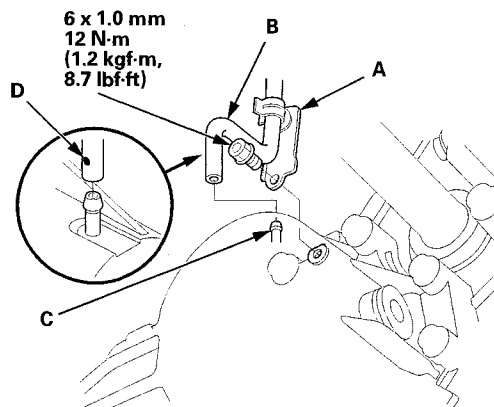


35. Install the torque converter cover (B).

36. With SH-AWD: Install the dowel pin (A) in the transmission, and install the transfer assembly (B) on the transmission.

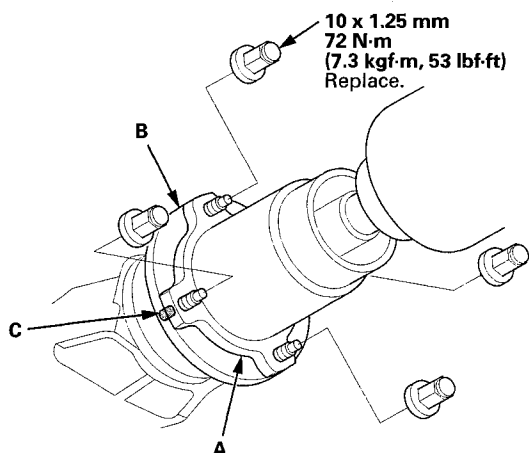


37. With SH-AWD: Secure the transfer breather tube bracket (A) on the transfer assembly with the bolt, and install the breather tube (B) over the breather pipe (C). Align the tube at the dot mark (D) in the direction shown.

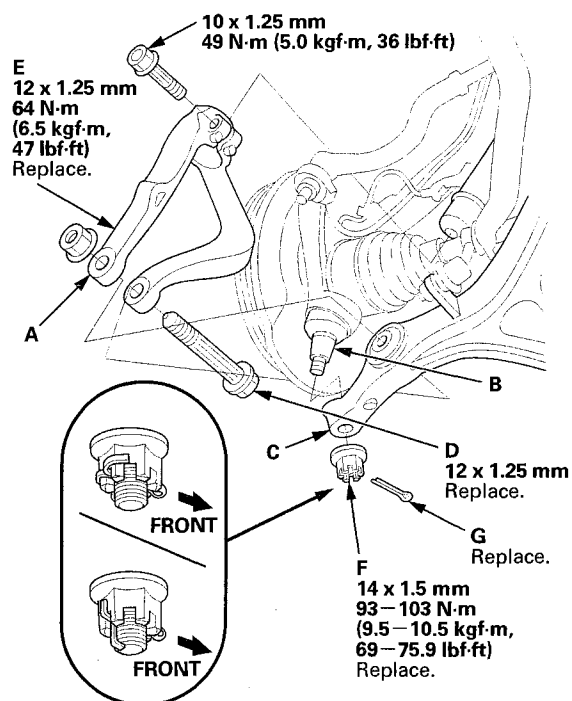




38. With SH-AWD Install the No. 1 propeller shaft (A) to the transfer companion flange (B) by aligning the reference mark (C).



39. Install the damper forks (A) with the damper pinch bolts, and install the ball joints (B) to each lower arms (C).



40. Install new damper fork bolts (D) and new self-locking nuts (E), and secure the ball joints with new castle nuts (F).

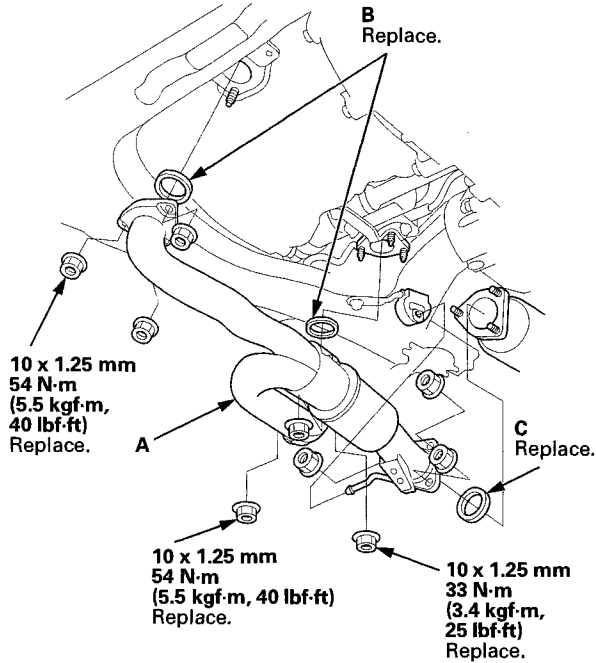
NOTE: Do not install the cotter pin (G) onto the castle nut until the castle nut tightened to the specified torque.

(cont'd)

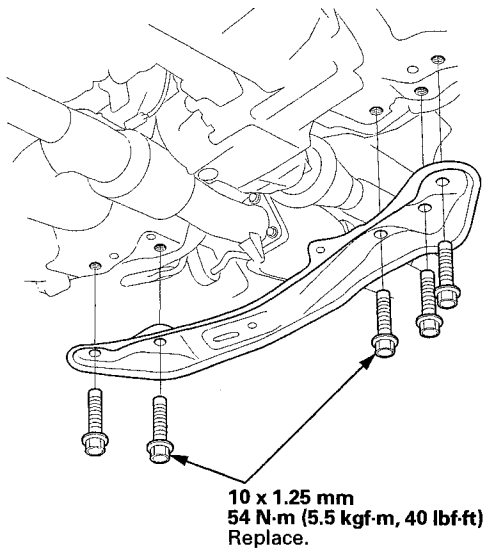
Automatic Transmission

Transmission Installation (cont'd)

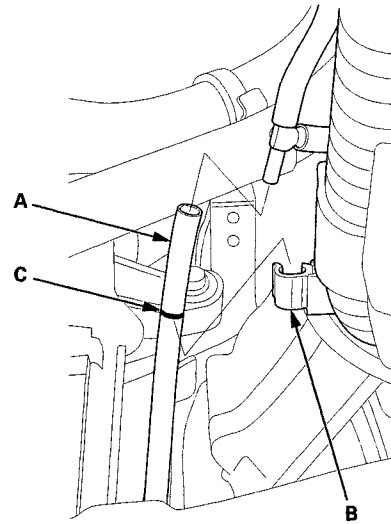
41. Install exhaust pipe A with new self-locking nuts and new gaskets (B) (C).



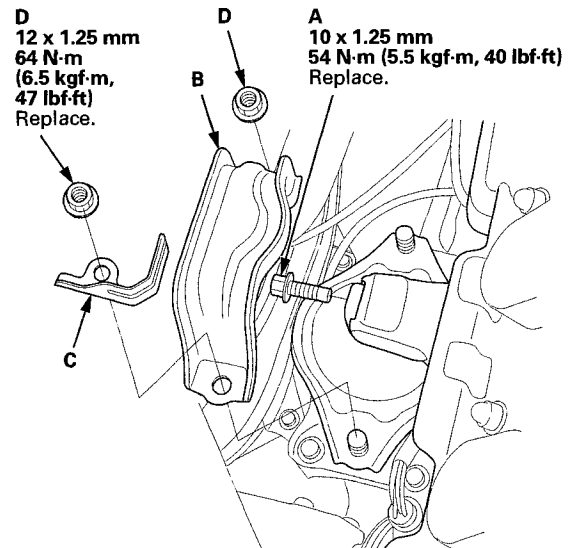
42. Install the front subframe stiffener with new mounting bolts.



43. Install the vacuum hose (A) to the joint, and install the vacuum hose on its clamp (B) at the make (C).



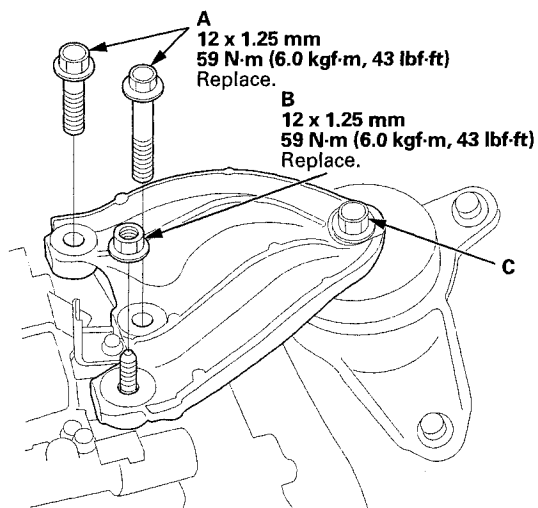
44. Install a new rear engine mount bolt (A), then install the rear engine mount stop (B) and the heat shield (C) with new nuts (D).



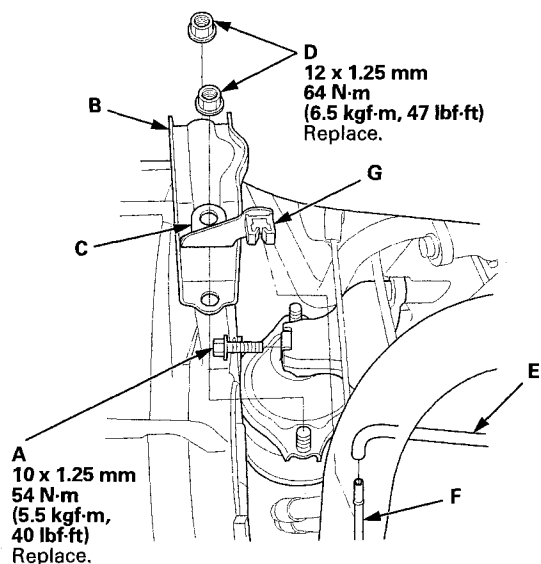


45. Install new upper transmission mount bracket bolts (A) and a new nut (B).

NOTE: If bolt (C) was removed by mistake during removal, the upper transmission mount bracket must be replaced as an assembly.



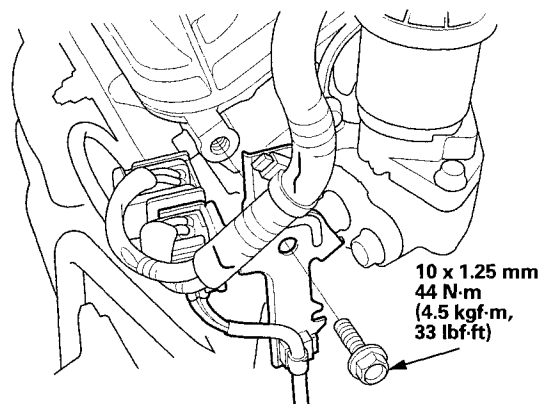
46. Install a new front engine mount bolt (A), then install the front engine mount stop (B) and the clamp bracket (C) with new nuts (D).



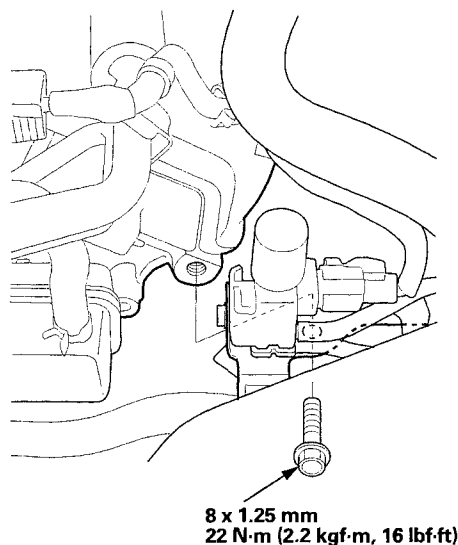
47. Install the vacuum hose (E) to the vacuum pipe (F), and install the vacuum pipe on its clamp (G).

48. Remove the engine support hanger, engine hanger balancer bar, and the 2008 V6 attachment arm.

49. Install the connector bracket to the front cylinder head.



50. Install the harness clamp bracket to the rear cylinder head.

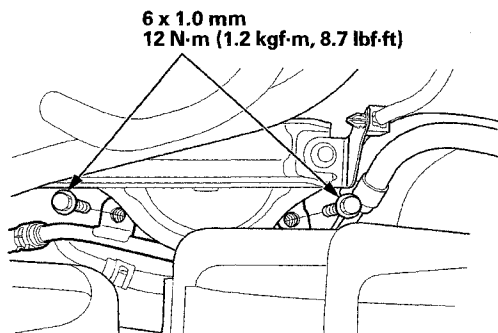


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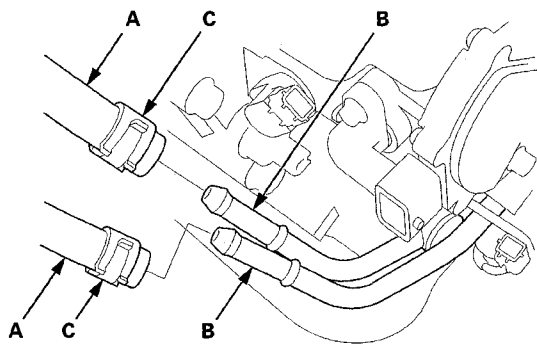
Automatic Transmission

Transmission Installation (cont'd)

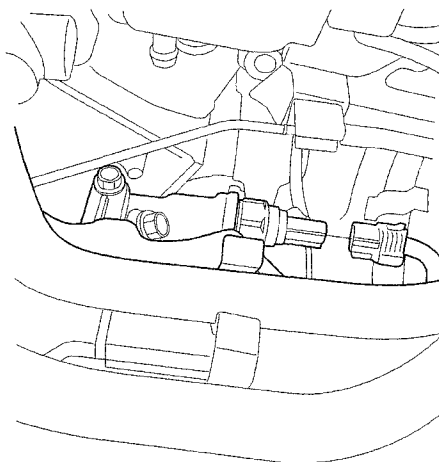
51. Install the ATF cooler line bracket.



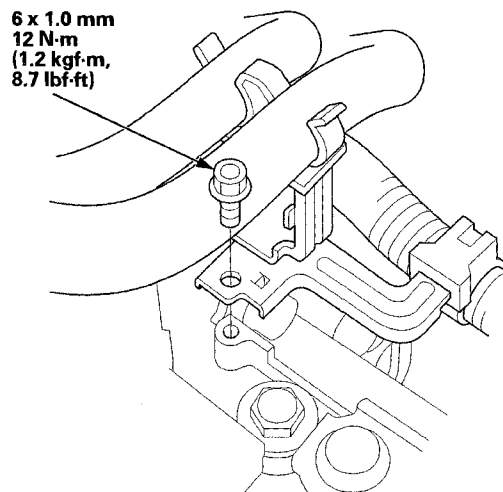
52. Connect the ATF cooler hoses (A) to the ATF cooler lines (B), and secure the hoses with the clips (C) (see page 14-239).



53. Connect the transmission fluid pressure switch A (2nd clutch) connector.

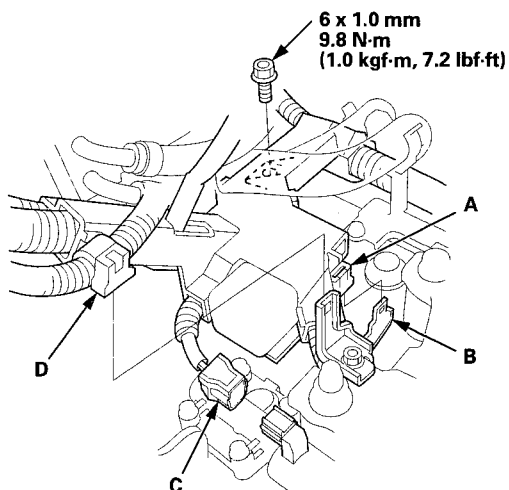


54. Secure the harness clamp bracket with the bolt.





55. Install the harness cover (A) on its bracket (B), and secure it with the harness cover mounting bolt.

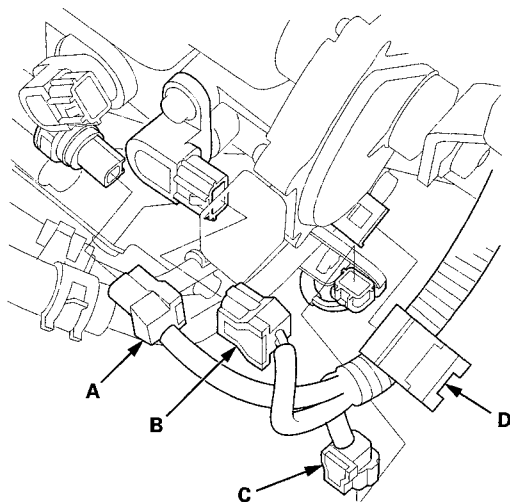


56. Connect the A/T clutch pressure control solenoid valve C connector (C).

57. Install the harness clamp (D) on the bracket.

58. Connect these connectors:

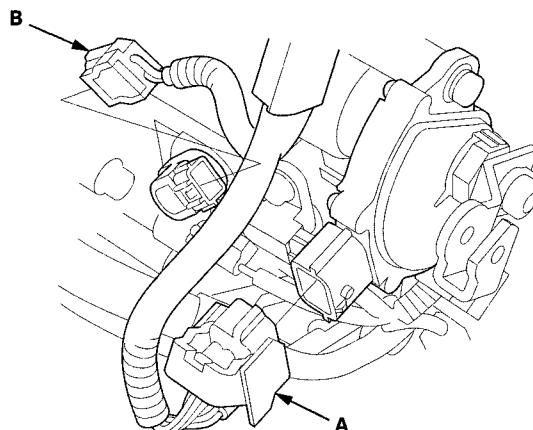
- Transmission fluid pressure switch B (3rd clutch) connector (A)
- Output shaft (countershaft) speed sensor connector (B)
- ATF temperature sensor connector (C)



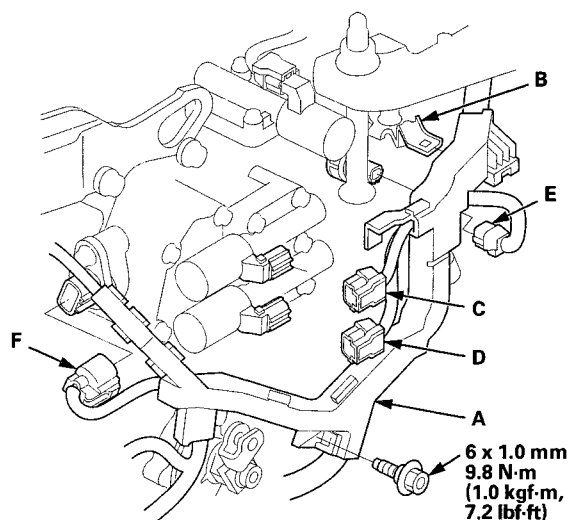
59. Install the harness clamp (D) on its bracket.

60. Connect these connectors:

- Transmission range switch connector (A)
- Input shaft (mainshaft) speed sensor connector (B)



61. Install the harness cover (A) on its bracket (B), and secure it with the bolt.



62. Connect these connectors:

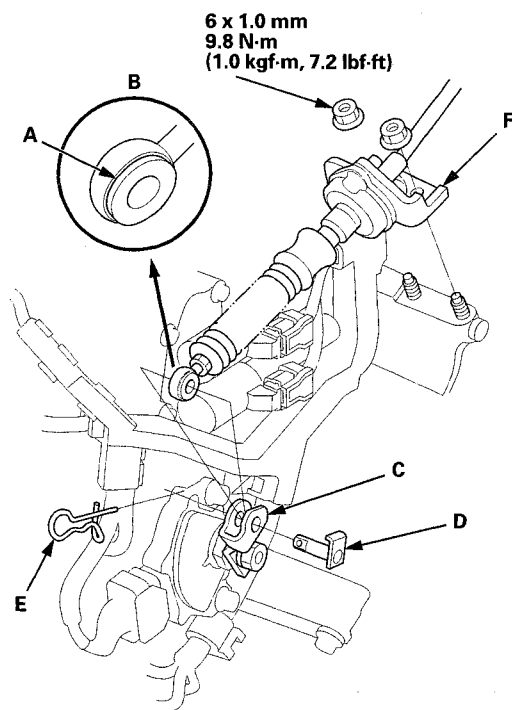
- A/T clutch pressure control solenoid valve A connector (C)
- A/T clutch pressure control solenoid valve B connector (D)
- 4th clutch transmission fluid pressure switch connector (E)
- Shift solenoid wire harness connector (F)

(cont'd)

Automatic Transmission

Transmission Installation (cont'd)

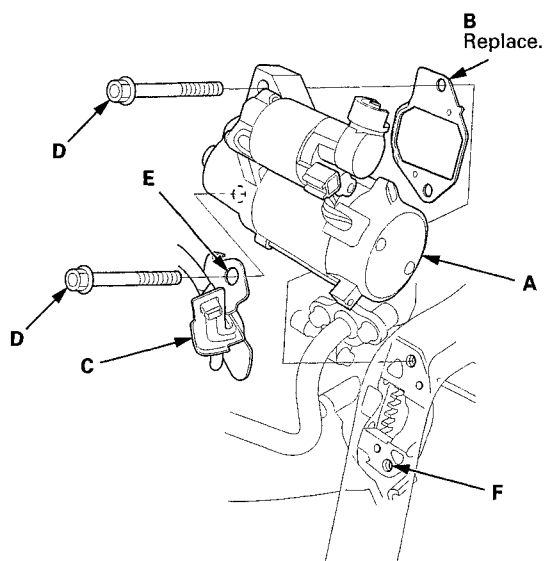
63. Apply molybdenum grease to the hole in the bushing (A) in the shift cable end (B).



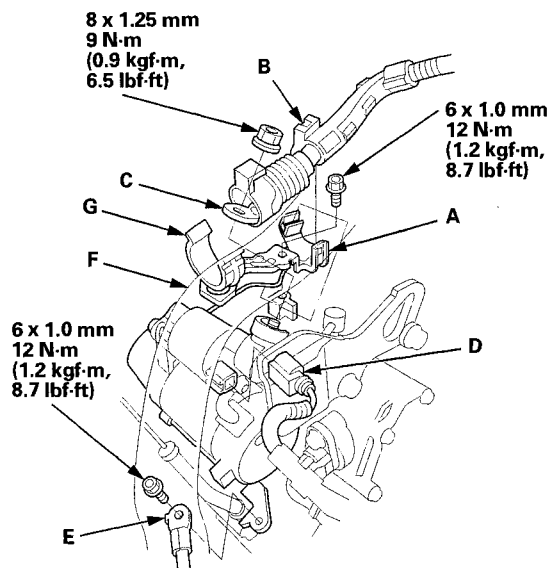
64. Attach the shift cable end to the selector control lever (C), then insert the control pin (D) into the selector control lever hole through the shift cable end, and secure the control pin with the spring clip (E).

65. Secure the shift cable bracket (F) with the nuts.

66. Install the starter (A), a new gasket (B), and the harness clamp bracket (C). Secure the mounting bolt (D) through the harness clamp bracket hose (E), and into the lower mounting bolt thread hole (F).



67. Install the harness clamp bracket (A), and install the harness clamp (B) on its bracket.

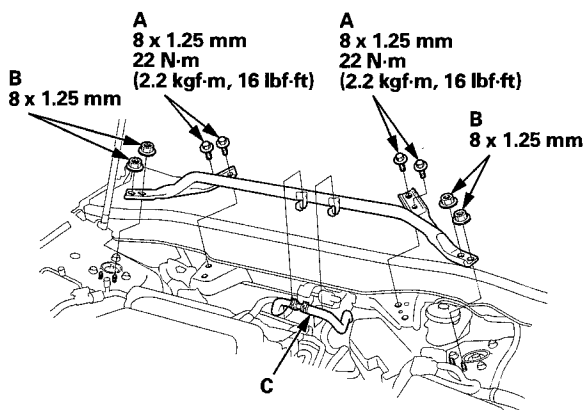


68. Install the positive starter cable (C) and the S terminal connector (D).

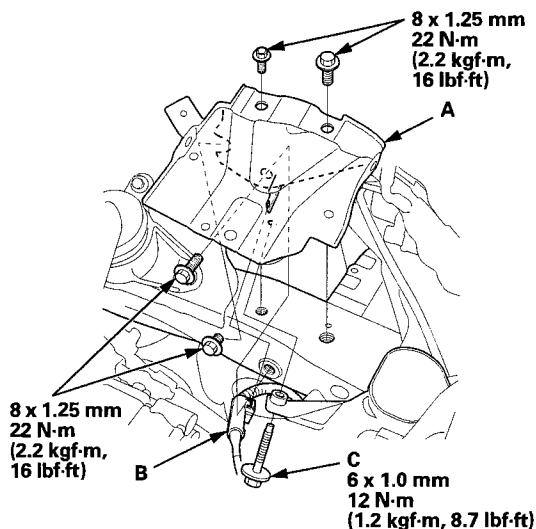
69. Install the transmission ground terminal (E), and install the water hose (F) in its clamp (G).



70. Install the strut brace mounting bolts (A), and loosely install the strut brace mounting nuts (B).



71. Install the vacuum hose (C) on the strut brace.
72. Install the battery base (A), and install the harness clamp (B) and the bolt (C).



73. Connect the steering joint onto the steering gearbox pinion shaft (see step 3 on page 17-11).
74. Install the steering wheel (see page 17-8).
75. Install the air cleaner housing (see page 11-421).
76. Do the battery installation procedure (see page 22-87).
77. Refill the transmission with ATF (see page 14-203).
78. Set the parking brake. Start the engine, and shift the transmission through all gears three times while pressing the brake pedal.
79. Check the shift lever operation, the A/T gear position indicator operation, and the shift cable adjustment.
80. Place a floor jack under the lower arm, and raise the front suspension to load it with the vehicle's weight. Do not place the jack against the ball joint pin of the knuckle.
- Tighten the damper fork mounting nut while holding the mounting bolt to 64 N·m (6.5 kgf·m, 47 lbf·ft), and tighten the damper pinch bolts to 49 N·m (5.0 kgf·m, 36 lbf·ft).
81. Tighten the ball joint mounting castle nuts to 93—103 N·m (9.5—10.5 kgf·m, 69—75.9 lbf·ft), then install new cotter pins onto the castle nuts, then bend the cotter pin ends (see step 7 on page 18-21).
82. Tighten the strut brace mounting nuts to 22 N·m (2.2 kgf·m, 16 lbf·ft).
83. Install the engine compartment covers (see page 20-186).
84. Reinstall the hood support struts to the upper location on both sides of the hood.
85. Install the splash shield.
86. Install the wheels.

(cont'd)

Automatic Transmission

Transmission Installation (cont'd)

87. Set the parking brake. Start the engine, and shift the transmission through all positions three times. Check the shift lever operation, A/T gear position indicator operation, and shift cable adjustment.
88. Check and adjust the front wheel alignment (see page 18-5).
89. Start the engine in P or N position, and warm it up to normal operating temperature (the radiator fan comes on).
90. Turn off the engine, and check the ATF level (see page 14-202).
91. Do the road test (see page 14-177).

ATF Cooler Cleaning

Special Tools Required

- ATF Cooler Cleaner GHTTTCF6H*
- Magnetic Nonbypass Spin-On Filter GTHGNBP2*

*: Available through the Acura Tool and Equipment Program 888-424-6857.

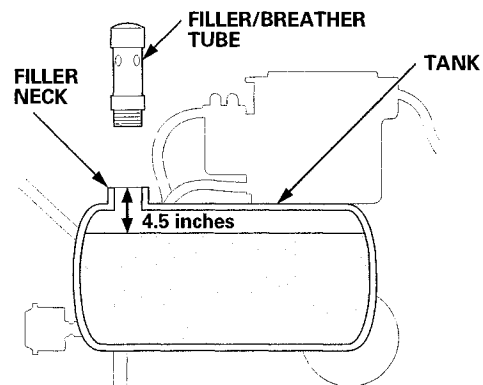
Before installing an overhauled or remanufactured automatic transmission, you must thoroughly clean the ATF cooler to prevent system contamination. Failure to do so could cause a repeat automatic transmission failure.

The cleaning procedure involves heated ATF-Z1 delivered under high pressure (100 psi). Check the security of all hoses and connections. Always wear safety glasses or a face shield, along with gloves and protective clothing. If you get ATF in your eyes or on your skin, rinse with water immediately.

⚠ WARNING

- Improper use of the ATF cooler cleaner can result in burns and other serious injuries.
- Always wear eye protection and protective clothing, and follow this procedure.

1. Check the fluid in the cooler cleaner tank. (The fluid level should be 4.5 inches from the top of the filler neck.) Adjust the level if needed; do not overfill. Use only Acura ATF-Z1; do not use any additives.

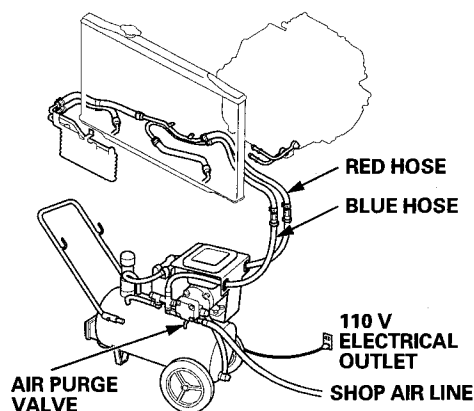




2. Plug the cooler cleaner into a 110 V grounded electrical outlet.

NOTICE

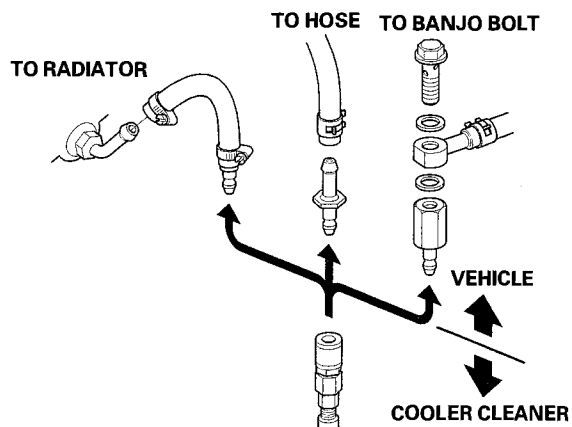
Make sure the outlet has no other appliances (light fixtures, drop lights, extension cords) plugged into it. Also, never plug the cooler cleaner into an extension cord or drop light; you could damage the unit.



3. Flip the HEAT toggle switch to ON; the green indicator above the toggle switch comes on. Wait 1 hour for the cooler cleaner to reach its operating temperature. (The cooler cleaner is ready to use when the temperature gauge reads 140 °F to 150 °F.)

NOTE: If the red indicator above the HEAT toggle switch comes on, the fluid level in the tank is too low for the tank heater to work (see step 1 of this procedure).

4. Select the appropriate pair of fittings, and attach them to the radiator, to the hoses, or to the banjo bolts for flow through the ATF cooler cleaner.



5. Connect the red hose to the cooler outlet line (the line that normally goes to the external filter on the transmission).
6. Connect the blue hose to the cooler inlet line.
7. Connect a shop air hose (regulated to 100 to 125 psi) to the air purge valve.

NOTICE

The quick-connect fitting has a one-way check valve to keep ATF from entering your shop's air system. Do not remove or replace the fitting. Attach the coupler provided with the cooler cleaner to your shop air line if your coupler is not compatible.

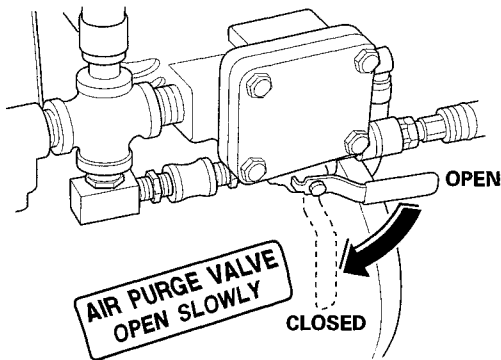
(cont'd)

Automatic Transmission

ATF Cooler Cleaning (cont'd)

8. Flip the MOTOR toggle switch to ON; the green indicator above the toggle switch comes on. Let the pump run for 5 minutes. While the pump is running, open and close the air purge valve periodically to cause agitation and improve the cleaning process. Always open the valve slowly. At the end of the 5-minute cleaning period, leave the air purge valve open.

NOTE: While the pump is running with the air purge valve open, it is normal to see vapor coming from the filler/breather tube vents.



9. With the air purge valve open, flip the MOTOR toggle switch to OFF; the green indicator goes off. Leave the air purge valve open for at least 15 seconds to purge the lines and hoses of residual ATF, then close the valve.
10. Disconnect the red and blue hoses from the ATF cooler. Now connect the red hose to the cooler inlet line.
11. Now connect the blue hose to the cooler outlet line.
12. Flip the MOTOR toggle switch to ON, and let the pump run for 5 minutes. While the pump is running, open and close the air purge valve periodically. Always open the valve slowly. At the end of the 5-minute cleaning period, leave the air purge valve open.

NOTE: While the pump is running with the air purge valve open, it is normal to see vapor coming from the filler/breather tube vents.

13. With the air purge valve open, flip the MOTOR toggle switch to OFF. Leave the air purge valve open for at least 15 seconds to purge the lines and hoses of residual ATF, then close the valve.

14. Disconnect the red and blue hoses from the ATF cooler lines.

15. Connect the red and blue hoses to each other.

16. Disconnect the shop air from the air purge valve. Disconnect and stow the coupler if used.

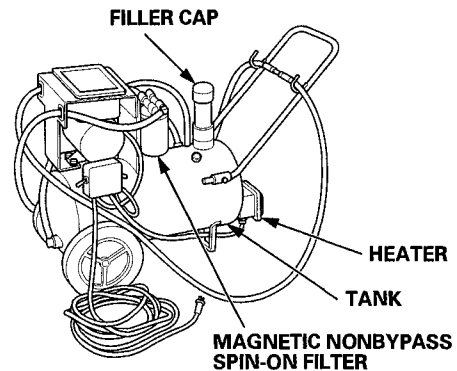
17. Disconnect and stow the fittings from the ATF cooler inlet and outlet lines.

18. Unplug the cooler cleaner from the 110 V outlet.

Tool Maintenance

Follow these instructions to keep the ATF cooler cleaner working properly:

- Replace the two magnetic nonbypass spin-on filters after every 20 hours of use, based on the hour-meter, or when you notice a restriction in the ATF flow.
- Check the level and condition of the fluid in the tank before each use.
- Replace the ATF in the tank when it looks dark or dirty.

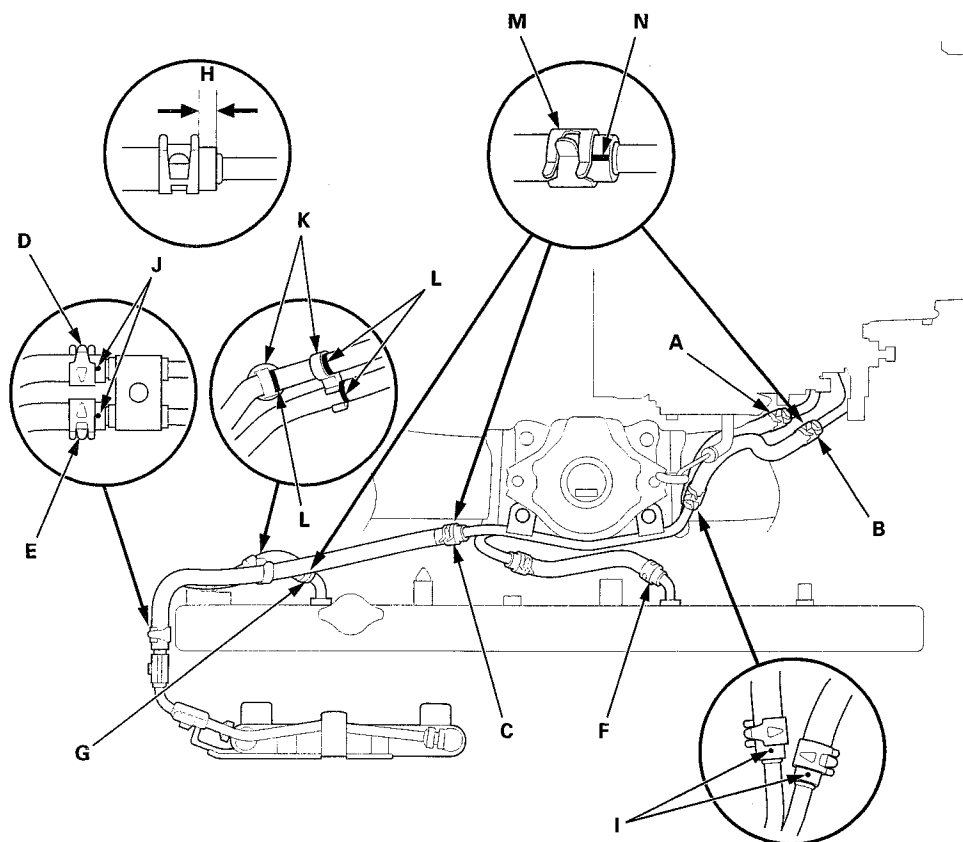




ATF Cooler Hose Replacement

Exploded View

With SH-AWD



NOTE: When installing the hose clamps, make sure they do not interfere with the surrounding parts.

1. Install the ATF cooler hoses over the ATF cooler lines with the clips at the appropriate points in reference to the following list. Align the paint marks (I) to the driver's side, and the white paint marks (J) to the passenger's side.

Point	Distance from Hose End to Clip (H)	Hose End Contact Point
A	6—8 mm (0.24—0.31 in)	Bulge
B		
C		
D		
E		
F	2—4 mm (0.08—0.16 in)	Bulge
G		

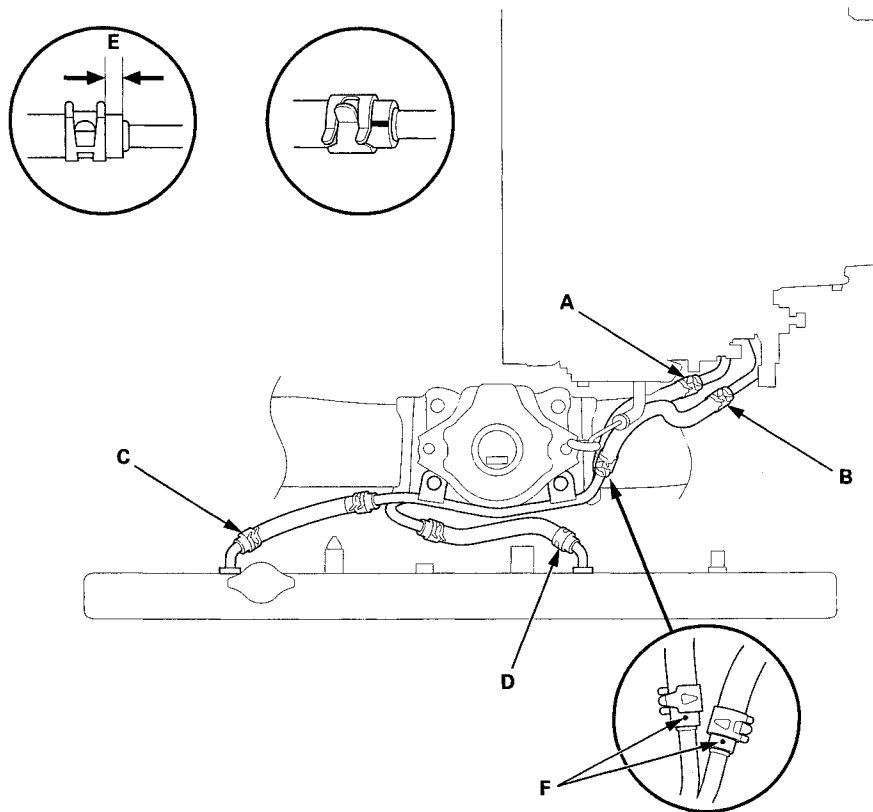
2. Secure the ATF cooler hose with the clamps (K) at the white paint line (L), then align the ATF cooler hose clamps (M) to the white paint line (N) in the direction shown.
3. Refill the transmission with ATF to the proper level (see page 14-203).

Automatic Transmission

ATF Cooler Hose Replacement (cont'd)

Exploded View

Without SH-AWD



NOTE: When installing the hose clamps, make sure they do not interfere with the surrounding parts.

1. Install the ATF cooler hoses over the ATF cooler lines with the clips at the appropriate points in reference to the following list. Align the paint marks (F) to the driver's side.

Point	Distance from Hose End to Clip (E)	Hose End Contact Point
A	6—8 mm (0.24—0.31 in)	Bulge
B		
C	2—4 mm (0.08—0.16 in)	Bulge
D		

2. Refill the transmission with ATF to the proper level (see page 14-203).

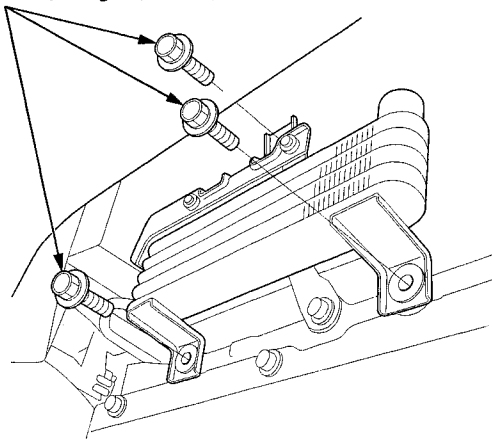


ATF Cooler Replacement

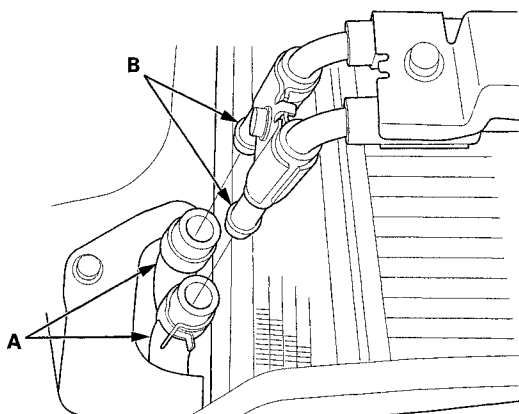
1. Raise the vehicle on a lift, or apply parking brake, block both rear wheels, and raise the front of the vehicle. Make sure it is securely supported.

2. Remove the ATF cooler assembly.

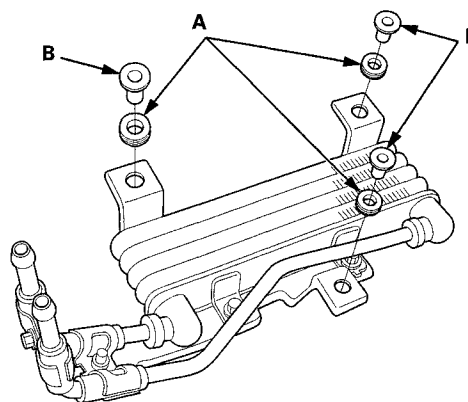
6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7 lbf·ft)



3. Disconnect the ATF cooler hoses (A) from the ATF cooler lines (B), then plug the hoses. Replace the ATF cooler.



4. If needed, replace the ATF cooler rubber mounts (A) and the collars (B).



5. Install the ATF cooler, then remove the plugs from the hose.

6. Connect the ATF cooler hoses (see page 14-239).

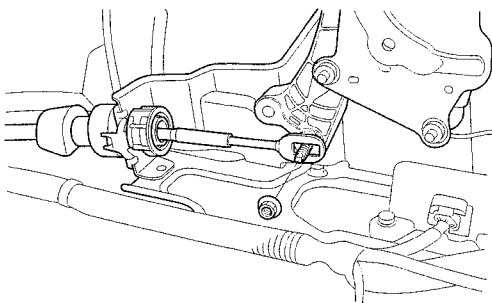
7. Secure the ATF cooler with the bolts.

8. Check the ATF level (see page 14-202).

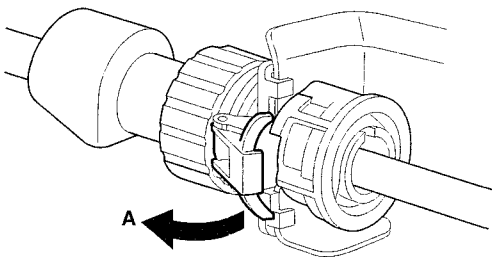
Automatic Transmission

Shift Lever Removal

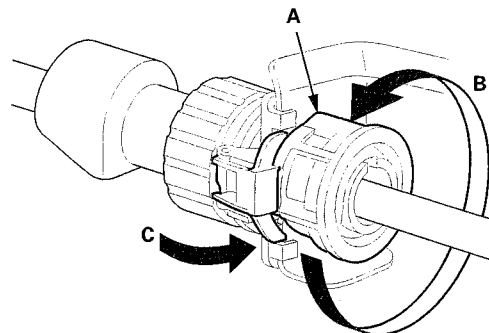
1. Remove the center console (see page 20-109).
2. Move the shift lever to R.
3. Remove the nut securing the shift cable end.



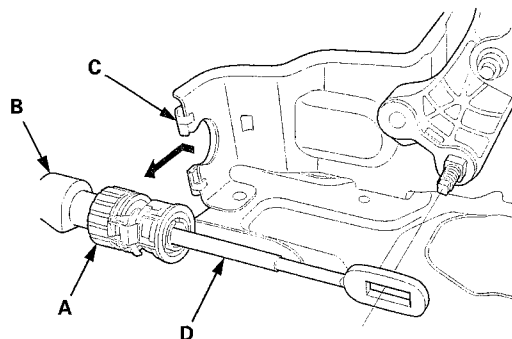
4. Unlock the retainer (A).



5. Rotate the socket holder retainer (A) counterclockwise (B) until it stops, and push the retainer lock (C) into the socket holder retainer to lock the retainer.



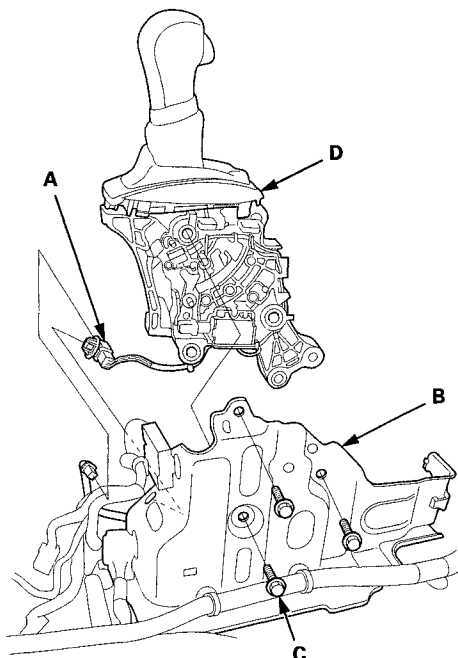
6. Slide the socket holder (A) away from the bracket as shown to remove the shift cable (B) from the shift cable bracket (C). Do not remove the shift cable by pulling the shift cable guide (D).





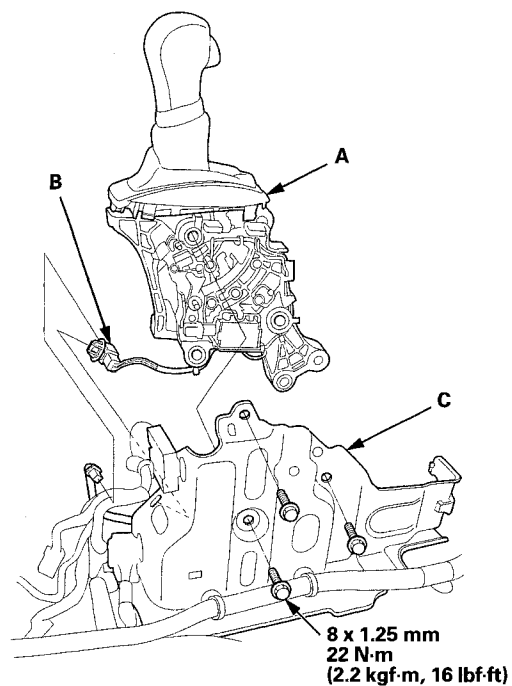
Shift Lever Installation

7. Disconnect the shift lever 4P connector (A), and remove the shift lever 4P connector from the shift lever bracket base (B).



8. Remove the shift lever mounting bolts (C), then remove the shift lever assembly (D).

1. Install the shift lever assembly (A).



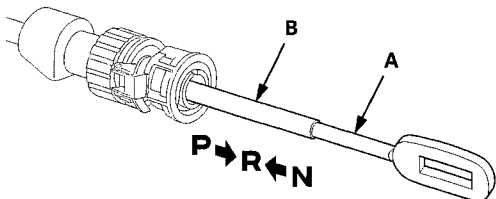
2. Connect the shift lever 4P connector (B).
3. Install the shift lever 4P connector on the shift lever bracket base (C).

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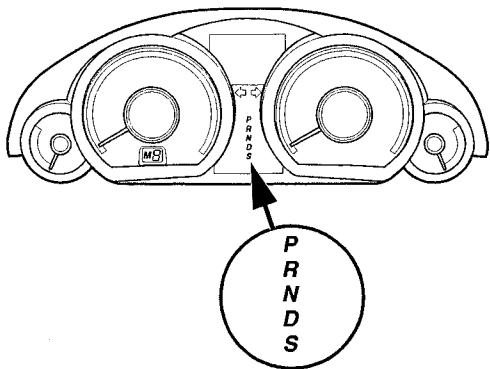
Automatic Transmission

Shift Lever Installation (cont'd)

4. Push the shift cable (A) until it stops, then release it. Pull the shift cable back one step from the P position so that the shift position is in R. Do not hold the shift cable guide (B) to adjust the shift cable.

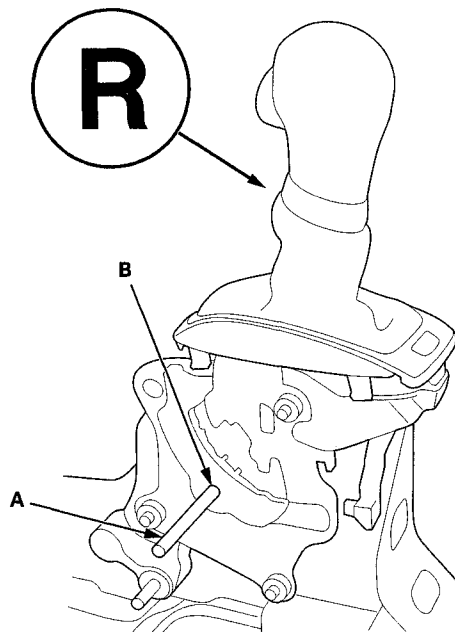


5. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, and check that the R position indicator comes on.



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

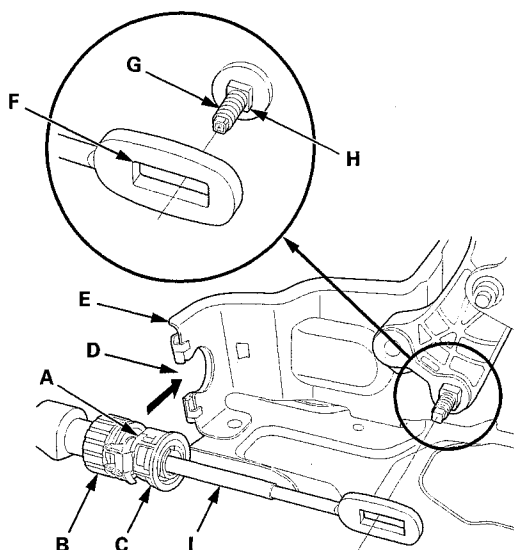
7. Place the shift lever in R, then insert a 6.0 mm (0.24 in) pin (A) into the positioning hole (B) on the shift lever positioning guide, and into the positioning hole on the shift lever bracket. Use only a 6.0 mm (0.24 in) pin with no burrs.



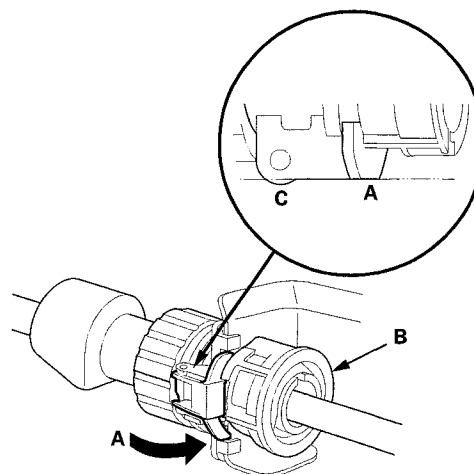


8. Align the shift cable slot (A) between the socket holder (B) and the socket holder retainer (C) with the opening (D) in the shift cable bracket (E), then slide the holder into the bracket while installing the shift cable end (F) over the mounting stud (G) by aligning its square hole with the square fitting (H) at the bottom of the stud. Do not install the shift cable by holding the shift cable guide (I).

NOTE: When the socket holder is installed in the shift cable bracket, the retainer lock is unhinged and releases the holder retainer lock, then the holder retainer returns under spring force to secure the shift cable.

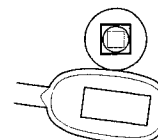


9. Push the retainer lock (A) fully to lock the socket holder retainer (B), and make sure that the retainer lock fits into the hinged-joint (C). If the retainer lock does not fit with the edge of the hinged-joint, rotate the holder retainer counterclockwise while pushing the retainer lock until it locks.

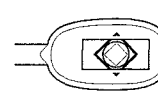
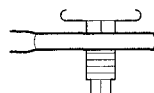


10. Make sure the shift cable end (A) is properly installed on the mounting stud (B).

Improperly installed:



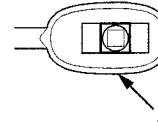
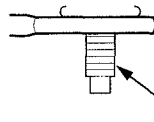
Shift cable end positions out of the mounting stud.



Shift cable end rides on the bottom of the mounting stud.



Properly installed:



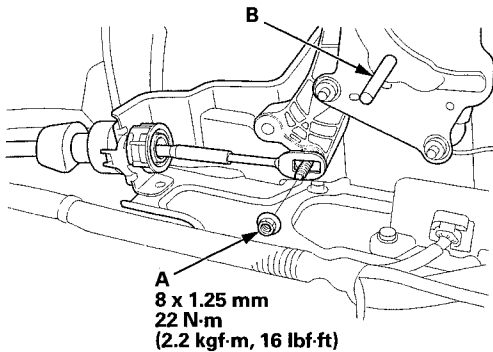
11. If the cable end is out of position on the mounting stud, remove the shift cable from the bracket, and reinstall the shift cable. Do not install the shift cable end on the mounting stud while the shift cable is on the bracket. If the shift cable end rides on the bottom of the mounting stud, rotate the stud and align the square fitting with the hole.

(cont'd)

Automatic Transmission

Shift Lever Installation (cont'd)

12. Install and tighten the nut (A) on the shift cable end.

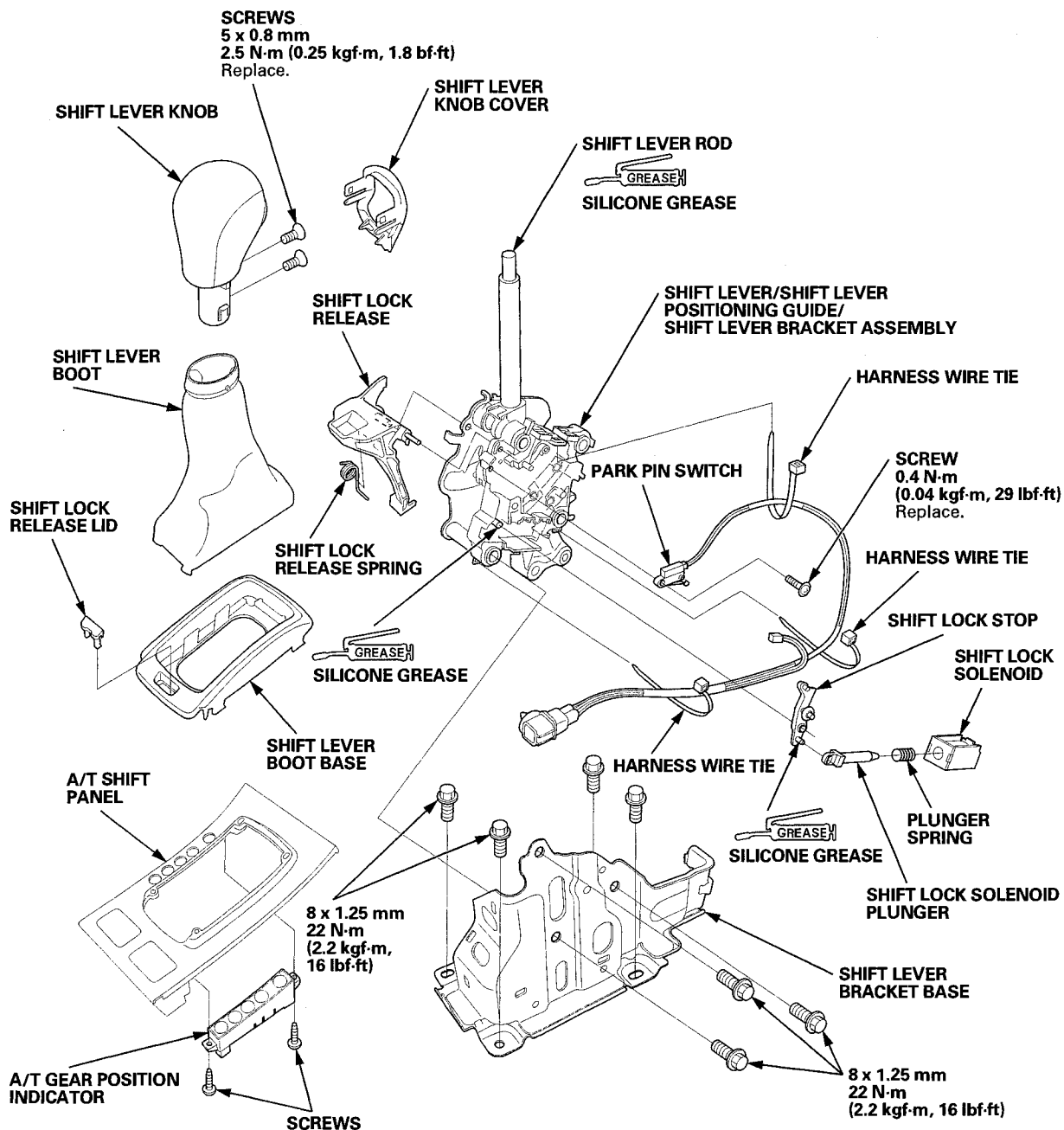


13. Remove the 6.0 mm (0.24 in) pin (B) that was installed to hold the shift lever.
14. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode. Move the shift lever to each position, and check that the A/T gear position indicator follows the transmission range switch.
15. Shift the shift lever to P, and check that the shift lock works properly. Push the shift lock release, and check that the shift lever releases, and also check that the shift lever locks when it is shifted back to P.
16. Install the center console (see page 20-109).



Shift Lever Disassembly/Reassembly

NOTE: Make sure not to get any silicone grease on the terminal part of the connectors and switches, especially if you have silicone grease on your hands or gloves.

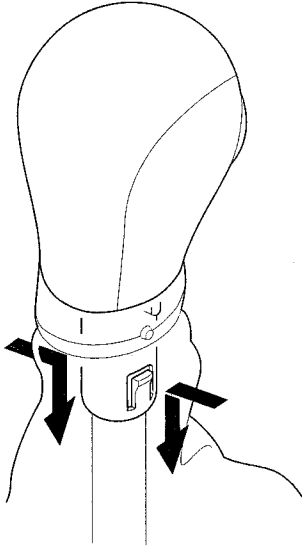


Automatic Transmission

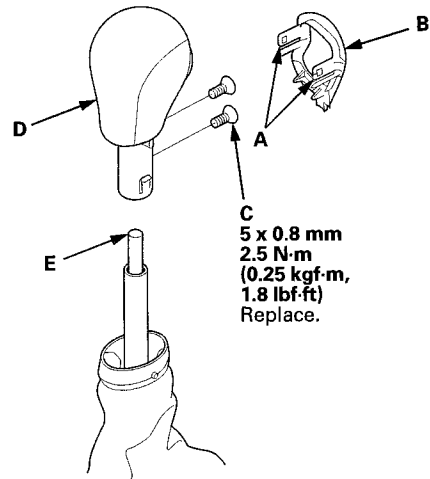
Shift Lever Knob Replacement

NOTE: Make sure not to get any silicone grease on the terminal part of the connectors and switches, especially if you have silicone grease on your hands or gloves.

1. Grasp the shift lever boot ring, and slip it out of the shift lever knob.



2. Wrap the end of a flat-tip screwdriver with tape, pry the shift lever knob cover locks (A), and remove the shift lever knob cover (B).

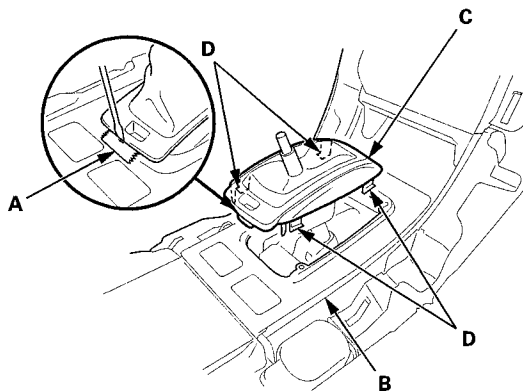


3. Remove the screws (C), and remove the shift lever knob (D).
4. Apply silicone grease to the top (E) of the shift lever rod.
5. Install a new shift lever knob on the shift lever, and secure it with new screws.
6. Install the shift lever knob cover on the shift lever knob.
7. Slide the shift lever boot ring over the shift lever knob until it snaps on.

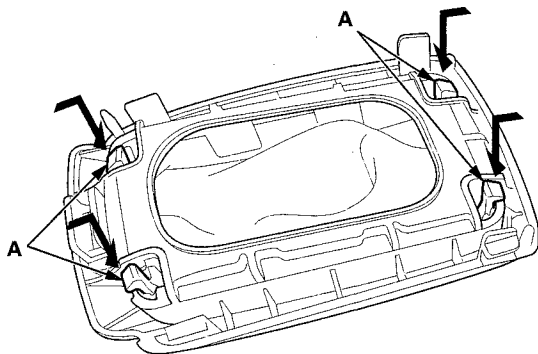


Shift Lever Boot and Shift Lever Boot Base Replacement

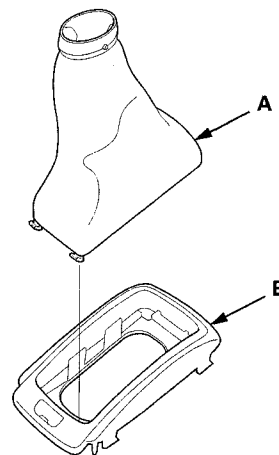
1. Remove the shift lever knob (see page 14-248).
2. Apply protective tape (A) to the A/T shift panel (B) along the side edge of the shift lever boot base (C). Pry up on the edge of the shift lever trim with a flat-tapped screwdriver wrapped with protective tape to release the hooks (D).



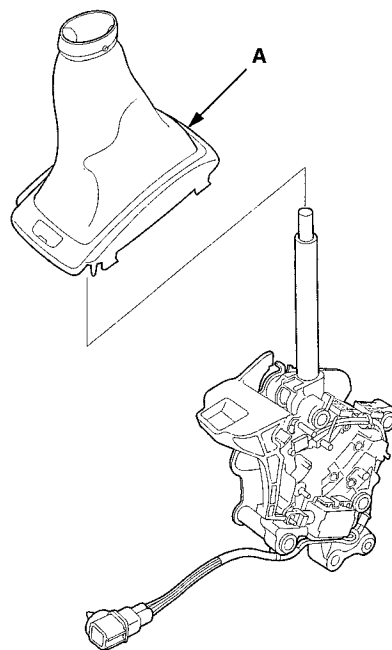
3. Release the lock tabs (A) on the shift lever boot using a screwdriver.



4. Replace the shift lever boot (A) or the shift lever boot base (B).



5. Install the shift lever boot on the shift lever boot base.
6. Install the shift lever boot base (A) on the A/T shift panel.

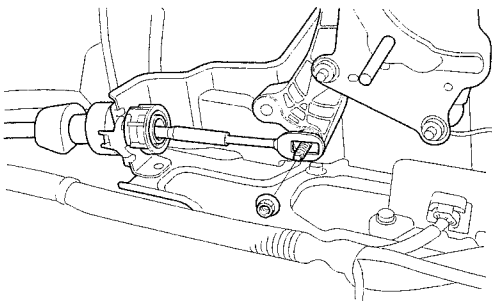


7. Install the shift lever knob (see page 14-248).

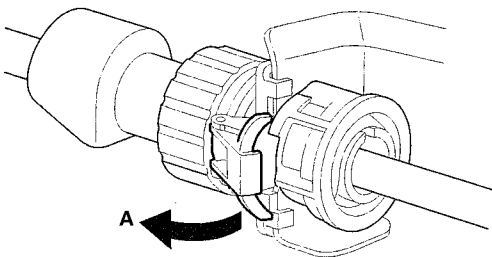
Automatic Transmission

Shift Cable Replacement

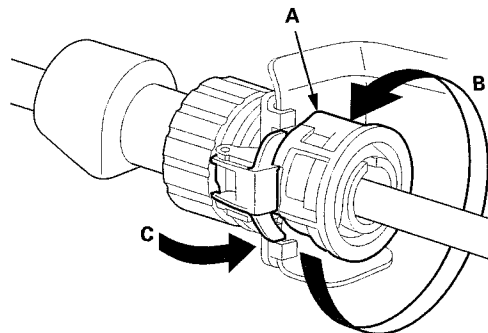
1. Remove the center console (see page 20-109).
2. Move the shift lever to R.
3. Remove the nut securing the shift cable end.



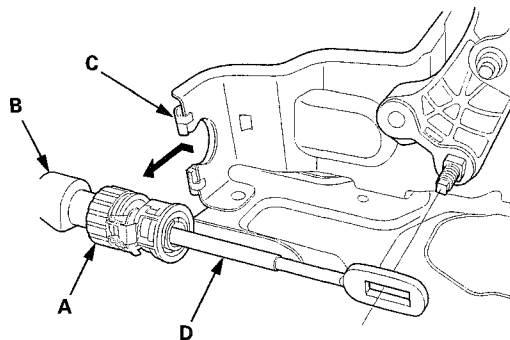
4. Unlock the retainer lock (A).



5. Rotate the socket holder retainer (A) counterclockwise (B) until it stops, and push the retainer lock (C) into the socket holder retainer to lock the retainer.

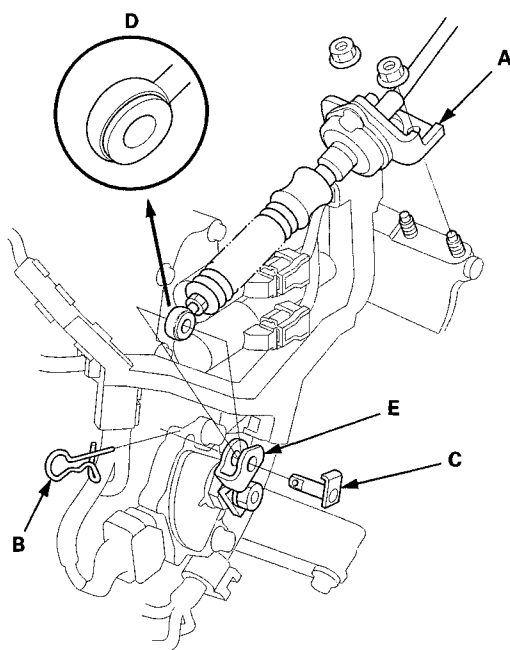


6. Slide the socket holder (A) away from the bracket as shown to remove the shift cable (B) from the socket holder bracket (C). Do not remove the shift cable by pulling the shift cable guide (D).





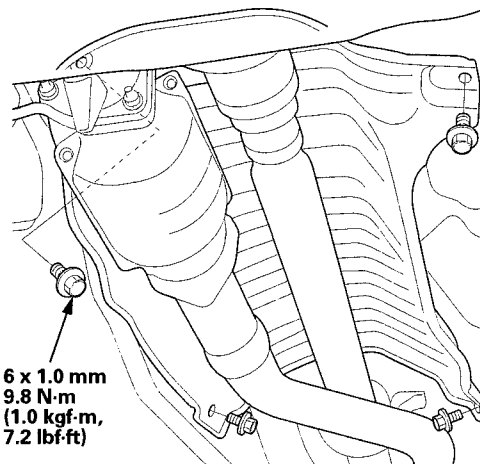
7. Do the battery removal procedure (see page 22-87).
8. Remove the air cleaner housing (see page 11-421).
9. Remove the splash shield.
10. Remove the battery base (see step 7 on page 14-211).
11. Remove the nuts securing the shift cable bracket (A).



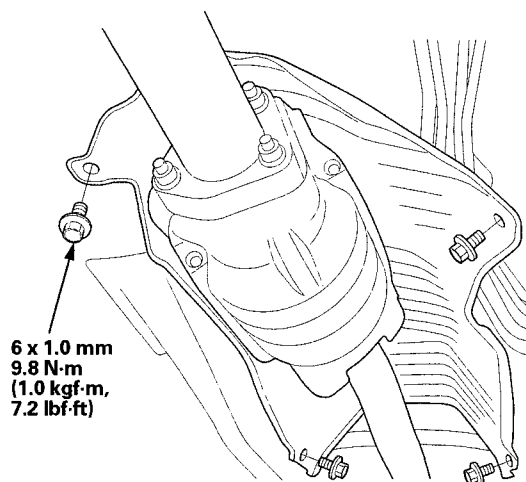
12. Remove the spring clip (B) and the control pin (C), then separate the shift cable end (D) from the selector control lever (E).
13. Raise the vehicle on a lift, or apply parking brake, block both rear wheels, and raise the front of the vehicle. Make sure it is securely supported.

14. Remove the heat shield.

With SH-AWD



Without SH-AWD



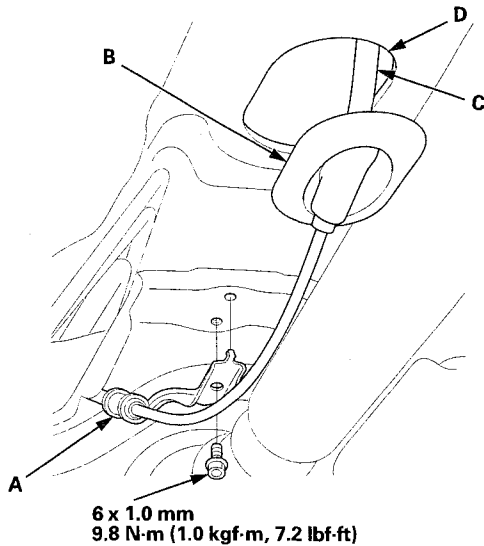
(cont'd)

Automatic Transmission

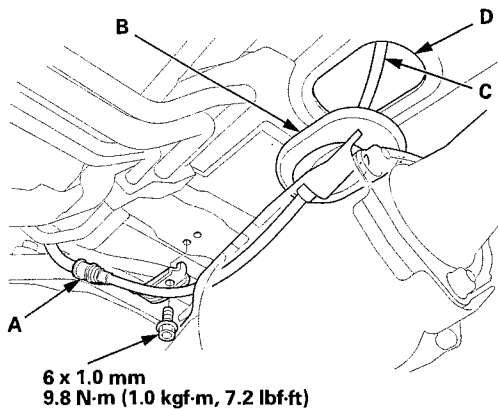
Shift Cable Replacement (cont'd)

15. Remove the bolt securing the shift cable bracket (A).

With SH-AWD



Without SH-AWD



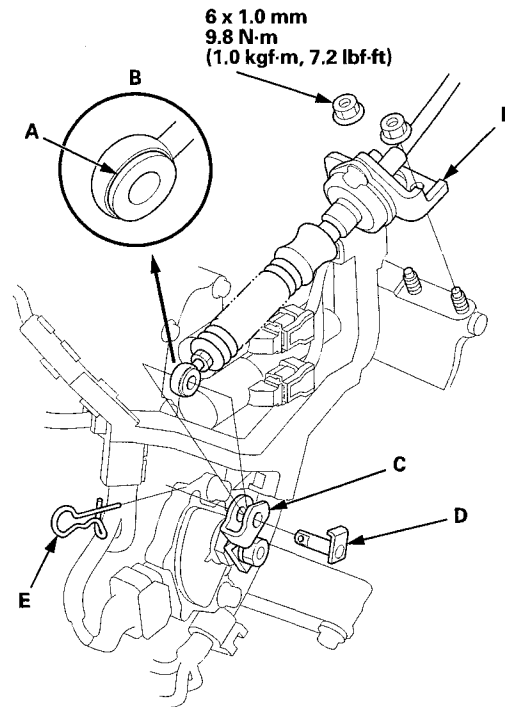
16. Remove the shift cable grommet (B), and pull out the shift cable (C).

17. Insert a new shift cable through the grommet hole (D), and install the grommet in its hole. Do not bend the shift cable excessively.

18. Secure the shift cable bracket with the bolt.

19. Install the heat shield.

20. Apply molybdenum grease to the hole in the bushing (A) in the shift cable end (B).



21. Attach the shift cable end to the selector control lever (C), then insert the control pin (D) into the selector control lever hole through the shift cable end, and secure the control pin with the spring clip (E).

22. Secure the shift cable bracket (F) with the nuts.

23. Install the battery base (see step 72 on page 14-235).

24. Install the splash shield.

25. Install the air cleaner housing (see page 11-421).

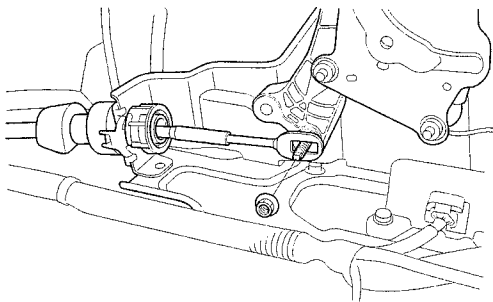
26. Do the battery installation procedure (see page 22-87).

27. Adjust the shift cable (see page 14-253).

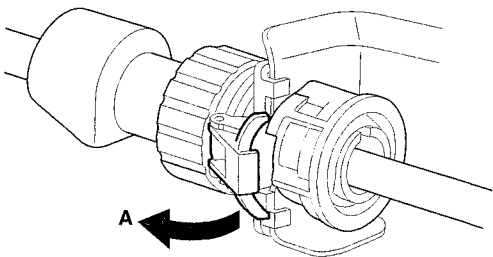


Shift Cable Adjustment

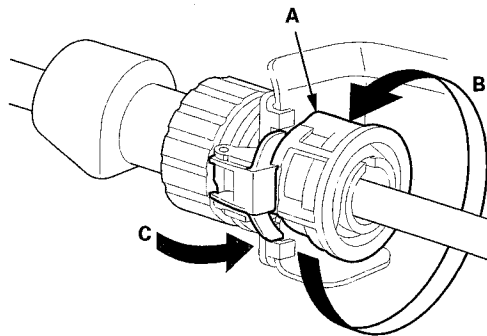
1. Remove the center console (see page 20-109).
2. Move the shift lever to R.
3. Remove the nut securing the shift cable end.



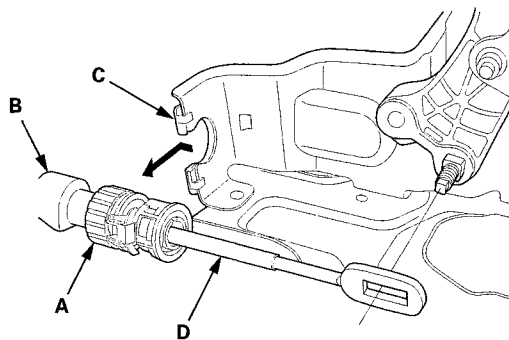
4. Unlock the retainer (A).



5. Rotate the socket holder retainer (A) counterclockwise (B) until it stops, and push the retainer lock (C) into the socket holder retainer to lock the retainer.



6. Slide the socket holder (A) away from the bracket as shown to remove the shift cable (B) from the shift cable bracket (C). Do not remove the shift cable by pulling the shift cable guide (D).

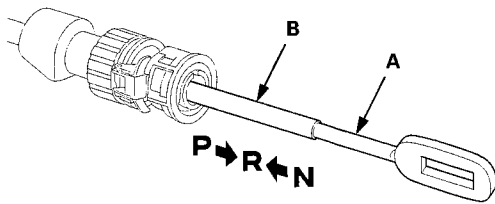


(cont'd)

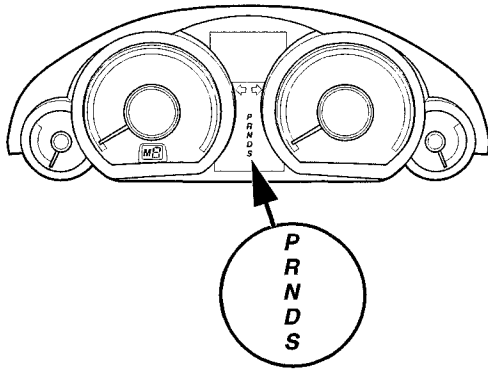
Automatic Transmission

Shift Cable Adjustment (cont'd)

7. Push the shift cable (A) until it stops, then release it. Pull the shift cable back one step from the P position so that the shift position is in R. Do not hold the shift cable guide (B) to adjust the shift cable.

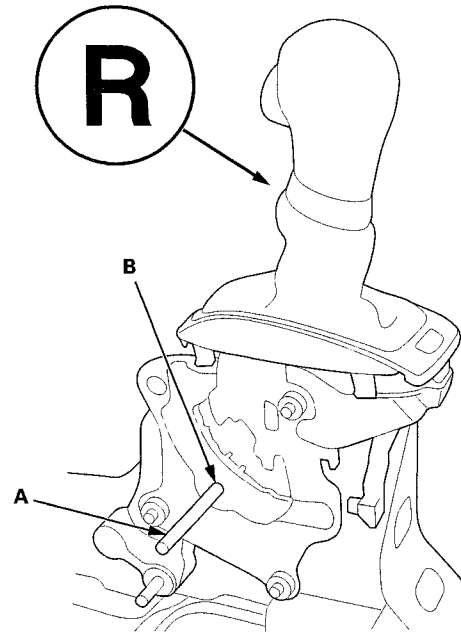


8. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, and check that the R position indicator comes on.



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

10. Place the shift lever in R, then insert a 6.0 mm (0.24 in) pin (A) into the positioning hole (B) on the shift lever positioning guide, and into the positioning hole on the shift lever bracket. Use only a 6.0 mm (0.24 in) pin with no burrs.

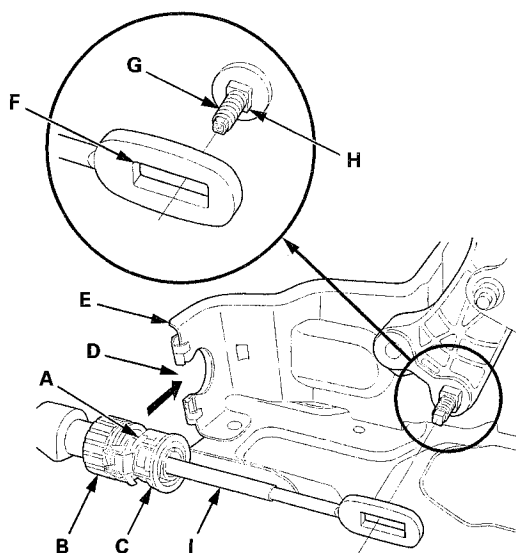


11. Check that the shift lever is secured in R.

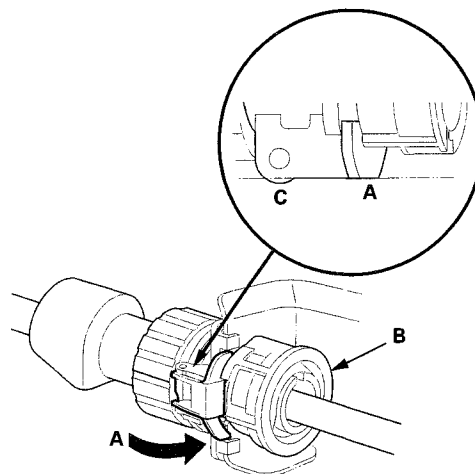


12. Align the shift cable slot (A) between the socket holder (B) and the socket holder retainer (C) with the opening (D) in the shift cable bracket (E), then slide the holder into the bracket while installing the shift cable end (F) over the mounting stud (G) by aligning its square hole with the square fitting (H) at the bottom of the stud. Do not install the shift cable by holding the shift cable guide (I).

NOTE: When the socket holder is installed in the shift cable bracket, the retainer lock is unhinged and releases the holder retainer lock, then the holder retainer returns under spring force to secure the shift cable.

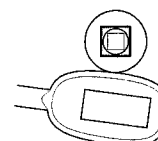


13. Push the retainer lock (A) fully to lock the socket holder retainer (B), and make sure that the retainer lock fits into the hinged-joint (C). If the retainer lock does not fit with the edge of the hinged-joint, rotate the holder retainer counterclockwise while pushing the retainer lock until it locks.

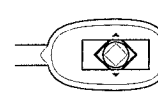
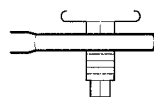


14. Make sure the shift cable end (A) is properly installed on the mounting stud (B).

Improperly installed:



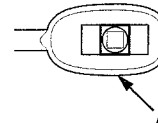
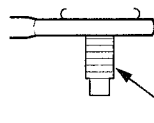
Shift cable end positions out of the mounting stud.



Shift cable end rides on the bottom of the mounting stud.



Properly installed:



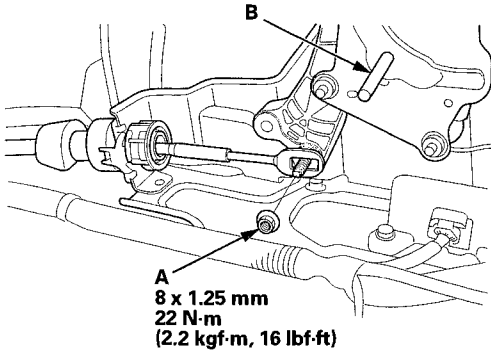
15. If the cable end is out of position on the mounting stud, remove the shift cable from the bracket, and reinstall the shift cable. Do not install the shift cable end on the mounting stud while the shift cable is on the bracket. If the shift cable end rides on the bottom of the mounting stud, rotate the stud and align the square fitting with the hole.

(cont'd)

Automatic Transmission

Shift Cable Adjustment (cont'd)

16. Install and tighten the nut (A) on the shift cable end.



17. Remove the 6.0 mm (0.24 in) pin (B) that was installed to hold the shift lever.

18. Turn the ignition switch to ON (II), or press the engine/start stop button to select the ON mode. Move the shift lever to each position, and check that the A/T gear position indicator follows the transmission range switch.

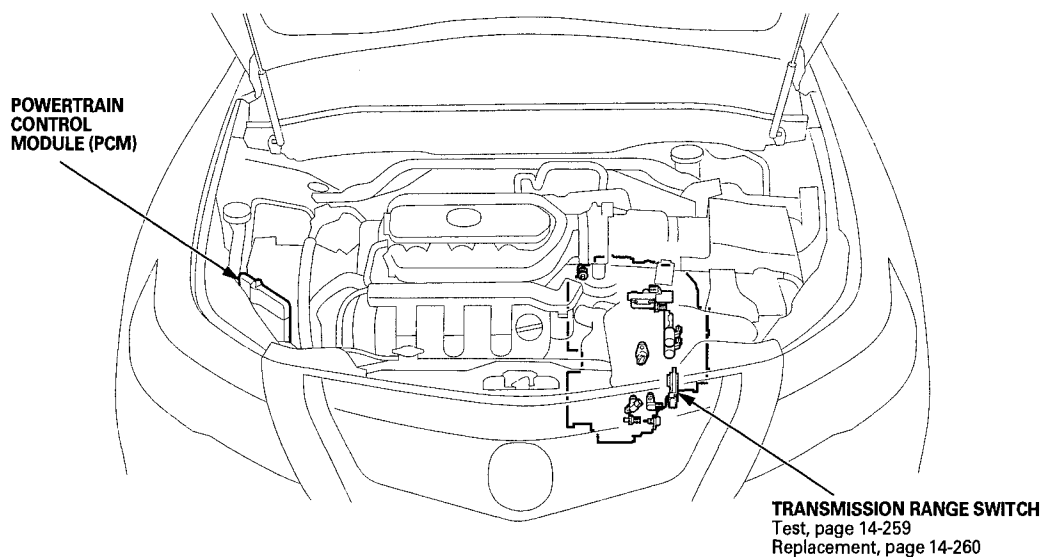
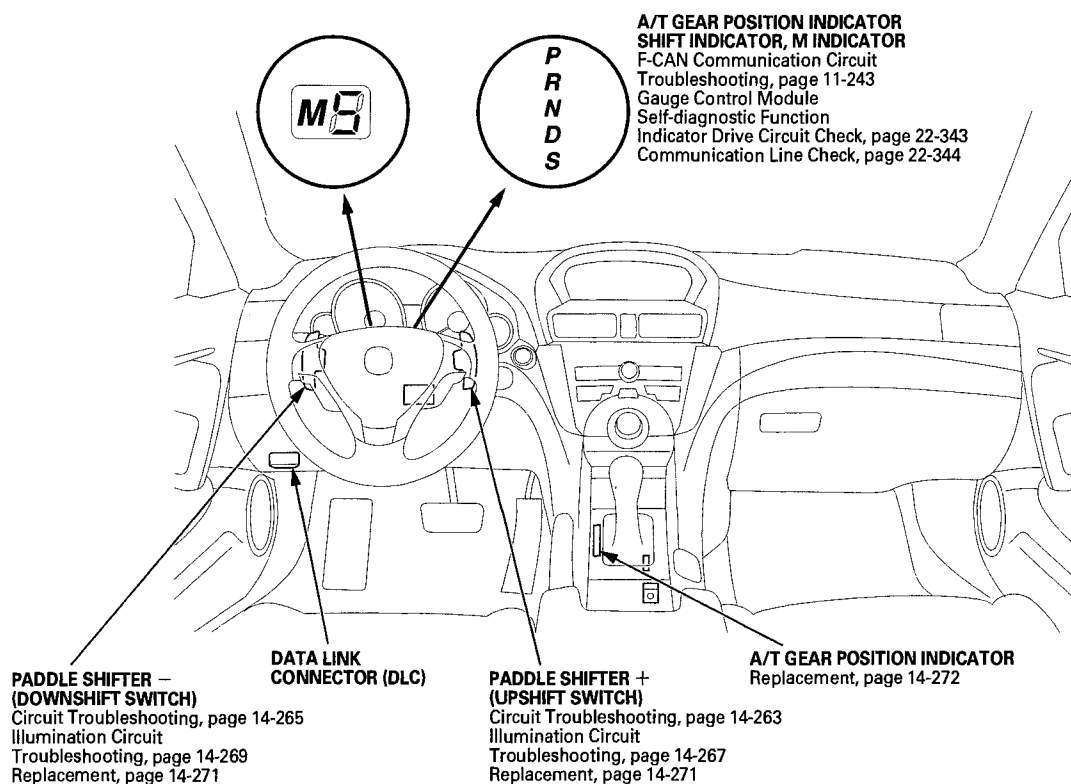
19. Shift the shift lever to P, and check that the shift lock works properly. Push the shift lock release, and check that the shift lever releases, and also check that the shift lever locks when it is shifted back to P.

20. Install the center console (see page 20-109).

A/T Gear Position Indicator

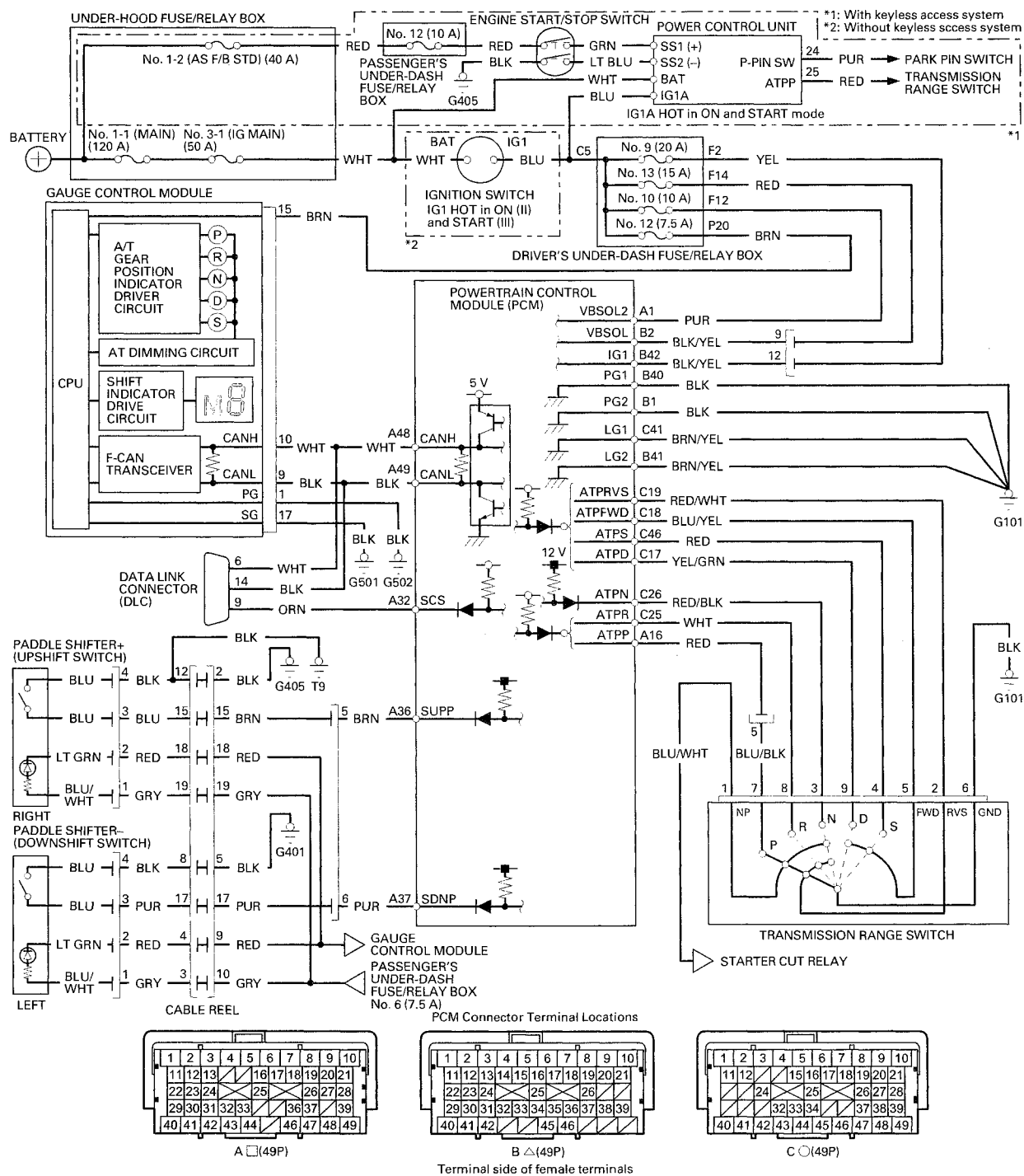


Component Location Index



A/T Gear Position Indicator

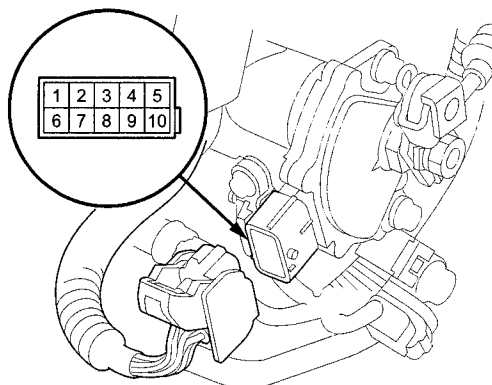
Circuit Diagram





Transmission Range Switch Test

1. Do the battery removal procedure (see page 22-87).
2. Remove the air cleaner housing (see page 11-421).
3. Remove the battery base (see step 7 on page 14-211).
4. Disconnect the transmission range switch connector.



5. Check for continuity between terminals at the transmission range switch connector. There should be continuity between the terminals in the following table for each switch position.

Transmission Range Switch Connector

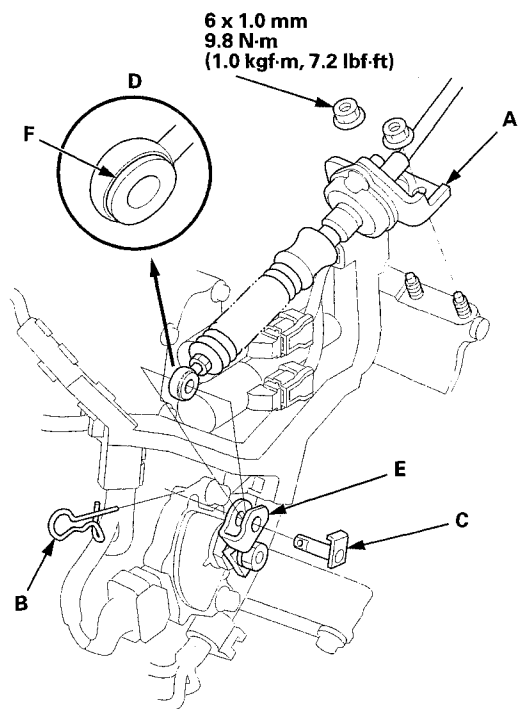
Position/Connector Terminal/Signal Connections										
	1	2	3	4	5	6	7	8	9	10
	ATP NP	ATP RVS	ATP N	ATP S	ATP FWD	GND	ATP P	ATP R	ATP D	—
P	○	○					○	○		
R		○					○		○	
N	○	○	○				○			
D					○	○			○	
S				○	○	○				

6. Transmission range switch test is finished if the test results are OK. If there is no continuity between any terminals, check that the transmission range switch installation. If the switch installation is OK, replace the switch (see page 14-260).
7. Check the connectors for rust, dirt, or oil, and clean or repair if necessary, then connect the connector securely.
8. Install the battery base (see step 72 on page 14-235).
9. Install the air cleaner housing (see page 11-421).
10. Do the battery installation procedure (see page 22-87).

A/T Gear Position Indicator

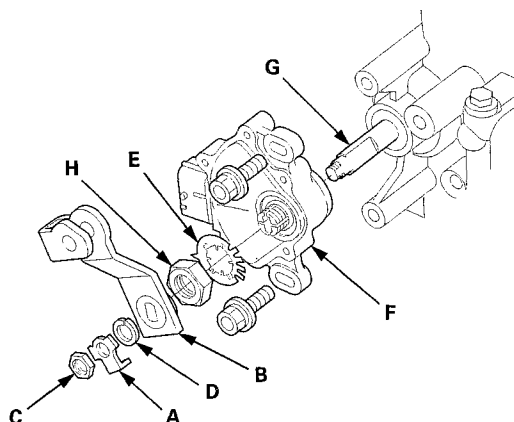
Transmission Range Switch Replacement

1. Do the battery removal procedure (see page 22-87).
2. Remove the air cleaner housing (see page 11-421).
3. Remove the battery base (see step 7 on page 14-211).
4. Remove the nuts securing the shift cable bracket (A).



5. Remove the spring clip (B) and the control pin (C), then separate the shift cable end (D) from the selector control lever (E).

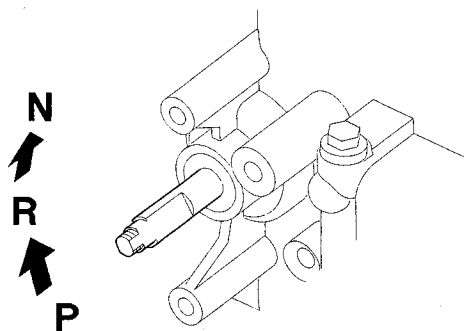
6. Check the bushing (F) in the shift cable end for proper fit and wear. If the bushing is loose or worn, replace the shift cable (see page 14-250).
7. Disconnect the transmission range switch connector.
8. Pry the lock tab of the lock washer (A) on the selector control lever (B), and remove the nut (C), the lock washer, the spring washer (D), and the selector control lever.



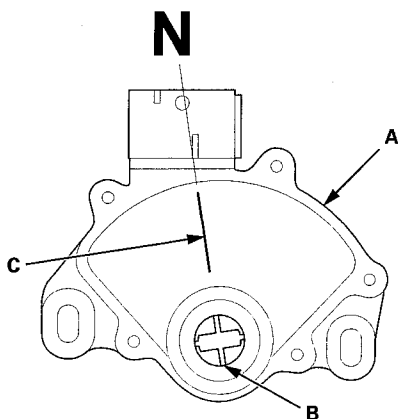
9. Pry the lock tabs of the lock washer (E) on the transmission range switch (F), hold the selector control shaft (G) with a 6.0 mm wrench, and loosen the locknut (H).
10. Remove the locknut and the lock washer, then remove the transmission range switch (two bolts).



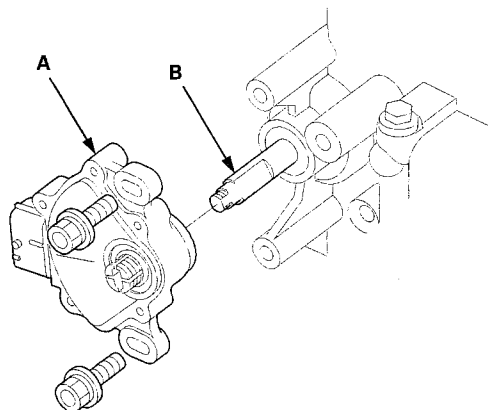
11. With a 6.0 mm wrench, turn the selector control shaft fully counterclockwise (viewed from the shaft end) to the P position. Turn the selector control shaft back two click-stopped positions so that it is in the N position.



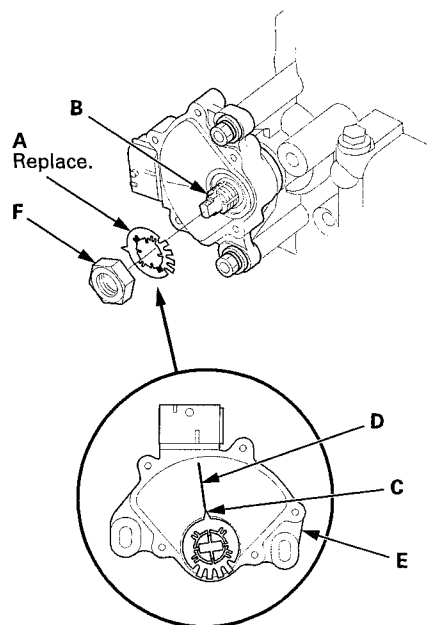
12. Set a new transmission range switch (A) to the N position. The transmission range switch clicks in the N position, and the selector control shaft slot (B) aligns with the N position line (C).



13. Install the transmission range switch (A) gently over the selector control shaft (B), and install the bolts loosely.



14. Install a new lock washer (A) over the selector control shaft (B) by aligning the indicator tab (C) of the lock washer with the N positioning line (D) on the transmission range switch (E), and install the locknut (F).

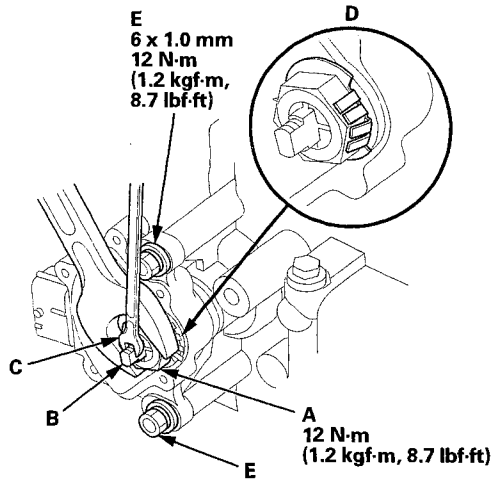


(cont'd)

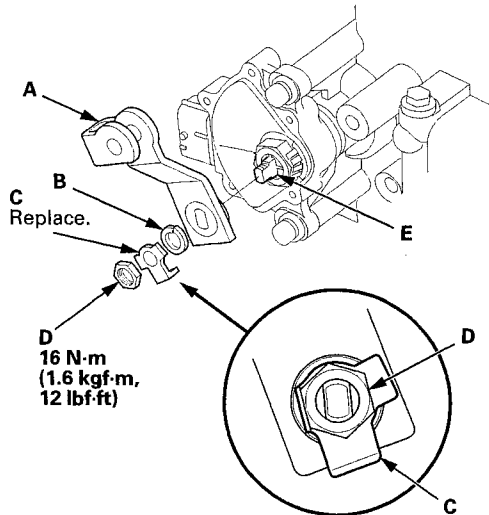
A/T Gear Position Indicator

Transmission Range Switch Replacement (cont'd)

15. Push the locknut against the transmission housing to seat the transmission range switch into the selector control shaft, and tighten the locknut (A) to 12 N·m (1.2 kgf·m, 8.7 lbf·ft) while holding the selector control shaft (B) with a 6.0 mm wrench (C), then bend the lock tabs (D) of the lock washer against the locknut.



16. Tighten the bolts (E) securing the transmission range switch to 12 N·m (1.2 kgf·m, 8.7 lbf·ft).
17. Install the control lever (A), the spring washer (B), a new lock washer (C), and the locknut (D) on the selector control shaft (E). Bend the lock tab of the lock washer against the locknut.



18. Check the connectors for rust, dirt, or oil. Clean if needed, then connect the connector securely.
19. Apply molybdenum grease to the hole in the bushing in the shift cable end. Attach the shift cable end to the selector control lever, then insert the control pin into the selector control lever hole through the shift cable end, and secure the control pin with the spring clip.
20. Secure the shift cable bracket with the nuts.
21. Install the battery base (see step 72 on page 14-235).
22. Install the air cleaner housing (see page 11-421).
23. Do the battery installation procedure (see page 22-87).
24. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode. Move the shift lever through all positions, and verify the transmission range switch matches with the A/T gear position indicator.
25. Check that the engine starts in P and N, and does not start in any other shift lever position.
26. Check that the back-up lights come on when the shift lever is in R.
27. Allow the front wheels to rotate freely, then start the engine, and check the shift lever operation.

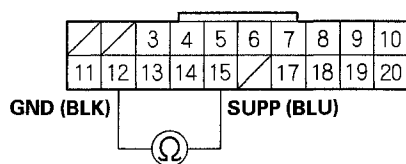


Paddle Shifter + (Upshift Switch) Circuit Troubleshooting

SRS components are located in this area. Review the SRS component locations (see page 24-11) and the precautions and procedures (see page 24-13) before doing repair or service.

1. Remove the steering wheel (see page 17-6).
2. Check for continuity between cable reel subharness 20P connector terminals No. 15 and No. 12 when pressing and releasing the paddle shifter + (upshift switch).

CABLE REEL SUBHARNESS 20P CONNECTOR



Wire side of female terminals

Is there continuity when pressing the paddle shifter + (upshift switch) and no continuity when the paddle shifter + (upshift switch) is released?

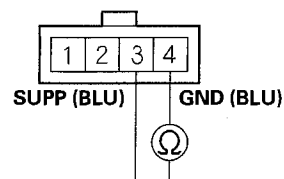
YES—Go to step 5.

NO—Go to step 3.

3. Disconnect the paddle shifter + (upshift switch) connector.

4. Check for continuity between paddle shifter + (upshift switch) connector terminals No. 3 and No. 4 when pressing and releasing the paddle shifter + (upshift switch).

PADDLE SHIFTER + (UPSHIFT SWITCH) CONNECTOR



Terminal side of male terminals

Is there continuity when pressing the paddle shifter + (upshift switch) and no continuity when the paddle shifter + (upshift switch) is released?

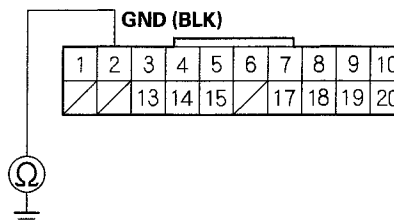
YES—Replace the cable reel subharness. ■

NO—Replace the paddle shifter + (upshift switch) (see page 14-271). ■

5. Remove the cable reel (see page 24-171).

6. Check for continuity between cable reel 20P connector terminal No. 2 and body ground.

CABLE REEL 20P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 7.

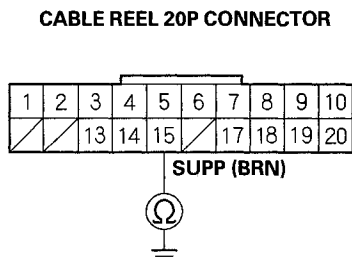
NO—Repair open in the wire between cable reel 20P connector terminal No. 2 and body ground (G501), or repair poor body ground (G501). ■

(cont'd)

A/T Gear Position Indicator

Paddle Shifter + (Upshift Switch) Circuit Troubleshooting (cont'd)

7. Check for continuity between cable reel 20P connector terminal No. 15 and body ground.



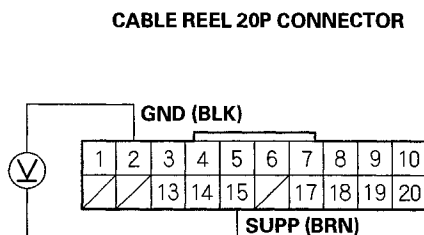
Wire side of female terminals

Is there continuity?

YES—Repair short to body ground in wire between cable reel 20P connector terminal No. 15 and PCM connector terminal A36. ■

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, and shift to S.
9. Measure the voltage between cable reel 20P connector terminals No. 2 and No. 15.



Wire side of female terminals

Is there battery voltage?

YES—Replace the cable reel (see page 24-171). ■

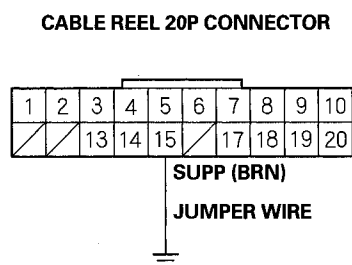
NO—Go to step 10.

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

11. Jump the SCS line with the HDS.

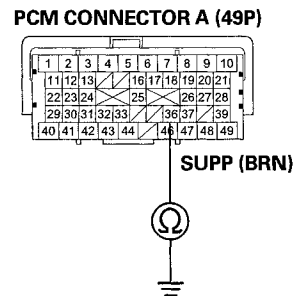
12. Disconnect PCM connector A (49P).

13. Connect cable reel 20P connector terminal No. 15 to body ground with a jumper wire.



Wire side of female terminals

14. Check for continuity between PCM connector terminal A36 and body ground.



Terminal side of female terminals

Is there continuity?

YES—Check for loose or poor connections at PCM connector terminal A36. If the connection is OK, substitute a known-good PCM (see page 11-7) and recheck. ■

NO—Repair open in the wire between PCM connector terminal A36 and the cable reel 20P connector. ■

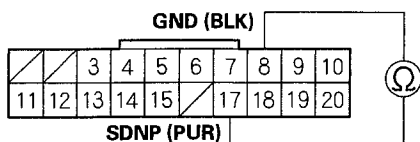


Paddle Shifter - (Downshift Switch) Circuit Troubleshooting

SRS components are located in this area. Review the SRS component locations (see page 24-11) and the precautions and procedures (see page 24-13) before doing repair or service.

1. Remove the steering wheel (see page 17-6).
2. Check for continuity between cable reel subharness 20P connector terminals No. 17 and No. 8 when pressing and releasing the paddle shifter — (downshift switch).

CABLE REEL SUBHARNESS 20P CONNECTOR



Wire side of female terminals

Is there continuity when pressing the paddle shifter — (downshift switch) and no continuity when the paddle shifter — (downshift switch) is released?

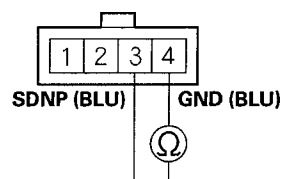
YES—Go to step 5.

NO—Go to step 3.

3. Disconnect the paddle shifter — (downshift switch) connector.

4. Check for continuity between paddle shifter — (downshift switch) connector terminals No. 3 and No. 4 when pressing and releasing the paddle shifter — (downshift switch).

PADDLE SHIFTER — (DOWNSHIFT SWITCH) CONNECTOR



Terminal side of male terminals

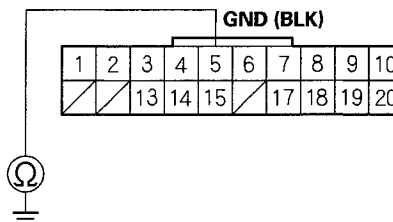
Is there continuity when pressing the paddle shifter — (downshift switch) and no continuity when the paddle shifter — (downshift switch) is released?

YES—Replace the cable reel subharness.■

NO—Replace the paddle shifter — (downshift switch) (see page 14-271).■

5. Remove the cable reel (see page 24-171).
6. Check for continuity between cable reel 20P connector terminal No. 5 and body ground.

CABLE REEL 20P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 7.

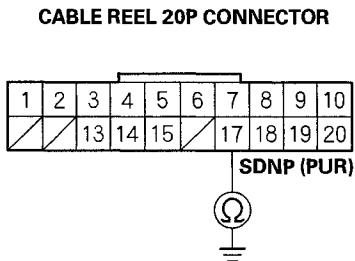
NO—Repair open in the wire between cable reel 20P connector terminal No. 5 and body ground (G501), or repair poor body ground (G501).■

(cont'd)

A/T Gear Position Indicator

Paddle Shifter - (Downshift Switch) Circuit Troubleshooting (cont'd)

7. Check for continuity between cable reel 20P connector terminal No. 17 and body ground.



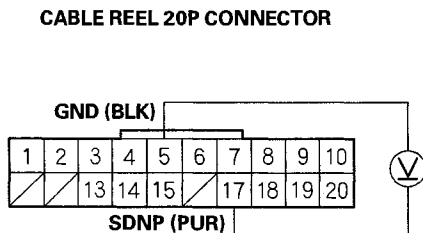
Wire side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between cable reel 20P connector terminal No. 17 and PCM connector terminal A37. ■

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, and shift to S.
9. Measure the voltage between cable reel 20P connector terminals No. 5 and No. 17.



Wire side of female terminals

Is there battery voltage?

YES—Replace the cable reel (see page 24-171). ■

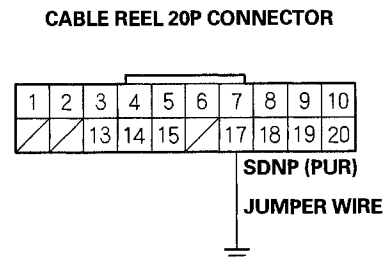
NO—Go to step 10.

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

11. Jump the SCS line with the HDS.

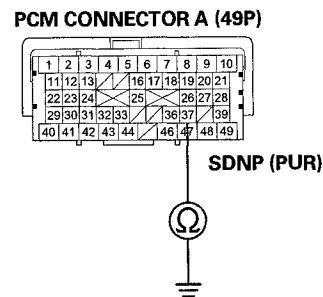
12. Disconnect PCM connector A (49P).

13. Connect cable reel 20P connector terminal No. 17 to body ground with a jumper wire.



Wire side of female terminals

14. Check for continuity between PCM connector terminal A37 and body ground.



Terminal side of female terminals

Is there continuity?

YES—Check for loose or poor connections at PCM connector terminal A37. If the connection is OK, substitute a known-good PCM (see page 11-7) and recheck. ■

NO—Repair open in the wire between PCM connector terminal A37 and the cable reel 20P connector. ■

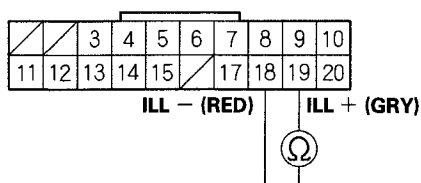


Paddle Shifter + (Upshift Switch) Illumination Circuit Troubleshooting

SRS components are located in this area. Review the SRS component locations (see page 24-11) and the precautions and procedures (see page 24-13) in the SRS before doing repair or service.

1. Remove the steering wheel (see page 17-6).
2. Check for continuity between cable reel subharness 20P connector terminals No. 18 and No. 19.

CABLE REEL SUBHARNESS 20P CONNECTOR



Wire side of female terminals

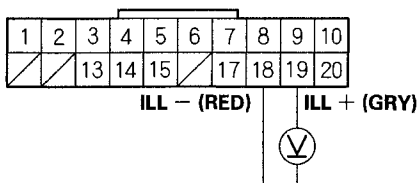
Is there continuity?

YES—Go to step 3.

NO—Go to step 10.

3. Remove the cable reel (see page 24-171).
4. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, and turn the lighting switch ON.
5. Measure the voltage between cable reel 20P connector terminals No. 18 and No. 19.

CABLE REEL 20P CONNECTOR



Wire side of female terminals

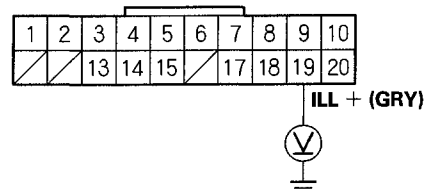
Is there battery voltage?

YES—Replace the cable reel (see page 24-171). ■

NO—Go to step 6.

6. Measure the voltage between cable reel 20P connector terminal No. 19 and body ground.

CABLE REEL 20P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 7.

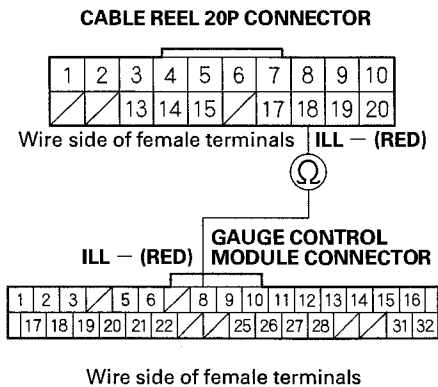
NO—Check for a blown No. 6 (7.5 A) fuse in the passenger's under-dash fuse/relay box. If the fuse is OK, repair open or short in the wire between cable reel 20P connector terminal No. 19 and the passenger's under-dash fuse relay box. ■

(cont'd)

A/T Gear Position Indicator

Paddle Shifter + (Upshift Switch) Illumination Circuit Troubleshooting (cont'd)

- 7. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
- 8. Remove the gauge control module (see page 22-367).
- 9. Check for continuity between cable reel 20P connector terminal No. 18 and gauge control module 32P connector terminal A2.

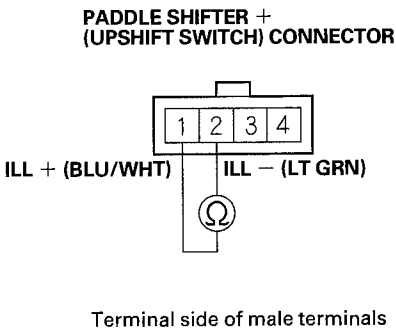


Is there continuity?

YES—Check the illumination control circuit in the gauge control module self-diagnostic function (see page 22-342). ■

NO—Repair open in the wire between cable reel 20P connector terminal No. 18 and gauge control module. ■

- 10. Disconnect the paddle shifter + (upshift switch) connector.
- 11. Check for continuity between paddle shifter + (upshift switch) connector terminals No. 1 and No. 2.



Is there continuity?

YES—Replace the cable reel subharness (see page 17-7). ■

NO—Replace the paddle shifter + (upshift switch) (see page 14-271). ■

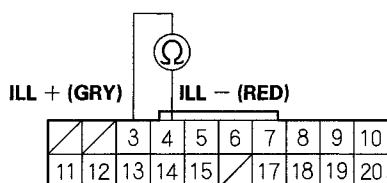


Paddle Shifter - (Downshift Switch) Illumination Circuit Troubleshooting

SRS components are located in this area. Review the SRS component locations (see page 24-11) and the precautions and procedures (see page 24-13) in the SRS before doing repair or service.

1. Remove the steering wheel (see page 17-6).
2. Check for continuity between cable reel subharness 20P connector terminals No. 3 and No. 4.

CABLE REEL SUBHARNESS 20P CONNECTOR



Wire side of female terminals

Is there continuity?

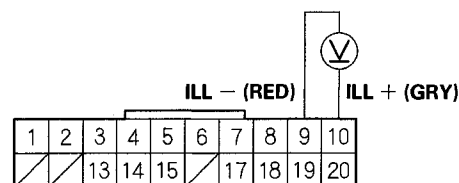
YES—Go to step 3.

NO—Go to step 10.

3. Remove the cable reel (see page 24-171).
4. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, and turn the lighting switch ON.

5. Measure the voltage between cable reel 20P connector terminals No. 9 and No. 10.

CABLE REEL 20P CONNECTOR



Wire side of female terminals

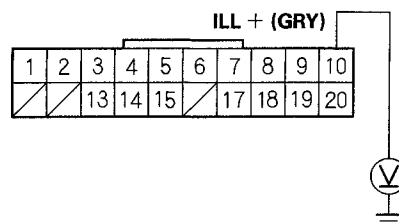
Is there battery voltage?

YES—Replace the cable reel (see page 24-171).■

NO—Go to step 6.

6. Measure the voltage between cable reel 20P connector terminal No. 17 and body ground.

CABLE REEL 20P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 7.

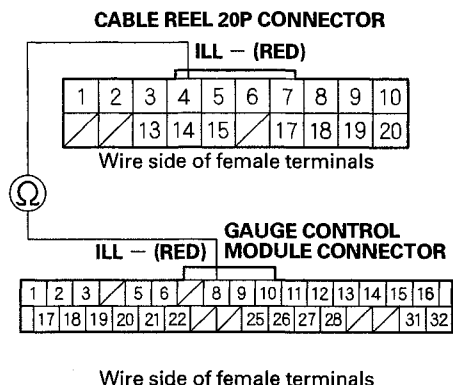
NO—Check for a blown No. 6 (7.5 A) fuse in the passenger's under-dash fuse/relay box. If the fuse is OK, repair open or short in the wire between cable reel 20P connector terminal No. 10 and the passenger's under-dash fuse relay box.■

(cont'd)

A/T Gear Position Indicator

Paddle Shifter - (Downshift Switch) Illumination Circuit Troubleshooting (cont'd)

7. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
8. Remove the gauge control module (see page 22-367).
9. Check for continuity between cable reel 20P connector terminal No. 4 and gauge control module 32P connector terminal A2.

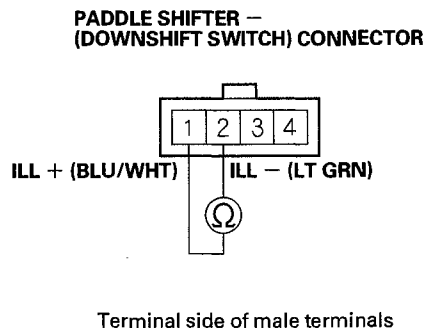


Is there continuity?

YES—Check the illumination control circuit in the gauge control module self-diagnostic function (see page 22-342). ■

NO—Repair open in the wire between cable reel 20P connector terminal No. 4 and gauge control module. ■

10. Disconnect the paddle shifter — (downshift switch) connector.
11. Check for continuity between paddle shifter — (downshift switch) connector terminals No. 1 and No. 2.



Is there continuity?

YES—Replace the cable reel subharness (see page 17-7). ■

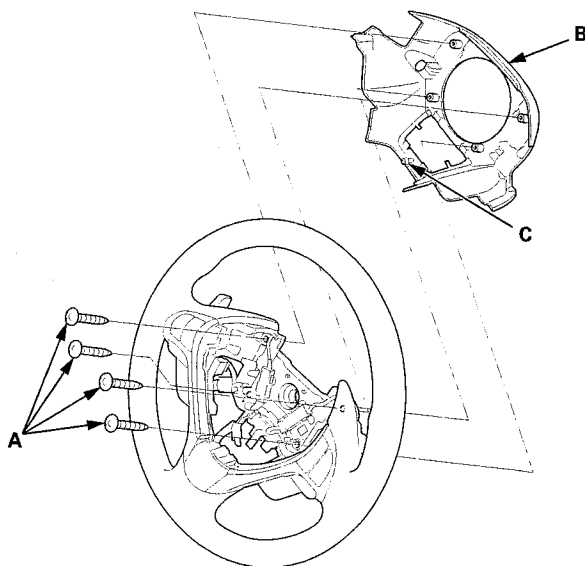
NO—Replace the paddle shifter — (downshift switch) (see page 14-271). ■



Paddle Shifter + (Upshift Switch) or Paddle Shifter - (Downshift Switch) Replacement

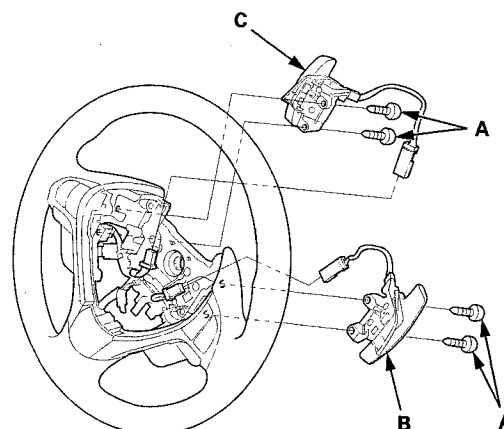
SRS components are located in this area. Review the SRS component locations (see page 24-11) and the precautions and procedures (see page 24-13) before doing repair or service.

1. Remove the steering wheel (see page 17-6).
2. Remove the four screws (A) securing the steering wheel rear cover (B).



3. Pull the snap-fit portion (C) up carefully, then remove the steering wheel rear cover.

4. Disconnect the paddle shifter + (upshift switch) or paddle shifter - (downshift switch) connector. Remove the screws (A) securing the paddle shifter + (upshift switch) (B) or paddle shifter - (downshift switch) (C), then remove the paddle shifter + (upshift switch) or paddle shifter - (downshift switch).

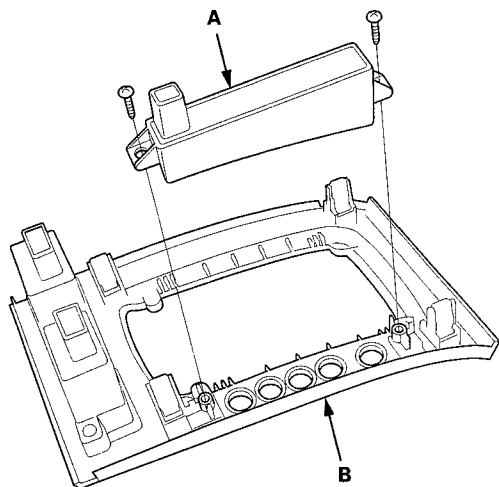


5. Install the new paddle shifter + (upshift switch) or paddle shifter - (downshift switch) on the steering wheel.
6. Connect the paddle shifter + (upshift switch) or paddle shifter - (downshift switch) connector securely, and install the connector in the connector holder.
7. Install the steering wheel rear cover with the screws.
8. Install the steering wheel (see page 17-8).

A/T Gear Position Indicator

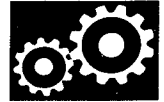
A/T Gear Position Indicator Replacement

1. Remove the A/T shift panel (see page 20-108).
2. Remove the A/T gear position indicator (A) from the A/T shift panel (B).

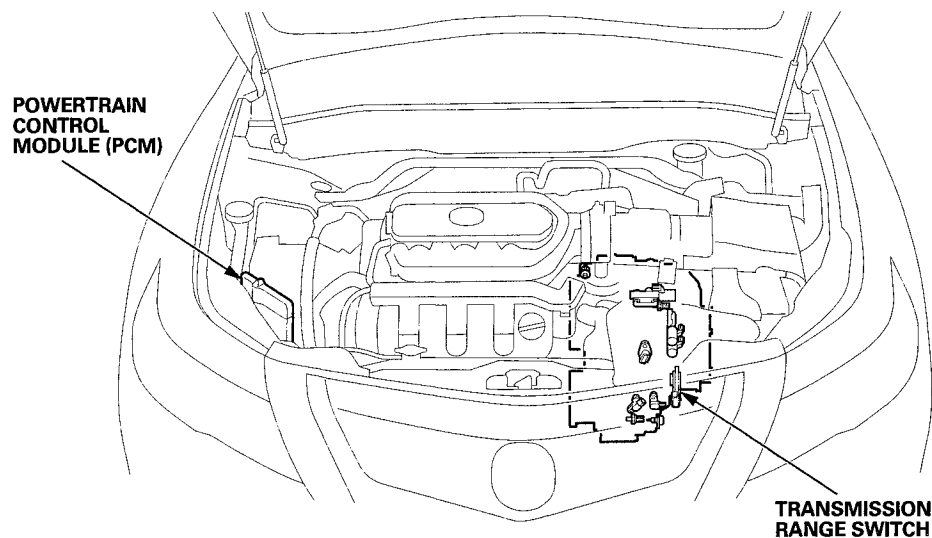
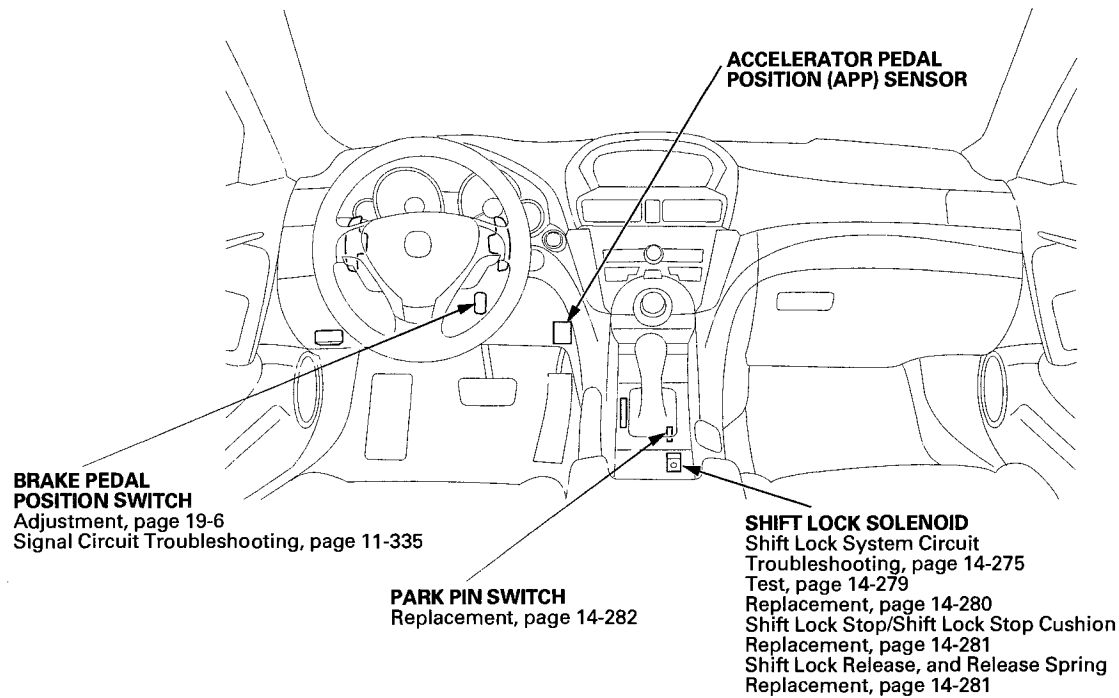


3. Install a new A/T gear position indicator with the screws.
4. Install the A/T shift panel (see page 20-108).

A/T Interlock System

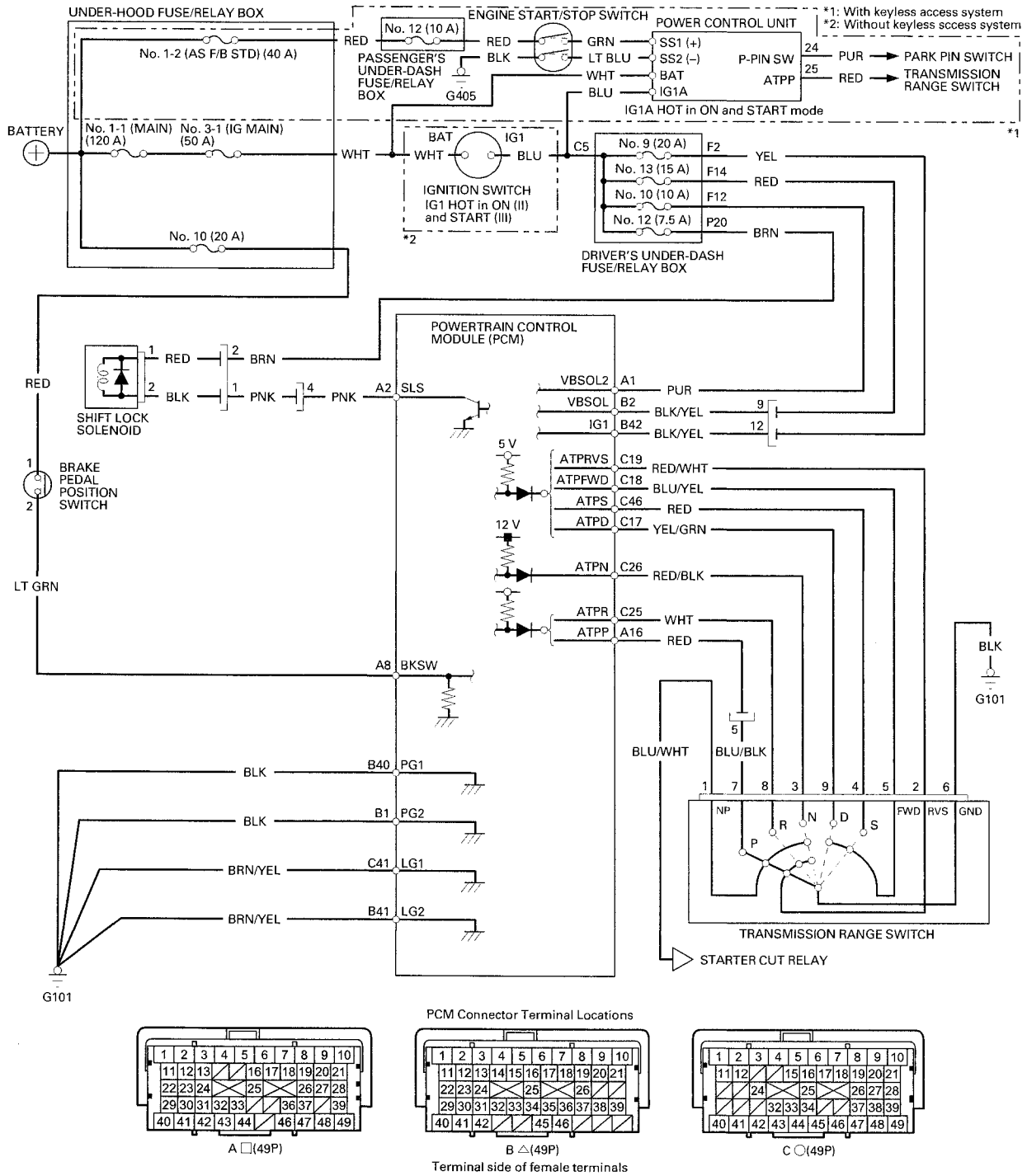


Component Location Index



A/T Interlock System

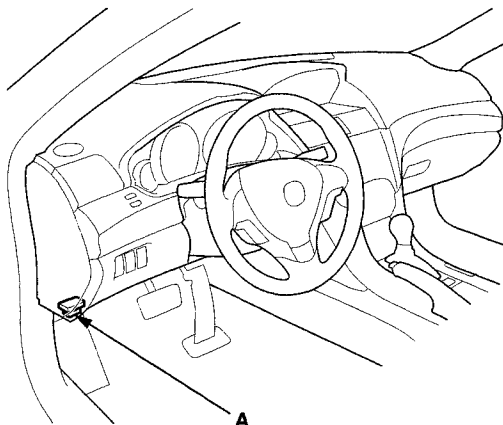
Circuit Diagram





Shift Lock System Circuit Troubleshooting

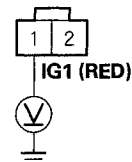
1. Connect the HDS to the DLC (A) located under the driver's side of the dashboard.



2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode. Make sure the HDS communicates with the PCM. If it does not, go to the DLC circuit troubleshooting (see page 11-258).
3. Select Shift Lock Solenoid Test in the Miscellaneous Test Menu, and check that the shift lock solenoid operates with the HDS.
Does the shift lock solenoid work properly?
YES—Go to step 16.
NO—Go to step 4.
4. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
5. Remove the center console (see page 20-109).
6. Disconnect the shift lock solenoid connector (see page 14-280).
7. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.

8. Measure the voltage between shift lock solenoid connector terminal No. 1 and body ground.

SHIFT LOCK SOLENOID CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 9.

NO—Check for a blown No. 12 (7.5 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between shift lock solenoid connector terminal No. 1 and the driver's under-dash fuse/relay box. ■

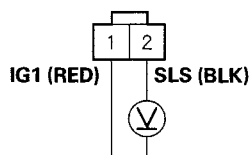
(cont'd)

A/T Interlock System

Shift Lock System Circuit Troubleshooting (cont'd)

9. Shift the shift lever in P, and press the brake pedal. Do not press the accelerator.
10. Measure the voltage between shift lock solenoid connector terminals No. 1 and No. 2 while pressing the brake pedal.

SHIFT LOCK SOLENOID CONNECTOR



Wire side of female terminals

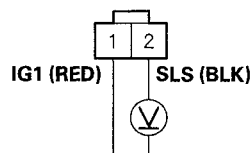
Is there battery voltage?

YES—Go to step 11.

NO—Go to step 12.

11. Release the brake pedal, and measure the voltage between shift lock solenoid connector terminals No. 1 and No. 2. The shift lever must be in P.

SHIFT LOCK SOLENOID CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Repair short to body ground in the wire between PCM connector terminal A2 and the shift lock solenoid connector. ■

NO—Check the shift lock mechanism. If the mechanism is OK, replace the shift lock solenoid (see page 14-280). ■

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

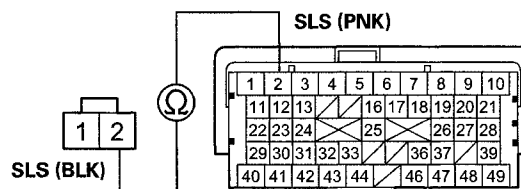
13. Jump the SCS line with the HDS.

14. Disconnect PCM connector A (49P).

15. Check for continuity between PCM connector terminal A2 and shift lock solenoid connector terminal No. 2.

SHIFT LOCK SOLENOID CONNECTOR

PCM CONNECTOR A (49P)



Wire side of female terminals

Terminal side of female terminals

Is there continuity?

YES—Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7), and recheck. If the symptom goes away with a known-good PCM, replace the original PCM (see page 11-282). ■

NO—Repair open in the wire between PCM connector terminal A2 and the shift lock solenoid connector. ■



16. Monitor the Brake Switch in the Data List with the HDS, and press the brake pedal.

Is the Brake Switch ON?

YES—Go to step 21.

NO—If the brake lights come on, go to step 17. If the brake lights do not work, repair faulty brake light circuit. ■

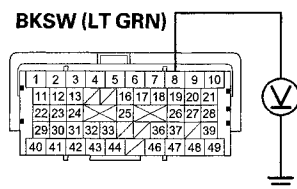
17. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.

18. Jump the SCS line with the HDS.

19. Disconnect PCM connector A (49P).

20. Measure the voltage between PCM connector terminal A8 and body ground while pressing the brake pedal and when the brake pedal is released.

PCM CONNECTOR A (49P)



Terminal side of female terminals

Is there battery voltage while pressing the brake pedal and about 0 V when the pedal is released?

YES—Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7), and recheck. If the symptom goes away with a known-good PCM, replace the original PCM (see page 11-282). ■

NO—Repair open in the wire between PCM connector terminal A8 and the brake pedal position switch. ■

21. Monitor the A/T P Switch in the Data List with the HDS with the shift lever in P.

Is the A/T P Switch ON?

YES—Go to step 33.

NO—Go to step 22.

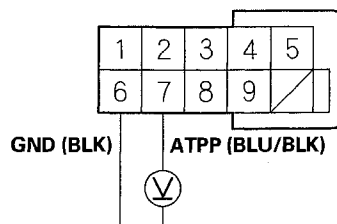
22. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.

23. Disconnect the transmission range switch connector.

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

25. Measure the voltage between transmission range switch connector terminals No. 7 and No. 6.

TRANSMISSION RANGE SWITCH CONNECTOR



Wire side of female terminals

Is there more than 5V?

YES—Go to step 26.

NO—Go to step 27.

26. Inspect the transmission range switch (see page 14-259).

Is the transmission range switch OK?

YES—Check for poor connections or terminals at the transmission range switch connector. ■

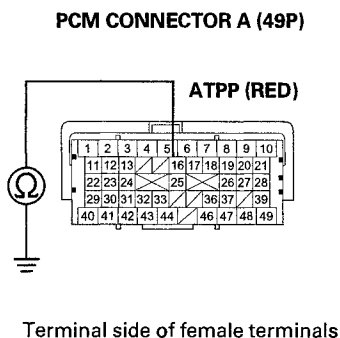
NO—Replace the transmission range switch (see page 14-260). ■

(cont'd)

A/T Interlock System

Shift Lock System Circuit Troubleshooting (cont'd)

27. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
28. Jump the SCS line with the HDS.
29. Disconnect PCM connector A (49P).
30. Check for continuity between PCM connector terminal A16 and body ground.

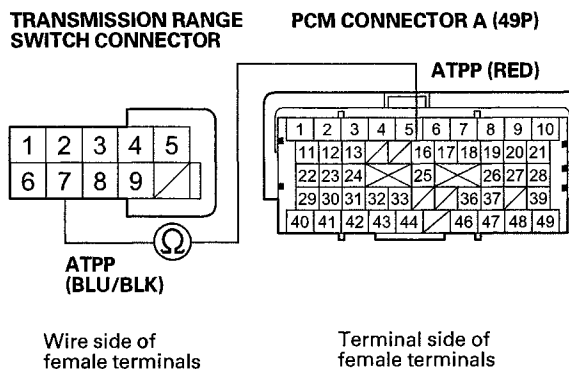


Is there continuity?

YES—Repair short to body ground in the wire between PCM connector terminal A16 and the transmission range switch connector. ■

NO—Go to step 31.

31. Check for continuity between PCM connector terminal A16 and transmission range switch connector terminal No. 7.



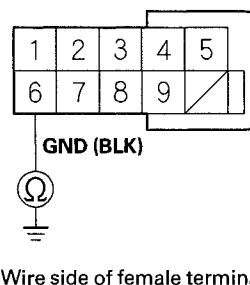
Is there continuity?

YES—Go to step 32.

NO—Repair open in the wire between PCM connector terminal A16 and the transmission range switch connector. ■

32. Check for continuity between transmission range switch connector terminal No. 6 and body ground.

TRANSMISSION RANGE SWITCH CONNECTOR



Is there continuity?

YES—Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7), and recheck. If the symptom goes away with a known-good PCM, replace the original PCM (see page 11-282). ■

NO—Repair open in the wire between transmission range switch connector terminal No. 6 and body ground (G101), or repair poor body ground (G101). ■



Shift Lock Solenoid Test

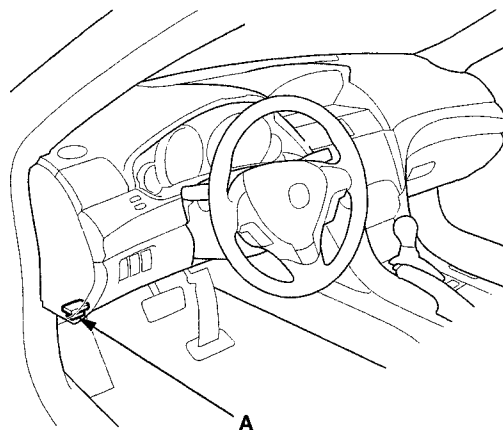
33. Check the APP Sensor (A) in the Data List with the HDS. Do not press the accelerator.

Is the APP Sensor A opening 5 % or more, or 1.16 V or higher?

YES—Check the APP sensor (see page 11-318). ■

NO—Update the PCM if it does not have the latest software (see page 11-281), or substitute a known-good PCM (see page 11-7), and recheck. If the symptom goes away with a known-good PCM, replace the original PCM (see page 11-282). ■

1. Connect the HDS to the DLC (A) located under the driver's side of the dashboard.



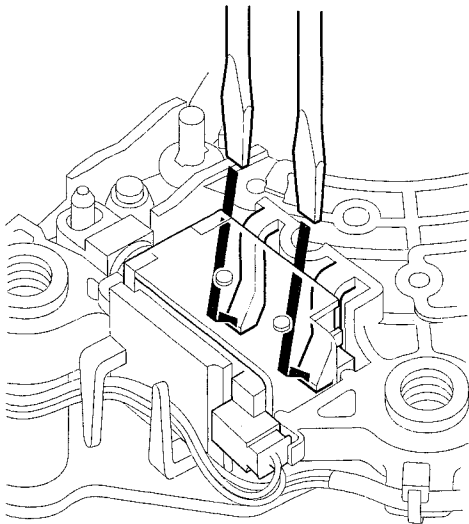
2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode. Make sure the HDS communicates with the PCM. If it does not, go to the DLC circuit troubleshooting (see page 11-258).
3. Select Shift Lock Solenoid Test in the Miscellaneous Test Menu, and check that the shift lock solenoid operates with the HDS.
4. Check that the shift lever can be moved out of P when the Shift Lock Solenoid is ON. Move the shift lever back to P, and check that it locks with the Shift Lock Solenoid is OFF.
5. Check that the shift lock releases when the shift lock release is pushed, and check that it locks when the shift lock release is released.
6. If the shift lock solenoid does not work properly, go to the shift lock system troubleshooting (see page 14-275).

A/T Interlock System

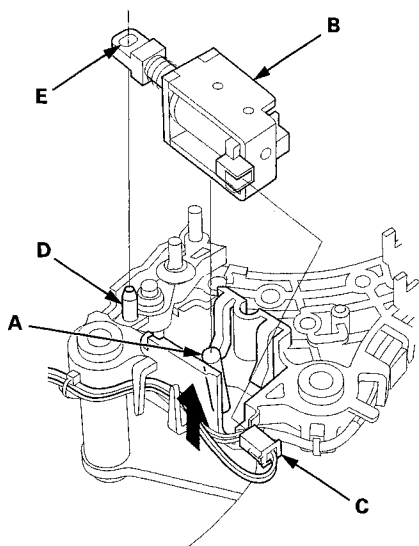
Shift Lock Solenoid Replacement

NOTE: Make sure not to get any silicone grease on the terminal part of the connectors and switches, especially if you have silicone grease on your hands or gloves.

1. Remove the shift lever assembly (see page 14-242).
2. Release the lock tabs retaining the shift lock solenoid using thin-bladed screwdrivers.



3. Insert a 6 mm pin (A), and push the shift lock solenoid (B) out.



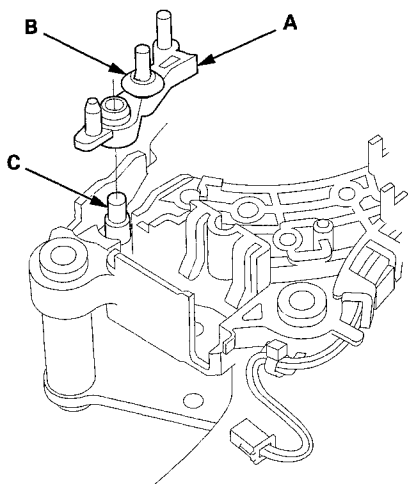
4. Disconnect the shift lock solenoid connector (C).
5. Apply silicone grease to the tip (D) of the shift lock stop and the solenoid plunger hole (E).
6. Connect the shift lock solenoid connector.
7. Install a new shift lock solenoid by aligning the joint of the shift lock solenoid plunger with the tip of the shift lock stop, then push the shift lock solenoid into the shift lever securely.
8. Install the shift lever assembly (see page 14-243).



Shift Lock Stop/Shift Lock Stop Cushion Replacement

NOTE: Make sure not to get any silicone grease on the terminal part of the connectors and switches, especially if you have silicone grease on your hands or gloves.

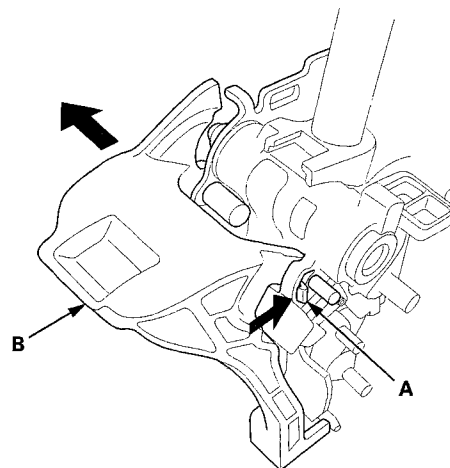
1. Remove the shift lock solenoid (see page 14-280).
2. Remove the shift lock stop (A) and the stop cushion (B) as a set.



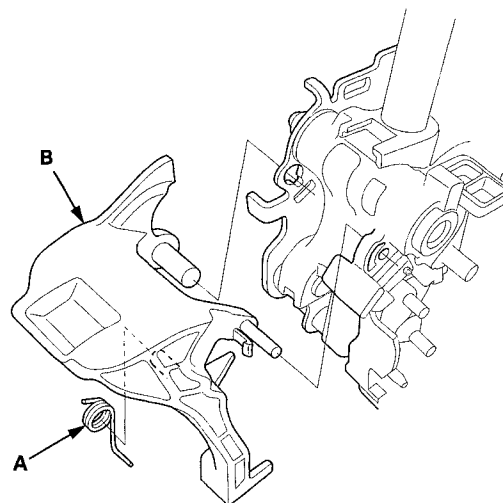
3. Apply silicone grease to the pin (C) on the shift lever bracket, and install new shift lock stop over the pin.
4. Install the shift lock solenoid (see page 14-280).

Shift Lock Release and Release Spring Replacement

1. Remove the shift lever assembly (see page 14-242).
2. Release the lock (A) of the shift lock release (B), then remove the shift lock release.



3. Remove the release spring (A) from the shift lock release (B).



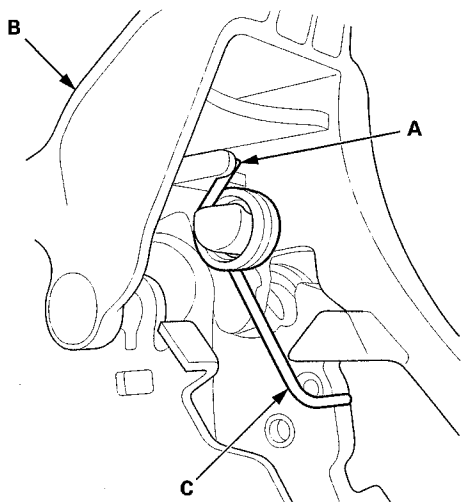
4. Replace the shift lock release or the release spring.

(cont'd)

A/T Interlock System

Shift Lock Release and Release Spring Replacement (cont'd)

5. Install the shift lock release spring in the shift lock release.
6. Install the shift lock release on the shift lever.
7. Make sure that the release spring end (A) is installed in the shift lock release (B), and the hooked end (C) of the release spring is on the shift lever bracket as shown.

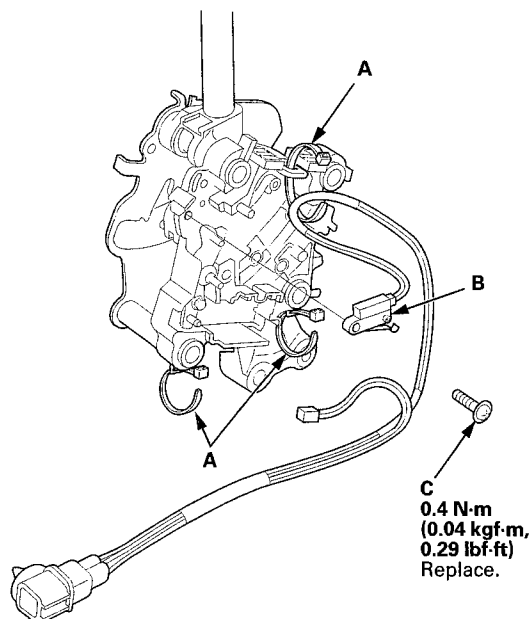


8. Install the shift lever assembly (see page 14-243).

Park Pin Switch Replacement

NOTE: The park pin switch, and the shift lock solenoid harness are not available separately. Replace the park pin switch, and the shift lock solenoid harness as a set.

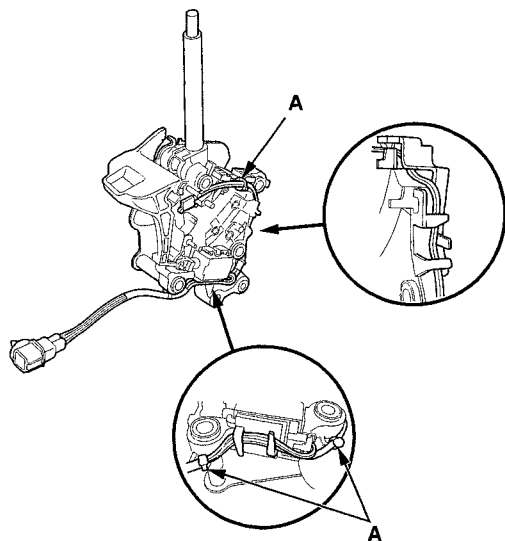
1. Remove the shift lock solenoid (see page 14-280).
2. Remove the harness wire ties (A), and remove the park pin switch (B).



3. Replace the park pin switch.
4. Install the park pin switch, and secure the park pin switch with a new screw (C).



5. Connect the shift lock solenoid connector to the shift lock solenoid. Then install the shift lock solenoid (see page 14-280).
6. Route the harnesses as shown. Take the slack out of the harnesses, and secure the harnesses with the harness wire ties (A).



7. Install the shift lever boot base (see page 14-249).
8. Install the shift lever assembly (see page 14-243).

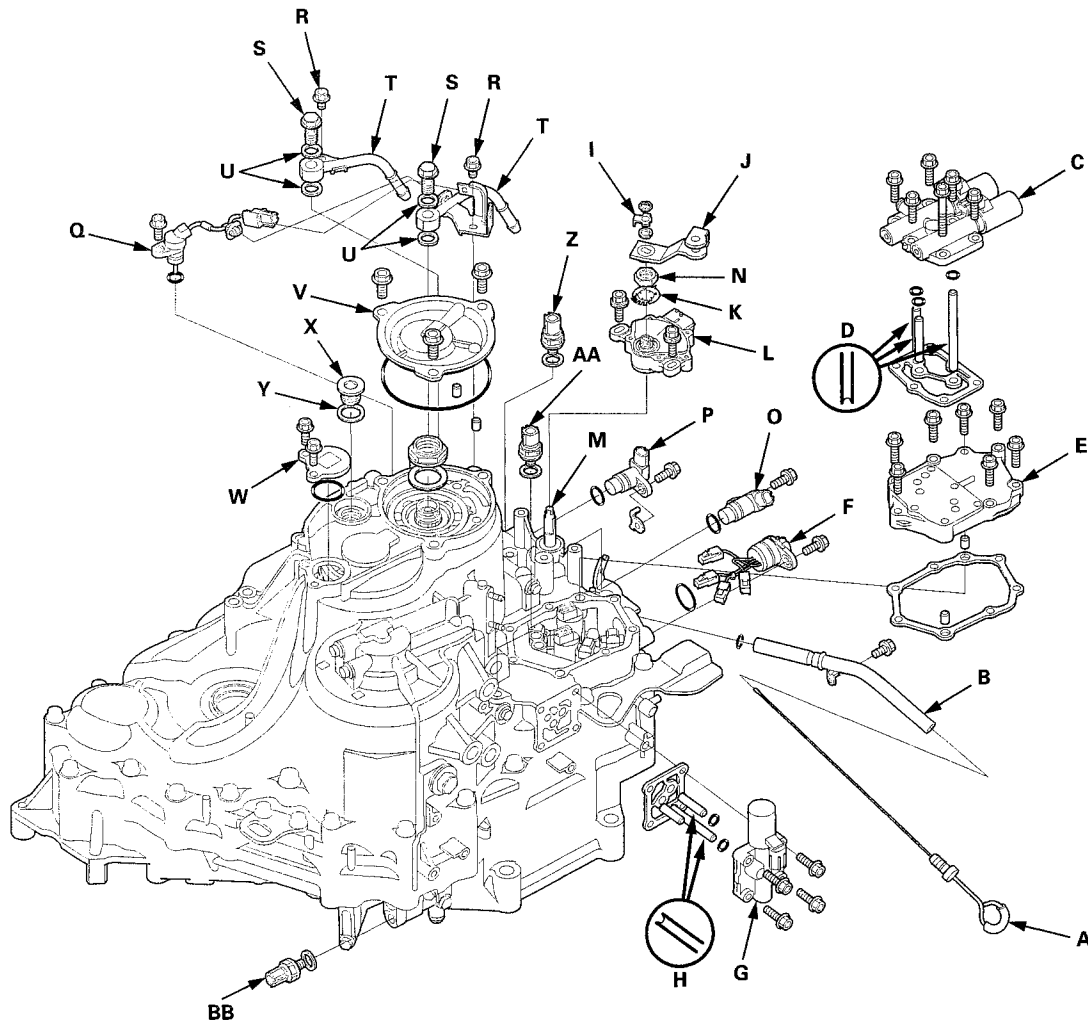
Automatic Transmission

Transmission Disassembly

Special Tools Required

Mainshaft Holder 07GAB-PF50101

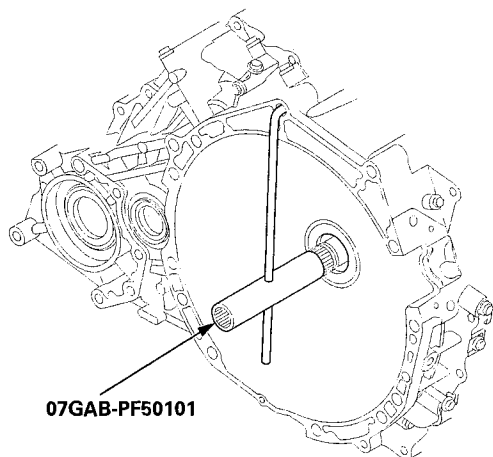
1. Remove the ATF dipstick (A) and the ATF dipstick guide tube (B).



2. Remove A/T clutch pressure control solenoid valves A and B (C) (six bolts), the ATF feed pipes (D) (three), the O-rings (three), and the gasket.
3. Remove the shift solenoid valve cover (E) (seven bolts), the dowel pins (two), and the gasket.
4. Disconnect the shift solenoid valve connectors, then remove the shift solenoid wire harness (F).
5. Remove A/T clutch pressure control solenoid valve C (G) (four bolts), the ATF feed pipes (H) (two), the O-rings (two), the ATF pipe, and the gasket.
6. Pry the lock tab of the lock washer (I) on the selector control lever (J), and remove the lock nut, the lock washer, the spring washer, and the selector control lever.

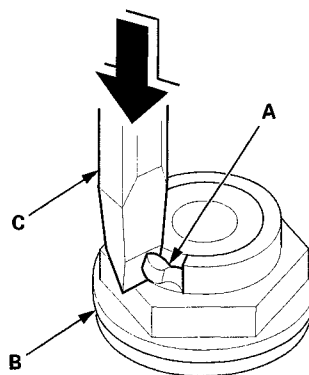


7. Pry the lock tabs of the lock washer (K) on the transmission range switch (L), hold the selector control shaft (M) with a 6.0 mm wrench, and loosen the locknut (N).
8. Remove the locknut and the lock washer, then remove the transmission range switch (two bolts).
9. Remove the input shaft (mainshaft) speed sensor (O), the output shaft (countershaft) speed sensor (P).
10. Remove the ATF temperature sensor connector and the harness clamp from the clamp bracket on the ATF cooler line, then remove the ATF temperature sensor (Q).
11. Remove the 6.0 mm bolts (R), the line bolts (S), the ATF cooler lines (T), and the sealing washers (U).
12. Remove the end cover (V) (three bolts), the dowel pins (two), the O-ring, the snap ring cap (W) (two bolts), the sealing plug (X), and the sealing washer (Y).
13. Remove the transmission fluid pressure switch B (3rd clutch) (Z) and the sealing washer.
14. Remove the 4th clutch transmission fluid pressure switch (AA) and the sealing washer.
15. Remove the transmission fluid pressure switch A (2nd clutch) (BB) and the sealing washer.
16. Slip the mainshaft holder onto the mainshaft.

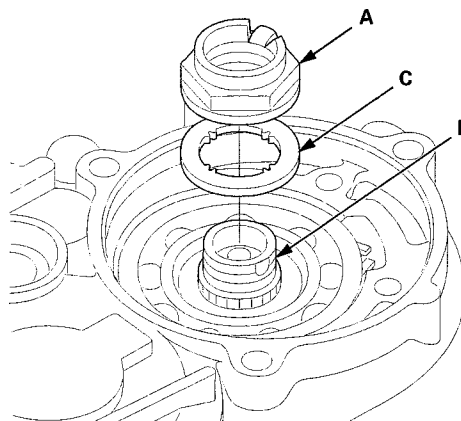


17. Cut the lock tab (A) off the mainshaft locknut (B) using a chisel (C).

NOTE: Keep all of the chiseled particles out of the transmission.



18. Remove the locknut (A) from the mainshaft (B).



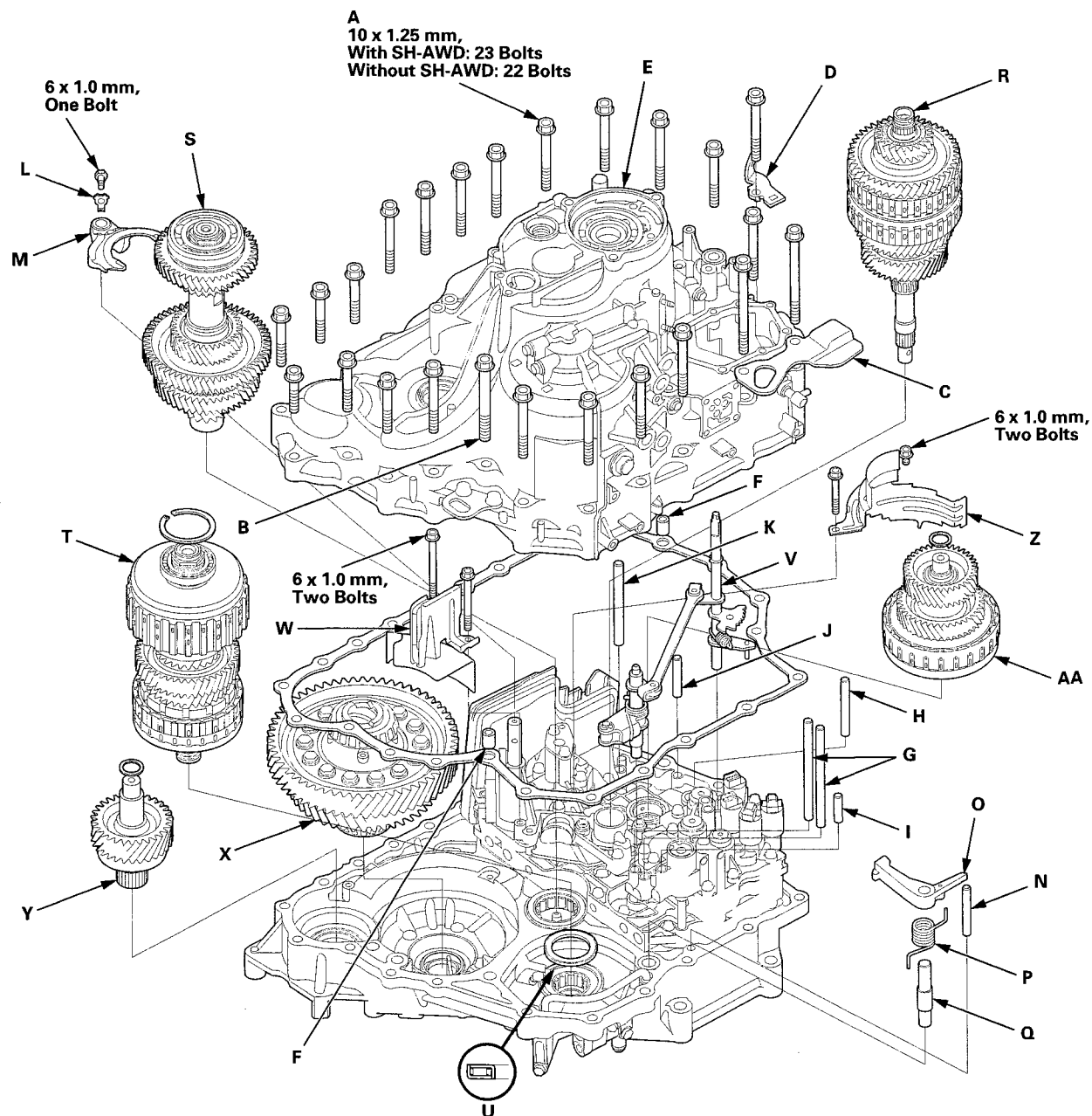
19. Pry the lock washer (C) and remove it.

(cont'd)

Automatic Transmission

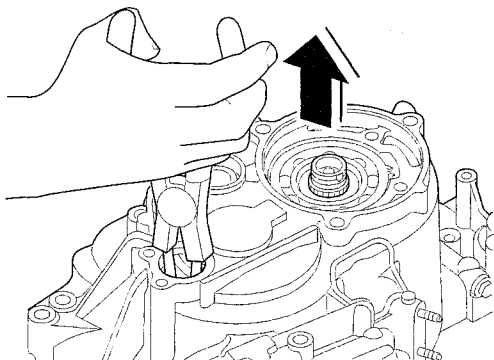
Transmission Disassembly (cont'd)

20. Remove the transmission housing mounting bolts (A) (with SH-AWD: 23 bolts, without SH-AWD: 22 bolts), 12 x 1.25 mm bolt (B), transmission hanger (C), and ground terminal bracket (D).

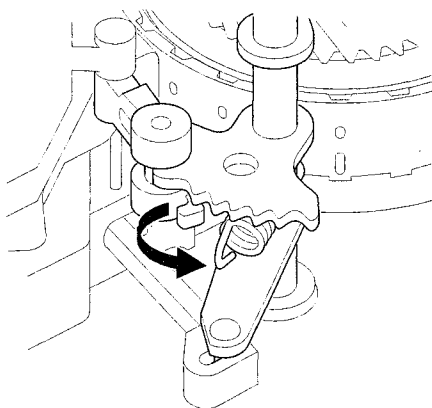




21. While expanding the snap ring of the countershaft bearing using snap ring pliers, lift the transmission housing.

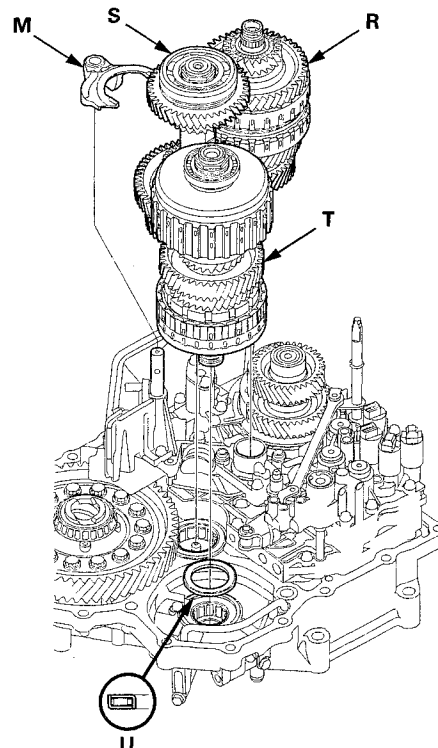


22. Release the snap ring pliers, and remove the transmission housing (E), the two dowel pins (F), and the gasket.
23. Remove the 8 x 151.5 mm ATF feed pipes (G) (two), the 8 x 85 mm pipe (H), and the 8 x 40 mm pipe (I) from the accumulator body.
24. Remove the 8 x 57.5 mm ATF feed pipe (J) and the 10 x 123 mm pipe (K) from the torque converter housing.
25. Remove the mainshaft holder from the mainshaft.
26. Pry the lock tab of the lock washer (L) on the shift fork (M), then remove the bolt and the lock washer.
27. Unhook the detent spring from the detent arm.



28. Remove the park pawl stop (N), the park pawl (O), the pawl spring (P), and the pawl shaft (Q).

29. Remove the mainshaft (R), the countershaft (S), the shift fork (M), and the secondary shaft (T) together, and remove the needle bearing (U) from the torque converter housing.



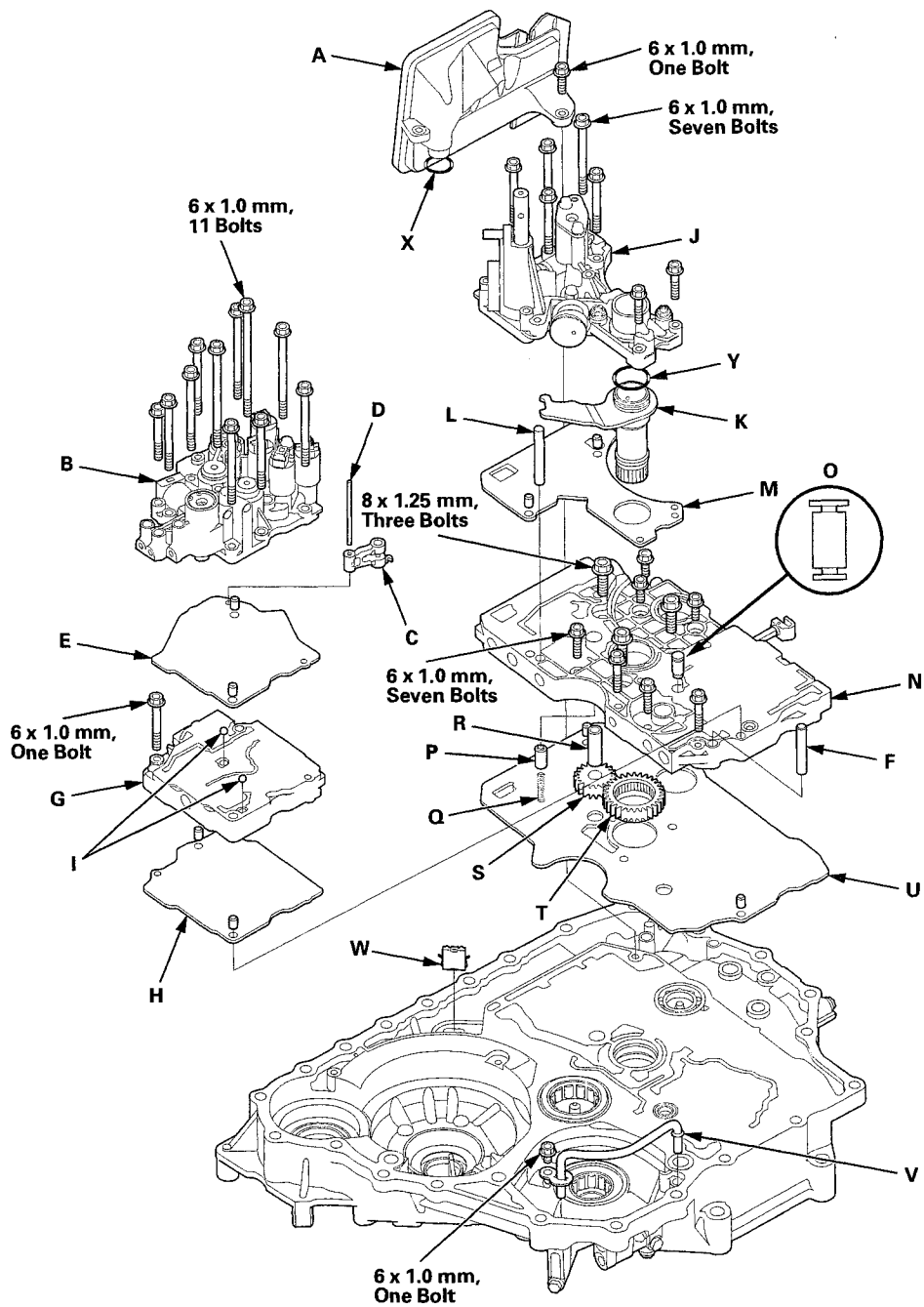
30. Remove the selector control shaft and the park lever link (V).
31. Remove the oil catch plate (W).
32. Remove the differential assembly (X).
33. With SH-AWD: Remove the transfer output shaft (Y).
34. Remove the baffle plate (Z).
35. Remove the intermediary shaft (AA).

(cont'd)

Automatic Transmission

Transmission Disassembly (cont'd)

36. Remove the ATF strainer (A) (one bolt).

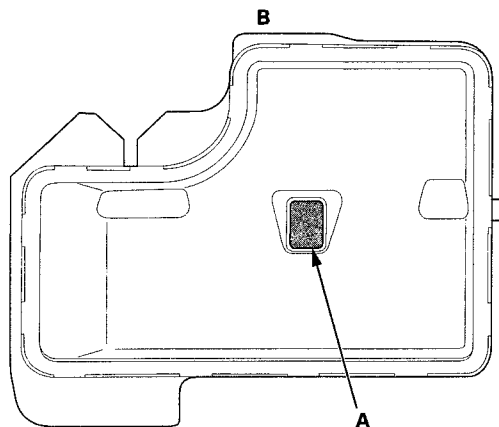




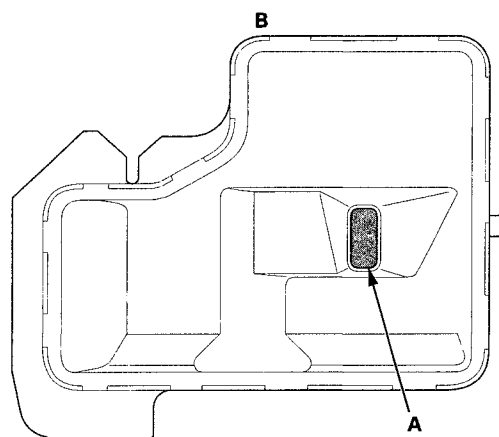
37. Remove the accumulator body (B) (11 bolts), the dowel pins (two), the detent arm (C), the detent arm shaft (D), and the accumulator separator plate (E).
38. Remove the 8 x 62 mm ATF feed pipe (F) from the main valve body.
39. Remove the secondary valve body (G) (one bolt), the dowel pins (two), and the secondary separator plate (H). Do not let the check balls (I) (two) fall out.
40. Remove the regulator valve body (J) (seven bolts), the stator shaft (K), the stator shaft stop (L), the dowel pins (two), and the regulator separator plate (M).
41. Remove the main valve body (N) (8 mm: three bolts, 6 mm: seven bolts). Do not let the lubrication check valve (O) fall out.
42. Remove the torque converter check valve (P) and the valve spring (Q).
43. Remove the ATF pump driven gear shaft (R), then remove the ATF pump driven gear (S), and the ATF pump drive gear (T).
44. Remove the dowel pins (two) and the main separator plate (U).
45. Remove the ATF passage pipe (V) (one bolt).
46. Remove the ATF magnet (W), clean it, then reinstall it in the torque converter housing.
47. Remove the O-ring (X) from the ATF strainer, and replace it with a new O-ring when reassembling the transmission.
48. Remove the O-ring (Y) from the stator shaft, and replace it with a new O-ring when reassembling the transmission.

49. Clean the inlet opening (A) of the ATF strainer (B) thoroughly with compressed air, then check that it is good condition and that the inlet opening is not clogged.

With SH-AWD



Without SH-AWD

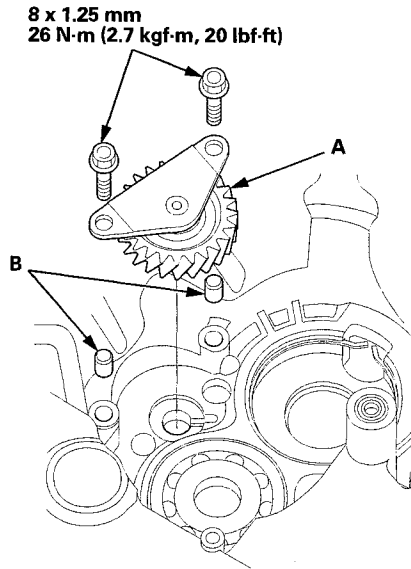


50. Check the ATF strainer for clogs, debris, or damage. If the strainer is clogged or damaged, replace it.

Transmission Housing

Reverse Idler Gear Removal/Installation

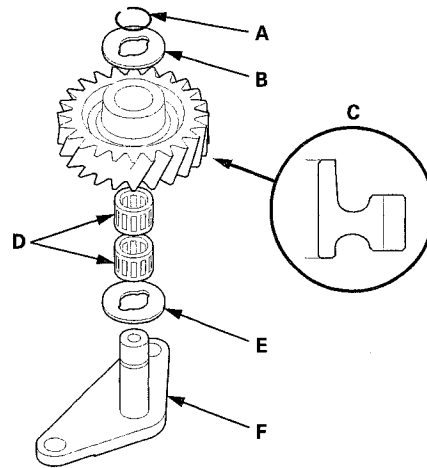
1. Remove the reverse idler gear assembly (A) from the transmission housing.



2. Install the reverse idler gear assembly with the two dowel pins (B) in the transmission housing.

Reverse Idler Gear Disassembly/Inspection/Reassembly

1. Remove the snap ring (A), then remove the thrust washer (B), the reverse idler gear (C), the needle bearings (D), and the thrust washer (E) from the reverse idler gear shaft/holder (F).

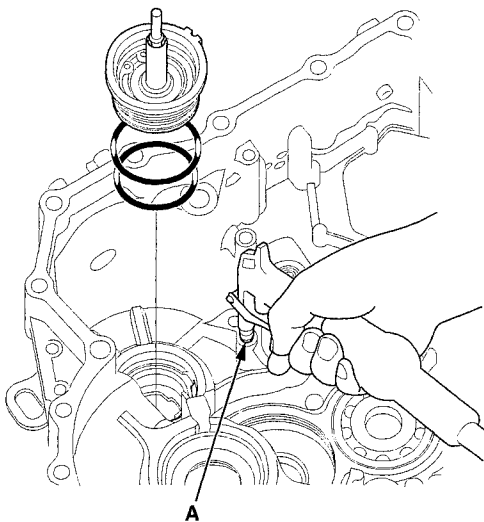


2. Inspect the reverse idler gear and the gear shaft for excessive wear and damage.
3. Inspect the needle bearings for galling and rough movement.
4. Install the thrust washer and the needle bearings over the gear shaft.
5. Install the reverse idler gear in the direction shown.
6. Install the thrust washer, then install the snap ring to secure the idler gear.



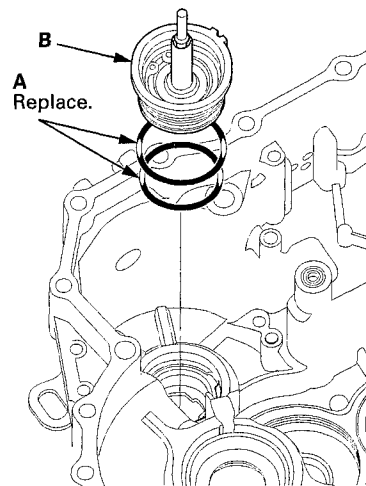
Secondary Shaft ATF Feed Pipe Cap Removal

1. Cover the tip of the 1st-hold clutch ATF feed pipe with a shop rag.
2. Apply air pressure to the ATF feed pipe hole (A) of the 1st-hold clutch pressure circuit, and remove the ATF feed pipe cap from the transmission housing.



Secondary Shaft ATF Feed Pipe Cap Installation

1. Install new O-rings (A) on the ATF feed pipe cap (B).



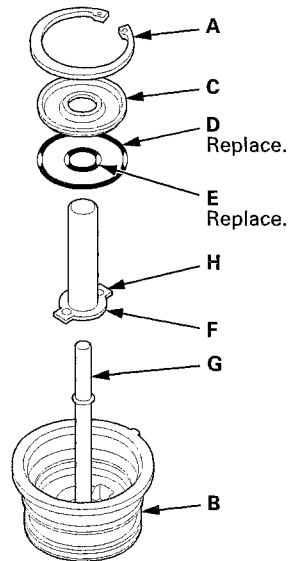
2. Install the ATF feed pipe cap in the transmission housing. Do not pinch the O-rings.

Transmission Housing

Secondary Shaft ATF Feed Pipe Cap, Feed Pipe Replacement

NOTE: The 1st-hold clutch ATF feed pipe/ATF feed cap is not available separately.

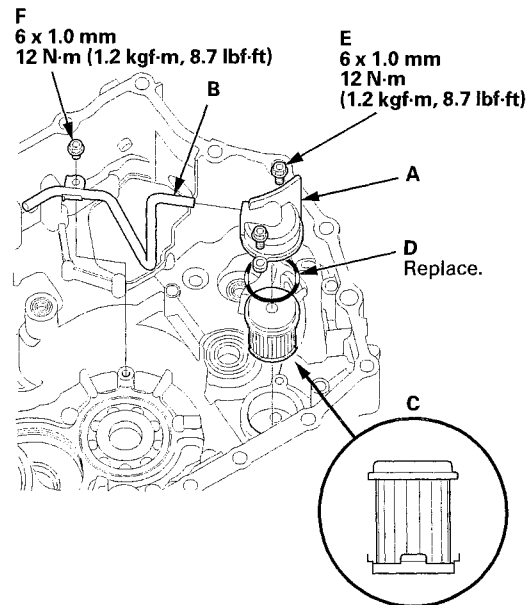
1. Remove the ATF feed pipe cap from the transmission housing (see page 14-291).
2. Remove the snap ring (A) from the ATF feed pipe cap (B), then remove the feed pipe guide (C), the O-rings (D) (E), and the 1st clutch ATF feed pipe (F).



3. Replace the 1st clutch ATF feed pipe or 1st-hold clutch ATF feed pipe/ATF feed pipe cap assembly.
4. Install a new O-ring (D) over the 1st clutch ATF feed pipe, then install the feed pipe over the 1st-hold clutch ATF feed pipe (G) while aligning the feed pipe tabs (H) with the guide in the cap.
5. Install a new O-ring (E) in the cap and the feed pipe guide, then secure the guide with the snap ring.
6. Install the ATF feed pipe cap in the transmission housing (see page 14-291).

ATF Filter Removal/Inspection/Installation

1. Remove the three 6.0 mm bolts securing the ATF filter cover (A) and the ATF pipe (B).



2. Remove the ATF pipe from the ATF filter cover, and remove the ATF filter (C) from the cover.
3. Clean the ATF filter, then check that it is in good condition, and is not clogged. Replace the ATF filter if it is clogged or damaged.
4. Install the ATF filter with a new O-ring (D) in the filter cover, and install the ATF pipe in the cover, then install them in the transmission housing.
5. Secure the ATF filter cover with the two bolts (E), then secure the ATF pipe with the bolt (F).

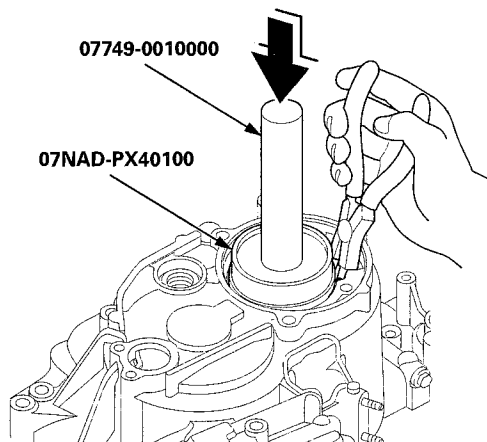


Mainshaft Bearing Removal

Special Tools Required

- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 78 x 80 mm 07NAD-PX40100

1. To remove the mainshaft bearing, expand the snap ring using snap ring pliers, then push the bearing out. Do not remove the snap ring unless it is necessary to clean the groove in the transmission housing.

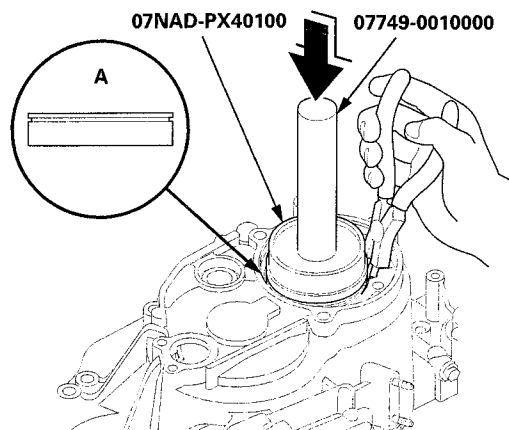


Mainshaft Bearing Installation

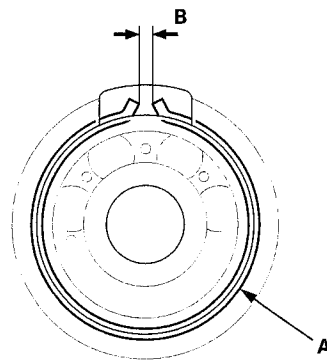
Special Tools Required

- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 78 x 80 mm 07NAD-PX40100

1. Install the bearing (A) in the direction shown.



2. Expand the snap ring using snap ring pliers, and insert the bearing part-way into the transmission housing.
3. Release the snap ring pliers, then push the bearing down into transmission housing until the snap ring snaps in place around it.
4. After installing the bearing, check that the snap ring (A) is seated in the bearing and housing groove, and that the snap ring end gap (B) is 0–7 mm (0–0.28 in).



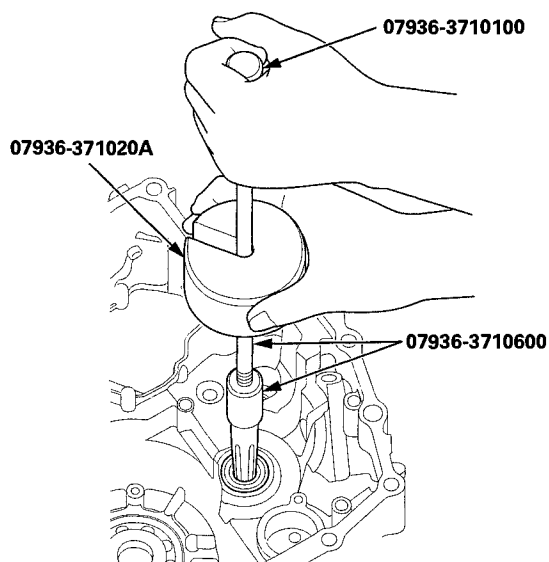
Transmission Housing

Intermediary Shaft Bearing Replacement

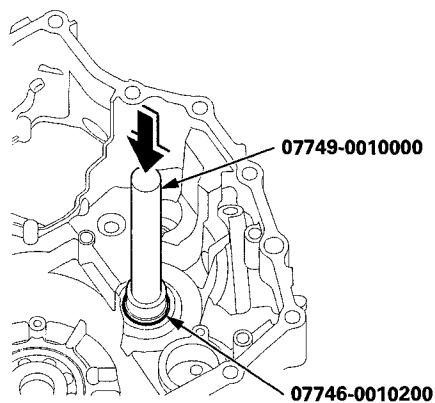
Special Tools Required

- Bearing Remover Shaft Set, 20 mm 07936-3710600
- Remover Handle 07936-3710100
- Slide Hammer 07936-371020A
- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 37 x 40 mm 07746-0010200

1. Remove the intermediary shaft bearing from the transmission housing using the 20 mm bearing remover shaft set, the remover handle, and the slide hammer.



2. Install a new bearing until it bottoms in the transmission housing using the driver handle and the 37 x 40 mm attachment.

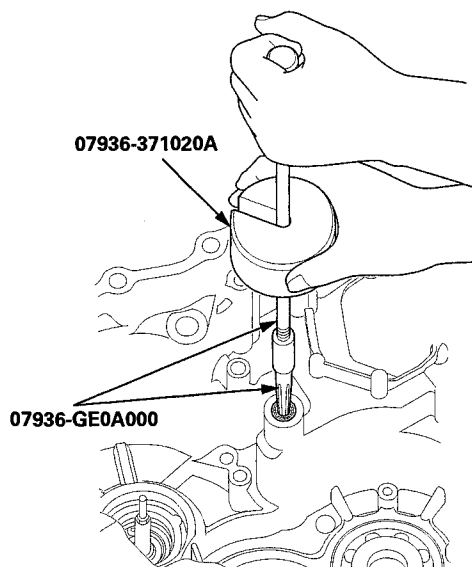


Park Lever Shaft Bearing Replacement

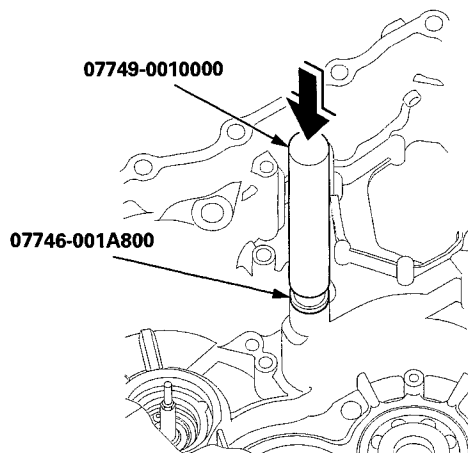
Special Tools Required

- Bearing Remover, 10 mm 07936-GE0A000
- Slide Hammer 07936-371020A
- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 22 x 24 mm 07746-001A800

1. Remove the park lever shaft bearing from the transmission housing using the bearing remover head, the bearing remover shaft, and the slide hammer.



2. Install a new bearing until it bottoms in the transmission housing using the driver handle and the 22 x 24 mm attachment.



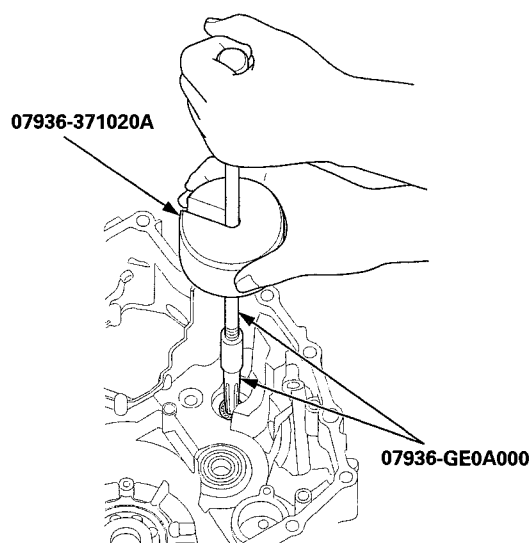


Selector Control Shaft Bearing Replacement

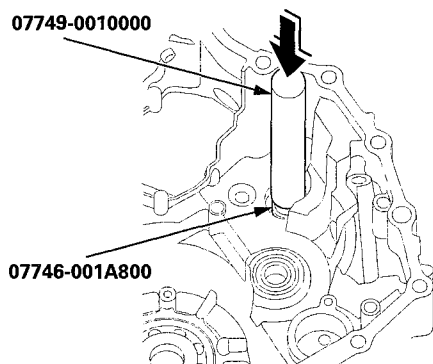
Special Tools Required

- Bearing Remover, 10 mm 07936-GE0A000
- Slide Hammer 07936-371020A
- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 22 x 24 mm 07746-001A800

1. Remove the control shaft bearing from the transmission housing using the bearing remover head, the bearing remover shaft, and the slide hammer.



2. Install a new bearing in the transmission housing using the driver handle and the 22 x 24 mm attachment.

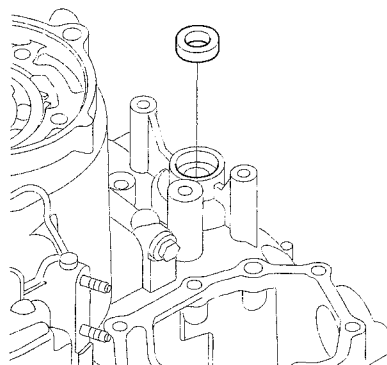


Selector Control Shaft Oil Seal Replacement

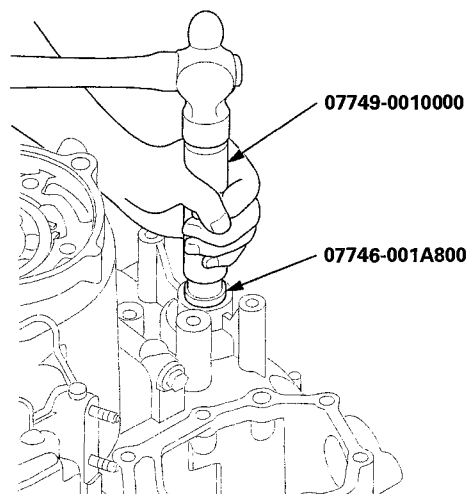
Special Tools Required

- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 22 x 24 mm 07746-001A800

1. Remove the oil seal from the transmission housing.



2. Install a new oil seal in the transmission housing using the driver handle and the 22 x 24 mm attachment.



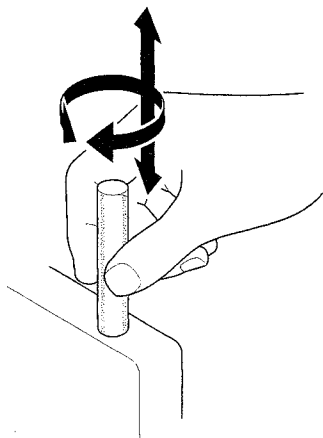
Valve Body

Valve Body Repair

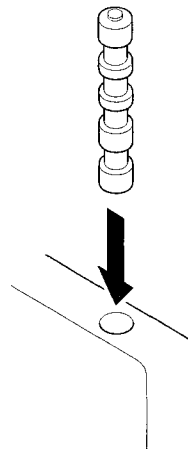
NOTE: This repair is only necessary if one or more of the valves in a valve body do not slide smoothly in their bores. Use this procedure to free the valves.

1. Soak a sheet of #600 abrasive paper in ATF for about 30 minutes.
2. Carefully tap the valve body so the sticking valve drops out of its bore. It may be necessary to use a small screwdriver to pry the valve free. Be careful not to scratch the bore with the screwdriver.
3. Inspect the valve for any scuff marks. Use the ATF-soaked #600 abrasive paper to polish off any burrs that are on the valve, then wash the valve in solvent and dry it with compressed air.
4. Roll up half of the ATF-soaked #600 abrasive paper and insert it in the valve bore of the sticking valve. Twist the paper slightly, so that it unrolls and fits into the bore tightly, then polish the bore by twisting the paper as you push it in and out.

NOTE: The valve body is aluminum and does not require much polishing to remove any burrs.



5. Remove the #600 abrasive paper. Thoroughly wash the entire valve body in solvent, then dry it with compressed air.
6. Coat the valve with ATF, then drop it into its bore. It should drop to the bottom of the bore under its own weight. If not, repeat steps 4 and 5, then retest. If the valve still sticks, replace the valve body.

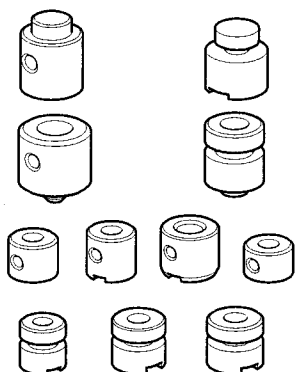


7. Remove the valve, and thoroughly clean it and the valve body with solvent. Dry all parts with compressed air, then reassemble using ATF as a lubricant.

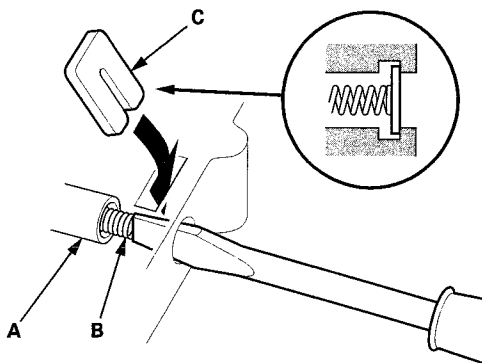


Valve Body Valve Installation

1. Coat all parts with ATF before assembly.
2. Install the valves and springs in the sequence shown for the main valve body (see page 14-298), the secondary valve body (see page 14-300), the regulator valve body (see page 14-301), and the accumulator body (see page 14-302). Refer to the following valve cap illustrations, and install each valve cap so the end shown facing up will be facing the outside of the valve body, then secure the valve cap with the valve cap clip.



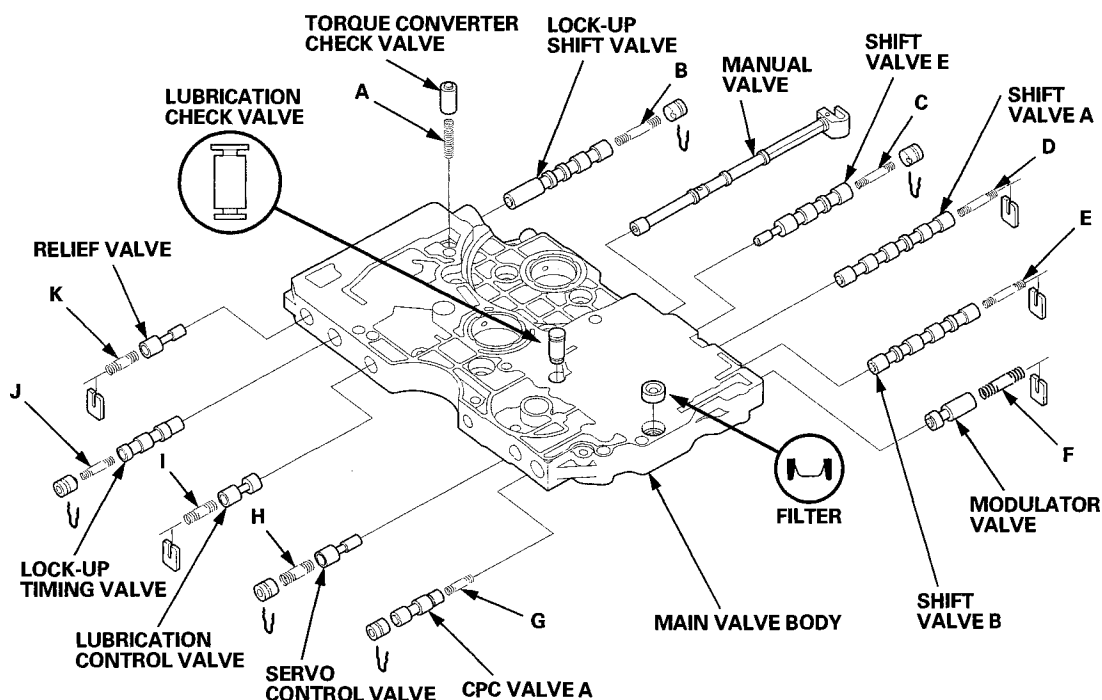
3. Install the valve (A) and the valve spring (B) in the valve body. Push the valve spring in using a screwdriver, then install the spring seat (C).



Valve Body

Main Valve Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent, and dry them with compressed air. Blow out all passages.
2. Inspect the main valve body for scoring and damage.
3. Check all valves for free movement. If any fail to slide freely, refer to the valve body repair procedure (see page 14-296).
4. Coat all parts with ATF during assembly.
5. Replace the filter with a new one, and install it and the lubrication check valve in the direction shown.



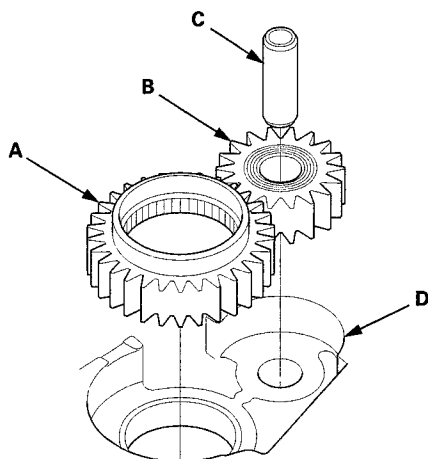
SPRING SPECIFICATIONS

Springs		Standard (New)-Unit: mm (in)			
		Wire Diameter	O.D.	Free Length	No. of Coils
A	Torque converter check valve spring (without SH-AWD)	1.1 (0.039)	8.6 (0.339)	35.0 (1.378)	12.8
	Torque converter check valve spring (with SH-AWD)	1.1 (0.043)	8.6 (0.339)	34.3 (1.350)	10.1
B	Lock-up shift valve spring	1.0 (0.039)	6.6 (0.260)	35.5 (1.398)	18.2
C	Shift valve E spring	0.7 (0.028)	6.6 (0.260)	42.4 (1.669)	17.9
D	Shift valve A spring	0.9 (0.035)	6.6 (0.260)	50.5 (1.988)	23.3
E	Shift valve B spring	0.8 (0.031)	6.6 (0.260)	49.1 (1.933)	21.7
F	Modulator valve spring	1.6 (0.063)	10.4 (0.409)	33.5 (1.319)	9.8
G	CPC valve A spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
H	Servo control valve spring	0.9 (0.035)	9.6 (0.378)	30.2 (1.189)	8.4
I	Lubrication control valve spring	0.9 (0.035)	8.7 (0.343)	25.0 (0.984)	7.2
J	Lock-up timing valve spring	0.6 (0.024)	6.6 (0.260)	30.9 (1.217)	11.1
K	Relief valve spring	1.0 (0.04)	9.6 (0.378)	28.1 (1.106)	7.7



ATF Pump Inspection

1. Install the ATF pump drive gear (A), the driven gear (B), and the ATF pump driven gear shaft (C) in the main valve body (D). Lubricate all parts with ATF, and install the ATF pump driven gear with its grooved and chamfered side facing up.



2. Measure the side clearance of the ATF pump drive gear (A) and the driven gear (B).

ATF Pump Gears Side (Radial) Clearance

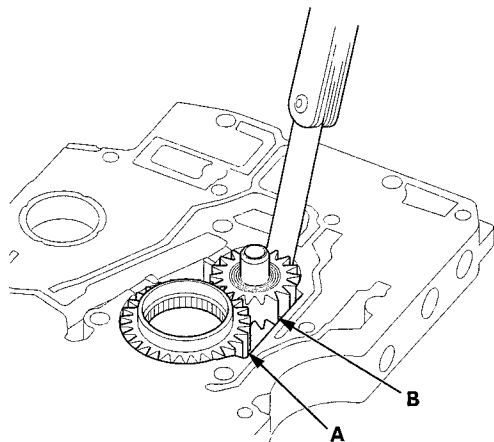
Standard (New):

ATF Pump Drive Gear

0.210–0.265 mm (0.0083–0.0104 in)

ATF Pump Driven Gear

0.070–0.125 mm (0.0028–0.0049 in)

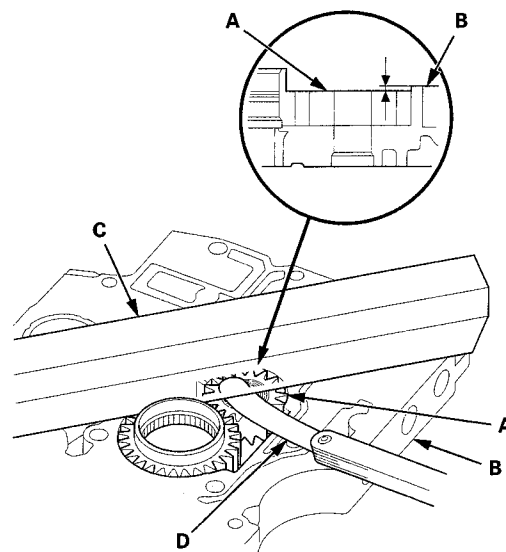


3. Remove the ATF pump driven gear shaft. Measure the thrust clearance between the ATF pump driven gear (A) and the main valve body (B) using a straight edge (C) and a feeler gauge (D).

ATF Pump Drive/Driven Gear Thrust (Axial) Clearance

Standard (New): 0.03–0.06 mm (0.001–0.002 in)

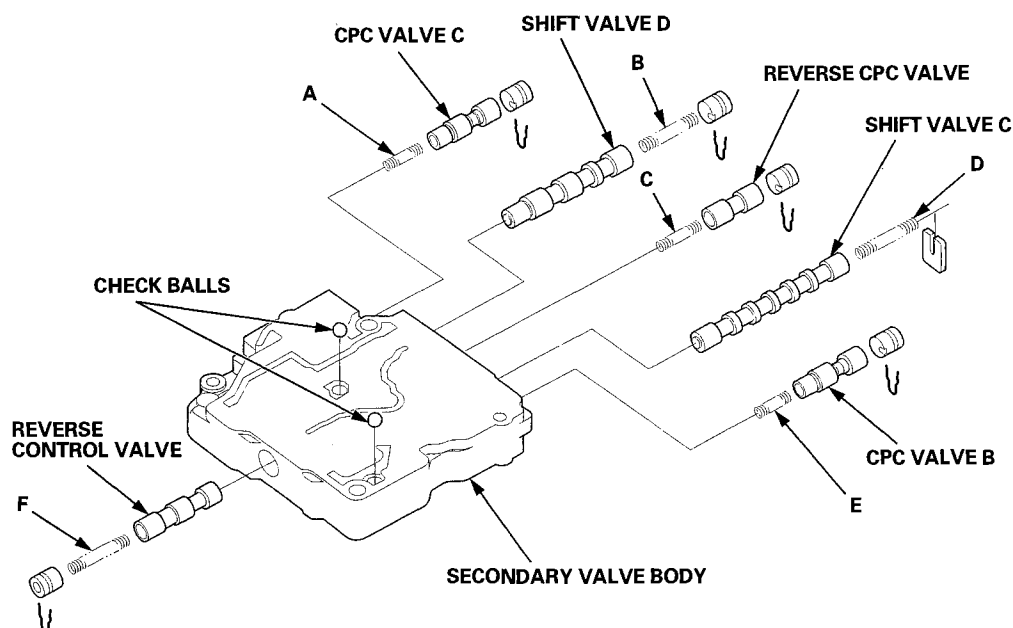
Service Limit: 0.07 mm (0.003 in)



Valve Body

Secondary Valve Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent, and dry them with compressed air. Blow out all passages.
2. Do not use a magnet to remove the check balls, it may magnetize the check balls.
3. Inspect the secondary valve body for scoring and damage.
4. Check all valves for free movement. If any fail to slide freely, refer to the valve body repair procedure (see page 14-296).
5. Coat all parts with ATF during assembly.



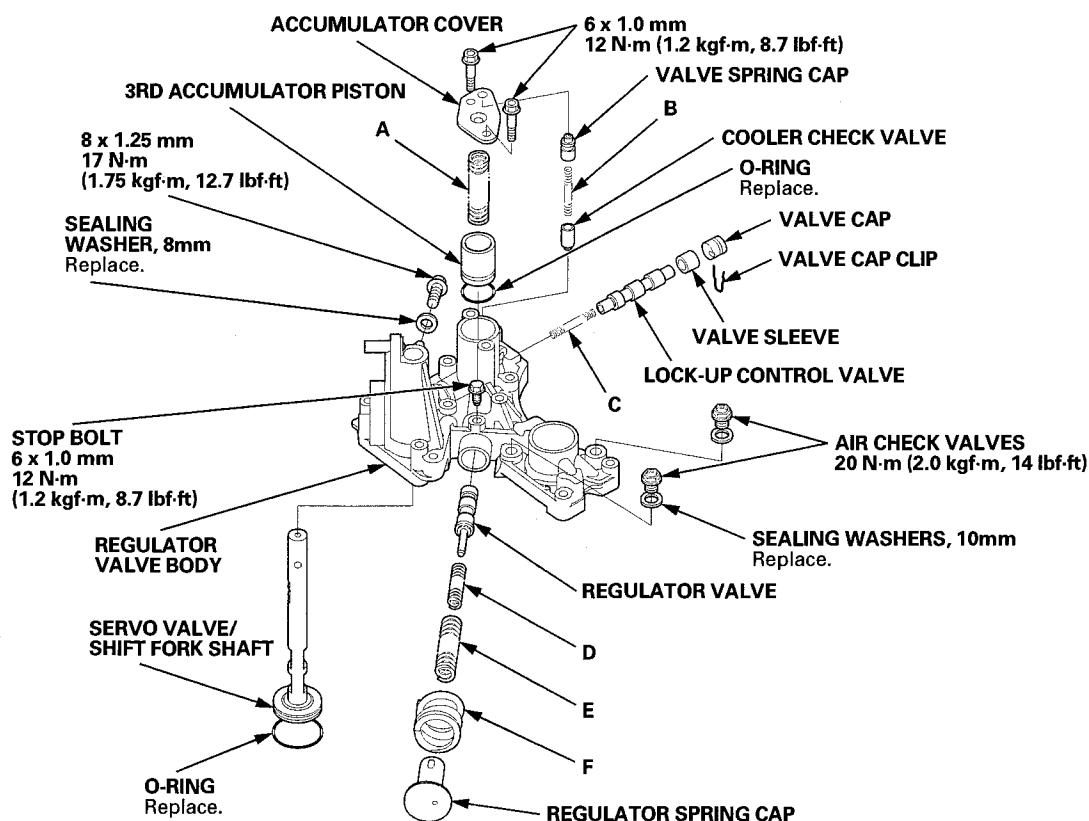
SPRING SPECIFICATIONS

Springs		Standard (New)-Unit: mm (in)			
		Wire Diameter	O.D.	Free Length	No. of Coils
A	CPC valve C spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
B	Shift valve D spring	0.7 (0.028)	6.6 (0.260)	42.4 (1.669)	17.6
C	Reverse CPC valve spring	0.8 (0.031)	6.1 (0.240)	24.4 (0.961)	14.6
D	Shift valve C spring	0.8 (0.031)	6.6 (0.260)	49.1 (1.933)	21.7
E	CPC valve B spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
F	Reverse control valve spring	0.8 (0.031)	6.6 (0.260)	49.1 (1.933)	21.7



Regulator Valve Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent, and dry them with compressed air. Blow out all passages.
2. Inspect the regulator valve body for scoring and damage.
3. Hold the regulator spring cap in place while removing the stop bolt. The regulator spring cap is spring loaded. Once the stop bolt is removed, release the spring cap slowly so it does not pop out.
4. Check all valves for free movement. If any fail to slide freely, refer to the valve body repair procedure (see page 14-296).
5. Coat all parts with ATF during assembly.
6. Align the hole in the regulator spring cap with the stop bolt hole, then press the spring cap into the valve body, and tighten the stop bolt.
7. Install the servo valve with a new O-ring, and the 3rd accumulator piston with a new O-ring.



SPRING SPECIFICATIONS

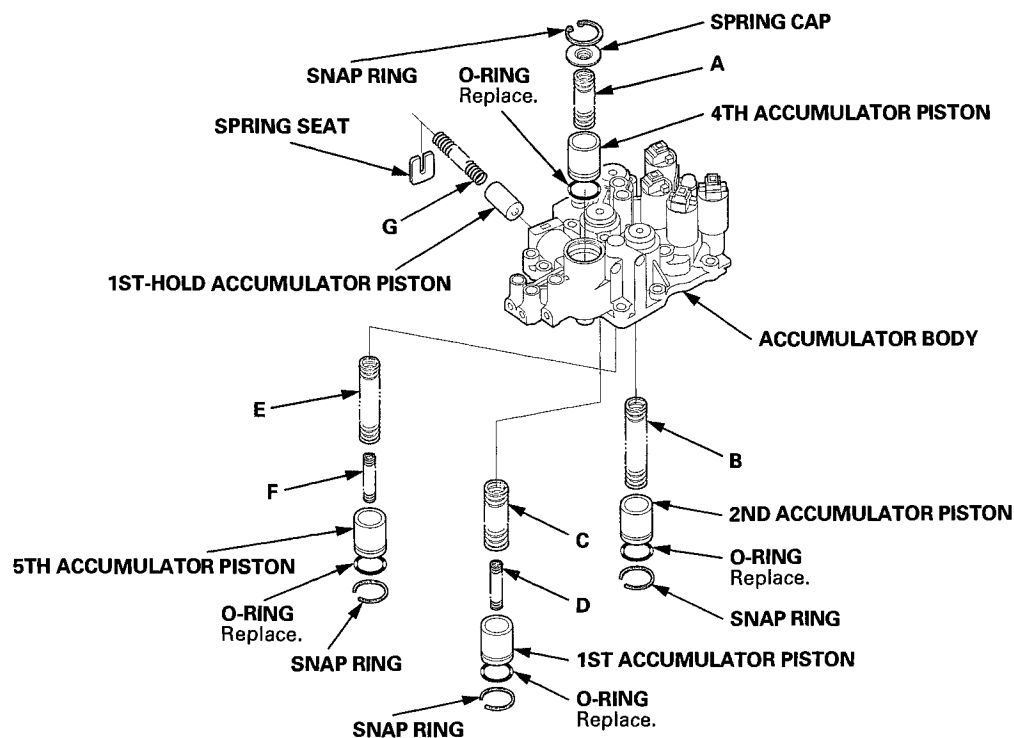
Springs		Standard (New)-Unit: mm (in)			
		Wire Diameter	O.D.	Free Length	No. of Coils
A	3rd accumulator spring	3.1 (0.122)	19.6 (0.772)	41.4 (1.630)	5.5
B	Cooler check valve spring	0.9 (0.035)	6.7 (0.264)	31.5 (1.240)	14.2
C	Lock-up control valve spring (type A)	0.7 (0.028)	6.6 (0.260)	42.9 (1.689)	14.2
	Lock-up control valve spring (type B)	0.8 (0.031)	6.6 (0.260)	44.3 (1.744)	25.5
D	Regulator valve spring B	1.4 (0.055)	8.8 (0.346)	44.0 (1.732)	12.0
E	Regulator valve spring A	1.85 (0.073)	14.7 (0.579)	86.9 (3.421)	16.2
F	Stator reaction spring	5.5 (0.217)	37.4 (1.472)	30.3 (1.193)	2.1

NOTE: As for the lock-up control valve spring, either type A or type B is applied.

Valve Body

Accumulator Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent, and dry them with compressed air. Blow out all passages.
2. Inspect the accumulator body for scoring and damage.
3. Coat all parts with ATF during assembly.
4. Replace the O-rings with a new ones.



SPRING SPECIFICATIONS

Springs		Standard: (New)-Unit mm (in)			
		Wire Diameter	O.D.	Free Length	No. of Coils
A	4th accumulator spring	3.3 (0.130)	19.6 (0.772)	39.1(1.539)	5.8
B	2nd accumulator spring	3.1 (0.122)	19.6 (0.772)	53.4 (2.102)	7.5
C	1st accumulator spring A	2.3 (0.091)	19.6 (0.772)	60.8 (2.394)	9.5
D	1st accumulator spring B	2.5 (0.098)	12.8 (0.504)	46.0 (1.811)	9.5
E	5th accumulator spring A	2.4 (0.094)	19.6 (0.772)	65.5 (2.579)	12.0
F	5th accumulator spring B	2.6 (0.102)	13.2 (0.520)	50.5 (1.988)	10.1
G	1st-hold accumulator spring	2.0 (0.079)	13.1 (0.516)	42.9(1.689)	9.8



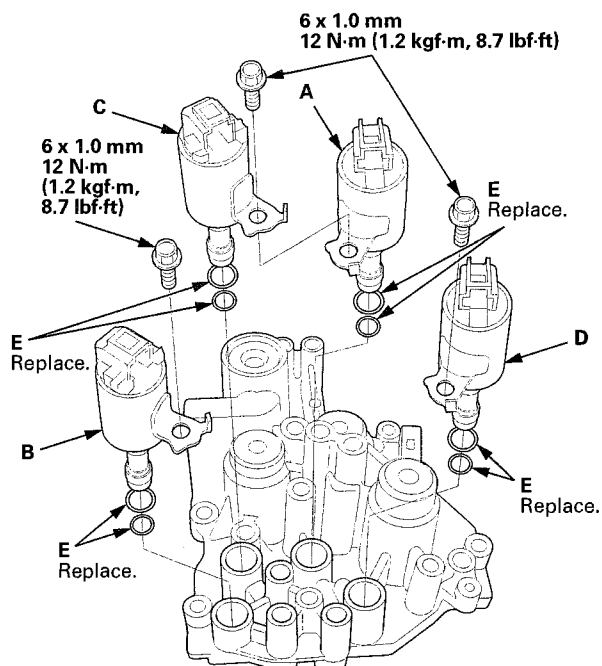
Shift Solenoid Valve Removal and Installation

NOTE:

- Do not hold the shift solenoid valve connector to remove and install the shift solenoid valve. Be sure to hold the shift solenoid valve body.
- Do not install shift solenoid valve C before installing shift solenoid valve A. If shift solenoid valve C is installed before installing shift solenoid valve A, it may damage the hydraulic control system.

1. Remove the shift solenoid valve mounting bolts, then remove the shift solenoid valves by holding the shift solenoid valve body.
2. Install new O-rings (two O-rings per shift solenoid valve) (E) on each solenoid valves.

NOTE: If you are installing a new solenoid valve, it comes with new O-rings already installed.



3. Install shift solenoid valve D (black connector) by holding the shift solenoid valve body; be sure the mounting bracket contacts the accumulator body.
4. Install shift solenoid valve A (black connector) by holding the shift solenoid valve body; be sure the mounting bracket contacts the accumulator body.

5. Install shift solenoid valve C (brown connector) by holding the shift solenoid valve body; be sure to position the mounting bracket on top of the bracket of shift solenoid valve A.
6. Install shift solenoid valve B (brown connector) by holding the shift solenoid valve body; be sure the mounting bracket contacts the accumulator body.
7. Install the shift solenoid valve mounting bolts.

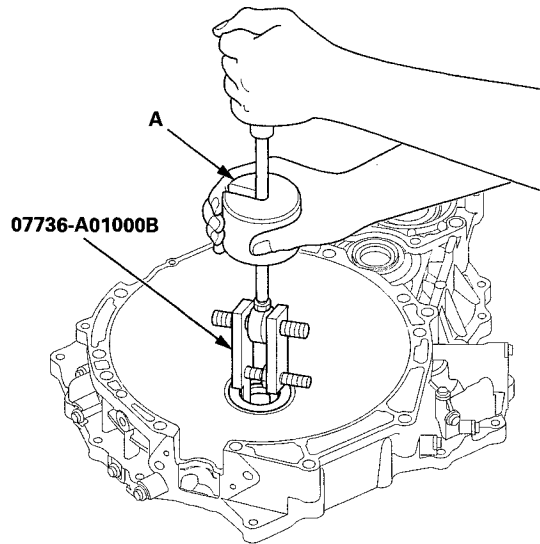
Torque Converter Housing

Mainshaft Bearing and Oil Seal Replacement

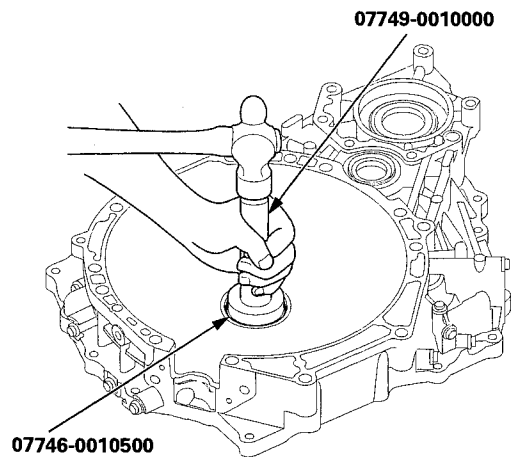
Special Tools Required

- Adjustable Bearing Puller, 25—40 mm 07736-A01000B
- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 62 x 68 mm 07746-0010500
- Attachment, 72 x 75 mm 07746-0010600

1. Remove the mainshaft bearing and the oil seal using the 25—40 mm adjustable bearing puller and a commercially available 3/8"-16 slide hammer (A).

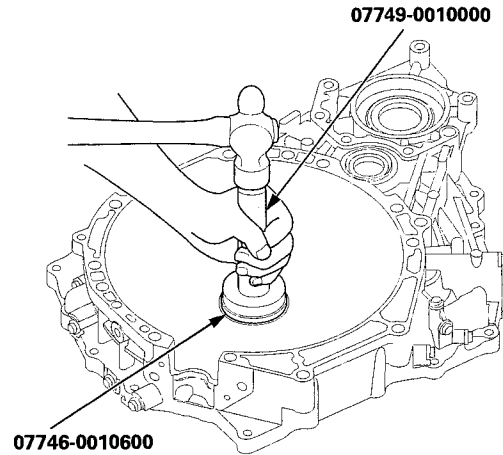


2. Install a new bearing until it bottoms in the torque converter housing using the driver handle and the 62 x 68 mm attachment.



3. Install a new oil seal flush to the torque converter housing using the driver handle and the 72 x 75 mm attachment.

NOTE: Do not drive the oil seal into the torque converter housing until it bottoms out, it will block the fluid return passage and cause transmission damage.



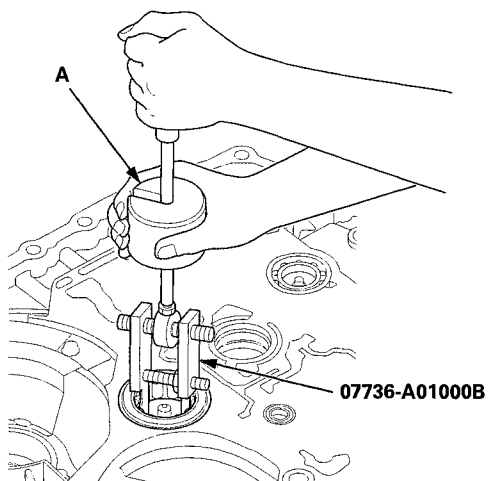


Countershaft Bearing Replacement

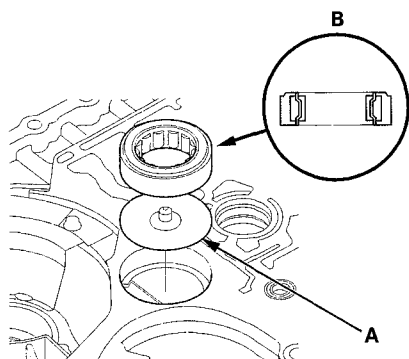
Special Tools Required

- Adjustable Bearing Puller, 25—40 mm 07736-A01000B
- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 78 x 80 mm 07NAD-PX40100

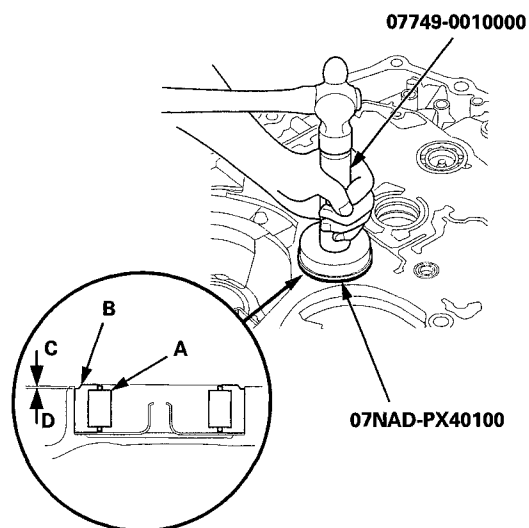
1. Remove the countershaft bearing from the torque converter housing using the 25—40 mm adjustable bearing puller and a commercially available 3/8"-16 slide hammer (A).



2. Install the ATF guide plate (A) into the torque converter housing, then install a new bearing (B) in the direction shown.



3. Install the bearing (A) in the torque converter housing using the driver handle and the 78 x 80 mm attachment; install the bearing outer notch-cut (B) to a depth (C) of 0—0.03 mm (0—0.001 in) below the torque converter housing surface (D).



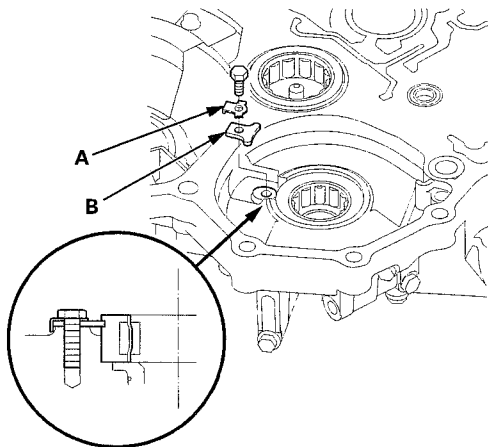
Torque Converter Housing

Secondary Shaft Bearing Replacement

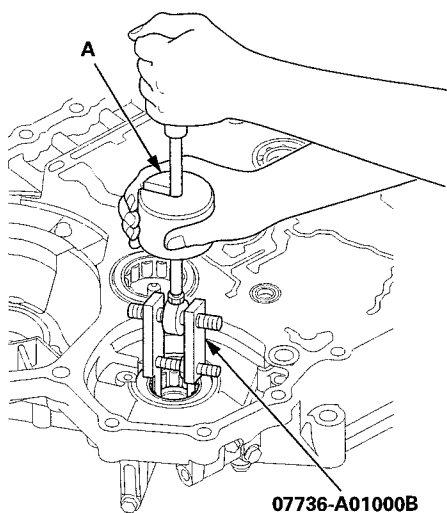
Special Tools Required

- Adjustable Bearing Puller, 25—40 mm 07736-A01000B
- Bearing Remover Shaft Set, 30 mm 07936-8890300
- Remover Handle 07936-3710100
- Slide Hammer 07936-371020A
- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 37 x 40 mm 07746-0010200
- Attachment, 62 x 68 mm 07746-0010500

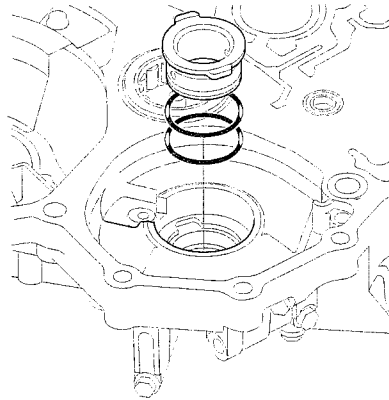
1. Remove the bolt, then remove the lock washer (A) and the bearing set plate (B).



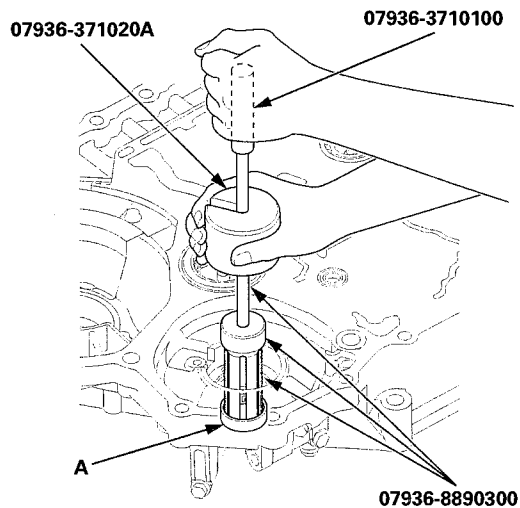
2. Remove the secondary shaft bearing from the torque converter housing using the 25—40 mm adjustable bearing puller and a commercially available 3/8"-16 slide hammer (A).



3. Remove the ATF guide collar from the torque converter housing.

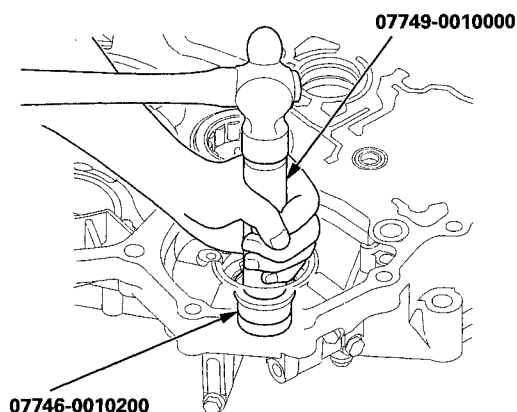


4. Remove the 29 x 39 x 9.5 mm secondary shaft bearing (A) from the torque converter housing using the 30 mm bearing remover shaft set, the remover handle, and the sliding hammer.

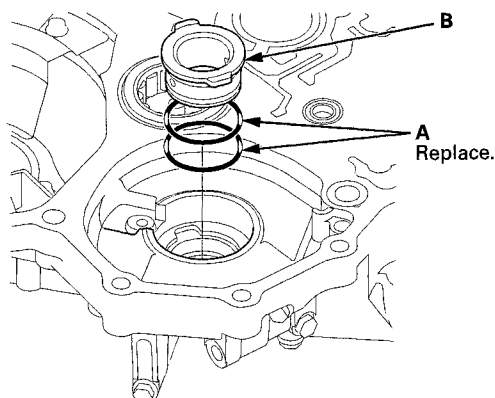




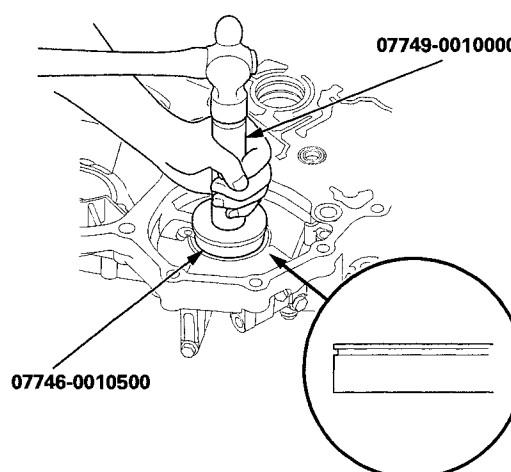
5. Install the 29 x 39 x 9.5 mm bearing into the torque converter housing using the driver handle and the 37 x 40 mm attachment.



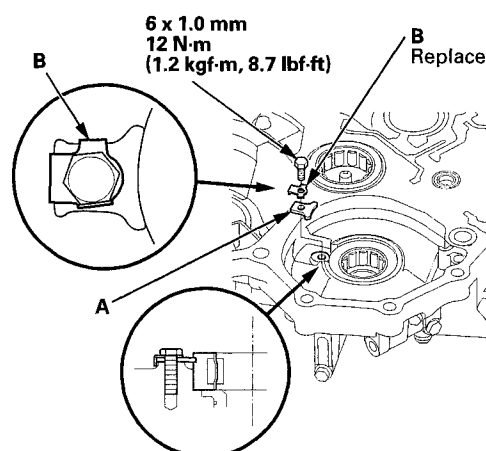
6. Install new O-rings (A) on the ATF guide collar (B), then install the guide collar in the torque converter housing.



7. Install the bearing in the direction shown in the torque converter housing using the driver handle and the 62 x 68 mm attachment.



8. Check that the bearing groove aligns with the set plate mounting surface, then install the set plate (A) by aligning it with the bearing groove.



9. Install a new lock washer (B) and the bolt, then bend the lock tab of the lock washer against the bolt head.

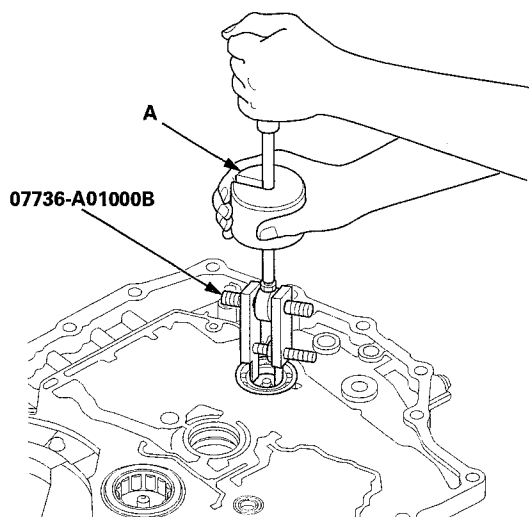
Torque Converter Housing

Intermediary Shaft Bearing Replacement

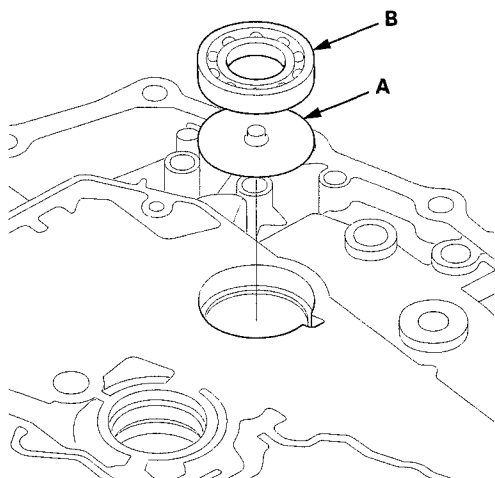
Special Tools Required

- Adjustable Bearing Puller, 25—40 mm 07736-A01000B
- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 52 x 55 mm 07746-0010400

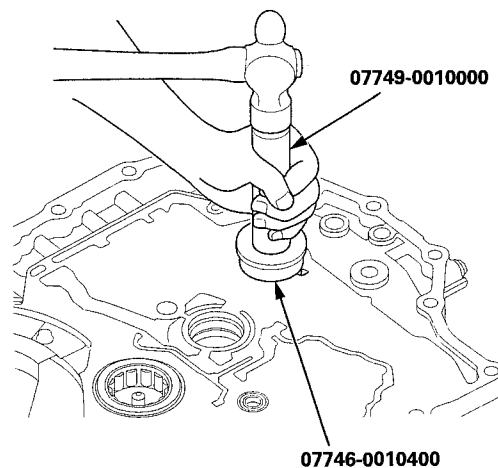
1. Remove the intermediary shaft bearing from the torque converter housing using the 25—40 mm adjustable bearing puller and a commercially available 3/8 "-16 slide hammer (A).



2. Install the ATF guide plate (A), then install a new bearing (B) in the torque converter housing.



3. Drive the bearing into the torque converter housing using the driver handle and the 52 x 55 mm attachment.



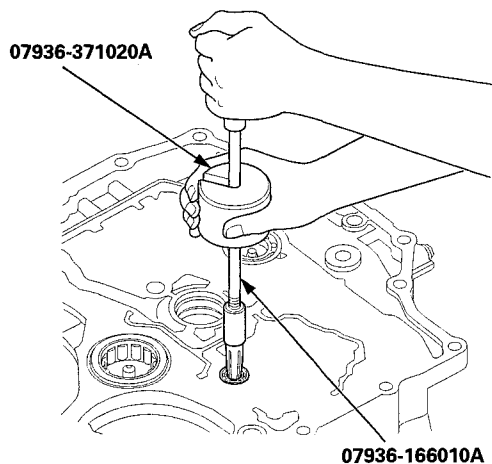


Park Lever Shaft Bearing Replacement

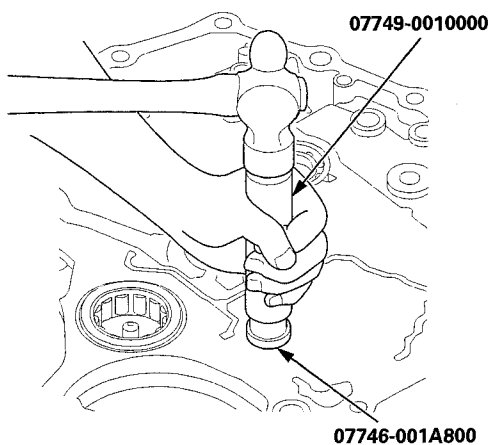
Special Tools Required

- Bearing Remover Shaft Set, 12 mm 07936-166010A
- Slide Hammer 07936-371020A
- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 22 x 24 mm 07746-001A800

1. Remove the park lever shaft bearing from the torque converter housing using the 12 mm bearing remover shaft set and the slide hammer.



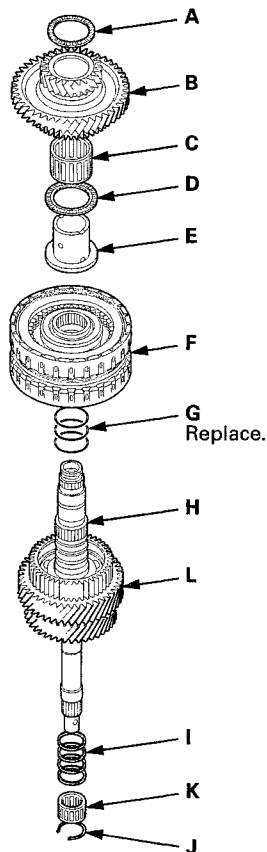
2. Install a new bearing until it bottoms out in the torque converter housing using the drive handle and the 22 x 24 mm attachment.



Shafts and Clutches

Mainshaft Disassembly, Inspection, and Reassembly

1. Remove the thrust needle bearing (A), the mainshaft 5th gear (B), the needle bearing (C), the thrust needle bearing (D), the mainshaft 5th gear collar (E), the 4th/5th clutch (F), and the O-rings (G) from the mainshaft (H).



2. Inspect the condition of the sealing rings (I). If the sealing rings are worn, distorted, or damaged, remove the set ring (J) and the needle bearing (K), and replace the sealing rings with new ones.
3. Inspect the thrust needle bearing and the needle bearing for wear and rough movement.
4. Inspect the splines for excessive wear and damage.
5. Inspect 4th gear for wear and damage, and inspect the 4th gear bearing for wear and rough rotation.
6. Replace the mainshaft 4th gear (L) if the gear or the bearing is worn or damaged.
7. Check the shaft bearing surfaces for scoring and excessive wear.
8. Lubricate all parts with ATF during reassembly.
9. Wrap the shaft splines with tape to prevent O-ring damage, install new O-rings on the mainshaft, then remove the tape.
10. Install the 4th/5th clutch.
11. Install the mainshaft 5th gear collar, the thrust needle bearing, the needle bearing, the mainshaft 5th gear, and the thrust needle bearing.

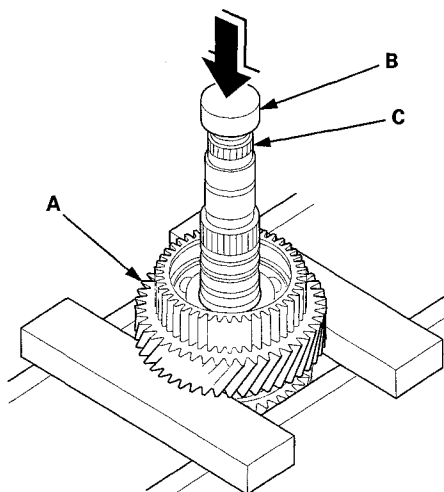


Mainshaft 4th Gear Replacement

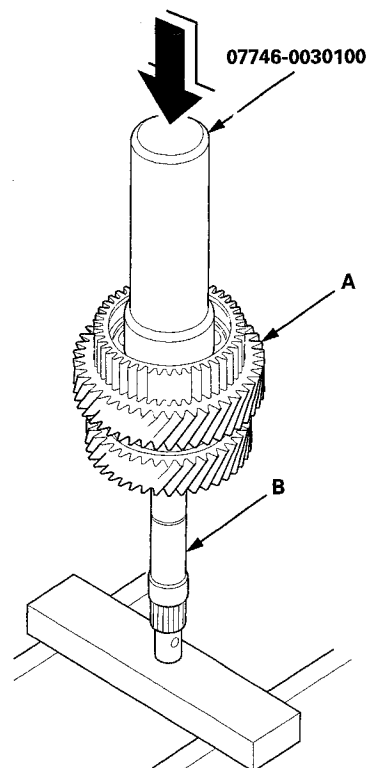
Special Tools Required

Driver Handle, 40 mm I.D. 07746-0030100

1. Remove the mainshaft 4th gear (A) with the press. Place a spacer (B) between the press and the mainshaft (C) to prevent damaging the mainshaft.



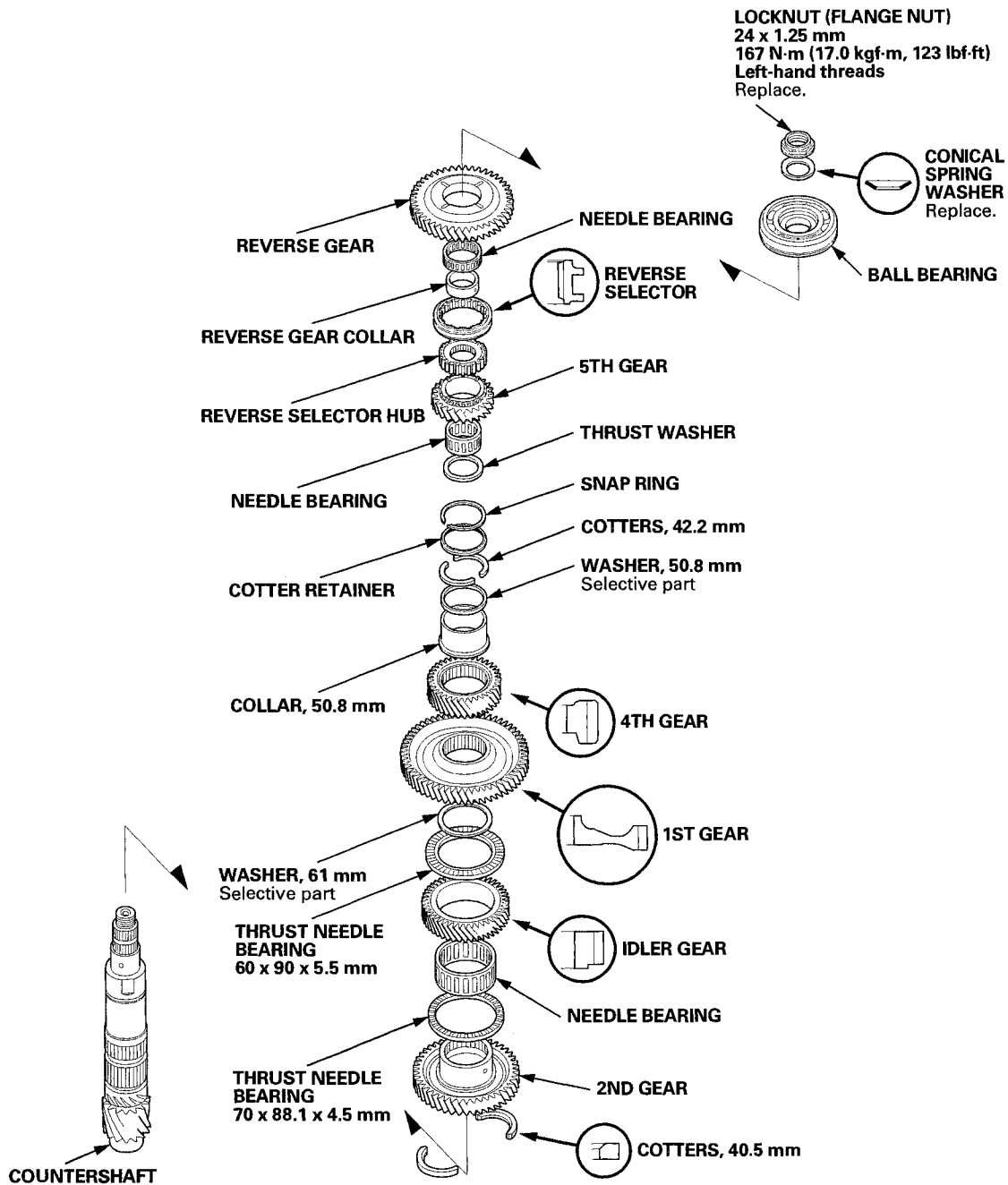
2. Slide a new mainshaft 4th gear (A) over the mainshaft (B), then press it into place using the 40 mm driver handle and a press.



Shafts and Clutches

Countershaft Disassembly

Exploded View

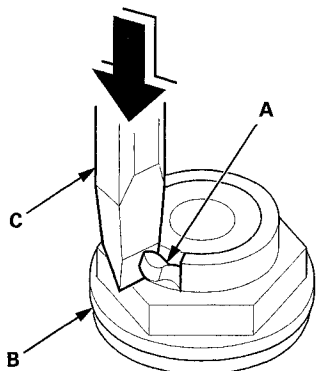




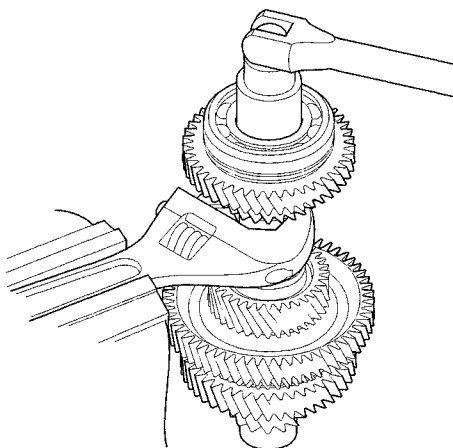
NOTE: Refer to the Exploded View as needed during the following procedure.

1. Cut the lock tab (A) off the countershaft locknut (B) using a chisel (C).

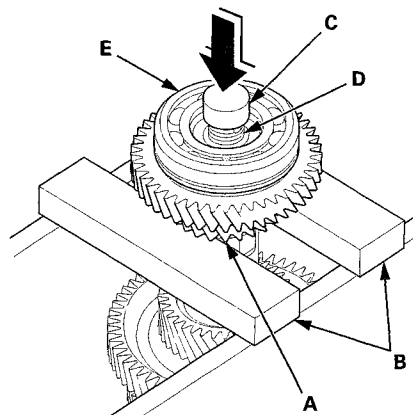
NOTE: Keep all of the chiseled particles out of the countershaft.



2. Hold the countershaft securely using a wrench and a vise, loosen the locknut, and remove it. The locknut has left-hand threads.



3. Place the countershaft 5th gear (A) on press bases (B), and place a spacer (C) between the countershaft (D) and the press to prevent damaging the countershaft.



4. Support the bottom of the countershaft with one hand, then press the countershaft out of the press-fitted bearing (E) and the press-fitted reverse selector hub. The countershaft will drop down after pressing it out of the press-fitted reverse selector hub. Some reverse selector hubs are not press-fitted, and the countershaft will drop down after pressing it out of the press-fitted bearing.

5. Remove the remaining parts from the countershaft.
6. Inspect the bearing for galling and rough movement.
7. Check the shaft bearing surfaces for scoring and excessive wear, and check the shaft splines for excessive wear and damage.

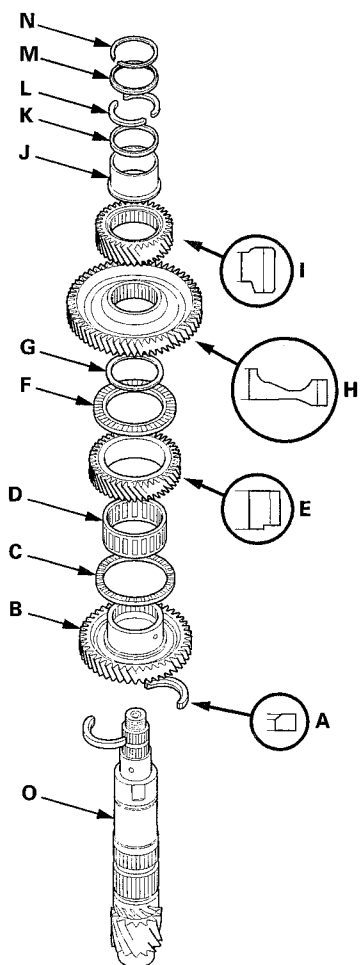
NOTE: If the countershaft is worn or damaged, replace the countershaft with the same letter (A, B, or C) for identification as the identifying letter on the final driven gear.

8. Check the idler gear axial clearance and the 4th gear axial clearance (see page 14-314).

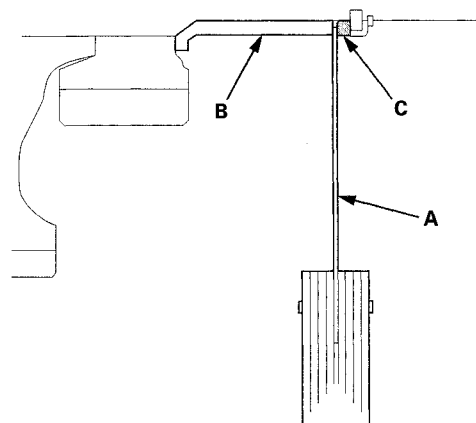
Shafts and Clutches

Countershaft Idler Gear and 4th Gear Axial Clearance Inspection

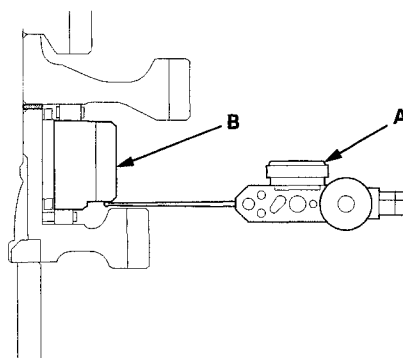
1. Install the 40.5 mm cotters (A), 2nd gear (B), the thrust needle bearing (C), the needle bearing (D), the idler gear (E), the thrust needle bearing (F), the selected 61 mm washer (G), 1st gear (H), 4th gear (I), the 50.8 mm collar (J), the original thickness 50.8 mm washer (K), the 42.2 mm cotters (L), the cotter retainer (M), and the snap ring (N) on the countershaft (O). Install the 40.5 mm cotters, the idler gear, 1st gear, and 4th gear in the direction shown.



2. Insert a feeler gauge blade (A) as thick as possible between the 50.8 mm collar (B) and the 50.8 mm washer (C).



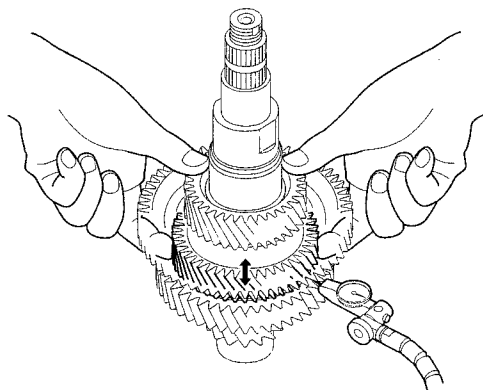
3. Set a dial indicator (A) on the idler gear (B).





4. Measure the idler gear axial clearance in at least three places while moving the idler gear. Use the average as the actual clearance.

Standard: 0.005–0.040 mm (0.0002–0.0016 in)



5. If the clearance is out of the standard, remove the 61 mm washer and measure its thickness.

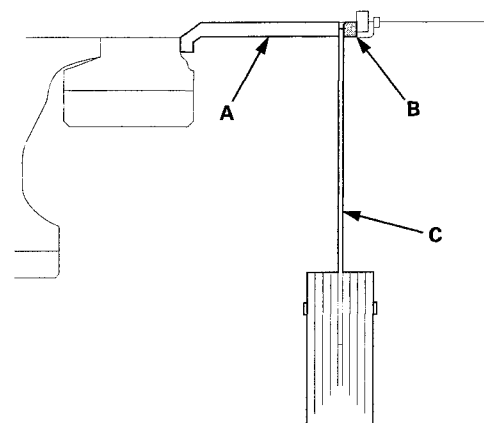
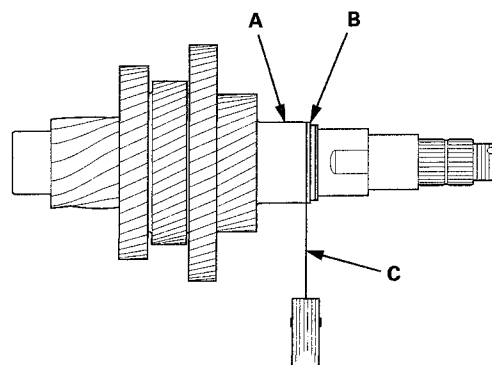
6. Select and install a new washer, then recheck the clearance.

WASHER, 61 mm

No.	Thickness
A	1.525 mm (0.0600 in)
B	1.505 mm (0.0593 in)
C	1.485 mm (0.0585 in)
D	1.465 mm (0.0577 in)
E	1.445 mm (0.0569 in)
F	1.425 mm (0.0561 in)
G	1.405 mm (0.0553 in)

7. Measure the clearance between the 50.8 mm collar (A) and the 50.8 mm washer (B) using the feeler gauge blade (C) in at least three places. Use the average as the actual clearance.

Standard: 0.005–0.040 mm (0.0002–0.0016 in)



(cont'd)

Shafts and Clutches

Countershaft Idler Gear and 4th Gear Axial Clearance Inspection (cont'd)

8. If the clearance is out of the standard, remove the 50.8 mm washer and measure its thickness.
9. Select and install a new washer, then recheck the clearance.

WASHER, 50.8 mm

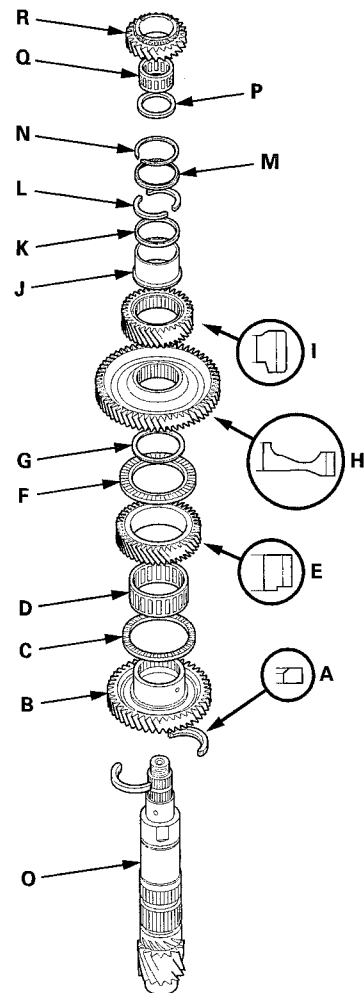
No.	Thickness
A	1.91 mm (0.0752 in)
B	1.93 mm (0.0760 in)
C	1.95 mm (0.0768 in)
D	1.97 mm (0.0776 in)
E	1.99 mm (0.0783 in)
F	2.01 mm (0.0791 in)
G	2.03 mm (0.0799 in)
H	2.05 mm (0.0807 in)
I	2.07 mm (0.0815 in)
J	2.09 mm (0.0823 in)
K	2.11 mm (0.0831 in)
L	2.13 mm (0.0839 in)
M	2.15 mm (0.0846 in)
N	2.17 mm (0.0854 in)
O	2.19 mm (0.0862 in)
P	2.21 mm (0.0870 in)
Q	2.23 mm (0.0878 in)
R	2.25 mm (0.0886 in)
S	2.27 mm (0.0894 in)
T	2.29 mm (0.0902 in)
U	2.31 mm (0.0909 in)
V	2.33 mm (0.0917 in)
W	2.35 mm (0.0925 in)
X	2.37 mm (0.0933 in)
Y	2.39 mm (0.0941 in)
Z	2.41 mm (0.0949 in)
AA	2.43 mm (0.0957 in)
AB	2.45 mm (0.0965 in)

Countershaft Reassembly

Special Tools Required

Driver Handle, 40 mm I.D. 07746-0030100

1. Install the 40.5 mm cotters (A), 2nd gear (B), the thrust needle bearing (C), the needle bearing (D), the idler gear (E), the thrust needle bearing (F), the original thickness 61 mm washer (G), 1st gear (H), 4th gear (I), the 50.8 mm collar (J), the original thickness 50.8 mm washer (K), the 42.2 mm cotters (L), the cotter retainer (M), and the snap ring (N) on the countershaft (O). Install the 40.5 mm cotters, the idler gear, 1st gear, and 4th gear in the direction shown.

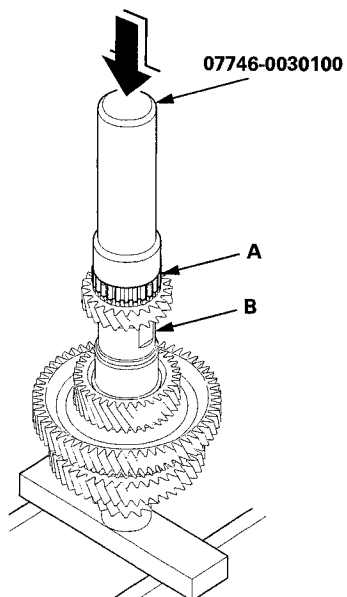


2. Install the thrust washer (P), the needle bearing (Q), and 5th gear (R).



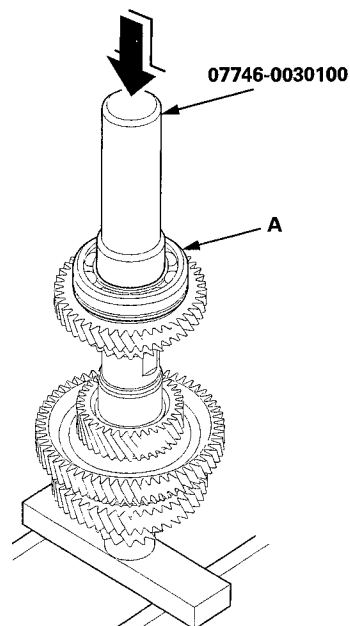
3. Slide the reverse selector hub (A) over the countershaft (B), then press it into place using the 40 mm driver handle and a press.

NOTE: Some reverse selector hubs are not press-fitted, and can be installed without using the 40 mm driver handle and a press.

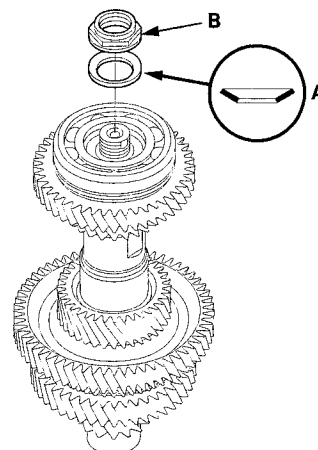


4. Install the reverse selector, the reverse gear collar, the needle bearing, and the reverse gear over the reverse selector hub.

5. Install the ball bearing (A) over the countershaft, then press it into place using the 40 mm driver handle and the press.



6. Install a new conical spring washer (A) in the direction shown, and install a new locknut (B).



(cont'd)

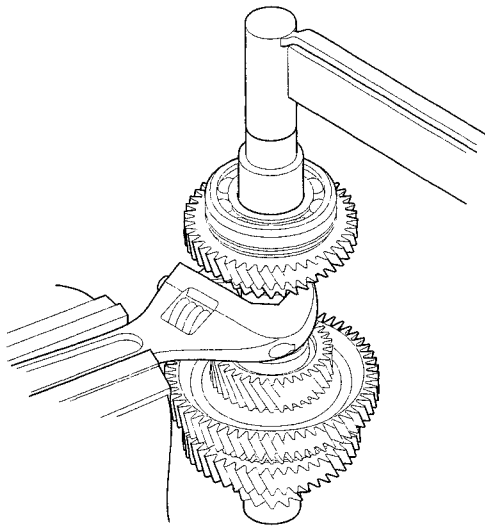
Shafts and Clutches

Countershaft Reassembly (cont'd)

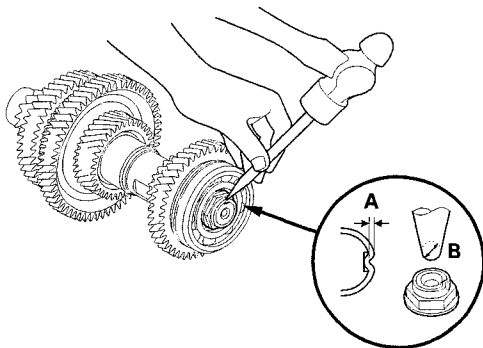
7. Hold the countershaft securely using a wrench and a vise, and tighten the locknut to 167 N·m (17.0 kgf·m, 123 lbf·ft).

NOTE:

- Use a torque wrench to tighten the locknut. Do not use an impact wrench.
- The locknut has left-hand threads.



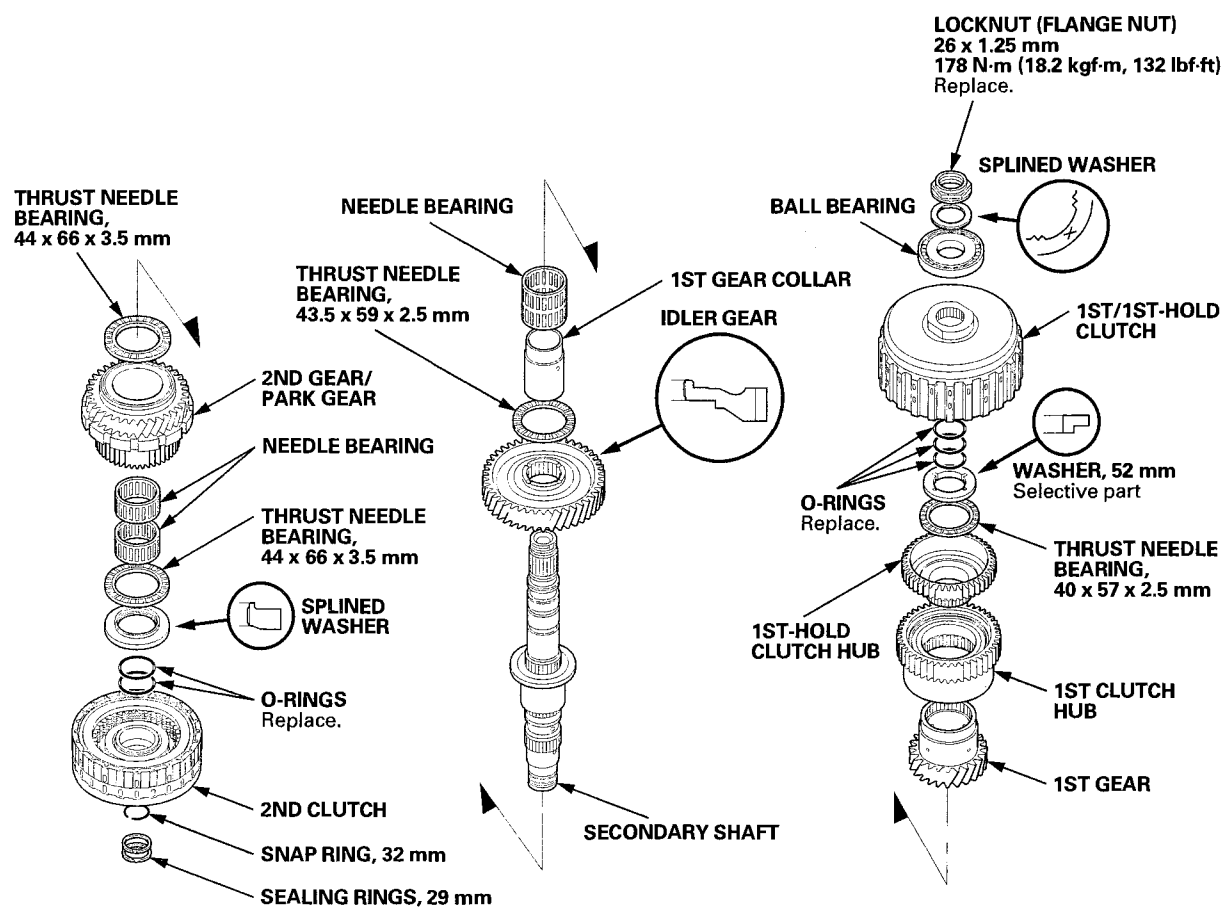
8. Stake the locknut into the shaft to a depth (A) of 0.7–1.3 mm (0.03–0.05 in) using a 3.5 mm punch (B).





Secondary Shaft Disassembly

Exploded View



(cont'd)

Shafts and Clutches

Secondary Shaft Disassembly (cont'd)

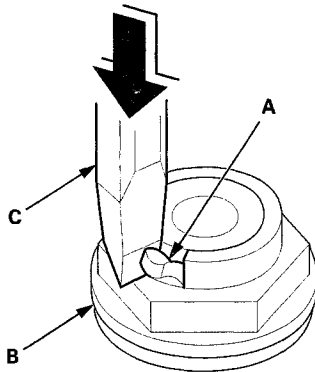
Special Tools Required

Wrench, 40 x 42 mm 07XAA-002010A

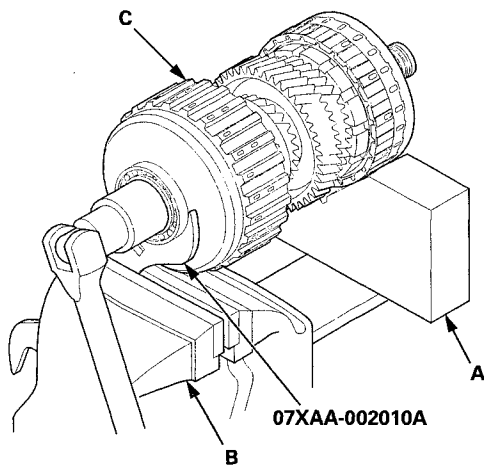
NOTE: Refer to the Exploded View as needed during the following procedure.

1. Cut the lock tab (A) off the secondary shaft locknut (B) using a chisel (C).

NOTE: Keep all of the chiseled particles out of the secondary shaft.

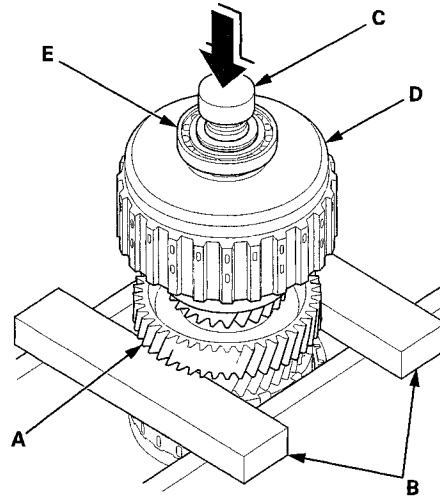


2. Place a V-block (A) on a vise (B), and put the secondary shaft (C) on the V-block and the vise.



3. Attach the 40 x 42 mm wrench onto the 1st clutch guide, and secure the 40 x 42 mm wrench with the vise to hold the secondary shaft. Loosen the locknut, and remove it. Remove any burrs from splines on the shaft and the splined washer.

4. Place the idler gear (A) on press bases (B), and place a spacer (C) between the secondary shaft (D) and the press to prevent damaging the secondary shaft.

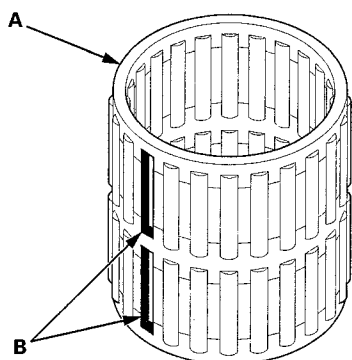


5. Support the bottom of the secondary shaft with one hand, then press the secondary shaft out of the press-fitted bearing (E). The secondary shaft will drop down after pressing it out of the press-fitted bearing.
6. Remove the 1st/1st-hold clutch, the 52 mm washer, the 40 x 57 x 2.5 mm thrust needle bearing, 1st gear assembly, the needle bearing, the 1st gear collar, the 43.5 x 59 x 2.5 mm thrust needle bearing, and the idler gear.
7. Remove the 32 mm snap ring, and remove the 2nd clutch, the splined washer, the needle bearings, the 2nd gear/park gear, and the 44 x 66 x 3.5 mm thrust needle bearings.



8. Inspect the bearings for galling and rough movement.

NOTE: The needle bearing (A) on the 1st gear collar contains the only two no-roller cavities (B); this is normal.



9. Check the shaft bearing surfaces for scoring and excessive wear, and check the shaft splines for excessive wear and damage.

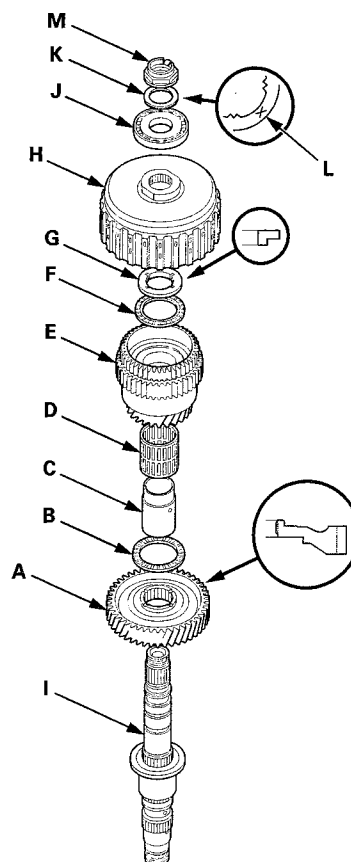
10. Check the 1st gear axial clearance (see page 14-321), the 1st gear one-way clutch (see page 14-323), and the secondary shaft installation height (see page 14-327).

Secondary Shaft 1st Gear Axial Clearance Inspection

Special Tools Required

- Driver Handle, 40 mm I.D. 07746-0030100
- Bearing Driver Attachment, 30 mm 07746-0030300

1. Install the idler gear (A), the 43.5 x 59 x 2.5 mm thrust needle bearing (B), the 1st gear collar (C), the needle bearing (D), the 1st gear assembly (E), the 40 x 57 x 2.5 mm thrust needle bearing (F), the selected 52 mm washer (G), and the 1st/1st-hold clutch (H) on the secondary shaft (I). Install the idler gear and the selected 52 mm washer in the direction shown. Do not install the O-rings during inspection.

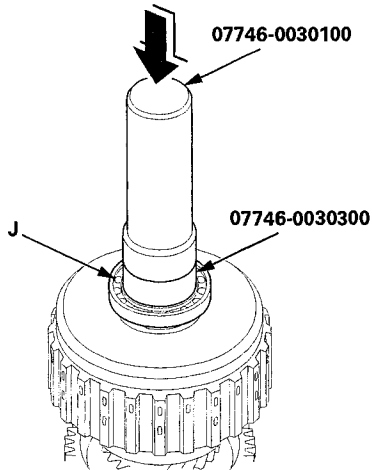


(cont'd)

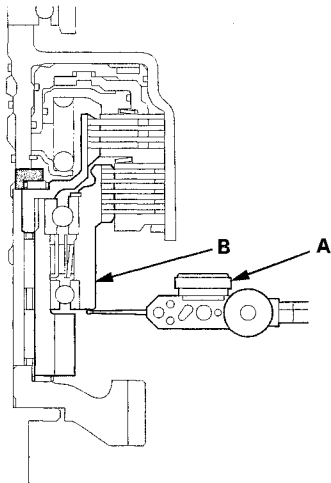
Shafts and Clutches

Secondary Shaft 1st Gear Axial Clearance Inspection (cont'd)

2. Install the ball bearing (J) over the 1st/1st-hold clutch guide using the 40 mm driver handle, the 30 mm attachment, and a press.

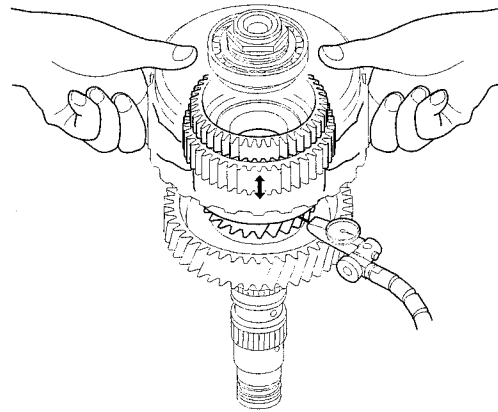


3. Install the splined washer (K) with the marked side (L) up over the ball bearing in the same manner as installing the ball bearing using the 40 mm driver handle, the 30 mm attachment, and the press.
4. Install the old locknut (M), and tighten it to 29 N·m (3.0 kgf·m, 22 lbf·ft).
5. Set the dial indicator (A) on the 1st clutch hub (B).

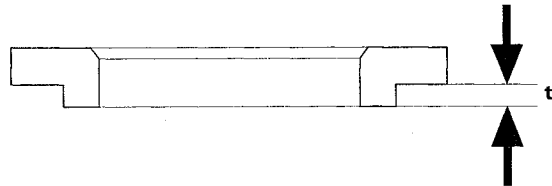


6. Measure the 1st gear axial clearance in at least three places while moving 1st gear. Use the average as the actual clearance.

Standard: 0.100—0.145 mm (0.004—0.006 in)



7. If the clearance is out of the standard, remove the washer and measure its height difference.





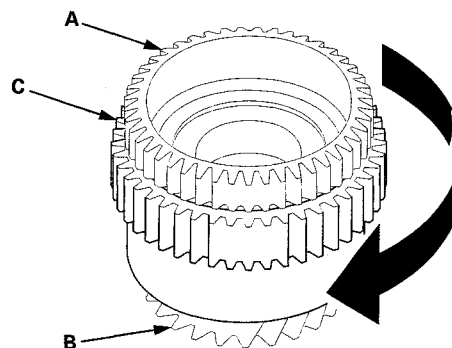
1st Gear One-way Clutch Inspection

8. Select and install a new washer, then recheck the clearance.

WASHER, 52 mm

No.	Thickness (t)
A	2.705 mm (0.106 in)
B	2.680 mm (0.106 in)
C	2.655 mm (0.105 in)
D	2.630 mm (0.104 in)
E	2.605 mm (0.103 in)
F	2.605 mm (0.103 in)
G	2.580 mm (0.102 in)
H	2.555 mm (0.101 in)
I	2.530 mm (0.100 in)
J	2.480 mm (0.098 in)
K	2.455 mm (0.097 in)
L	2.430 mm (0.096 in)
M	2.405 mm (0.095 in)

1. Hold the 1st-hold clutch hub (A), and turn 1st gear (B) in the direction shown to be sure it turns freely. Also make sure 1st gear locks in the opposite direction.



2. If any problem occurs on the 1st gear one-way clutch, replace the 1st clutch hub (C). The 1st gear one-way clutch is not available separately from the 1st clutch hub.
3. Also check 1st gear and the 1st-hold clutch hub for wear and damage. If 1st gear and the 1st-hold clutch hub are worn or damaged, replace the damaged part, refer to 1st Clutch Hub Replacement (see page 14-324).

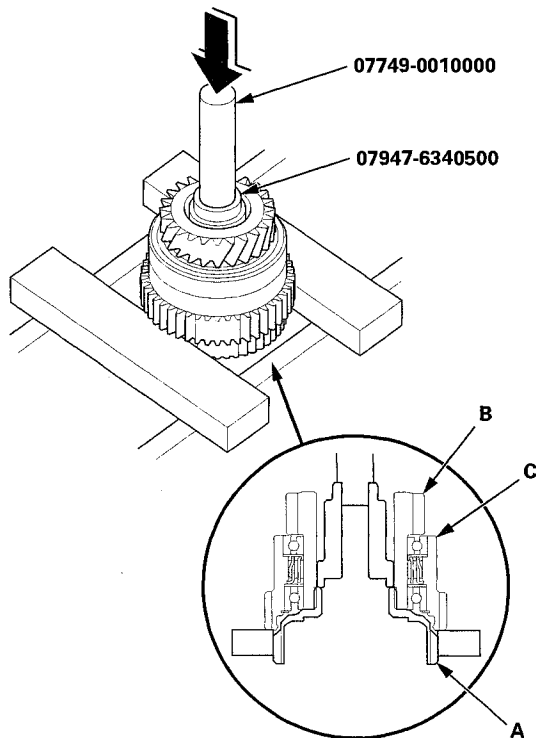
Shafts and Clutches

1st Clutch Hub Replacement

Special Tools Required

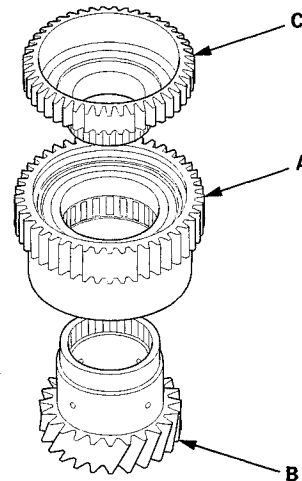
- Driver Handle, 15 x 135L 07749-0010000
- Driver Attachment, 43.5 mm 07947-6340500
- Attachment, 78 x 90 mm 07GAD-SD40101

1. Remove the 1st-hold clutch hub (A) from 1st gear (B) using the driver handle, the 43.5 mm driver attachment, and a press.

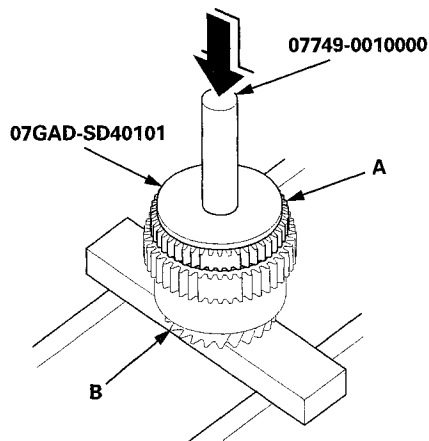


2. Remove the 1st clutch hub (C) from 1st gear.

3. Install a new 1st clutch hub (A) over 1st gear (B), and install the 1st-hold clutch hub (C) in 1st gear.



4. Install the 1st-hold clutch hub (A) in 1st gear (B) using the driver handle, the 78 x 90 mm attachment, and the press.



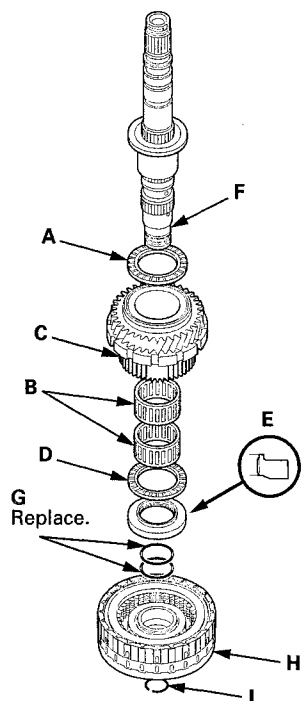


Secondary Shaft Reassembly

Special Tools Required

- Driver Handle, 40 mm I.D. 07746-0030100
- Bearing Driver Attachment, 30 mm 07746-0030300
- Wrench, 40 x 42 mm 07XAA-002010A

1. Install the 44 x 66 x 3.5 mm thrust needle bearing (A), the needle bearings (B), the 2nd gear/park gear (C), the 44 x 66 x 3.5 mm thrust needle bearing (D), and the splined washer (E) in the direction shown on the secondary shaft (F).



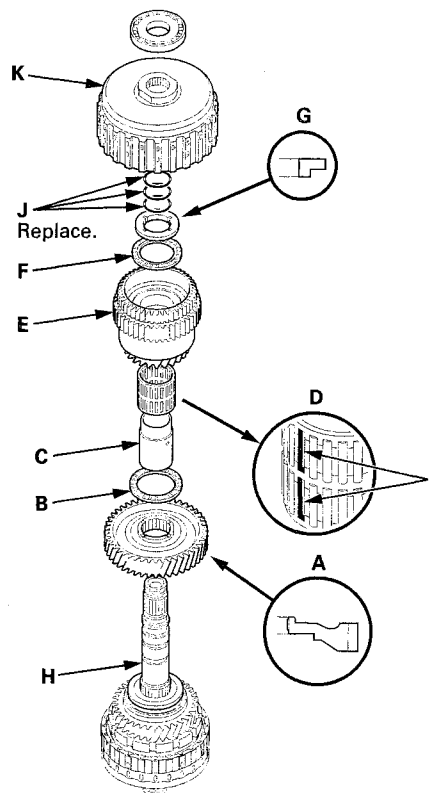
2. Wrap the shaft splines with tape, and install new O-rings (G) in the 2nd clutch O-ring grooves, then remove the tape.

NOTE: To prevent damage to the O-rings, be sure to install the O-rings after installing the splined washer.

3. Install the 2nd clutch (H) on the secondary shaft, and secure the 2nd clutch with the snap ring (I).

4. Install the idler gear (A) in the direction shown, the 43.5 x 59 x 2.5 mm thrust needle bearing (B), the 1st gear collar (C), the needle bearing (D), the 1st gear assembly (E), the 40 x 57 x 2.5 mm thrust needle bearing (F), and the 52 mm washer (G) in the direction shown on the secondary shaft (H).

NOTE: The needle bearing (D) contains two no-roller cavities (I); this is normal.



5. Wrap the shaft splines with tape, and install new O-rings (J) in the 1st/1st-hold clutch O-ring grooves, then remove the tape.

NOTE: To prevent damage to the O-rings, be sure to install the O-rings after installing the 1st gear collar and the 52 mm washer.

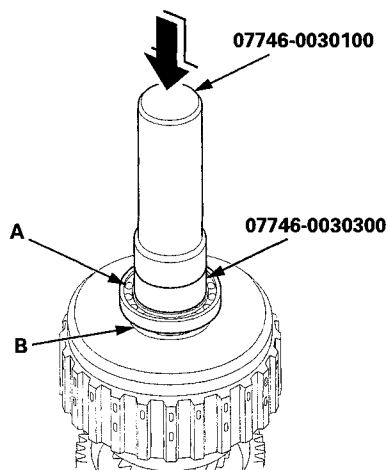
6. Install the 1st/1st-hold clutch (K).

(cont'd)

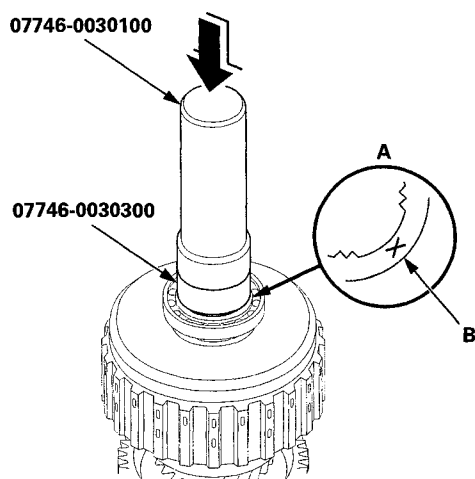
Shafts and Clutches

Secondary Shaft Reassembly (cont'd)

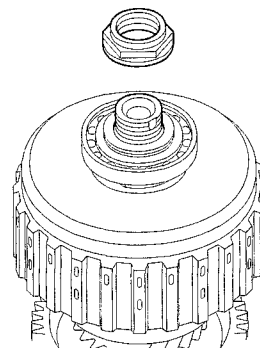
7. Install the ball bearing (A) over the 1st/1st-hold clutch guide (B) using the 40 mm driver handle, the 30 mm bearing driver attachment, and a press.



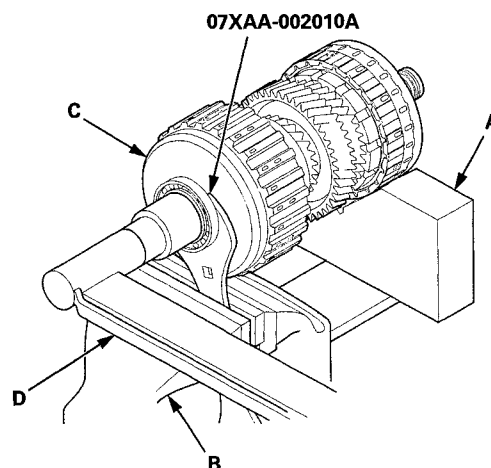
8. Install a new splined washer (A) with the marked side (B) up over the ball bearing using the 40 mm driver handle, the 30 mm bearing driver attachment, and the press.



9. Install a new locknut.



10. Place a V-block (A) on a vise (B), and put the secondary shaft (C) on the V-block and the vise.

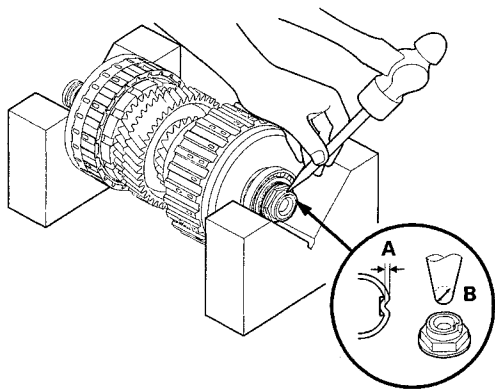


11. Attach the 40 x 42 mm wrench onto the top of the 1st clutch guide, and secure the 40 x 42 mm wrench with the vise to hold the secondary shaft. Tighten the locknut to 178 N·m (18.2 kgf·m, 132 lbf·ft) using a torque wrench (D).

NOTE: Use a torque wrench to tighten the locknut. Do not use an impact wrench.

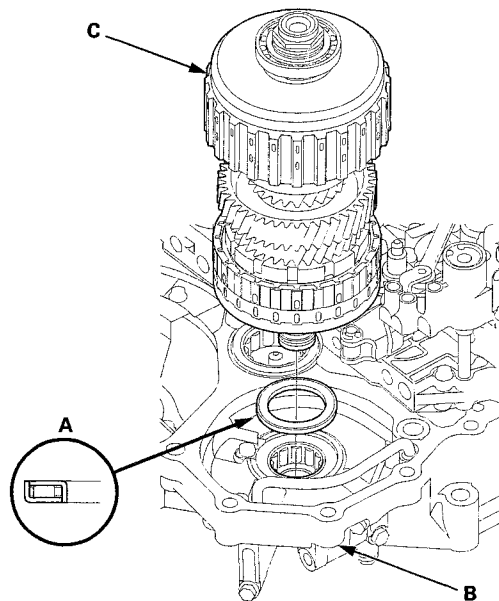


12. Stake the locknut to a depth (A) of 0.7—1.3 mm (0.03—0.05 in) using a 3.5 mm punch (B).



Secondary Shaft Installation Height Inspection/Adjustment

1. Install the thrust needle bearing (A) in the torque converter housing (B) in the direction shown, and install the secondary shaft assembly (C).

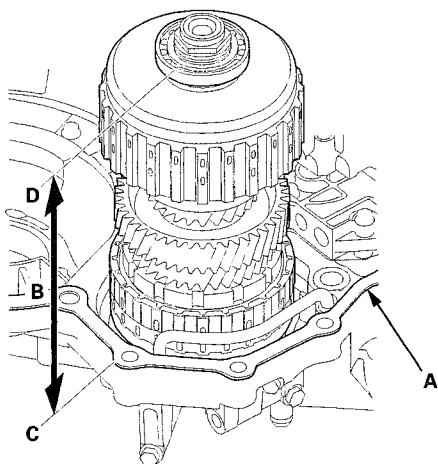


(cont'd)

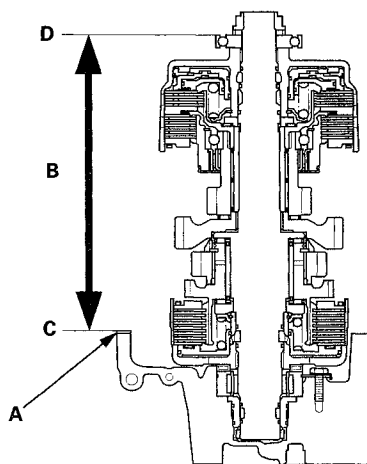
Shafts and Clutches

Secondary Shaft Installation Height Inspection/Adjustment (cont'd)

2. Install a new gasket (A) on the torque converter housing.

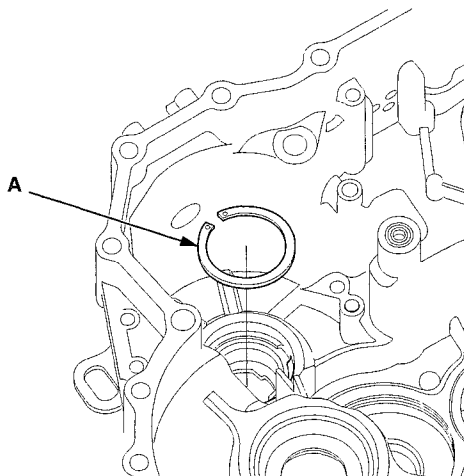


Secondary Shaft Cutaway View



3. Measure the installed height (B) of the secondary shaft installation between the surface (C) of the gasket and the top of the ball bearing outer race (D), then note the measurement.

4. Remove the 65 mm thrust shim (A) from the transmission housing, and measure its thickness.



5. Calculate the thickness of the 65 mm thrust shim using the formula.

Formula:

$$\text{65 mm Thrust Shim Thickness} = \text{Secondary Shaft Installation Height Standard} - \text{Measurement}$$

Secondary Shaft Installation Height Standard:

228.04 – 228.13 mm (8.9779 – 8.9815 in)



6. Select the 65 mm thrust shim from the following table.

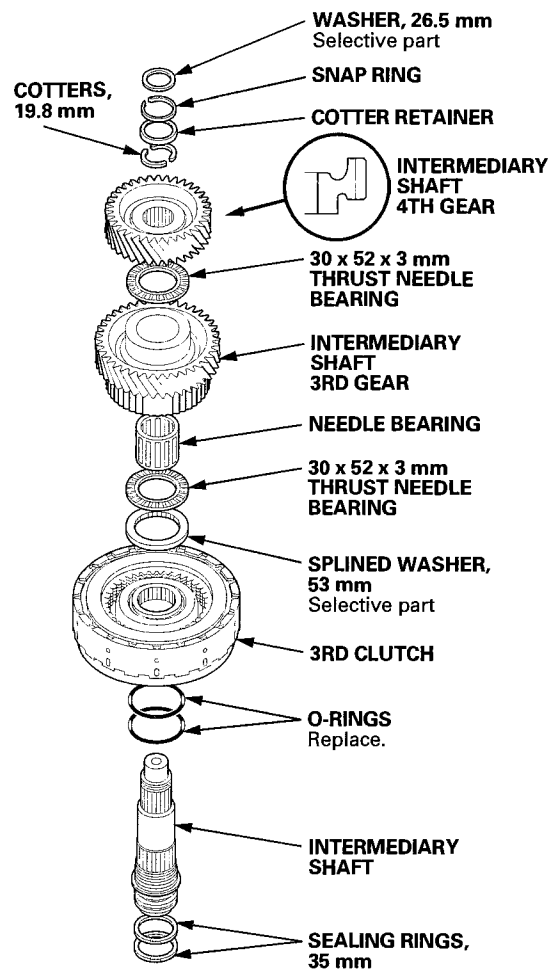
THRUST SHIM, 65 mm

No.	Thickness
0A	0.80 mm (0.031 in)
A	0.84 mm (0.033 in)
B	0.88 mm (0.035 in)
C	0.92 mm (0.036 in)
D	0.96 mm (0.038 in)
E	1.00 mm (0.039 in)
F	1.04 mm (0.041 in)
G	1.08 mm (0.043 in)
H	1.12 mm (0.044 in)
I	1.16 mm (0.046 in)
J	1.20 mm (0.047 in)
K	1.24 mm (0.049 in)
L	1.28 mm (0.050 in)
M	1.32 mm (0.052 in)
N	1.36 mm (0.054 in)
O	1.40 mm (0.055 in)
P	1.44 mm (0.057 in)
Q	1.48 mm (0.058 in)
R	1.52 mm (0.060 in)
S	1.56 mm (0.061 in)
T	1.60 mm (0.063 in)
U	1.64 mm (0.065 in)
V	1.68 mm (0.066 in)
W	1.72 mm (0.068 in)
X	1.76 mm (0.069 in)
Y	1.80 mm (0.071 in)
Z	1.84 mm (0.072 in)
AA	1.88 mm (0.074 in)
AB	1.92 mm (0.076 in)
AC	1.96 mm (0.077 in)
AD	2.00 mm (0.079 in)
AE	2.04 mm (0.080 in)
AF	2.08 mm (0.082 in)
AG	2.12 mm (0.083 in)
AH	2.16 mm (0.085 in)
AI	2.20 mm (0.087 in)
AJ	2.24 mm (0.088 in)
AK	2.28 mm (0.090 in)
AL	2.32 mm (0.091 in)
AM	0.76 mm (0.030 in)

7. Install the thrust shim in the transmission housing.

Intermediary Shaft Disassembly, Inspection, and Reassembly

1. Remove the 26.5 mm washer, the snap ring, the cotter retainer, and the 19.8 mm cotters from the intermediary shaft.



2. Remove the intermediary shaft 4th gear using a press (see page 14-330), to disassemble the intermediary shaft and the gears.
3. Inspect the bearings for galling and rough movement.

(cont'd)

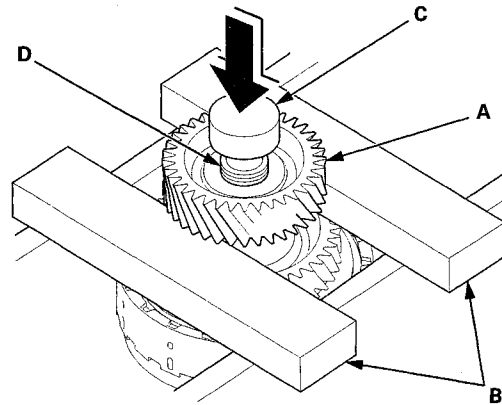
Shafts and Clutches

Intermediary Shaft Disassembly, Inspection, and Reassembly (cont'd)

4. Check the shaft bearing surfaces for scoring and excessive wear, and check the shaft splines for excessive wear and damage.
5. Check the sealing rings for excessive wear and damage.
6. Check the intermediary shaft 3rd gear axial clearance (see page 14-331), and the intermediary shaft installation height (see page 14-333).
7. Before installing the O-rings, wrap the shaft splines with tape to prevent damage to the O-rings.
8. Lubricate all parts with ATF, and reassemble the shaft and gears.
9. Install the press-fitted intermediary shaft 4th gear in the direction shown using the 40 mm driver handle and a press (see page 14-331).

Intermediary Shaft 4th Gear Removal

1. Place intermediary shaft 4th gear (A) on press bases (B), and place a spacer (C) between the intermediary shaft (D) and the press to prevent damaging the intermediary shaft.



2. Support the bottom of the intermediary shaft with one hand, then press the intermediary shaft out of the press-fitted intermediary shaft 4th gear. The intermediary shaft will drop down after pressing it out of the press-fitted gear.
3. Remove the remaining parts from the intermediary shaft.

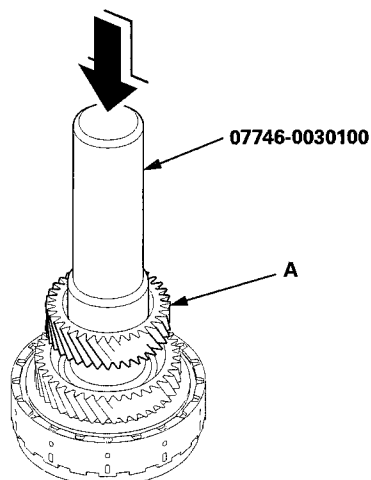


Intermediary Shaft 4th Gear Installation

Special Tools Required

Driver Handle, 40 mm I.D. 07746-0030100

1. Wrap the shaft splines with tape, and install new O-rings in the 3rd clutch O-ring grooves, then remove the tape.
2. Install the 3rd clutch, 53 mm splined washer, the 30×52×3 mm thrust needle bearing, the needle bearing, 3rd gear, the 30×52×3 mm thrust needle bearing on the intermediary shaft.
3. Install the intermediary shaft 4th gear (A) using the 40 mm driver handle and a press.



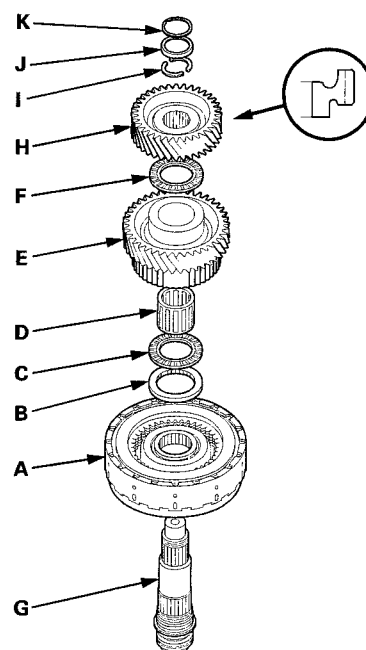
4. Install the 19.8 mm cotters, the cotter retainer, and the snap ring.
5. Install the 26.5 mm washer on the top of the intermediary shaft.

Intermediary Shaft 3rd Gear Axial Clearance Inspection

Special Tools Required

Driver Handle, 40 mm I.D. 07746-0030100

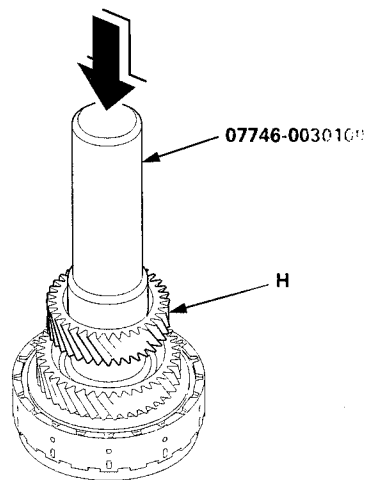
1. Install the 3rd clutch (A), the selected 53 mm splined washer (B), the 30 x 52 x 3 mm thrust needle bearing (C), the needle bearing (D), intermediary shaft 3rd gear (E), and the 30 x 52 x 3 mm thrust needle bearing (F) on the intermediary shaft (G). Do not install the O-rings during inspection.



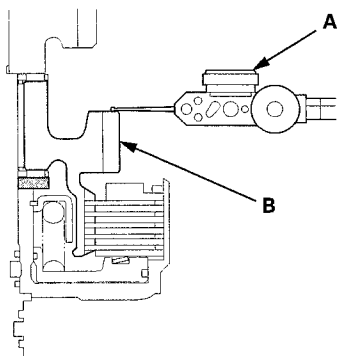
(cont'd)

Shafts and Clutches

Intermediary Shaft 3rd Gear Axial Clearance Inspection (cont'd)



2. Install the intermediary shaft 4th gear (H) using the 40 mm driver handle and a press.
3. Install the 19.8 mm cotter (I), the cotter retainer (J), and the snap ring (K).
4. Set the dial indicator (A) on the intermediary shaft 3rd gear (B).



5. Turn the intermediary shaft 3rd gear axial clearance at least three places while moving the 40 mm driver handle up and down. Use the 07746-0030100 as the driver handle.

Standard 0.045 mm (0.0002 - 0.0018 in)

out of the two and use the difference measurement to select new 13 mm splined washers. Then re-

13 mm

Thickness

95 mm (0.1673 in)	
105 mm (0.1651 in)	
115 mm (0.1629 in)	
125 mm (0.1606 in)	
135 mm (0.1584 in)	
145 mm (0.1562 in)	
155 mm (0.1528 in)	
165 mm (0.1636 in)	
175 mm (0.1644 in)	
185 mm (0.1652 in)	
195 mm (0.1659 in)	
205 mm (0.1667 in)	
215 mm (0.1675 in)	

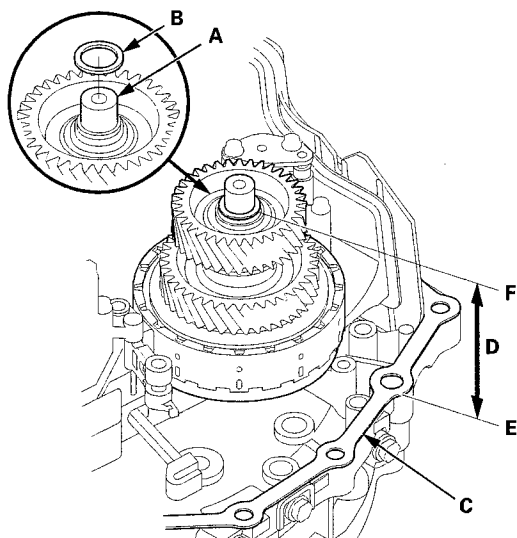


Intermediary Shaft Installation Height Inspection/Adjustment

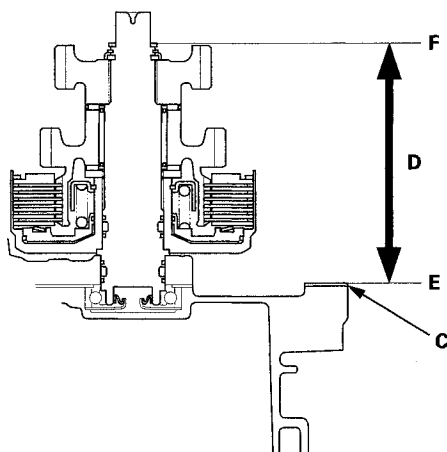
1. Install the intermediary shaft (A) in the torque converter housing, and install the selected 26.5 mm washer (B) on the intermediary shaft.

Intermediary Shaft Installation Height Standard:

137.285—137.385 mm (5.40491—5.40885 in)



Intermediary Shaft Cutaway View



2. Install a new gasket (C) on the torque converter housing.
3. Measure the installed height (D) of the intermediary shaft between the surface (E) of the gasket and the surface of the 26.5 mm washer (F).

4. If the measurement is out of standard, remove the 26.5 mm washer and measure its thickness.
5. Select and install a new 26.5 mm washer, then recheck the installation height.

WASHER, 26.5 mm

No.	Thickness
A	1.05 mm (0.041 in)
B	1.13 mm (0.044 in)
C	1.21 mm (0.048 in)
D	1.29 mm (0.051 in)
E	1.37 mm (0.054 in)
F	1.45 mm (0.057 in)
G	1.53 mm (0.060 in)
H	1.61 mm (0.063 in)
I	1.69 mm (0.067 in)
J	1.77 mm (0.070 in)
K	1.85 mm (0.073 in)
L	1.93 mm (0.076 in)
M	2.01 mm (0.079 in)
N	2.09 mm (0.082 in)
O	0.97 mm (0.038 in)

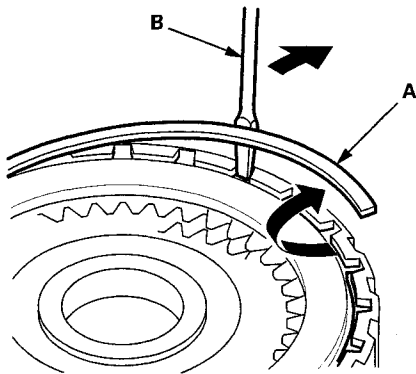
Shafts and Clutches

Clutch Disassembly

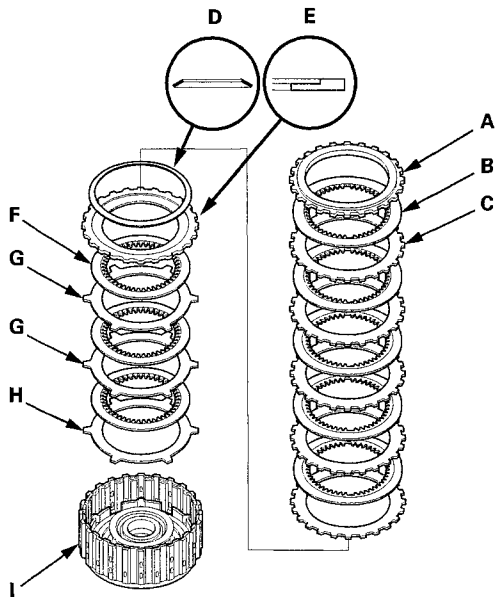
Special Tools Required

Clutch Spring Compressor Set 07LAE-PX40000

1. Remove the snap ring (A) with a screwdriver (B).

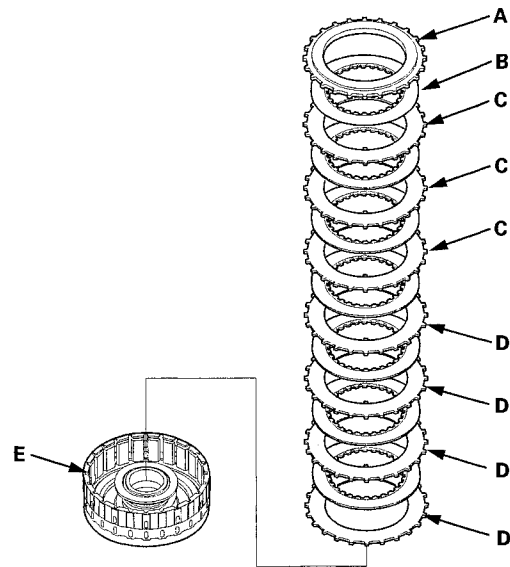


2. Remove the 1st clutch end-plate (A), the 1st clutch discs (B) (5), the 1st clutch wave-plates (C) (5), the disc spring (D), 1st-hold clutch plate B (E), the 1st-hold clutch discs (F) (3), the 1st-hold clutch wave-plates (G) (2), and the 1st-hold clutch flat-plate (H) (1) from the 1st clutch drum (I).

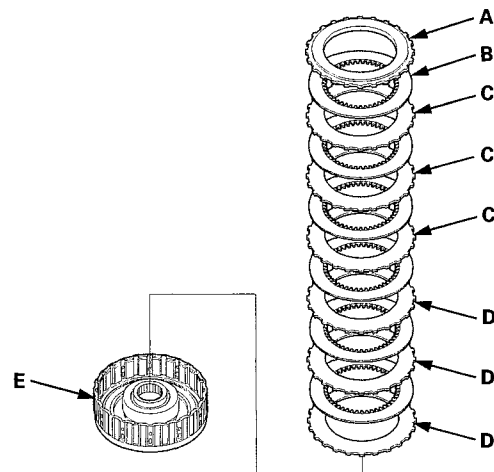


3. Make reference marks on the clutch wave-plate.

4. Remove the clutch end-plate (A), the clutch discs (B) (7), the clutch wave-plates (C) (3), and the clutch flat-plates (D) (4) from the 2nd clutch drum (E).

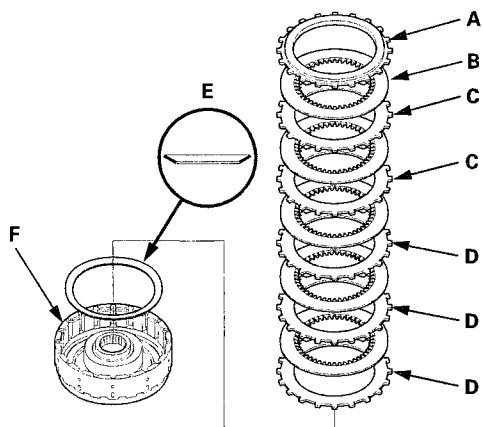


5. Make reference marks on the clutch wave-plates.
6. With SH-AWD: Remove the clutch end-plate (A), the clutch discs (B) (6), the clutch wave-plates (C) (3), the clutch flat plates (D) (3) from the 3rd clutch drum (E).

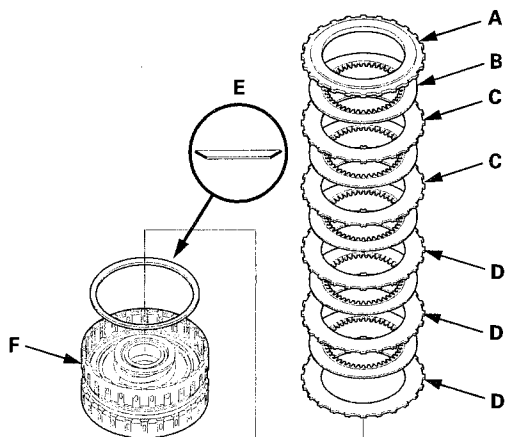




7. Without SH-AWD: Remove the clutch end-plate (A), the clutch discs (B) (5), the clutch wave-plates (C) (2), the clutch flat-plates (D) (3), and the disc spring (E) from the 3rd clutch drum (F).

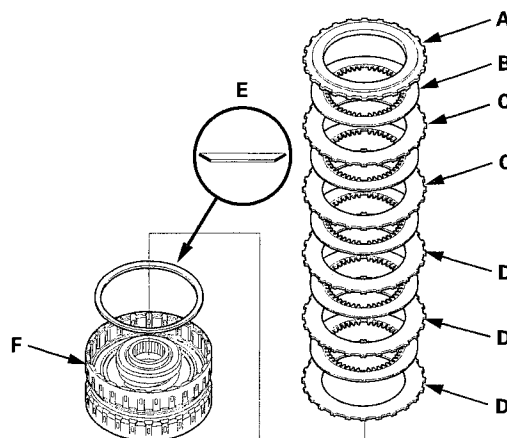


8. Make reference marks on the clutch wave-plates.
9. Remove the clutch end-plate (A), the clutch discs (B) (5), the clutch wave-plates (C) (2), the clutch flat-plates (D) (3), and the disc spring (E) from the 4th clutch drum (F).

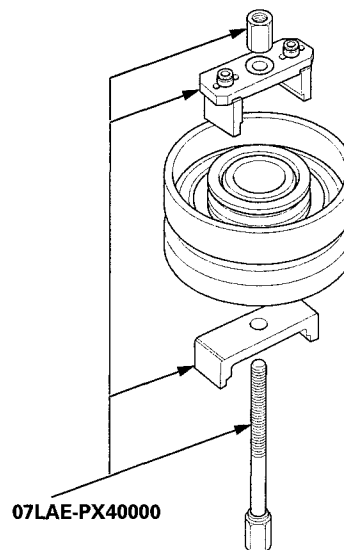


10. Make reference marks on the clutch wave-plates.

11. Remove the clutch end-plate (A), the clutch discs (B) (5), the clutch wave-plates (C) (2), the clutch flat-plates (D) (3), and the disc spring (E) from the 5th clutch drum (F).



12. Make reference marks on the clutch wave-plates.
13. Install the clutch spring compressor.

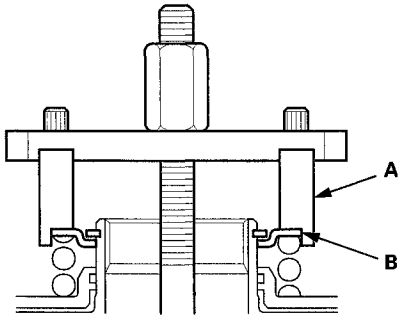


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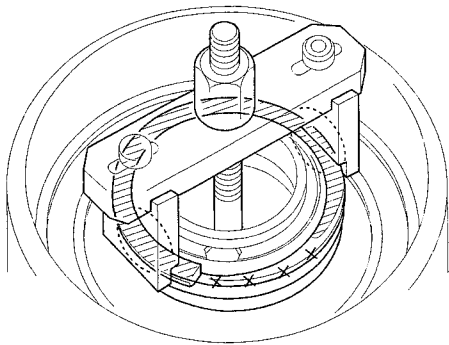
Shafts and Clutches

Clutch Disassembly (cont'd)

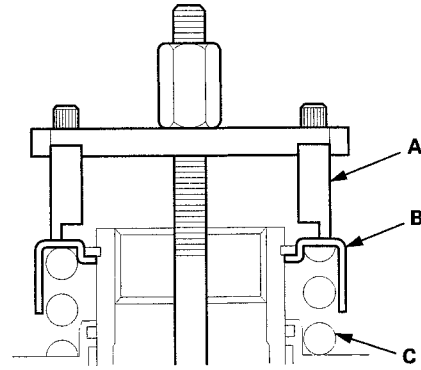
14. Be sure the clutch spring compressor (A) is adjusted to make full contact with the spring retainer (B) on the 1st, 2nd, and 4th clutches.



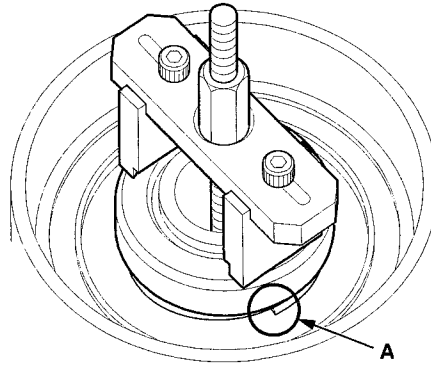
15. Check the placement of the clutch spring compressor. If either end of the clutch spring compressor is set over an area of the spring retainer that is unsupported by the return spring, the spring retainer may be damaged.



16. Set the clutch spring compressor (A) on the spring retainer (B) of the 3rd and 5th clutches so that it pushes on the clutch return spring (C).

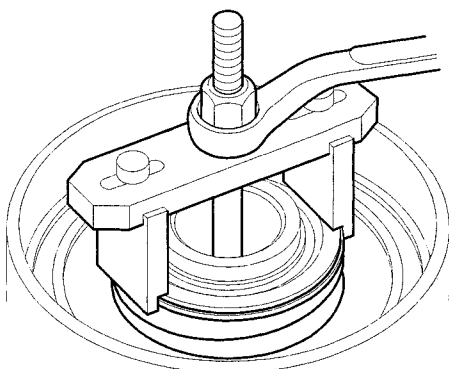


17. Check the placement of the clutch spring compressor. If either end of the clutch spring compressor is not set over the clutch return spring end (A), the spring retainer may be damaged.

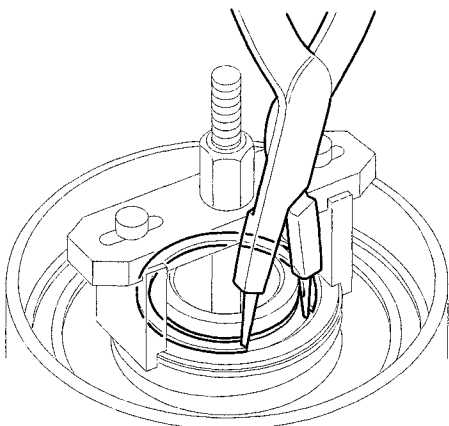




18. Compress the return spring until the snap ring can be removed.

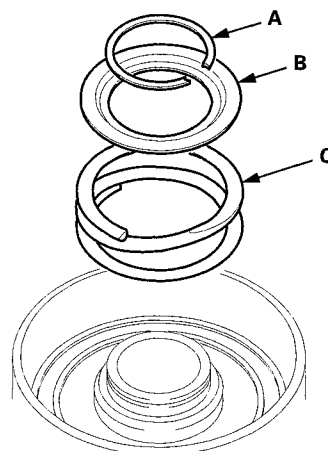


19. Remove the snap ring using snap ring pliers.

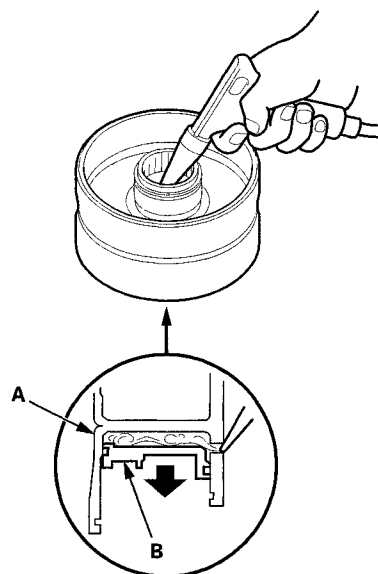


20. Remove the clutch spring compressor.

21. Remove the snap ring (A), the spring retainer (B), and the return spring (C).



22. Wrap a shop rag around the clutch drum (A), and apply air pressure to the fluid passage to remove the clutch piston (B). Place a finger tip on the other passage while applying air pressure.

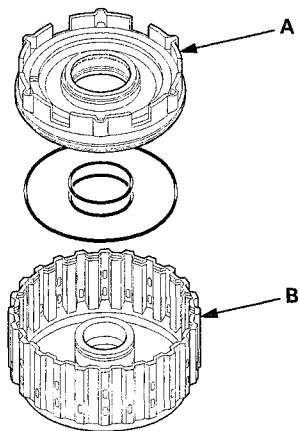


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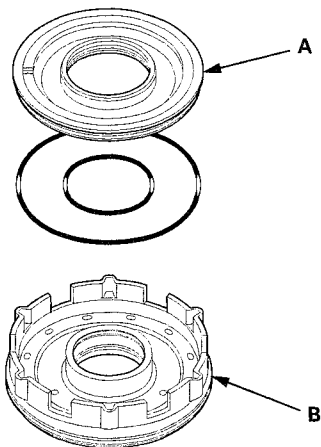
Shafts and Clutches

Clutch Disassembly (cont'd)

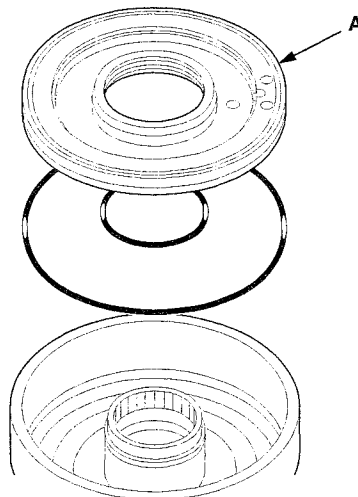
23. Remove the 1st/1st-hold clutch piston (A) from the clutch drum (B), and remove the O-rings from the 1st clutch piston.



24. Remove the 1st-hold clutch piston (A) from the 1st clutch piston (B), and remove the O-rings from the 1st-hold clutch piston.



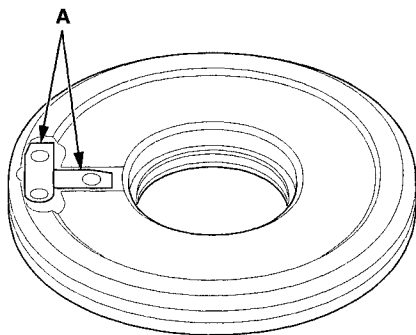
25. Remove the clutch piston (A), and remove the O-rings from the 2nd, 3rd, 4th, and 5th clutch pistons.





Clutch Inspection

1. Inspect the clutch pistons and the clutch piston check valves (A). If the clutch piston check valves are loose or damaged, replace the clutch piston.



2. Check the spring retainer for wear and damage. If the spring retainer is worn or damaged, replace it.
3. Inspect the clutch discs, the clutch plates, and the clutch end-plate for wear, damage, and discoloration.

Clutch Discs

Standard Thickness: 1.94 mm (0.076 in)

Clutch Flat-plates and Clutch Wave-plates Standard Thickness

With SH-AWD:

1st Clutch:	1.6 mm (0.063 in)
1st-hold Clutch:	1.8 mm (0.071 in)
2nd Clutch:	1.8 mm (0.071 in)
3rd Clutch:	1.8 mm (0.071 in)
4th Clutch:	1.6 mm (0.063 in)
5th Clutch:	1.6 mm (0.063 in)

Without SH-AWD:

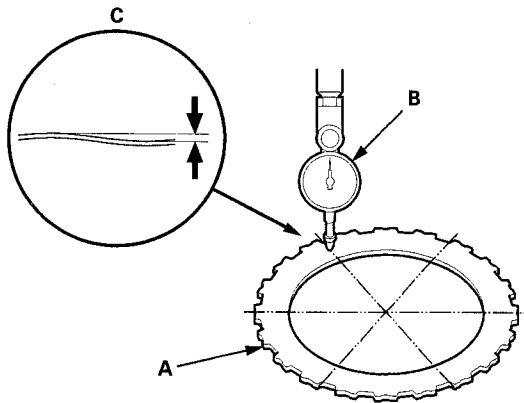
1st Clutch:	1.6 mm (0.063 in)
1st-hold Clutch:	1.8 mm (0.071 in)
2nd Clutch:	1.8 mm (0.071 in)
3rd Clutch:	2.0 mm (0.079 in)
4th Clutch:	1.6 mm (0.063 in)
5th Clutch:	1.6 mm (0.063 in)

- If the clutch discs are worn or damaged, replace them as a set. If the clutch discs are replaced, inspect the clearance between the clutch end-plate and the top disc (see page 14-342).
- If any clutch wave-plate is worn, damaged, or discolored, replace the damaged clutch wave-plate with a new clutch wave-plate, and inspect the other clutch wave-plates for phase difference (see page 14-340). If the clutch wave-plate is replaced, inspect the clearance between the clutch end-plate and the top disc (see page 14-342).
- If any clutch flat-plate is worn, damaged, or discolored, replace them as a set. If the clutch flat-plate are replaced, inspect the clearance between the clutch end-plate and the top disc (see page 14-342).
- If the clutch end-plate is worn, damaged, or discolored, inspect the clearance between the clutch end-plate and the top disc (see page 14-342), then replace the clutch end-plate.

Shafts and Clutches

Clutch Wave-plate Phase Difference Inspection

1. Place the clutch wave-plate (A) on a surface plate, and set a dial indicator (B) on the clutch wave-plate.



2. Find the bottom (C) of a phase difference of the clutch wave-plate, zero the dial indicator and make a reference mark on the bottom of the clutch wave-plate.

3. Measure the phase differences of the 1st, 1st-hold, 2nd, 3rd (with SH-AWD), 4th (without SH-AWD), and the 5th (without SH-AWD) clutch wave-plates.

- 1. Rotate the clutch wave-plate about 60-degrees while holding the clutch wave-plate by its circumference. The dial indicator should be at the top of a phase difference. Do not rotate the clutch wave-plate while holding its surface, always rotate it while holding its circumference.
- 2. Read the dial indicator. The dial indicator reads the phase difference of the clutch wave-plate between the bottom and top.

Standard Phase Difference

With SH-AWD:

1st Clutch: 0.17—0.30 mm (0.007—0.012 in)

1st-hold

Clutch: 0.07—0.20 mm (0.003—0.008 in)

2nd Clutch: 0.11—0.21 mm (0.004—0.008 in)

3rd Clutch: 0.07—0.20 mm (0.003—0.008 in)

Without SH-AWD:

1st Clutch: 0.17—0.30 mm (0.007—0.012 in)

1st-hold

Clutch: 0.10—0.20 mm (0.004—0.008 in)

2nd Clutch: 0.11—0.21 mm (0.004—0.008 in)

4th Clutch: 0.12—0.22 mm (0.005—0.009 in)

5th Clutch: 0.12—0.22 mm (0.005—0.009 in)

- 3. Rotate the clutch wave-plate about 60-degrees. The dial indicator should be at the bottom of a phase difference, and zero the dial indicator.
- 4. Measure the phase difference at the other two tops of the clutch wave-plate by following steps -1 thru -3.



4. With SH-AWD: Measure the phase difference of the 4th and 5th clutch wave-plates.

- 1. Rotate the clutch wave-plate about 51-degrees or 64-degrees while holding the clutch wave-plate by its circumference. The dial indicator should be at the top of a phase difference. Do not rotate the clutch wave-plate while holding its surface, always rotate it while holding its circumference.
- 2. Read the dial indicator. The dial indicator reads the phase difference of the clutch wave-plate between the bottom and top.

Standard Phase Difference

With SH-AWD:

4th Clutch: 0.07—0.20 mm (0.003—0.008 in)

5th Clutch: 0.07—0.20 mm (0.003—0.008 in)

- 3. Rotate the clutch wave-plate about 51-degrees or 64-degrees. The dial indicator should be at the bottom of a phase difference, and zero the dial indicator.
- 4. Measure the phase difference at the other two tops of the clutch wave-plate by following steps -1 thru -3.

5. Without SH-AWD: Measure the phase difference of the 3rd clutch wave plate.

- 1. Rotate the clutch wave-plate about 54-degrees or 72-degrees while holding the clutch wave-plate by its circumference. The dial indicator should be at the top of a phase difference. Do not rotate the clutch wave-plate while holding its surface, always rotate it while holding its circumference.
- 2. Read the dial indicator. The dial indicator reads the phase difference of the clutch wave-plate between the bottom and top.

Standard Phase Difference

3rd Clutch: 0.1—0.2 mm (0.004—0.008 in)

- 3. Rotate the clutch wave-plate about 54-degrees or 72-degrees. The dial indicator should be at the bottom of a phase difference and zero the dial indicator.
 - 4. Measure the phase difference at the other two tops of the clutch wave-plate by following steps -1 thru -3.
6. If two of the three measurements are within the standard, the clutch wave-plate is OK. If two of the measurements are out of the standard, replace the clutch wave plate.

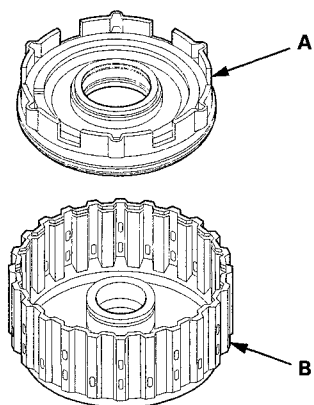
Shafts and Clutches

Clutch Clearance Inspection

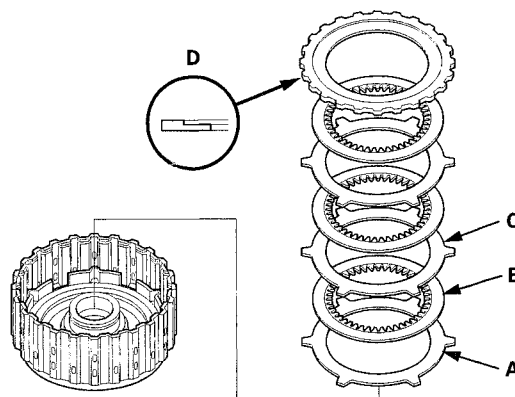
Special Tools Required

Clutch Compressor Attachment 07ZAE-PRP0100

1. Inspect the clutch piston, the clutch discs, the plates, and the end-plate for wear and damage (see page 14-339), and inspect the clutch wave-plate phase difference (see page 14-340), if necessary.
2. Install the 1st-hold clutch piston in the 1st clutch piston, and install the 1st/1st-hold clutch piston (A) in the 1st clutch drum (B). Do not install the O-rings on the clutch pistons during inspection.



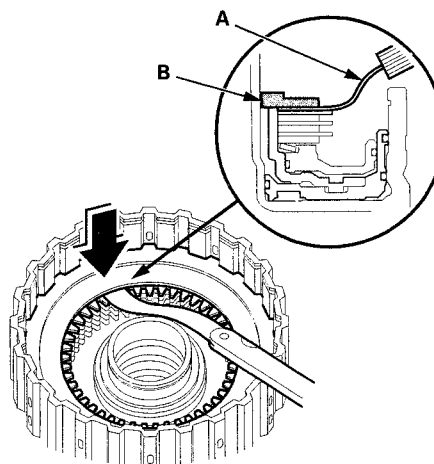
3. Install the 1st-hold clutch flat-plate (A), alternately install the clutch discs (B) (3) and the 1st-hold clutch wave-plates (C) (2), then install 1st-hold clutch plate B (D) with the flat side toward the top disc.



4. Measure the clearance between 1st-hold clutch plate B and the top disc using a feeler gauge (A) while pressing 1st-hold clutch plate B down. Take measurements in at least three places, and use the average as the actual clearance.

Clearance Between 1st-hold Clutch Plate B and Top Disc

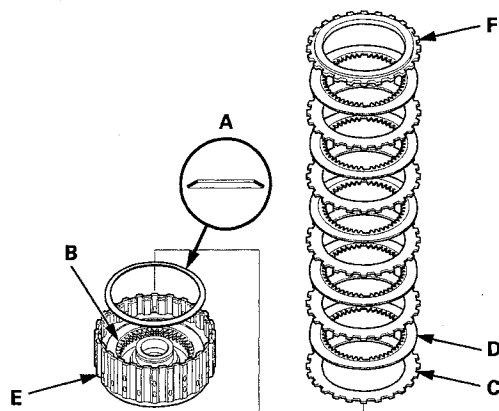
Standard: 0.6—1.0 mm (0.024—0.039 in)



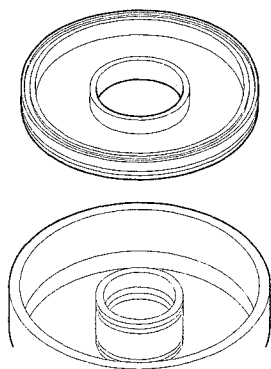
5. If the clearance is out of the standard, replace 1st-hold clutch plate B and the 1st-hold clutch discs as a set, and recheck.



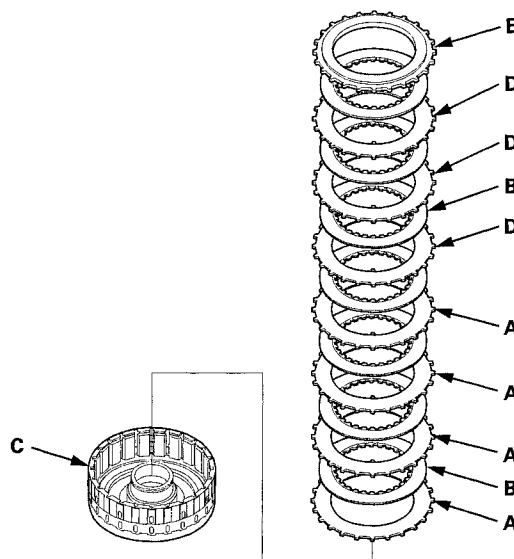
6. Install the disc spring (A) on 1st-hold clutch plate B in the direction shown. Starting with the 1st clutch wave-plate, alternately install the clutch wave-plates (C) (5) and the clutch discs (D) (5) in the 1st clutch drum (E), then install the clutch end-plate (F) with the flat side toward the top disc.



7. Install the clutch pistons in the 2nd, 3rd, 4th, and the 5th clutch drums. Do not install the O-rings on the clutch pistons during inspection.



8. Starting with the 2nd clutch flat-plate, alternately install the clutch flat-plates (A) (4) and the clutch discs (B) (4) in the 2nd clutch drum (C), and alternately install the clutch wave-plates (D) (3) and the clutch discs (B) (3). Install the clutch end-plate (E) with the flat side toward the top disc.

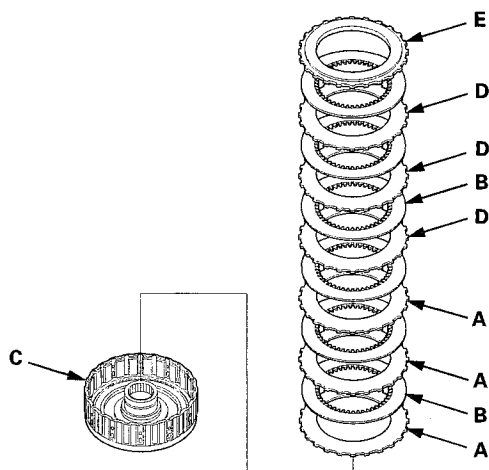


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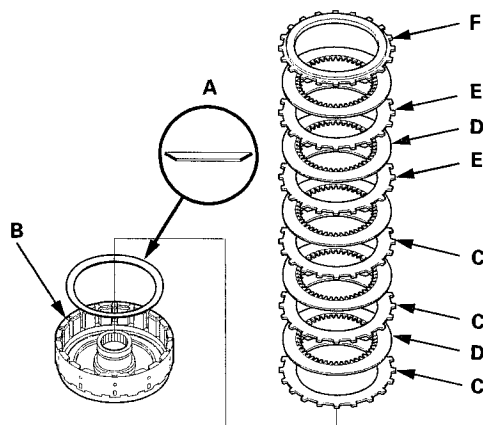
Shafts and Clutches

Clutch Clearance Inspection (cont'd)

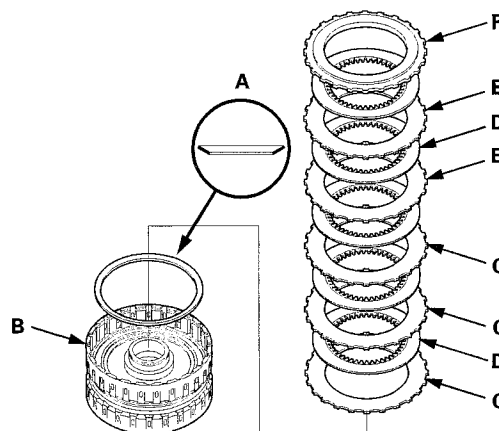
9. With SH-AWD: Starting with the 3rd clutch flat-plate, alternately install the clutch flat-plates (A) (3) and the clutch discs (B) (3) in the 3rd clutch drum (C), and alternately install the clutch wave-plates (D) (3) and the clutch discs (B) (3). Install the clutch end-plate (E) with the flat side toward the top disc.



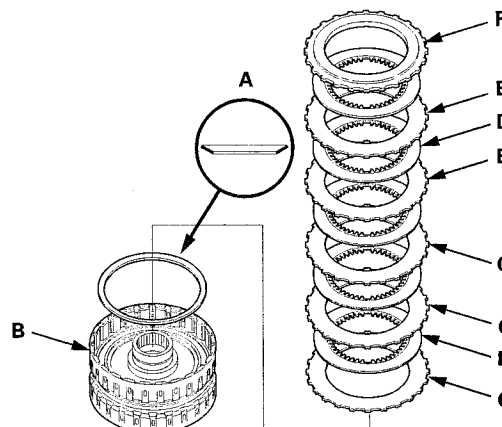
10. Without SH-AWD: Install the disc spring (A) in the 3rd clutch drum (B) in the direction shown. Starting with the 3rd clutch flat-plate, alternately install the clutch flat-plates (C) (3) and clutch discs (D) (3), and alternately install the clutch wave-plates (E) (2) and the clutch discs (D) (2). Install the clutch end-plate (F) with the flat side toward the top disc.



11. Install the disc spring (A) in the 4th clutch drum (B) in the direction shown. Starting with the 4th clutch flat-plate, alternately install the clutch flat-plates (C) (3) and clutch discs (D) (3), and alternately install the clutch wave-plates (E) (2) and the clutch discs (D) (2). Install the clutch end-plate (F) with the flat side toward the top disc.

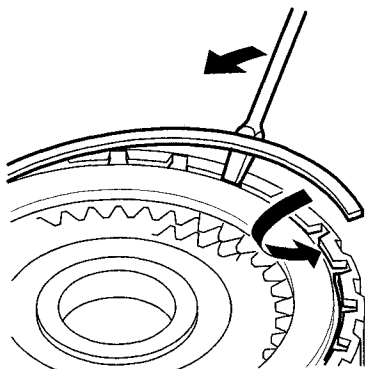


12. Install the disc spring (A) in the 5th clutch drum (B) in the direction shown. Starting with the 5th clutch flat-plate, alternately install the clutch flat-plates (C) (3) and clutch discs (D) (3), and alternately install the clutch wave-plates (E) (2) and the clutch discs (D) (2). Install the clutch end-plate (F) with the flat side toward the top disc.

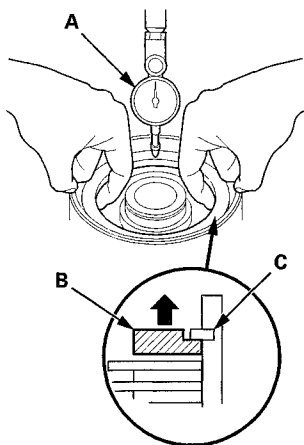




13. Install the snap ring using a screwdriver to secure the clutch end-plate.

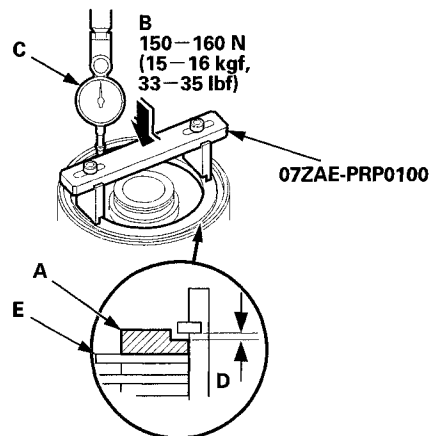


14. Set a dial indicator (A) on the clutch end-plate (B).



15. Zero the dial indicator with the clutch end-plate lifted up to the snap ring (C).

16. Release the clutch end-plate to lower it, then put the clutch compressor attachment on the end-plate (A).



17. Press the clutch compressor attachment down with 150–160 N (15–16 kgf, 33–35 lbf) (B) using a force gauge, and read the dial indicator (C).

18. The dial indicator reads the clearance (D) between the clutch end-plate and the top disc (E). Take measurements in at least three places, and use the average as the actual clearance.

Clearance Between Clutch End-Plate and Top Disc Standard:

1st Clutch:	1.15–1.35 mm (0.045–0.053 in)
2nd Clutch:	1.05–1.25 mm (0.041–0.049 in)
3rd Clutch (with SH-AWD):	0.90–1.10 mm (0.035–0.043 in)
3rd Clutch (without SH-AWD):	0.80–1.00 mm (0.031–0.039 in)
4th Clutch:	0.75–0.95 mm (0.030–0.037 in)
5th Clutch:	0.75–0.95 mm (0.030–0.037 in)

(cont'd)

Shafts and Clutches

Clutch Clearance Inspection (cont'd)

19. If the clearance is out of the standard, select a new clutch end-plate from the following table.



1ST CLUTCH END-PLATES

Mark	Thickness (t)
1	3.1 mm (0.122 in)
2	3.2 mm (0.126 in)
3	3.3 mm (0.130 in)
4	3.4 mm (0.134 in)
5	3.5 mm (0.138 in)
6	3.6 mm (0.142 in)
7	3.7 mm (0.146 in)
8	3.8 mm (0.150 in)
9	3.9 mm (0.154 in)

2ND, 3RD, 4TH, and 5TH CLUTCH END-PLATES

Mark	Thickness (t)
1	2.1 mm (0.083 in)
2	2.2 mm (0.087 in)
3	2.3 mm (0.091 in)
4	2.4 mm (0.094 in)
5	2.5 mm (0.098 in)
6	2.6 mm (0.102 in)
7	2.7 mm (0.106 in)
8	2.8 mm (0.110 in)
9	2.9 mm (0.114 in)

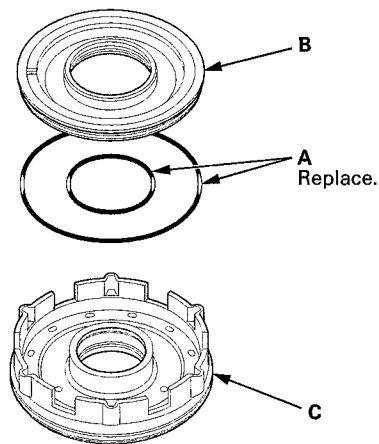
20. Install a new clutch end-plate, and recheck the clearance. If the thickest clutch end-plate is installed, but the clearance is still over the standard, replace the clutch discs and the clutch end-plates.

Clutch Reassembly

Special Tools Required

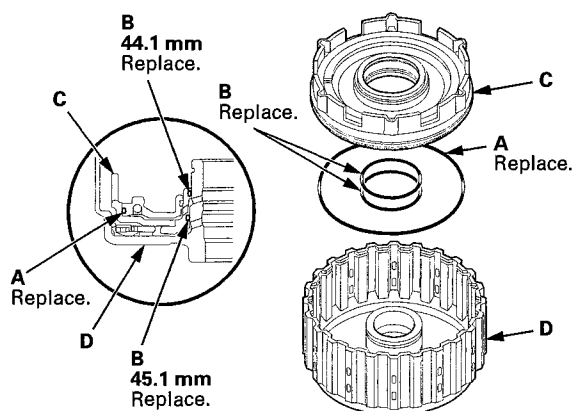
Clutch Spring Compressor Set 07LAE-PX40000

1. Soak the clutch discs thoroughly in ATF for a minimum of 30 minutes.
2. Install new O-rings (A) on the 1st-hold clutch piston (B), and install the 1st-hold clutch piston in the 1st clutch piston (C).

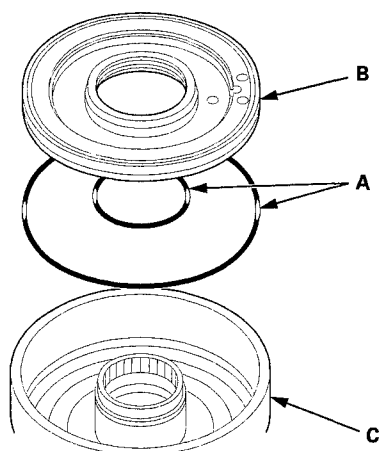




3. Install new O-rings (A) (B) on the 1st clutch piston (C), and install the 1st clutch piston in the 1st clutch drum (D) while applying pressure and rotating to ensure proper seating. Do not pinch the O-ring.

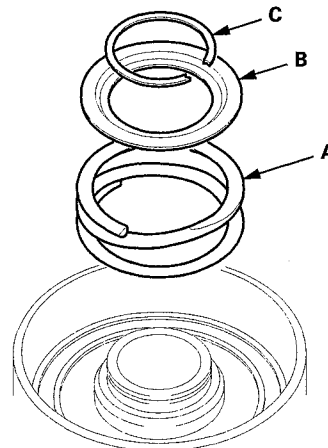


4. Install the O-rings (A) on the 2nd, 3rd, 4th and 5th clutch piston (B).

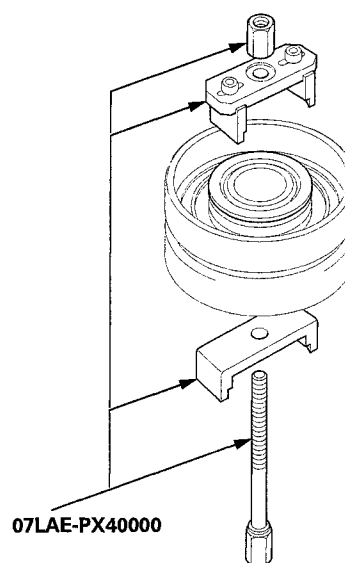


5. Install the clutch pistons in the clutch drums (C) while applying pressure and rotating to ensure proper seating. Do not pinch the O-ring.

6. Set the return spring (A) and the spring retainer (B), and position the snap ring (C) on the spring retainer.



7. Install the clutch spring compressor.

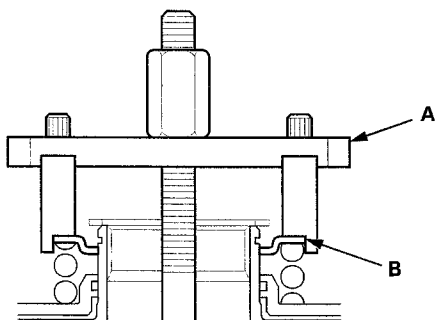


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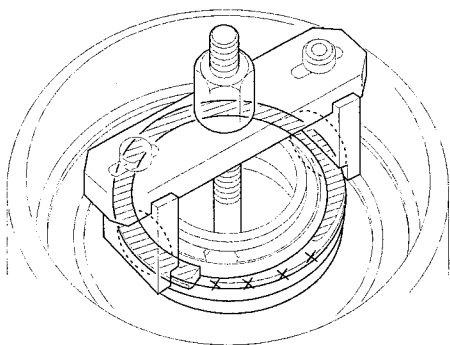
Shafts and Clutches

Clutch Reassembly (cont'd)

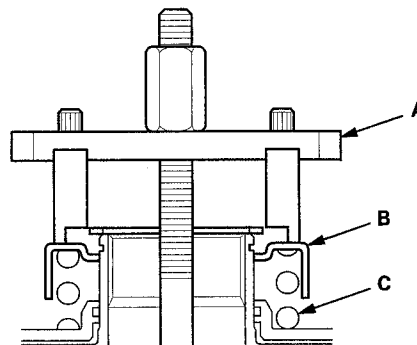
8. Be sure the clutch spring compressor (A) is adjusted to have full contact with the spring retainer (B) on the 1st, 2nd, and 4th clutches.



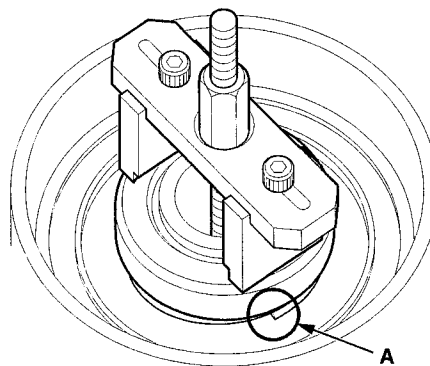
9. Check the placement of the clutch spring compressor. If either end of the clutch spring compressor is set over an area of the spring retainer that is unsupported by the return spring, the spring retainer may be damaged.



10. Set the clutch spring compressor (A) on the spring retainer (B) of the 3rd and 5th clutches so that it compresses the clutch return spring (C).

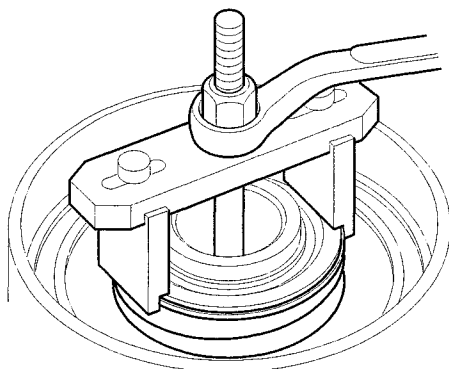


11. Check the placement of the clutch spring compressor. If either end of the clutch spring compressor is not set over the clutch return spring end (A), the spring retainer may be damaged.

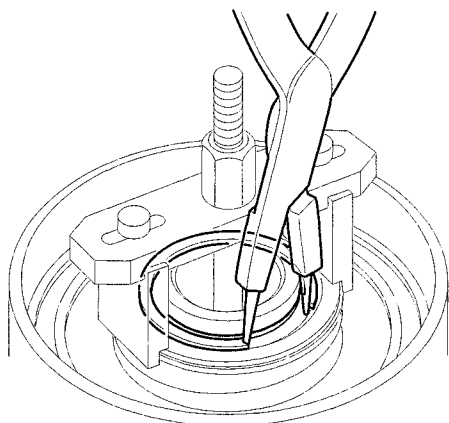




12. Compress the return spring until the snap ring can be installed.

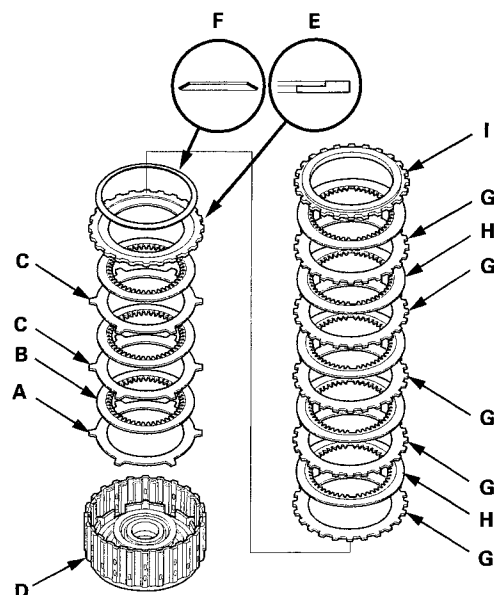


13. Install the snap ring using snap ring pliers.



14. Remove the clutch spring compressor.

15. Install the 1st-hold clutch flat-plate (A), alternately install the clutch discs (B) (3) and the 1st-hold clutch wave-plates (C) (2) in the 1st clutch drum (D), then install 1st-hold clutch plate B (E) with the flat side toward the top disc.



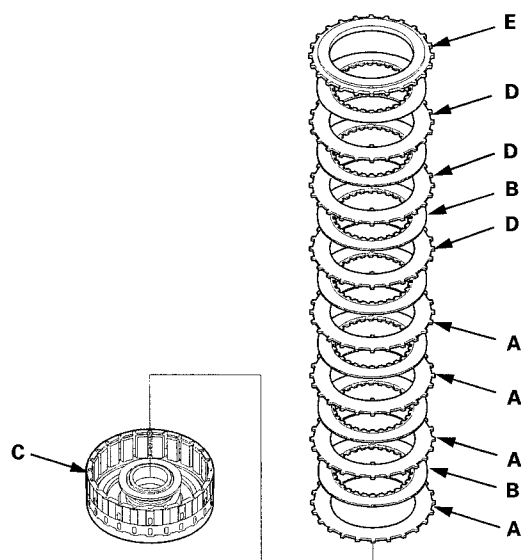
16. Install the disc spring (F) on 1st-hold clutch plate B in the direction shown. Starting with the 1st clutch wave-plate, alternately install the clutch wave-plates (G) (5) and the 1st clutch discs (H) (5), then install the clutch end-plate (I) with the flat side toward the top disc.

(cont'd)

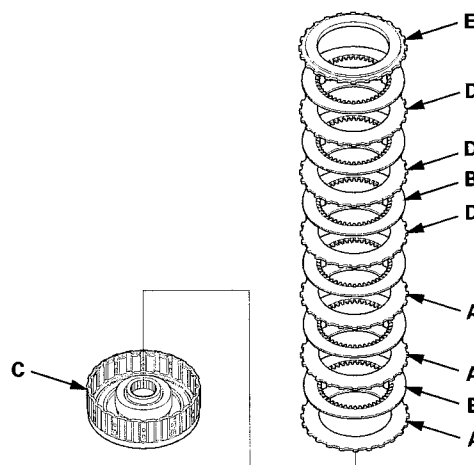
Shafts and Clutches

Clutch Reassembly (cont'd)

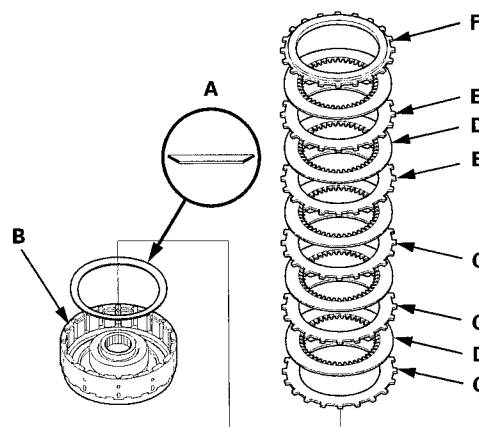
17. Starting with the 2nd clutch flat-plate, alternately install the clutch flat-plates (A) (4) and the clutch discs (B) (4) in the 2nd clutch drum (C), and alternately install the clutch wave-plates (D) (3) and the clutch discs (B) (3). Install the clutch end-plate (E) with the flat side toward the top disc.



18. With SH-AWD: Starting with the 3rd clutch flat-plate, alternately install the clutch flat-plates (A) (3) and the clutch discs (B) (3) in the 3rd clutch drum (C), and alternately install the clutch wave-plates (D) (3) and the clutch discs (B) (3). Install the clutch end-plate (E) with the flat side toward the top disc.

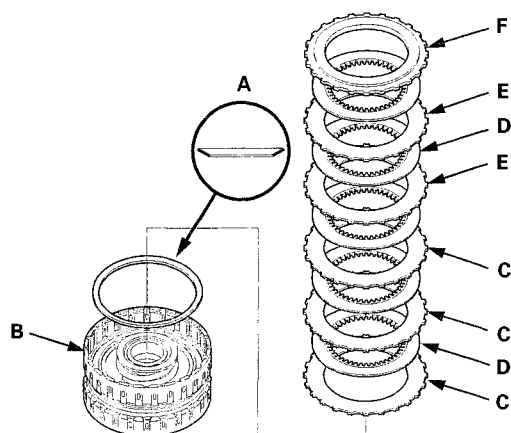


19. Without SH-AWD: Install the disc spring (A) in the 3rd clutch drum (B) in the direction shown. Starting with the 3rd clutch flat-plate, alternately install the clutch flat-plates (C) (3) and the clutch discs (D) (3), and alternately install the clutch wave-plates (E) (2) and the clutch discs (D) (2). Install the clutch end-plate (F) with the flat side toward the top disc.

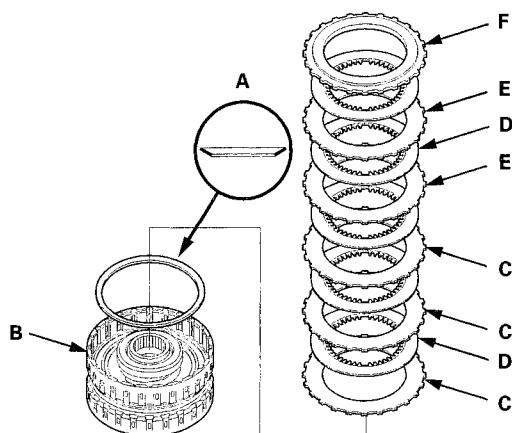




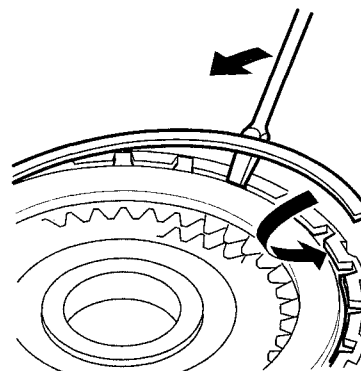
20. Install the disc spring (A) in the 4th clutch drum (B) in the direction shown. Starting with the 4th clutch flat-plate, alternately install the clutch flat-plates (C) (3) and the clutch discs (D) (3), and alternately install the clutch wave-plates (E) (2) and the clutch discs (D) (2). Install the clutch end-plate (F) with the flat side toward the top disc.



21. Install the disc spring (A) in the 5th clutch drum (B) in the direction shown. Starting with the 5th clutch flat-plate, alternately install the clutch flat-plates (C) (3) and the clutch discs (D) (3), and alternately install the clutch wave-plates (E) (2) and the clutch discs (D) (2). Install the clutch end-plate (F) with the flat side toward the top disc.



22. Install the snap ring using a screwdriver to secure the clutch end-plate.



23. Check that the clutch piston moves by applying air pressure into the fluid passage.

Automatic Transmission

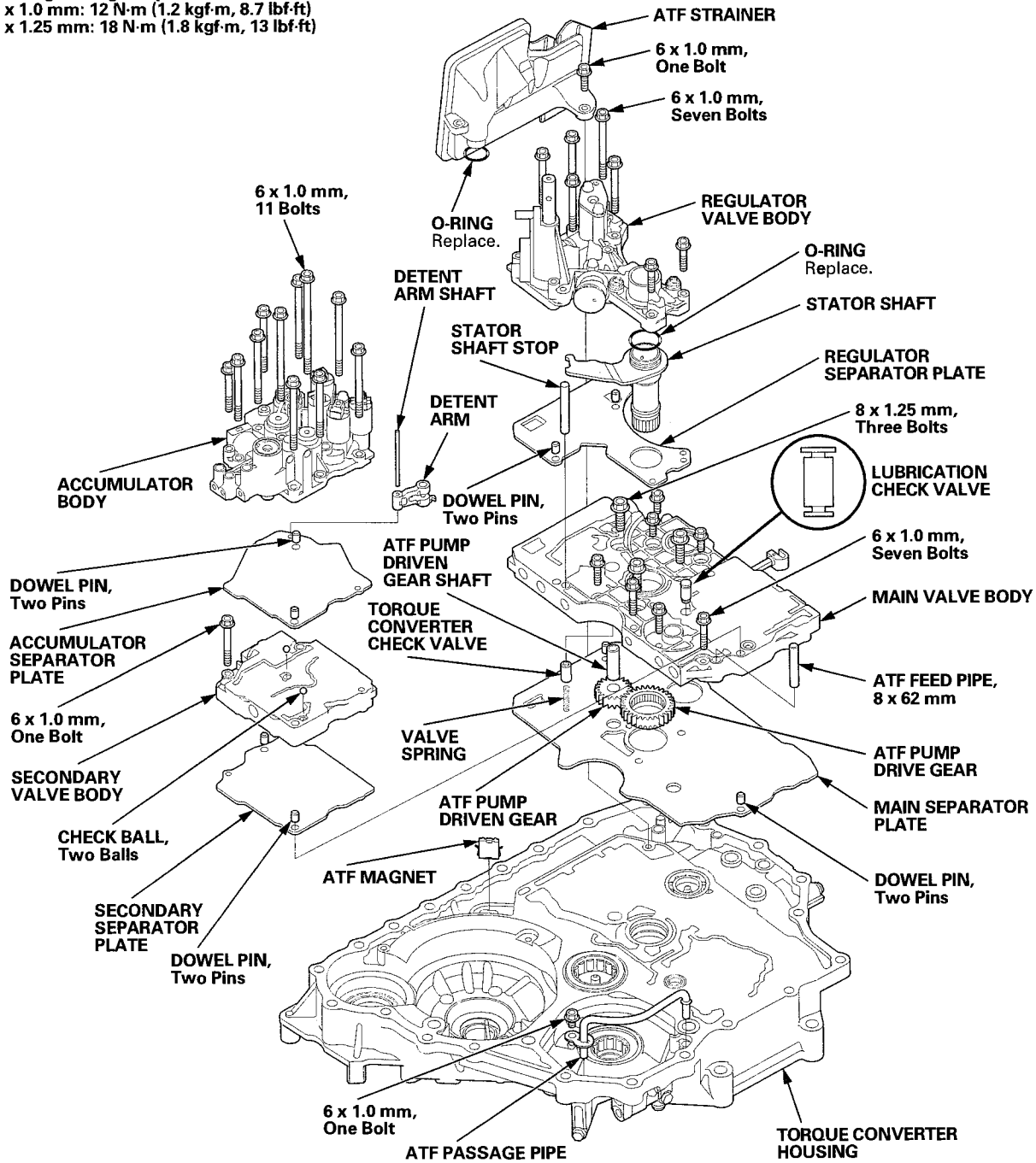
Transmission Reassembly

Exploded View

Bolt Tightening Torque:

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

8 x 1.25 mm: 18 N·m (1.8 kgf·m, 13 lbf·ft)

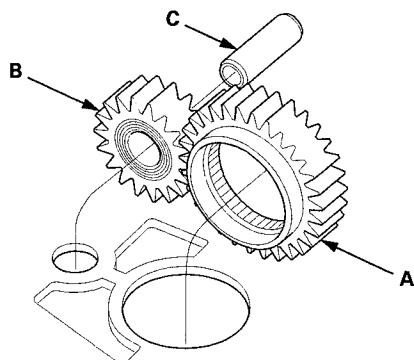




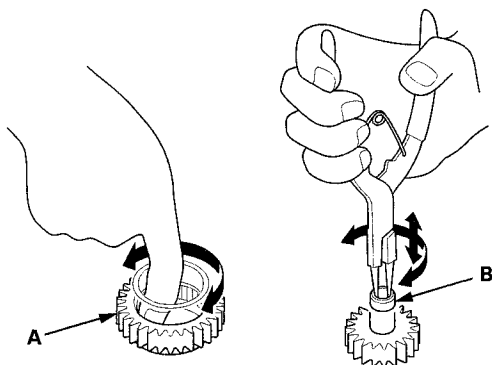
Special Tools Required

Mainshaft Holder 07GAB-PF50101

1. Make sure that the ATF magnet is cleaned and installed in the torque converter housing. Clean and install the ATF magnet, if necessary.
2. Install the main separator plate and the two dowel pins on the torque converter housing. Then install the ATF pump drive gear (A), the driven gear (B), and the ATF pump driven gear shaft (C). Install the ATF pump driven gear with its grooved and chamfered side facing down.



3. Install the torque converter check valve spring and the valve in the torque converter housing.
4. Install the main valve body (seven 6 mm bolts and three 8 mm bolts). Make sure the ATF pump drive gear (A) rotates smoothly in the normal operating direction, and the ATF pump driven gear shaft (B) moves smoothly in the axial and normal operating direction.



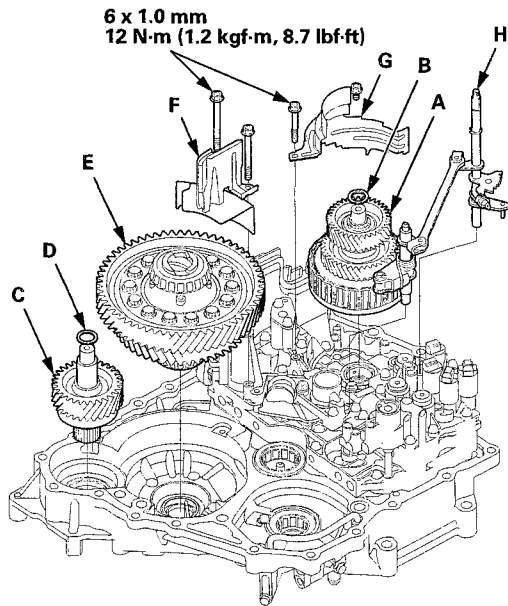
5. If the ATF pump drive gear and the ATF pump driven gear shaft do not move smoothly, loosen the main valve body bolts. Realign the ATF pump driven gear shaft, and retighten the bolts to the specified torques, then recheck. Failure to align the ATF pump driven gear shaft correctly will result in a seized ATF pump drive gear or ATF pump driven gear shaft.
6. Install the lubrication check valve in the main valve body, in the direction shown in the exploded view.
7. Install the secondary separator plate and the two dowel pins on the main valve body, and install the secondary valve body (one bolt).
8. Install the two check balls in the secondary valve body.
9. Install the accumulator separator plate and the two dowel pins on the secondary valve body.
10. Position the detent arm on the accumulator separator plate, and install the detent arm shaft into the detent arm through the separator plates to the main valve body.
11. Install the 8 x 62 mm ATF feed pipe in the main valve body, and install the accumulator body (11 bolts).
12. Install the regulator separator plate and the two dowel pins on the main valve body.
13. Install the stator shaft with a new O-ring, and install the regulator valve body (seven bolts).
14. Install the stator shaft stop in the main valve body.
15. Install the ATF strainer with a new O-ring (one bolt).
16. Install the ATF passage pipe (one bolt) in the torque converter housing.

(cont'd)

Automatic Transmission

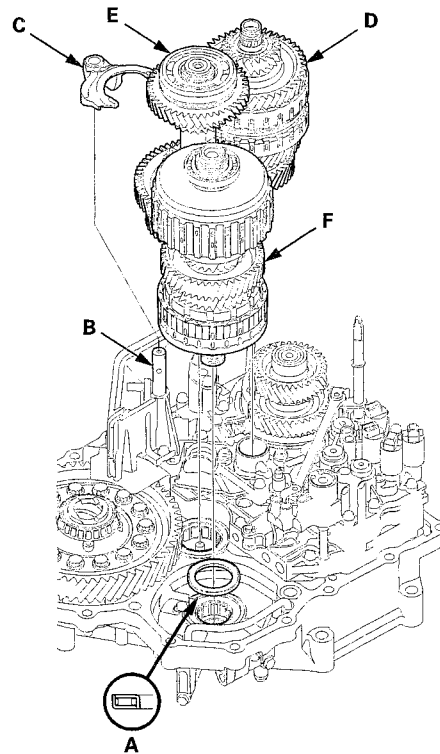
Transmission Reassembly (cont'd)

17. Install the intermediary shaft (A) into the main valve body, and install the 26.5 mm washer (B) on the top of the intermediary shaft.



18. With SH-AWD: Install the transfer output shaft (C) in the torque converter housing, and install the thrust shim (D) on the top of the transfer output shaft.
19. Install the differential assembly (E) in the torque converter housing.
20. Install the oil catch plate (F), and make sure if the differential is clear of the oil catch plate.
21. Install the baffle plate (G), and make sure if the intermediary shaft is clear of the baffle plate.
22. Install the selector control shaft and the park lever link (H).
23. Assemble the mainshaft, the countershaft, and the secondary shaft.

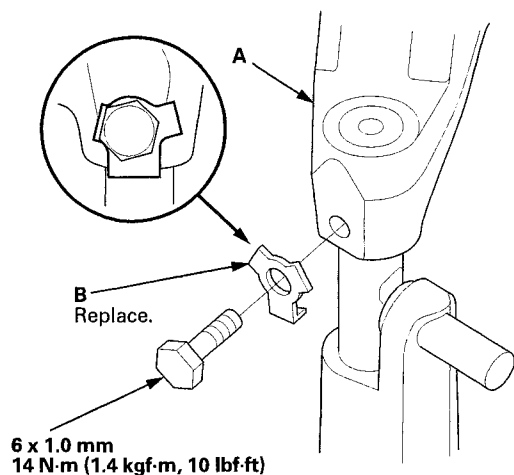
24. Install the thrust needle bearing (A) on the secondary shaft bearing in the torque converter housing.



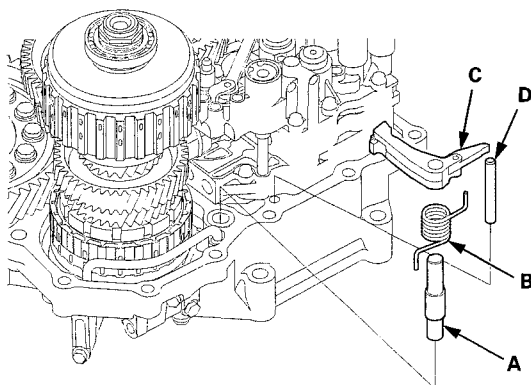
25. Turn the shift fork shaft (B) so the large chamfered hole is facing the fork bolt hole of the shift fork.
26. Engage the shift fork (C) with the reverse selector on the countershaft, and join the mainshaft (D), the countershaft (E), and the secondary shaft (F), then install them in the torque converter housing and the shift fork on the shift fork shaft.



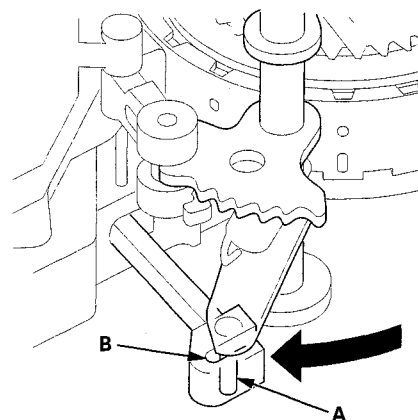
27. Secure the shift fork (A) to the shift fork shaft with the lock bolt and a new lock washer (B), then bend the lock tab of the lock washer against the bolt head.



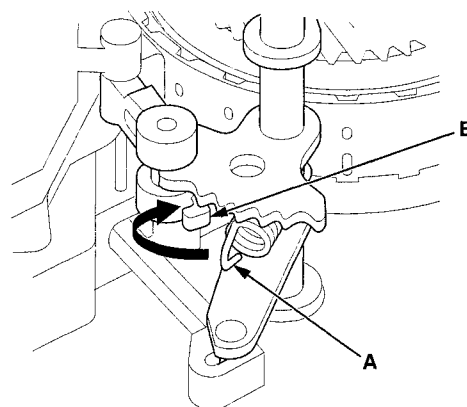
28. Install the park pawl shaft (A), the pawl spring (B), the park pawl (C), and the park pawl stop (D).



29. Align the control lever pin (A) with the manual valve guide (B).



30. Hook the detent spring (A) to the detent arm (B).

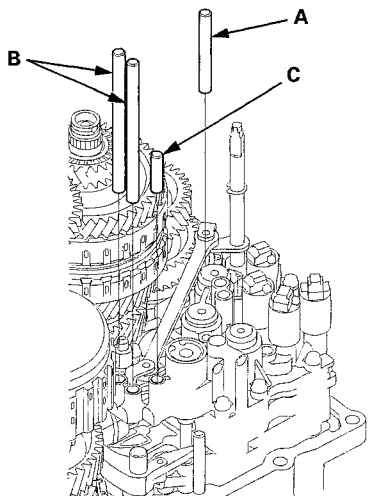


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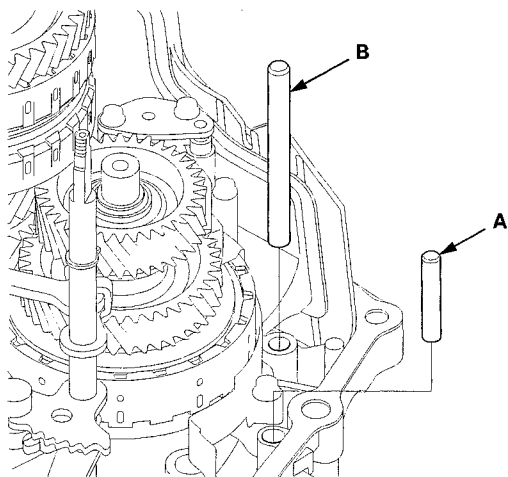
Automatic Transmission

Transmission Reassembly (cont'd)

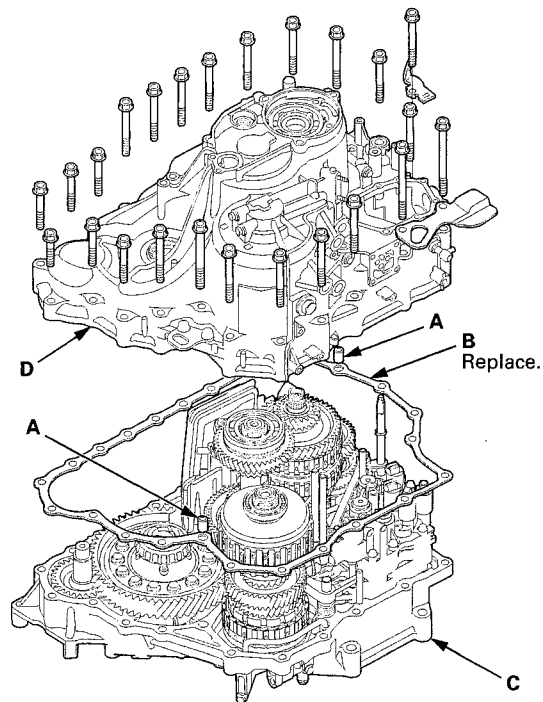
31. Install the 8 x 85 mm ATF feed pipe (A), the 8 x 151.5 mm pipes (B), and the 8 x 40 mm pipe (C) in the accumulator body.



32. Install the 8 x 57.5 mm ATF feed pipe (A) and the 10 x 123 mm pipe (B) in the torque converter housing.

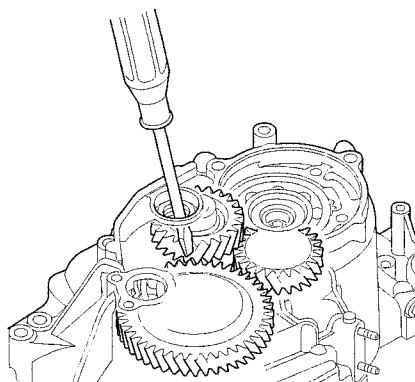


33. Install the two dowel pins (A) and a new gasket (B) on the torque converter housing (C).



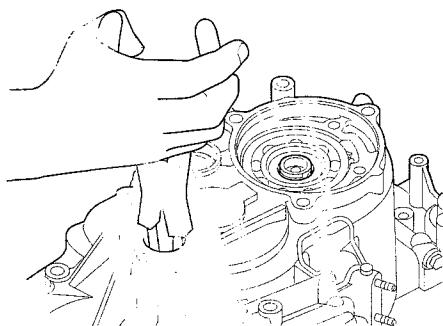
34. Place the transmission housing (D) on the torque converter housing.

35. Wrap a screwdriver tip with tape to prevent damage to the reverse idler gear teeth. Engage the reverse idler gear with the reverse gears by rotating the idler gear using a screwdriver.



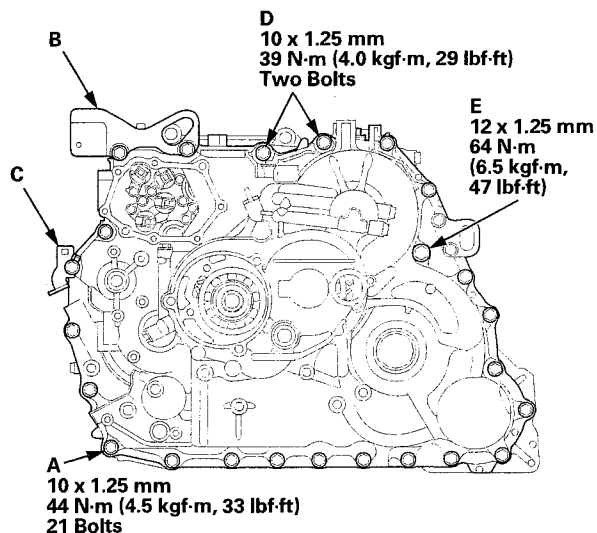


- 36 While expanding the snap ring of the countershaft bearing using snap ring pliers, install the transmission housing onto the bearing part-way. Then release snap ring pliers, and push down on the transmission housing until it bottoms and snap ring snaps into place in the transmission housing snap ring groove.

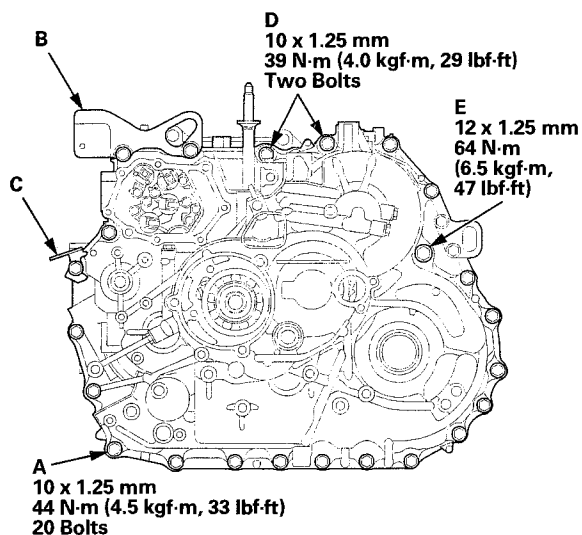


37. Install the transmission housing mounting bolts (A) along with the transmission hanger (B) and the ground terminal bracket (C), and tighten the bolts in at least two steps in a criss-cross pattern to 44 N·m (4.5 kgf·m, 33 lbf·ft).

With SH-AWD



Without SH-AWD



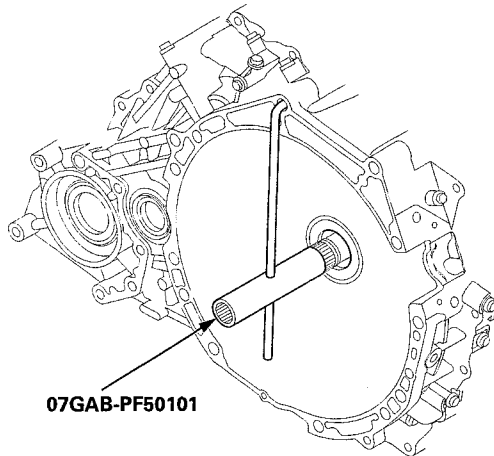
38. Install and tighten the two mounting bolts (D) to 39 N·m (4.0 kgf·m, 29 lbf·ft). Keep the mounting bolts free of grease or oil.
39. Install and tighten the 12 x 1.25 mm bolt (E) to 64 N·m (6.5 kgf·m, 47 lbf·ft).

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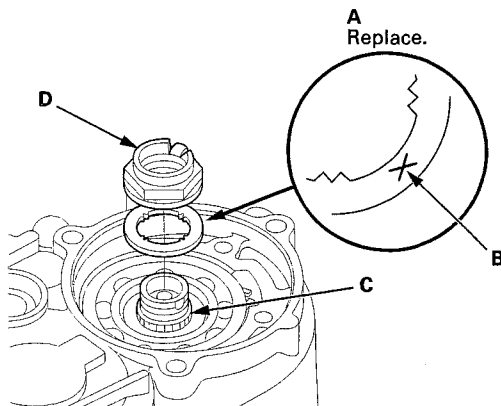
Automatic Transmission

Transmission Reassembly (cont'd)

40. Install the mainshaft holder onto the mainshaft.

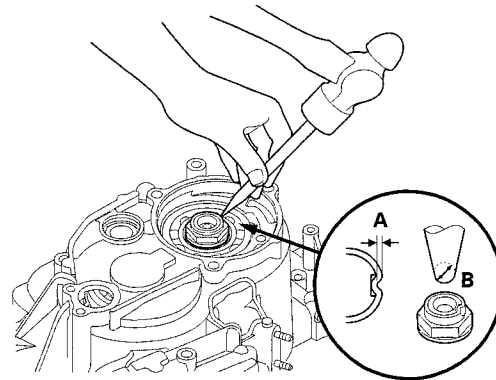


41. Install a new lock washer (A) with the marked side (B) up over the mainshaft (C), and apply ATF to surfaces of the lock washer and the old locknut (D).

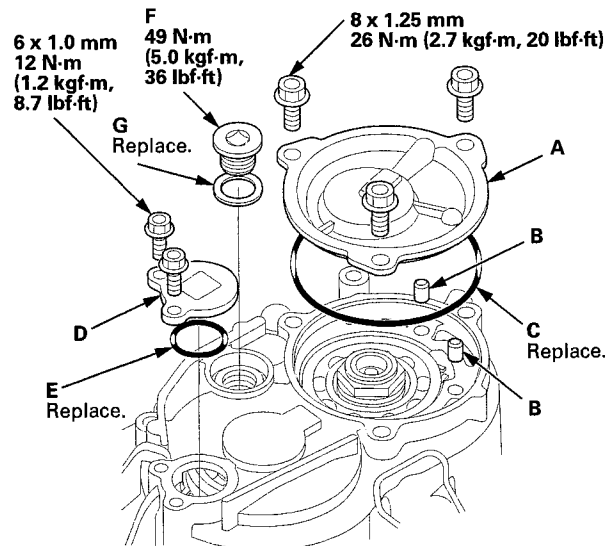


42. Install the old locknut, and tighten it to seat the lock washer to 178 N·m (18.2 kgf·m, 132 lbf·ft), then remove the old locknut.

43. Install a new locknut, and tighten it to 178 N·m (18.2 kgf·m, 132 lbf·ft), then stake the locknut to a depth (A) of 0.7–1.3 mm (0.03–0.05 in) using a 3.5 mm punch (B).



44. Install the end cover (A), the dowel pins (B), and a new O-ring (C).

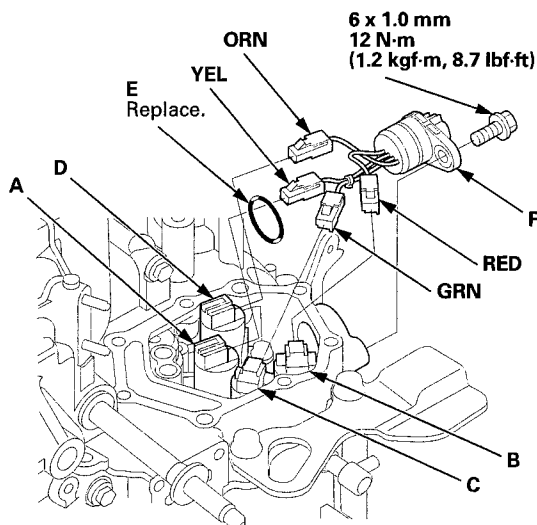


45. Install the snap ring cap (D) and a new O-ring (E).

46. Apply thread lock sealant to the threads of the sealing plug (F), and install the sealing plug and a new sealing washer (G).



47. Install a new O-ring (E) on the shift solenoid wire harness (F).



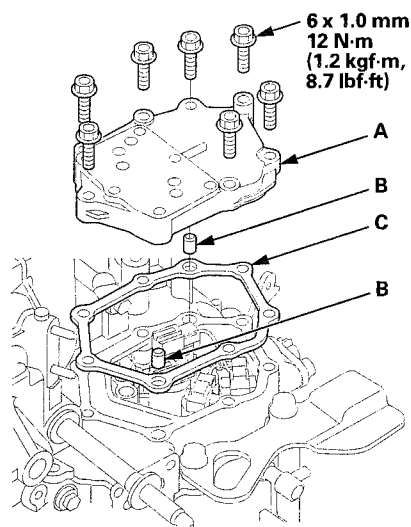
48. Route the shift solenoid wire harness through the transmission housing, and install the shift solenoid wire harness.

49. Connect the shift solenoid valve connectors to the shift solenoid valves:

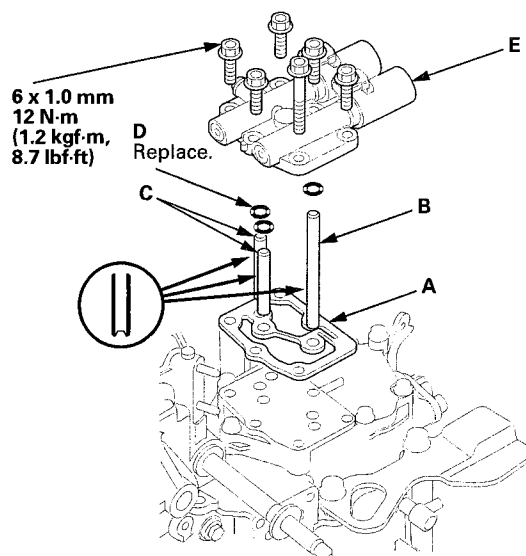
- YEL wire connector to shift solenoid valve A.
- RED wire connector to shift solenoid valve B.
- GRN wire connector to shift solenoid valve C.
- ORN wire connector to shift solenoid valve D.

50. Secure the shift solenoid wire harness with the bolt on the transmission housing.

51. Install the solenoid valve cover (A) with the two dowel pins (B) and a new gasket (C), and secure it with the seven bolts.



52. Place a new gasket (A) on the solenoid valve cover, then install the 8 x 102.8 mm ATF feed pipe (B) and the 8 x 55.3 mm pipes (C) with the filter end in the transmission housing.



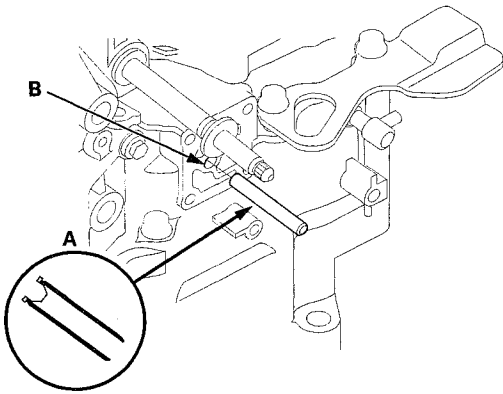
53. Install new O-rings (D) over the ATF feed pipes, and install the A/T clutch pressure control solenoid valves A and B (E).

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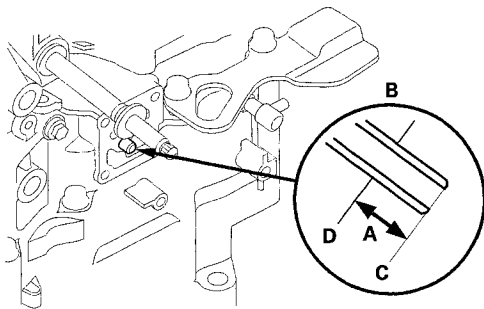
Automatic Transmission

Transmission Reassembly (cont'd)

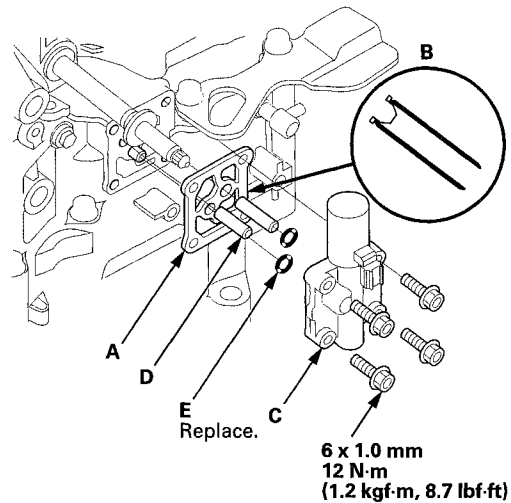
54. Install the 8 x 53 mm ATF joint pipe (A) with the filter end into its mounting hole (B).



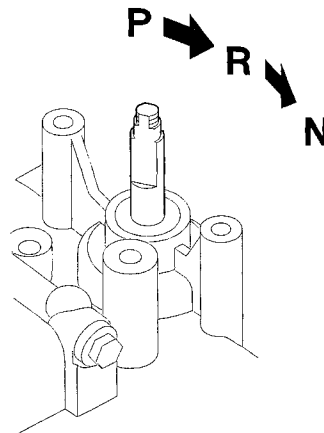
55. Check the height (A) of the 8 x 53 mm ATF joint pipe (B) between the top (C) of the pipe and the solenoid valve body mounting surface (D). The height is about 7.0 mm (0.28 in). If the height is over 7.0 mm (0.28 in), install the pipe securely until it stops the accumulator body.



56. Install a new gasket (A) on the transmission housing. Install the 8 x 36 mm ATF pipe (B) with the filter end in the transmission housing, and install the 8 x 25.2 mm ATF pipe (D).

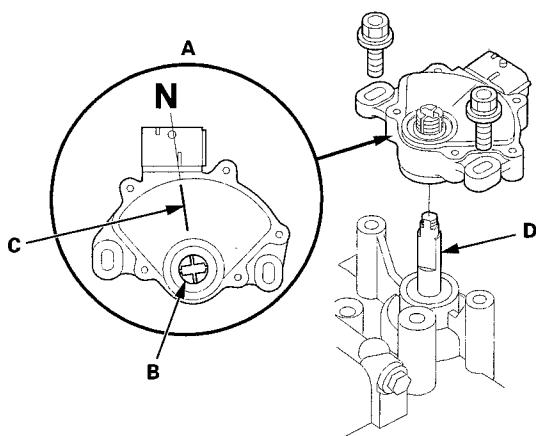


57. Install new O-rings (E) over the ATF joint pipes.
58. Install A/T clutch pressure control solenoid valve C.
59. With a 6.0 mm wrench, turn the selector control shaft fully counterclockwise (viewed from the shaft end) to the P position. Turn the selector control shaft back two click-stopped positions so that it is in the N position.



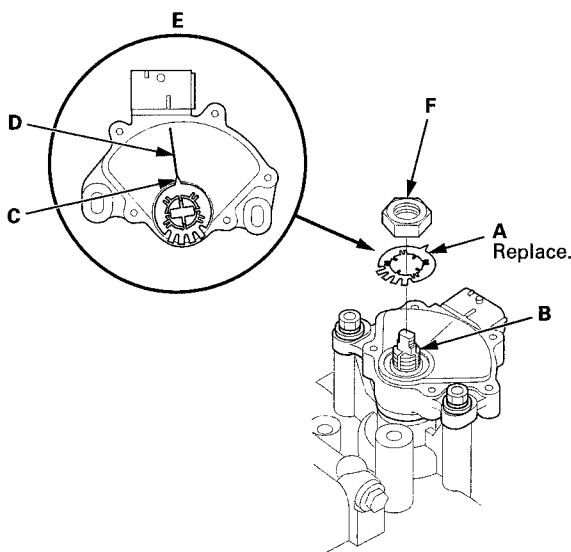


60. Set the transmission range switch (A) to the N position. The transmission range switch clicks in the N position, and the selector control shaft hole (B) aligns with the N positioning line (C).

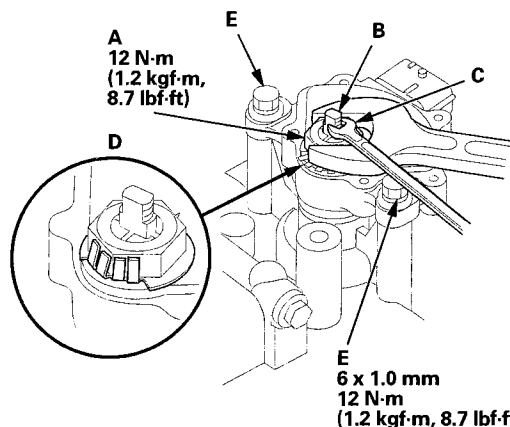


61. Install the transmission range switch gently over the selector control shaft (D), and install the bolts loosely.

62. Install a new lock washer (A) over the selector control shaft (B) by aligning the indicator tab (C) of the lock washer with the N positioning line (D) on the transmission range switch (E), and install the locknut (F).

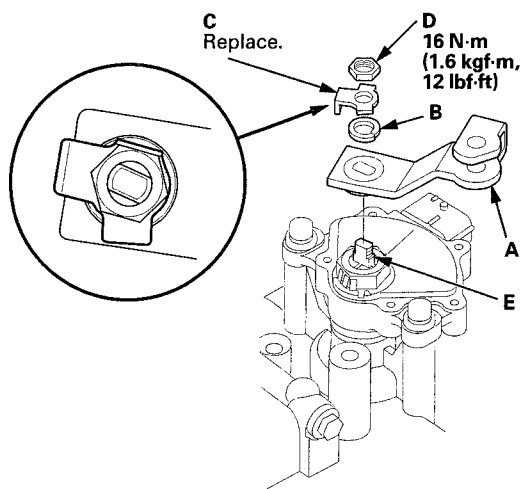


63. Push the locknut against the transmission housing to seat the transmission range switch into the selector control shaft, and tighten the locknut (A) to 12 N·m (1.2 kgf·m, 8.7 lbf·ft) while holding the selector control shaft (B) with a 6 mm wrench (C), then bend the lock tabs (D) against the locknut.



64. Tighten the bolts (E) securing the transmission range switch to 12 N·m (1.2 kgf·m, 8.7 lbf·ft).

65. Install the selector control lever (A), the spring washer (B), a new lock washer (C), and the locknut (D) on the selector control shaft (E). Bend the lock tab of the lock washer against the locknut.

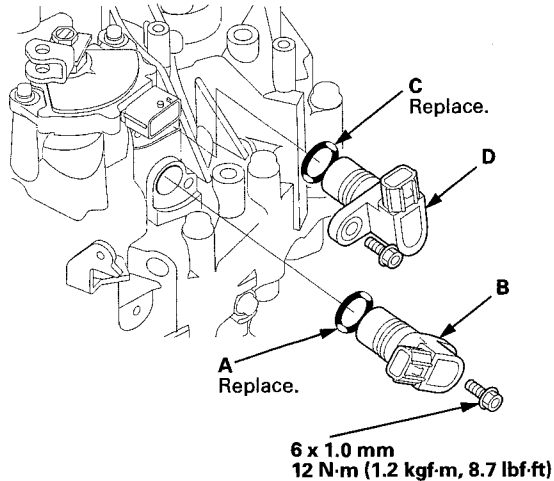


(cont'd)

Automatic Transmission

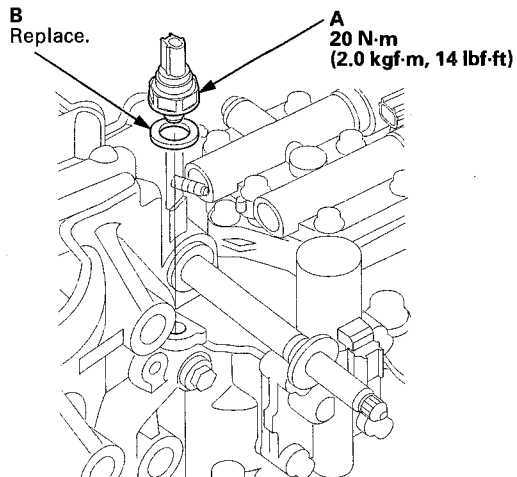
Transmission Reassembly (cont'd)

66. Install a new O-ring (A) on the input shaft (mainshaft) speed sensor (B), and install the input shaft (mainshaft) speed sensor.

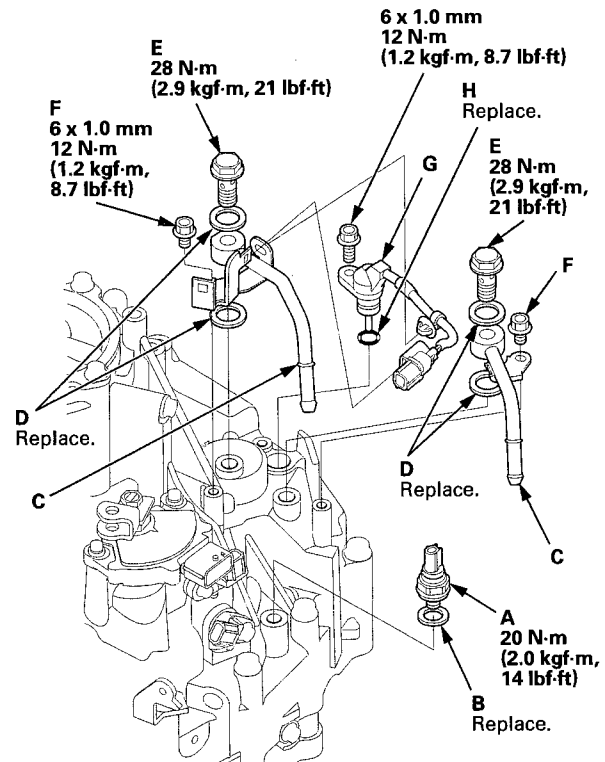


67. Install a new O-ring (C) on the output shaft (countershaft) speed sensor (D), and install the output shaft (countershaft) speed sensor.

68. Install the 4th clutch transmission fluid pressure switch (A) with a new sealing washer (B). Tighten the switch by gripping the metal part, not the plastic part.



69. Install the transmission fluid pressure switch B (3rd clutch) (A) with a new sealing washer (B). Tighten the switch by gripping the metal part, not the plastic part.



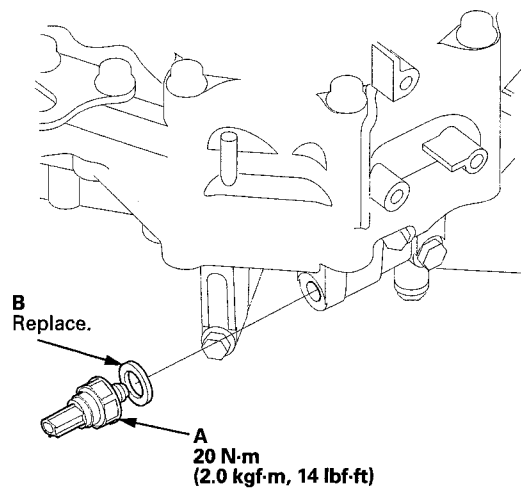
70. Install the ATF cooler lines (C) with new sealing washers (D) and the line bolts (E).

71. Secure the ATF cooler lines with the 6.0 mm bolts (F). Tighten the bolts to 12 N·m (1.2 kgf·m, 8.7 lbf·ft).

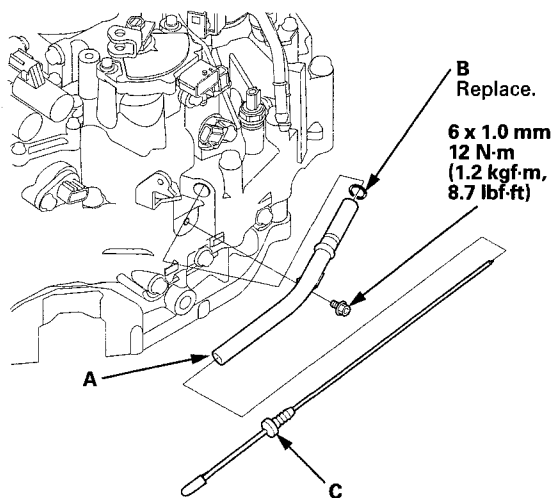
72. Install the ATF temperature sensor (G) with a new O-ring (H). Install the harness clamp on the clamp bracket, and install the connector on the connector bracket.



73. Install the transmission fluid pressure switch A (2nd clutch) (A) with a new sealing washer (B). Tighten the switch by gripping the metal part, not the plastic part.



74. Install the ATF dipstick guide tube (A) with a new O-ring (B).

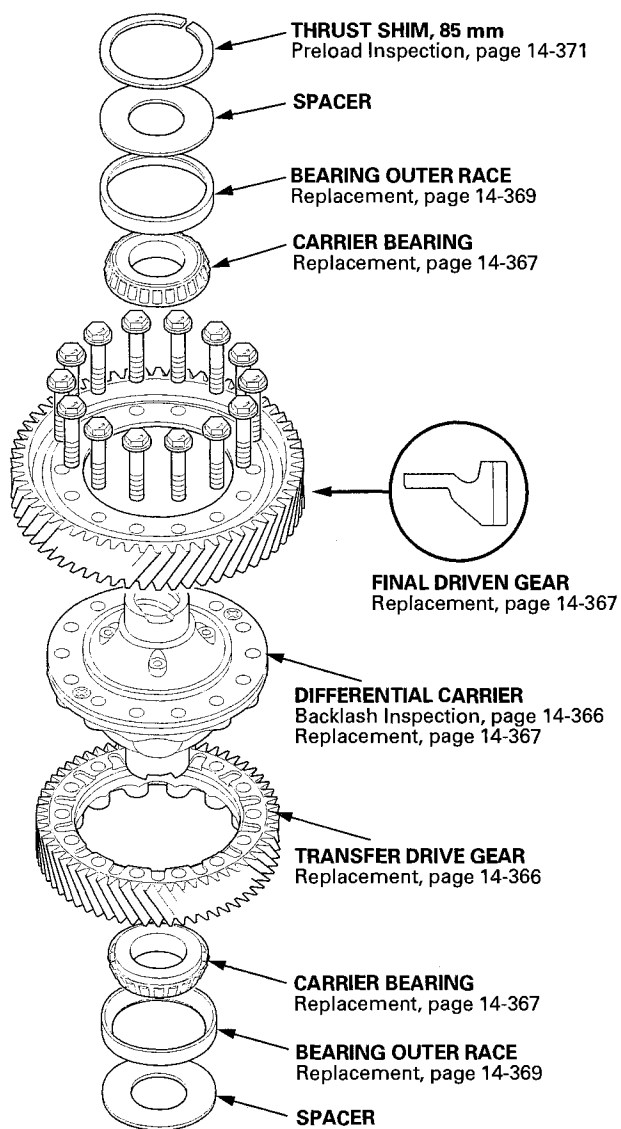


75. Install the ATF dipstick (C) in the guide tube.

A/T Differential

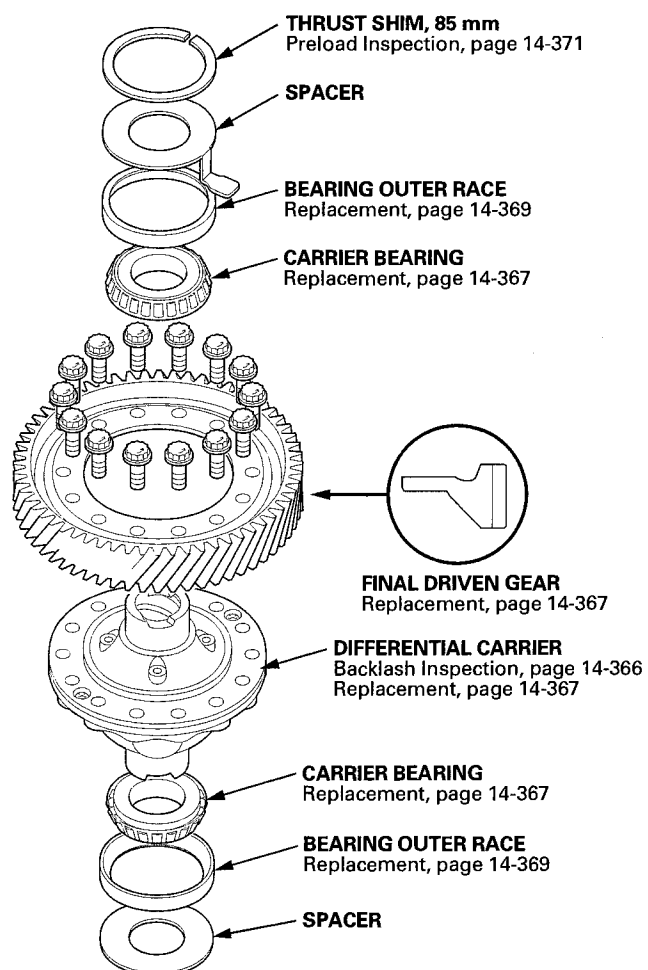
Component Location Index

With SH-AWD





Without SH-AWD

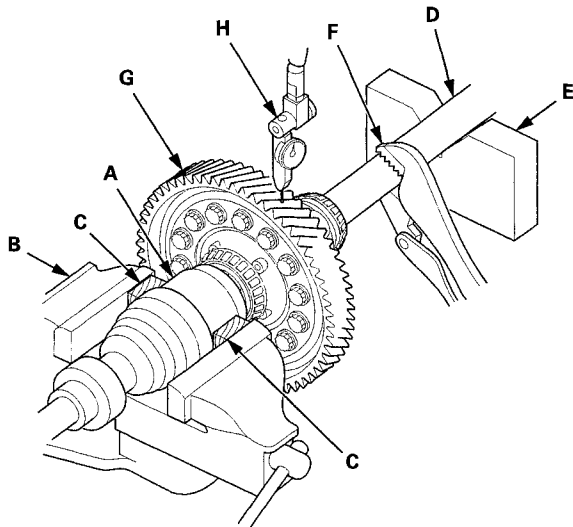


A/T Differential

Backlash Inspection

NOTE: To prevent damage to the inboard joint, always use soft jaws or equivalent materials between the inboard joint and a vise.

1. Install the driveshaft and the intermediate shaft into the differential assembly.
2. Secure the driveshaft inboard joint (A) in a bench vise (B) with soft jaws (C).



3. Place the intermediate shaft (D) on a V-block (E), then hold the intermediate shaft using locking pliers (F).
4. Measure the backlash of the final driven gear (G) using a dial indicator (H).

Standard: 1.4–2.0 mm (0.055–0.079 in)

- If the backlash is within the standard, go to step 5.
- If the backlash is out of the standard, replace the differential assembly.

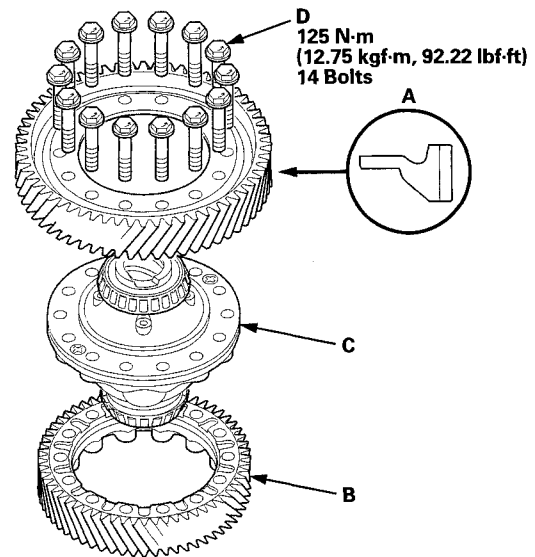
5. Remove the driveshaft inboard joint from the bench vise.
6. Remove the driveshaft and the intermediate shaft from the differential assembly.

Differential Carrier, Final Driven Gear, and Transfer Drive Gear Replacement

NOTE: Inspect and adjust the bearing preload whenever the carrier is replaced.

1. Remove the final driven gear (A) and the transfer drive gear (B) from the differential carrier (C).

NOTE: The final driven gear bolts (D) have left-hand threads.



2. Install the final driven gear on the differential carrier in the direction shown.
3. Install the bolts through the differential carrier to the transfer drive gear.
4. Tighten the bolts to the specified torque in a crisscross pattern in at least two steps.

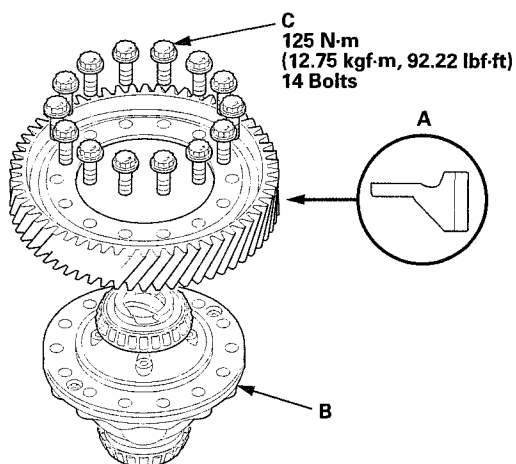


Differential Carrier and Final Driven Gear Replacement

NOTE: Inspect and adjust the carrier bearing preload whenever the differential carrier is replaced.

1. Remove the final driven gear (A) from the differential carrier (B).

NOTE: The final driven gear bolts (C) have left-hand threads.



2. Install the final driven gear on the differential carrier in the direction shown.
3. Tighten the bolts to the specified torque in a crisscross pattern in at least two steps.

Carrier Bearing Replacement

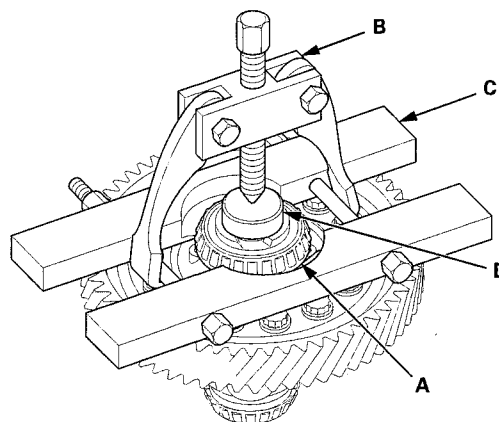
Special Tools Required

Attachment, 45 x 55 mm 07MAD-PR90100

NOTE:

- The bearing and the outer race should be replaced as a set.
- Inspect and adjust the carrier bearing preload whenever the bearing is replaced.
- Check the bearing for wear and rough rotation. If the bearing is OK, removal is not necessary.

1. Remove the carrier bearing (A) with a commercially available bearing puller (B), a bearing separator (C), and a spacer (D).



(cont'd)

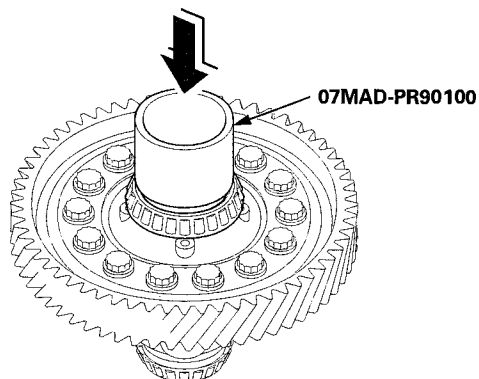
A/T Differential

Carrier Bearing Replacement (cont'd)

2. Install new carrier bearings using the 45 x 55 mm attachment and a press.

NOTE:

- Press the bearing on until it bottoms.
- Use the small end of the 45 x 55 mm attachment to install the bearings.
- Press the bearing on securely so there is no clearance between the bearing and the differential carrier.

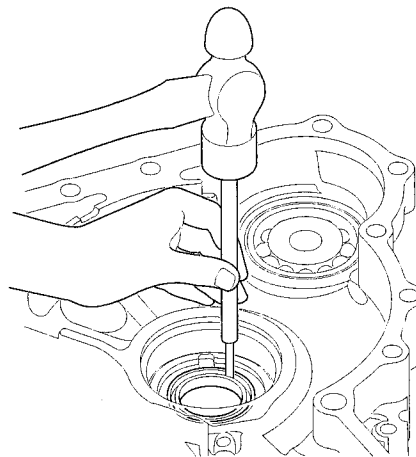


Oil Seal Replacement

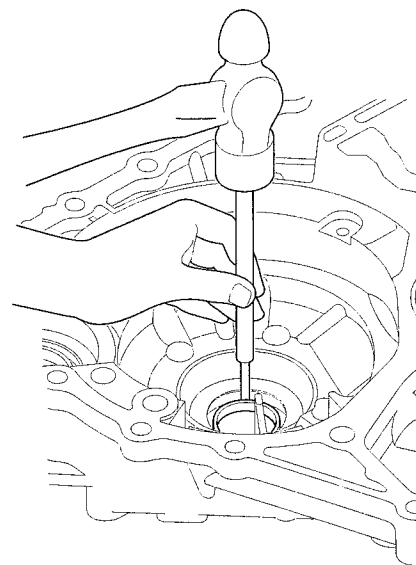
Special Tools Required

- Driver Handle, 15 x 135L 07749-0010000
- Oil Seal Driver Attachment 07GAD-PG40100
- Oil Seal Driver Attachment, 58 mm 07JAD-PH80101

1. Remove the oil seal from the transmission housing.

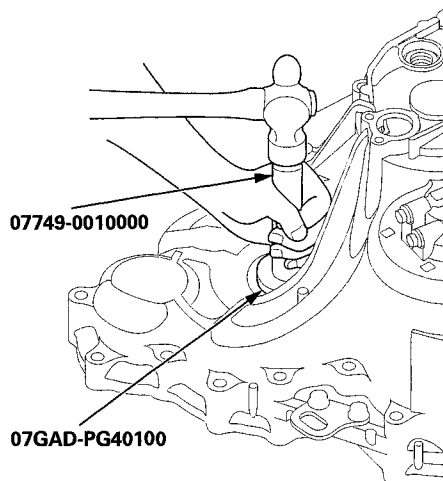


2. Remove the oil seal from the torque converter housing.

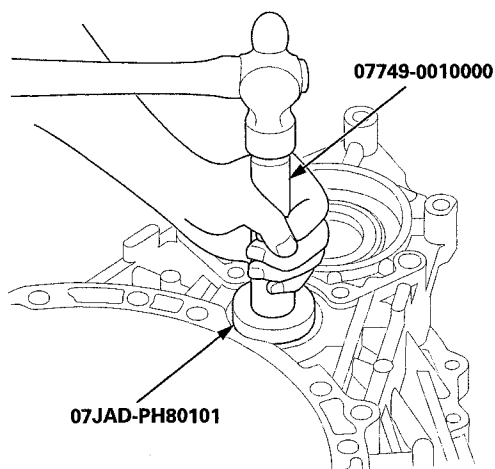




3. Install a new oil seal flush with the transmission housing using the driver handle and the oil seal driver attachment.



4. Install a new oil seal flush with the torque converter housing using the driver handle and the 58 mm oil seal driver attachment.



Carrier Bearing Outer Race Replacement

Special Tools Required

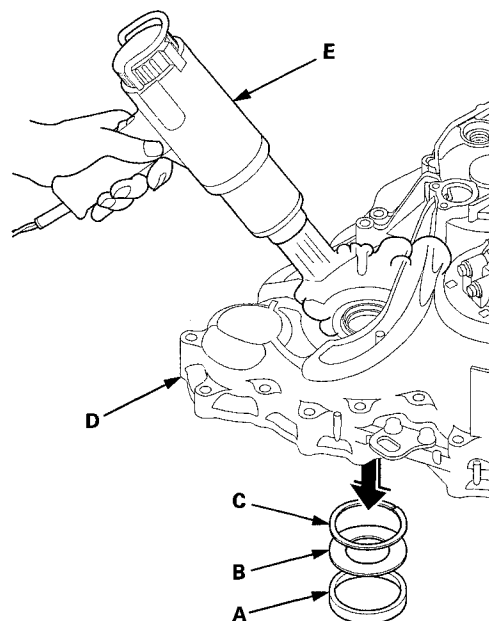
- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 83 mm 07HAD-SG00100
- Attachment, 78 x 90 mm 07GAD-SD40101

NOTE:

- Replace the tapered roller bearing with a new one whenever the bearing outer race is replaced.
- Do not use the shim(s) from the torque converter housing side.
- Adjust the preload after replacing the bearing and the outer race.
- Coat all parts with ATF during installation.

1. Remove the bearing outer race (A), the spacer (B), and the 85 mm thrust shim (C) from the transmission housing (D) by heating the transmission housing to about 212 °F (100 °C) using a heat gun (E). Do not heat the transmission housing more than 212 °F (100 °C).

NOTE: Let the transmission housing cool to room temperature before installing a new bearing outer race.

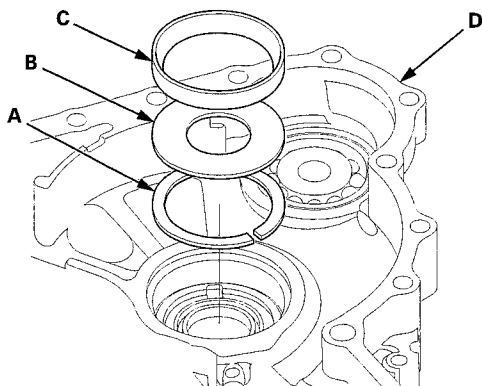


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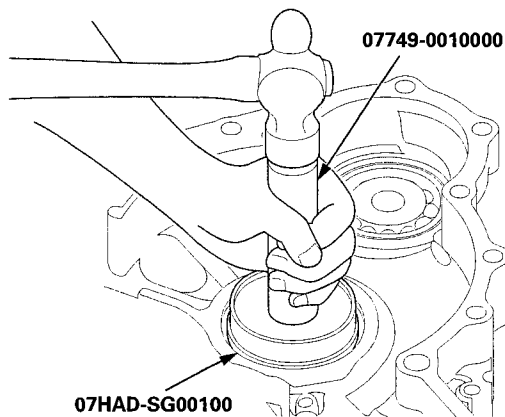
A/T Differential

Carrier Bearing Outer Race Replacement (cont'd)

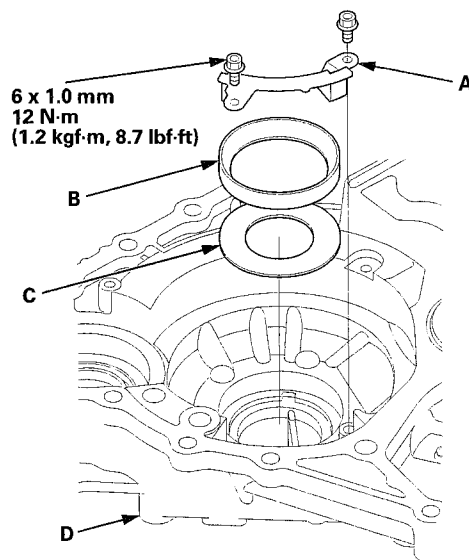
2. Install the 85 mm thrust shim (A), the spacer (B), and the bearing outer race (C) in the transmission housing (D).



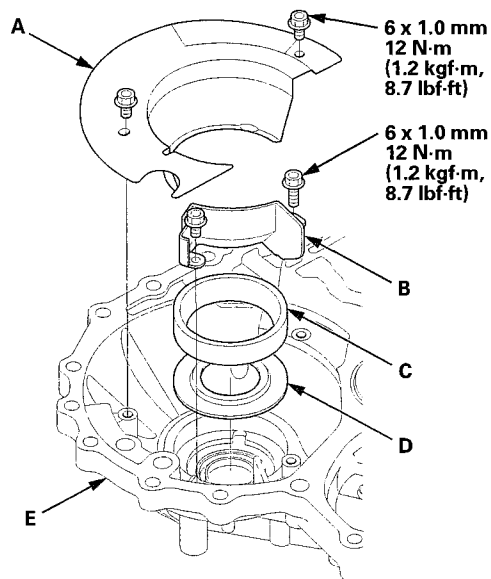
3. Using the driver handle and the 83 mm attachment, drive the bearing outer race securely into the transmission housing so there is no clearance between the bearing outer race, the spacer, the 85 mm thrust shim, and the transmission housing.



4. With SH-AWD: Remove the oil catch plate (A), and remove the bearing outer race (B) and the spacer (C) from the torque converter housing (D).



5. Without SH-AWD: Remove the baffle plate (A), the oil catch plate (B), and remove the bearing outer race (C) and the spacer (D) from the torque converter housing (E).

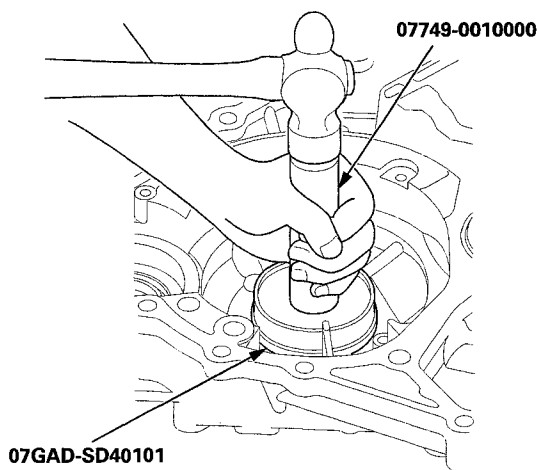


6. Install the spacer and a new bearing outer race in the torque converter housing.



Carrier Bearing Preload Inspection

7. Drive the bearing outer race securely in the torque converter housing using the driver handle and the 78 x 90 mm attachment.



8. Install the oil catch plate and the baffle plate (without SH-AWD) over the bearing outer race in the torque converter housing.

Special Tools Required

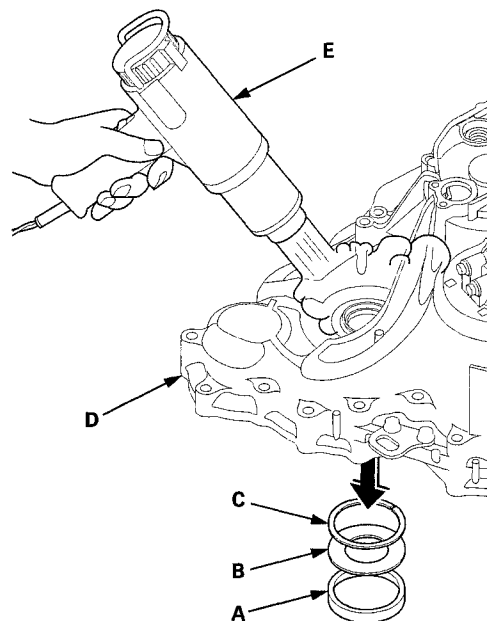
- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 83 mm 07HAD-SG00100
- Preload Inspection Tool 070AJ-0020101

NOTE:

- If the transmission housing, the torque converter housing, the differential carrier, the tapered roller bearing, the bearing outer race, or the 85 mm thrust shim were replaced, the bearing preload must be adjusted.
- Replace the tapered roller bearing when the bearing outer race is replaced.
- Do not use a shim on the torque converter housing side.
- Coat all parts with ATF during installation.

1. Remove the bearing outer race (A), the spacer (B), and the 85 mm thrust shim (C) from the transmission housing (D) by heating the transmission housing to about 212 °F (100 °C) using a heat gun (E). Do not heat the transmission housing more than 212 °F (100 °C).

NOTE: Let the transmission housing cool to room temperature before adjusting the bearing preload.

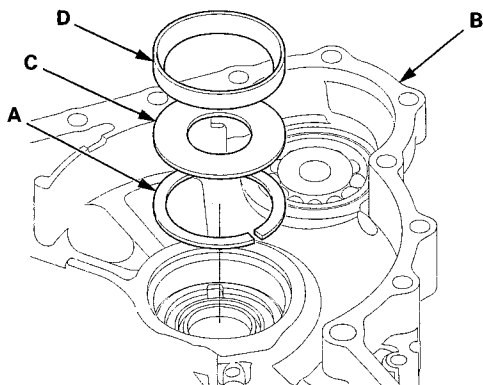


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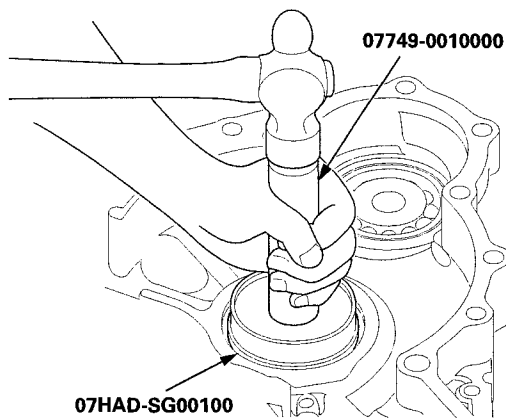
A/T Differential

Carrier Bearing Preload Inspection (cont'd)

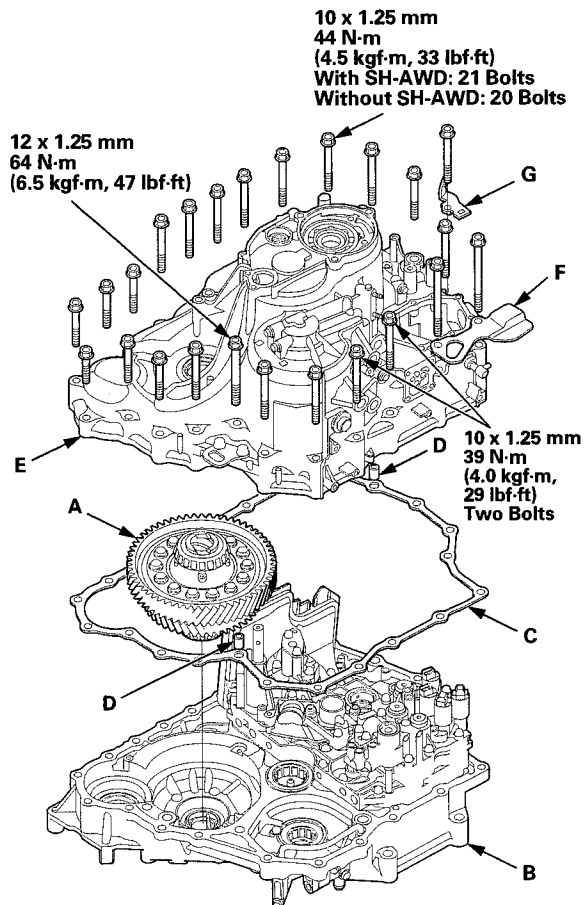
2. Install the 85 mm thrust shim (A) in the transmission housing (B). If you replace the 85 mm thrust shim with a new one, use the same thickness shim as the old one.



3. Install the spacer (C) and the bearing outer race (D) in the transmission housing.
4. Drive the bearing outer race securely in the transmission housing using the driver handle and the 83 mm attachment so there is no clearance between the bearing outer race, the spacer, the 85 mm thrust shim, and the transmission housing.



5. Install the differential assembly (A) in the torque converter housing (B), and install a new gasket (C) and the two dowel pins (D) on the torque converter housing.



6. Install the transmission housing (E), and install the mounting bolts (with SH-AWD: 24 bolts, without SH-AWD: 23 bolts) with the transmission hanger (F) and the ground terminal bracket (G), then tighten the bolts to the specified torque.
7. Rotate the differential assembly in both directions to seat the bearings.



8. Measure the starting torque of the differential assembly using a preload inspection tool, a torque wrench (A), and a socket (B). Measure the starting torque at normal room temperature in both directions.

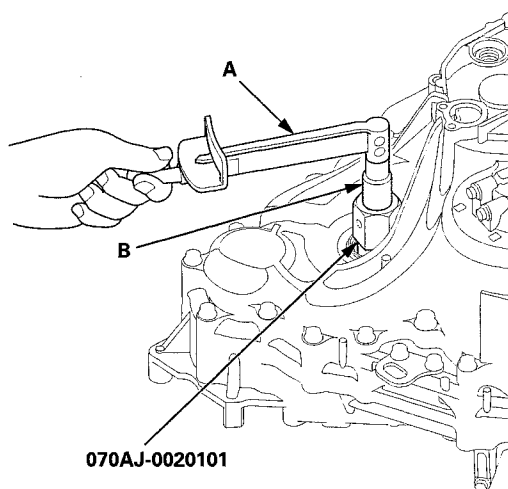
Standard

New Bearing:

3.9–5.1 N·m (40–52 kgf·cm, 35–45 lbf·in)

Reused Bearing:

3.6–4.8 N·m (37–49 kgf·cm, 32–43 lbf·in)



9. If the starting torque is out of the standard, remove the 85 mm thrust shim and select a new 85 mm thrust shim from the following table. Install a new 85 mm thrust shim, and recheck. To increase the starting torque, increase thickness of the 85 mm thrust shim. To decrease the starting torque, decrease the thickness of the 85 mm thrust shim.

Changing the 85 mm thrust shim to the next size will increase or decrease the starting torque about 0.5–0.6 N·m (5–6 kgf·cm, 5–5 lbf·in)

THRUST SHIM, 85 mm

No.	Thickness
A	1.350 mm (0.0531 in)
B	1.375 mm (0.0541 in)
C	1.400 mm (0.0551 in)
D	1.425 mm (0.0561 in)
E	1.450 mm (0.0571 in)
F	1.475 mm (0.0581 in)
G	1.500 mm (0.0591 in)
H	1.525 mm (0.0600 in)
I	1.550 mm (0.0610 in)
J	1.575 mm (0.0620 in)
K	1.600 mm (0.0630 in)
L	1.625 mm (0.0640 in)
M	1.650 mm (0.0650 in)
N	1.675 mm (0.0659 in)
O	1.700 mm (0.0669 in)
P	1.725 mm (0.0679 in)
Q	1.750 mm (0.0689 in)
R	1.775 mm (0.0699 in)
S	1.800 mm (0.0709 in)
T	1.825 mm (0.0719 in)
U	1.850 mm (0.0728 in)
V	1.875 mm (0.0738 in)
W	1.900 mm (0.0748 in)
X	1.925 mm (0.0758 in)
Y	1.950 mm (0.0768 in)
Z	1.975 mm (0.0778 in)

(cont'd)

(cont'd)

A/T Differential

Carrier Bearing Preload Inspection (cont'd)

THRUST SHIM, 85 mm (cont'd)

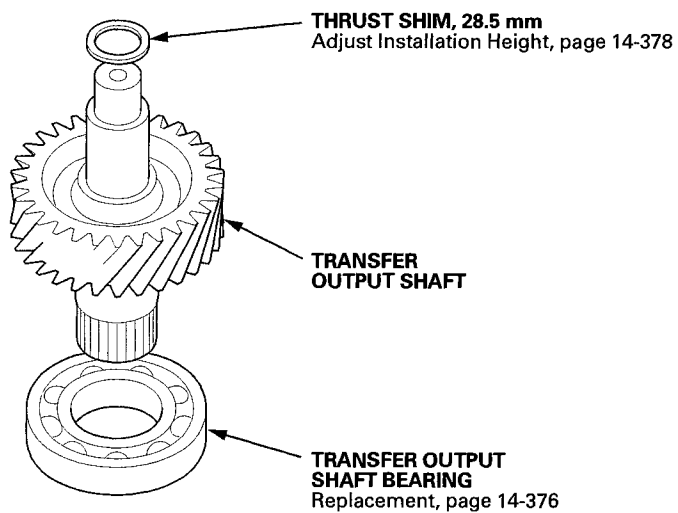
No.	Thickness
AA	2.000 mm (0.0787 in)
AB	2.025 mm (0.0797 in)
AC	2.050 mm (0.0807 in)
AD	2.075 mm (0.0817 in)
AE	2.100 mm (0.0827 in)
AF	2.125 mm (0.0837 in)
AG	2.150 mm (0.0846 in)
AH	2.175 mm (0.0856 in)
AI	2.200 mm (0.0866 in)
AJ	2.225 mm (0.0876 in)
AK	2.250 mm (0.0886 in)
AL	2.275 mm (0.0896 in)
AM	2.300 mm (0.0906 in)
AN	2.325 mm (0.0915 in)
AO	2.350 mm (0.0925 in)
AP	1.250 mm (0.0492 in)
AQ	1.275 mm (0.0502 in)
AR	1.300 mm (0.0512 in)
AS	1.325 mm (0.0522 in)

10. Install a new 85 mm thrust shim, then recheck the starting torque.

Transfer Output Shaft



Component Location Index



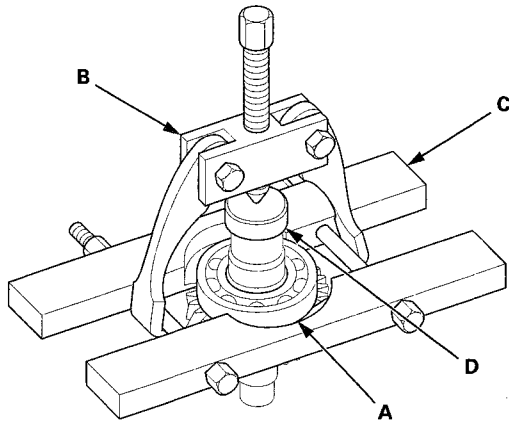
Transfer Output Shaft

Transfer Output Shaft Bearing Replacement

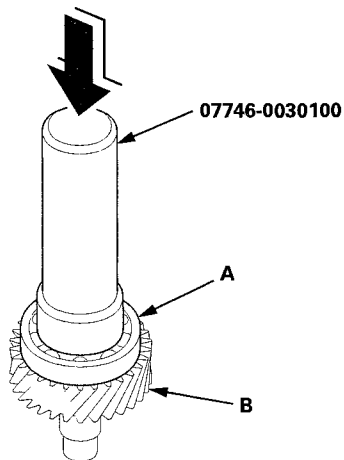
Special Tools Required

Driver Handle, 40 mm I.D. 07746-0030100

1. Remove the transfer output shaft bearing (A) using a commercially available puller (B), a bearing separator (C), and a spacer (D). Place the spacer between the transfer output shaft and the puller to prevent damaging the transfer output shaft.



2. Install a new bearing (A) on the transfer output shaft (B) using the 40 mm driver handle and a press.

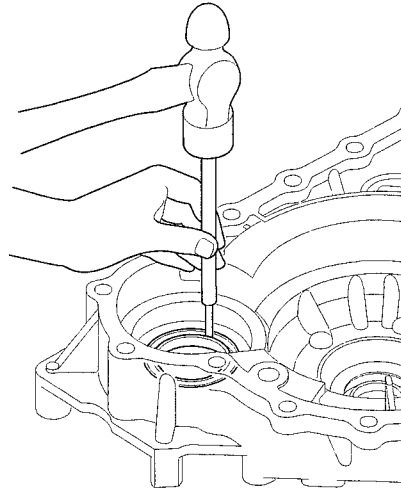


Oil Seal Replacement

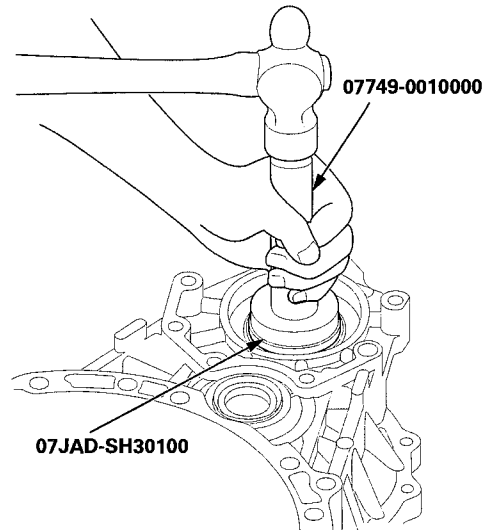
Special Tools Required

- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 65 mm 07JAD-SH30100

1. Remove the oil seal from the torque converter housing.



2. Install a new oil seal flush to the torque converter housing using the driver handle and the 65 mm attachment.



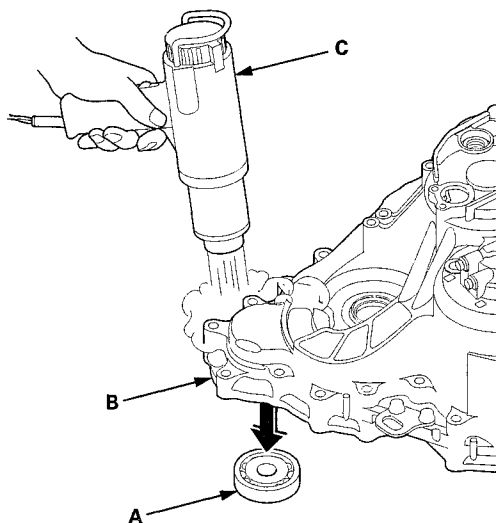


Transmission Housing Bearing Replacement

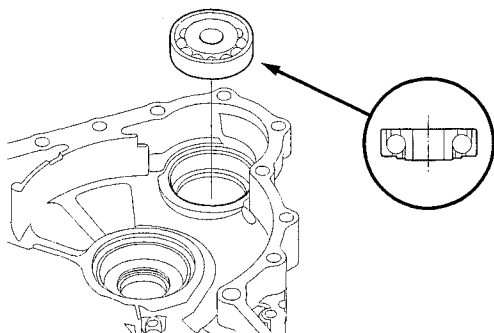
Special Tools Required

- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 72 x 75 mm 07746-0010600

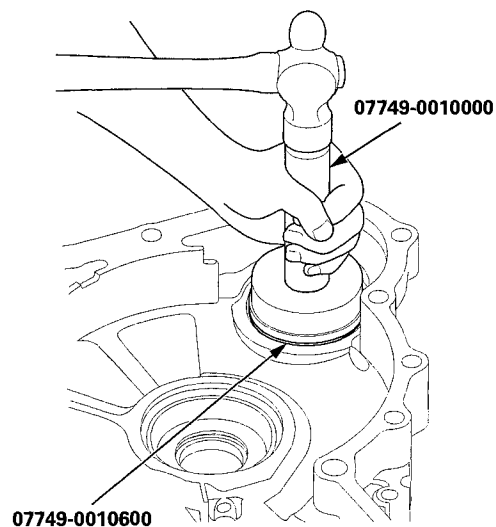
1. Remove the transfer output shaft bearing (A) from the transmission housing (B) by heating the transmission housing to about 212 °F (100 °C) using a heat gun (C). Do not heat the transmission housing more than 212 °F (100 °C).



2. Install a new bearing in the transmission housing in the direction shown.



3. Drive a new bearing until it bottoms in the housing using the driver handle and the 72 x 75 mm attachment.



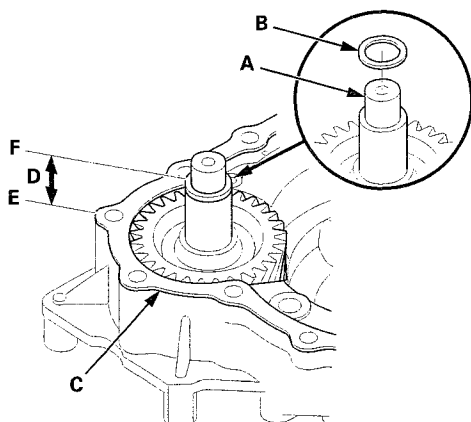
Transfer Output Shaft

Transfer Output Shaft Installation Height Inspection/Adjustment

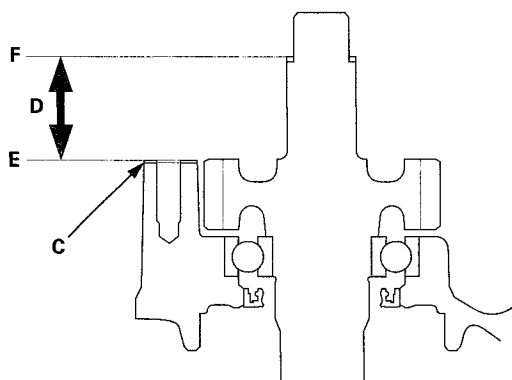
NOTE: If the transfer output shaft, transfer output shaft bearing, transmission housing bearing, transmission housing, or torque converter housing were replaced, adjust the transfer output shaft installation height with the 28.5 mm thrust shim.

1. Install the transfer output shaft (A) in the torque converter housing, and install the 28.5 mm thrust shim (B) on the top of the shaft. If you replace the 28.5 mm thrust shim with a new one, use the same thickness shim as the old one.

Standard: 46.31–46.35 mm (1.823–1.825 in)



Transfer Output Shaft Cutaway View



2. Install a new gasket (C) on the torque converter housing.
3. Measure the installed height (D) of the transfer output shaft between the surface (E) of the gasket and the top (F) of the 28.5 mm thrust shim in at least three places. Use the average as the actual height.

4. If the measurement is out of standard, remove the 28.5 mm thrust shim and measure its thickness.
5. Select and install a new thrust shim, then recheck the installation height.

THRUST SHIM, 28.5 mm

No.	Thickness
A	1.82 mm (0.0717 in)
B	1.84 mm (0.0724 in)
C	1.86 mm (0.0723 in)
D	1.88 mm (0.0740 in)
E	1.90 mm (0.0748 in)
F	1.92 mm (0.0756 in)
G	1.94 mm (0.0764 in)
H	1.96 mm (0.0772 in)
I	1.98 mm (0.0780 in)
J	2.00 mm (0.0787 in)
K	2.02 mm (0.0795 in)
L	2.04 mm (0.0803 in)
M	2.06 mm (0.0811 in)
N	2.08 mm (0.0819 in)
O	2.10 mm (0.0827 in)
P	2.12 mm (0.0835 in)
Q	2.14 mm (0.0843 in)
R	2.16 mm (0.0850 in)
S	2.18 mm (0.0858 in)
T	2.20 mm (0.0866 in)
U	2.22 mm (0.0874 in)
V	2.24 mm (0.0882 in)
W	2.26 mm (0.0890 in)
X	2.28 mm (0.0898 in)
Y	2.30 mm (0.0906 in)
Z	2.32 mm (0.0913 in)
AA	2.34 mm (0.0921 in)

Transfer Assembly

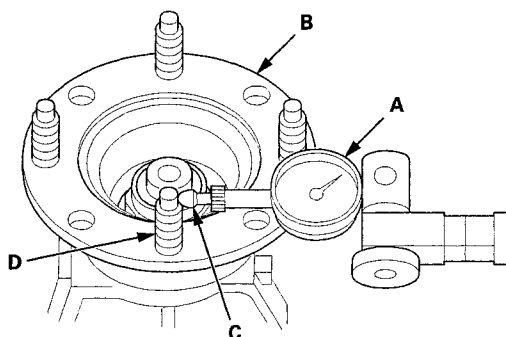


Inspection

NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and a vise.

Transfer Gear Backlash Measurement

1. Set a dial indicator (A) on the transfer companion flange (B); position the dial indicator tip (C) on the top of the bolt (D).

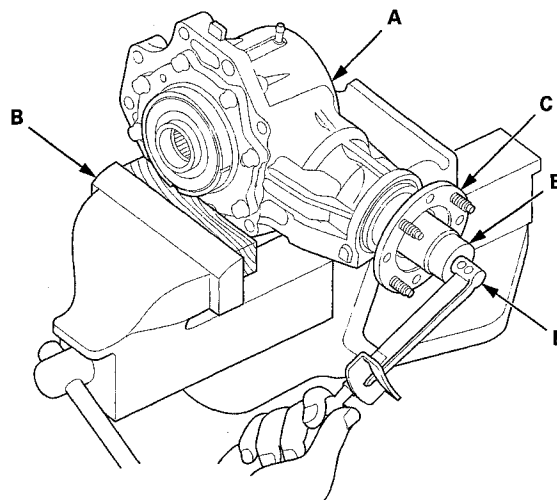


2. Measure the transfer gear backlash.

Standard: 0.06—0.16 mm (0.002—0.006 in)

Total Starting Torque Measurement

3. Secure the transfer housing (A) in a bench vise (B) with soft jaws.



4. Rotate the transfer companion flange several times to seat the tapered roller bearings.
5. Measure the starting torque at the companion flange (C) using a torque wrench (D) and a socket (E).

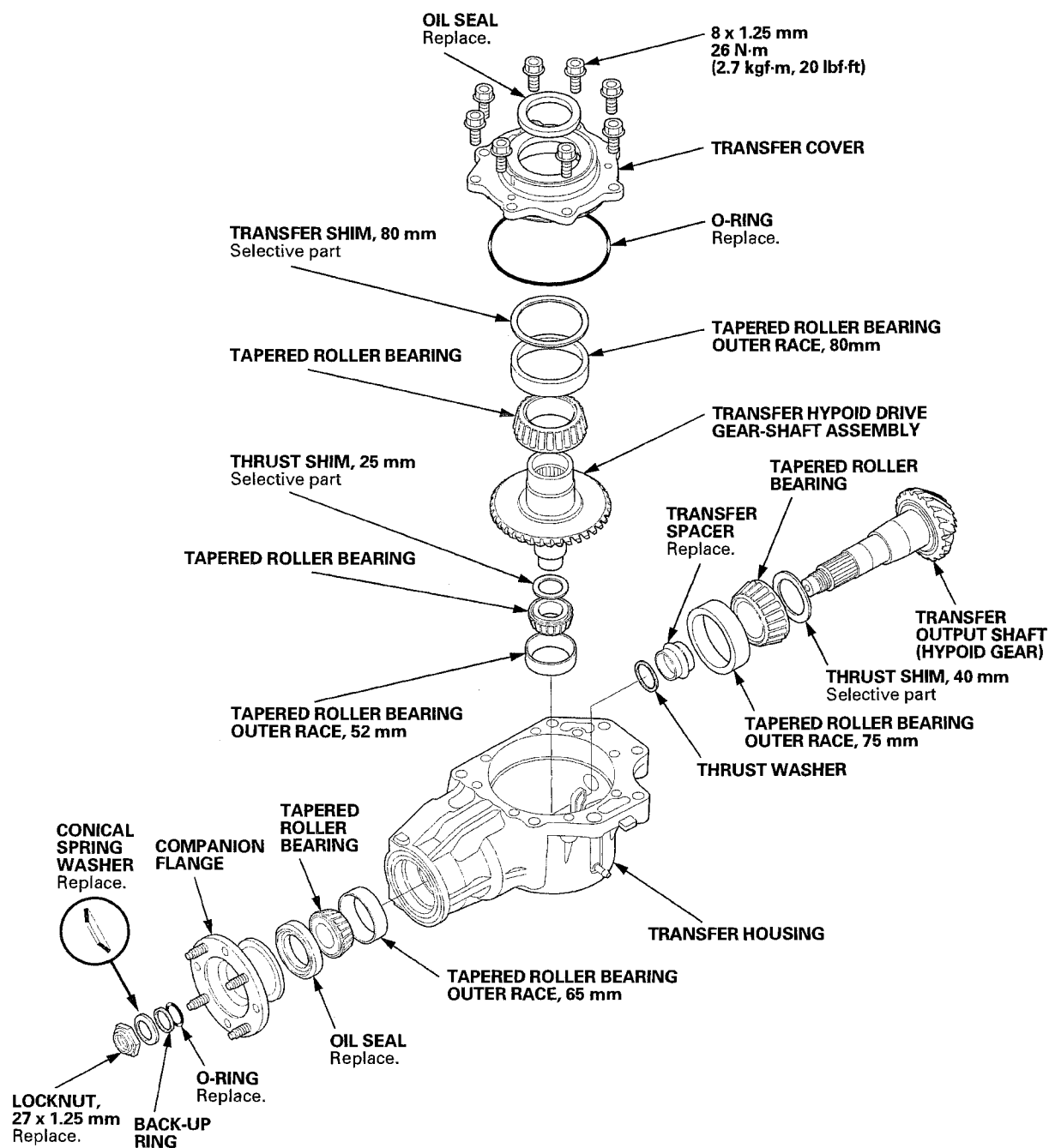
**Standard: 2.64—4.23 N·m
(26.9—43.1 kgf·cm, 23.3—37.4 lbf·in)**

6. If the starting torque is out of standard, disassemble the transfer assembly, and repair it.

Transfer Assembly

Disassembly

Exploded View



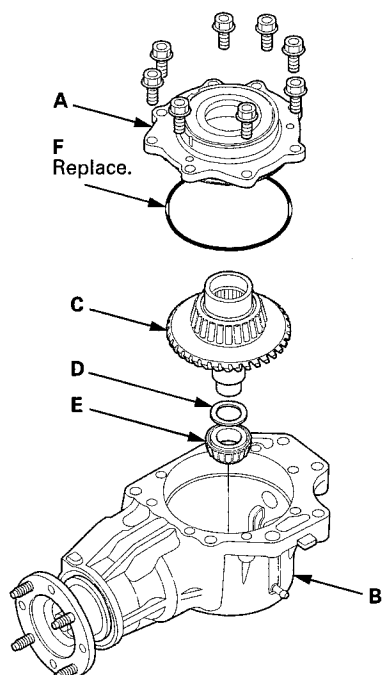


Special Tools Required

Flange Holder 07XAB-0010101

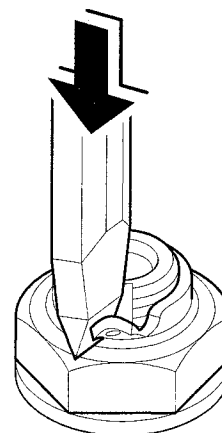
NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

1. Remove the transfer cover (A) from the transfer housing (B).

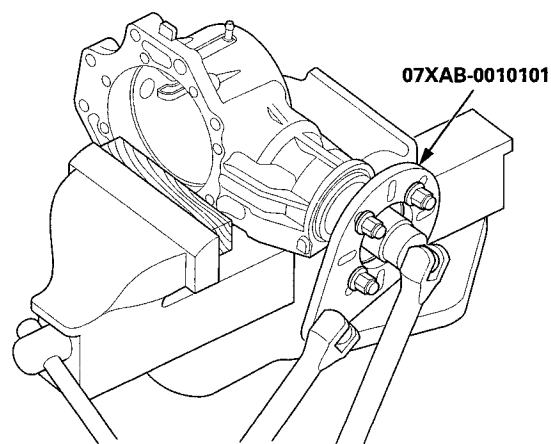


2. Remove the transfer hypoid drive gear/shaft assembly (C), 25 mm thrust shim (D), and the tapered roller bearing (E).
3. Remove the O-ring (F) from the transfer cover.
4. Drain the transfer fluid (hypoid gear oil) from the transfer housing.

5. Cut the lock tab on the locknut using a chisel.



6. Secure the transfer housing in a bench vise with soft jaws.



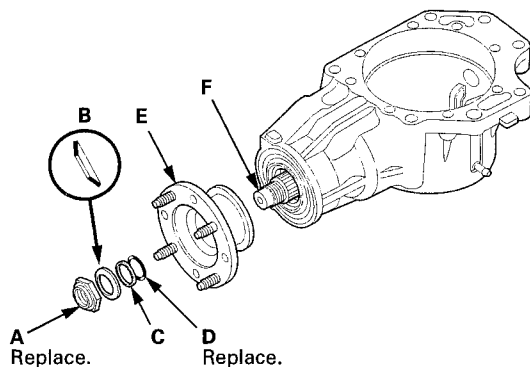
7. Install the flange holder on the companion flange, then loosen the locknut.
8. Remove the companion flange holder.

(cont'd)

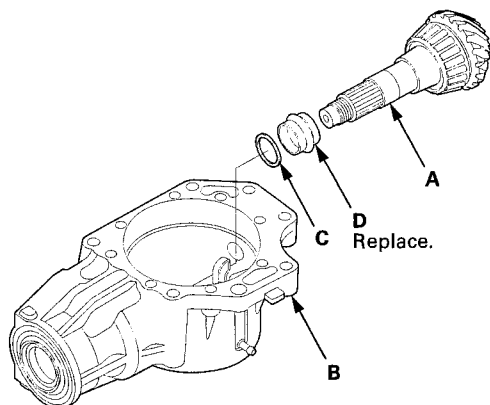
Transfer Assembly

Disassembly (cont'd)

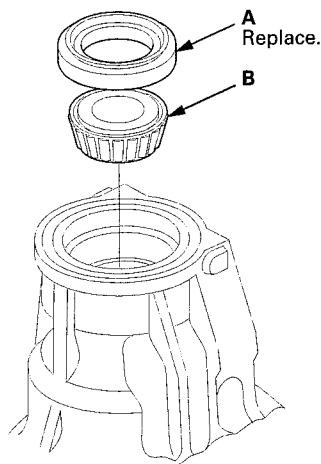
9. Remove the locknut (A), the conical spring washer (B), the back-up ring (C), the O-ring (D), and the companion flange (E) from the transfer output shaft (hypoid gear) (F).



10. Remove the transfer output shaft (hypoid gear) (A) from the transfer housing (B), then remove the thrust washer (C) and the transfer spacer (D) from the transfer output shaft (hypoid gear).



11. Remove the oil seal (A) and the tapered roller bearing (B) from the transfer housing.



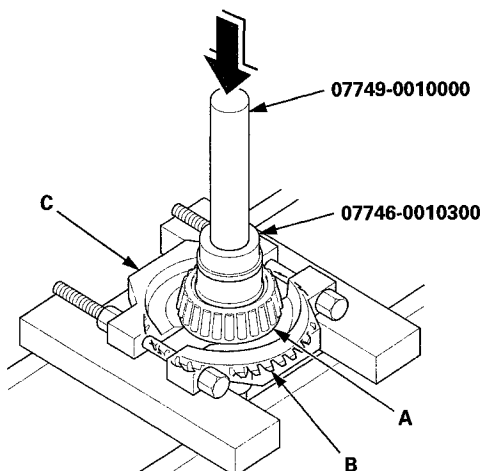


Transfer Hypoid Drive Gear Bearing Replacement

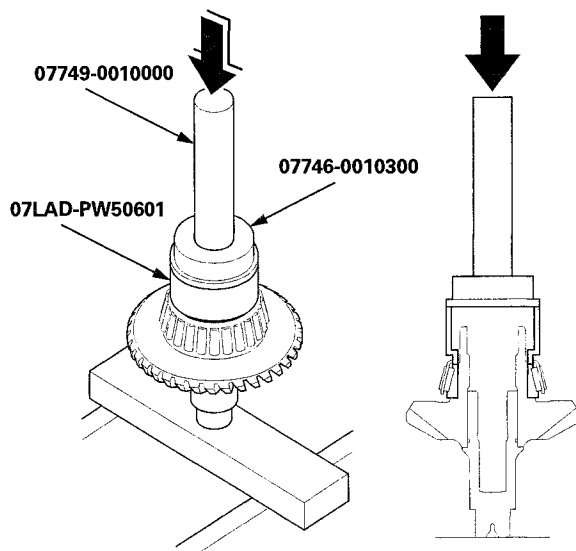
Special Tools Required

- Driver Handle, 15 x 135L 07749-0010000
- Bearing Driver Attachment, 42 x 47 mm 07746-0010300
- Attachment, 40 x 50 mm 07LAD-PW50601

1. Remove the tapered roller bearing (A) from the transfer hypoid drive gear (B) using the driver handle, the bearing driver 42 x 47 mm attachment, a bearing separator (C) and a press.



2. Install a new bearing on the transfer hypoid drive gear using the driver handle, the 40 x 50 mm attachment, and a press.

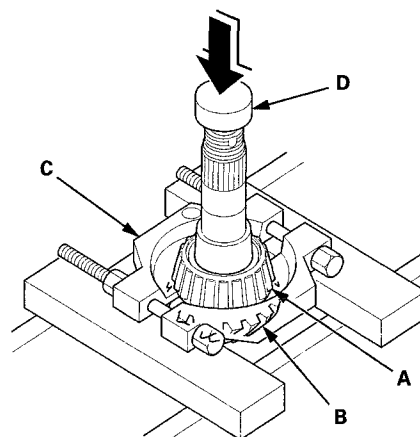


Transfer Output Shaft (Hypoid Gear) Bearing Removal/Installation

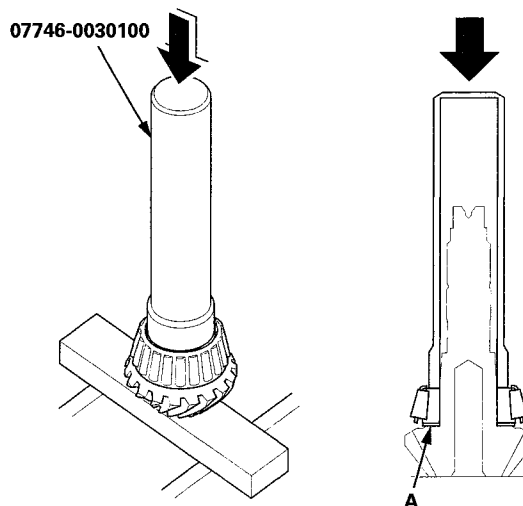
Special Tools Required

Driver Handle, 40 mm I.D. 07746-0030100

1. Remove the tapered roller bearing (A) from the transfer output shaft (hypoid gear) (B) using a bearing separator (C) and a press. Place a spacer (D) between the transfer output shaft and a press to prevent damaging the transfer output shaft.



2. Install the 40 mm thrust shim (A) over the transfer output shaft (hypoid gear).



3. Install the tapered roller bearing over the transfer output shaft (hypoid gear) using the 40 mm driver handle and a press.

Transfer Assembly

Transfer Housing Tapered Roller Bearing Outer Race Replacement

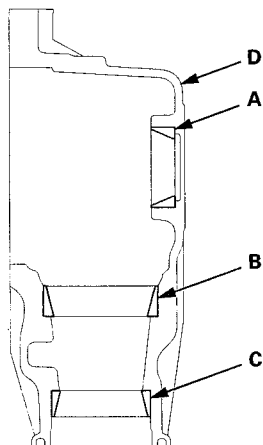
Special Tools Required

- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 52 x 55 mm 07746-0010400
- Attachment, 65 mm 07JAD-SH30100
- Tapered Bearing Race Installer A 07MAF-SP0011A
- Installer Shaft 07MAF-SP0013A

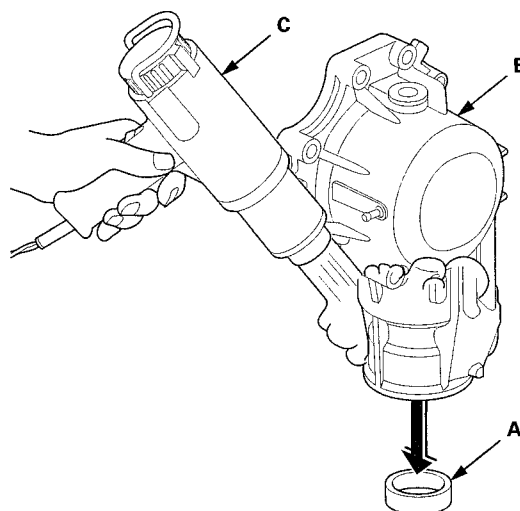
NOTE: Replace the tapered roller bearing with a new one whenever the tapered roller bearing outer race is replaced.

1. Remove the 52 mm tapered roller bearing outer race (A), the 75 mm tapered roller bearing outer race (B), and the 65 mm tapered roller bearing outer race (C) from the transfer housing (D).

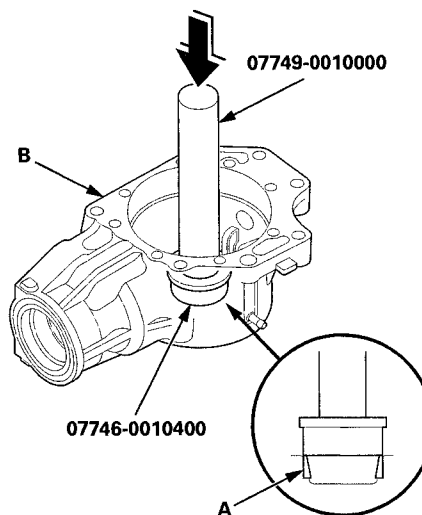
NOTE: Some tapered roller bearing outer races (52 mm, 65 mm, and 75 mm) are press-fitted in the transfer housing and must be removed by heating the transfer housing.



2. Remove the press-fitted tapered bearing outer race (A) from the transfer housing (B) by heating the transfer housing to about 212 °F (100 °C) using a heat gun (C). Do not heat the transfer housing more than 212 °F (100 °C).



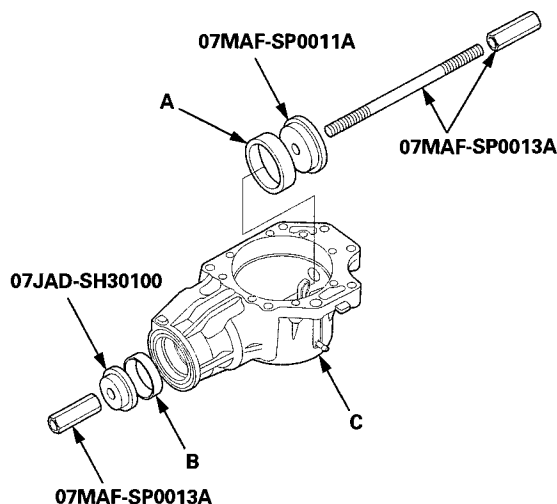
3. Install a new 52 mm tapered roller bearing outer race (A) until it bottoms in the transfer housing (B) using the driver handle and the 52 x 55 mm attachment.



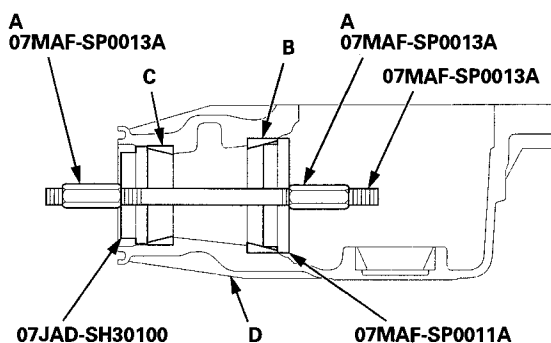


Transfer Cover Tapered Roller Bearing Outer Race Removal/Installation

4. Install a new 75 mm tapered roller bearing outer race (A) and a new 65 mm tapered roller bearing outer race (B) in the transfer housing (C), set the 65 mm attachment and the tapered bearing race installer A over the tapered roller bearing outer races, and install the installer shaft through the 65 mm attachment and installer.



5. Tighten the installer shaft nut (A) to install the tapered roller bearing outer races (B) (C) into the transfer housing (D) securely.

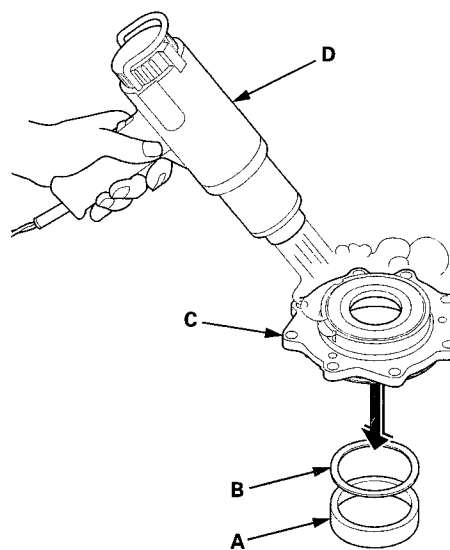


Special Tools Required

- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 78 x 80 mm 07NAD-PX40100

NOTE: Replace the tapered roller bearing with a new one whenever the tapered roller bearing outer race is replaced.

1. Remove the bearing outer race (A) and the 80 mm thrust shim (B) from the transfer cover (C). If the tapered roller bearing outer race is press-fitted, remove the tapered roller bearing outer race by heating the transfer cover to about 212 °F (100 °C) using a heat gun (D). Do not heat the transfer cover more than 212 °F (100 °C).

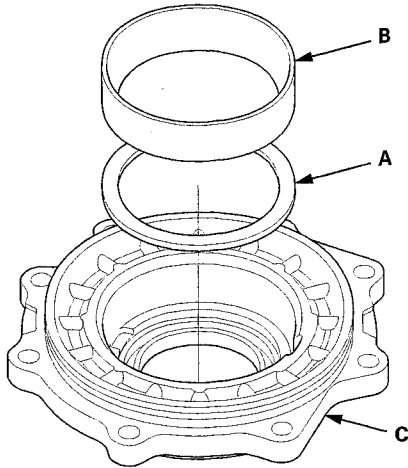


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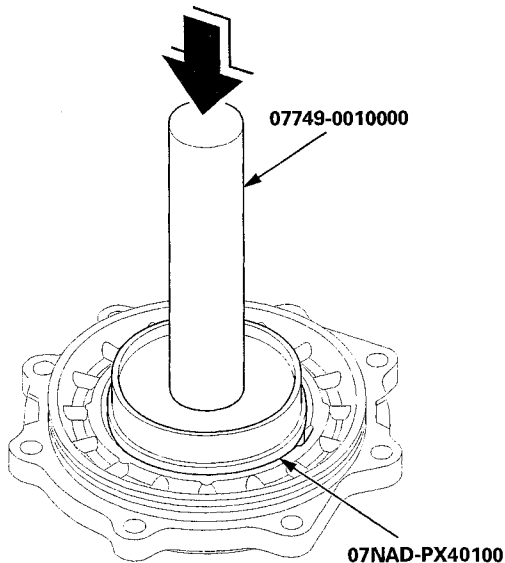
Transfer Assembly

Transfer Cover Tapered Roller Bearing Outer Race Removal/Installation (cont'd)

2. Install the 80 mm thrust shim (A) and the tapered roller bearing outer race (B) in the transfer cover (C).



3. Drive the tapered roller bearing outer race securely in the transfer cover using the driver handle and the 78 x 80 mm attachment so there is no clearance between the tapered roller bearing outer race, the 80 mm thrust shim, and the transfer cover.

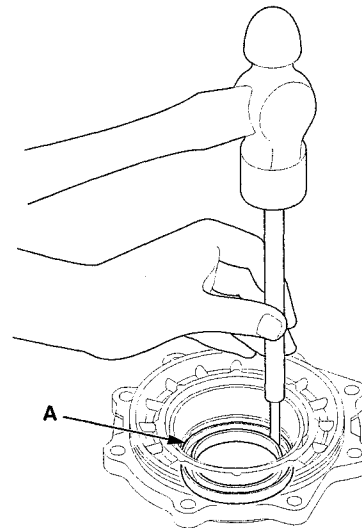


Transfer Cover Oil Seal Replacement

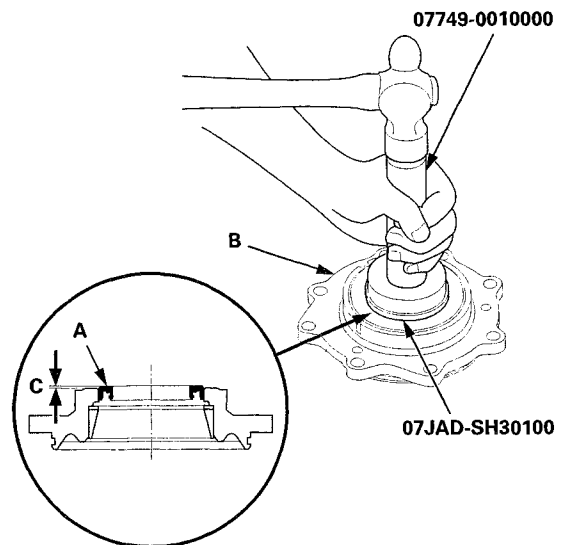
Special Tools Required

- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 65 mm 07JAD-SH30100

1. Remove the oil seal (A) from the transfer cover.



2. Install a new oil seal (A) in the transfer cover (B) to a height (C) of 0–1 mm (0–0.04 in) above the transfer cover surface using the driver handle and the 65 mm attachment.





Reassembly

Special Tools Required

- Driver Handle, 40 mm I.D. 07746-0030100
- Driver Handle, 15 x 135L 07749-0010000
- Attachment, 65 mm 07JAD-SH30100
- Flange Holder 07XAB-0010101
- Attachment, 78 x 80 mm 07NAD-PX40100

NOTE:

- While reassembling the transfer assembly:
 - Check and adjust the transfer gear tooth contact.
 - Measure and adjust the transfer gear backlash.
 - Check and adjust the tapered roller bearing starting torque.
- Coat all parts with transfer fluid (hypoid gear oil) during reassembly.
- Replace the tapered roller bearing and the tapered roller bearing outer race as a set if either part is replaced.
- Replace the transfer hypoid drive gear and the transfer output shaft (hypoid gear) as a set if either part is replaced.
- To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

1. Select the 40 mm thrust shim if the transfer output shaft (hypoid gear) is replaced. Calculate the thickness of the 40 mm thrust shim using the following formula, and select the shim from the following table.

FORMULA: $A/100 - B/100 + C = X$

A: Number on the existing transfer output shaft (hypoid gear)

B: Number on the replacement transfer output shaft (hypoid gear)

C: Thickness of the existing 40 mm thrust shim

X: Thickness needed for the replacement 40 mm thrust shim

NOTE: The number on the transfer output shaft (hypoid gear) is shown in 1/100 mm.

EXAMPLE

A: Existing transfer output shaft (hypoid gear)

Number = +2

B: Replacement transfer output shaft (hypoid gear)

Number = -1

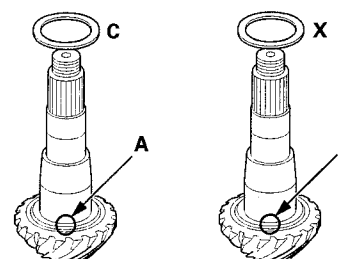
C: Existing 40 mm thrust shim

thickness = 1.05 mm

X: Replacement 40 mm thrust shim thickness

$$\begin{aligned} X &= A/100 - B/100 + C \\ &= 2/100 - (-1)/100 + 1.05 \\ &= 0.02 + 0.01 + 1.05 = 1.08 \text{ (mm)} \end{aligned}$$

Select No. M 40 mm thrust shim of 1.08 mm (0.043 in)



THRUST SHIM, 40 mm

Shim No.	Thickness
A	0.72 mm (0.028 in)
B	0.75 mm (0.030 in)
C	0.78 mm (0.031 in)
D	0.81 mm (0.032 in)
E	0.84 mm (0.033 in)
F	0.87 mm (0.034 in)
G	0.90 mm (0.035 in)
H	0.93 mm (0.037 in)
I	0.96 mm (0.038 in)
J	0.99 mm (0.039 in)
K	1.02 mm (0.040 in)
L	1.05 mm (0.041 in)
M	1.08 mm (0.043 in)
N	1.11 mm (0.044 in)
O	1.14 mm (0.045 in)

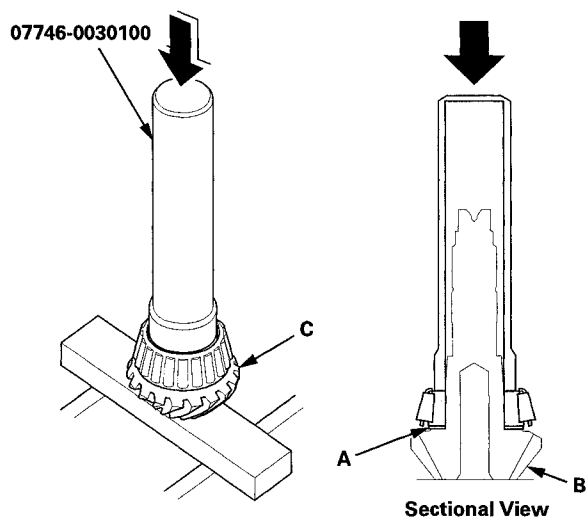
2. Select the 40 mm thrust shim if the tapered roller bearing on the transfer output shaft (hypoid gear) is replaced. Measure the thickness of the replacement bearing and the existing bearing, and calculate the difference of the bearing thickness. Adjust the thickness of the existing 40 mm thrust shim by the amount of difference in bearing thickness, and select the replacement 40 mm thrust shim.

(cont'd)

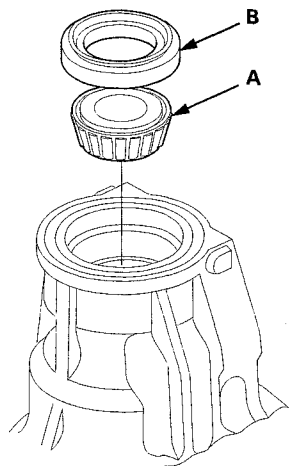
Transfer Assembly

Reassembly (cont'd)

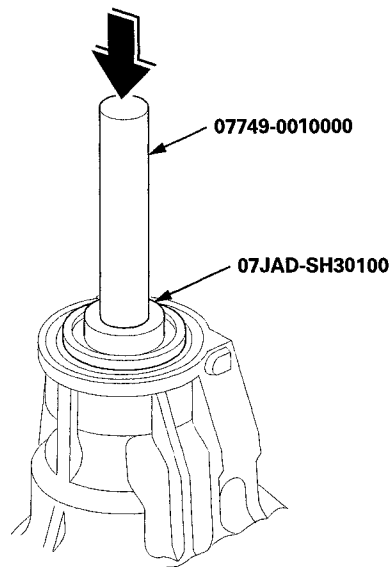
3. Install the 40 mm thrust shim (A) on the transfer output shaft (hypoid gear) (B), then install the tapered roller bearing (C) using the 40 mm driver handle and a press.



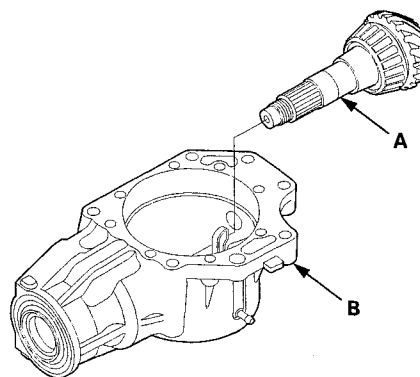
4. Place the tapered roller bearing (A) on the tapered roller bearing outer race of the companion flange side of the transfer housing, and install a new oil seal (B).



5. Drive the oil seal securely in the transfer housing using the driver handle and the 65 mm attachment.

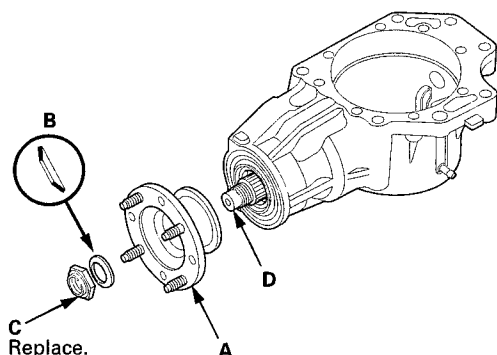


6. Install the transfer output shaft (hypoid gear) (A) in the transfer housing (B). Do not install the transfer spacer and the thrust washer on the transfer output shaft (hypoid gear).

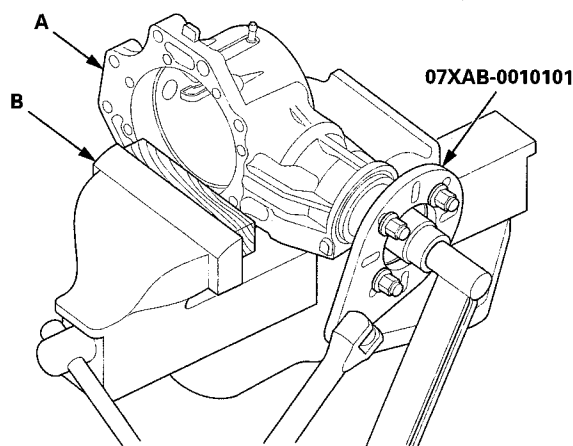




7. Install the companion flange (A), the conical spring washer (B) (in the direction shown), and a new locknut (C) on the transfer output shaft (hypoid gear) (D). Do not install the O-ring and the back-up ring.



8. Secure the transfer housing (A) in a bench vise (B) with soft jaws.

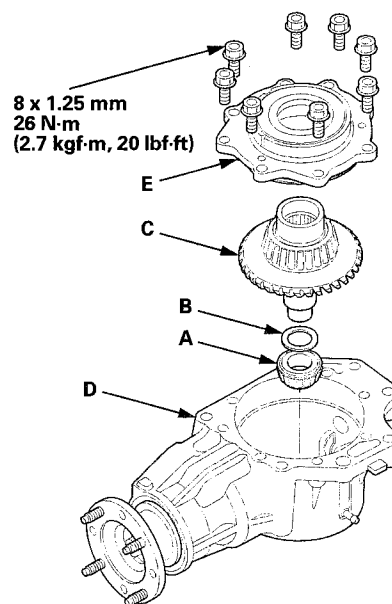


9. Install the flange holder on the companion flange.
10. Tighten the locknut while measuring the starting torque of the transfer output shaft (hypoid gear) so the starting torque is within 1.15–1.71 N·m (11.7–17.4 kgf·cm, 10.2–15.1 lbf·in). Do not stake the locknut in this step.

11. Remove the flange holder.

12. Apply Prussian Blue to both sides of the transfer hypoid drive gear teeth lightly and evenly.

13. Install the tapered roller bearing (A), the 25 mm thrust shim (B), and the transfer drive gear-shaft assembly (C) in the transfer housing (D).



14. Install the transfer cover (E), and secure it with the bolts. Do not install the O-ring on the transfer cover.

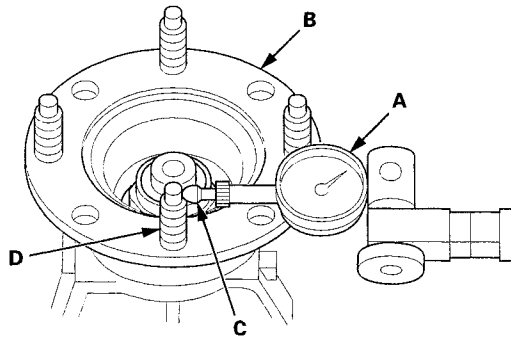
15. Rotate the companion flange in both directions until the transfer gears rotate one full turn in both directions.

(cont'd)

Transfer Assembly

Reassembly (cont'd)

16. Set a dial indicator (A) on the transfer companion flange (B); position the dial indicator tip (C) on the top of the bolt (D).

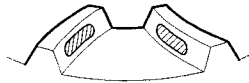


17. Measure transfer gear backlash.

Standard: 0.06—0.16 mm (0.002—0.006 in)

18. Remove the transfer cover and the transfer hypoid drive gear/shaft assembly, and check the transfer hypoid drive gear tooth contact pattern.

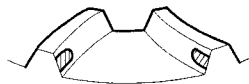
CORRECT TOOTH CONTACT PATTERN



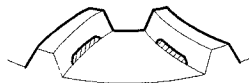
INCORRECT TOOTH CONTACT PATTERN



TOE CONTACT



HEEL CONTACT



FLANK CONTACT



FACE CONTACT

19. If the backlash measurement is out of standard, adjust the backlash with the 40 mm thrust shim, and recheck. Do not use more than two 40 mm thrust shims to adjust the backlash.

20. If the transfer gear tooth contact is incorrect, adjust the tooth contact with the 25 mm, 40 mm, or 80 mm thrust shim. Do not use more than two shims of each thrust shim to adjust the tooth contact.

• Toe Contact

Use a thinner 40 mm thrust shim to move the transfer output shaft (hypoid gear) away from the transfer hypoid drive gear. Because this movement causes the transfer gear backlash to change, move the transfer hypoid drive gear toward the transfer output shaft (hypoid gear) to adjust the transfer gear backlash as follows:

- Reduce the thickness of the 25 mm thrust shim.
- Increase the thickness of the 80 mm thrust shim by amount the 25 mm thrust shim was reduced.

• Heel Contact

Use a thicker 40 mm thrust shim to move the transfer output shaft (hypoid gear) toward the transfer hypoid drive gear. Because this movement causes the transfer backlash to change, move the transfer hypoid drive gear away from the transfer output shaft (hypoid gear) to adjust the transfer gear backlash as follows:

- Increase the thickness of the 25 mm thrust shim.
- Reduce the thickness of the 80 mm thrust shim by the amount the 25 mm thrust shim was reduced.

• Flank Contact

Use a thicker 25 mm thrust shim to move the transfer hypoid drive gear away from the transfer output shaft (hypoid gear).

Flank contact must be adjusted within the limits of the transfer gear backlash. If the backlash exceeds the limits, adjust as described under Heel Contact.

• Face Contact

Use a thinner 25 mm thrust shim to move the transfer hypoid drive gear toward the transfer output shaft (hypoid gear).

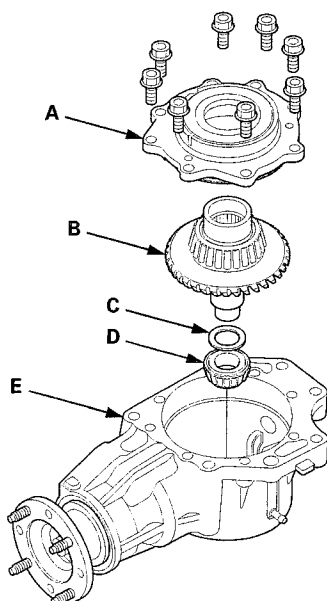
Face contact must be adjusted within the limits of the transfer gear backlash. If the backlash exceeds the limits, adjust as described under Toe Contact.



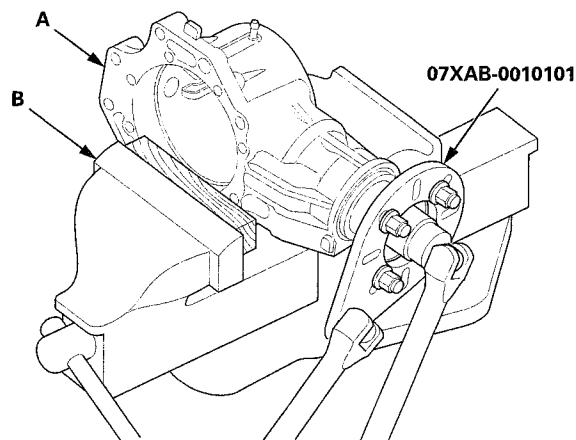
THRUST SHIM, 25 mm

Shim No.	Thickness
1.70	1.70 mm (0.067 in)
1.73	1.73 mm (0.068 in)
1.76	1.76 mm (0.069 in)
1.79	1.79 mm (0.070 in)
1.82	1.82 mm (0.072 in)
1.85	1.85 mm (0.073 in)
1.88	1.88 mm (0.074 in)
1.91	1.91 mm (0.075 in)
1.94	1.94 mm (0.076 in)
1.97	1.97 mm (0.078 in)
2.00	2.00 mm (0.079 in)
2.03	2.03 mm (0.080 in)
2.06	2.06 mm (0.081 in)
2.09	2.09 mm (0.082 in)
2.12	2.12 mm (0.083 in)
2.15	2.15 mm (0.085 in)
2.18	2.18 mm (0.086 in)
2.21	2.21 mm (0.087 in)
2.24	2.24 mm (0.088 in)

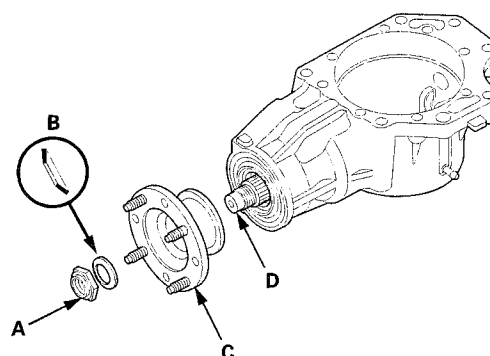
21. Remove the transfer cover (A), the transfer hypoid drive gear/shaft assembly (B), the 25 mm thrust shim (C), and the tapered roller bearing (D) from the transfer housing (E) after adjusting the transfer gear backlash or transfer gear tooth contact.



22. Secure the transfer housing (A) in a bench vise (B) with soft jaws.



23. Install the flange holder on the companion flange, then loosen the locknut.
24. Remove the flange holder.
25. Remove the locknut (A), the conical spring washer (B), and the companion flange (C) from the transfer output shaft (hypoid gear) (D).



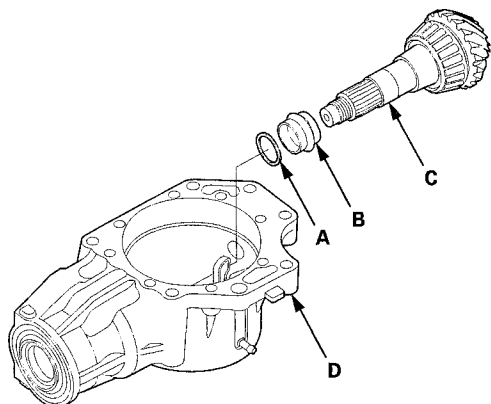
26. Remove the transfer output shaft (hypoid gear) from the transfer housing.

(cont'd)

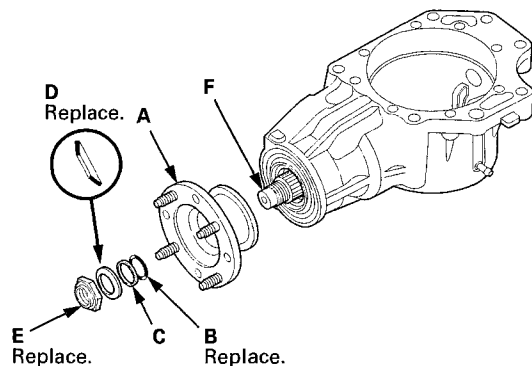
Transfer Assembly

Reassembly (cont'd)

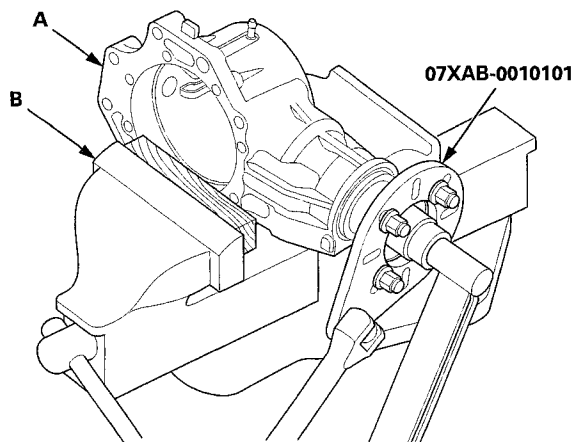
27. Install a thrust washer (A) and a new transfer spacer (B) on the transfer output shaft (hypoid gear) (C), and install them in the transfer housing (D).



28. Coat the threads of the locknut and transfer output shaft (hypoid gear) with transfer fluid (hypoid gear oil).
29. Install the companion flange (A). Coat a new O-ring (B) with transfer fluid (hypoid gear oil), then install the O-ring, the back-up ring (C), a new conical spring washer (D), and a new locknut (E) on the transfer output shaft (hypoid gear) (F). Install the conical spring washer in the direction shown.



30. Secure the transfer housing (A) in a bench vise (B) with soft jaws.



31. Install the flange holder on the companion flange.
32. Tighten the locknut while measuring the starting torque of the transfer output shaft (hypoid gear) so the starting torque is within 1.15–1.71 N·m (11.7–17.4 kgf·cm, 10.2–15.1 lbf·in).

Tightening Torque:

108–294 N·m

(11.0–30.0 kgf·m, 79.6–217 lbf·ft)

Starting Torque:

1.15–1.71 N·m

(11.7–17.4 kgf·cm, 10.2–15.1 lbf·in)

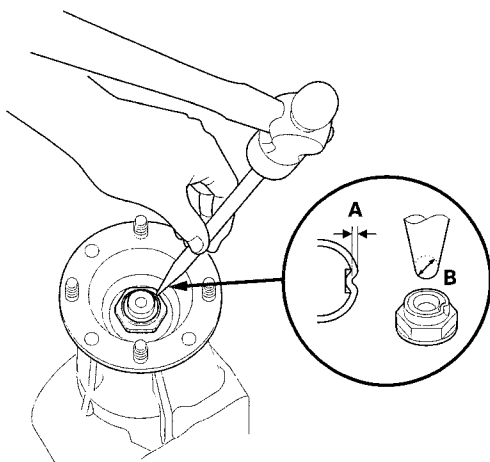
NOTE:

- Rotate the companion flange several times to seat the tapered roller bearings, then measure the starting torque.
- If the starting torque exceeds 1.71 N·m (17.4 kgf·cm, 15.1 lbf·in), replace the transfer spacer and reassemble the parts. Do not adjust the torque with the locknut loose.
- If the tightening torque exceeds 294 N·m (30.0 kgf·m, 217 lbf·ft), replace the transfer spacer and reassemble the parts.

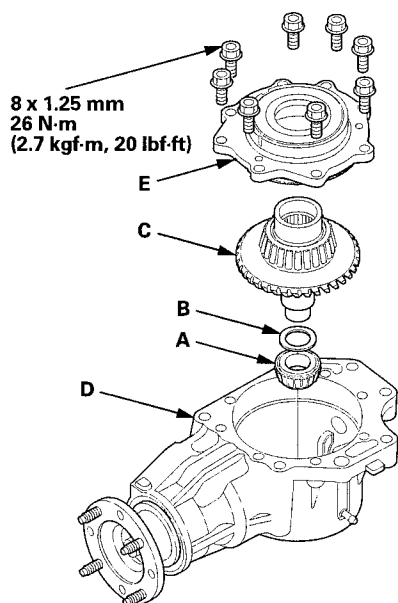
33. Remove the flange holder.



34. Stake the locknut to a depth (A) of at least 0.7 mm (0.03 in) using a 3.5 mm punch (B). Be careful not to make a crack on the locknut when staking.

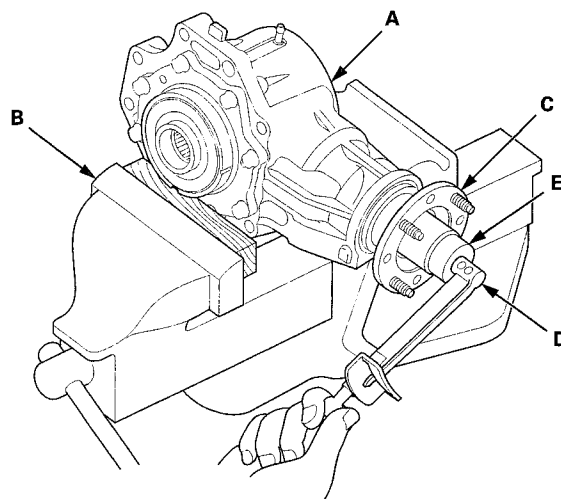


35. Install the tapered roller bearing (A), the 25 mm thrust shim (B), and the transfer hypoid drive gear/shaft assembly (C) in the transfer housing (D).



36. Temporarily install the transfer cover (E) without the O-ring. Install and tighten the bolts.

37. Secure the transfer housing (A) in a bench vise (B) with soft jaws.



38. Rotate the transfer companion flange (C) several times to seat the tapered roller bearings.
39. Measure the total starting torque at the companion flange by using a torque wrench (D) and a socket (E).
40. Calculate the transfer hypoid drive gear/shaft starting torque by using the following formula.

Transfer Hypoid Drive Gear/Shaft Starting Torque Formula:

$$A - B = X$$

- A:** Actual total starting torque (measured in step 39)
- B:** Actual transfer output shaft (hypoid gear) starting torque (measured in step 32)
- X:** Transfer hypoid drive gear-shaft starting torque

41. Check that the calculated transfer hypoid drive gear/shaft starting torque is within the following reference value range.

Reference Value Range of Transfer Hypoid Drive Gear/Shaft Starting Torque:

1.49–2.52 N·m
(15.2–25.7 kgf·cm, 13.1–22.3 lbf·in)

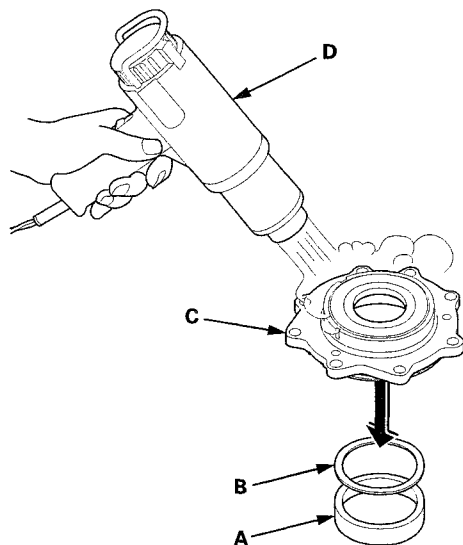
- If the calculated transfer hypoid drive gear/shaft starting torque is within the reference value range, remove the transfer cover from the transfer housing, then go to step 47.
- If the calculated transfer hypoid drive gear/shaft starting torque is out of the reference value range, go to step 42.

(cont'd)

Transfer Assembly

Reassembly (cont'd)

42. Remove the bearing outer race (A) and the 80 mm thrust shim (B) from the transfer cover (C). If the tapered roller bearing outer race is press-fitted, remove the tapered roller bearing outer race by heating the transfer cover to about 212 °F (100 °C) using a heat gun (D). Do not heat the transfer cover more than 212 °F (100 °C).



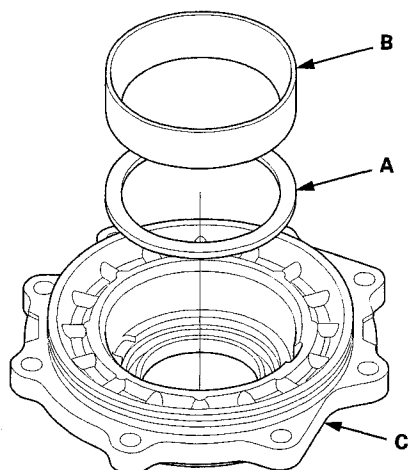
43. Measure thickness of the removed 80 mm thrust shim, and select a new 80 mm thrust shim.

THRUST SHIM, 80 mm

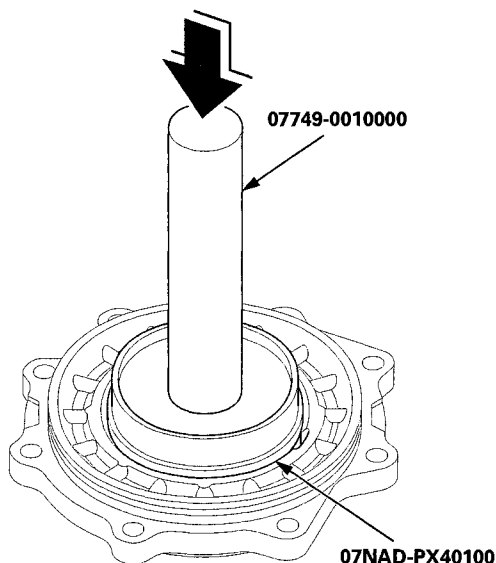
Shim No.	Thickness
A	1.52 mm (0.060 in)
B	1.55 mm (0.061 in)
C	1.58 mm (0.062 in)
D	1.61 mm (0.063 in)
E	1.64 mm (0.065 in)
F	1.67 mm (0.066 in)
G	1.70 mm (0.067 in)
H	1.73 mm (0.068 in)
I	1.76 mm (0.069 in)
J	1.79 mm (0.070 in)
K	1.82 mm (0.072 in)
L	1.85 mm (0.073 in)
M	1.88 mm (0.074 in)
N	1.91 mm (0.075 in)
O	1.94 mm (0.076 in)
P	1.97 mm (0.078 in)
Q	2.00 mm (0.079 in)
R	2.03 mm (0.080 in)
S	2.06 mm (0.081 in)
T	2.09 mm (0.082 in)
U	2.12 mm (0.083 in)
V	2.15 mm (0.085 in)
W	2.18 mm (0.086 in)
X	2.21 mm (0.087 in)
Y	2.24 mm (0.088 in)
Z	2.27 mm (0.089 in)
AA	2.30 mm (0.091 in)
AB	2.33 mm (0.092 in)
AC	2.36 mm (0.093 in)
AD	2.39 mm (0.094 in)
AE	2.42 mm (0.095 in)
AF	2.45 mm (0.096 in)
AG	2.48 mm (0.098 in.)
AH	2.51 mm (0.099 in)
AI	2.54 mm (0.100 in)
AJ	2.57 mm (0.101 in)
AK	2.60 mm (0.102 in)
AL	2.63 mm (0.104 in)
AM	2.66 mm (0.105 in)



44. Install the 80 mm thrust shim (A) and the tapered roller bearing outer race (B) in the transfer cover (C). If you heated the transfer cover, let it cool to room temperature before installing the 80 mm thrust shim.

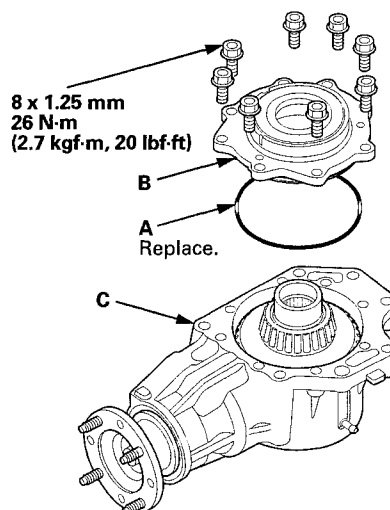


45. Drive the tapered roller bearing outer race securely in the transfer cover using the driver handle and the 78 x 80 mm attachment so there is no clearance between the tapered roller bearing outer race, the 80 mm thrust shim, and the transfer cover.



46. After replacing the 80 mm thrust shim, recheck and make sure that the total starting torque is within specification.

47. Install a new O-ring (A) on the transfer cover (B), then install the transfer cover on the transfer housing (C).

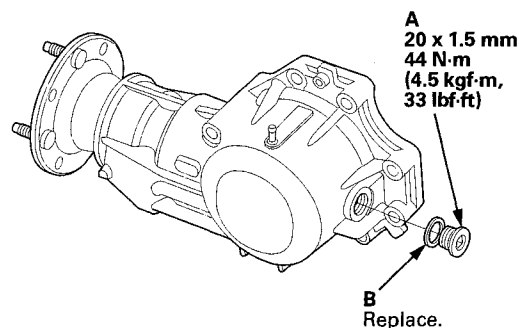


48. Remove the filler plug (A), then refill the transfer assembly with transfer fluid (hypoid gear oil). Use an SAE 90 viscosity hypoid gear oil, API classified GL4 or GL5 only.

Viscosity:

SAE 90: Above 0 °F (−18 °C)

Hypoid Gear Oil Capacity: 0.45 L (0.48 US qt)



49. Install the filler plug with a new sealing washer (B).