2004 AUTOMATIC TRANSMISSIONS

Diagnosis - MCTA 5-Speed

SPECIAL TOOLS

Ref.No.	Tool Number	Description	Qty
①	07GAB-PF50101 or 07GAB-PF50100	Mainshaft Holder	1
②	07GAD-SD40101	Attachment, 78 x 90 mm	1
③	07GAE-PG40200 or 07GAE-PG4020A	Clutch Spring Compressor Bolt Assembly	1
④	07HAC-PK40102	Housing Puller	1
⑤	07HAJ-PK40201	Preload Inspection Tool	1
⑥	07JAD-PH80101	Oil Seal Driver Attachment	1
⑦	07KAF-PS30200	Bearing Separator	1
⑧	07LAD-PW50601	Attachment, 40 x 50 mm	1
⑨	07LAE-PX40100	Clutch Spring Compressor Attachment	2
⑩	07MAJ-PY4011A	A/T Pressure Hose, 2210 mm	4
⑪	07MAJ-PY40120	A/T Pressure Hose Adapter	4
⑫	07QAD-P0A0100	Attachment, 42 mm I.D.	1
⑬	07SAZ-001000A	Backprobe Set	2
⑭	07ZAE-PRP0100	Clutch Compressor Attachment	1
⑮	07406-0020400 or 07406-0020401	A/T Oil Pressure Gauge Set w/Panel	1
⑯	07736-A01000B or 07736-A01000A	Adjustable Bearing Puller, 25—40 mm	1
⑰	07746-0010100	Attachment, 32 x 35 mm	1
⑱	07746-0010300	Attachment, 42 x 47 mm	1
⑲	07746-0010400	Attachment, 52 x 55 mm	1
⑳	07746-0010500	Attachment, 62 x 68 mm	1
㉑	07746-0010600	Attachment, 72 x 75 mm	1
㉒	07746-0010800	Attachment, 22 x 24 mm	1
㉓	07746-0030100	Driver 40 mm I.D.	1
㉔	07749-0010000	Driver	1
㉕	07947-SD90101	Oil Seal Driver Attachment	1
㉖	07947-ZV00100	Oil Seal Driver Attachment	1

④: If the top arm is too short, replace it with 07SAC-P0Z01001.
⑨: 07HAE-PL50101 may be used to substitute one of these tools.
⑲: Must be used with commercially available 3/8''-16 slide hammer.

G01818255

Fig. 1: Special Tools (1 Of 2)

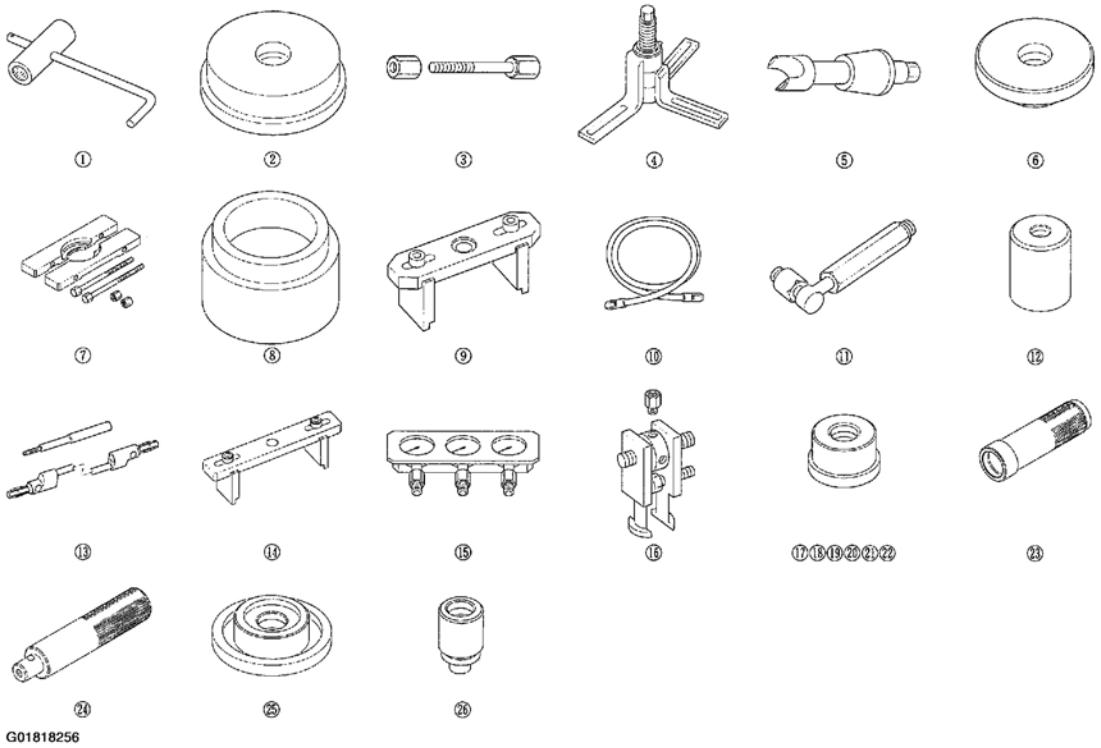


Fig. 2: Special Tools (2 Of 2)

GENERAL TROUBLESHOOTING INFORMATION

HOW TO CHECK FOR DTCS WITH THE HONDA DIAGNOSTIC SYSTEM

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

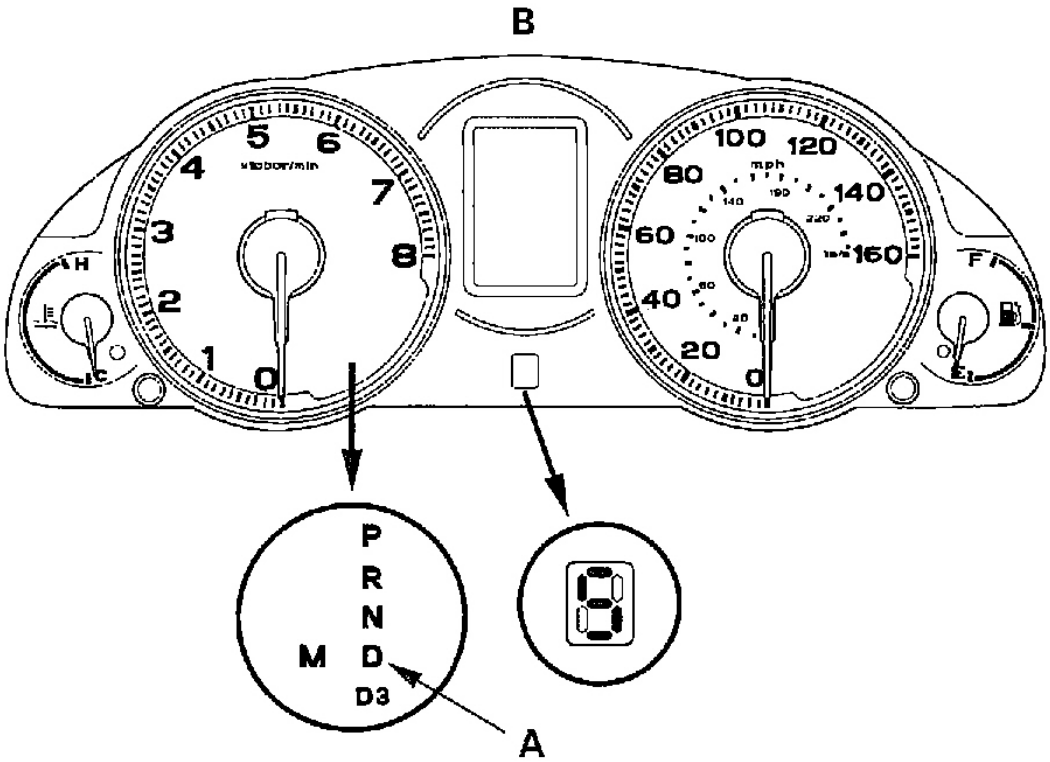


Fig. 3: Identifying "D" Indicator

When the data link connector (DLC) (A) (located under the left end of the dash) is connected to the Honda diagnostic system (HDS), it will indicate the diagnostic trouble code (DTC) when the ignition switch is turned ON (II).

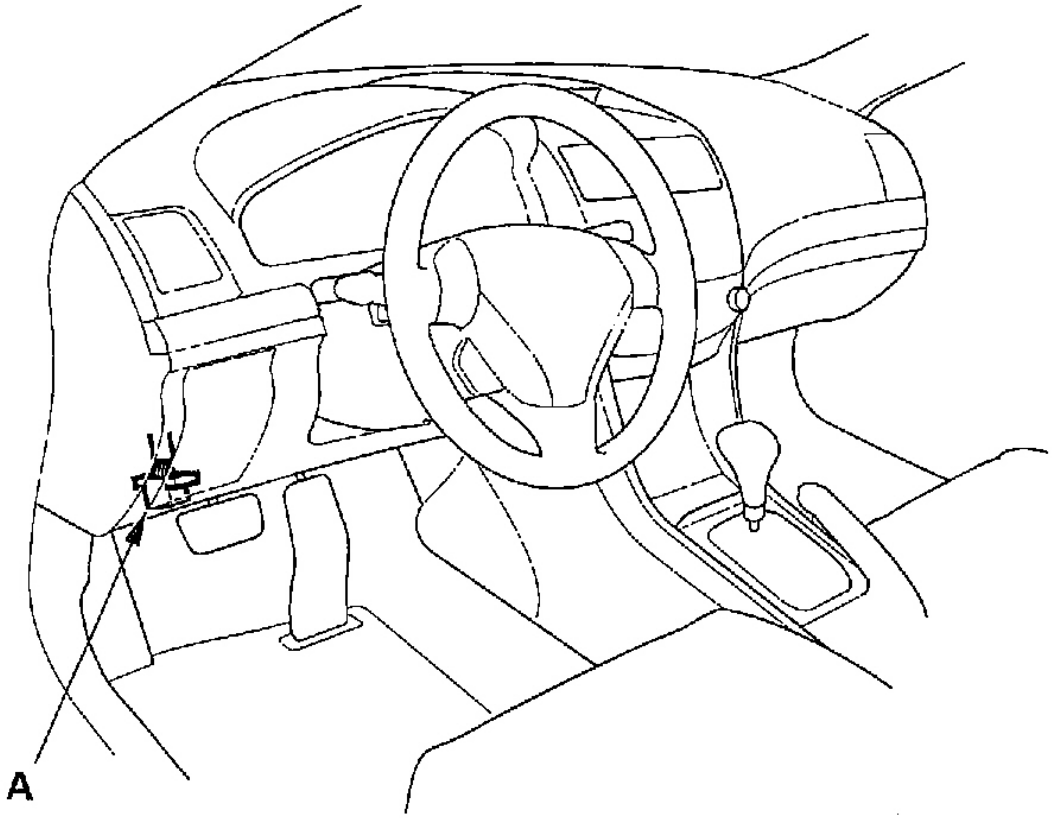


Fig. 4: Locating The Data Link Connector (DLC)

If the **D** indicator or 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 ON (II), select A/T system and observe the DTC in the DTCs MENU on the tester screen.
3. Record all fuel and emissions DTCs, A/T DTCs, and freeze data.
4. If there is a fuel and emissions DTC, first check the fuel and emissions system as indicated by the DTC (except for DTC P0700, DTC P0700 means there is one or more A/T DTCs, and no problems were detected in the fuel and emissions circuit of the PCM).
5. Clear the DTC and data.
6. 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 DTC troubleshooting Index. If the DTC does not return, there was an intermittent problem within the circuit; make sure all pins and terminals in the circuit are tight.

HOW TO CHECK FOR DTCS WITH THE SCS MODE (RETRIEVING THE FLASH CODES)

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

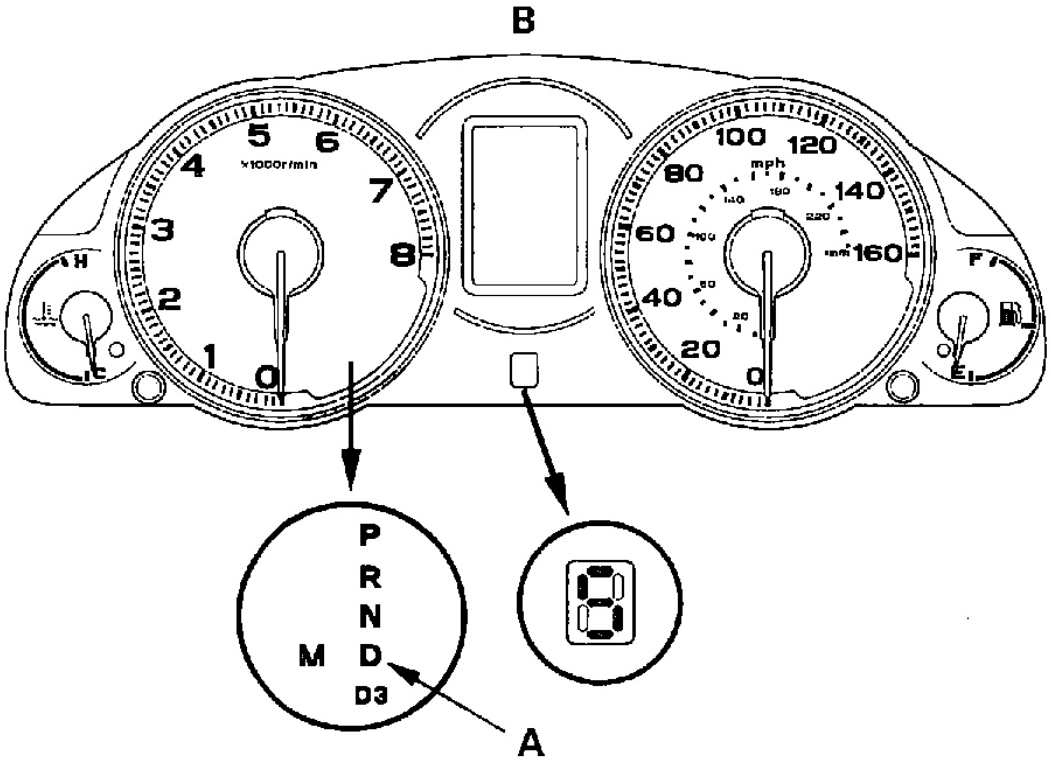


Fig. 5: Identifying "D" Indicator

When the **D** indicator has been reported on, connect the HDS to the DLC (A) (located under the left end of the dash). Turn the ignition switch ON (II), select SCS mode, then the **D** indicator will indicate the DTC.

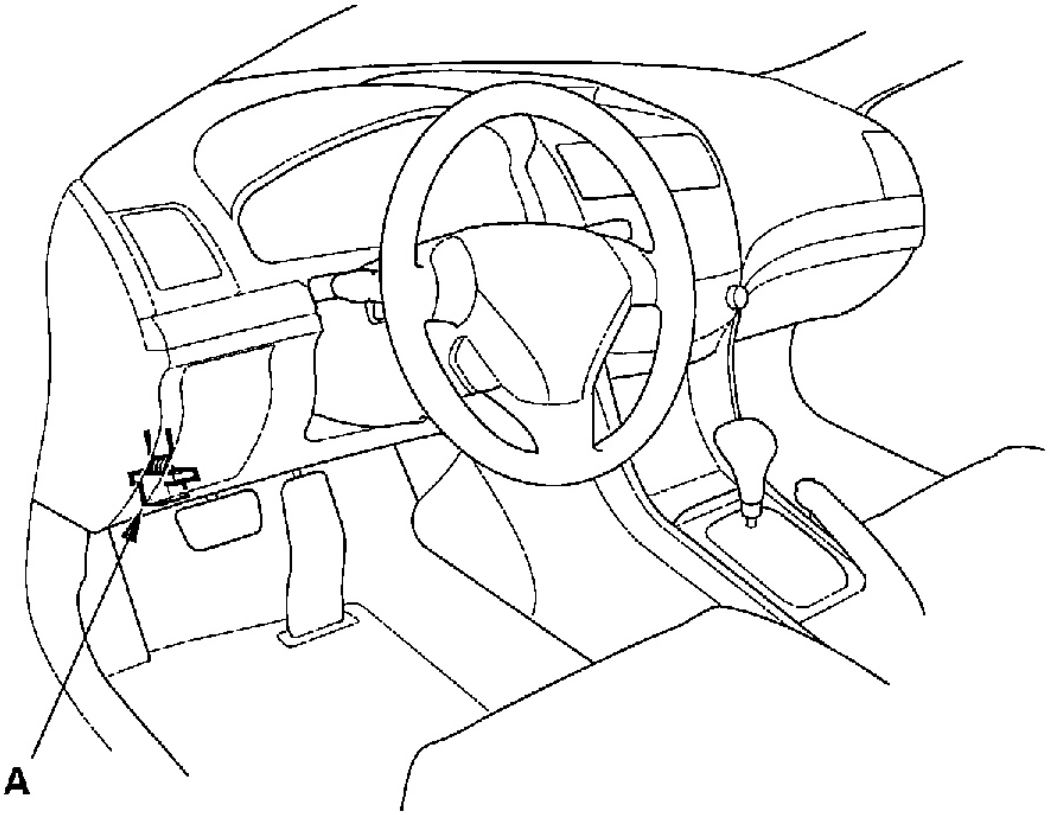


Fig. 6: Locating The Data Link Connector (DLC)

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 ON (II), select SCS mode, then observe the **D** indicator in the gauge assembly. Code 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.

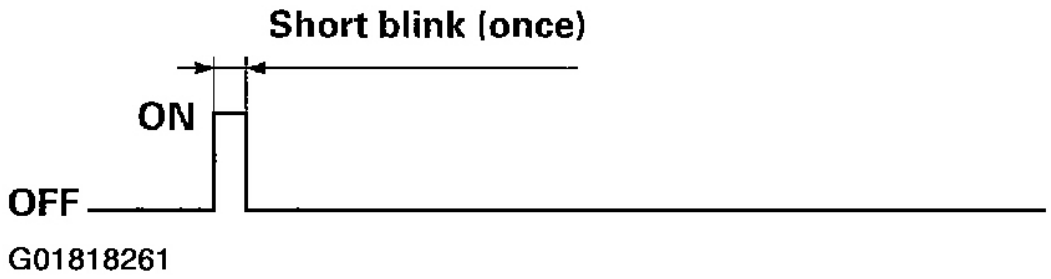


Fig. 7: Example: DTC 1-1

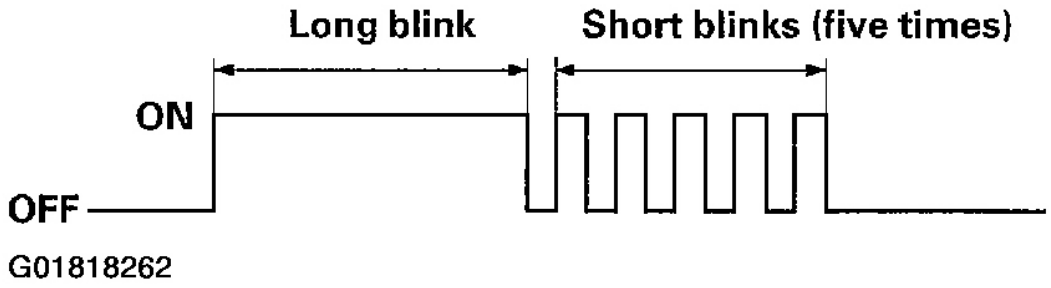


Fig. 8: Example: DTC 15-5

3. Record all fuel and emissions DTCs and A/T DTCs.
4. If there is a fuel and emissions DTC, first check the fuel and emissions system as indicated by the DTC (except DTC 70, DTC 70 means there is one or more A/T DTCs, and no problems were detected in the fuel and emissions circuit of the PCM).
5. Clear the DTC and data.
6. Drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, and then recheck for DTC. If the A/T DTC returns, go to the DTC Troubleshooting Index. If the DTC does not return, there was an intermittent problem within the circuit. Make sure all pins and terminals in the circuit are tight.

CLEAR A/T DTCS & PCM RESET PROCEDURES

1. Connect the HDS to the DLC.
2. Turn the ignition switch ON (II).
3. Clear the DTC(s) on the HDS screen.

HOW TO TROUBLESHOOT CIRCUITS AT THE PCM

Special Tools Required: Backprobe set 07SAZ-001000A (two required)

1. Pull back the carpet, and remove the passenger's center lower cover (see **PASSENGER'S DASHBOARD LOWER COVER REMOVAL/INSTALLATION**).
2. Inspect the circuit on the PCM, according to the DTC troubleshooting, with the special tools and a digital multimeter.
3. Connect the backprobe adapters (A) to the stacking patch cords (B), and connect the cords to a multimeter (C).

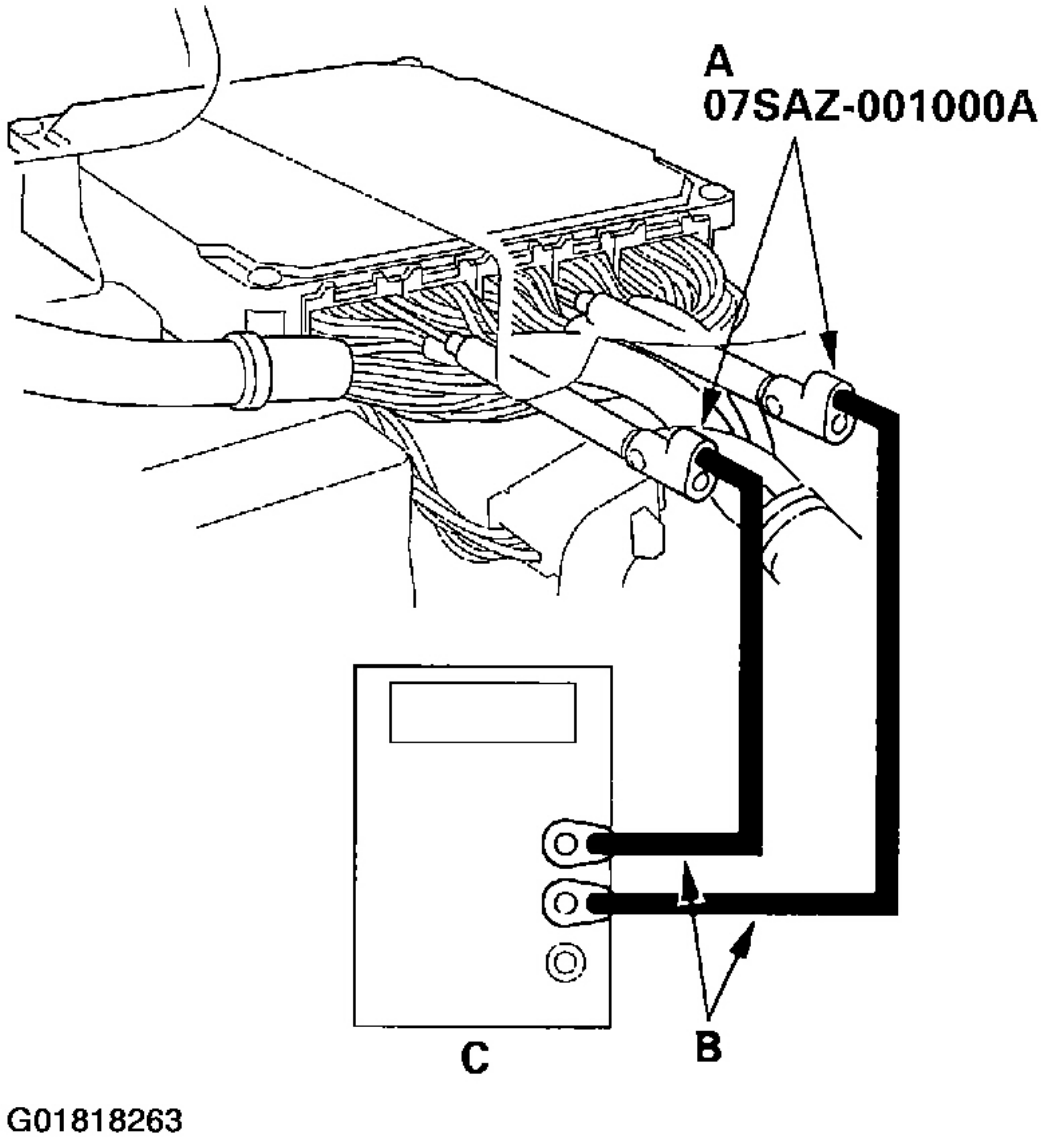


Fig. 9: Connecting The Backprobe Adapters To The Stacking Patch Cords & Connecting The

Cords To A Multimeter

4. Using the wire insulation as a guide for the contoured tip of the backprobe adapter, gently slide the tip into the connector from the wire side until it touches the end of the wire terminal.
5. If you cannot get to the wire side of the connector or the wire side is sealed, disconnect the connector and use the tester probe to probe the connectors from the terminal side. Do not force the probe into the connector.

PCM UPDATING & SUBSTITUTION FOR TESTING

Special Tools Required: Honda Interface Module (HIM) EQS05A35570

Use this procedure when you have to substitute a known-good PCM in a troubleshooting procedure. Update the PCM only if the PCM does not already have the latest software loaded.

Do not turn the ignition switch OFF while updating the PCM. If you turn the ignition switch OFF, the PCM can be damaged.

How to Update the PCM

NOTE:

- **To ensure the latest program is installed, update a PCM whenever the PCM is substituted or replaced.**
- **You cannot update a PCM with the program it already has. It will only accept a new program.**
- **Before you update the PCM, make sure the vehicle's battery is fully charged.**
- **To prevent PCM damage, do not operate any electrical system; audio system, brakes, air conditioning, power windows, moonroof, and door locks, during the update.**
- **If you need to diagnose the Honda interface module (HIM) because the HIM's red (#3) light came on or was flashing during the update, leave the ignition switch in the ON (II) position when you disconnect the HIM from the DLC. This will prevent PCM damage.**

1. Turn the ignition switch ON (II). Do not start the engine.
2. Connect the Honda interface module (HIM) to the DLC (A) located under the left end of the dash.

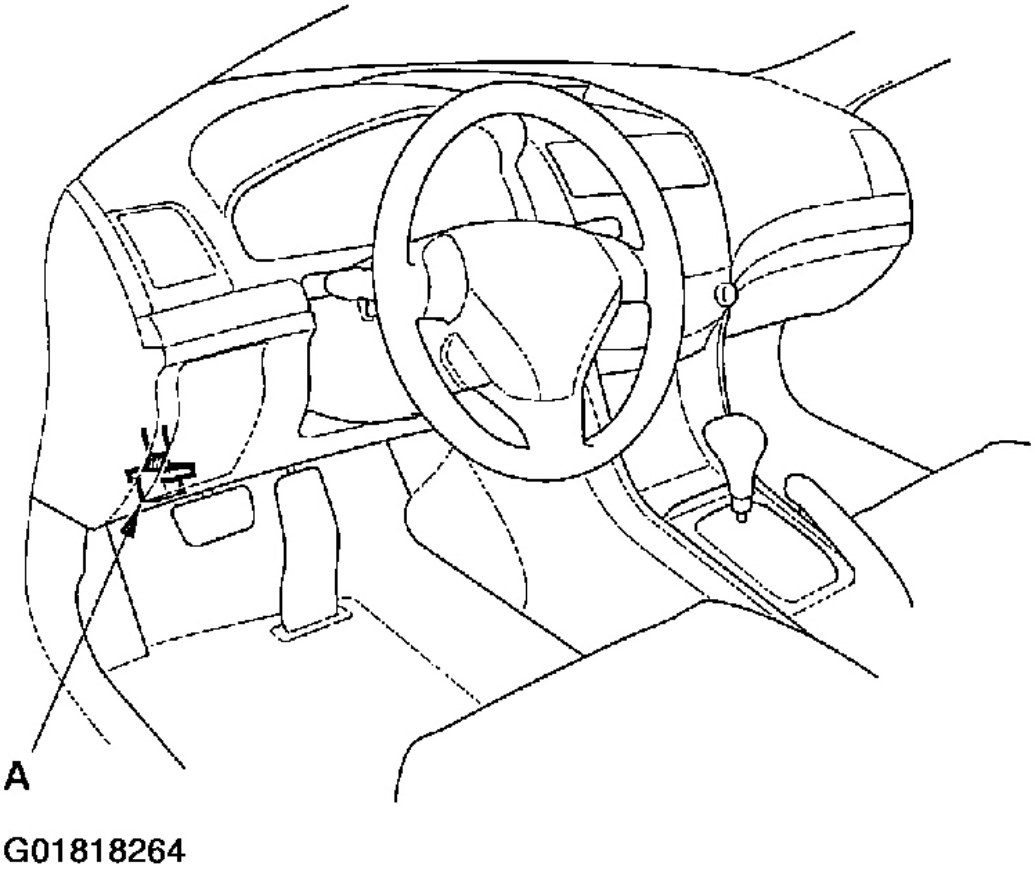


Fig. 10: Locating The Data Link Connector (DLC)

3. Update the PCM according to the procedures described on the HIM label. If the software in the PCM is the latest, replace the PCM.

How to Substitute the PCM

1. Connect the HDS to the DLC.
2. Turn the ignition switch OFF.
3. Jump the SCS line with the HDS.
4. Remove the PCM, and install a known-good PCM.
5. Rewrite the immobilizer code with the PCM replacement procedure in the HDS; this will allow you to start the engine.
6. After completing your test, reinstall the original PCM and rewrite the immobilizer code with the PCM replacement procedure in the HDS again.

HOW TO REMOVE & INSTALL THE PCM

1. Pull back the carpet, and remove the driver's and passenger's center lower cover (see **PASSENGER'S DASHBOARD LOWER COVER REMOVAL/INSTALLATION**).
2. Connect the HDS to the DLC.
3. Turn the ignition switch OFF.
4. Jump the SCS line with the HDS.
5. Disconnect PCM connectors.
6. Remove the two bolts, and remove the PCM.
7. Install the PCM in the reverse order of the removal.

HOW TO END A TROUBLESHOOTING SESSION

NOTE: This procedure must be done after any troubleshooting.

1. Turn the ignition switch OFF.
2. Connect the HDS to the DLC.
3. Turn the ignition switch ON (II).
4. Clear the DTC(s) on the HDS screen.
5. Turn the ignition switch ON (II).
6. Start the engine in the **P** or **N** position, and warm it up to normal operating temperature (the radiator fan comes on). And continue to run the engine at idle with all accessories turned off for more than 5 minutes to learn the idle control system in the PCM (see **ECM/PCM IDLE LEARN PROCEDURE**).
7. To verify that the problem is repaired, test-drive the vehicle for several minutes at speeds over 30 mph (50 km/h) or in freeze data range.

DTC TROUBLESHOOTING INDEX

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

DTC *(1)	D Indicator	MIL	Detection Item	Page
P0705 (5-2) *(2)	Blinks	ON	Transmission range switch (multiple shift-position input)	(see page 14-74)
P0706 (6-2) *(2)	OFF	ON	Transmission range switch (open)	(see page 14-82)
P0711 (28-5) *(2)	Blinks	OFF	ATF temperature sensor (range/performance)	(see page 14-85)
P0712 (28-3) *(2)	Blinks	OFF	ATF temperature sensor (short)	(see page 14-86)
P0713 (28-4) *(2)	Blinks	OFF	ATF temperature sensor (open)	(see page 14-87)
P0716 (15-5) *(2)	Blinks	ON	Mainshaft speed sensor (range/performance)	(see page 14-89)
P0717 (15-3) *(2)	Blinks	ON	Mainshaft speed sensor (no signal input)	(see page 14-93)
P0718 (15-6) *(2)	Blinks	ON	Mainshaft speed sensor (intermittent failure)	(see page 14-97)
P0721 (9-5) *(2)	Blinks	ON	Countershaft speed sensor (range/performance)	(see page 14-99)
P0722 (9-3) *(2)	Blinks	ON	Countershaft speed sensor (no signal input)	(see page 14-103)
P0723 (9-6) *(2)	Blinks	ON	Countershaft speed sensor (intermittent failure)	(see page 14-107)
P0731 (64-1)	Blinks	OFF	1st gear incorrect ratio	(see page 14-109)
P0732 (64-2)	Blinks	OFF	2nd gear incorrect ratio	(see page 14-110)
P0733 (64-3)	Blinks	OFF	3rd gear incorrect ratio	(see page 14-111)
P0734 (64-4)	Blinks	OFF	4th gear incorrect ratio	(see page 14-112)
P0735 (64-5)	Blinks	OFF	5th gear incorrect ratio	(see page 14-113)
P0741 (40-3)	Blinks	OFF	Torque converter clutch circuit performance or stuck OFF	(see page 14-114)
P0747 (76-4)	Blinks	ON	A/T clutch pressure control solenoid valve A stuck ON	(see page 14-115)
P0752 (70-4)	Blinks	ON	Shift solenoid valve A stuck ON	(see page 14-116)
P0756 (71-3)	Blinks	ON	Shift solenoid valve B stuck OFF	(see page 14-117)
P0757 (71-4)	Blinks	ON	Shift solenoid valve B stuck ON	(see page 14-118)
P0761 (72-3)	Blinks	ON	Shift solenoid valve C stuck OFF	(see page 14-119)

G01818265

Fig. 11: DTC Troubleshooting Index (1 Of 3)

DTC * (1)	D Indicator	MIL	Detection Item	Page
P0771 (74-3)	Blinks	ON	Shift solenoid valve E stuck OFF	(see page 14-120)
P0776 (77-3)	Blinks	ON	A/T clutch pressure control solenoid valve B stuck OFF	(see page 14-121)
P0777 (77-4)	Blinks	ON	A/T clutch pressure control solenoid valve B stuck ON	(see page 14-122)
P0780 (45-1)	Blinks	ON	Shift control system	(see page 14-123)
P0796 (78-3)	Blinks	ON	A/T clutch pressure control solenoid valve C stuck OFF	(see page 14-124)
P0797 (78-4)	Blinks	ON	A/T clutch pressure control solenoid valve C stuck ON	(see page 14-125)
P0812 (62-2) * (2)	Blinks	OFF	Transmission range switch ATP RVS switch	(see page 14-126)
P0815 (24-5) * (2)	Blinks	ON	Transmission gear selection switch upshift switch (short or stuck ON)	(see page 14-128)
P0816 (24-6) * (2)	Blinks	ON	Transmission gear selection switch downshift switch (short or stuck ON)	(see page 14-130)
P0842 (25-3) * (2)	Blinks	ON	2nd clutch transmission fluid pressure switch (short or stuck ON)	(see page 14-132)
P0843 (25-4) * (2)	Blinks	ON	2nd clutch transmission fluid pressure switch (open or stuck OFF)	(see page 14-134)
P0847 (26-3) * (2)	Blinks	OFF	3rd clutch transmission fluid pressure switch (short or stuck ON)	(see page 14-136)
P0848 (26-4) * (2)	Blinks	OFF	3rd clutch transmission fluid pressure switch (open or stuck OFF)	(see page 14-138)
P0957 (24-3) * (2)	Blinks	ON	Transmission gear selection switch (short or stuck ON)	(see page 14-140)
P0958 (24-4) * (2)	Blinks	ON	Transmission gear selection switch (open or stuck OFF)	(see page 14-142)
P0962 (16-3) * (2)	Blinks	ON	A/T clutch pressure control solenoid valve A (open/ short)	(see page 14-144)
P0963 (16-4) * (2)	Blinks	ON	A/T clutch pressure control solenoid valve A	(see page 14-146)
P0966 (23-3) * (2)	Blinks	ON	A/T clutch pressure control solenoid valve B (open/ short)	(see page 14-148)
P0967 (23-4) * (2)	Blinks	ON	A/T clutch pressure control solenoid valve B	(see page 14-150)
P0970 (29-3) * (2)	Blinks	ON	A/T clutch pressure control solenoid valve C (open/ short)	(see page 14-152)
P0971 (29-4) * (2)	Blinks	ON	A/T clutch pressure control solenoid valve C	(see page 14-154)
P0973 (7-3) * (2)	Blinks	ON	Shift solenoid valve A (short)	(see page 14-156)

G01818266

Fig. 12: DTC Troubleshooting Index (2 Of 3)

DTC * (1)	D Indicator	MIL	Detection Item	Page
P0974 (7-4) * (2)	Blinks	ON	Shift solenoid valve A (open)	(see page 14-158)
P0976 (8-3) * (2)	Blinks	ON	Shift solenoid valve B (short)	(see page 14-160)
P0977 (8-4) * (2)	Blinks	ON	Shift solenoid valve B (open)	(see page 14-162)
P0979 (22-3) * (2)	Blinks	ON	Shift solenoid valve C (short)	(see page 14-164)
P0980 (22-4) * (2)	Blinks	ON	Shift solenoid valve C (open)	(see page 14-166)
P0982 (60-3) * (2)	Blinks	ON	Shift solenoid valve D (short)	(see page 14-168)
P0983 (60-4) * (2)	Blinks	ON	Shift solenoid valve D (open)	(see page 14-170)
P0985 (61-3) * (2)	Blinks	ON	Shift solenoid valve E (short)	(see page 14-172)
P0986 (61-4) * (2)	Blinks	ON	Shift solenoid valve E (open)	(see page 14-174)
P1730 (45-2)	Blinks	ON	Shift control system • Shift solenoid valves A or D stuck OFF • Shift solenoid valve B stuck ON • Shift valves A, B, or D stuck	(see page 14-176)
P1731 (45-3)	Blinks	ON	Shift control system • Shift solenoid valve E stuck ON • Shift valve E stuck • A/T clutch pressure control solenoid valve A stuck OFF	(see page 14-178)
P1732 (45-4)	Blinks	ON	Shift control system • Shift solenoid valves B or C stuck ON • Shift valves B or C stuck	(see page 14-180)
P1733 (45-5)	Blinks	ON	Shift control system • Shift solenoid valve D stuck ON • Shift valve D stuck • A/T clutch pressure control solenoid valve C stuck OFF	(see page 14-182)
P1734 (45-6)	Blinks	ON	Shift control system • Shift solenoid valves B or C stuck OFF • Shift valves B or C stuck	(see page 14-184)

G01818267

Fig. 13: DTC Troubleshooting Index (3 Of 3)

SYMPTOM TROUBLESHOOTING INDEX

These symptoms DO NOT trigger diagnostic trouble codes (DTCs) or cause the **D** indicator to blink. If the malfunction indicator lamp (MIL) was reported ON or the **D** indicator has been blinking, check for DTCs. If the vehicle has one of the symptoms in the following chart, check the probable cause(s) for it, in the sequence listed, until you find the problem.

Symptom	Probable cause(s)	Notes
When you turn the ignition switch ON (II), the D indicator comes on and stays on in all shift lever positions or never comes on at all	Communication line between multiplex integrated control unit and gauge control module defective	Check the multiplex integrated control system—communication line between the multiplex integrated control unit and gauge control module (see page 22-105).
D3 or M indicator does not come on while the shift lever is in that position	Communication line between multiplex integrated control unit and gauge control module defective	Check the multiplex integrated control system—communication line between the multiplex integrated control unit and gauge control module (see page 22-105).
Shift lever cannot be moved from P position while you're pushing on the brake pedal	A problem in the shift lock system (interlock system)	Check the interlock system—shift lock system/reverse lock system circuit (see page 14-249).
Shift lever cannot pass through R position from N position	A problem in the reverse lock system of interlock system	Check the interlock system—shift lock system/reverse lock system circuit (see page 14-249).
Ignition switch cannot be moved from ACC (I) position to LOCK (0) position (Key is pushed in, shift lever in P position)	A problem in the key interlock system (interlock system)	Check the interlock system—key interlock system circuit (see page 14-250).

G01818268

Fig. 14: Symptom Troubleshooting Index (1 Of 11)

Symptom	Probable cause(s)	Notes
Engine runs, but vehicle does not move in any gear	1. Low ATF level 2. Shift cable broken or out of adjustment 3. Joint in shift cable and transmission or body worn 4. ATF pump worn or binding 5. Regulator valve stuck or spring worn 6. ATF strainer clogged 7. Mainshaft worn or damaged 8. Final gears worn or damaged 9. Transmission-to-engine assembly error 10. Axle disengaged	• Check the ATF level, and check the ATF cooler lines for leakage and loose connections. If necessary, flush the ATF cooler lines. • Check for a loose shift cable at the shift lever and the transmission control shaft. • Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Check the line pressure. • Be careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the main valve body. This will result in ATF pump seizure if not detected. Use the proper tools. • Install the main seal flush with the torque converter housing. If you push it into the torque converter housing until it bottoms out, it will block the fluid return passage and result in damage. • Check the ATF strainer for debris. If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, find the damaged components that caused the debris. If no cause for contamination is found, replace the torque converter. • Inspect the differential pinion shaft for wear under the pinion gears. If the differential pinion shaft is worn, overhaul the differential assembly, replace the ATF strainer, thoroughly clean the transmission, and flush the torque converter, cooler, and lines.
Vehicle moves in the R, but not in the D or D3 position, or the M position in 1st gear	1. 1st accumulator defective 2. 1st gears worn or damaged 3. 1st clutch defective	• Check the 1st clutch pressure. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace the discs as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate. • Inspect the 1st clutch feed pipe. If the 1st clutch feed pipe is scored, replace the end cover. • Replace the secondary shaft if the bushing for the 1st clutch feed pipe is loose or damaged.

G01818269

Fig. 15: Symptom Troubleshooting Index (2 Of 11)

Symptom	Probable cause(s)	Notes
Vehicle moves in the D, D3, R, but not in the M position in 2nd gear	1. 2nd accumulator defective 2. 2nd gears worn or damaged 3. 2nd clutch defective	• Check the 2nd clutch pressure. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace the discs as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate.
Vehicle moves in the D, D3, M, but not in the R position	1. Shift solenoid valve E defective 2. Shift fork shaft stuck 3. Shift valve E defective 4. 4th/reverse accumulator defective 5. 4th clutch defective 6. Reverse gears worn or damaged	• Check the D indicator, and check for loose connectors. Inspect the shift solenoid valve E for seizure, and O-rings for wear and damage. • Check for a missing shift fork bolt on the shift fork shaft. • Check the 4th clutch pressure. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace the discs as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate. • Inspect the reverse selector gear teeth chamfers, and inspect engagement teeth chamfers of the countershaft 4th gear and reverse gear. Replace the reverse gears and the reverse selector if they are worn or damaged. If the transmission makes a clicking, grinding, or whirring noise, also replace the mainshaft 4th gear, reverse idler gear, and countershaft 4th gear.
Poor acceleration; flares on starting off in D, D3, R, and M positions: Stall speed high in D and D3 positions, and in M position in 1st and 2nd gears	1. Low ATF level 2. Shift cable broken or out of adjustment 3. ATF pump worn or binding 4. Regulator valve stuck or spring worn 5. ATF strainer clogged 6. Torque converter check valve defective	• Check the ATF level, and check the ATF cooler lines for leakage and loose connections. If necessary, flush the ATF cooler lines. • Check for a loose shift cable at the shift lever and the transmission control shaft. • Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Check the ATF strainer for debris. If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, find the damaged components that caused debris, and no cause for contamination is found, replace the torque converter.

G01818270

Fig. 16: Symptom Troubleshooting Index (3 Of 11)

Symptom	Probable cause(s)	Notes
Poor acceleration; flares on starting off in the D, D3, R, and M positions: Stall speed high when starting off in the M position in 2nd gear	2nd clutch defective	• Check the 2nd clutch pressure. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace the discs as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate.
Poor acceleration; flares on starting off in the D, D3, R, and M positions: Stall speed high in the R position	1. Shift cable broken or out of adjustment 2. 4th clutch defective	• Check for a loose shift cable at the shift lever and the transmission control shaft. • Check the 4th clutch pressure in the D and R positions. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace the discs as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate.
Poor acceleration; flares on starting off in the D, D3, R, and M positions: Stall speed low in the D and D3 positions, and in the M position in 1st and 2nd gears	1. Shift solenoid valve E defective 2. Torque converter one-way clutch defective 3. Engine output low 4. Torque converter clutch piston defective 5. Lock-up shift valve defective	• Check the D indicator, and check for loose connectors. Inspect the shift solenoid valve E for seizure, and O-ring for wear and damage. • Replace the torque converter.
Poor acceleration; flares on starting off in the D, D3, R, and M positions: Stall speed low in the R position	1. Torque converter one-way clutch defective 2. Engine output low 3. Torque converter clutch piston defective 4. Lock-up shift valve defective	Replace the torque converter.

G01818271

Fig. 17: Symptom Troubleshooting Index (4 Of 11)

Symptom	Probable cause(s)	Notes
Engine idle vibration	1. Low ATF level 2. Shift solenoid valve E defective 3. Drive plate defective or transmission misassembled 4. Engine output low 5. Torque converter clutch piston defective 6. ATF pump worn or binding 7. Lock-up shift valve defective 8. Misadjusted engine and transmission mounts	• Check the ATF level, and check the ATF cooler lines for leakage and loose connections. If necessary, flush the ATF cooler lines. • Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Inspect the ATF strainer for clogging with particles of steel or aluminum. If the ATF strainer is clogged, replace it, and flush the torque converter, cooler, and lines. • Check the D indicator, and check for loose connectors. Inspect the shift solenoid valve E for seizure, and O-rings for wear and damage. • Check for a misinstalled/damaged drive plate. • Set idle rpm in gear to the specified idle speed. If still no good, adjust the engine and transmission mounts as outlined in the engine section of this service manual. • Replace the torque converter.
Vehicle moves in the N position	1. Excessive ATF 2. Foreign material in separator plate orifice 3. Relief valve defective 4. 1st clutch defective 5. 2nd clutch defective 6. 3rd clutch defective 7. 4th clutch defective 8. 5th clutch defective 9. Clutch end-plate-to-top-disc clearance incorrect 10. Needle bearing seized, worn, or damaged 11. Thrust washer seized up, worn, or damaged	• Check the ATF level, and drain any excess. • Check if the ATF strainer is clogged. If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, find the damaged components that caused the debris, and if no cause for contamination is found, replace the torque converter. • Check the 1st, 2nd, 3rd, 4th and 5th clutch pressures. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace the discs as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate. • Inspect the 1st clutch feed pipe. If the 1st clutch feed pipe is scored, replace the end cover. • Inspect the 3rd clutch feed pipe. If the 3rd clutch feed pipe is scored, replace it and O-ring under the feed pipe guide. • Replace the secondary shaft if the bushing for the 1st or 3rd clutch feed pipe is loose or damaged. • Inspect the 5th clutch feed pipe. If the 5th clutch feed pipe is scored, replace it and O-ring under the feed pipe guide. • Replace the mainshaft if the bushing for the 5th clutch feed pipe is loose or damaged.

G01818272

Fig. 18: Symptom Troubleshooting Index (5 Of 11)

Symptom	Probable cause(s)	Notes
Late shift from the N position to the D and D3 positions	1. Shift solenoid valve E defective 2. A/T clutch pressure control solenoid valve A defective 3. A/T clutch pressure control solenoid valve B defective 4. A/T clutch pressure control solenoid valve C defective 5. Shift cable broken or out of adjustment 6. Joint in shift cable and transmission or body worn 7. Mainshaft speed sensor defective 8. Countershaft speed sensor defective 9. ATF temperature sensor defective 10. Foreign material in separator plate orifice 11. Servo control valve defective 12. 1st accumulator defective 13. 1st check ball stuck 14. Lock-up shift valve defective 15. 1st clutch defective	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/gasket and O-rings for wear and damage, and inspect the solenoid valves for seizure. • Check the mainshaft speed sensor and countershaft speed sensor installation. • Check for a loose shift cable at the shift lever and the transmission control shaft. • Check the 1st clutch pressure. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace the discs as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate. • Inspect the 1st clutch feed pipe. If the 1st clutch feed pipe is scored, replace the end cover.
Late shift from the N position to the R position	1. Shift solenoid valve E defective 2. A/T clutch pressure control solenoid valve A defective 3. Shift cable broken or out of adjustment 4. Joint in shift cable and transmission or body worn 5. Mainshaft speed sensor defective 6. Countershaft speed sensor defective 7. ATF temperature sensor defective 8. Shift fork shaft stuck 9. Foreign material in separator plate orifice 10. Shift valve E defective 11. 4th/reverse accumulator defective 12. Lock-up shift valve defective 13. 4th clutch defective	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/gasket and O-rings for wear and damage, and inspect the solenoid valves for seizure. • Check the mainshaft speed sensor and countershaft speed sensor installation. • Check for a loose shift cable at the shift lever and the transmission control shaft. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace the discs as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate. • Check for a missing shift fork bolt on the shift fork shaft. • Check the 4th clutch pressure. • Inspect the servo valve and O-ring.

G01818273

Fig. 19: Symptom Troubleshooting Index (6 Of 11)

Symptom	Probable cause(s)	Notes
No shift	1. Mainshaft speed sensor defective 2. Countershaft speed sensor defective	Check the D indicator, and check for loose connectors. Check the mainshaft and countershaft speed sensor installation.
Excessive shock or flares on all upshifts and downshifts	1. A/T clutch pressure control solenoid valve B defective 2. A/T clutch pressure control solenoid valve C defective 3. Mainshaft speed sensor defective 4. Countershaft speed sensor defective 5. ATF temperature sensor defective 6. Foreign material in separator plate orifice	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/gasket and O-rings for wear and damage, and inspect the solenoid valves for seizure. • Check the mainshaft speed sensor and countershaft speed sensor installation.
Excessive shock or flares on 1-2 upshift or 2-1 downshift	1. Shift solenoid valve E defective 2. A/T clutch pressure control solenoid valve A defective 3. A/T clutch pressure control solenoid valve B defective 4. A/T clutch pressure control solenoid valve C defective 5. 2nd clutch transmission fluid pressure switch defective 6. Foreign material in separator plate orifice 7. 1st accumulator defective 8. 2nd accumulator defective 9. 1st check ball stuck 10. 2nd check ball stuck 11. Lock-up shift valve defective 12. 1st clutch defective 13. 2nd clutch defective	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/gasket and O-rings for wear and damage, and inspect the solenoid valves for seizure. • Check the 1st and 2nd clutch pressures. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace the discs as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate. • Inspect the 1st clutch feed pipe. If the 1st clutch feed pipe is scored, replace the end cover. • Replace the secondary shaft if the bushing for the 3rd clutch feed pipe is loose or damaged.

G01818274

Fig. 20: Symptom Troubleshooting Index (7 Of 11)

Symptom	Probable cause(s)	Notes
Excessive shock or flares on 2-3 upshift or 3-2 downshift	1. A/T clutch pressure control solenoid valve B defective 2. A/T clutch pressure control solenoid valve C defective 3. 3rd clutch transmission fluid pressure switch defective 4. Foreign material in separator plate orifice 5. 2nd accumulator defective 6. 3rd accumulator defective 7. 2nd check ball stuck 8. 2nd clutch defective 9. 3rd clutch defective	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/gasket for wear and damage, and inspect the solenoid valves for seizure. • Check the 2nd and 3rd clutch pressures. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace the discs as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate. • Inspect the 3rd clutch feed pipe. If the 3rd clutch feed pipe is scored, replace it and O-ring under the feed pipe guide. • Replace the secondary shaft if the bushing for the 3rd clutch feed pipe is loose or damaged.
Excessive shock or flares on 3-4 upshift or 4-3 downshift	1. A/T clutch pressure control solenoid valve B defective 2. A/T clutch pressure control solenoid valve C defective 3. Foreign material in separator plate orifice 4. 3rd accumulator defective 5. 4th accumulator defective 6. 3rd clutch defective 7. 4th clutch defective	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/gasket and O-rings for wear and damage, and inspect the solenoid valves for seizure. • Check the 3rd and 4th clutch pressures. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace the discs as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate. • Inspect the 3rd clutch feed pipe. If the 3rd clutch feed pipe is scored, replace it and O-ring under the feed pipe guide. • Replace the secondary shaft if the bushing for the 3rd clutch feed pipe is loose or damaged.

G01818275

Fig. 21: Symptom Troubleshooting Index (8 Of 11)

Symptom	Probable cause(s)	Notes
Excessive shock or flares on 4-5 upshift or 5-4 downshift	1. A/T clutch pressure control solenoid valve B defective 2. A/T clutch pressure control solenoid valve C defective 3. Foreign material in separator plate orifice 4. 4th accumulator defective 5. 5th accumulator defective 6. 4th clutch defective 7. 5th clutch defective	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/gasket for wear and damage, and inspect the solenoid valves for seizure. • Check the 4th and 5th clutch pressures. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace the discs as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate. • Inspect the 5th clutch feed pipe. If the 5th clutch feed pipe is scored, replace it and O-ring under the feed pipe guide. • Replace the mainshaft if the bushing for the 5th clutch feed pipe is loose or damaged.
Noise from transmission in all shift lever positions	1. ATF pump worn or binding 2. Mainshaft bearing, countershaft bearing or secondary shaft bearing defective	• Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Be careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the main valve body. This will result in ATF pump seizure if not detected. Use the proper tools. • Install the main seal flush with the torque converter housing. If you push it into the torque converter housing until it bottoms out, it will block the fluid return passage and result in damage. • Inspect if the ATF strainer is clogged with particles of steel or aluminum. If clogged, replace it, and flush the torque converter, cooler, and lines. • Inspect the mainshaft and countershaft for wear or damage.
Vehicle does not accelerate more than 31 mph (50 km/h)	Torque converter one-way clutch defective	Replace the torque converter.
Vibration in all shift lever positions	Drive plate defective or transmission misassembled	• Check for a misinstalled/damaged drive plate. • Set idle rpm in gear to the specified idle speed. If still no good, adjust the engine and transmission mounts as outlined in the engine section of this service manual.

G01818276

Fig. 22: Symptom Troubleshooting Index (9 Of 11)

Symptom	Probable cause(s)	Notes
Shift lever does not operate smoothly	1. Transmission range switch defective or out of adjustment 2. Shift cable broken or out of adjustment 3. Joint in shift cable and transmission or body worn	• Check the D indicator, and check for loose connectors. Inspect the transmission range switch for operation. • Check for a loose shift cable at the shift lever and the transmission control shaft.
Transmission does not shift into P position	1. Shift cable broken or out of adjustment 2. Joint in shift cable and transmission or body worn 3. Park mechanism defective	• Check for a loose shift cable at the shift lever and the transmission control shaft. • Check the park pawl spring installation and the park lever spring installation. If installation is incorrect, install the spring correctly. Make sure that the park lever stop is not installed upside down. Check the distance between the park pawl shaft and park lever roller pin. If the distance is out of tolerance, adjust the distance with the park lever stop.
Lock-up clutch does not disengage	1. Shift solenoid valve E defective 2. A/T clutch pressure control solenoid valve A defective 3. Torque converter clutch piston defective 4. Lock-up shift valve defective 5. Lock-up control valve defective	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/gasket for wear and damage, and inspect the solenoid valves for seizure. • Replace the torque converter.
Unstable lock-up clutch operation	1. Shift solenoid valve E defective 2. A/T clutch pressure control solenoid valve A defective 3. Torque converter clutch piston defective 4. Torque converter check valve defective 5. Lock-up shift valve defective 6. Lock-up control valve defective	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/gasket for wear and damage, and inspect the solenoid valves for seizure. • Replace the torque converter.

G01818277

Fig. 23: Symptom Troubleshooting Index (10 Of 11)

Symptom	Probable cause(s)	Notes
Lock-up clutch does not engage	1. Shift solenoid valve E defective 2. A/T clutch pressure control solenoid valve A defective 3. Mainshaft speed sensor defective 4. Countershaft speed sensor defective 5. Torque converter clutch piston defective 6. Torque converter check valve defective 7. Lock-up shift valve defective 8. Lock-up control valve defective	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/gasket for wear and damage, and inspect the solenoid valves for seizure. • Replace the torque converter. • Check the mainshaft speed sensor and countershaft speed sensor installation.
A/T gear position indicator does not indicate shift lever positions	1. Transmission range switch defective or out of adjustment 2. Shift cable broken or out of adjustment 3. Joint in shift cable and transmission or body worn	• Check the D indicator, and check for loose connectors. Inspect the transmission range switch operation. • Check for a loose shift cable at the shift lever and the transmission control shaft.
Speedometer and odometer do not operate	Countershaft speed sensor defective	• Check the D indicator, and check for loose connectors. Inspect the transmission range switch operation. • Check the countershaft speed sensor installation.
Transmission shifts up during low-rev engine speed condition; engine cannot rev up to high speed	VTEC rocker arms defective	Check the engine rocker arms as described in the engine section of this service manual.

G01818278

Fig. 24: Symptom Troubleshooting Index (11 Of 11)

SYSTEM DESCRIPTION

GENERAL OPERATION

The automatic transmission is a combination of a 3-element torque converter and triple-shaft electronically controlled unit which provides 5 speeds forward and 1 reverse. The entire unit is positioned in line with the engine.

TORQUE CONVERTER, GEARS & CLUTCHES

The torque converter consists of a pump, turbine, and stator assembly in a single unit. The converter housing (pump) is connected to the engine crankshaft and turn as the engine turns. Around the outside of the torque converter is a ring gear which meshes with the starter pinion when the engine is being started. The entire torque converter assembly serves as a flywheel while transmitting power to the transmission mainshaft, the transmission has three parallel shafts; the mainshaft, the countershaft and the secondary shaft. The mainshaft is

in line with the engine crankshaft, and includes the 4th and 5th clutches, and gears for 5th, 4th, reverse, and idler. The mainshaft reverse gear is integral with the mainshaft 4th gear. The countershaft includes the gears for 1st, 2nd, 3rd, 4th, 5th, reverse, park, and the final drive. The final drive gear is integral with the countershaft. The countershaft 4th gear and the countershaft reverse gear can be locked to the countershaft providing the 4th or reverse gear, depending on which way the selector is moved. The secondary shaft includes the 1st, 2nd, and 3rd clutches, and gears for 1st, 2nd, 3rd, and idler. The idler shaft is located between the mainshaft and secondary shaft, and the idler gear transmits power between the mainshaft and the secondary shaft. The gears on the mainshaft and the secondary shaft are in constant mesh with those on the countershaft. When certain combinations of gears in the transmission are engaged by the clutches, power is transmitted through the mainshaft, then to the secondary shaft to the countershaft provide drive.

ELECTRONIC CONTROL

The electronic control system consists of the powertrain control module (PCM), sensors, and solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions. The PCM is located below the dashboard, under the front lower panel behind the center console.

HYDRAULIC CONTROL

The valve bodies include the main valve body, the regulator valve body, and the servo body. They are bolted to the torque converter housing. The main valve body contains the manual valve, the shift valves A, B, C, and E, the relief valve, the lock-up control valve, the cooler check valve, the servo control valve, and the ATF pump gears. The regulator valve body contains the regulator valve, the torque converter check valve, lock-up shift valve, and the 1st and 3rd accumulators. The servo body contains the servo valve, the shift valve D, accumulators for 2nd, 4th, and 5th, and shift solenoid valves for A, B, C, D, and E. Fluid from the regulator passes through the manual valve to the various control valves. The 1st, 3rd, and 5th clutches receive fluid from their respective feed pipes, and the 2nd and the 4th clutches receive fluid from the internal hydraulic circuit.

SHIFT CONTROL MECHANISM

The PCM controls to shift gears the shift solenoid valves A, B, C, D, and E, and the A/T clutch pressure control solenoid valves A, B, and C, while receiving input signals from various sensors and switches located throughout the vehicle. The shift solenoid valves shift the positions of the shift valves to switch the port leading hydraulic pressure to the clutch. The A/T clutch pressure control solenoid valves A, B, and C regulate their respective pressure, and pressurize to the clutches to engage it and its corresponding gear. The pressures of the A/T clutch pressure control solenoid valves also apply to the shift valves to switch the port.

LOCK-UP MECHANISM

The lock-up mechanism operates in **D** position (2nd, 3rd, 4th, and 5th), in $\mathbf{D}_3$ position (2nd and 3rd), and **M** (sequential sportshift mode) position (3rd, 4th, and 5th). 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 volume of the lock-up mechanism. When the shift solenoid valve E is turned on by the PCM, shift solenoid valve E pressure switches the lock-up shift valve lock-up on and off. The A/T clutch pressure control solenoid valve A and the lock-up control valve control the volume of the lock-up conditions.

GEAR SELECTION

The shift lever has five positions: **P** PARK, **R** REVERSE, **N** NEUTRAL, **D** DRIVE 1st through 5th gear range with automatic shift and sequential sportshift in **M** (sequential sportshift mode) position, and $\mathbf{D}_3$ DRIVE 1st through 3rd gear range with automatic shift.

Starting is possible only in the **P** and **N** positions because of a slide-type neutral-safety switch.

Position		Description
P PARK		Front wheels locked; park pawl engaged with park gear on countershaft. All clutches are released.
R REVERSE		Reverse; reverse selector engaged with countershaft reverse gear and 4th clutch engaged.
N NEUTRAL		All clutches are released.
D DRIVE (1st through 5th)	Automatic shift	General driving; starts off in 1st, shifts automatically to 2nd, 3rd, 4th, then 5th, depending on vehicle speed and throttle position. Downshifts through 4th, 3rd, 2nd, and 1st on deceleration to stop. The lock-up mechanism operates in 2nd, 3rd, 4th, and 5th gears.
	M position Sequential sportshift mode	Manual gear shift driving; vehicle can starts off in 1st and 2nd gears, and does not upshift automatically. The lock-up mechanism operates in 3rd, 4th and 5th gears.
D3 DRIVE (1st through 3rd)		For rapid acceleration at highway speeds and general driving, up-hill and down-hill driving; starts off in 1st, shifts automatically to 2nd, then 3rd, depending on vehicle speed and throttle position. Downshifts through 2nd to 1st on deceleration to stop. The lock-up mechanism operates in 2nd and 3rd gears.

G01818279

Fig. 25: Identifying Gear Selections

AUTOMATIC TRANSAXLE (A/T) GEAR POSITION INDICATOR

The A/T gear position indicator in the instrument panel shows which shift lever position has been selected without having to look down at the shift lever. With the shift lever in the **M** (sequential sportshift mode) position, the shift indicator between the speedometer and tachometer in the instrument panel will display the gear selected.

CLUTCHES & GEARS

The 5-speed automatic transmission uses hydraulically-actuated clutches to engage or disengage the transmission gears. When hydraulic pressure is introduced into the clutch drum, the clutch piston moves. This presses the friction discs and steel plates together, locking them so they don't slip. Power is then transmitted through the engaged clutch pack to its hub-mounted gear. Likewise, when the hydraulic pressure is bled from the clutch pack, the piston releases the friction discs and 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 top of the secondary shaft. The 1st clutch is joined back-to-back to the 3rd clutch. The 1st clutch 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 end of the secondary shaft, opposite the end cover. The 2nd clutch is supplied hydraulic pressure by a circuit connected to the internal hydraulic circuit.

3rd Clutch

The 3rd clutch engages/disengages 3rd gear, and is located at the top of the secondary shaft. The 3rd clutch is joined back-to-back to the 1st clutch. The 3rd clutch is supplied hydraulic pressure by its ATF feed pipe within the secondary shaft.

4th Clutch

The 4th clutch engages/disengages 4th gear, as well as reverse gear, and is located at the top of the mainshaft. The 4th clutch is joined back-to-back to the 5th clutch. The 4th clutch is supplied hydraulic pressure by its ATF feed pipe within the mainshaft.

5th Clutch

The 5th clutch engages/disengages 5th gear, and is located at the top of the mainshaft. The 5th clutch is joined back-to-back to the 4th clutch. The 5th clutch is supplied hydraulic pressure by its ATF feed pipe within the mainshaft.

Gear operation

Gears on the mainshaft:

- 4th gear engages/disengages with the mainshaft by the 4th clutch.
- 5th gear engages/disengages with the mainshaft by the 5th clutch.
- Reverse gear engages/disengages with the mainshaft by the 4th clutch.
- Idler gear is splined with the mainshaft, and rotates with the mainshaft.

Gears on the countershaft:

- Final drive gear is integral with the countershaft.
- 1st, 2nd, 3rd, 5th, and park gears are splined with the countershaft, and rotate with the countershaft.
- 4th gear and reverse gear rotate freely from the countershaft. The reverse selector engages 4th gear and reverse gear with the reverse selector hub. The reverse selector hub is splined to the countershaft so that the 4th gear and reverse gear engage with the countershaft.

Gears on the secondary shaft:

- 1st gear engages/disengages with the secondary shaft by the 1st clutch.
- 2nd gear engages/disengages with the secondary shaft by the 2nd clutch.
- 3rd gear engages/disengages with the secondary shaft by the 3rd clutch.
- Idler gear is splined with the secondary shaft, and rotates with the secondary shaft.

The idler gear on the idler shaft transmits power between the mainshaft and the secondary shaft.

The reverse idler gear transmits power from the mainshaft reverse gear to the countershaft reverse gear, and changes rotation direction of the countershaft to reverse.

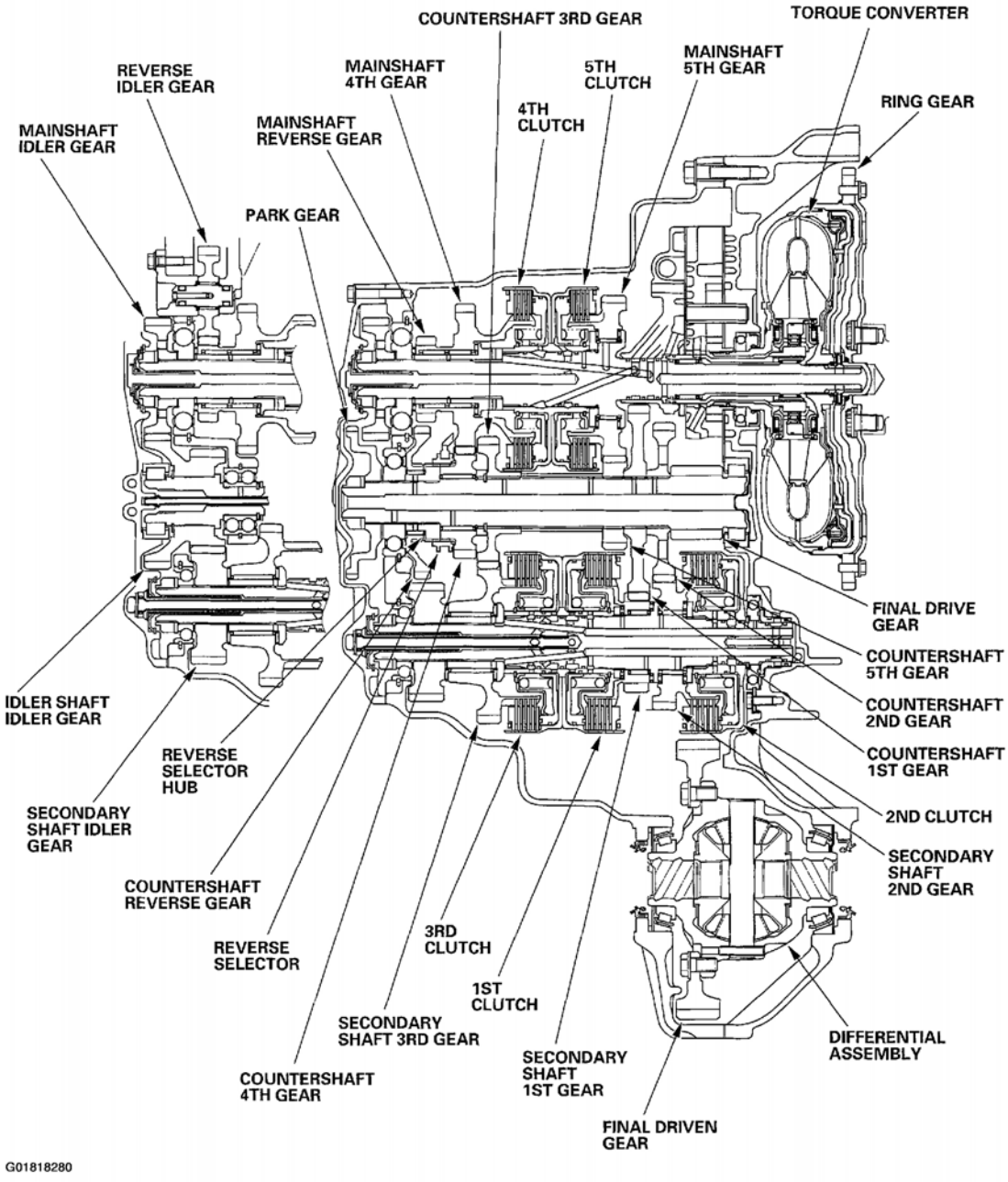


Fig. 26: Transmission Cutaway View

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 torque converter drives the mainshaft idler gear, the idler shaft idler gear, and the secondary idler 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** position:

- When shifted from **D** position, the reverse selector engages with the countershaft 4th gear and the reverse selector hub, and the 4th gear engages with the countershaft.
- When shifted from **R** position, the reverse selector engages with the countershaft reverse gear and the reverse selector hub, and the reverse gear engages with the countershaft.

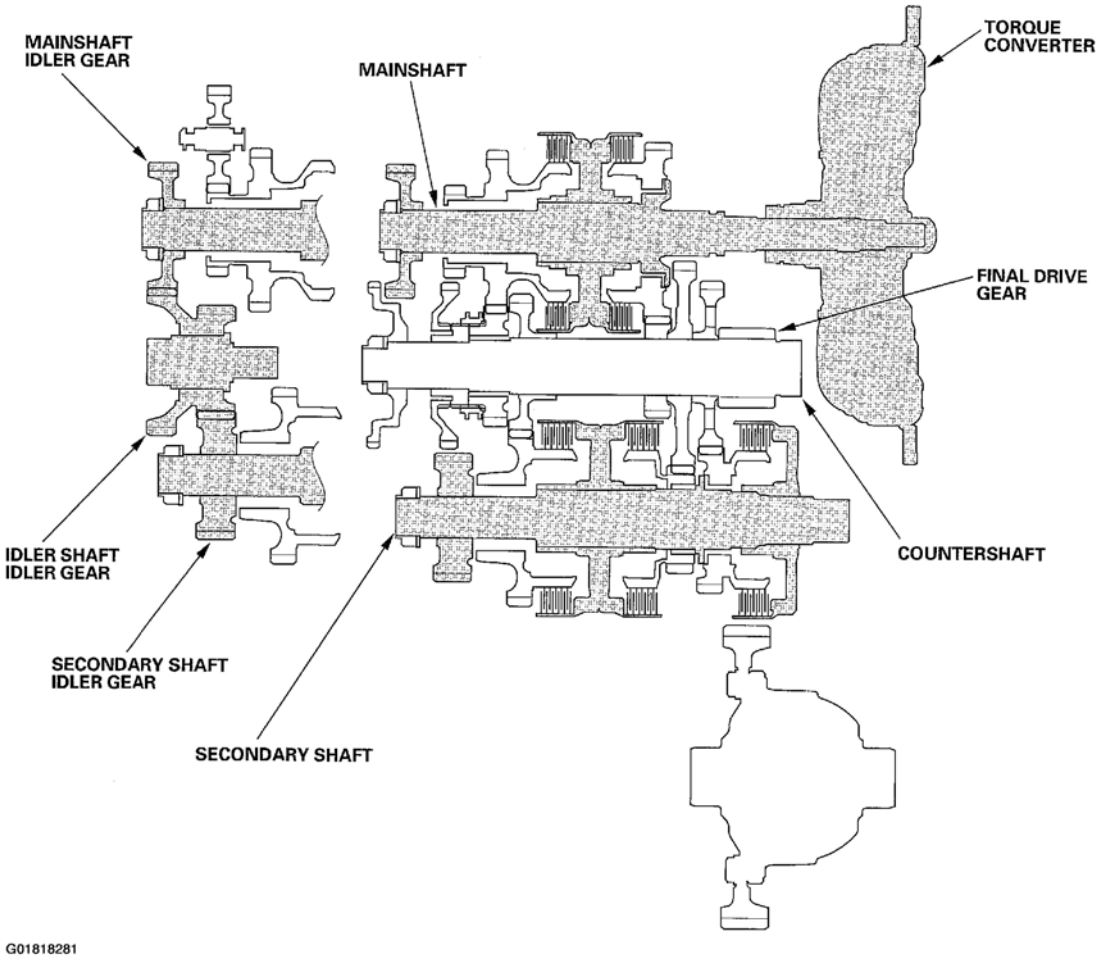


Fig. 27: N Position Power Flow

1st Gear

Hydraulic pressure is applied to the 1st clutch, then the 1st clutch engages the secondary shaft 1st gear with the secondary shaft.

The mainshaft idler gear drives the secondary shaft via the idler shaft idler gear and the secondary shaft idler

gear.

The secondary shaft 1st gear drives the countershaft 1st gear and the countershaft.

Power is transmitted to the final drive gear, which in turn drives the final driven gear.

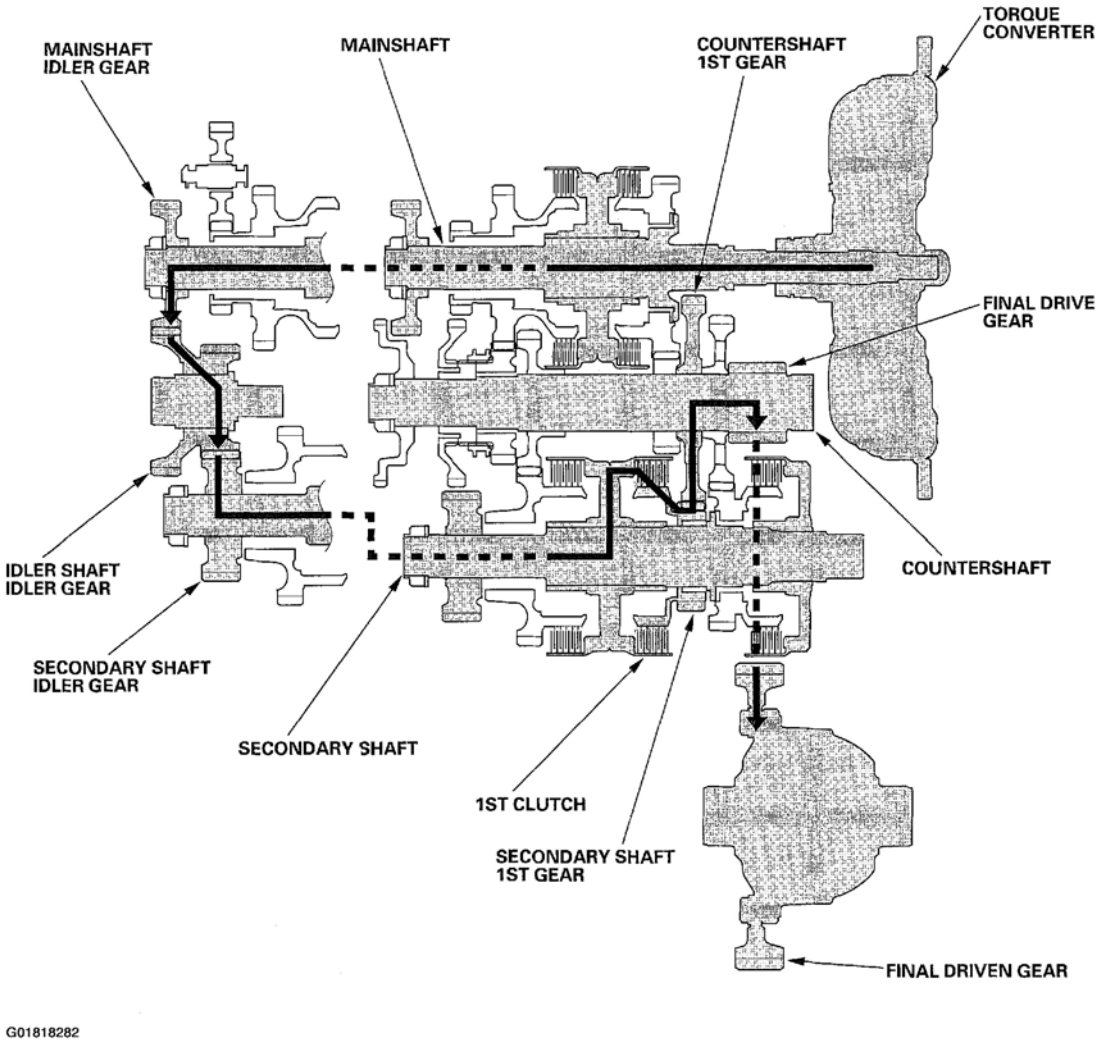


Fig. 28: 1st Gear Power Flow

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 idler gear drives the secondary shaft via the idler shaft idler gear and the secondary shaft idler gear.

The secondary shaft 2nd gear drives the countershaft 2nd gear and the countershaft.

Power is transmitted to the final drive gear, which in turn drives the final driven gear.

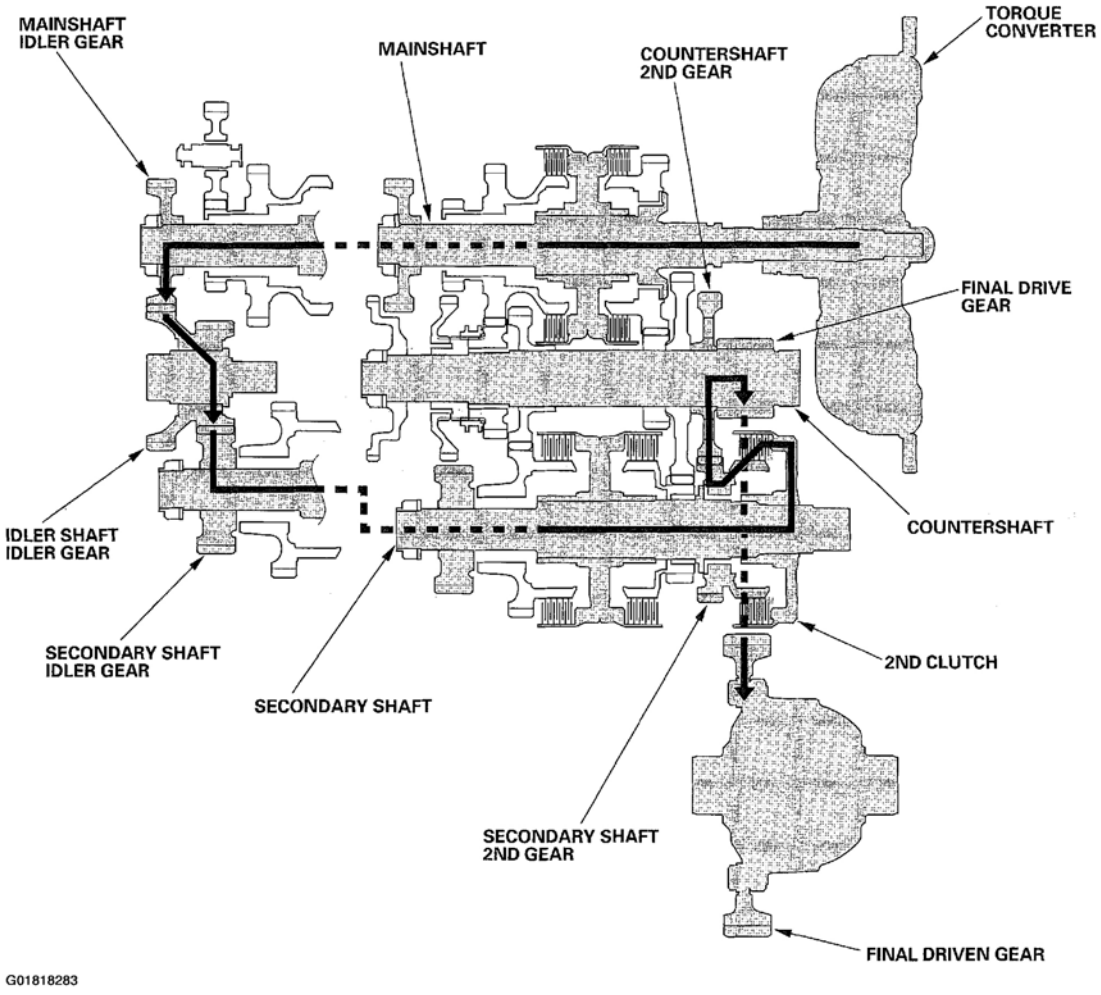


Fig. 29: 2nd Gear Power Flow

3rd Gear

Hydraulic pressure is applied to the 3rd clutch, then the 3rd clutch engages the secondary shaft 3rd gear with the secondary shaft.

The mainshaft idler gear drives the secondary shaft via the idler shaft idler gear and secondary shaft idler gear.

The secondary shaft 3rd gear drives the countershaft 3rd gear and the countershaft.

Power is transmitted to the final drive gear, which in turn drives the final driven gear.

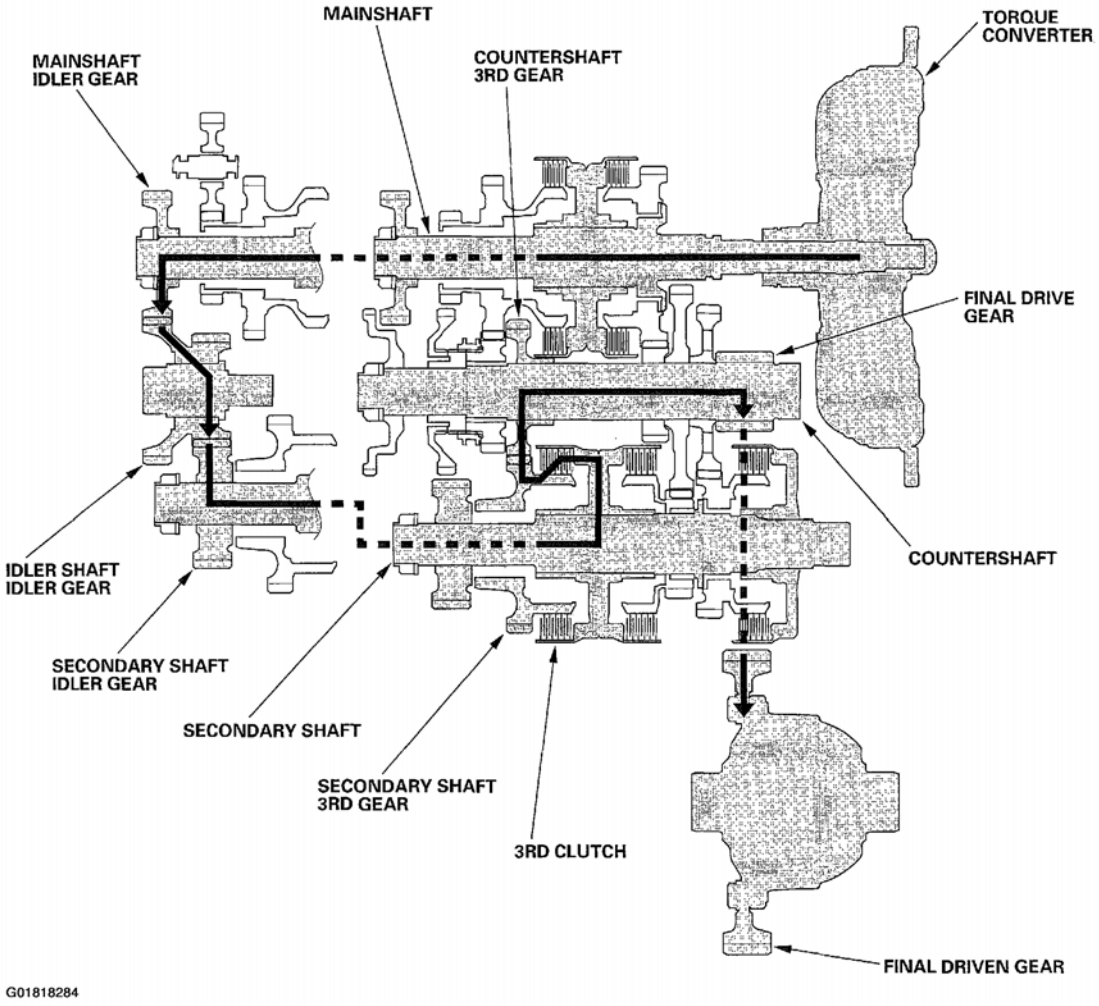


Fig. 30: 3rd Gear Power Flow

4th Gear

Hydraulic pressure is applied to the servo valve to engage the reverse selector with the countershaft 4th gear and reverse selector hub while the shift lever is in the **D** , $\mathbf{D}_3$, and **M** positions (forward range).

Hydraulic pressure is also applied to the 4th clutch, then the 4th clutch engages the mainshaft 4th gear with the mainshaft.

The mainshaft 4th gear drives the countershaft 4th gear and the countershaft.

Power is transmitted to the final drive gear, which in turn drives the final driven gear.

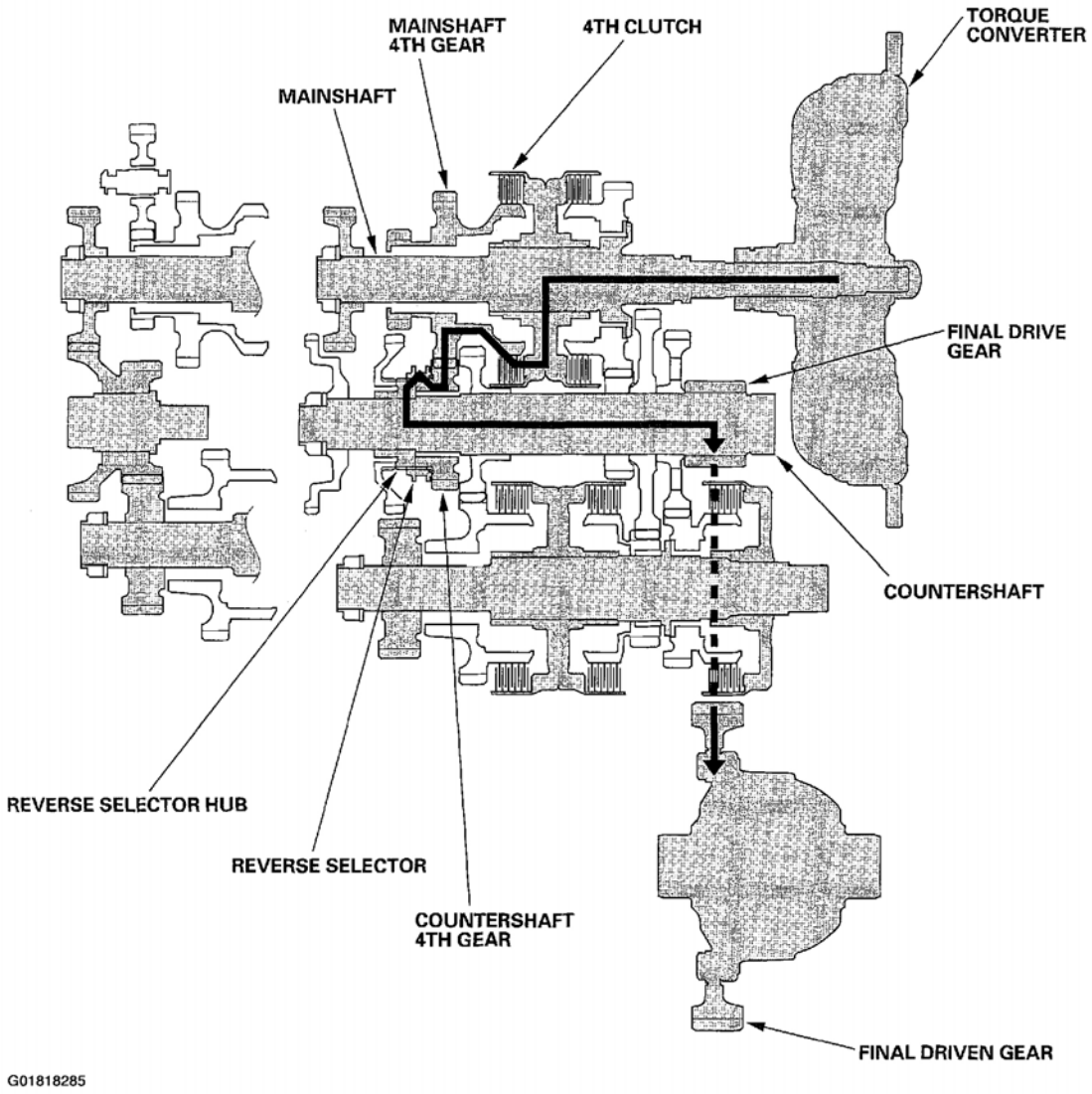


Fig. 31: 4th Gear Power Flow

5th Gear

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 and the countershaft.

Power is transmitted to the final drive gear, which in turn drives the final driven gear.

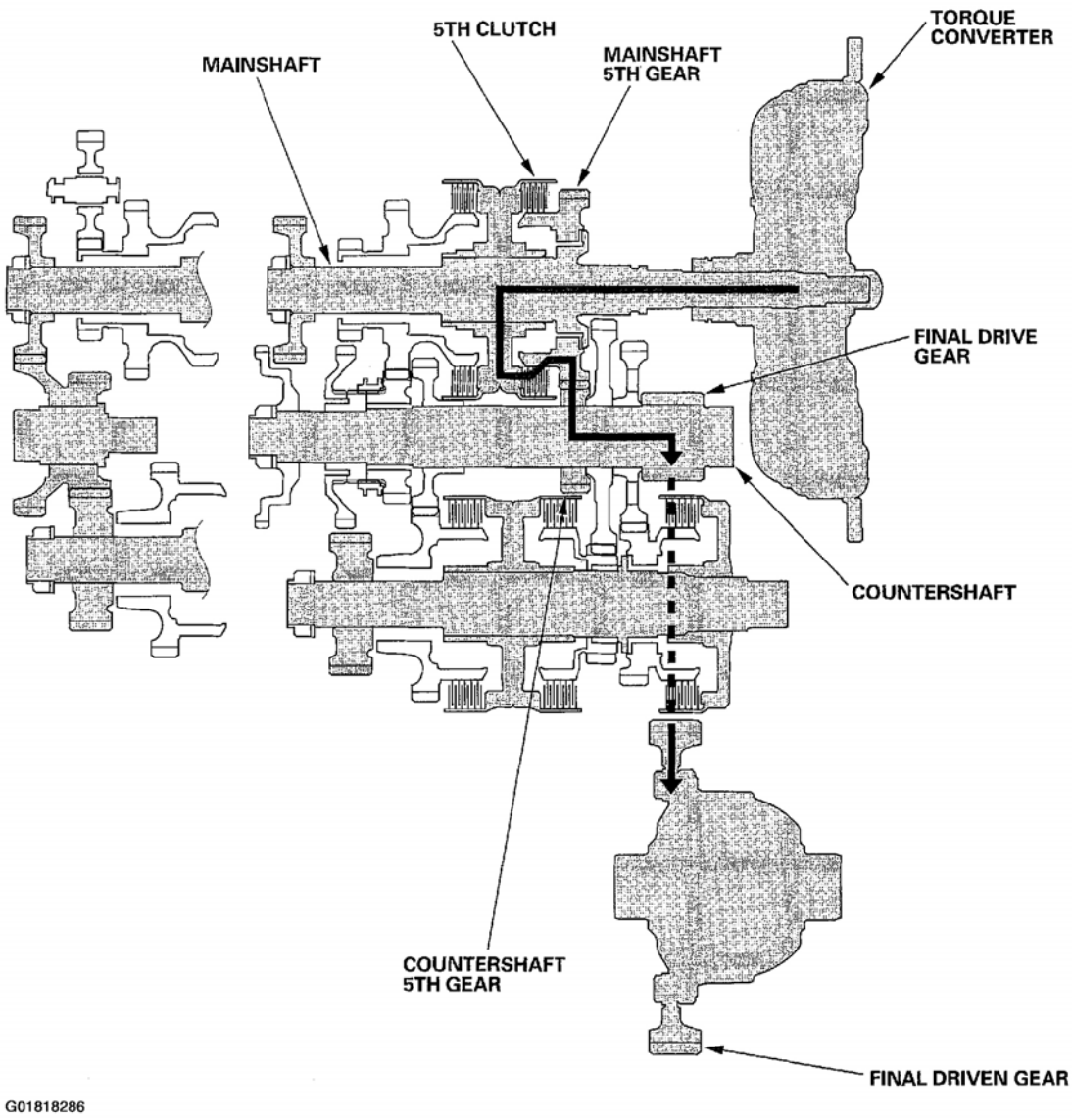


Fig. 32: 5th Gear Power Flow

R Position

Hydraulic pressure is applied to the servo valve to engage the reverse selector with the countershaft reverse gear and reverse selector hub while the shift lever is in the **R** position.

Hydraulic pressure is also applied to the 4th clutch, then the 4th clutch engages the mainshaft reverse gear with the mainshaft.

The mainshaft reverse gear drives the countershaft reverse gear via the reverse idler gear.

The rotation direction of the countershaft reverse gear is changed by the reverse idler gear.

The countershaft reverse gear drives the countershaft via the reverse selector, which drives the reverse selector hub.

Power is transmitted to the final drive gear, which in turn drives the final driven gear.

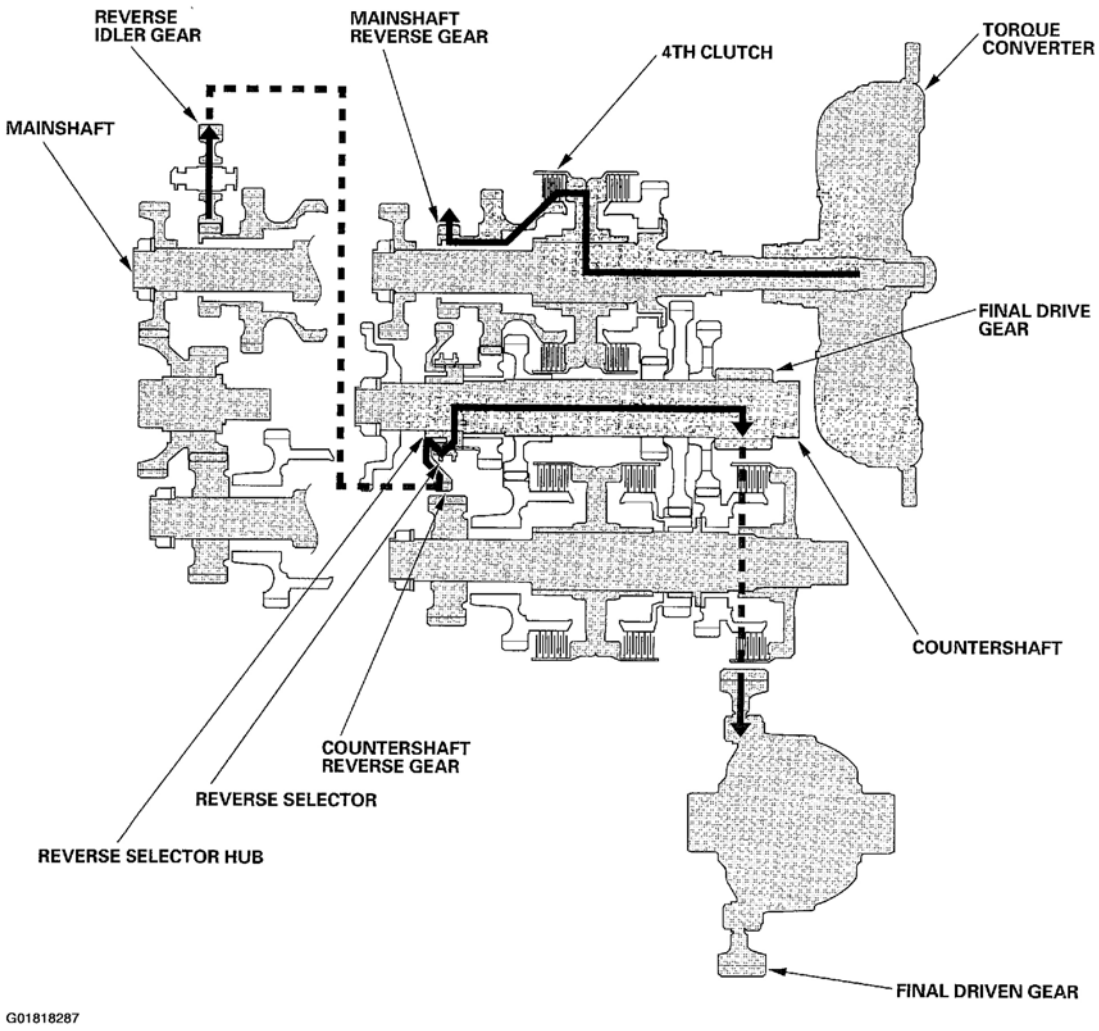


Fig. 33: R Position Power Flow

ELECTRONIC CONTROL SYSTEM

Functional Diagram

The electronic control system consists of the powertrain control module (PCM), sensors, and solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions.

The PCM receives input signals from the sensors, switches, and other control units, perform processing data, and outputs signals for the engine control system and A/T control system. The A/T control system includes shift control, grade logic control, clutch pressure control, and lock-up control is stored in the PCM.

The PCM switches the shift solenoid valves and the A/T clutch pressure control solenoid valves to control shifting transmission gears and lock-up torque converter clutch.

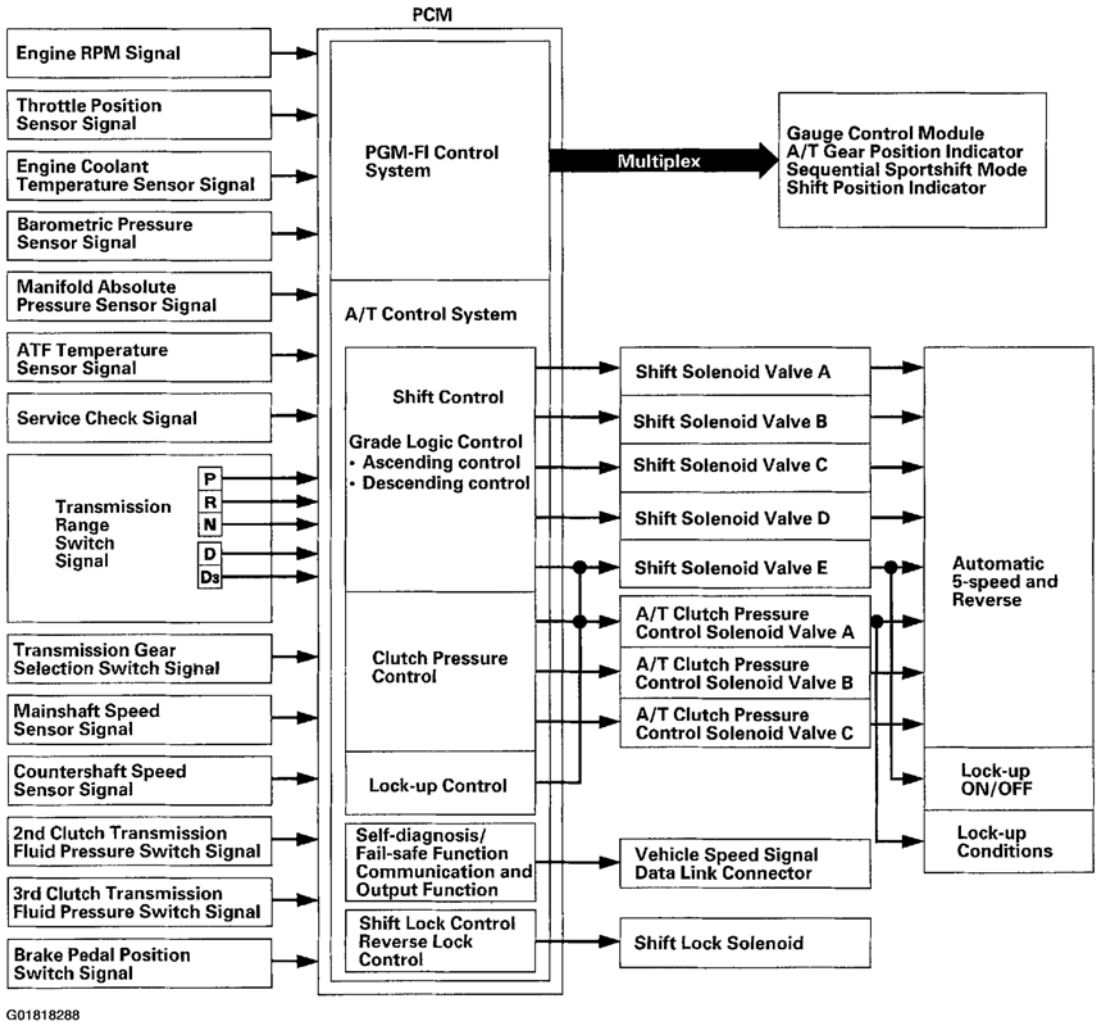


Fig. 34: Electronic Control System Schematic

Electronic Controls Location

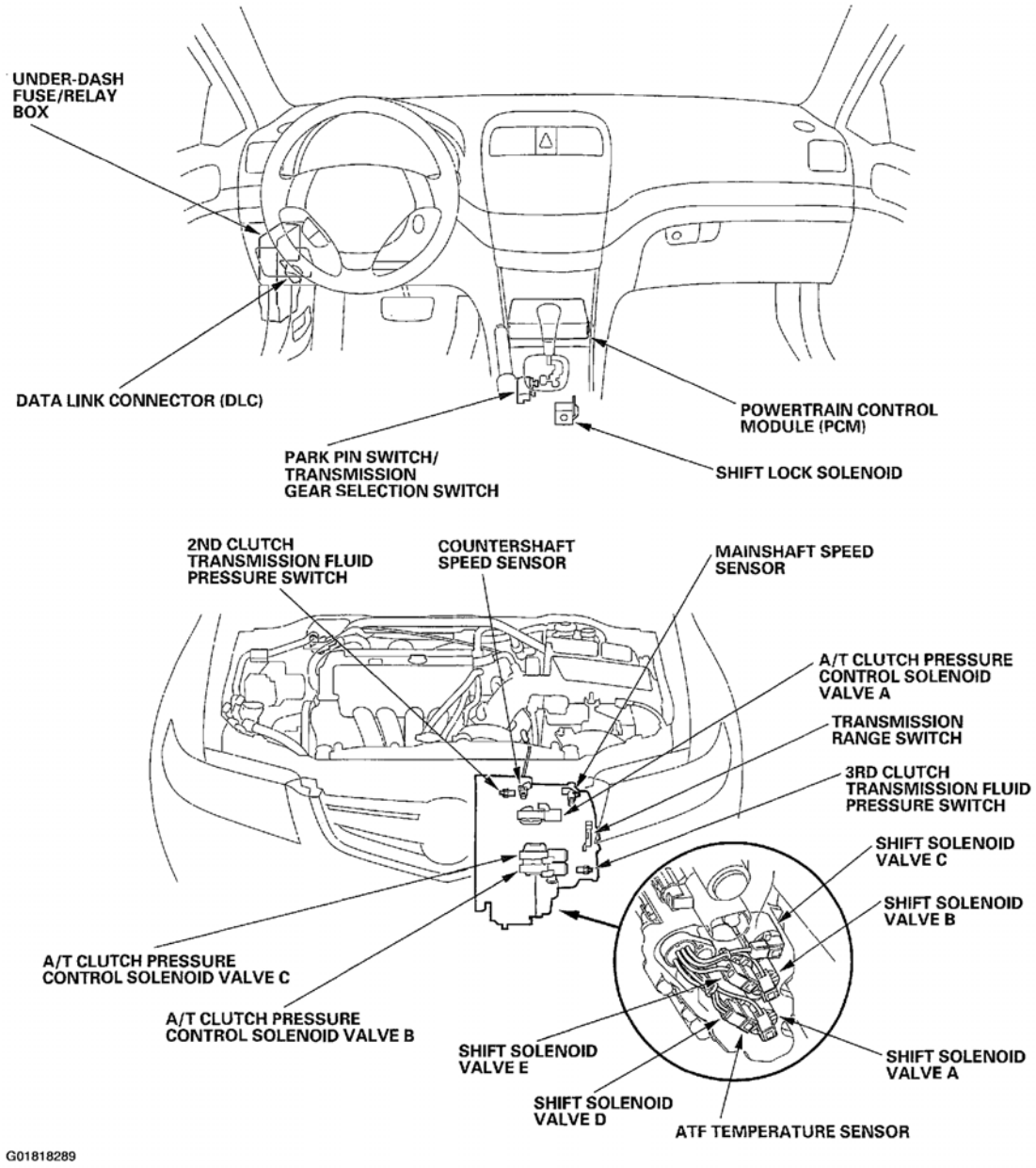


Fig. 35: Locating Electronic Controls

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, D, and E to control shifting.

Also, a grade logic control system has been adopted to control shifting in **D** and $\mathbf{D}_3$ positions. The PCM compares actual driving conditions with memorized driving conditions, based on the input from the throttle position sensor, the engine coolant temperature sensor, the barometric pressure sensor, the brake pedal position

switch signal, and the shift lever position signal, to control shifting while the vehicle is ascending or descending a slope.

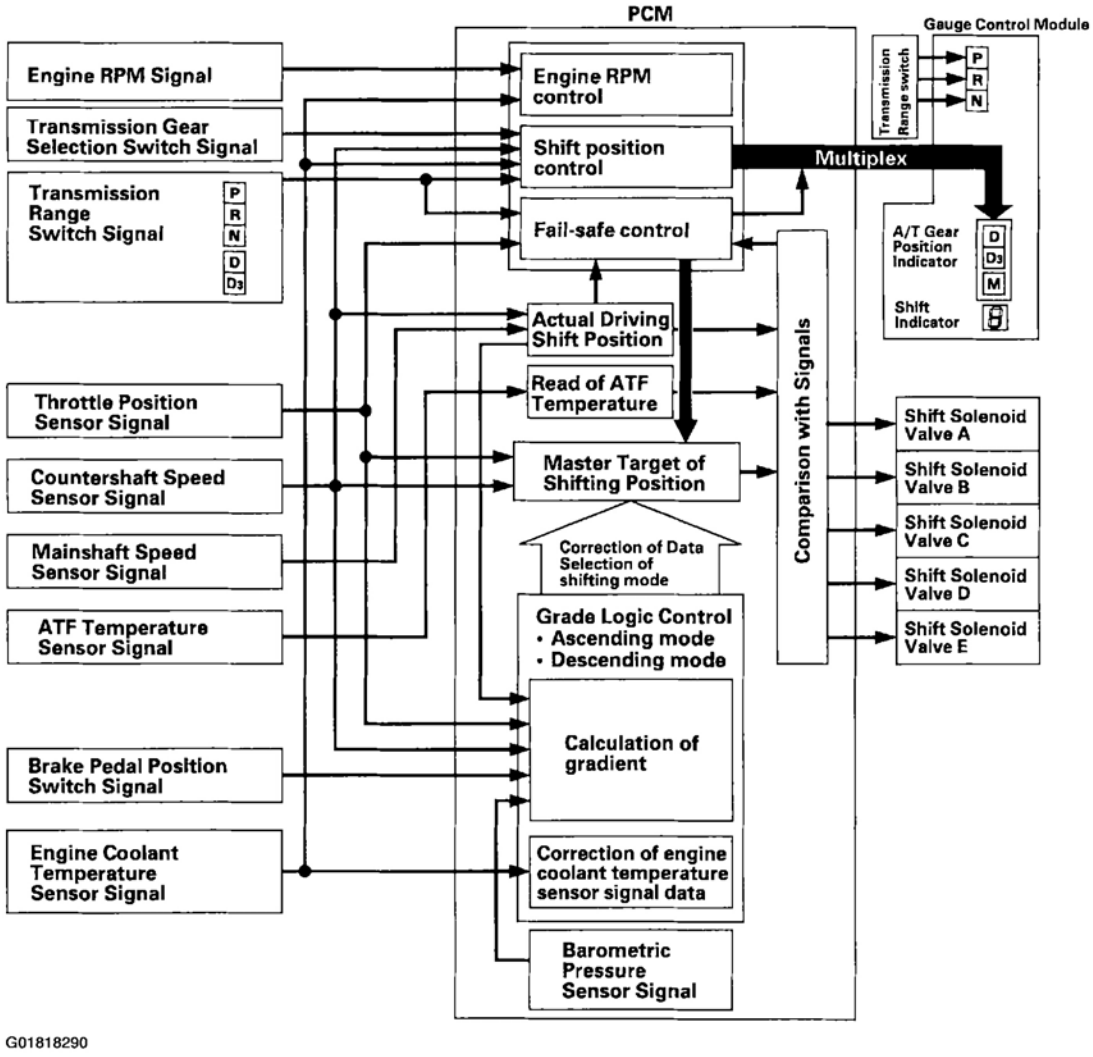


Fig. 36: Shift Control Schematic

The PCM turns the shift solenoid valves A, B, C, D, and E ON and OFF to control shifting transmission gear. The combination of driving signals to shift solenoid valves A, B, C, D, and E are shown in table below.

Position	Gear position	Shift solenoid valves				
		A	B	C	D	E
D, D3, M	Shifting from N position	OFF	ON	ON	OFF	OFF
	Stays in 1st	ON	ON	ON	OFF	OFF
	Shifting gears between 1st and 2nd	OFF	ON	ON	OFF	OFF
	Stays in 2nd	OFF	ON	OFF	ON	OFF
	Shifting gears between 2nd and 3rd	OFF	ON	ON	ON	OFF
	Stays in 3rd	OFF	OFF	ON	OFF	OFF
D, M	Shifting gears between 3rd and 4th	OFF	OFF	OFF	OFF	OFF
	Stays in 4th	ON	OFF	OFF	OFF	OFF
	Shifting gears between 4th and 5th	ON	OFF	OFF	ON	OFF
	Stays in 5th	ON	OFF	ON	ON	OFF
R	Shifting from P and N position	OFF	ON	OFF	OFF	ON
	Stays in reverse	ON	ON	OFF	OFF	ON
	Reverse inhibit	ON	ON	OFF	OFF	OFF
P	Park	OFF	ON	OFF	OFF	ON
N	Neutral	OFF	ON	ON	OFF	OFF

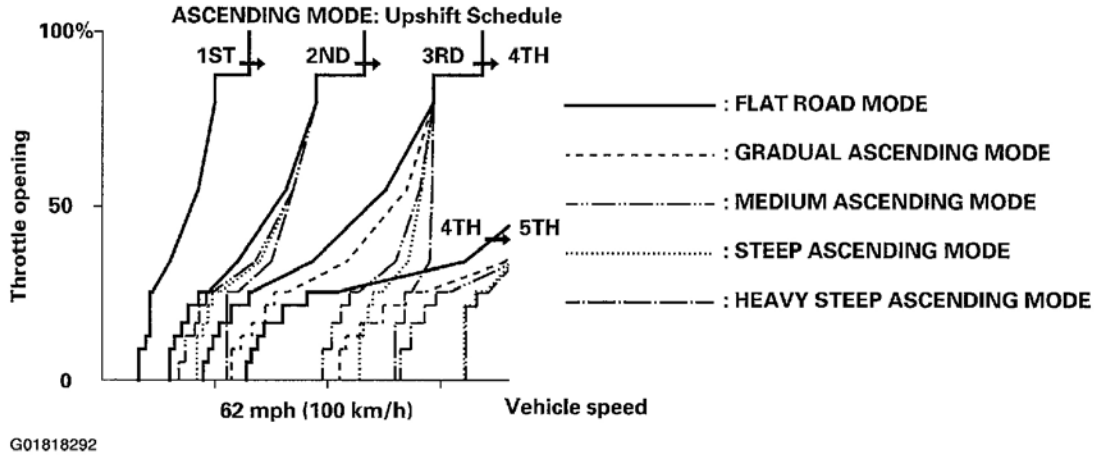
G01818291

Fig. 37: Transmission Gear/Shift Solenoid Valve Table

GRADE LOGIC CONTROL: ASCENDING CONTROL

When the PCM determines that the vehicle is climbing a hill in **D** and $\mathbf{D}_3$ positions, the system extends the engagement area of 2nd, 3rd, and 4th gears to prevent the transmission from frequently shifting between 2nd and 3rd gears, between 3rd and 4th gears, and between 4th and 5th gears, so the vehicle can run smooth and have more power when needed.

Shift schedules stored in the PCM between 2nd and 3rd gears, between 3rd and 4th gears, and between 4th and 5th gears, enable it to automatically select the most suitable gear according to the magnitude of a gradient.



G01818292

Fig. 38: Grade Logic Control: Ascending Control Table

GRADE LOGIC CONTROL: DESCENDING CONTROL

When the PCM determines that the vehicle is going down a hill in **D** and $\mathbf{D}_3$ positions, the shift-up speed from

4th to 5th gear, from 3rd to 4th gear, and from 2nd to 3rd gear (when the throttle is closed) becomes faster than the set speed for flat road driving to widen the 4th gear, 3rd gear, and 2nd gear driving area. This, in combination with engine braking from the deceleration lock-up, achieves smooth driving when the vehicle is descending. There are three descending modes with different 4th gear driving areas, 3rd gear driving areas, and 2nd gear driving areas according to the magnitude of a gradient stored in the PCM. When the vehicle is in 5th gear or 4th gear, and you are decelerating when you are applying the brakes on a steep hill, the transmission will downshift to lower gear. When you accelerate, the transmission will then return to a higher gear.

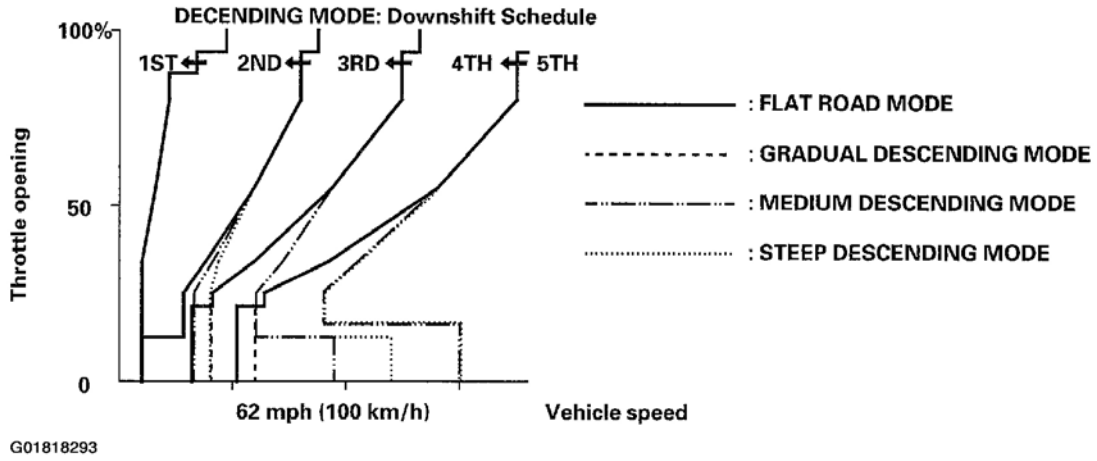


Fig. 39: Grade Logic Control: Descending Control Table

CLUTCH PRESSURE CONTROL

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

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

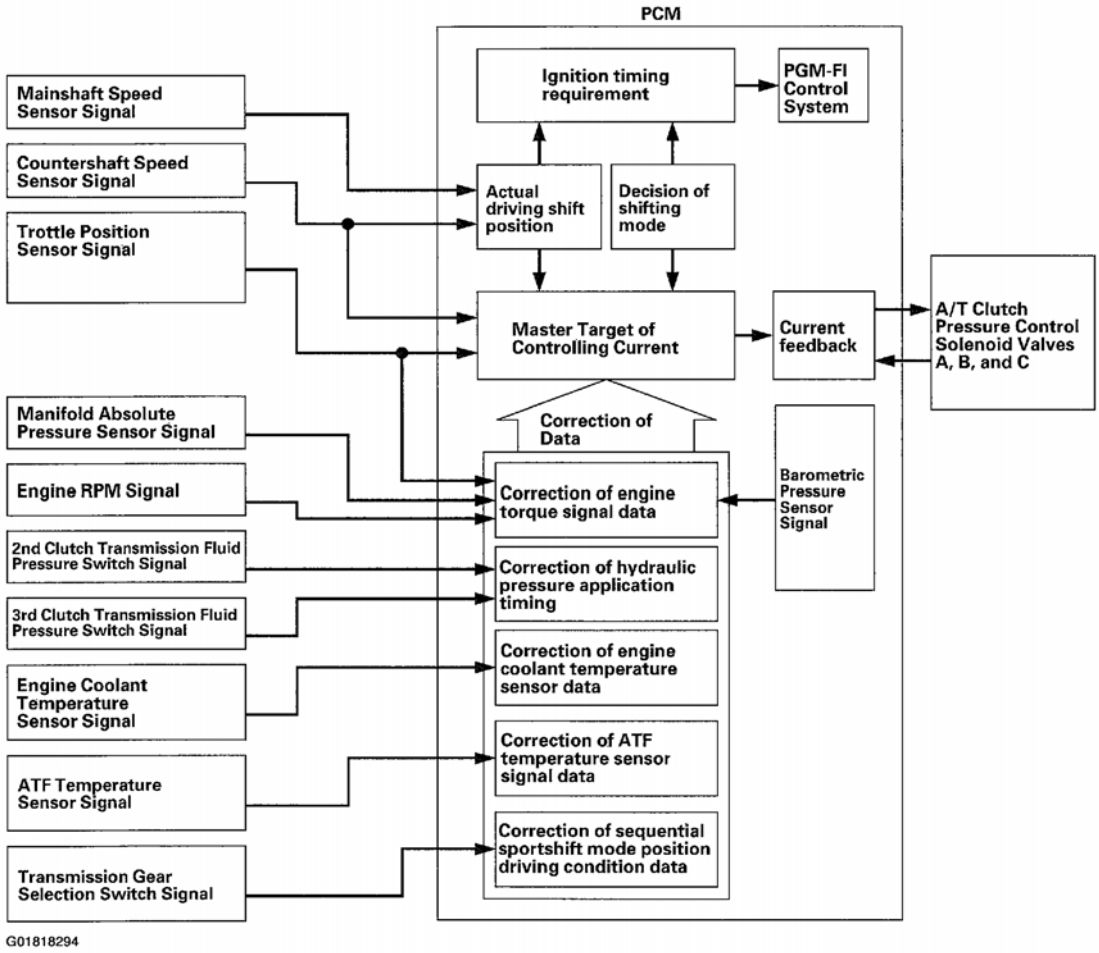


Fig. 40: Clutch Pressure Control Schematic

LOCK-UP CONTROL

The shift solenoid valve E controls the hydraulic pressure to switch the lock-up shift valve and lock-up ON and OFF.

The PCM actuates the shift solenoid valve E and the A/T clutch pressure control solenoid valve A to control the torque converter clutch lock-up. When the shift solenoid valve E is turned ON, the condition of the lock-up starts.

The A/T clutch pressure control solenoid valve A regulates and applies the hydraulic pressure to the lock-up control valve to control the amount of the lock-up.

The lock-up mechanism operates in 2nd, 3rd, 4th, and 5th gears in **D** position, 2nd and 3rd gears in $\mathbf{D}_3$ position, and 3rd, 4th, and 5th gears in **M** position.

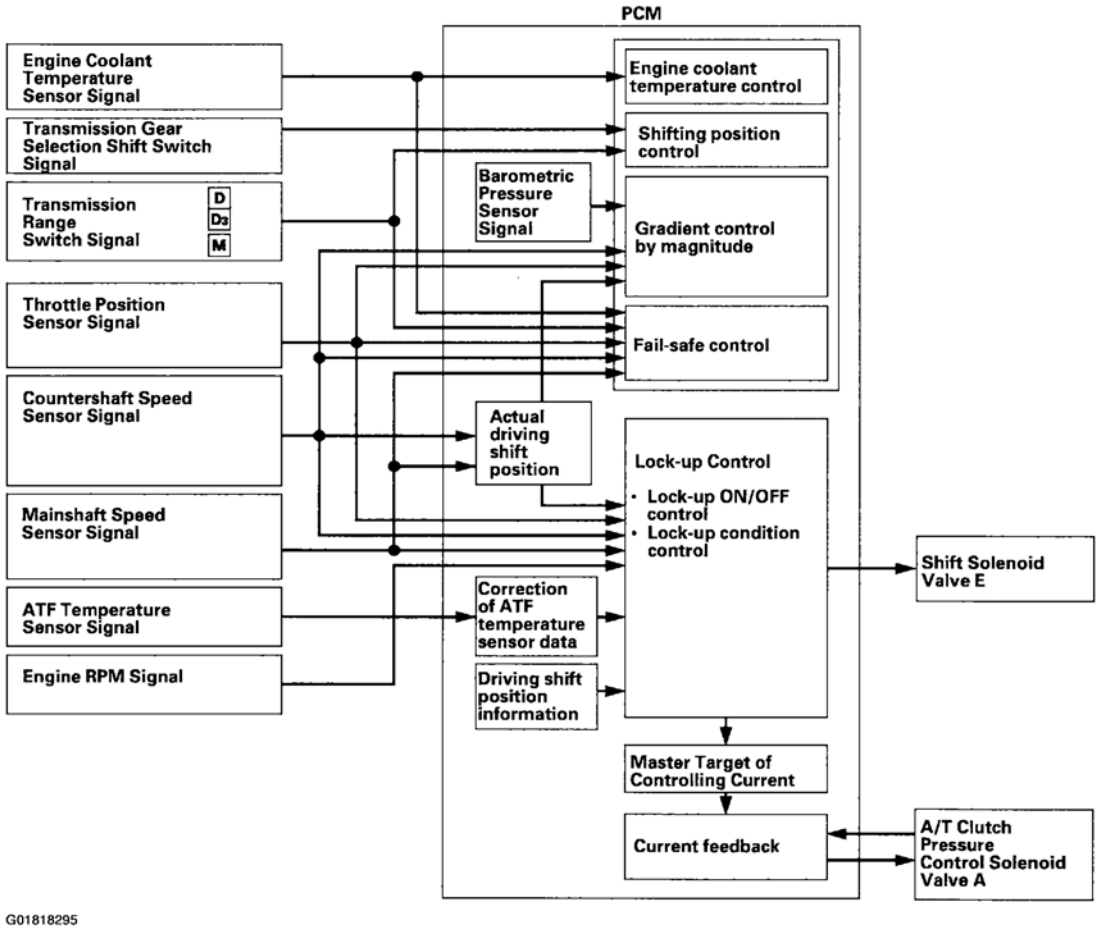


Fig. 41: Lock-up Control Schematic

PCM ELECTRICAL CONNECTIONS

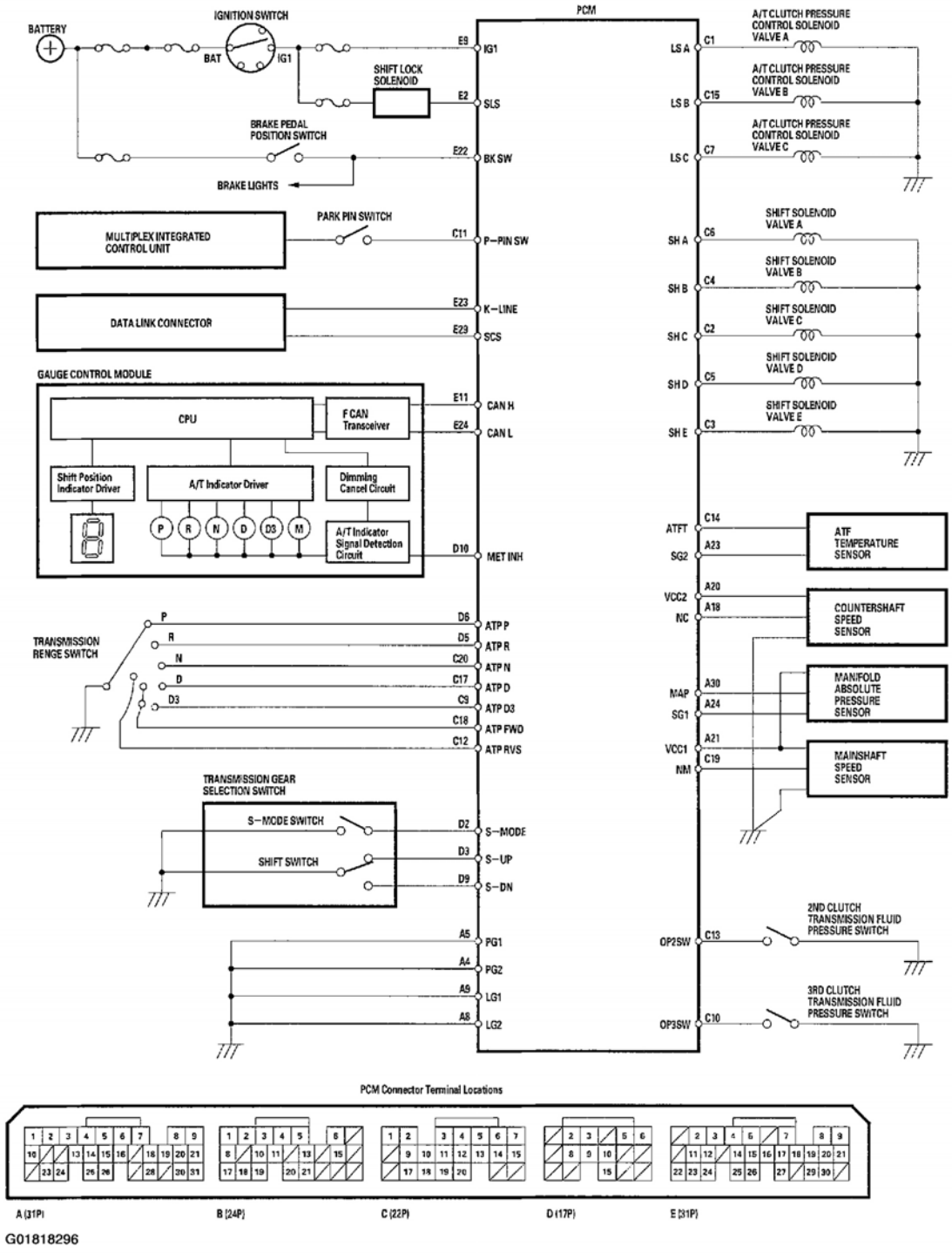


Fig. 42: PCM Connector Terminal Locations

PCM INPUTS & OUTPUTS

The PCM terminal voltage and measuring conditions are shown for the connector terminals that are related to

the A/T control system. The other terminal voltage and measuring conditions are described in Fuel and Emission.

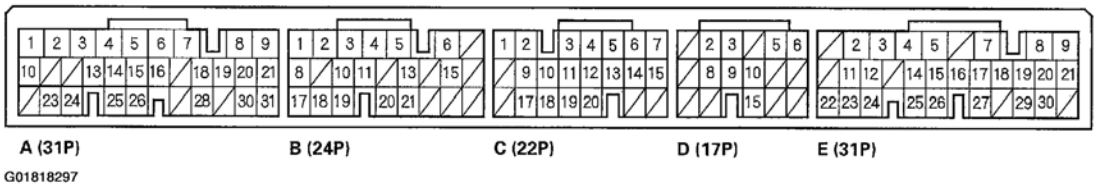


Fig. 43: Identifying PCM Connector Terminals

Terminal Number	Wire Color	Signal	Description	Measuring Conditions/Terminal Voltage
A2	YEL/BLK	IGP2	Power supply circuit from main relay	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
A3	YEL/BLK	IGP1	Power supply circuit from main relay	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
A4	BLK	PG2	Ground	Less than 1.0 V at all times
A5	BLK	PG1	Ground	Less than 1.0 V at all times
A8	BRN/YEL	LG2	Ground	Less than 1.0 V at all times
A9	BRN/YEL	LG1	Ground	Less than 1.0 V at all times
A18	BLK/BLU	NC	Countershaft speed sensor signal input	With ignition switch ON (II): 0 V or about 5 V While driving: About 2.5 V
A20	YEL/BLU	VCC2	Power supply circuit for sensors	With ignition switch ON (II): About 5 V With ignition switch OFF: 0 V
A21	YEL/RED	VCC1	Power supply circuit for sensors	With ignition switch ON (II): About 5 V With ignition switch OFF: 0 V
A23	GRN/YEL	SG2	Sensor ground	Less than 1.0 V at all times
A24	GRN/WHT	SG1	Sensor ground	Less than 1.0 V at all times

G01818298

Fig. 44: PCM Connector A (31P) Inputs & Outputs

Terminal Number	Wire Color	Signal	Description	Measuring Condition/Terminal Voltage
C1	RED/BLK	LS A	A/T clutch pressure control solenoid valve A control	With ignition switch ON (II): Pulsing signal
C2	GRN	SH C	Shift solenoid valve C control	Battery voltage in these positions: • N • 1st, 3rd, and 5th gears in D, D3, and M • Reverse inhibit in R 0 V in these positions: • P and R • 2nd and 4th gears in D, D3, and M
C3	YEL	SH E	Shift solenoid valve E control	Battery voltage in these positions: • P and R 0 V in these positions: • Reverse inhibit in R • N • 1st gear in D, D3, and M
C4	GRN/WHT	SH B	Shift solenoid valve B control	Battery voltage in these positions: • P, R, and N • 1st and 2nd gears in D, D3, and M 0 V in these positions: • Reverse inhibit in R • 3rd, 4th, and 5th gears in D, D3, and M
C5	GRN/RED	SH D	Shift solenoid valve D control	Battery voltage in these positions: • 2nd and 5th gears in D, D3, and M 0 V in these positions: • Reverse inhibit in R • P, R, and N • 1st, 3rd, and 4th gears in D, D3, and M
C6	BLU/BLK	SH A	Shift solenoid valve A control	Battery voltage in these positions: • R • 1st, 4th, and 5th gears in D, D3, and M 0 V in these positions: • Reverse inhibit in R • P and N • 2nd and 3rd gears in D, D3, and M
C7	BLU/YEL	LS C	A/T clutch pressure control solenoid valve C control	With ignition switch ON (II): Pulsing signal

G01818300

Fig. 45: PCM Connector C (22P) Inputs & Outputs

Terminal Number	Wire Color	Signal	Description	Measuring Condition/Terminal Voltage
C9	RED	ATP D3	Transmission range switch D3 position signal input	In the D3 position: 0 V In other than the D3 position: About 5 V
C10	BLU/WHT	OP3SW	3rd clutch transmission fluid pressure switch signal input	With ignition switch ON (II): About 5 V With 3rd clutch pressure: 0 V
C11	BLU/YEL	P-PIN SW	Interlock control signal output	With ignition switch ON (II), in the P position: About 5 V With ignition switch ON (II), in other than P position: 0 V
C12	RED/WHT	ATP RVS	Transmission range switch RVS (R position) signal input	In R position: 0 V In other than the R position: About 5 V
C13	BLU/RED	OP2SW	2nd clutch transmission fluid pressure switch signal input	With ignition switch ON (II): About 5 V With 2nd clutch pressure: 0 V
C14	RED/YEL	ATFT	ATF temperature sensor signal input	With ignition switch ON (II): 0.2 V – 4.8 V (Depending on ATF temperature) With ignition switch OFF: 0 V
C15	BRN/WHT	LS B	A/T clutch pressure control solenoid valve B control	With ignition switch ON (II): Pulsing signal
C17	YEL/GRN	ATP D	Transmission range switch D position signal input	In the D position: 0 V In other than the D position: About 5 V
C18	BLU/YEL	ATP FWD	Transmission range switch D and D3 position signals input	In the D and D3 positions: 0 V In other than the D and D3 positions: About 5 V
C19	WHT/RED	NM	Mainshaft speed sensor signal input	With ignition switch ON (II): 0 V or about 5 V With engine at idling in N position: About 2.5 V
C20	RED/BLK	ATP N	Transmission range switch N position signal input	In the N position: 0 V In other than the N position: About 5 V

G01818301

Fig. 46: PCM Connector C (22P) Inputs & Outputs

Terminal Number	Wire Color	Signal	Description	Measuring Conditions/Terminal Voltage
D2	BRN	S-MODE	Transmission gear selection switch S mode switch signal input	In M position: 0 V In other than M position: About 5V
D3	WHT/BLU	S-UP	Transmission gear selection switch upshift switch signal input	In M position: • Shift lever pushed toward upshift position (marked with +): 0 V • Shift lever released in neutral position: About 5 V
D5	WHT	ATP R	Transmission range switch R position input	In the R position: 0 V In other than the R position: About 5 V
D6	BLU/BLK	ATP P	Transmission range switch P position input	In the P position: 0 V In other than the P position: About 5 V
D9	ORN	S-DN	Transmission gear selection switch downshift switch signal input	In M position: • Shift lever pushed toward downshift position (marked with −): 0V • Shift lever released in neutral position: About 5V
D10	LT GRN	METINH	A/T gear position indicator control signal output	With ignition switch ON (II): Battery voltage

G01818303

Fig. 47: PCM Connector D (17P) Inputs & Outputs

Terminal Number	Wire Color	Signal	Description	Measuring Conditions/Terminal Voltage
E2	YEL/BLK	SLS	Shift lock solenoid control (ground side)	With ignition switch ON (II), in the P position, brake pedal pressed, and accelerator released: 0 V
E9	BLK/YEL	IG1	Power supply circuit for solenoid valves	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
E11	WHT	CAN H	F-CAN communication with network	With ignition switch ON (II): Pulsing signal
E22	WHT/BLK	BKSW	Brake pedal position switch signal input	Brake pedal pressed: Battery voltage Brake pedal released: 0 V
E23	BLU	K-LINE	Communication line PCM-to-DLC	With ignition switch ON (II): Battery voltage
E24	RED	CAN L	F-CAN communication with network	With ignition switch ON (II): Pulsing signal
E29	BRN	SCS	Detects service check signal	With the SCS shorted with the HDS: About 0 V With the SCS open: About 5 V

G01818304

Fig. 48: PCM Connector E (31P) Inputs & Outputs

HYDRAULIC CONTROLS

Valve Bodies

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

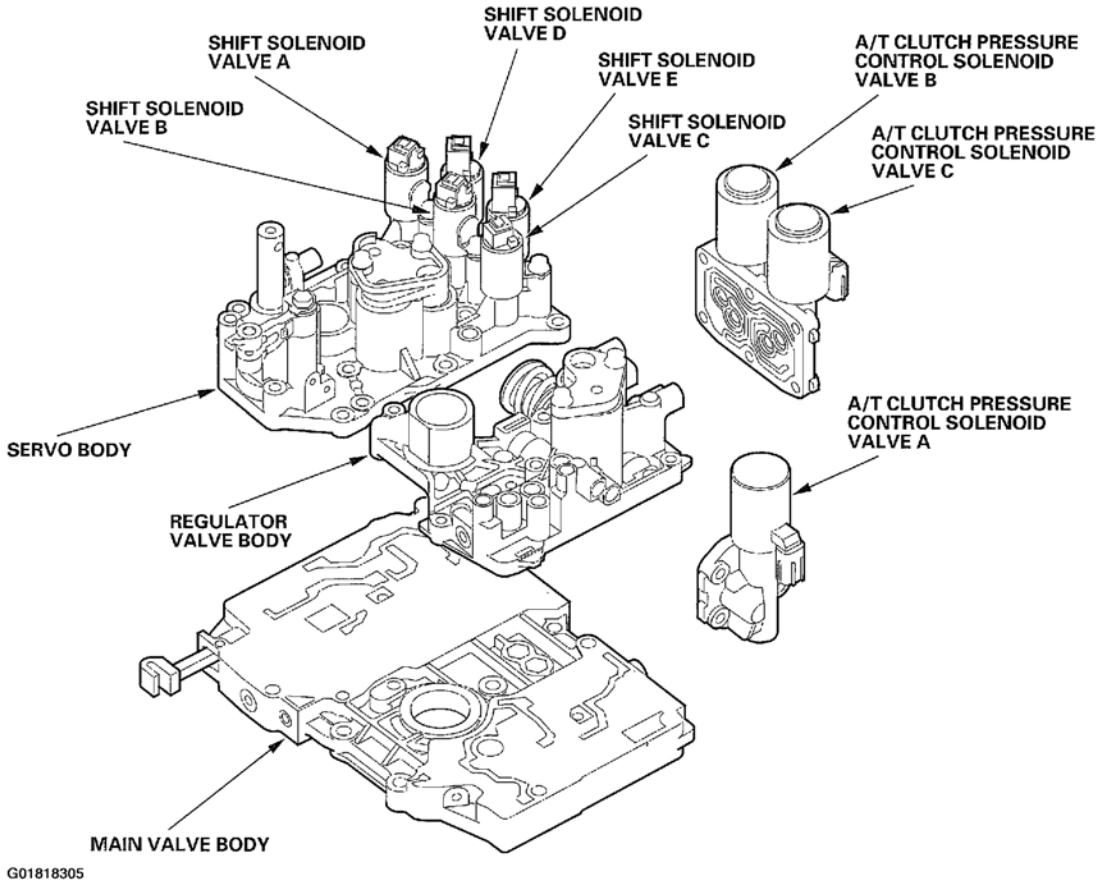


Fig. 49: Identifying Valve Body Components

Main Valve Body

The main valve body contains the manual valve, the shift valves A, B, C, and E, the relief valve, the lock-up control valve, the cooler check valve, the servo control valve, and the ATF pump gears. The primary function of the main valve body is to switch fluid pressure on and off and to control hydraulic pressure going to the hydraulic control system.

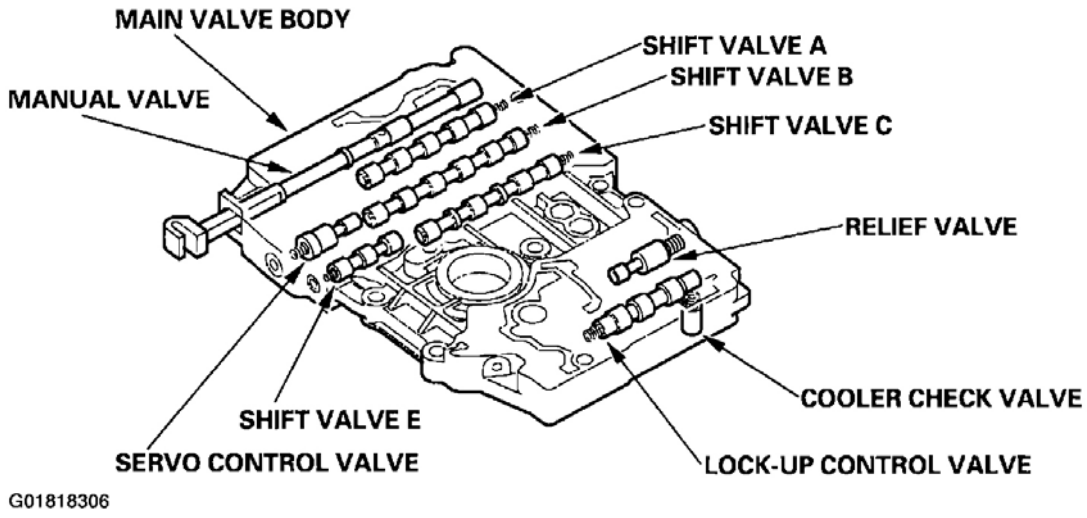


Fig. 50: Identifying Main Valve Body Components

Regulator Valve Body

The regulator valve body contains the regulator valve, the torque converter check valve, lock-up shift valve, and the 1st and 3rd accumulators.

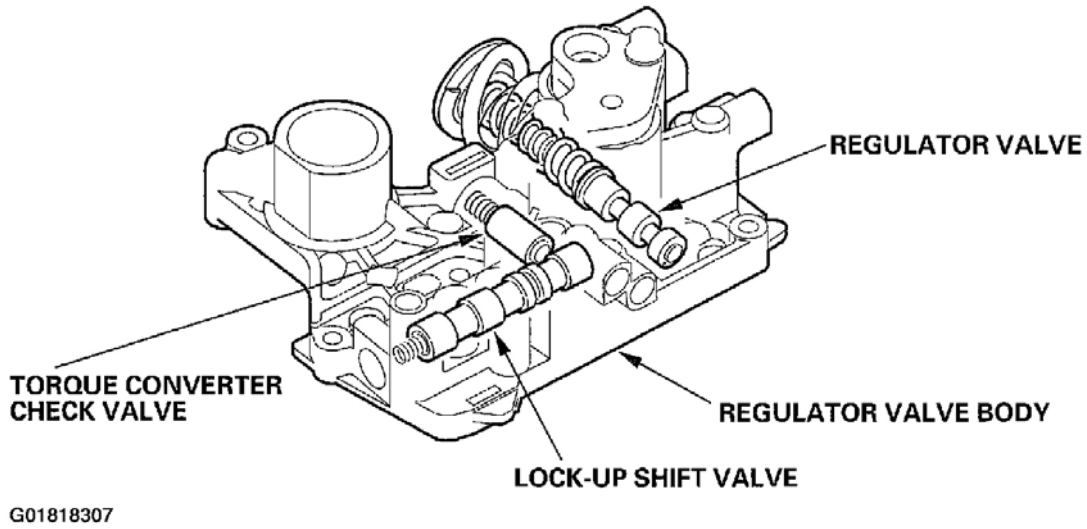


Fig. 51: Identifying Regulator Valve Body Components

Regulator Valve

The regulator Valve maintains a constant hydraulic pressure from the ATF pump to the hydraulic control system, while also furnishing fluid to the lubrication system and torque converter. The fluid from the ATF

pump flows through B and C. Fluid entering from B flows through the valve orifice to the A cavity. This pressure of the A cavity pushes the regulator valve to the right side, and this movement of the regulator valve uncovers the fluid port to the torque converter and the relief valve. The fluid flows out to the torque converter and the relief valve, and the regulator valve moves to the left side. According to the level of the hydraulic pressure through B, the position of the regulator valve changes, and the amount of fluid from C through torque converter also changes. This operation is continued, maintaining the line pressure.

NOTE: When used, "left" or "right" indicates direction on the illustration below.

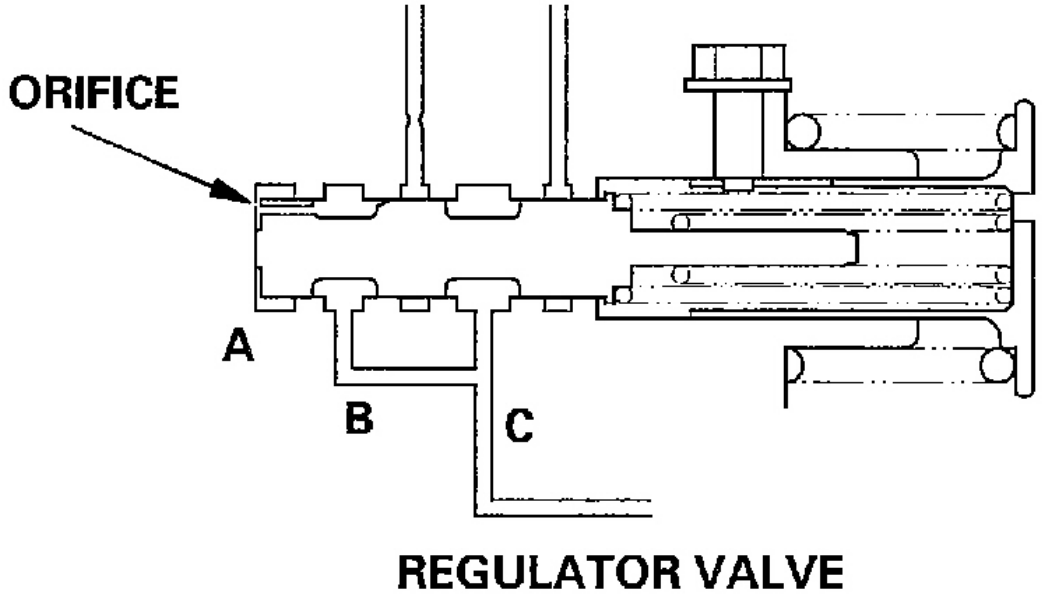


Fig. 52: Identifying Regulator Valve

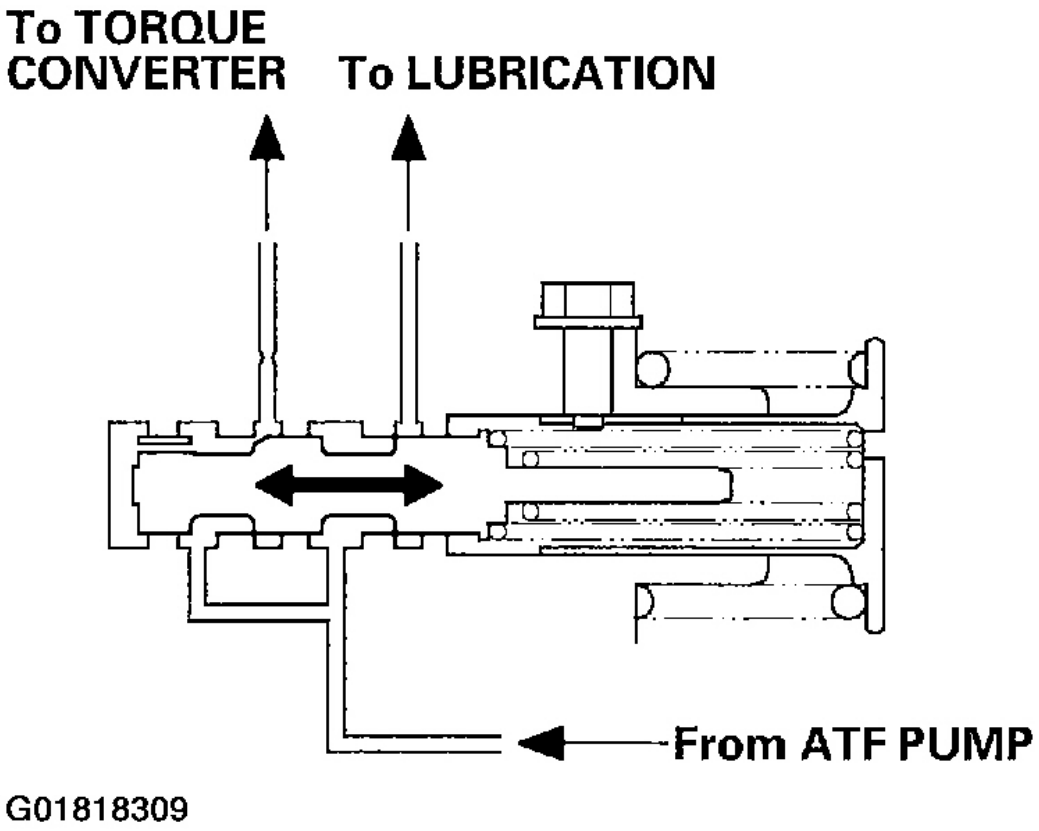


Fig. 53: Regulator Valve Operation

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

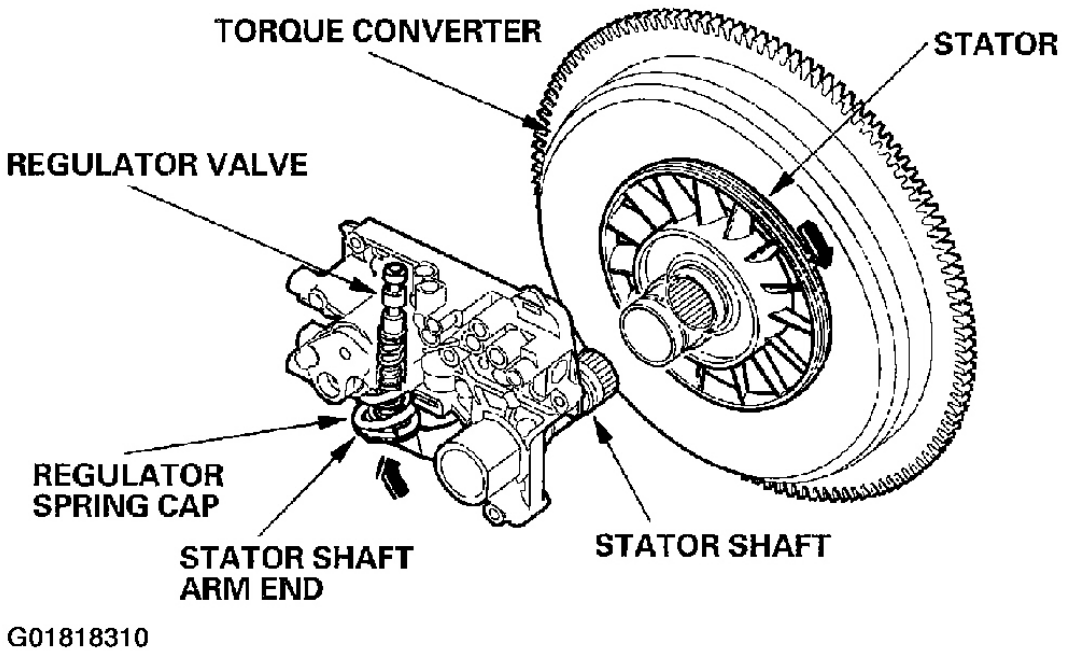


Fig. 54: Locating Regulator Valve

Servo Body

The servo body contains the servo valve, the shift valve D, accumulators for 2nd, 4th, and 5th, and shift solenoid valves for A, B, C, D, and E.

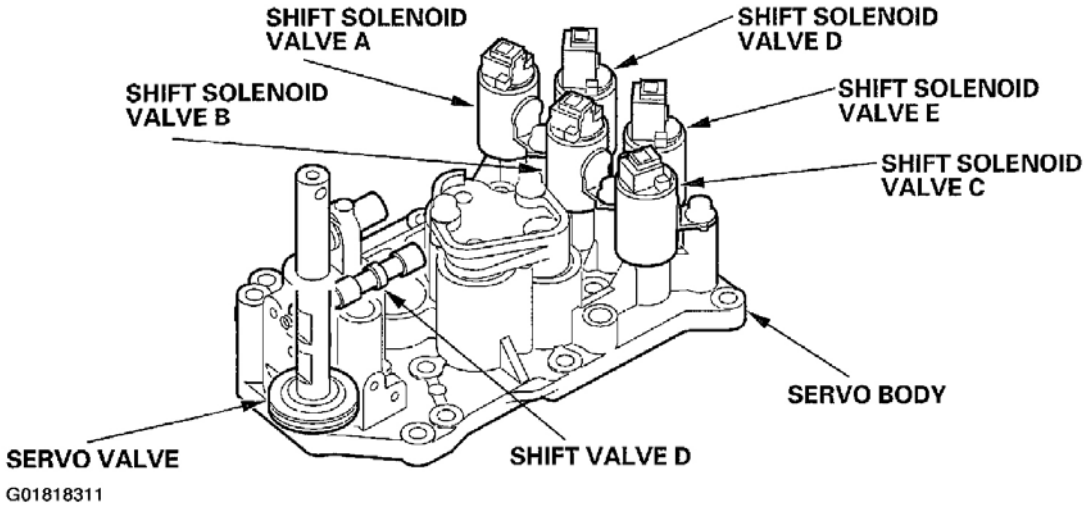


Fig. 55: Identifying Servo Body Components

Accumulator

The accumulators are located in the regulator valve body and the servo body. The regulator valve body contains the 1st and 3rd accumulators, and the servo body contains the 2nd, 4th, and 5th accumulators.

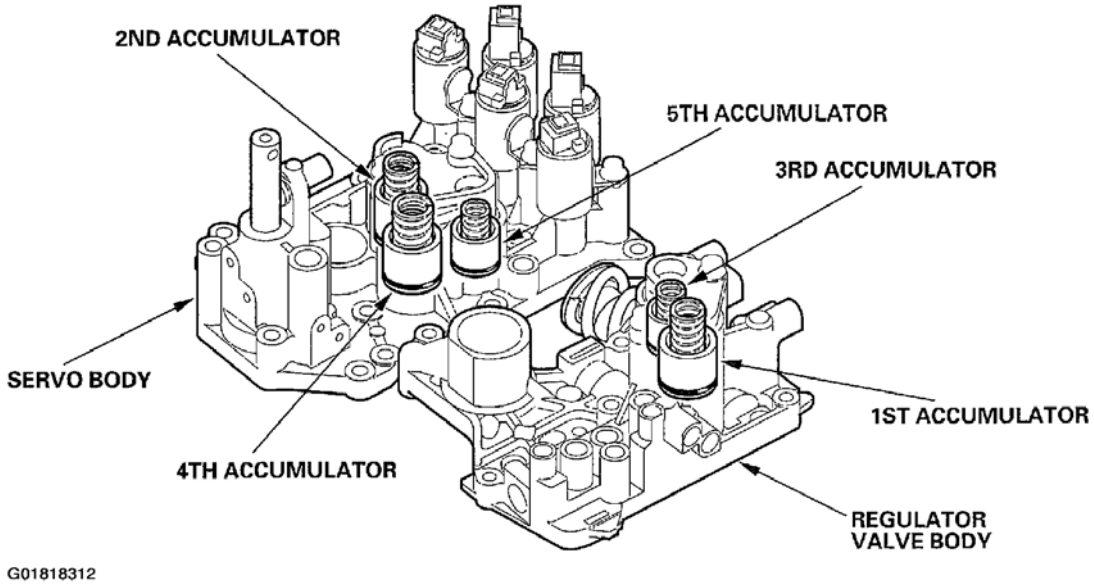


Fig. 56: Identifying Accumulators

HYDRAULIC FLOW

Distribution of Hydraulic Pressure

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

The PCM controls the shift solenoid valves ON and OFF. The shift solenoid valve intercepts line pressure from the ATF pump via the manual valve when the shift solenoid valve is OFF. When the shift solenoid valve is turned ON, line pressure changes to shift solenoid valve pressure at the shift solenoid valve, then the solenoid valve pressure flows to the shift valve. Applying shift solenoid pressure to the shift valves moves the position of the shift valve, and switches the port of the hydraulic circuit. 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 apply the pressure to the clutches to engage smoothly. The clutches receive optimum clutch pressure which is regulated by the A/T clutch pressure control solenoid valves for comfortable driving and shifting under all conditions.

PORT NO.	DESCRIPTION OF PRESSURE	PORT NO.	DESCRIPTION OF PRESSURE
1	LINE	SB	SHIFT SOLENOID VALVE B
3	LINE	SC	SHIFT SOLENOID VALVE C
3'	LINE	SD	SHIFT SOLENOID VALVE D
4	LINE	SE	SHIFT SOLENOID VALVE E
4'	LINE	10	1ST CLUTCH
4''	LINE	20	2ND CLUTCH
7	LINE	30	3RD CLUTCH
1A	LINE or A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A	40	4TH CLUTCH
1B	LINE	50	5TH CLUTCH
3A	LINE	55	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A
3B	LINE	55'	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A
3C	LINE	56	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B
5A	LINE	57	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C
5B	LINE	90	TORQUE CONVERTER
5C	LINE	91	TORQUE CONVERTER
5D	LINE	92	TORQUE CONVERTER
5E	LINE or A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B	93	ATF COOLER
5F	LINE or A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A or B	94	TORQUE CONVERTER
5G	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B	95	LUBRICATION
5H	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C	96	TORQUE CONVERTER
5J	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C	97	TORQUE CONVERTER
5K	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C	99	SUCTION
5L	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C	X	DRAIN
5N	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C	HX	HIGH POSITION DRAIN
SA	SHIFT SOLENOID VALVE A	AX	AIR DRAIN

G01818313

Fig. 57: Distribution Of Hydraulic Pressure At The Ports

N Position

The PCM controls the shift solenoid valves. The conditions of the shift solenoid valves and positions of the shift valves are as follows:

- Shift solenoid valve A: OFF Shift valve A stays on right side
- Shift solenoid valve B: ON Shift valve B moves to left side
- Shift solenoid valve C: ON Shift valve C moves to left side
- Shift solenoid valve D: OFF Shift valve D stays on left side
- Shift solenoid valve E: OFF Shift valve E stays on left side

Line pressure (1) flows to the shift solenoid valves and the A/T clutch pressure control solenoid valve A, and changes to A/T clutch pressure control solenoid valve A pressure (55) at the A/T clutch pressure control solenoid valve A. A/T clutch pressure control solenoid valve A pressure (55) becomes line pressure (1B) at the shift valve A, and stops at the manual valve. Under this condition, hydraulic pressure is not applied to the clutches.

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

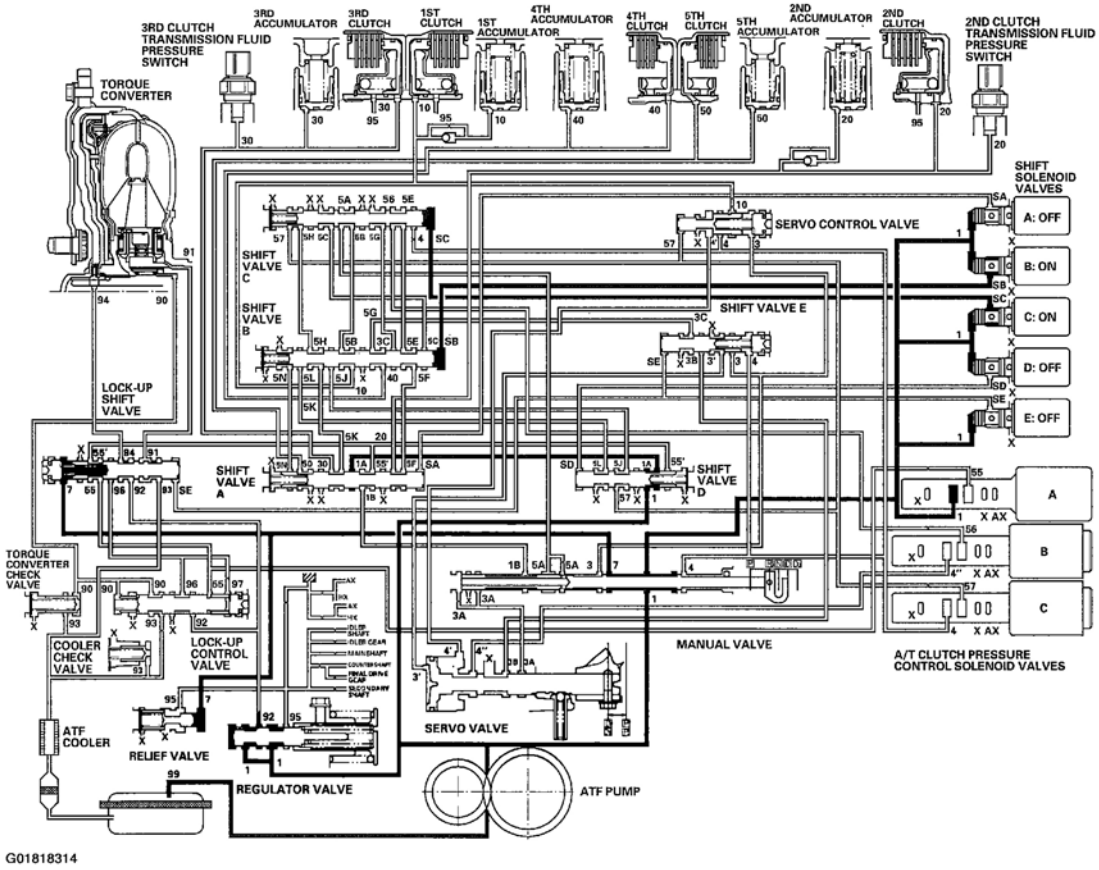


Fig. 58: N Position Hydraulic Flow

D Position: 1st gear shifting from N position

Shift solenoid valves remain the same as in the **N** position, when shifting to the **D** position from **N** . The manual valve is moved to the **D** position, and switches the port of line pressure (4) leading to the A/T clutch pressure control solenoid valve C. Hydraulic pressure to the 1st clutch from the A/T clutch pressure control solenoid valve A is available as shift solenoid valve A is OFF, B and C stay ON. A/T clutch pressure control solenoid valve A pressure (55) changes to 1st clutch pressure (10) at the shift valve B, and flows to the 1st clutch. The 1st clutch is engaged gently when shifting to the **D** position from **N** .

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

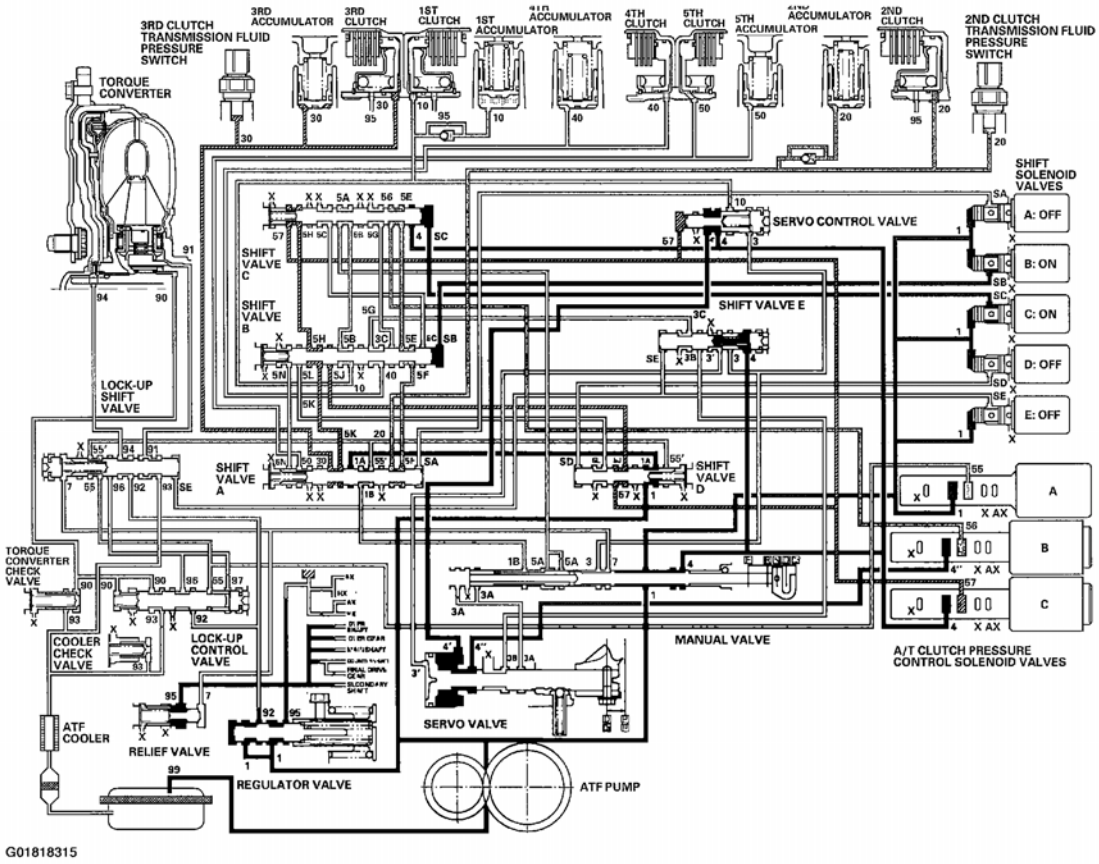


Fig. 59: D Position: 1st Gear Shifting From N Position Hydraulic Flow

D Position: Driving in 1st gear

The PCM turns shift solenoid valves A ON, and keeps B and C ON, and D and E OFF. Shift solenoid valve A pressure (SA) is applied to the right side of shift valve A. Shift valve A is moved to the left side to uncover the line pressure port leading to the 1st clutch, and to cover A/T clutch pressure control solenoid valve pressure port.

Fluid flows to the 1st clutch by way of:

Line pressure (1) --> Shift valve D--Line pressure (1A) --> Shift valve A--Line pressure (1B) Manual valve--Line pressure (5A) --> Shift valve C--Line pressure (5B) --> Shift valve B--1st clutch pressure (10) --> 1st clutch

The 1st clutch pressure (10) is applied to the 1st clutch, and the 1st clutch, is engaged securely.

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

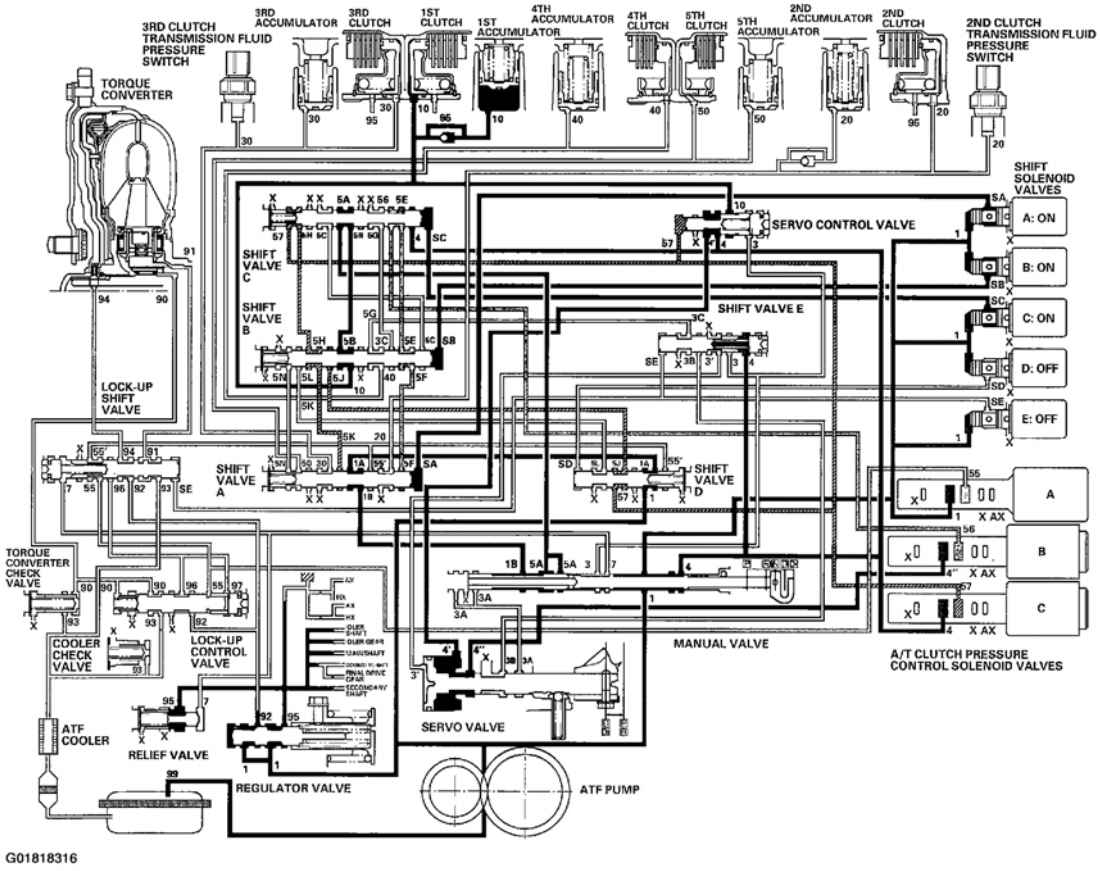


Fig. 60: D Position: Driving In 1st Gear Hydraulic Flow

D Position: Shifting between 1st gear & 2nd gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift solenoid valve A OFF, and keeps B and C ON, and D and E OFF. Shift solenoid valve A pressure (SA) in the right side of the shift valve A is released. Shift valve A is moved to the right side to uncover the ports of A/T clutch pressure control solenoid valve pressure leading to the 1st and 2nd clutches. The PCM controls the A/T clutch pressure control solenoid valve to regulate hydraulic pressure. A/T clutch pressure control solenoid valve A pressure (55) changes to 1st clutch pressure (10) at shift valve B, and A/T clutch pressure control solenoid valve B pressure (56) changes to 2nd clutch pressure (20) at shift valve A. The 1st and 2nd clutches are engaged gently.

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

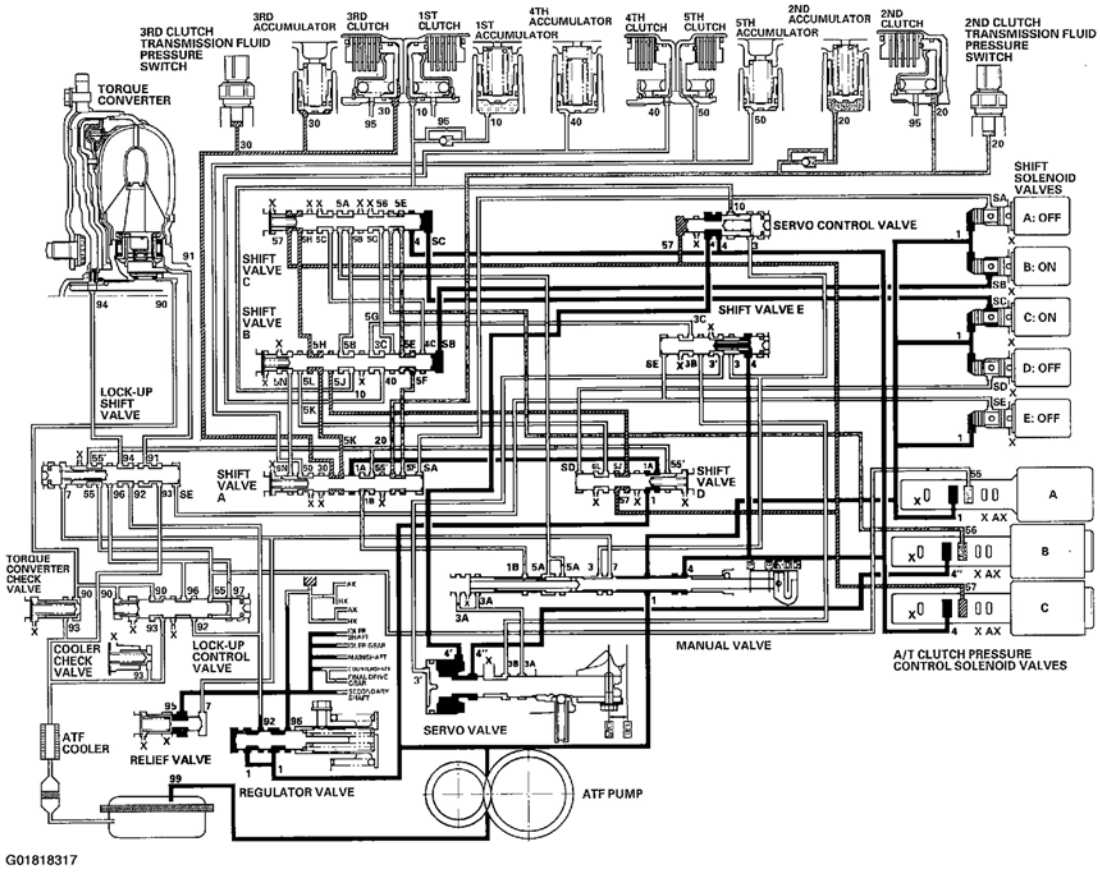


Fig. 61: D Position: Shifting Between 1st Gear & 2nd Gear Hydraulic Flow

D Position: Driving in 2nd gear

The PCM turns shift solenoid valves C OFF, D ON, and keeps A and E OFF, and B ON. Shift solenoid valve C pressure (SC) in the right side of the shift valve C is released. Shift valve C is moved to the right side to switch the ports. This movement covers A/T clutch pressure control solenoid valve pressure ports to stop at the shift valves C and A, and uncover the line pressure port leading to the 2nd clutch.

Fluid flows to 2nd clutch by way of:

Line pressure (1) --> Manual valve--Line pressure (4) --> Shift valve C--Line pressure (5E) --> Shift valve B--Line pressure (5F) --> Shift valve A--2nd clutch pressure (20) --> 2nd clutch

The 2nd clutch pressure (20) is applied to the 2nd clutch, and the 2nd clutch is engaged securely.

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

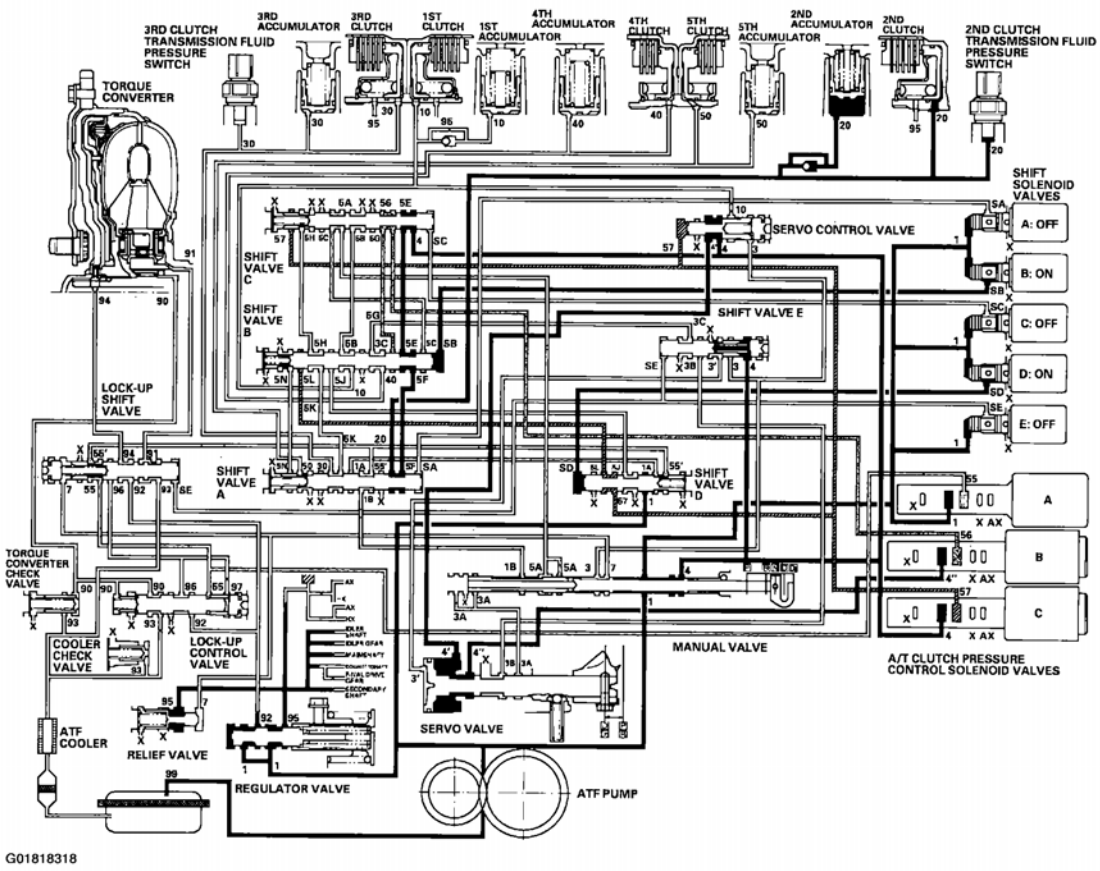


Fig. 62: D Position: Driving In 2nd Gear Hydraulic Flow

D Position: Shifting between 2nd gear & 3rd gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift solenoid valve C ON, and keeps A and E OFF, and B and D ON. Shift solenoid valve C pressure (SC) is applied to the right side of shift valve C. Shift valve C is moved to the left side to uncover the ports of A/T clutch pressure control solenoid valves leading to the 2nd and 3rd clutches. The PCM controls the A/T clutch pressure control solenoid valves to regulate hydraulic pressure. A/T clutch pressure control solenoid valve B pressure (56) changes to 2nd clutch pressure (20) at the shift valve A, and A/T clutch pressure control solenoid valve C pressure (57) changes to 3rd clutch pressure (30) at the shift valve A. The 2nd and 3rd clutches are engaged gently.

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

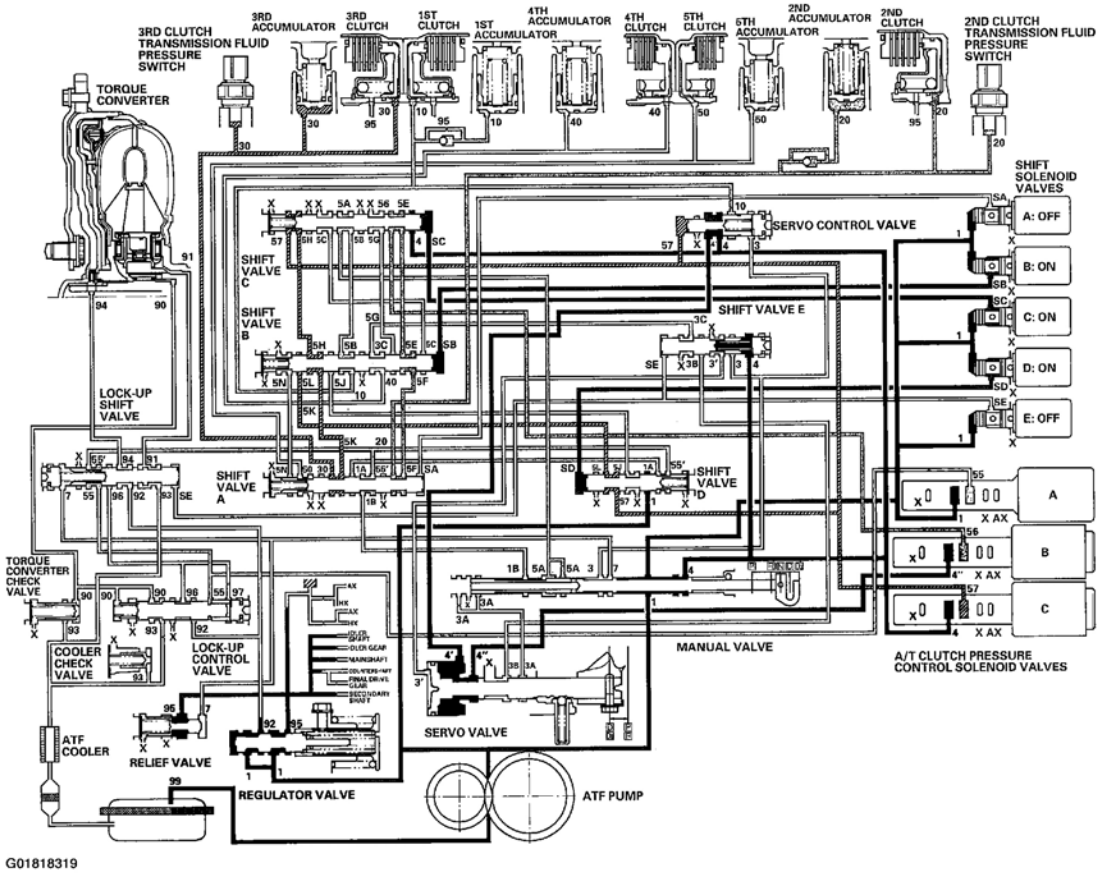


Fig. 63: D Position: Shifting Between 2nd Gear & 3rd Gear Hydraulic Flow

D Position: Driving in 3rd gear

The PCM turns shift solenoid valves A, B, D, and E OFF, and C ON. Shift solenoid valve B pressure (SB) in the right side of shift valve B is moved to the right side. Shift solenoid valve D pressure (SD) in the left side of the shift valve D is released, and the shift valve D is moved to the left side. This valve movement switches A/T clutch pressure control solenoid valve C pressure port leading to the 3rd clutch.

A/T clutch pressure control solenoid valve C pressure (57) changes to (5J) at the shift solenoid valve D and to (5K) at the shift valve B, and becomes 3rd clutch pressure (30) at the shift valve A. The 3rd clutch pressure (30) is applied to the 3rd clutch, and the 3rd clutch is engaged securely.

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

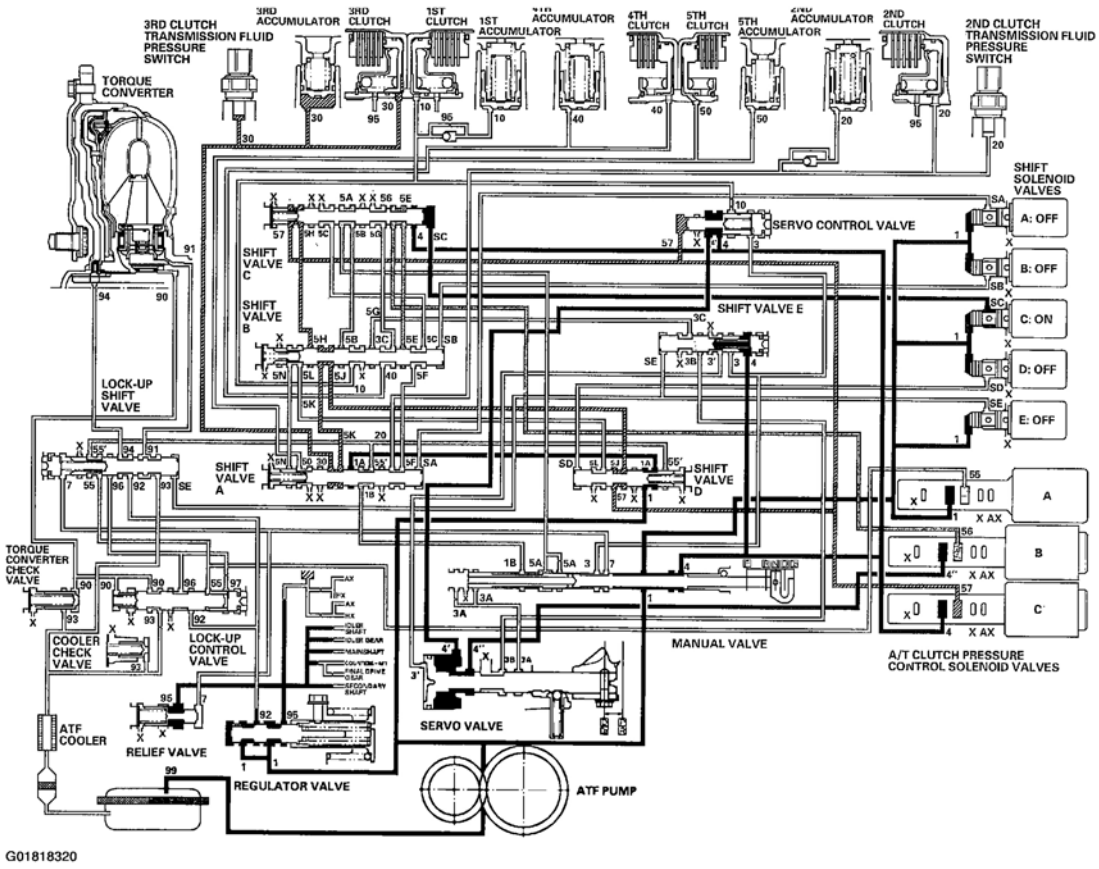


Fig. 64: D Position: Driving In 3rd Gear Hydraulic Flow

D Position: Shifting between 3rd gear & 4th gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift solenoid valves C OFF, and keeps A, B, D, and E OFF. Shift solenoid valve C pressure (SC) in the right side of the shift valve C is released. Shift valve C is moved to the right side to uncover the ports of A/T clutch pressure control solenoid valves B and C pressures leading to the 3rd and 4th clutches. The PCM controls the A/T clutch pressure control solenoid valves to regulate hydraulic pressure. A/T clutch pressure control solenoid valve B pressure changes to 3rd clutch pressure (30) at the shift valve A, and A/T clutch pressure control solenoid valve B pressure (56) changes to 4th clutch pressure (40) at the shift valve B. The 3rd and 4th clutches are engaged gently.

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

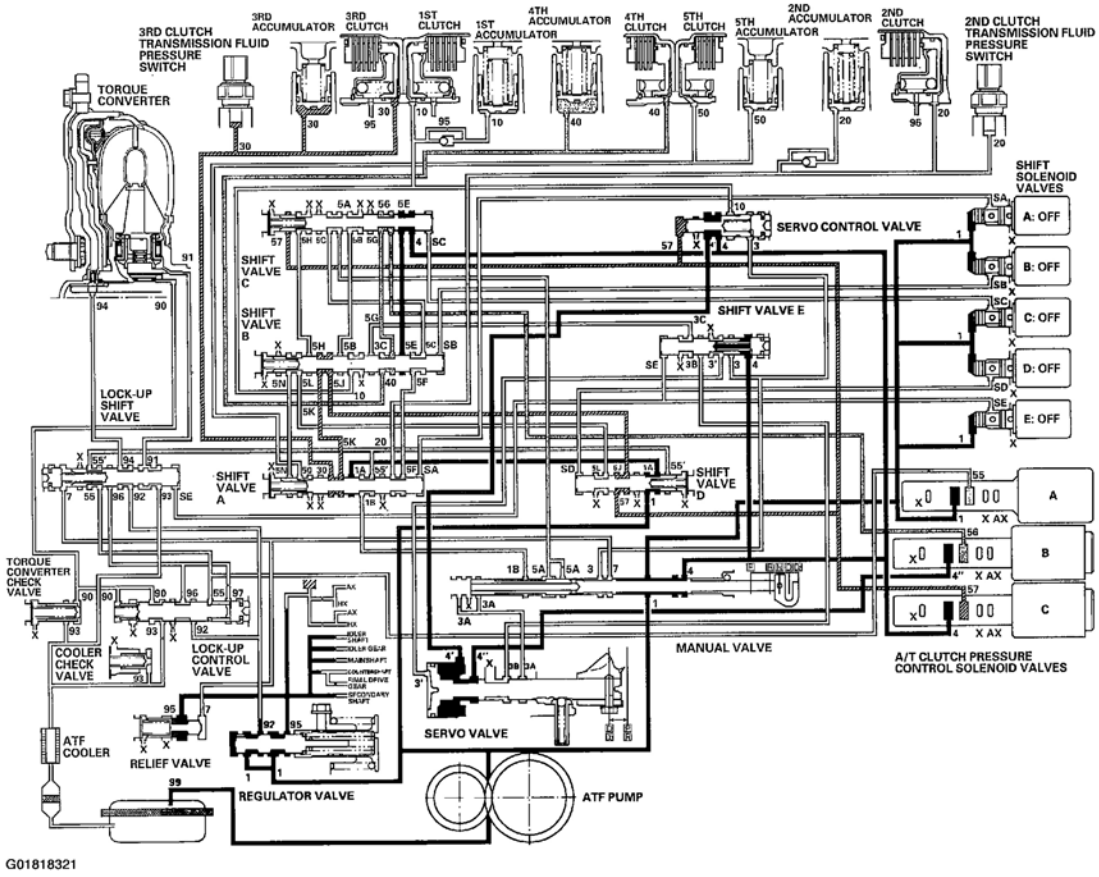


Fig. 65: D Position: Shifting Between 3rd Gear & 4th Gear Hydraulic Flow

D Position: Driving in 4th gear

The PCM turns shift solenoid valves A ON, and keeps B, C, D, and E OFF. Shift solenoid valve A pressure (SA) is applied to the right side of shift valve A. Shift valve A is moved to the left side to cover the ports of A/T clutch pressure control solenoid valves A and C leading to the 2nd and 3rd clutches.

A/T clutch pressure control solenoid valve B pressure (56) changes to (5G) at the shift solenoid valve C, and becomes 4th clutch pressure (40) at the shift valve B. The 4th clutch pressure (40) is held to high by A/T clutch pressure control solenoid valve B, and the 4th clutch is engaged securely.

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

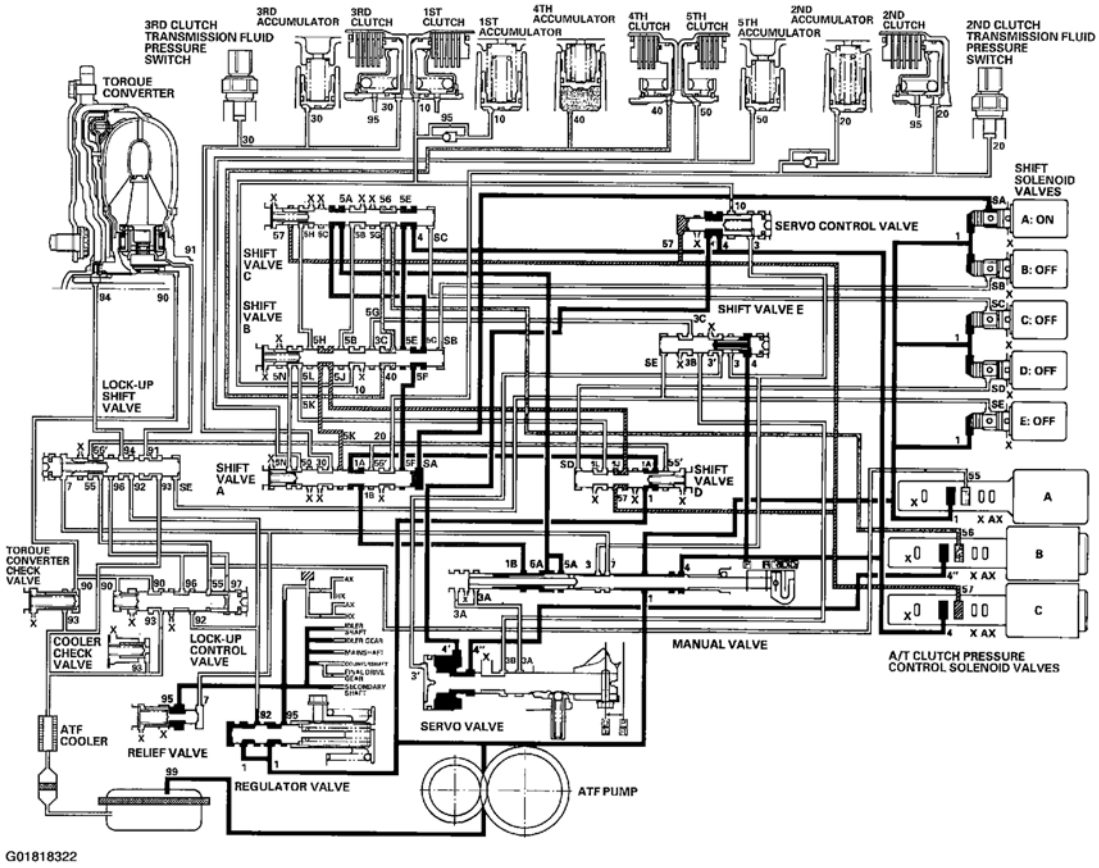


Fig. 66: D Position: Driving In 4th Hydraulic Flow

D Position: Shifting between 4th gear & 5th gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift solenoid valves D ON, and keeps A ON, and B, C, and E OFF. Shift solenoid valve D pressure (SD) in applied to the left side of the shift valve D. Shift valve D is moved to the right side to uncover A/T clutch pressure control solenoid valve C pressure to the 5th clutch. A/T clutch pressure control solenoid valve B pressure (56) changes to 4th clutch pressure (40) at shift valve B. A/T clutch pressure control solenoid valve C pressure (57) changes to (5L) at shift valve D and to (5N) at shift valve B, and becomes 5th clutch pressure (50) at shift valve A. The 4th and 5th clutches are engaged gently.

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

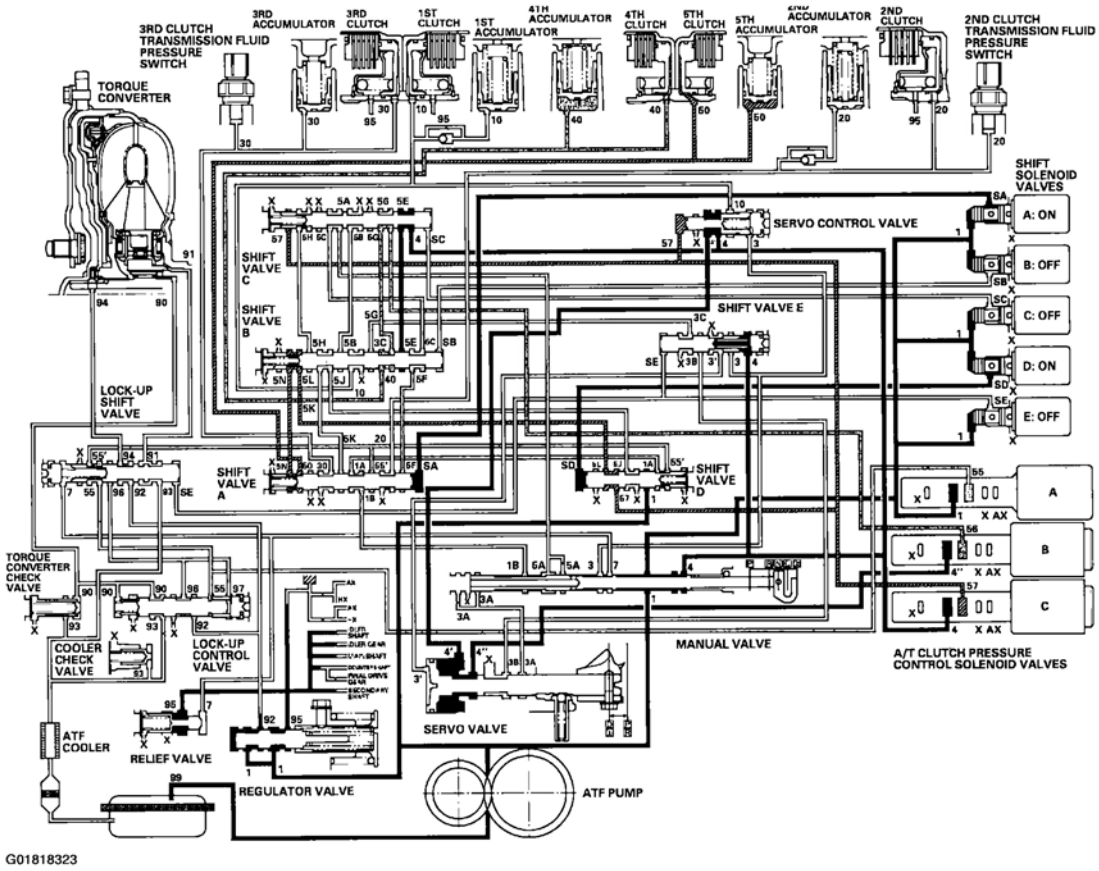


Fig. 67: D Position: Shifting Between 4th Gear & 5th Gear Hydraulic Flow

D Position: Driving in 5th gear

The PCM turns shift solenoid valves C ON, and keeps A and D ON, and B and E OFF. Shift solenoid valve C pressure (SC) is applied to the right side of shift valve C. Shift valve C is moved to the left side to switch the port of A/T clutch pressure control solenoid valve B pressure to the 4th clutch.

The 5th clutch pressure (50) is held to high by the A/T clutch pressure control solenoid valve C, and the 5th clutch is engaged securely.

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

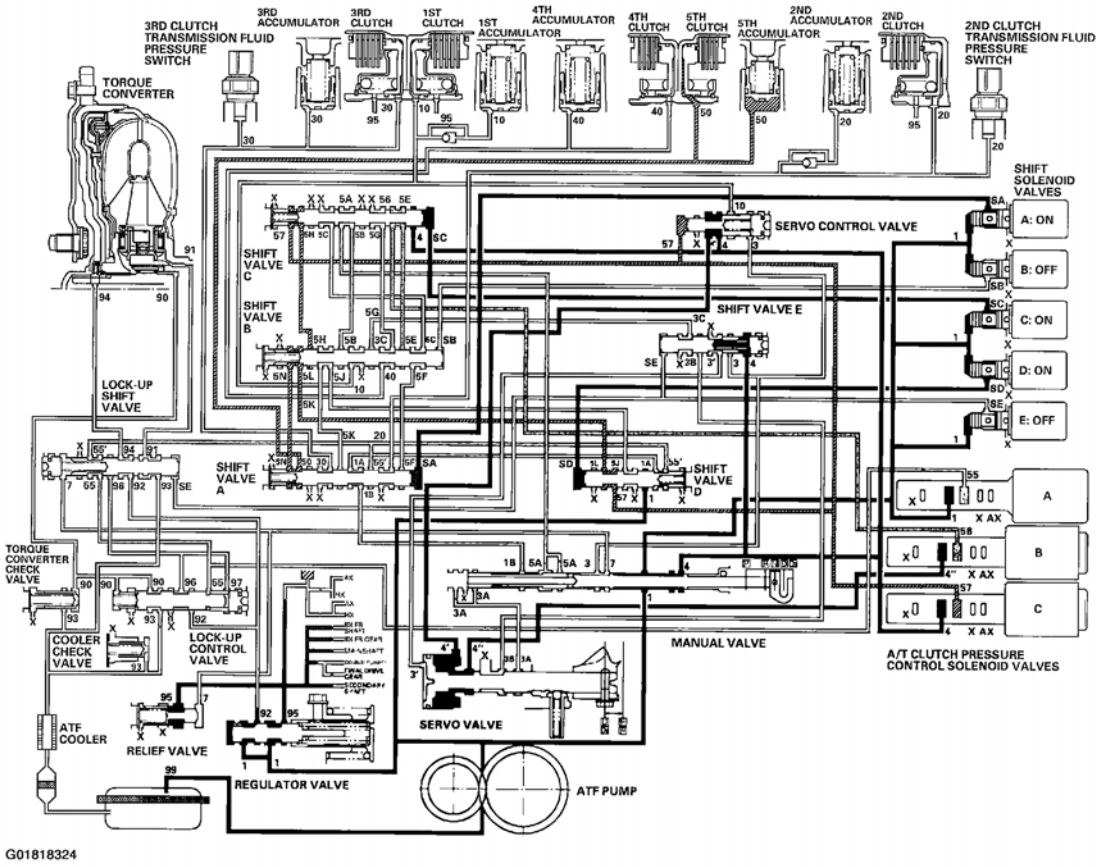


Fig. 68: D Position: Driving In 5th Gear Hydraulic Flow

R Position: Shifting to R position from P or N position

When shifting to the **R** position, the PCM turns shift solenoid valves B and E ON, and A, C, and D OFF. Shift solenoid valve B pressure (SB) is applied to the right side of the shift valve B, and the shift valve B is moved to the left side. Shift solenoid valve E pressure (SE) is applied to the left side of shift valve E, and shift valve E is moved to the right side. Line pressure (1) changes to (3) at the manual valve, and flows to the servo valve via the shift valve E. The servo valve is moved to reverse range position. Movement of the shift valves B and E, and servo valve creates 4th clutch line pressure between the 4th clutch and the A/T clutch pressure control solenoid valve A. The 4th clutch pressure (40) is applied to the 4th clutch, and the 4th clutch is engaged gently.

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

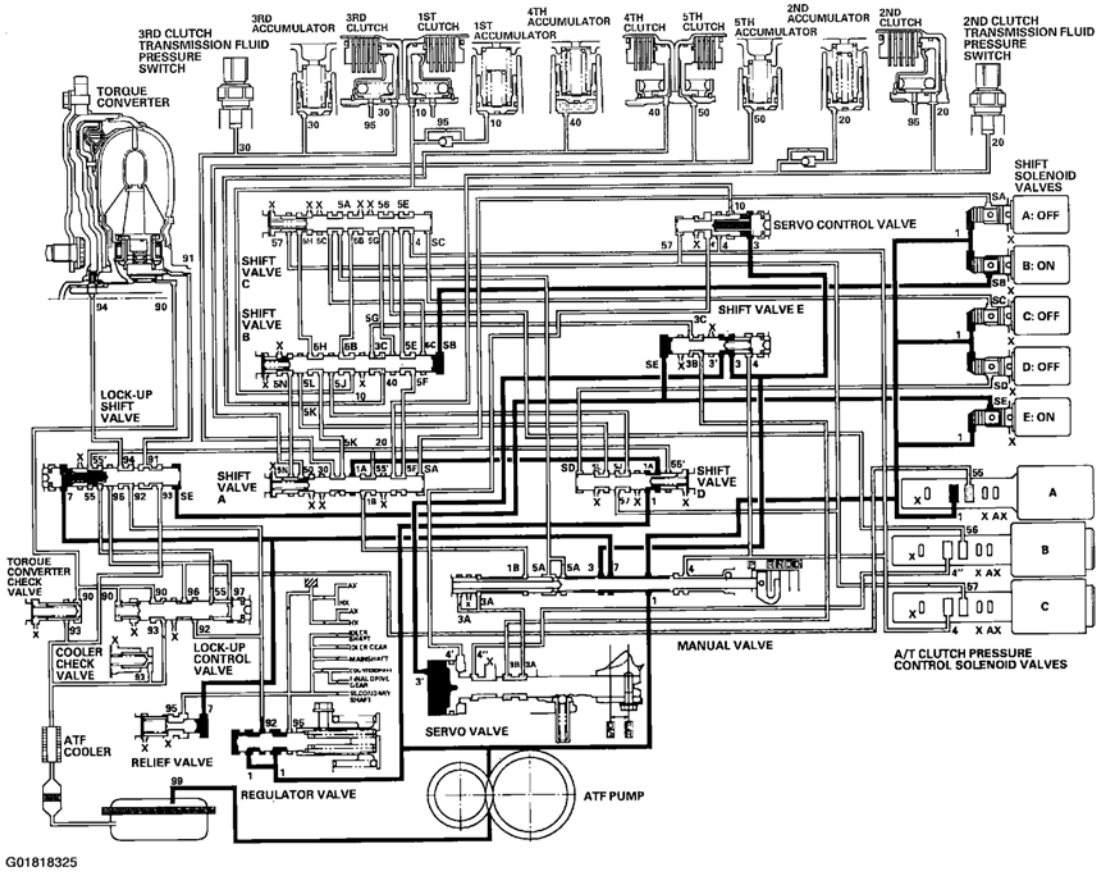


Fig. 69: R Position: Shifting To R Position From P Or N Position Hydraulic Flow

R Position: Driving in reverse gear

After starting off in reverse gear, the PCM turns shift solenoid valves A ON, and keeps B and E ON, and C and D OFF. Shift solenoid valve A port (SA) is applied to the right side of shift valve A to cover A/T clutch pressure control solenoid valve A pressure, and to uncover the port leading to the 4th clutch, creating full line pressure. The 4th clutch is engaged securely with line pressure.

Reverse Inhibitor Control

While the vehicle is moving forward, the PCM keeps shift solenoid valve E OFF. The shift valve E covers the port of line pressure (3') leading to the servo valve reverse position. The servo valve cannot be shifted to reverse position, and hydraulic pressure is not applied to 4th clutch from the servo valve for reverse; as a result, power is not transmitted to the reverse direction.

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

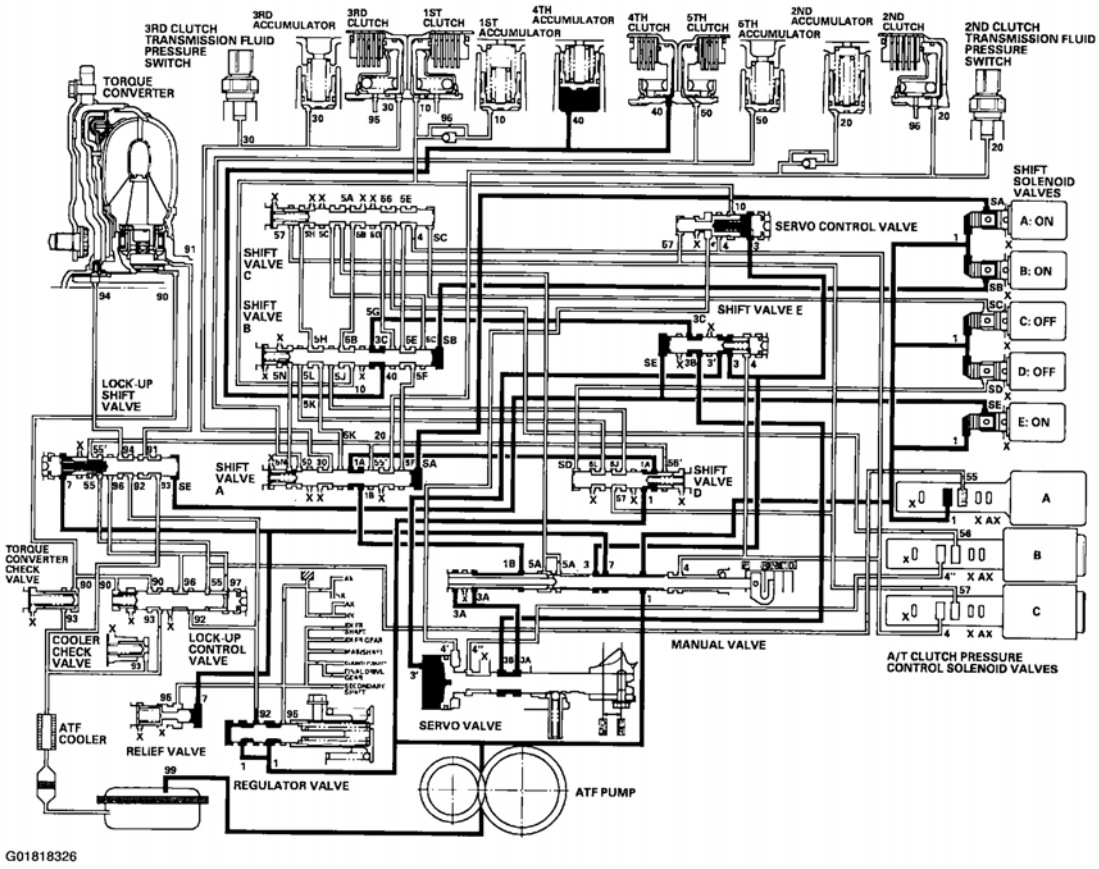


Fig. 70: Reverse Inhibitor Control Hydraulic Flow

P Position

Shift solenoid valves B and E are turned ON, and A, C, and D turned OFF by the PCM. Line pressure (1) flows to the shift solenoid valves and the A/T clutch pressure control solenoid valve A. Line pressure (3) changes to (3') at the shift valve E, and flows to the servo valve. The servo valve is moved to reverse/park position. Hydraulic pressure is not applied to the clutches.

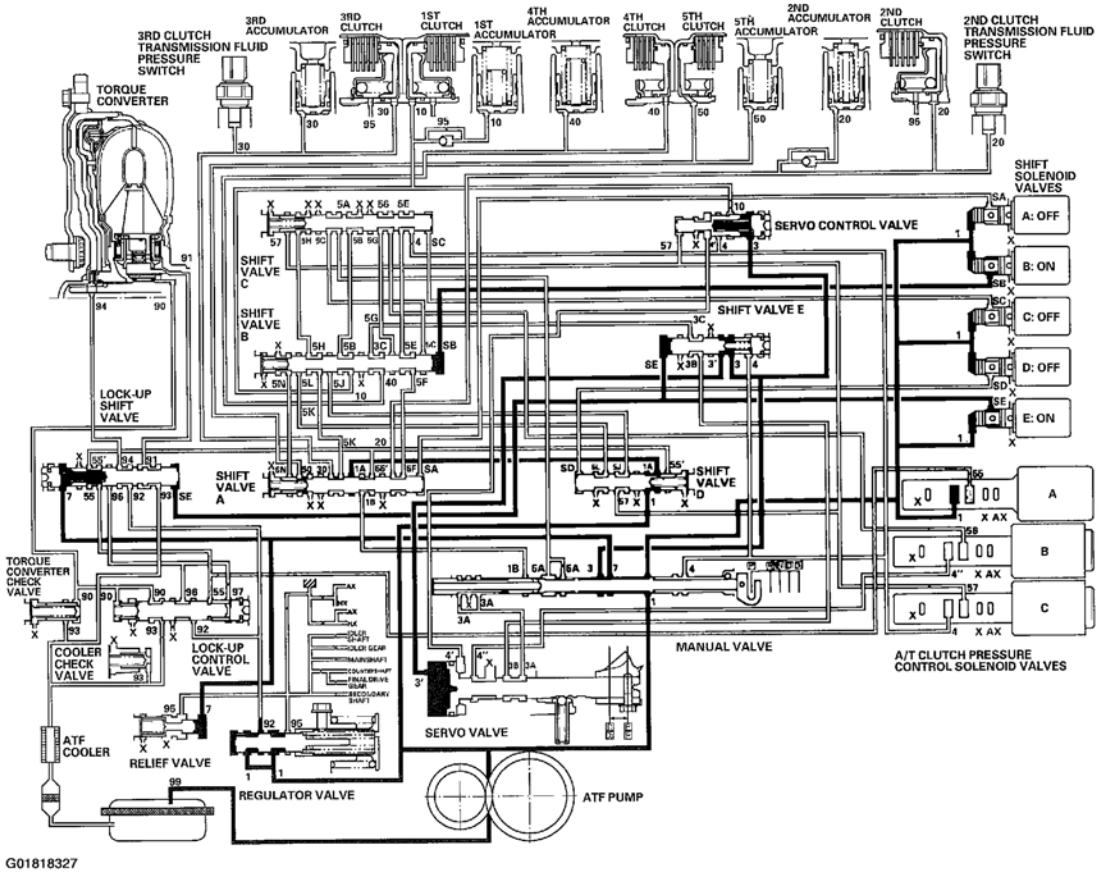


Fig. 71: P Position Hydraulic Flow

LOCK-UP SYSTEM

The lock-up mechanism of the torque converter clutch operates in **D** position (2nd, 3rd, 4th, and 5th), in $\mathbf{D}_3$ position (2nd and 3rd), and **M** (sequential sportshift mode) position (3rd, 4th, and 5th). 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 volume of the lock-up mechanism. When shift solenoid valve E is turned on by the PCM, shift solenoid valve E pressure switches the lock-up shift valve lock-up on and off. The A/T clutch pressure control solenoid valve A and the lock-up control valve control the amount of the lock-up conditions.

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; the torque converter clutch lock-up is ON, and the mainshaft rotates at the same speed as the

engine.

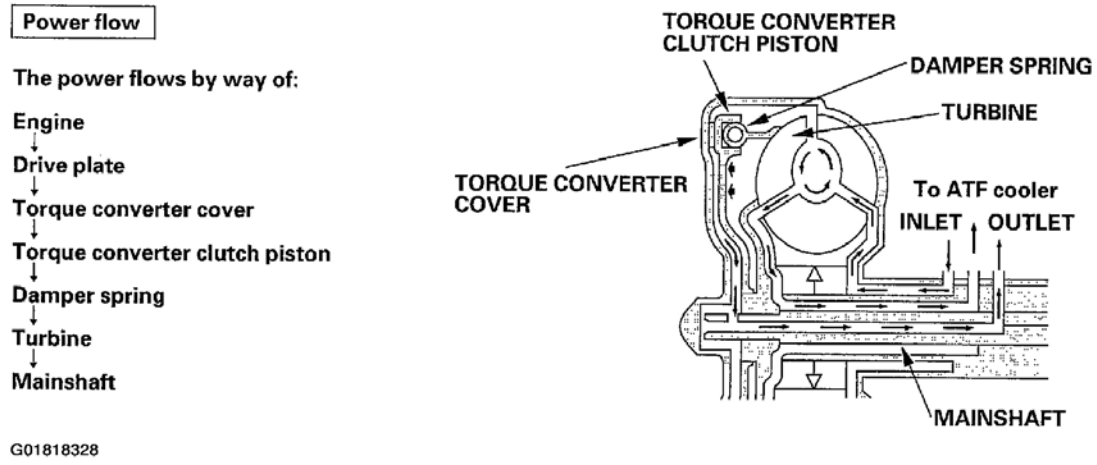


Fig. 72: Torque Converter Clutch Lock-up ON (Engaging Torque Converter Clutch) Fluid Flow

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

Fluid entering from the chamber between the torque converter cover and the torque converter clutch piston passes through the torque converter and goes out through 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, and the torque converter lock-up clutch is released; torque converter clutch lock-up is OFF.

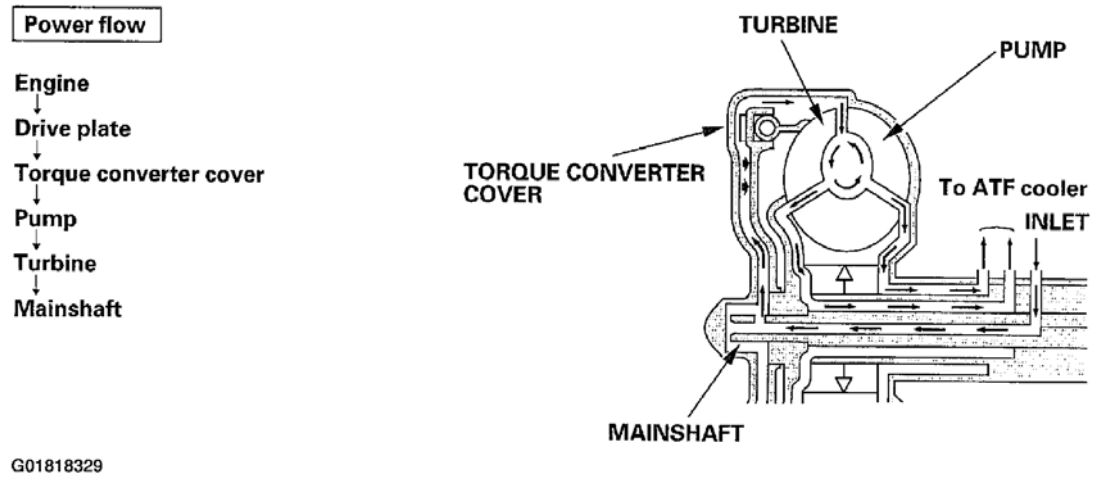


Fig. 73: Torque Converter Clutch Lock-up OFF (Disengaging Torque Converter Clutch) Fluid Flow

No Lock-up

Shift solenoid valve E is turned OFF by the PCM, and shift solenoid valve E pressure (SE) is not applied to the

lock-up shift valve. The lock-up shift valve stays to the right to uncover the torque converter pressure ports leading to the left side of the torque converter and releasing pressure from the right side of the torque converter. Torque converter pressure (92) changes to (94) at the lock-up shift valve, and enters into the left side of the torque converter to disengage the torque converter clutch. This keeps the torque converter clutch piston keeps away from the torque converter cover and the torque converter lock-up clutch is OFF.

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

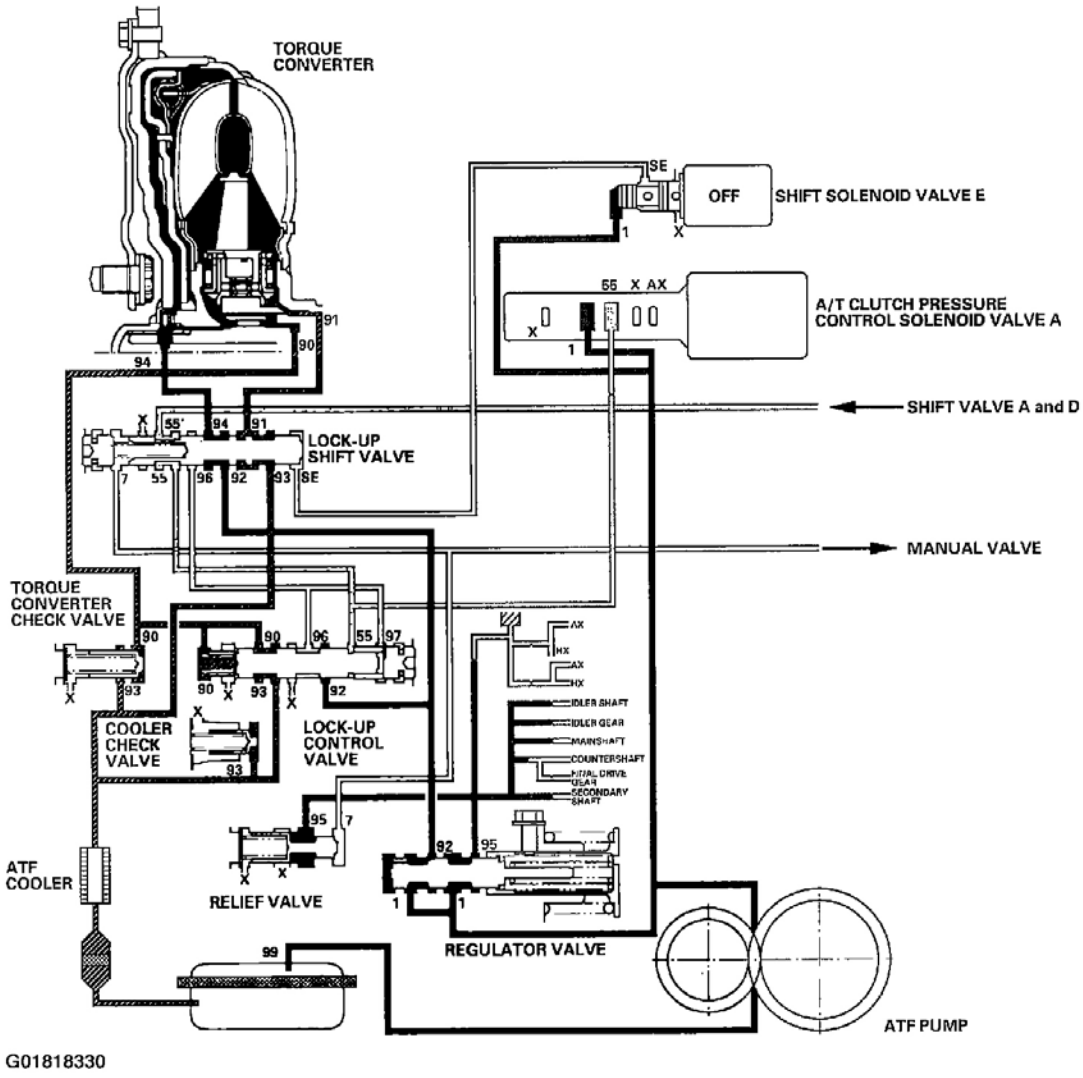


Fig. 74: No Lock-up Fluid Flow

Partial Lock-up

As the speed of the vehicle reaches the prescribed value, shift solenoid valve E is turned ON by the PCM, and shift solenoid valve E pressure (SE) is applied to the right side of the lock-up shift valve. The lock-up shift

valve is moved to the left side to switch the torque converter pressure (91) port, which goes to the right side of the torque converter, and the port of torque converter pressure (94) is released from the left side of the torque converter. Torque converter pressure (91) flows to the right side of the torque converter to engage the torque converter clutch. The PCM also controls the A/T clutch pressure control solenoid valve A to regulate A/T clutch pressure control solenoid valve A pressure (55) is applied to the lock-up shift valve and lock-up control valve. The position of the lock-up control valve depends on A/T clutch pressure control solenoid valve A pressure (55) and torque converter pressure released from the torque converter. The lock-up control valve controls the amount of torque converter clutch lock-up until fluid between the clutch piston and torque converter cover is fully released; the torque converter clutch is in partial lock-up condition.

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

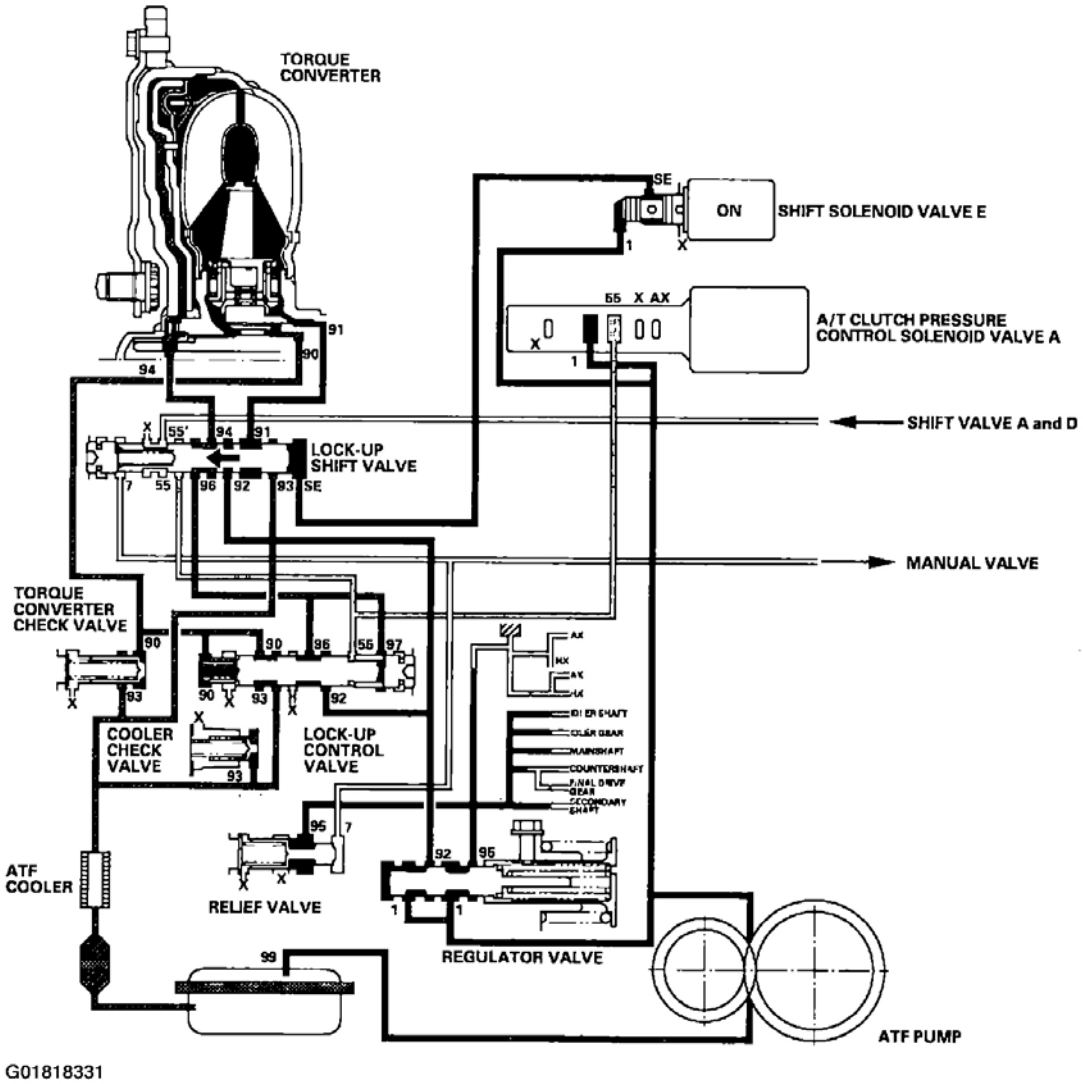


Fig. 75: Partial Lock-up Fluid Flow

Full Lock-up

When the vehicle speed increases, the PCM sends a signal to A/T clutch pressure control solenoid valve A to increase A/T clutch pressure control solenoid valve A pressure (55), and the lock-up control valve is moved to the left by the increased pressure. Then increased converter pressure (94) from the left side of the torque converter is completely released at the lock-up control valve, and torque converter pressure (91) engages the torque converter clutch securely; the torque converter clutch is in full lock-up condition.

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

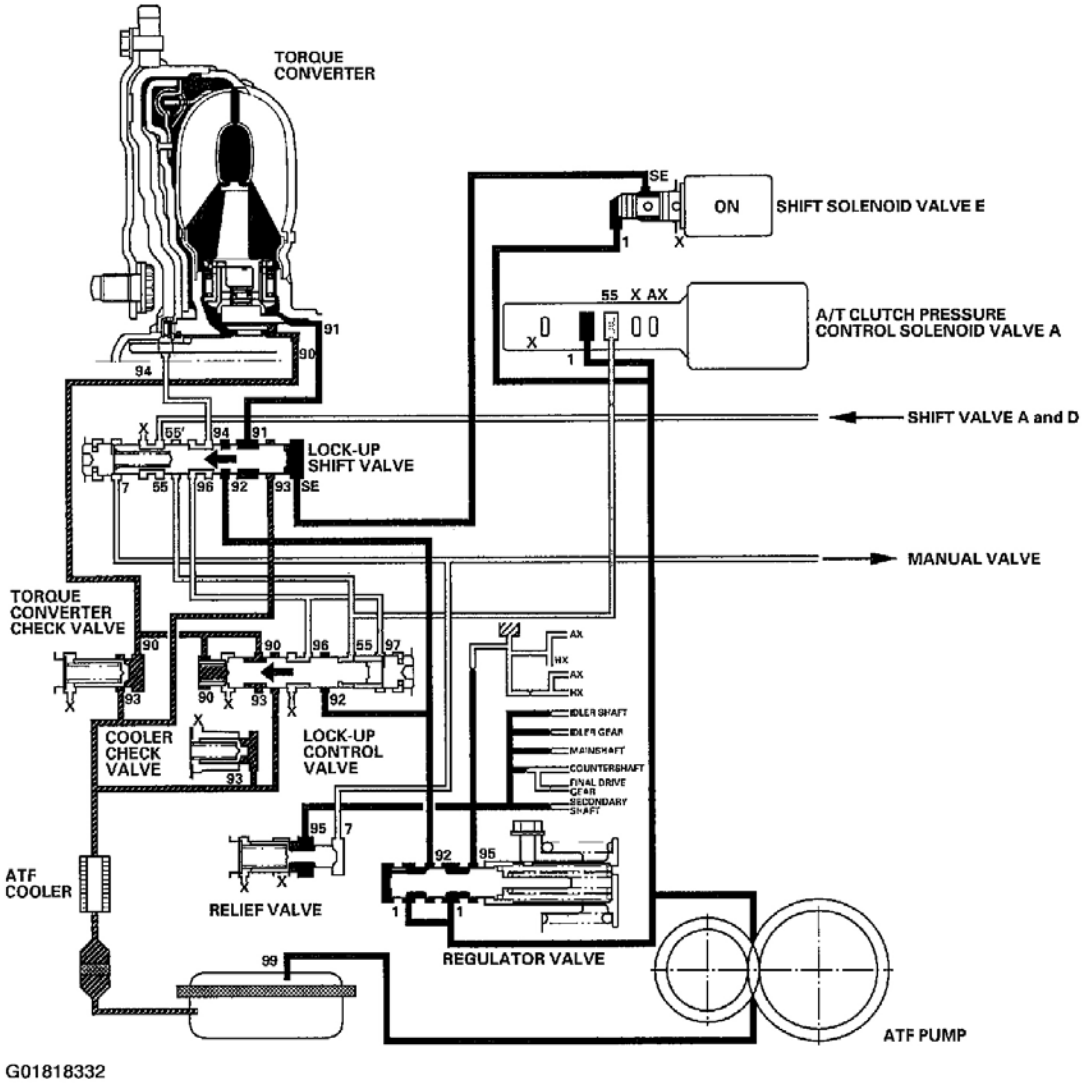


Fig. 76: Full Lock-up Fluid Flow

SHIFT LEVER MECHANISM

The shift lever has five positions; the **P** , **R** , **N** , **D** , and $\mathbf{D}_3$ positions. The **D** position has two modes; automatic shift mode and sequential sportshift mode with the shift lever moved to the **M** position. The shift lever movement and position is indicated by the A/T gear position indicator panel. The shift lever can be shifted out of the **P** position and into the **R** position without pressing the shift lever. The shift lock/reverse lock mechanism is an additional shift lever lockout mechanism. The shift lever is engaged with the shift lever link in the **P** , **R** , **N** , **D** , and $\mathbf{D}_3$ positions. This unit shifts the transmission using the shift cable connected between the shift cable link and the transmission control shaft.

In the **M** position, the shift lever is disengaged from the shift lever link, and the shift lever can be used to shift gears manually between 1st through 5th, much like a manual transmission.

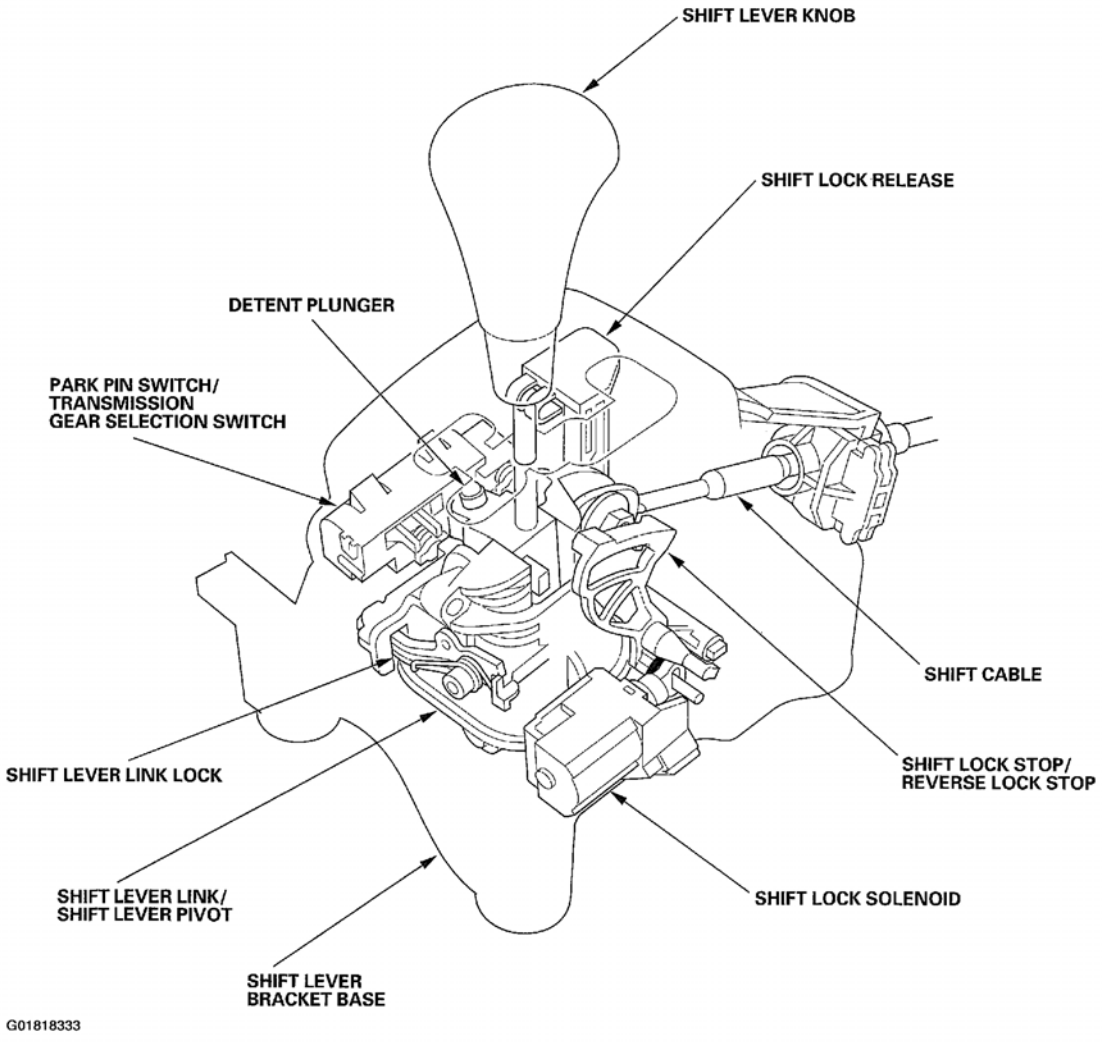


Fig. 77: Identifying Shift Lever Mechanism Components

SHIFT LEVER MECHANISM IN M POSITION

When the shift lever shifts to the **M** position, the shift lever is disengaged from the shift lever link/shift lever

pivot, and the shift lever link lock pops up to engage with the shift lever bracket base; the shift lever link/shift lever pivot and shifting position in the transmission are held in the **D** position.

The shift lever link lock is spring loaded, it pops up in the **M** position, and does not engage the shift lever link/shift lever pivot in any position except **M** .

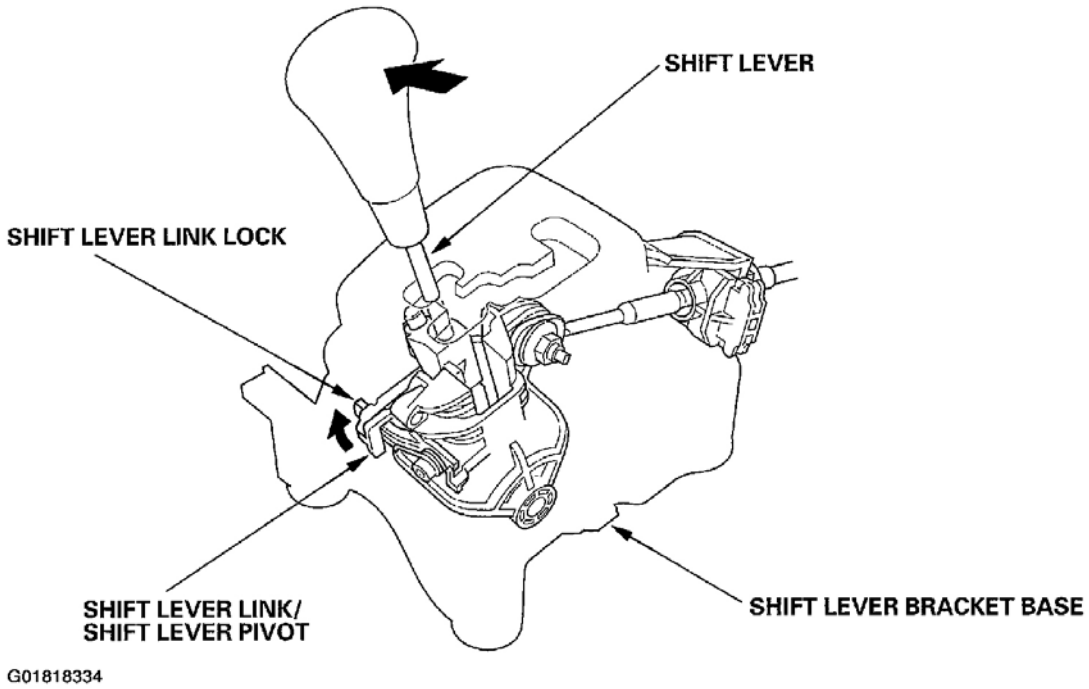


Fig. 78: Shift Lever Mechanism in M Position

The shift lever fits into the **M** position by using a detent plunger with a spring. When shifting to upshift and downshift positions, the detent plunger is depressed by the detent bracket inner wall, and detent plunger spring puts the shift lever back into the neutral position. The detent plunger also works in the **P** position.

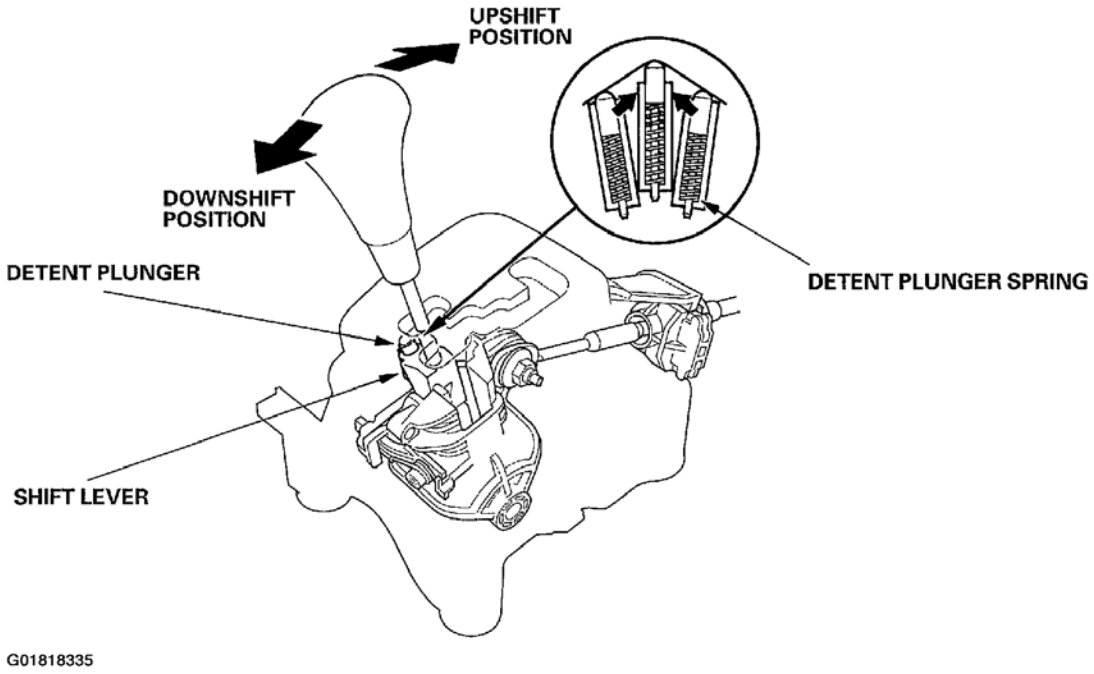


Fig. 79: Shifting To Upshift & Downshift Positions

SHIFT LOCK/REVERSE LOCK MECHANISM

The shift lock system reduces the risk of unintentional engine starting. Starting the engine is possible only in the **P** and **N** positions. The shift lock mechanism consists of the shift lock solenoid, shift lock stop/reverse lock stop, shift lock release, and related parts. The reverse lock mechanism shares the shift lock mechanism. The shift lock solenoid is electronically controlled by the shift lock/reverse lock control system signals. If the shift lock solenoid does not operate, the shift lock/reverse lock mechanism can be released by pressing the shift lock release.

In the **P** position while pressing the brake pedal and releasing the accelerator, the shift lock solenoid is turned ON, and the shift lock solenoid plunger is retracted, releasing the shift lock stop. This allows the shift lever to be moved.

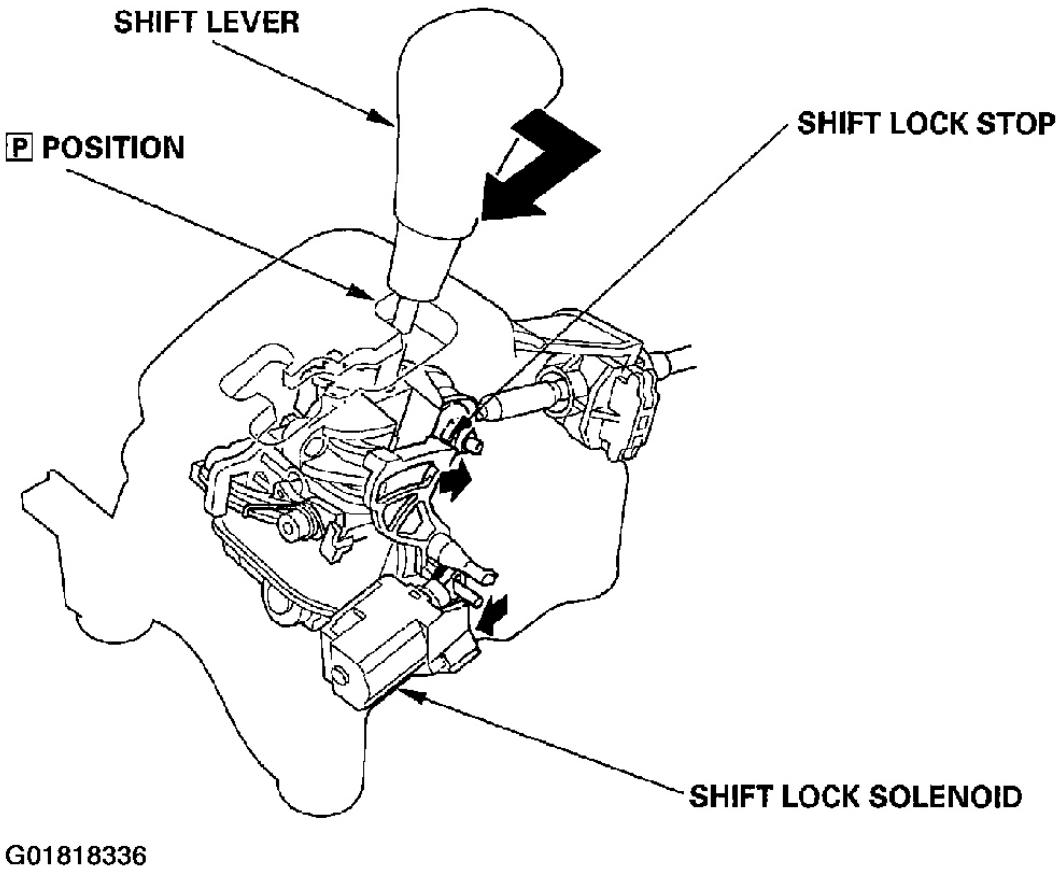


Fig. 80: Shift Lock/Reverse Lock Mechanism

When the brake pedal is released or the accelerator is pressed, the shift lock solenoid stays OFF, and the shift lock stop locks the shift lever in the **P** position.

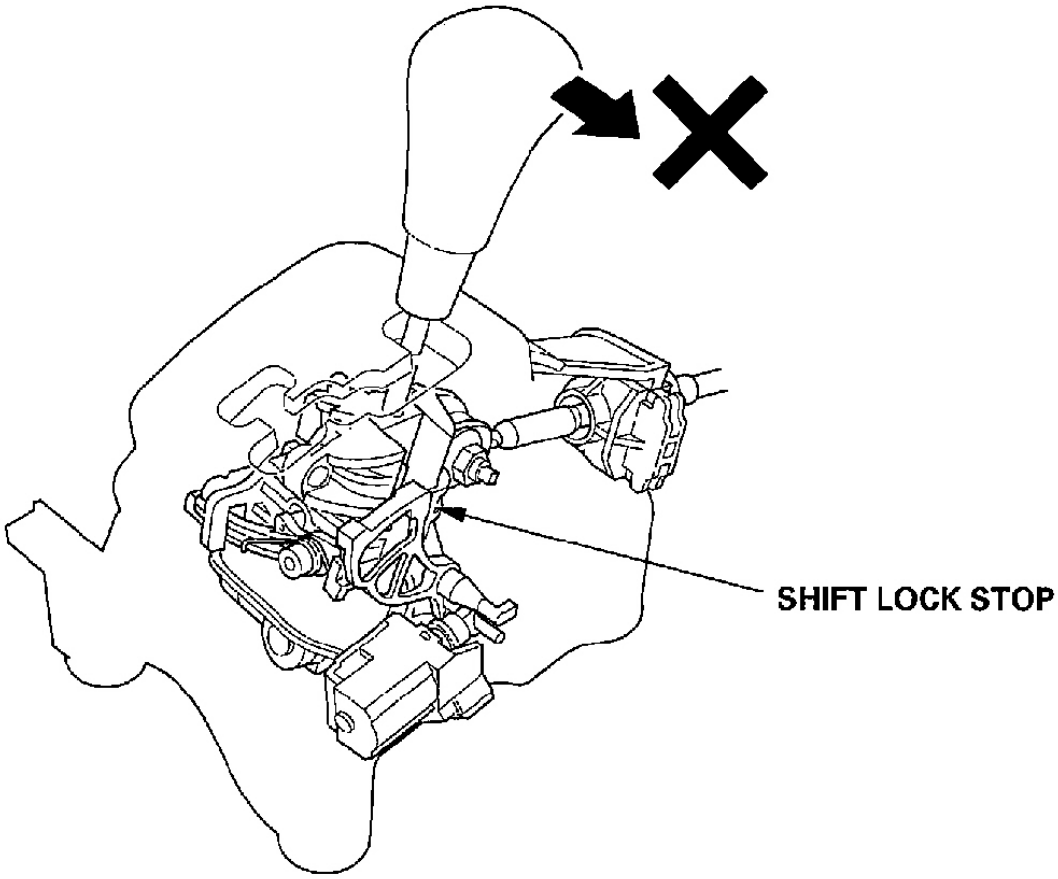


Fig. 81: Shift Lock Stop Locking The Shift Lever

When the shift lever is shifted to the **R** position from **N** , the shift lock solenoid is turned ON, and the shift lock solenoid plunger is retracted to release the reverse lock stop. This allows the shift lever to be moved to the **R** position.

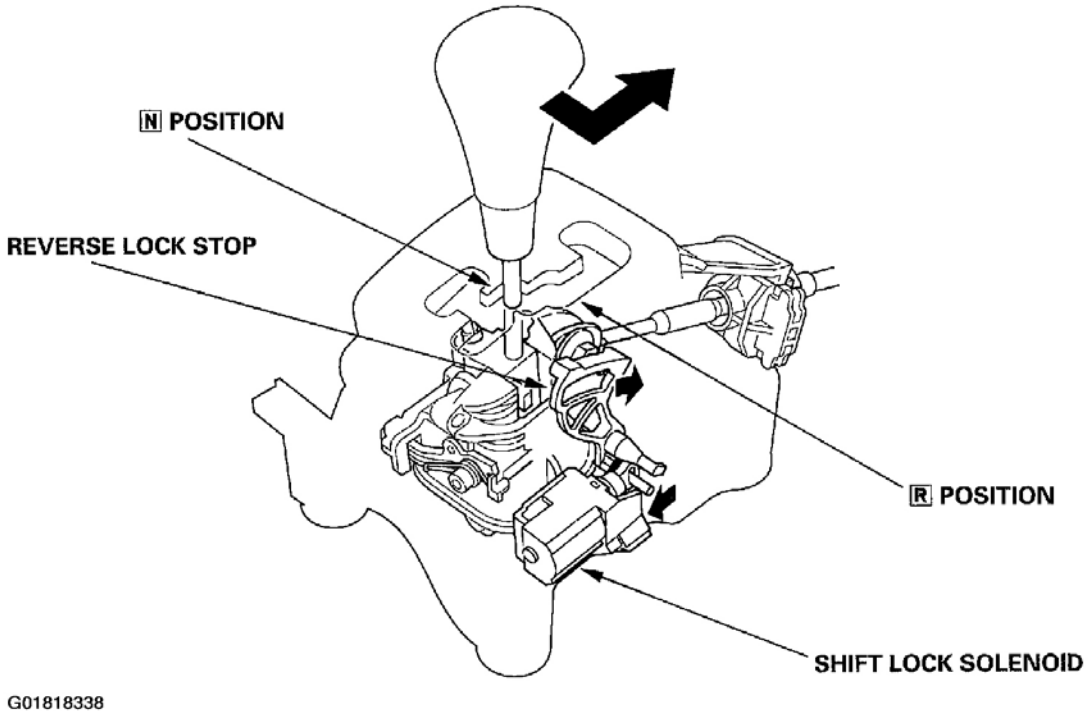


Fig. 82: Shift Lock Solenoid Plunger Retracted To Release The Reverse Lock Stop

If the conditions (acceleration at 6 mph (10 km/h) or less, and deceleration at 5 mph (8 km/h) or less in the **D** position) for turning ON the solenoid are not met, the shift lock solenoid stays OFF, and the reverse lock stop locks the shift lever in the **N** position.

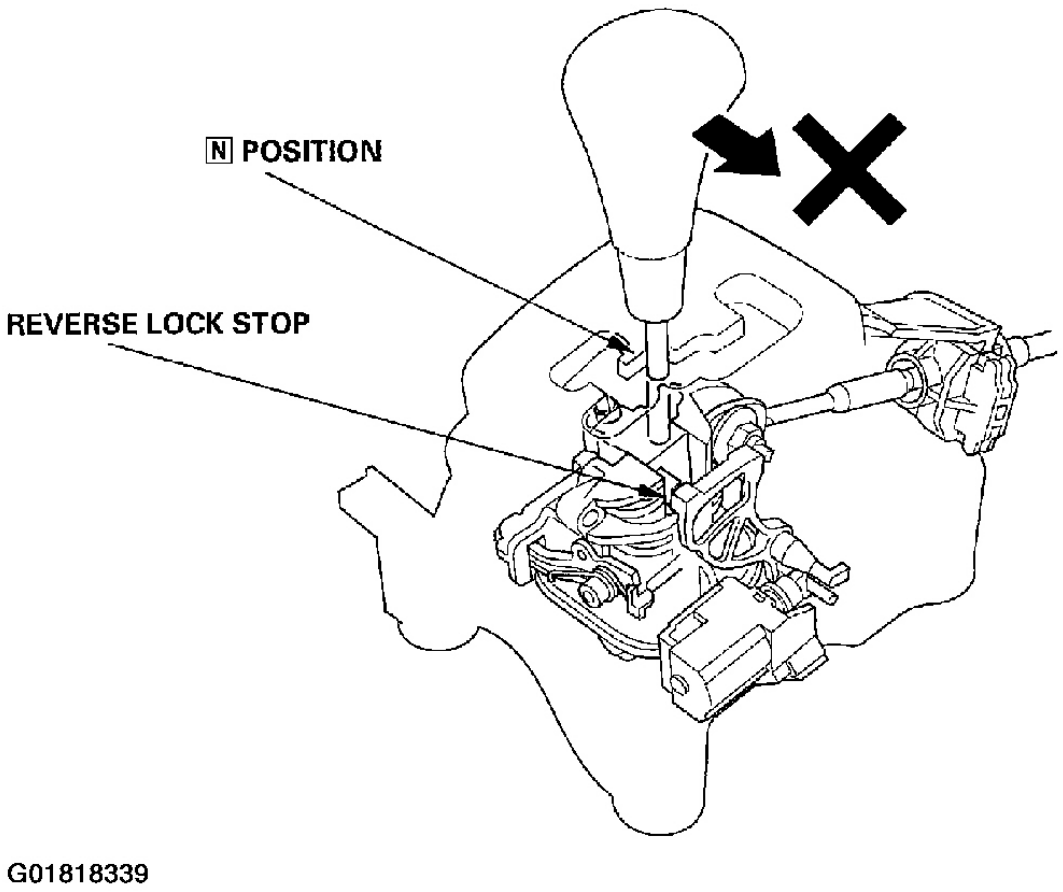


Fig. 83: Reverse Lock Stop Locking The Shift Lever

WIRING DIAGRAM

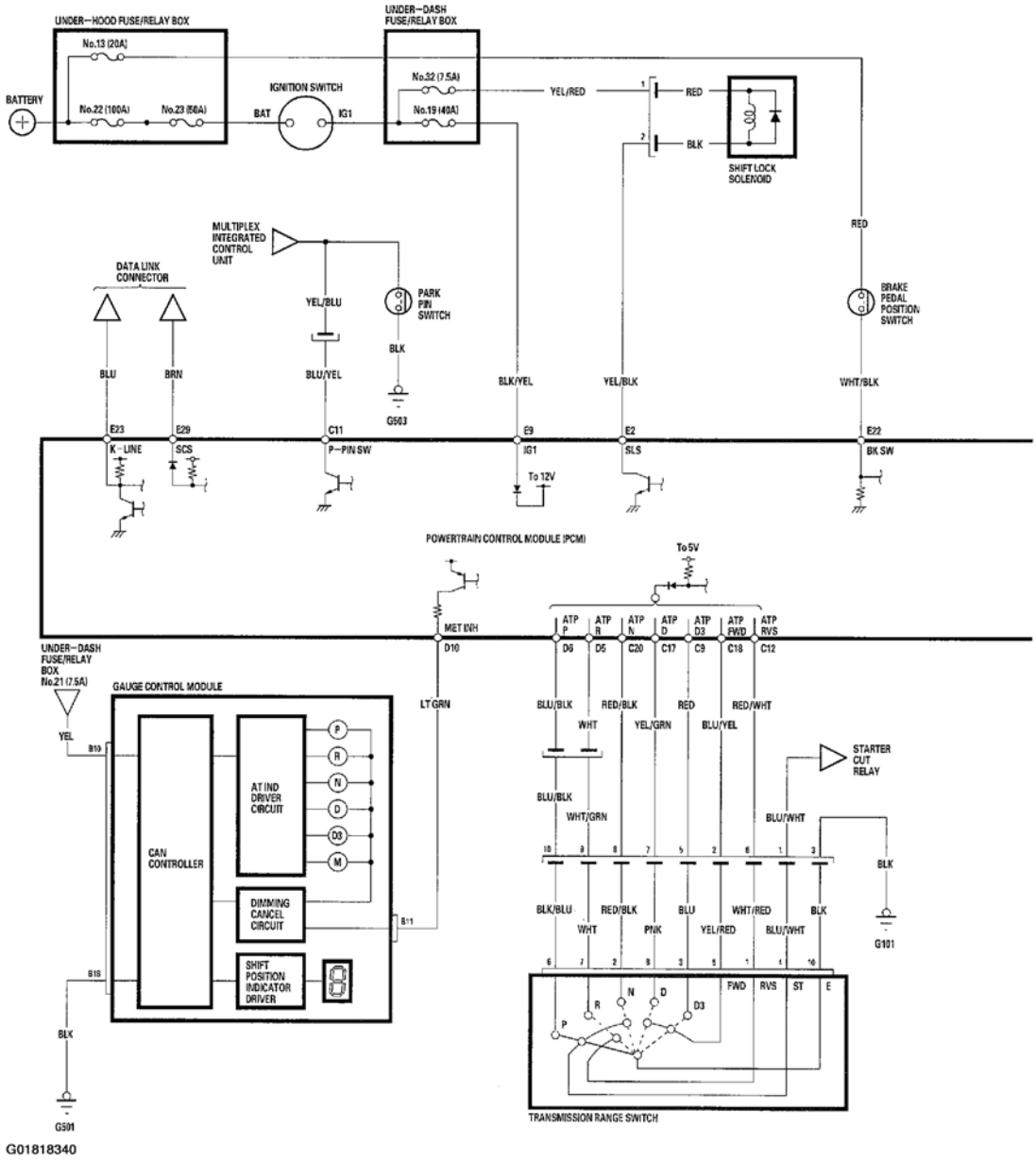


Fig. 84: Circuit Diagram - PCM A/T Control System Wiring Diagram (1 Of 3)

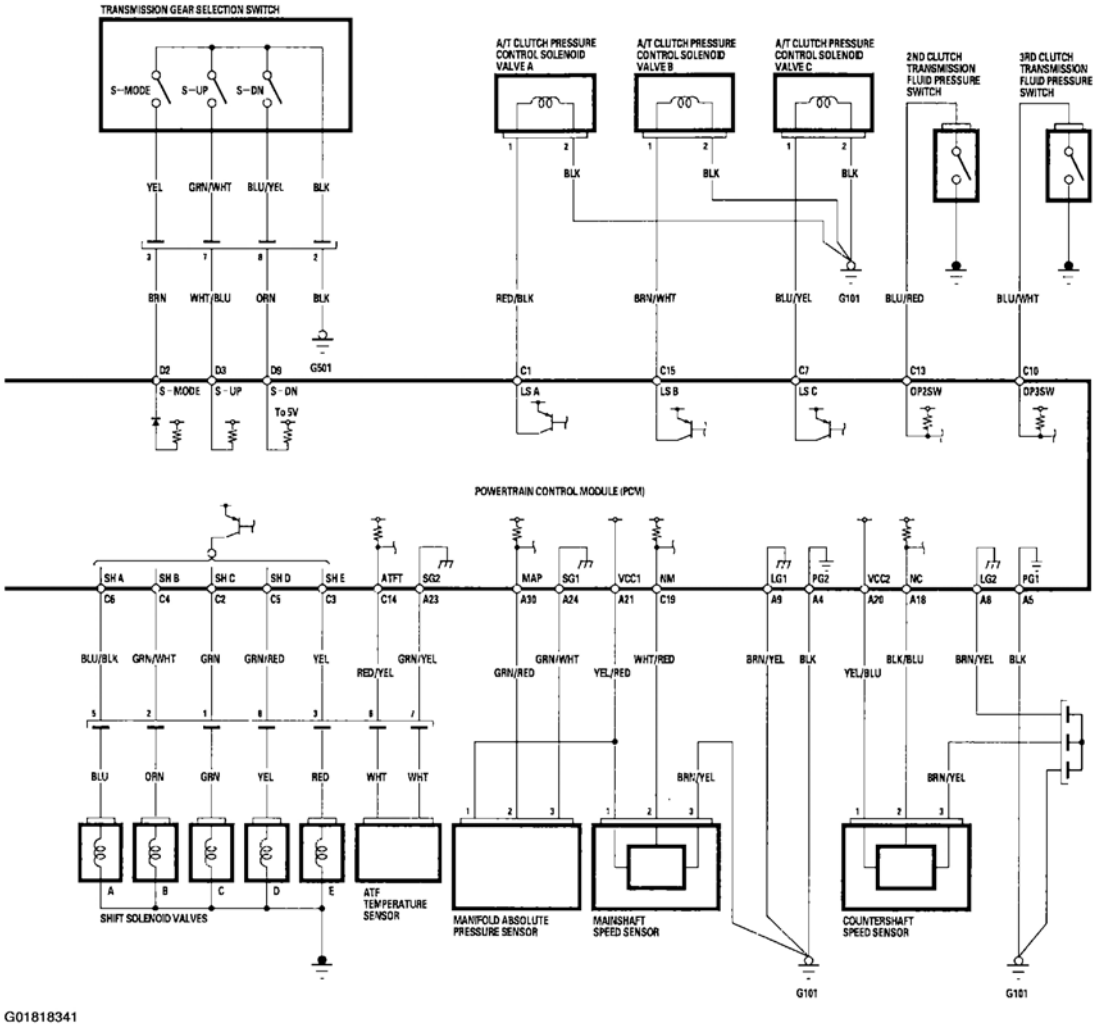


Fig. 85: Circuit Diagram - PCM A/T Control System Wiring Diagram (2 Of 3)

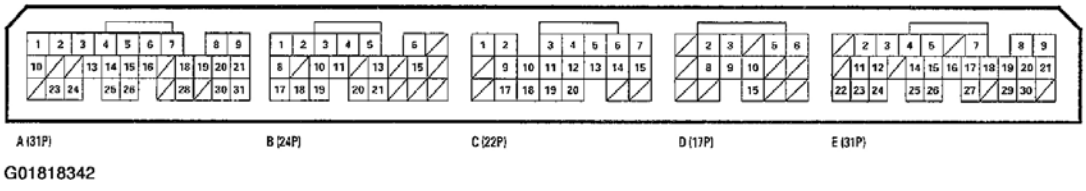


Fig. 86: Circuit Diagram - PCM A/T Control System Wiring Diagram (3 Of 3)

DTC TROUBLESHOOTING

DTC P0705: SHORT IN TRANSMISSION RANGE SWITCH CIRCUIT (MULTIPLE SHIFT-POSITION INPUT)

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Start the engine.
3. Move the shift lever to each position, and check the OBD STATUS in DTCs MENU for a pass/fail test of code P0705.

   Did the result indicate a fail?

   YES: Go to step 4.

   NO: Intermittent failure, the system is OK at this time. Check for an intermittent short in the wires between the transmission range switch and PCM. If the tester indicates NOT COMPLETE, return to step 1 and recheck.
4. Test the transmission range switch (see **TRANSMISSION RANGE SWITCH TEST**).

   Is the switch OK?

   YES: Go to step 5.

   NO: Replace the transmission range switch, then go to step 49 .
5. Turn the ignition switch ON (II).
6. Shift to all positions other than **P** .
7. Measure the voltage between PCM connector terminals D6 and A8 or A9.

   Is there about 5 V?

   YES: Go to step 14 .

   NO: Go to step 8.

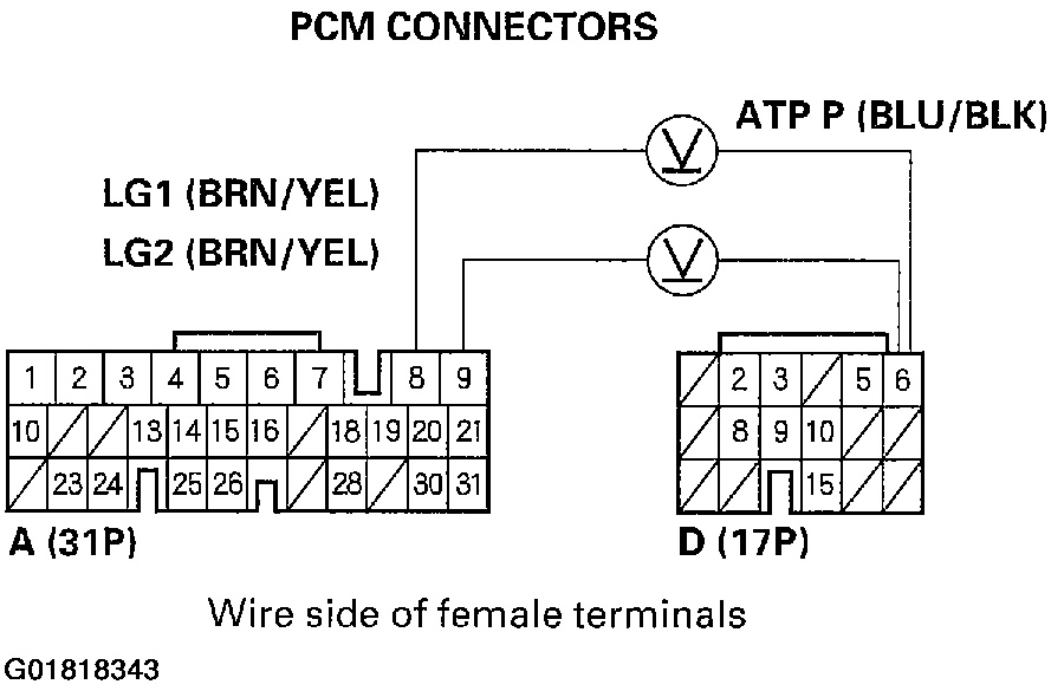


Fig. 87: Measuring The Voltage Between PCM Connector Terminals D6 & A8 Or A9

8. Turn the ignition switch OFF.
9. Jump the SCS line with the HDS.
10. Disconnect PCM connector D (17P).
11. Check for continuity between PCM connector terminal D6 and body ground.

Is there continuity?

YES: Repair short in the wire between PCM connector terminal D6 and the transmission range switch, then go to step 49 .

NO: Go to step 12.

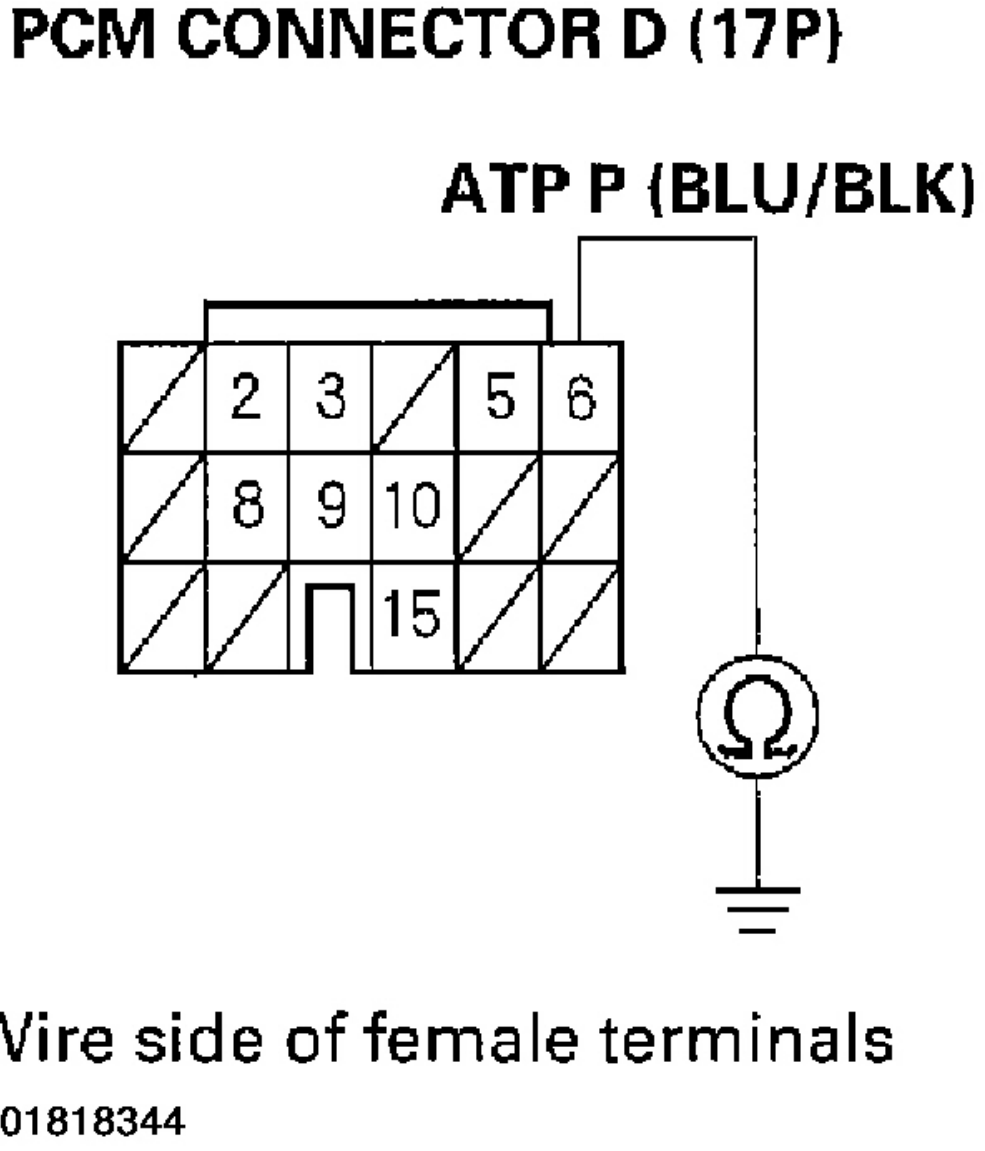


Fig. 88: Checking For Continuity Between PCM Connector Terminal D6 & Body Ground

12. Disconnect PCM connector A (31P).
13. Check for continuity between PCM connector terminals A8 and body ground, and between A9 and body ground.

    Is there continuity?

    YES: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the

symptom/indication goes away with a known-good PCM, replace the original PCM.

NO: Repair open in the wire between PCM connector terminals A8, A9 and ground (G101), or repair poor ground (G101), then go to step 49 .

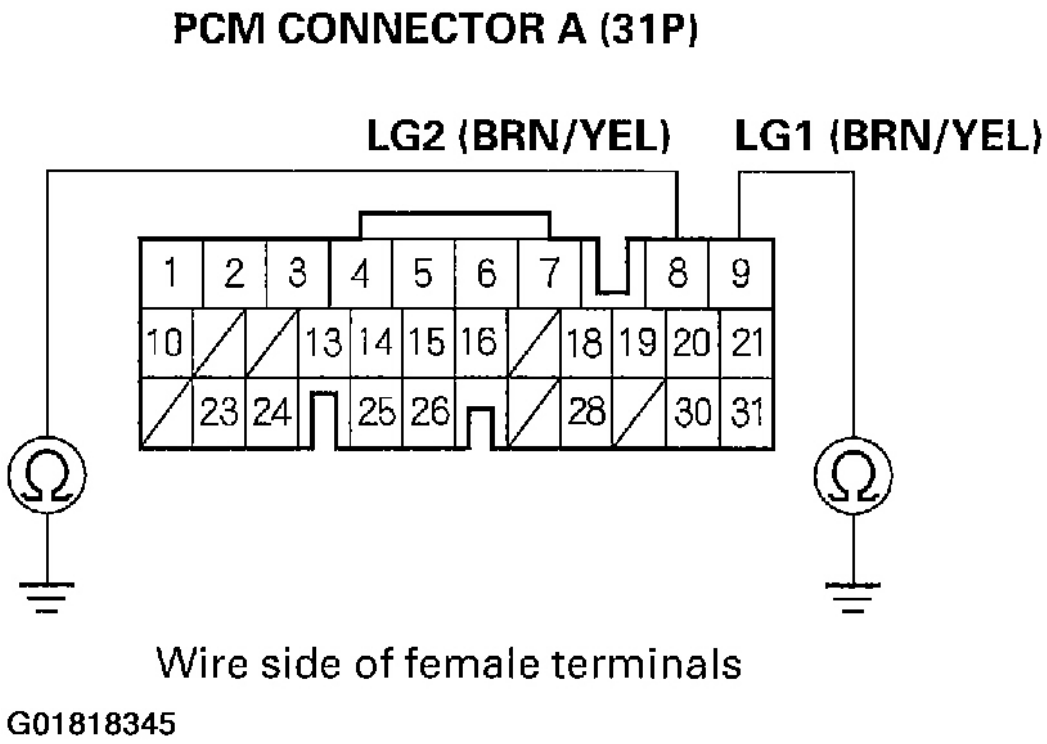


Fig. 89: Checking For Continuity Between PCM Connector Terminals A8 & Body Ground & Between A9 & Body Ground

14. Shift to all positions other than **R** .
15. Measure the voltage between PCM connector terminals D5 and A8 or A9.

    Is there about 5 V?

    YES: Go to step 20 .

    NO: Go to step 16.

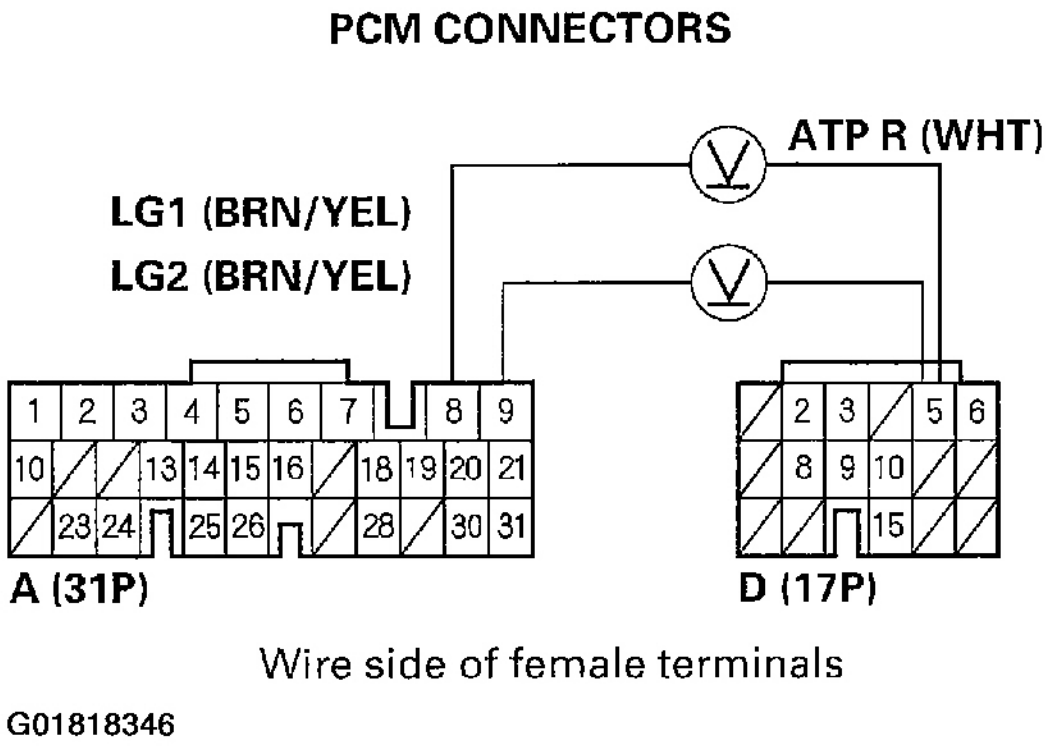


Fig. 90: Measuring The Voltage Between PCM Connector Terminals D5 & A8 Or A9

16. Turn the ignition switch OFF.
17. Jump the SCS line with the HDS.
18. Disconnect PCM connector D (17P).
19. Check for continuity between PCM connector terminal D5 and body ground.

Is there continuity?

YES: Repair short in the wire between PCM connector terminal D5 and the transmission range switch, then go to step 49 .

NO: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

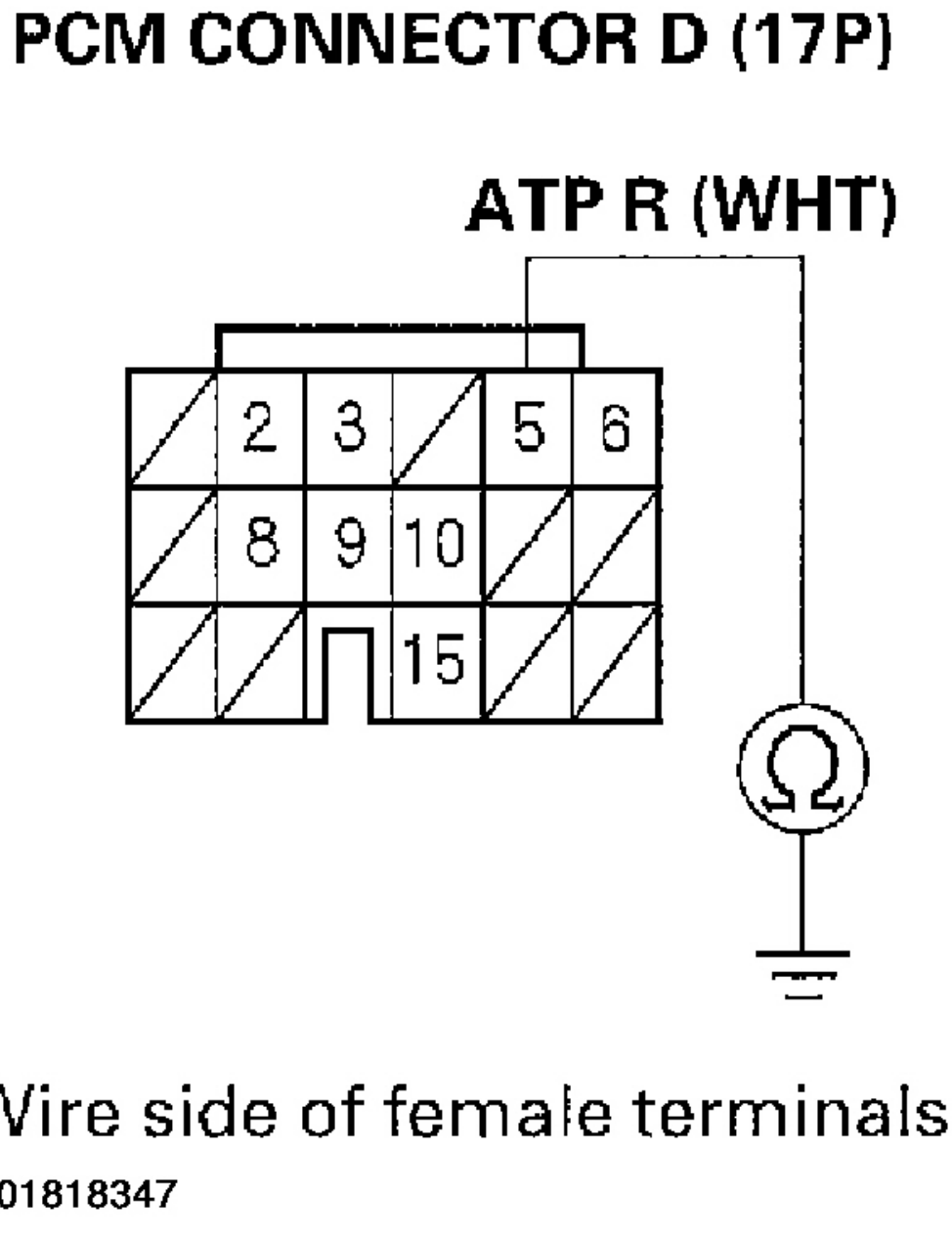


Fig. 91: Checking For Continuity Between PCM Connector Terminal D5 & Body Ground

20. Measure the voltage between PCM connector terminals C12 and A8 or A9.

Is there about 5 V?

YES: Go to step 25 .

NO: Go to step 21.

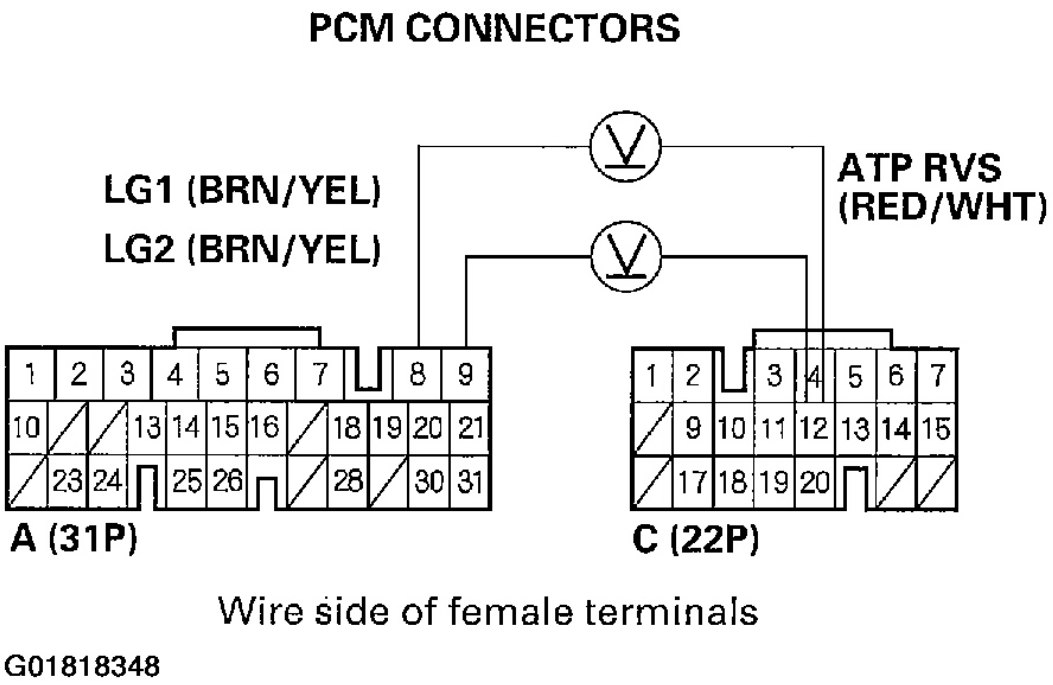


Fig. 92: Measuring The Voltage Between PCM Connector Terminals C12 & A8 Or A9

21. Turn the ignition switch OFF.
22. Jump the SCS line with the HDS.
23. Disconnect PCM connector C (22P)
24. Check for continuity between PCM connector terminal C12 and body ground.

Is there continuity?

YES: Repair short in the wire between PCM connector terminal C12 and the transmission range switch, then go to step 49 .

NO: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

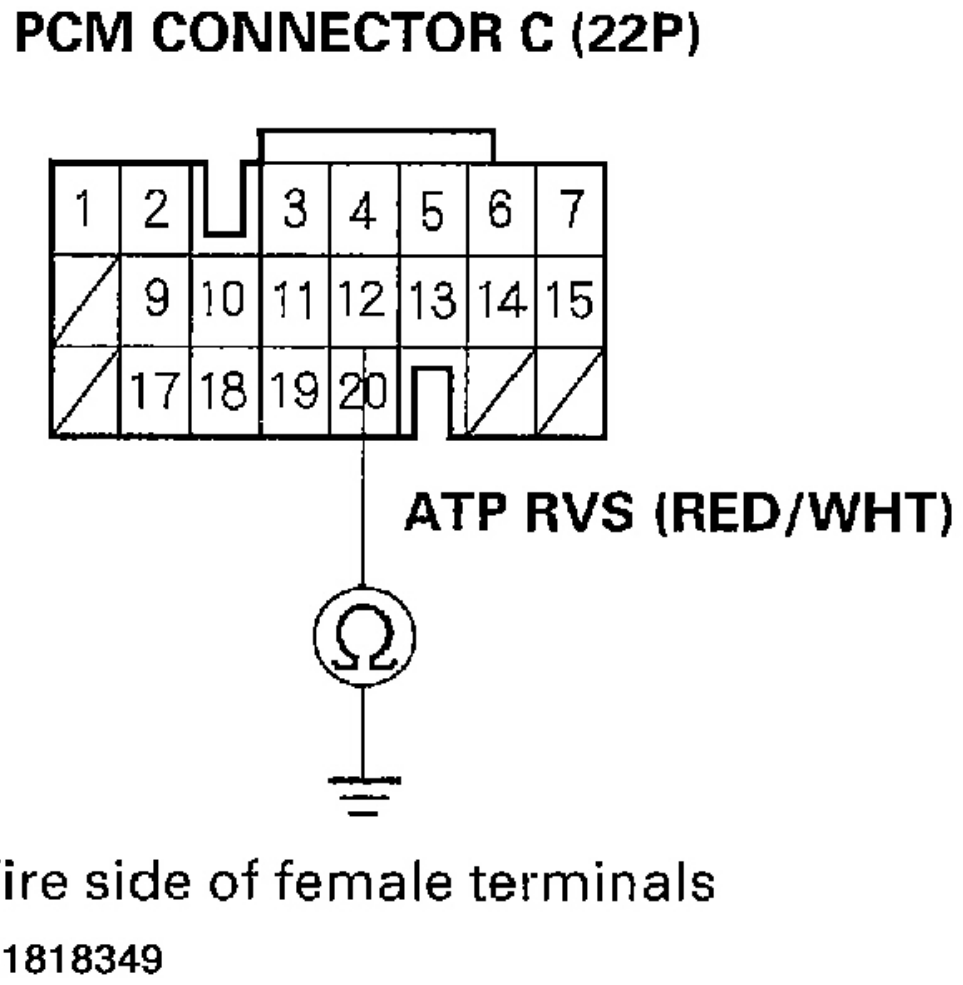


Fig. 93: Checking For Continuity Between PCM Connector Terminal C12 & Body Ground

25. Shift to all positions other than **N** .
26. Measure the voltage between PCM connector terminals C20 and A8 or A9.

Is there about 5 V?

YES: Go to step 31 .

NO: Go to step 27.

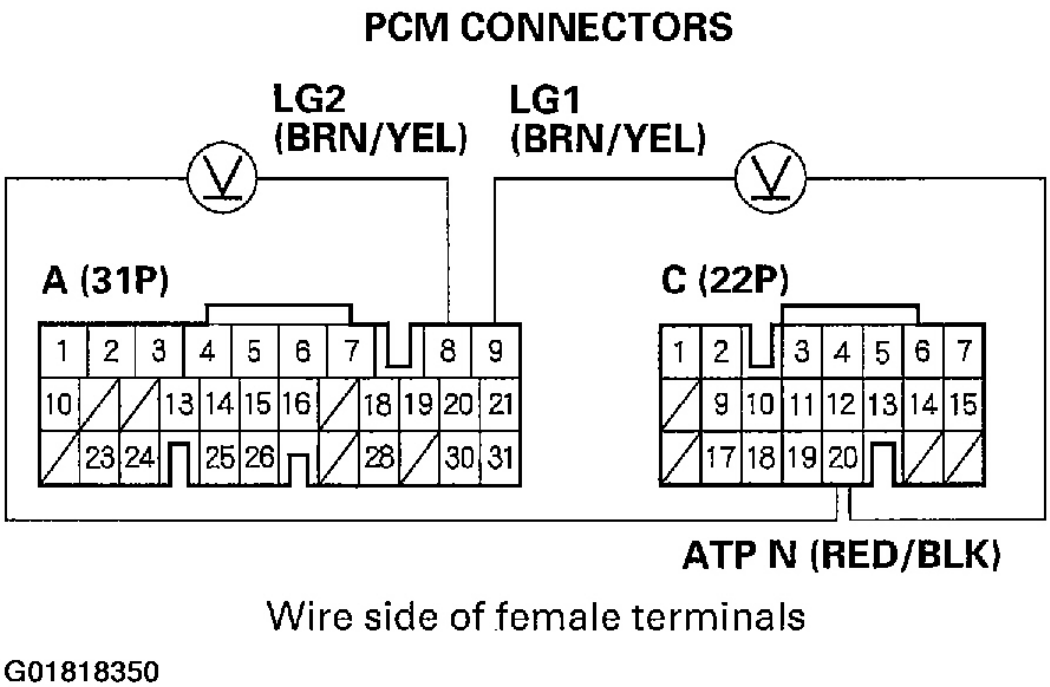


Fig. 94: Measuring The Voltage Between PCM Connector Terminals C20 & A8 Or A9

27. Turn the ignition switch OFF.
28. Jump the SCS line with the HDS.
29. Disconnect PCM connector C (22P).
30. Check for continuity between PCM connector terminal C20 and body ground.

Is there continuity?

YES: Repair short in the wire between PCM connector terminal C20 and the transmission range switch, then go to step 49 .

NO: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

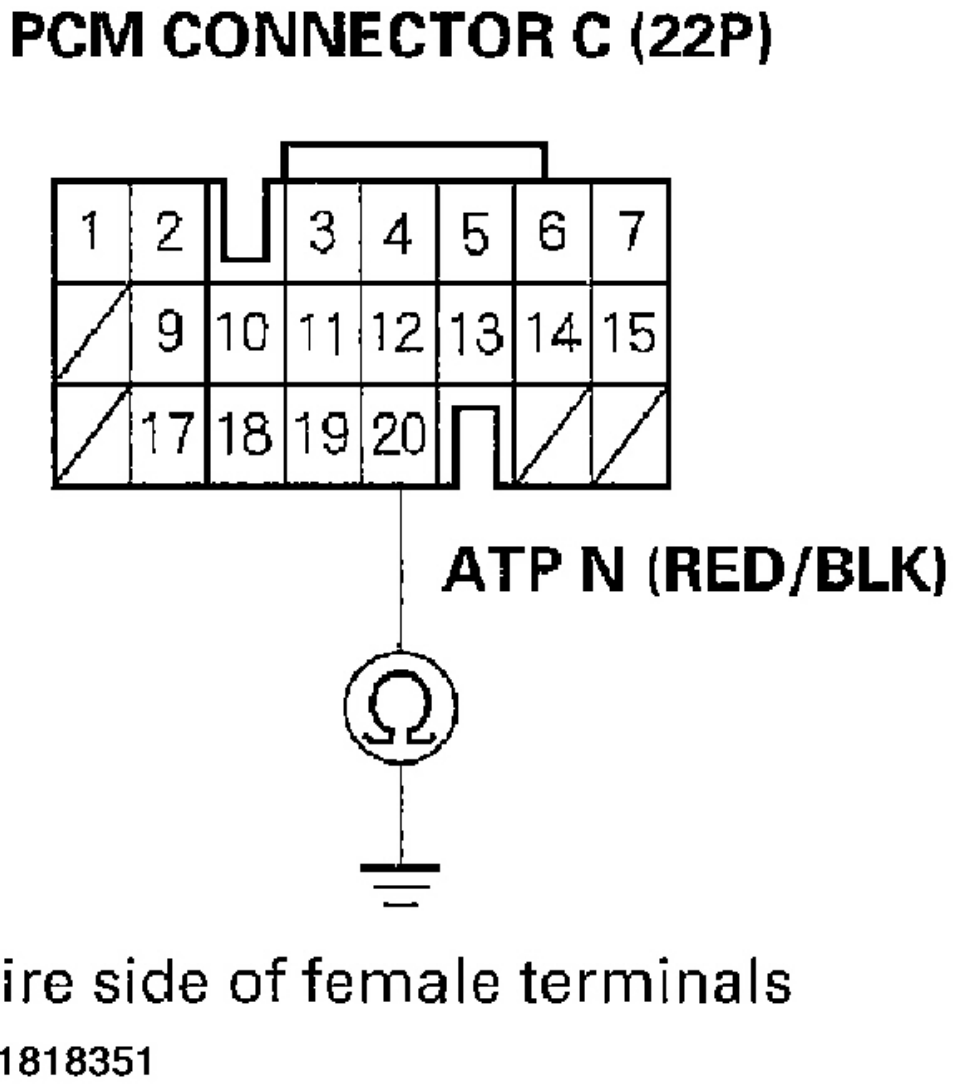


Fig. 95: Checking For Continuity Between PCM Connector Terminal C20 & Body Ground

31. Shift to all positions other than **D** .
32. Measure the voltage between PCM connector terminals C17 and A8 or A9.

    Is there about 5 V?

    YES: Go to step 37 .

    NO: Go to step 33.

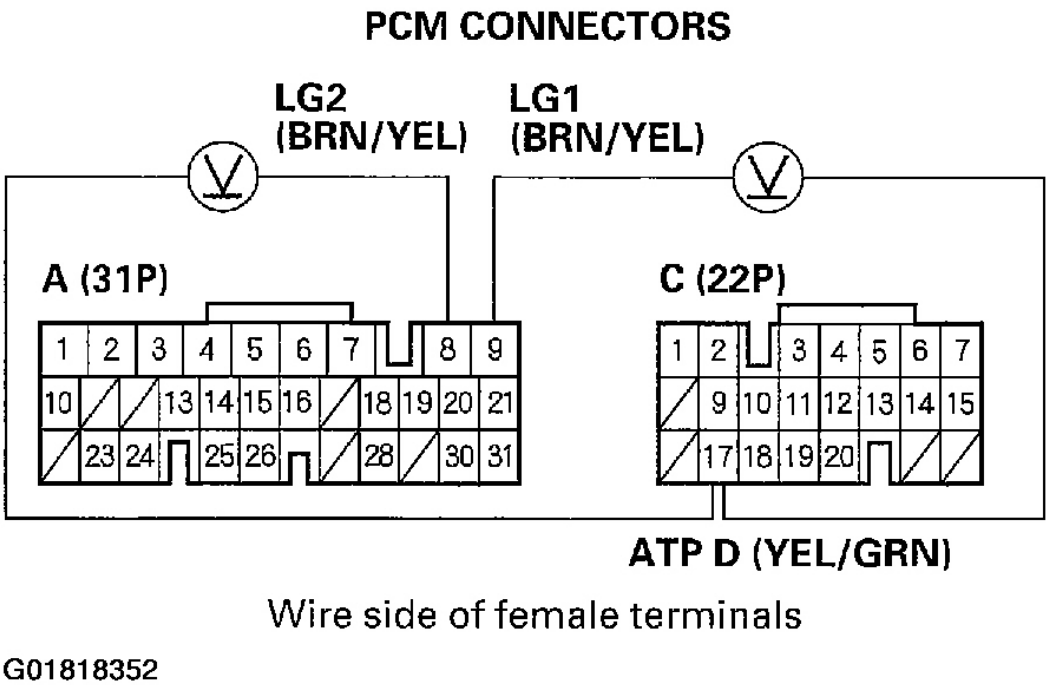


Fig. 96: Measuring The Voltage Between PCM Connector Terminals C17 & A8 Or A9

33. Turn the ignition switch OFF.
34. Jump the SCS line with the HDS.
35. Disconnect PCM connector C (22P).
36. Check for continuity between PCM connector terminal C17 and body ground.

Is there continuity?

YES: Repair short in the wire between PCM connector terminal C17 and the transmission range switch, then go to step 49 .

NO: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

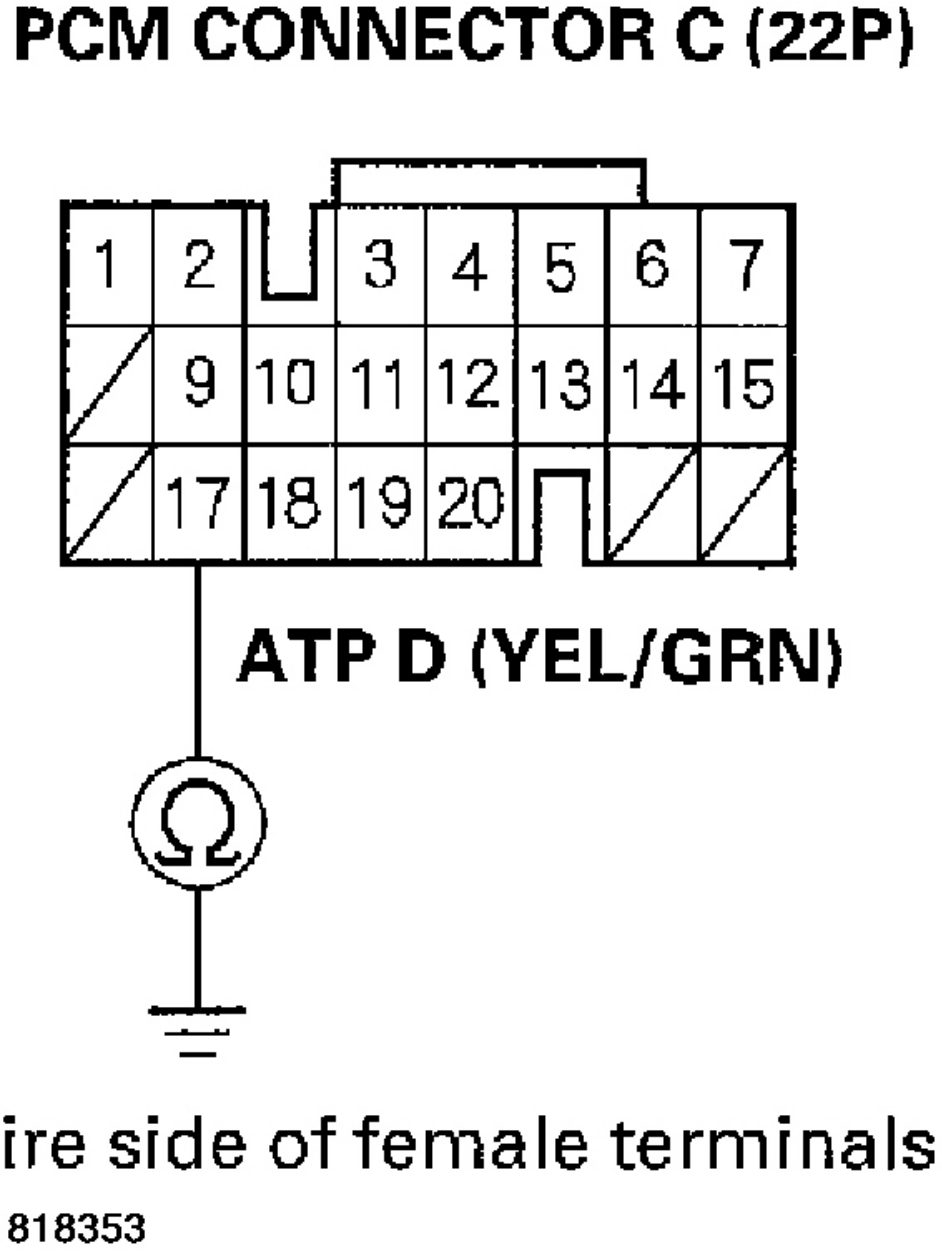


Fig. 97: Checking For Continuity Between PCM Connector Terminal C17 & Body Ground

37. Shift to all positions other than $\mathbf{D_3}$.
38. Measure the voltage between PCM connector terminals C9 and A8 or A9.

    Is there about 5 V?

YES: Go to step 43 .

NO: Go to step 39.

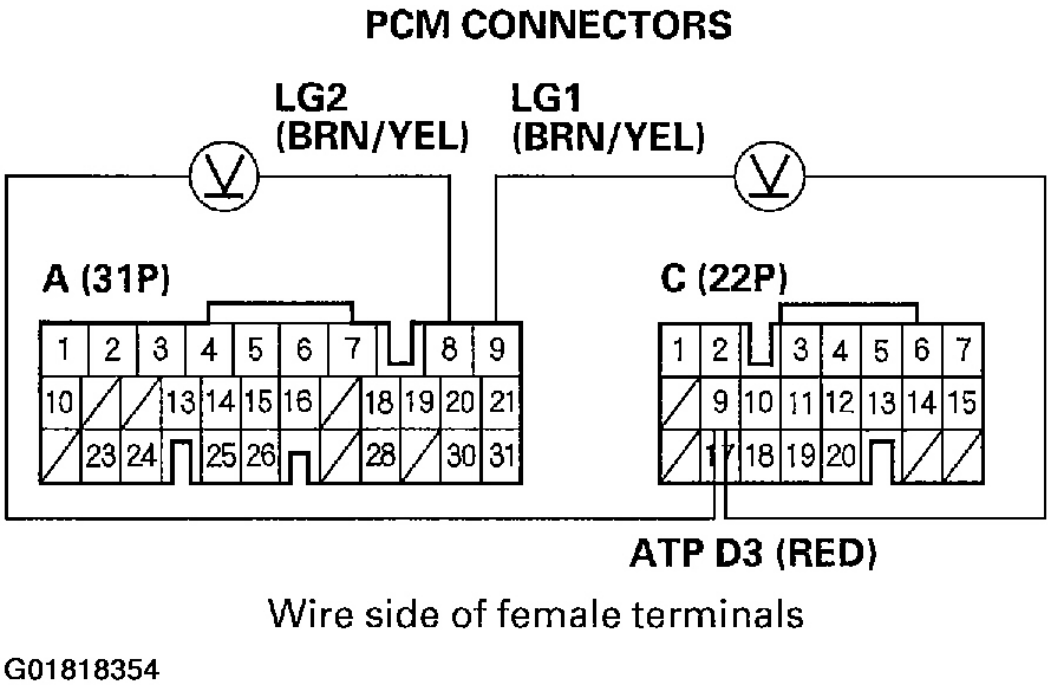


Fig. 98: Measuring The Voltage Between PCM Connector Terminals C9 & A8 Or A9

39. Turn the ignition switch OFF.
40. Jump the SCS line with the HDS.
41. Disconnect PCM connector C (22P).
42. Check for continuity between PCM connector terminal C9 and body ground.

Is there continuity?

YES: Repair short in the wire between PCM connector terminal C9 and the transmission range switch, then go to step 49 .

NO: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

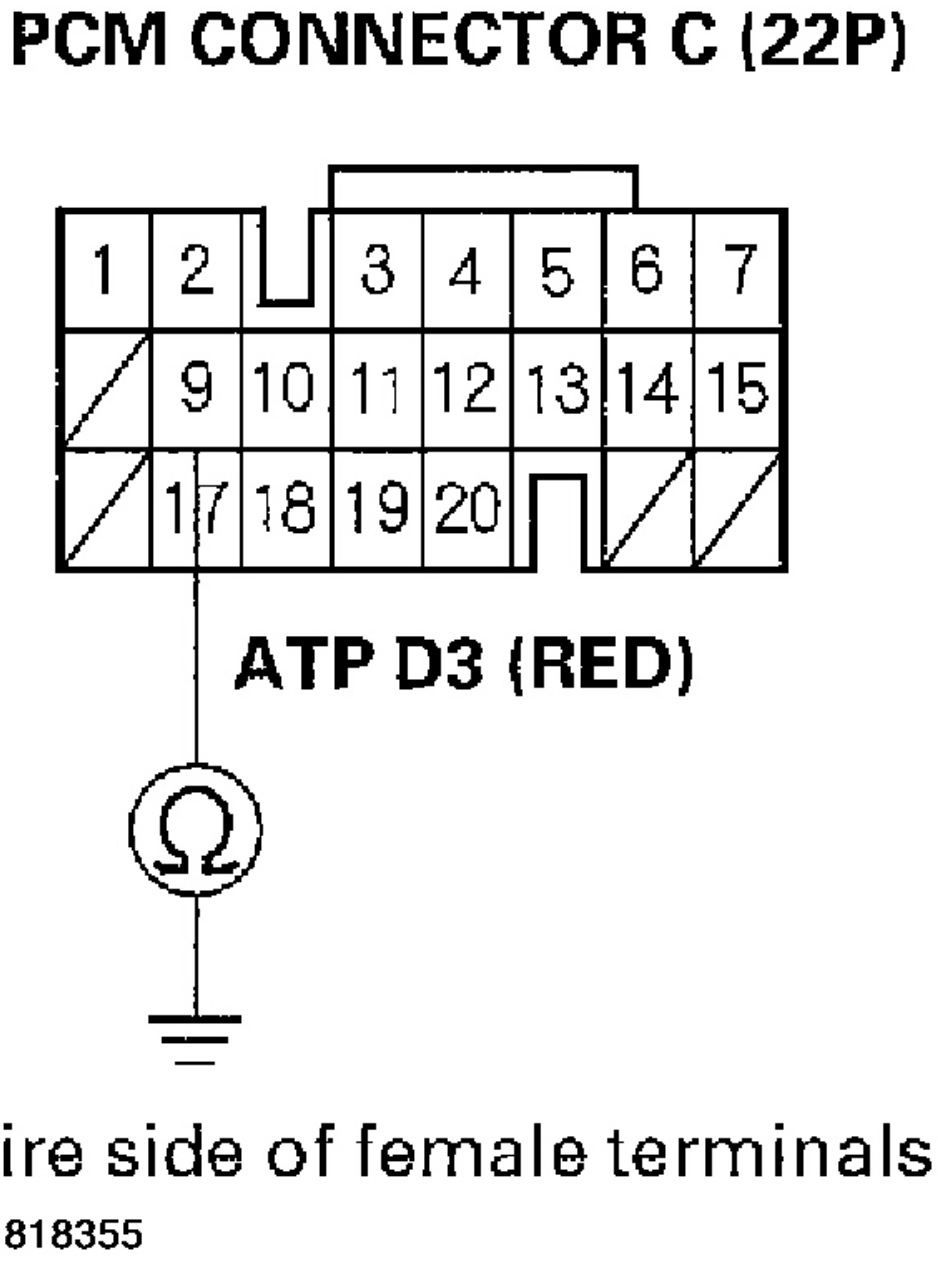


Fig. 99: Checking For Continuity Between PCM Connector Terminal C9 & Body Ground

43. Shift to all positions other than **D** and $\mathbf{D}_3$.
44. Measure the voltage between PCM connector terminals C18 and A8 or A9.

    Is there about 5 V?

YES: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

NO: Go to step 45.

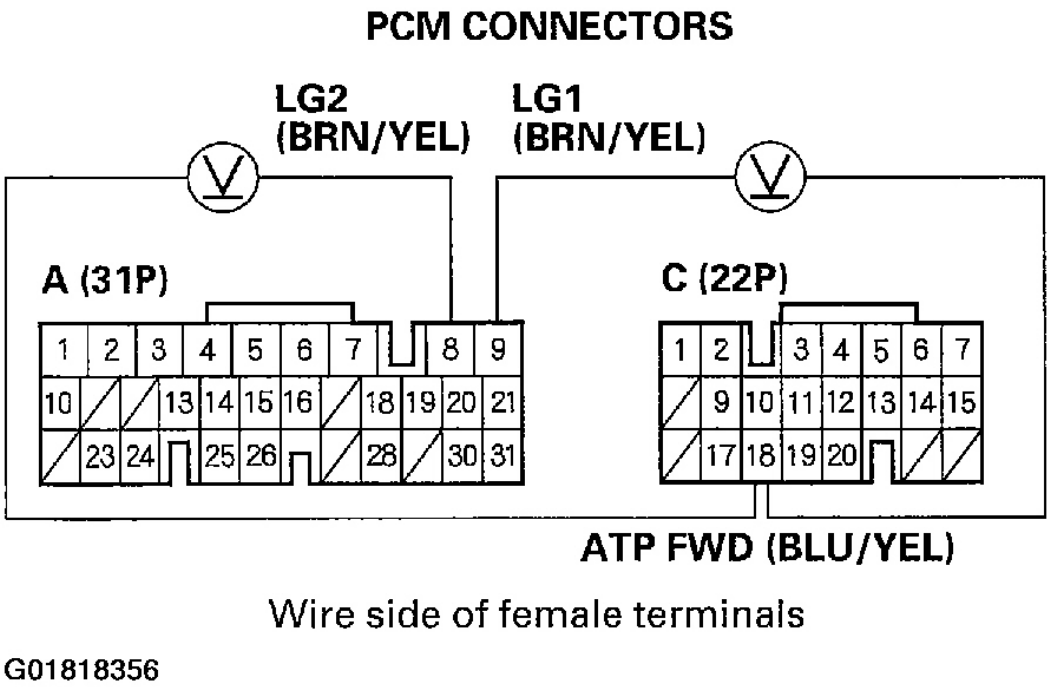


Fig. 100: Measuring The Voltage Between PCM Connector Terminals C18 & A8 Or A9

45. Turn the ignition switch OFF.
46. Jump the SCS line with the HDS.
47. Disconnect PCM connector C (22P).
48. Check for continuity between PCM connector terminal C18 and body ground.

Is there continuity?

YES: Repair short in the wire between PCM connector terminal C18 and the transmission range switch, then go to step 49.

NO: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

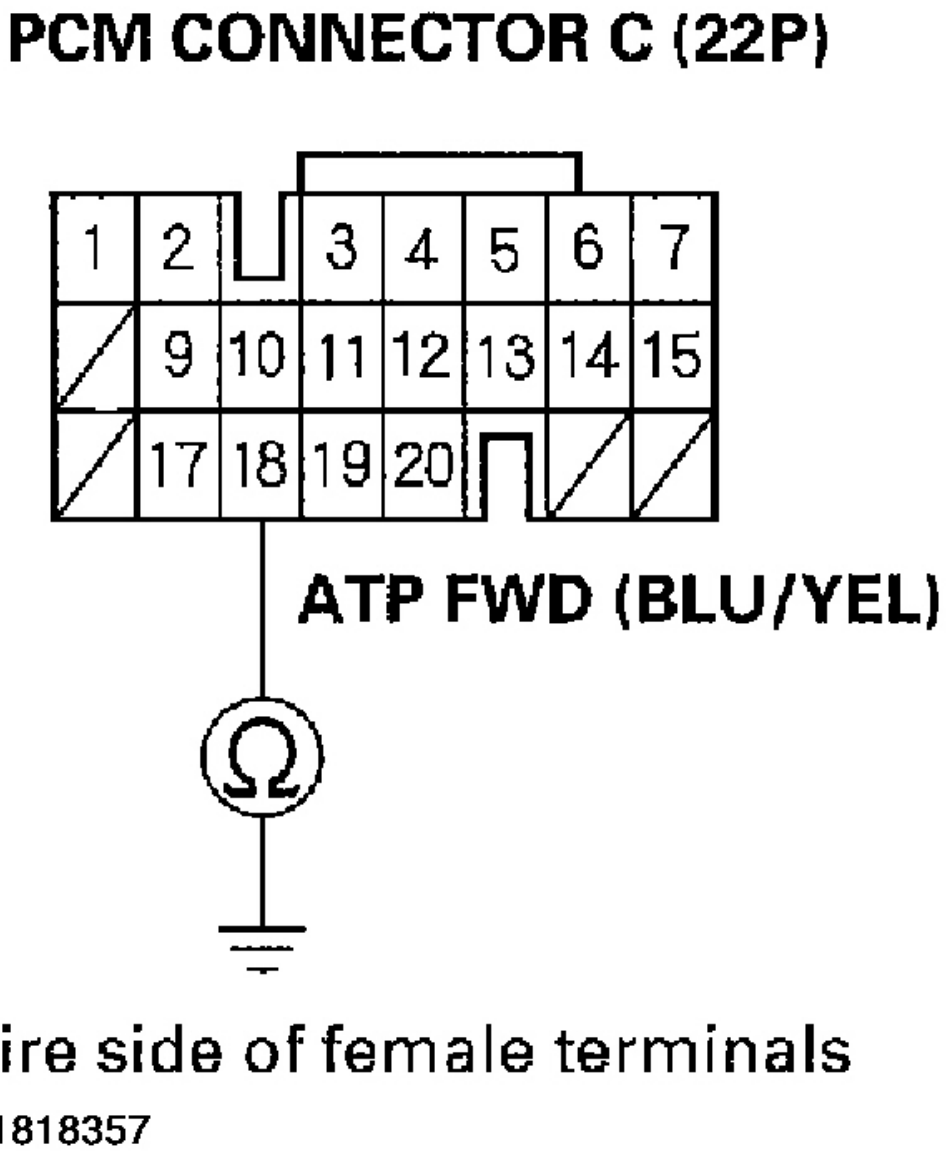


Fig. 101: Checking For Continuity Between PCM Connector Terminal C18 & Body Ground

49. Clear the DTC with the HDS.
50. Move the shift lever to each position, and check the OBD STATUS in DTCs MENU for a pass/fail test of code P0705.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0706: OPEN IN TRANSMISSION RANGE SWITCH CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.
3. Start the engine, drive the vehicle in the **D** position until the vehicle speed reaches 35 mph (56 km/h), then slow down and stop the wheels.
4. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0706.

   Did the result indicate a fail?

   YES: Go to step 5.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the transmission range switch and PCM. If the tester indicates NOT COMPLETE, return to step 1 and recheck.
5. Test the transmission range switch (see **TRANSMISSION RANGE SWITCH TEST**).

   Is the switch OK?

   YES: Inspect the end of the selector control shaft (see step 6 of **TRANSMISSION RANGE SWITCH TEST**), and go to step 6.

   NO: Replace the transmission range switch, then go to step 24 .
6. Install the transmission range switch correctly, and adjust the shift cable (see **SHIFT CABLE**).
7. Clear the DTC with the HDS.
8. Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.
9. Start the engine, drive the vehicle in the **D** position until the vehicle speed reaches 35 mph (56 km/h), then slow down and stop the wheels.
10. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0706.

    Did the result indicate a fall?

    YES: Go to step 11.

    NO: The problem has been corrected. If the tester indicates NOT COMPLETE, return to step 7 and recheck.
11. Shift the shift lever into the **D** position, and verify the ATP FWD and ATP D inputs with the HDS in the A/T data list.

    Is the ATP FWD and ATP D ON?

    YES: Go to step 12.

    NO: Go to step 17 .

12. Shift to the **D_3** position, and verify the ATP FWD and ATP D3 inputs with the HDS in the A/T date list.

    Is the ATP FWD and ATP D3 ON?

    YES: Go to step 13.

    NO: Go to step 17 .

13. Clear the DTC with the HDS, and turn the ignition switch OFF.
14. Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.
15. Start the engine, drive the vehicle in the **D** position until the vehicle speed reaches 35 mph (56 km/h), then slow down and stop the wheels.
16. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0706.

    Did the result indicate a fail?

    YES: Go to step 17.

    NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the transmission range switch and PCM. If the tester indicates NOT COMPLETE, return to step 13 and recheck.

17. Turn the ignition switch OFF.
18. Disconnect the transmission range switch connector.
19. Check for continuity between transmission range switch connector terminal No. 10 and body ground.

    Is there continuity?

    YES: Go to step 20.

    NO: Repair open in the wire between transmission range switch connector terminal No. 10 and ground (G101), or repair poor ground (G101), then go to step 24 .

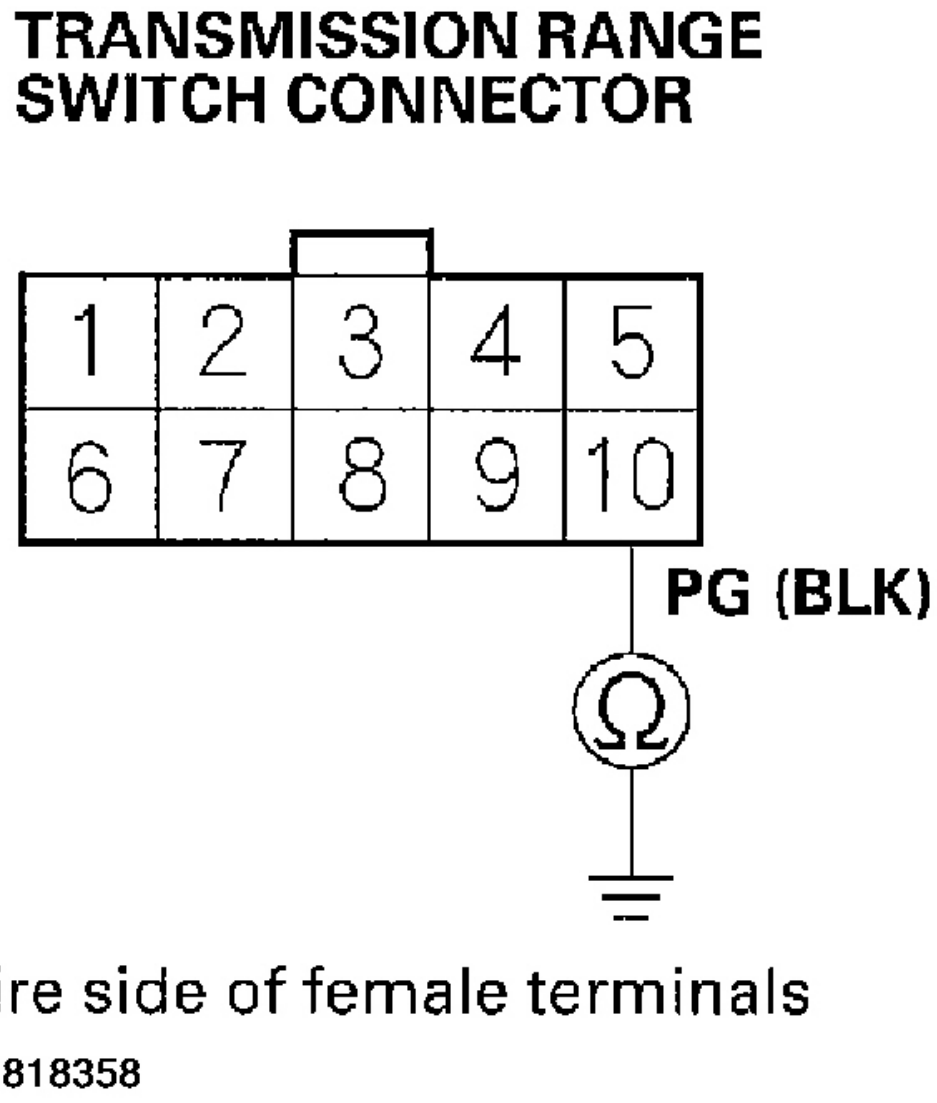


Fig. 102: Checking For Continuity Between Transmission Range Switch Connector Terminal No. 10 & Body Ground

20. Turn the ignition switch ON (II).
21. Measure the voltage between transmission range switch connector terminals No. 5 and No. 10.

Is there voltage?

YES: Go to step 22.

NO: Repair open in the wire between the transmission range switch and PCM connector terminal C18, then go to step 24 .

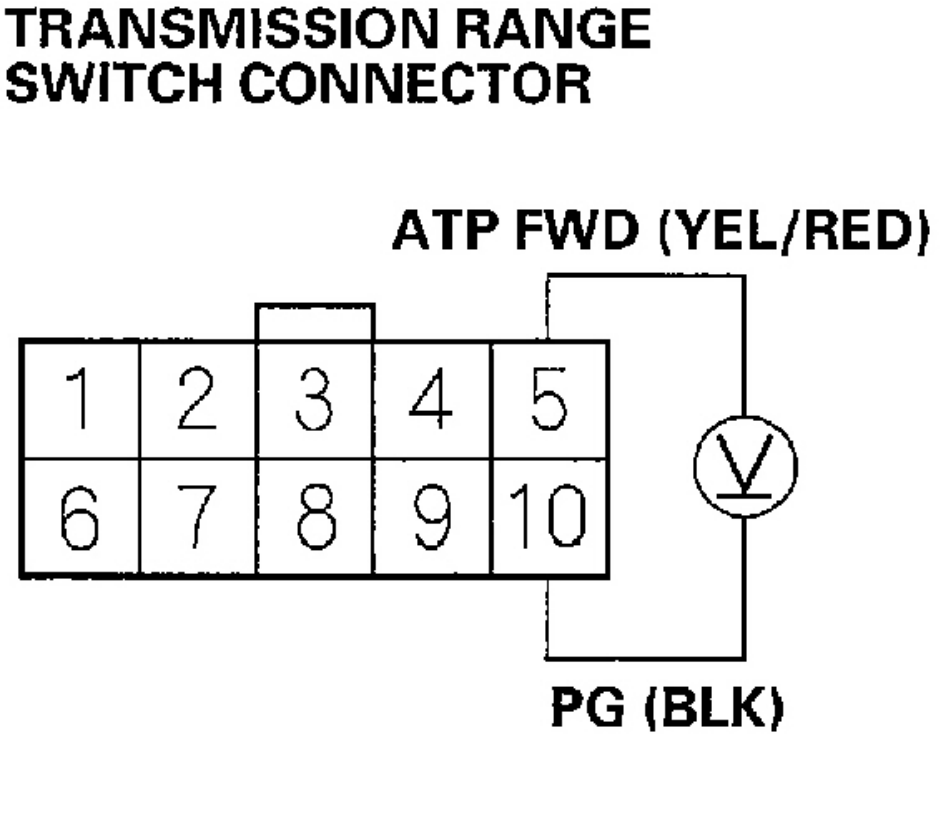


Fig. 103: Measuring The Voltage Between Transmission Range Switch Connector Terminals No. 5 & No. 10

22. Measure the voltage between transmission range switch connector terminals No. 8 and No. 10.

Is there voltage?

YES: Go to step 23.

NO: Repair open in the wire between the transmission range switch and PCM connector terminal C17, then go to step 24 .

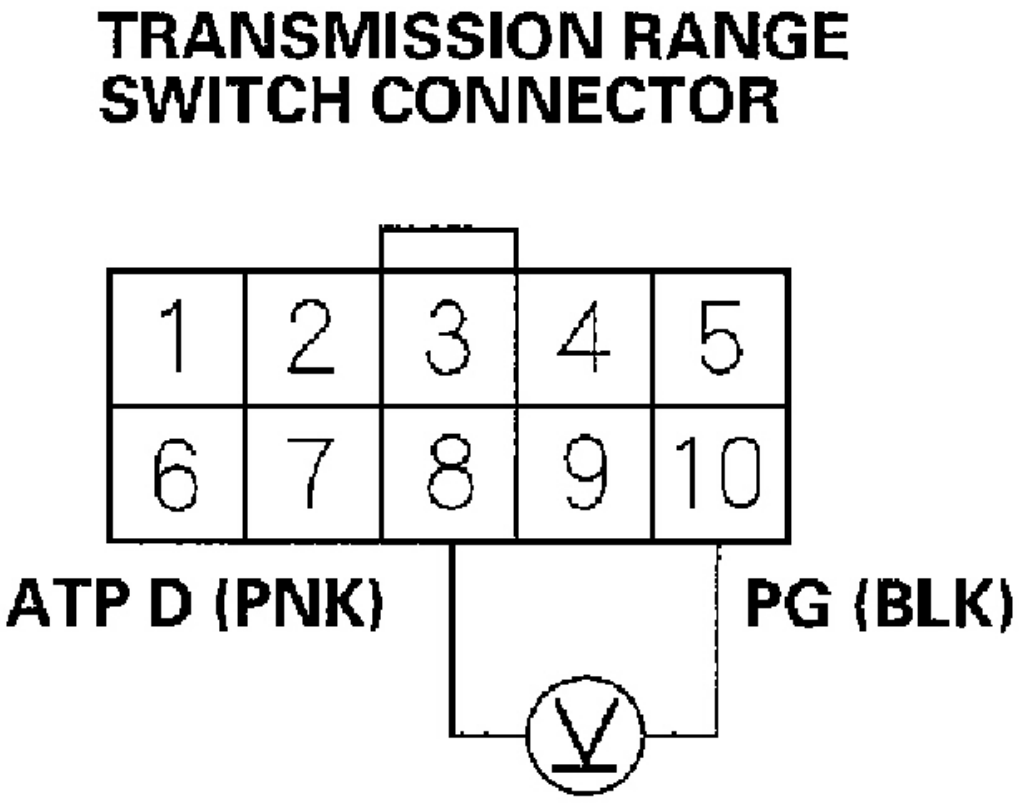


Fig. 104: Measuring The Voltage Between Transmission Range Switch Connector Terminals No. 8 & No. 10

23. Measure the voltage between transmission range switch connector terminals No. 3 and No. 10.

Is there voltage?

YES: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

NO: Repair open in the wire between the transmission range switch and PCM connector

terminal C9, then go to step 24.

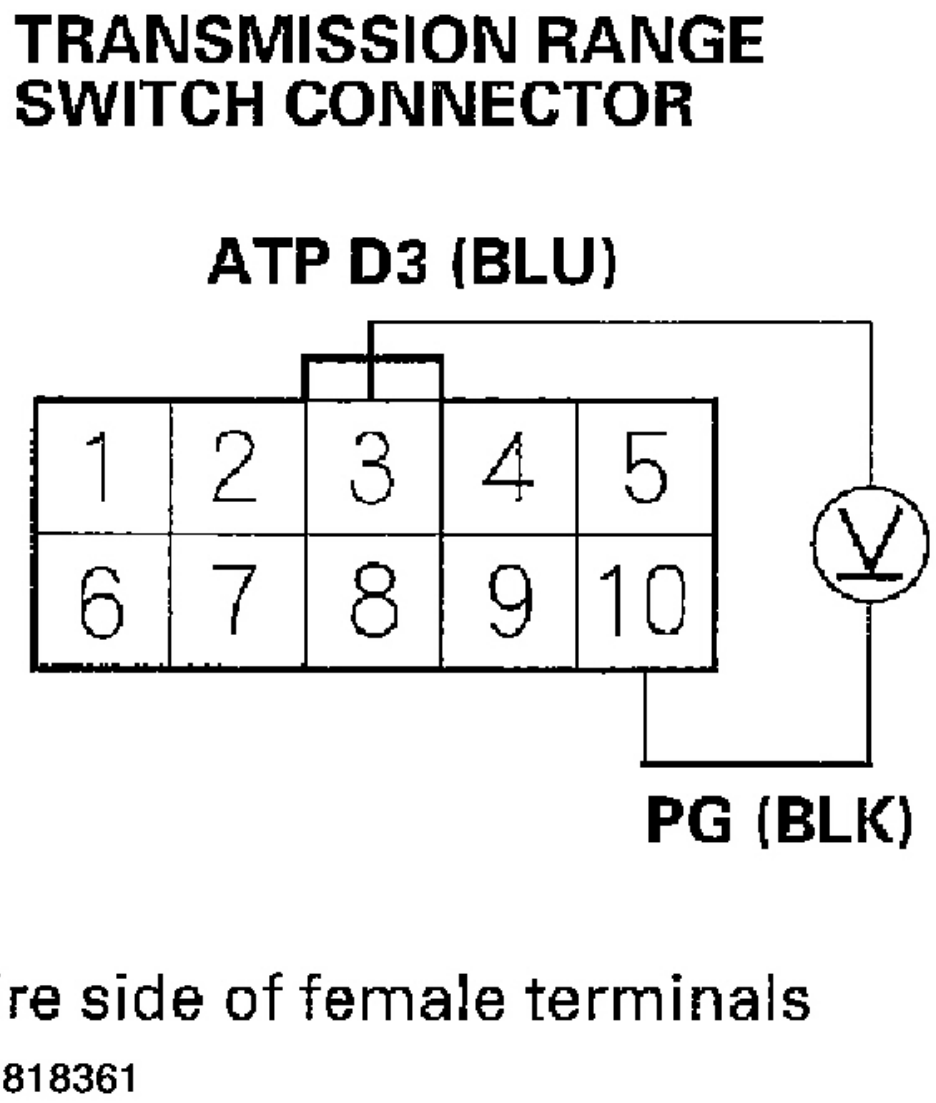


Fig. 105: Measuring The Voltage Between Transmission Range Switch Connector Terminals No. 3 & No. 10

24. Clear the DTC with the HDS, and turn the ignition switch OFF.
25. Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.
26. Start the engine, drive the vehicle in the **D** position until the vehicle speed reaches 35 mph (56 km/h), then slow down and stop the wheels.

27. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0706.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0711: PROBLEM IN ATF TEMPERATURE SENSOR CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Check the ATF temperature with the HDS.

Does the ATF temperature exceed the ambient-air temperature?

YES: Record the ATF temperature. Leave the engine off for more than 30 minutes, and go to step 2.

NO: Record the ATF temperature. Test the stall speed RPM (see **STALL SPEED TEST**) three times. Go to step 2 after stall speed testing.

2. Check the ATF temperature with the HDS.

Did the ATF temperature change?

YES: Leave the engine off for at least 30 more minutes, and go to step 3.

NO: Replace ATF temperature sensor (see **ATF TEMPERATURE SENSOR TEST & REPLACEMENT**), then go to step 5 .

3. Check the ECT SENSOR with the HDS.

Is the ECT SENSOR equal to the ambient-air temperature?

YES: Go to step 4.

NO: Leave the engine off until ECT sensor equals ambient-air temperature, then go to step 4.

4. Check the ATF temperature with the HDS.

Is the ATF temperature almost equal to ECT SENSOR?

YES: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the ATF temperature sensor and PCM.

NO: Replace ATF temperature sensor (see **ATF TEMPERATURE SENSOR TEST & REPLACEMENT**), then go to step 5.

5. Clear the DTC with the HDS.
6. Test-drive the vehicle for several minutes in the **D** position in all five gears.
7. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0711.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0712: SHORT IN ATF TEMPERATURE SENSOR CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Check ATF temperature sensor voltage with the HDS in the A/T data list.

   Is ATF temperature sensor voltage 0.07 V or less?

   YES: Go to step 2.

   NO: Intermittent failure, the system is OK at this time. Check for intermittent short in the wires between the ATF temperature sensor and PCM.
2. Disconnect the shift solenoid harness connector at the shift solenoid valve cover.
3. Check ATF temperature sensor voltage with the HDS.

   Is ATF temperature sensor voltage 0.07 V or less?

   YES: Go to step 4.

   NO: Check for a short to ground in the shift solenoid harness wire in the transmission (see **ATF TEMPERATURE SENSOR TEST & REPLACEMENT**). If the wire is OK, replace ATF temperature sensor (see **ATF TEMPERATURE SENSOR TEST & REPLACEMENT**), then go to step 8 .
4. Turn the ignition switch OFF.
5. Jump the SCS line with the HDS.
6. Disconnect PCM connector C (22P).
7. Check for continuity between the No. 6 terminal of the shift solenoid harness connector and body ground.

   Is there continuity?

   YES: Repair short to ground in the wire between PCM connector terminal C14 and the shift solenoid harness connector, then go to step 8.

   NO: Check for a short to ground in the shift solenoid harness wire in the transmission (see **ATF TEMPERATURE SENSOR TEST & REPLACEMENT**). If the wire is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

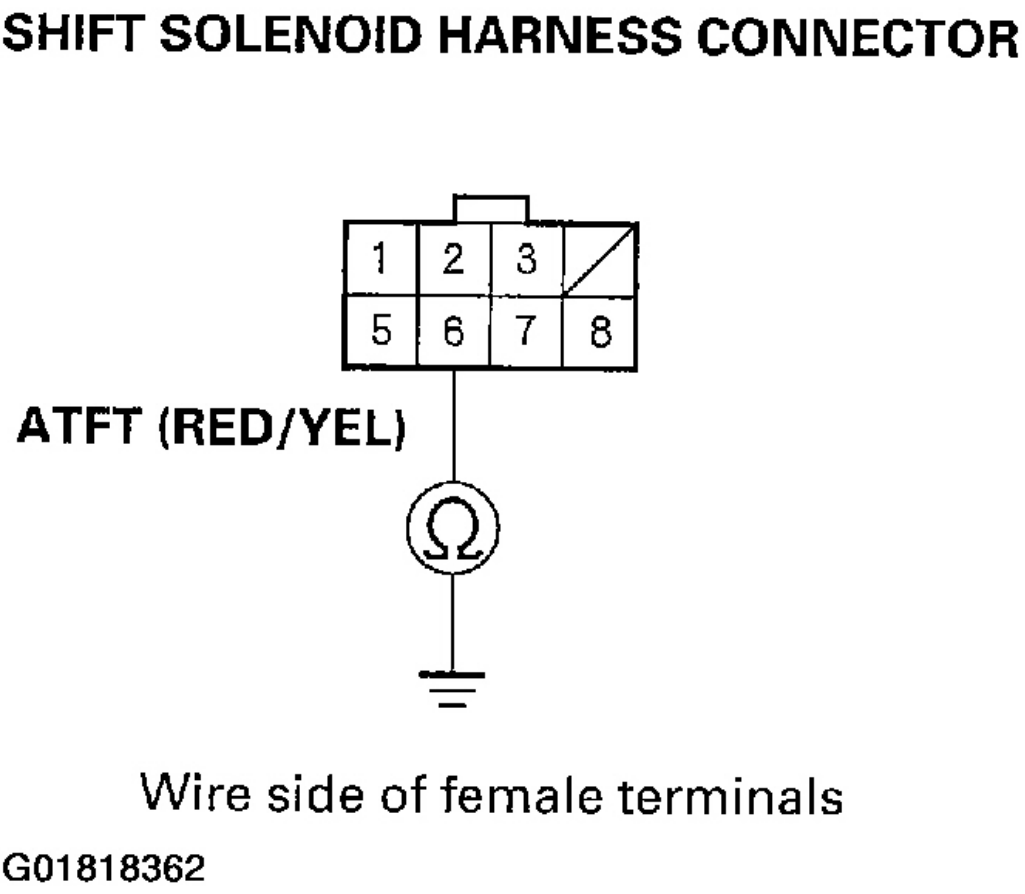


Fig. 106: Checking For Continuity Between The No. 6 Terminal Of The Shift Solenoid Harness Connector & Body Ground

8. Clear the DTC with the HDS.
9. Test-drive the vehicle for several minutes in the **D** position in all five gears.
10. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0712.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0713: OPEN IN ATF TEMPERATURE SENSOR CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**

- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Check ATF temperature sensor voltage with the HDS in the A/T data list.

   Does ATF temperature sensor voltage exceed 4.93 V?

   YES: Go to step 2.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the ATF temperature sensor and PCM.
2. Turn the ignition switch OFF.
3. Disconnect the shift solenoid harness connector.
4. Turn the ignition switch ON (II).
5. Measure the voltage between shift solenoid harness connector terminal No. 6 and body ground.

   Is there about 5 V?

   YES: Go to step 6.

   NO: Go to step 7 .

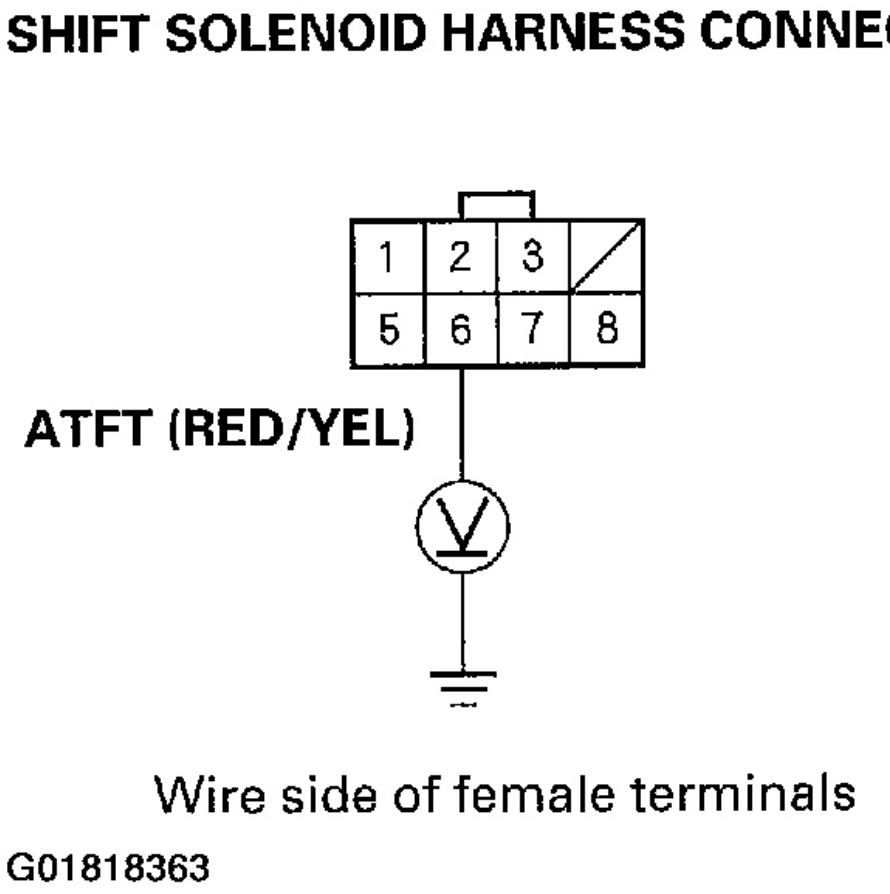


Fig. 107: Measuring The Voltage Between Shift Solenoid Harness Connector Terminal No. 6 & Body Ground

6. Measure the voltage between shift solenoid harness connector terminals No. 6 and No. 7.

   Is there about 5 V?

   YES: Check the ATF temperature sensor and shift solenoid harness in the transmission housing (see **ATF TEMPERATURE SENSOR TEST & REPLACEMENT**)

   NO: Repair open in the wire between PCM connector terminal A23 and the shift solenoid harness connector, then go to step 8 .

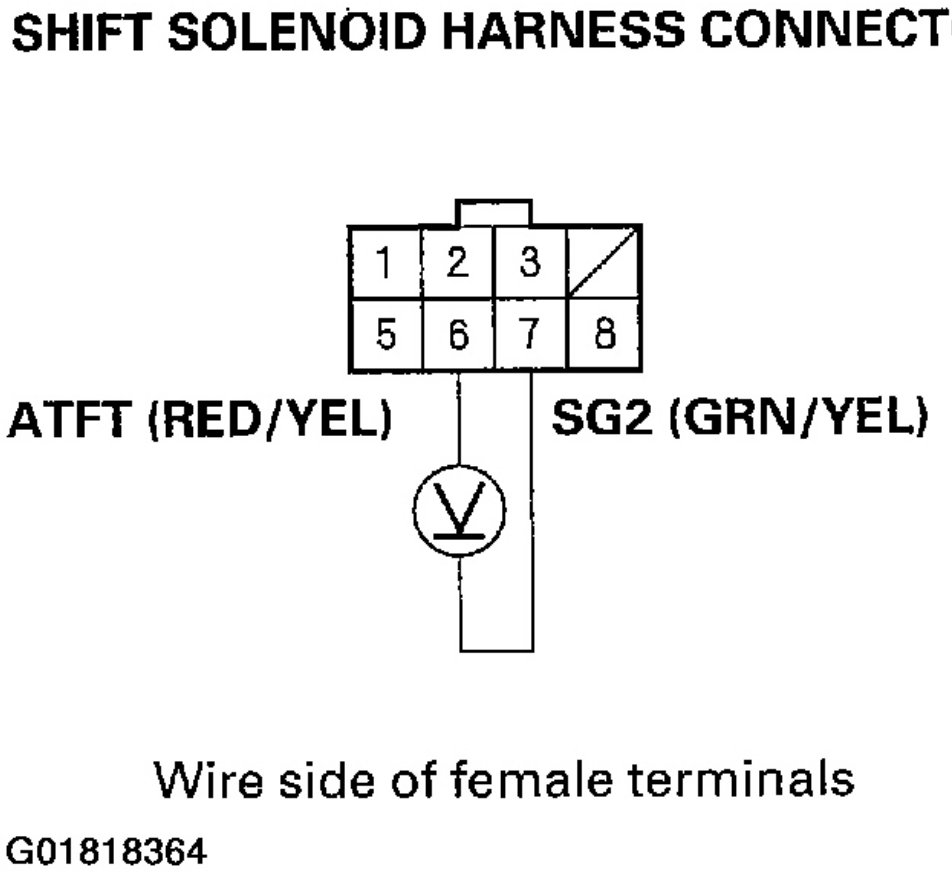


Fig. 108: Measuring The Voltage Between Shift Solenoid Harness Connector Terminals No. 6 & No. 7

7. Measure the voltage between PCM connector terminal C14 and body ground.

   Is there about 5 V?

   YES: Repair open in the wire between PCM connector terminal C14 and the shift solenoid harness connector, then go to step 8.

   NO: Check for loose or poor connections at PCM connector terminal C14. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

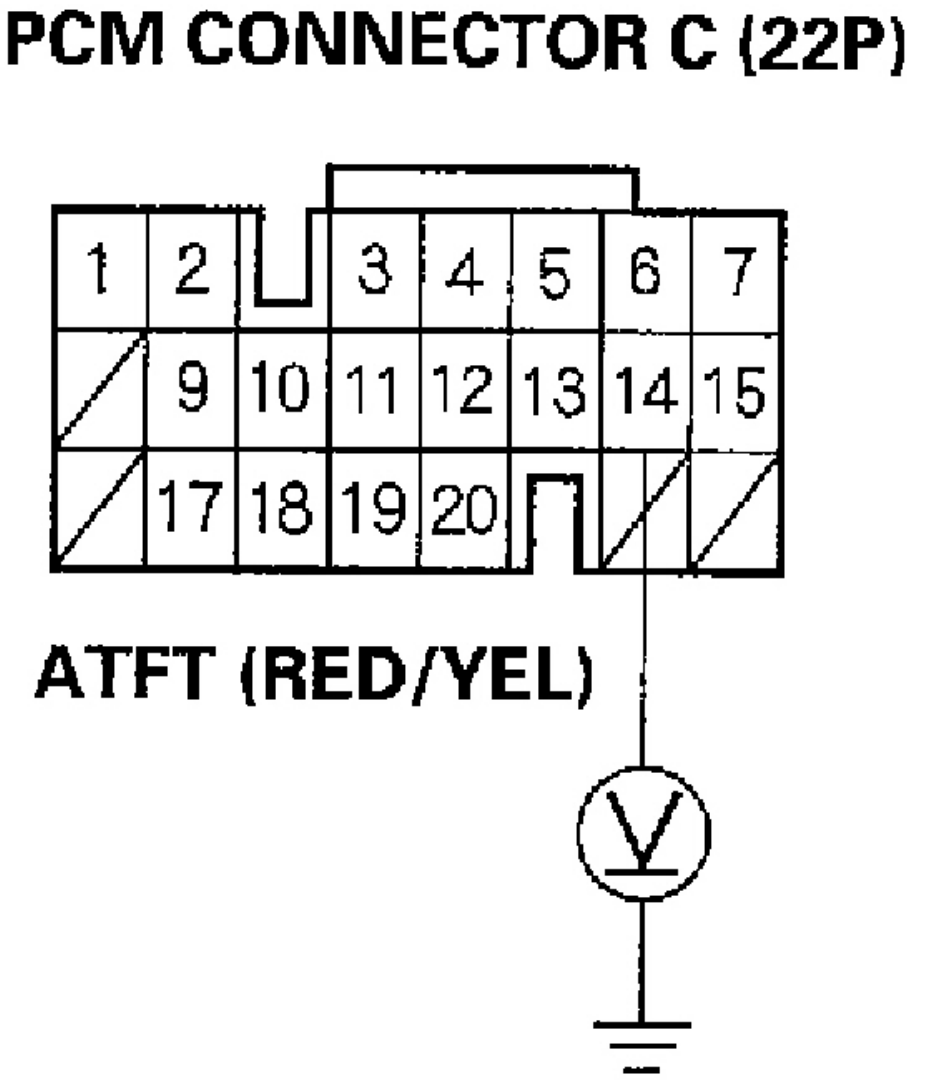


Fig. 109: Measuring The Voltage Between PCM Connector Terminal C14 & Body Ground

8. Clear the DTC with the HDS.
9. Test-drive the vehicle for several minutes in the **D** position in all five gears.
10. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0713.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0716: PROBLEM IN MAINSHAFT SPEED SENSOR CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Record all freez data, then clear the DTC with the HDS.
2. Check for proper mainshaft speed sensor installation (see **MAINSHAFT SPEED SENSOR REPLACEMENT**).
3. Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.
4. Start the engine, drive the vehicle in the **D** position, and hold the vehicle at speeds over 30 mph (48 km/h) for more than 10 seconds.
5. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0716.

   Did the result indicate a fail?

   YES: Go to step 6.

   NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 4 and recheck.
6. Turn the ignition switch OFF.
7. Jump the SCS line with the HDS.
8. Disconnect PCM connector A (31P) and mainshaft speed sensor connector.
9. Check for continuity between PCM connector terminals A8 and body ground, and between A9 and body ground.

   Is there continuity?

   YES: Go to step 10.

   NO: Repair open in the wires between PCM connector terminals A8, A9 and ground (G 101), or repair poor ground (G101), then go to step 30 .

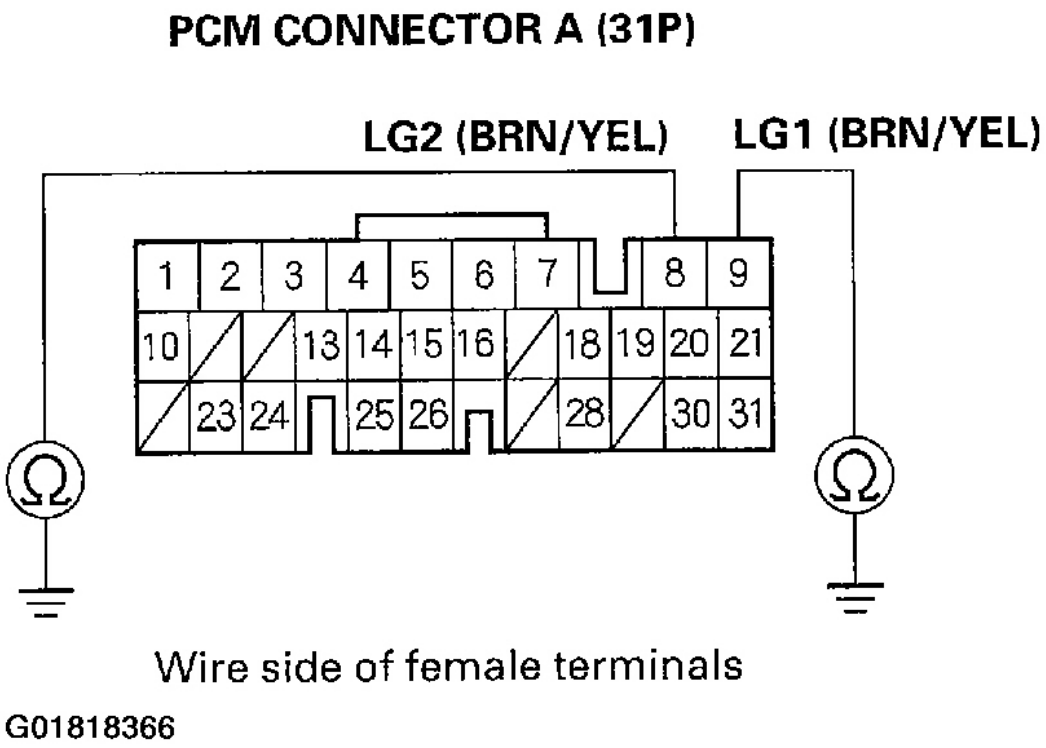


Fig. 110: Checking For Continuity Between PCM Connector Terminals A8 & Body Ground & Between A9 & Body Ground

10. Connect PCM connector A (31P).
11. Turn the ignition switch ON (II).
12. Measure the voltage between mainshaft speed sensor connector terminal No. 1 and body ground.

Is there about 5 V?

YES: Go to step 13.

NO: Go to step 24 .

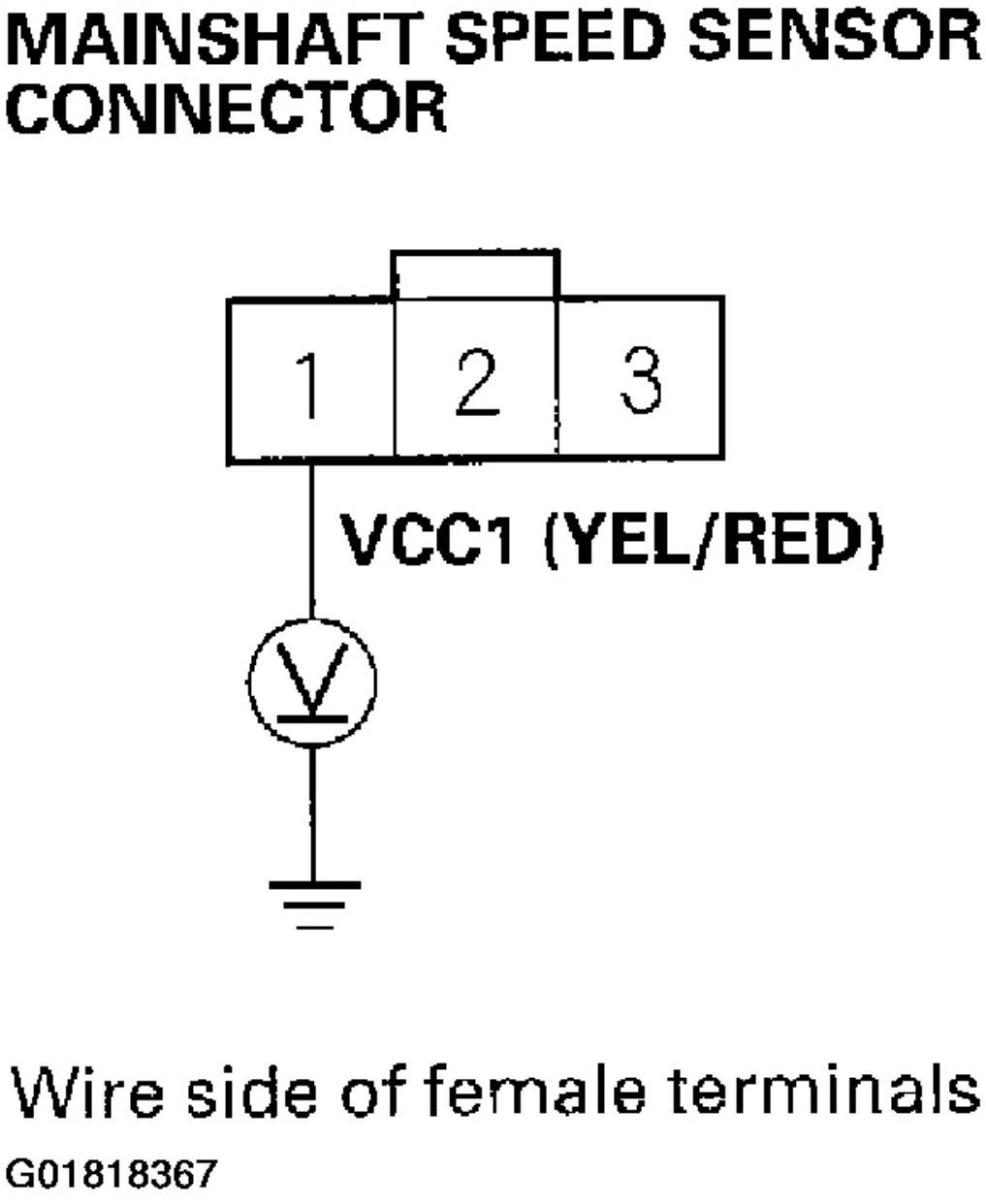


Fig. 111: Measuring The Voltage Between Mainshaft Speed Sensor Connector Terminal No. 1 & Body Ground

13. Turn the ignition switch OFF.
14. Disconnect PCM connector C (22P).
15. Check for continuity between mainshaft speed sensor connector terminal No. 2 and body ground.

Is there continuity?

YES: Repair short to ground in the wire between PCM connector terminal C19 and mainshaft speed sensor, then go to step 30 .

NO: Go to step 16.

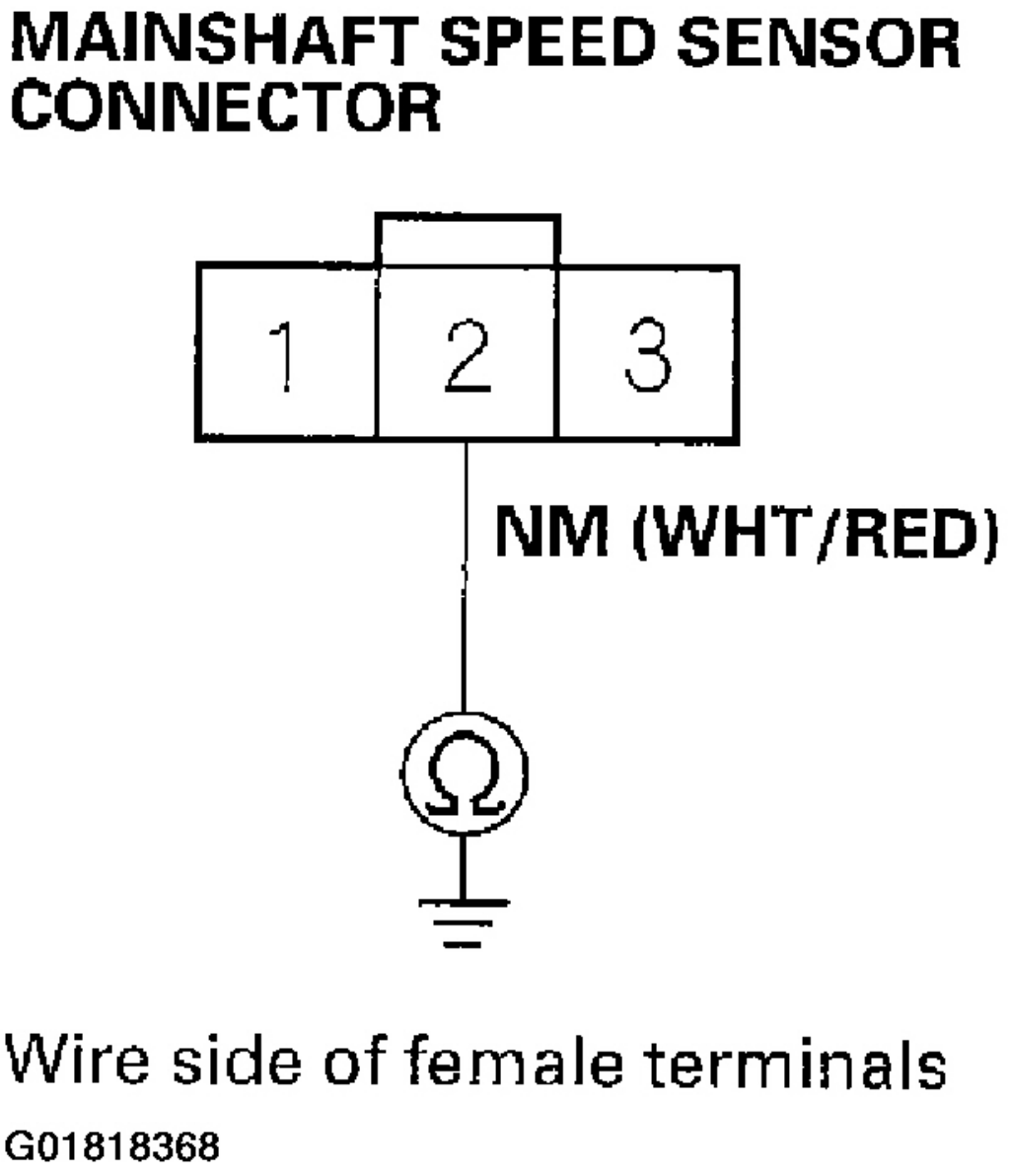


Fig. 112: Checking For Continuity Between Mainshaft Speed Sensor Connector Terminal No. 2 & Body Ground

16. Check for continuity between mainshaft speed sensor connector terminal No. 3 and body ground.

Is there continuity?

YES: Go to step 17.

NO: Repair open in the wire between the mainshaft speed sensor connector and ground (G101), then go to step 30 .

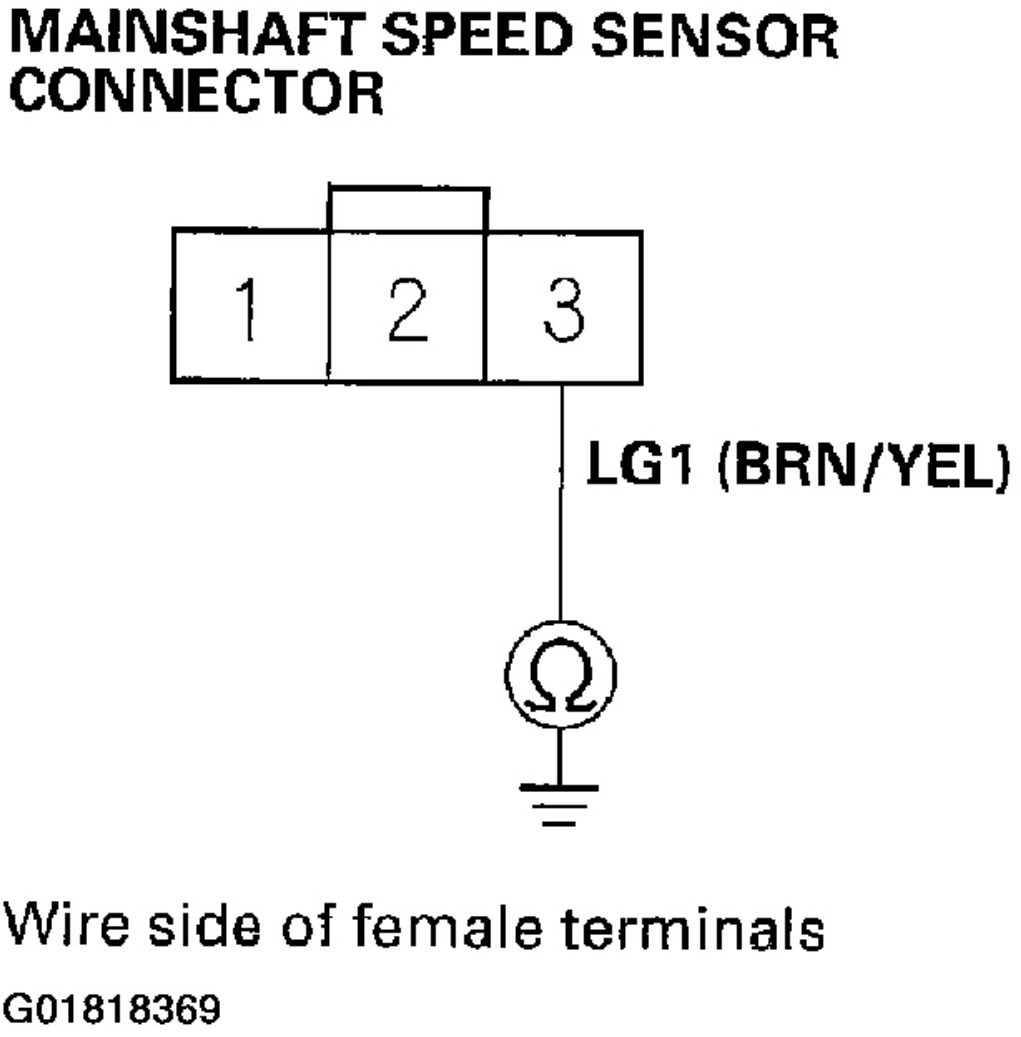


Fig. 113: Checking For Continuity Between Mainshaft Speed Sensor Connector Terminal No. 3 & Body Ground

17. Connect PCM connector C (22P).
18. Turn the ignition switch ON (II).

19. Measure the voltage between mainshaft speed sensor connector terminals No. 2 and No. 3.

Is there about 5 V?

YES: Go to step 20.

NO: Go to step 29 .

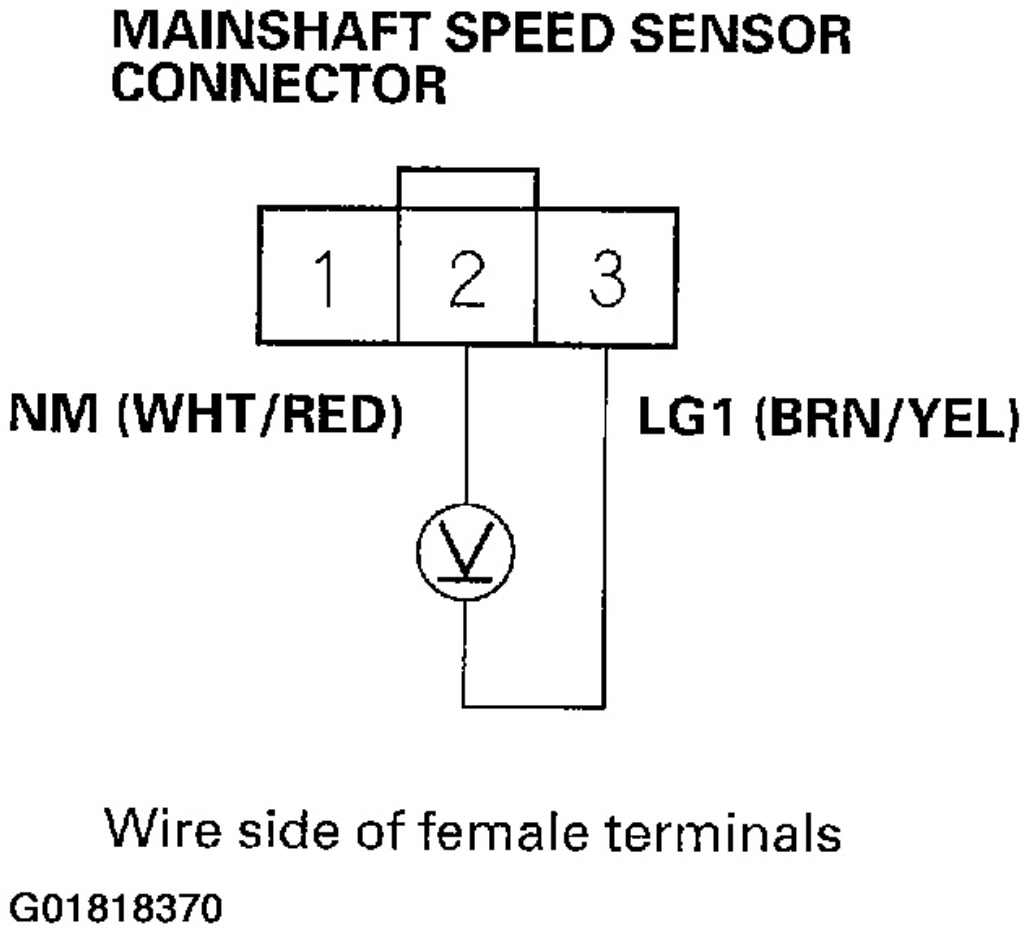


Fig. 114: Measuring The Voltage Between Mainshaft Speed Sensor Connector Terminals No. 2 & No. 3

20. Connect the mainshaft speed sensor connector.
21. Measure the voltage between PCM connector terminals C19 and A8 or A9.

Is the voltage 0 V or about 5 V?

YES: Go to step 22.

NO: Replace the mainshaft speed sensor (see **MAINSHAFT SPEED SENSOR**

REPLACEMENT), then go to step 30 .

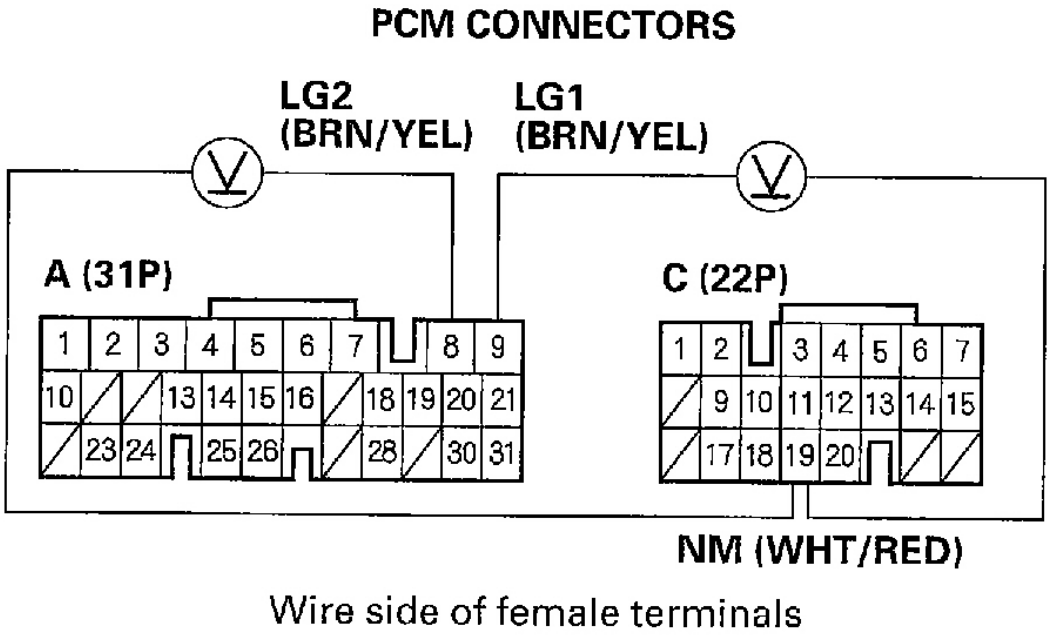


Fig. 115: Measuring The Voltage Between PCM Connector Terminals C19 & A8 Or A9

22. Shift to the **P** position. Start the engine, and let it idle.
23. With the engine idling, measure the voltage between PCM connector terminals C19 and A8 or A9.

Is there 1.5 V-3.5 V?

YES: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

NO: Replace the mainshaft speed sensor (see **MAINSHAFT SPEED SENSOR REPLACEMENT**), then go to step 30 .

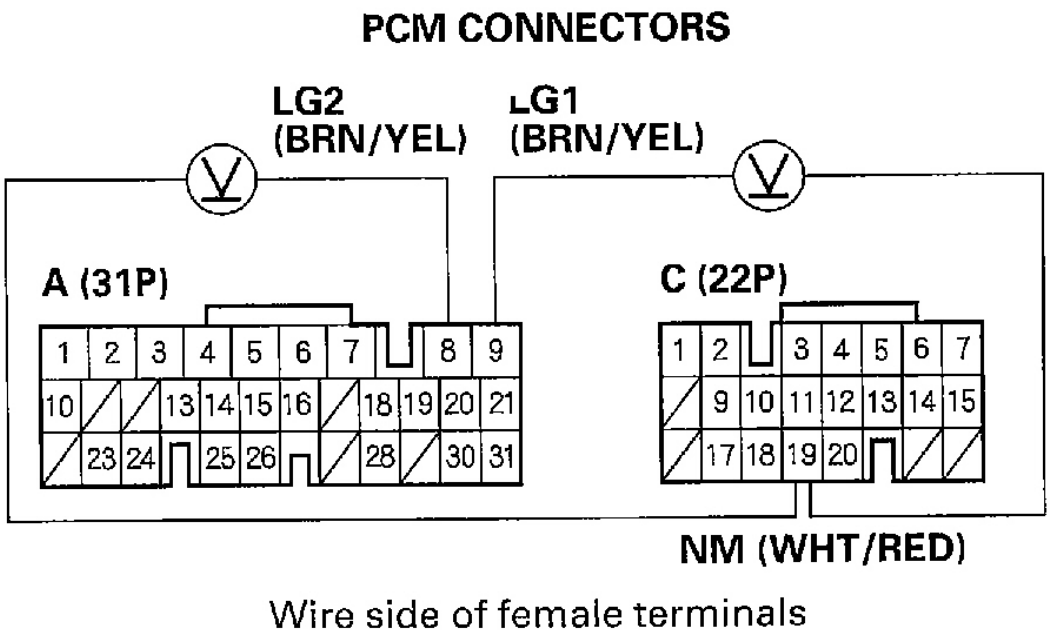


Fig. 116: Measuring The Voltage Between PCM Connector Terminals C19 & A8 Or A9

24. Measure the voltage between PCM connector terminals A21 and A8 or A9.

    Is there 4.75 V-5.25 V?

    YES: Repair open in the wire between PCM connector terminal A21 and the mainshaft speed sensor connector, then go to step 30 .

    NO: Go to step 25.

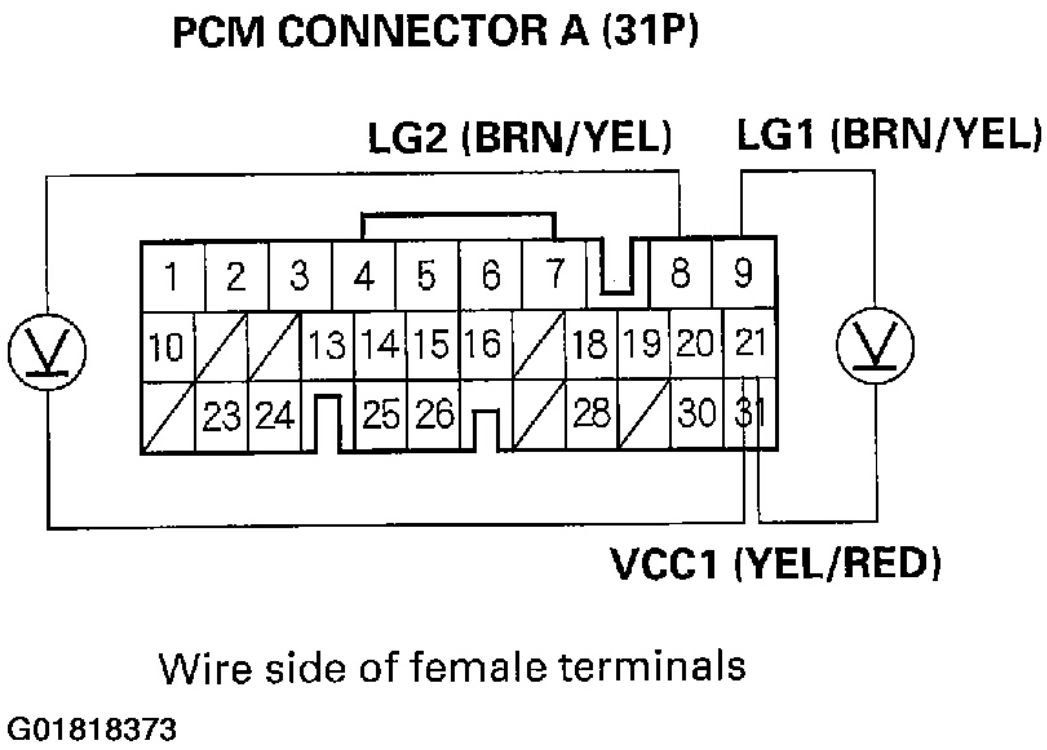


Fig. 117: Measuring The Voltage Between PCM Connector Terminals A21 & A8 Or A9

25. Turn the ignition switch OFF.
26. Jump the SCS line with the HDS.
27. Disconnect PCM connector A (31P).
28. Check for continuity between PCM connector terminal A21 and body ground.

Is there continuity?

YES: Repair short to ground in the wire between PCM connector terminal A21 and the mainshaft speed sensor connector, then go to step 30 .

NO: Check for loose or poor connections at PCM connector terminal A21. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

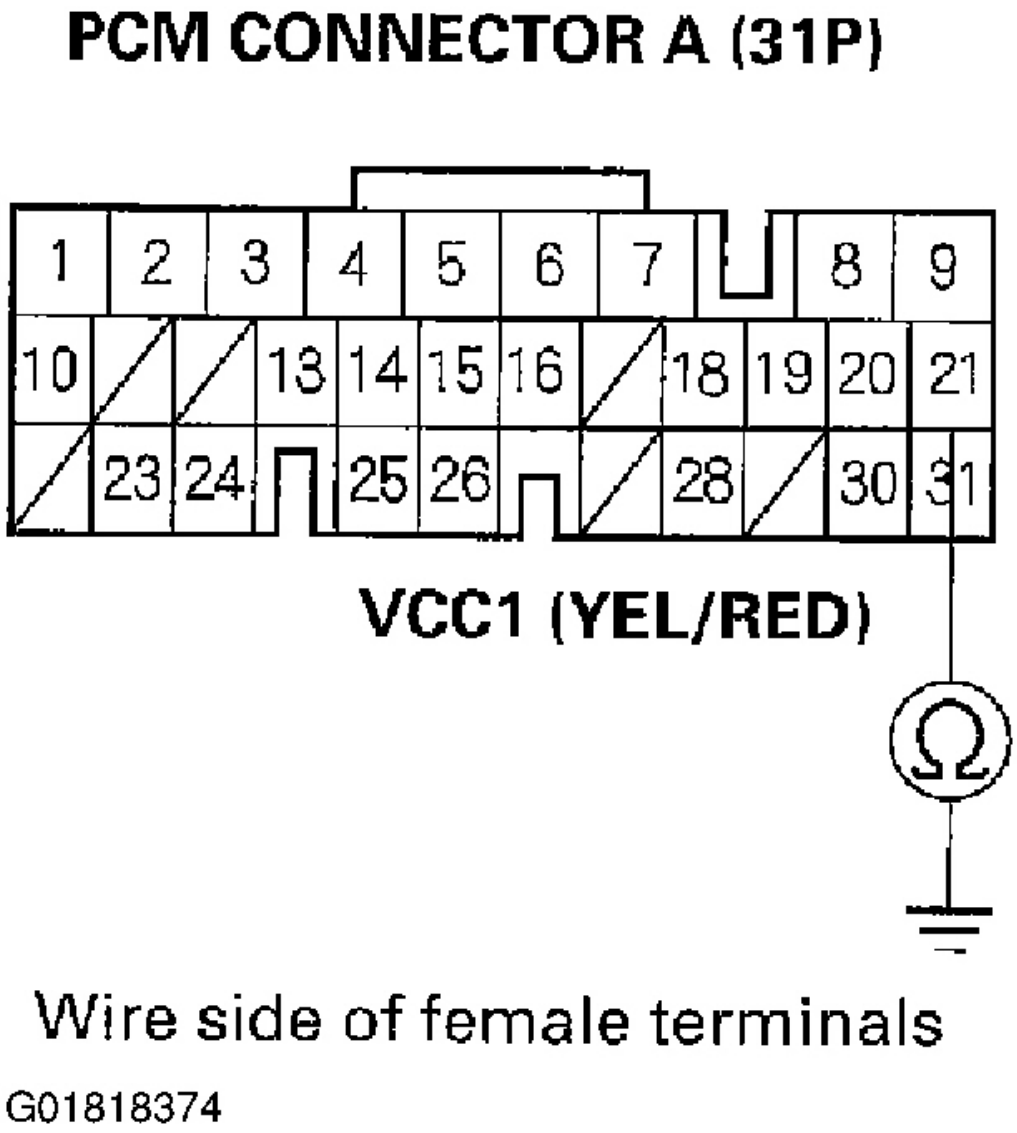


Fig. 118: Checking For Continuity Between PCM Connector Terminal A21 & Body Ground

29. Measure the voltage between PCM connector terminals C19 and A8 or A9.

Is there about 5 V?

YES: Repair open in the wire between PCM connector terminal C19 and the mainshaft speed sensor connector, then go to step 30.

NO: Check for loose or poor connections at PCM connector terminal C19. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the

symptom/indication goes away with a known-good PCM, replace the original PCM.

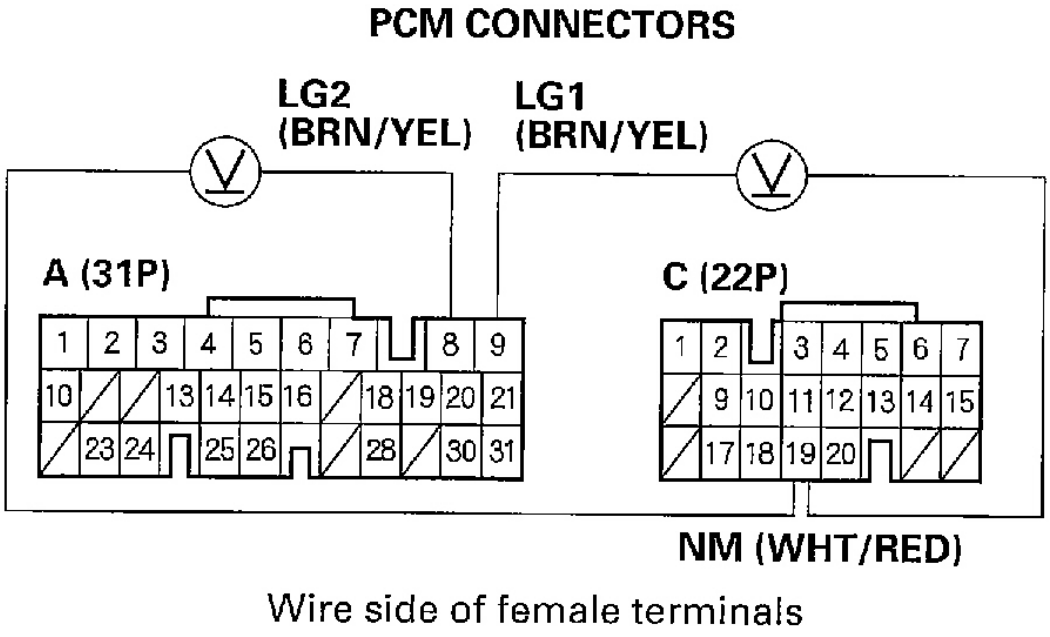


Fig. 119: Measuring The Voltage Between PCM Connector Terminals C19 & A8 Or A9

30. Clear the DTC with the HDS.
31. Test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data.
32. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0716.

Did the result pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0717: PROBLEM IN MAINSHAFT SPEED SENSOR CIRCUIT (NO SIGNAL INPUT)

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Record all freeze data, and clear the DTC with the HDS.
2. Check for proper mainshaft speed sensor installation (see **MAINSHAFT SPEED SENSOR**

REPLACEMENT).

3. Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.
4. Start the engine, drive the vehicle in the **D** position, and hold the vehicle at speeds over 30 mph (48 km/h) for more than 10 seconds. Slow down and stop the wheels.
5. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0717.

   Did the result fail?

   YES: Go to step 6.

   NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 4 and recheck.
6. Turn the ignition switch OFF.
7. Jump the SCS line with the HDS.
8. Disconnect PCM connector A (31P) and mainshaft speed sensor connector.
9. Check for continuity between PCM connector terminals A8 and body ground, and between A9 and body ground.

   Is there continuity?

   YES: Go to step 10.

   NO: Repair open in the wires between PCM connector terminals A8, A9 and ground (G101), or repair poor ground (G101), then go to step 30 .

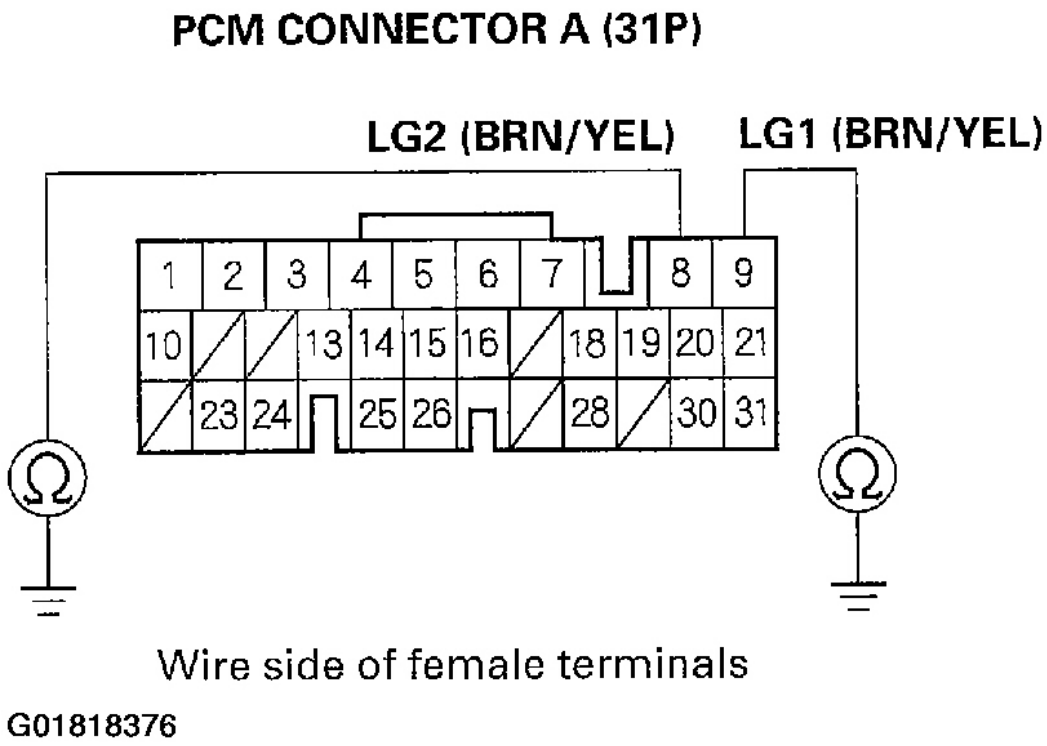


Fig. 120: Checking For Continuity Between PCM Connector Terminals A8 & Body Ground & Between A9 & Body Ground

10. Connect PCM connector A (31P).
11. Turn the ignition switch ON (II).
12. Measure the voltage between mainshaft speed sensor connector terminal No. 1 and body ground.

Is there about 5 V?

YES: Go to step 13.

NO: Go to step 24 .

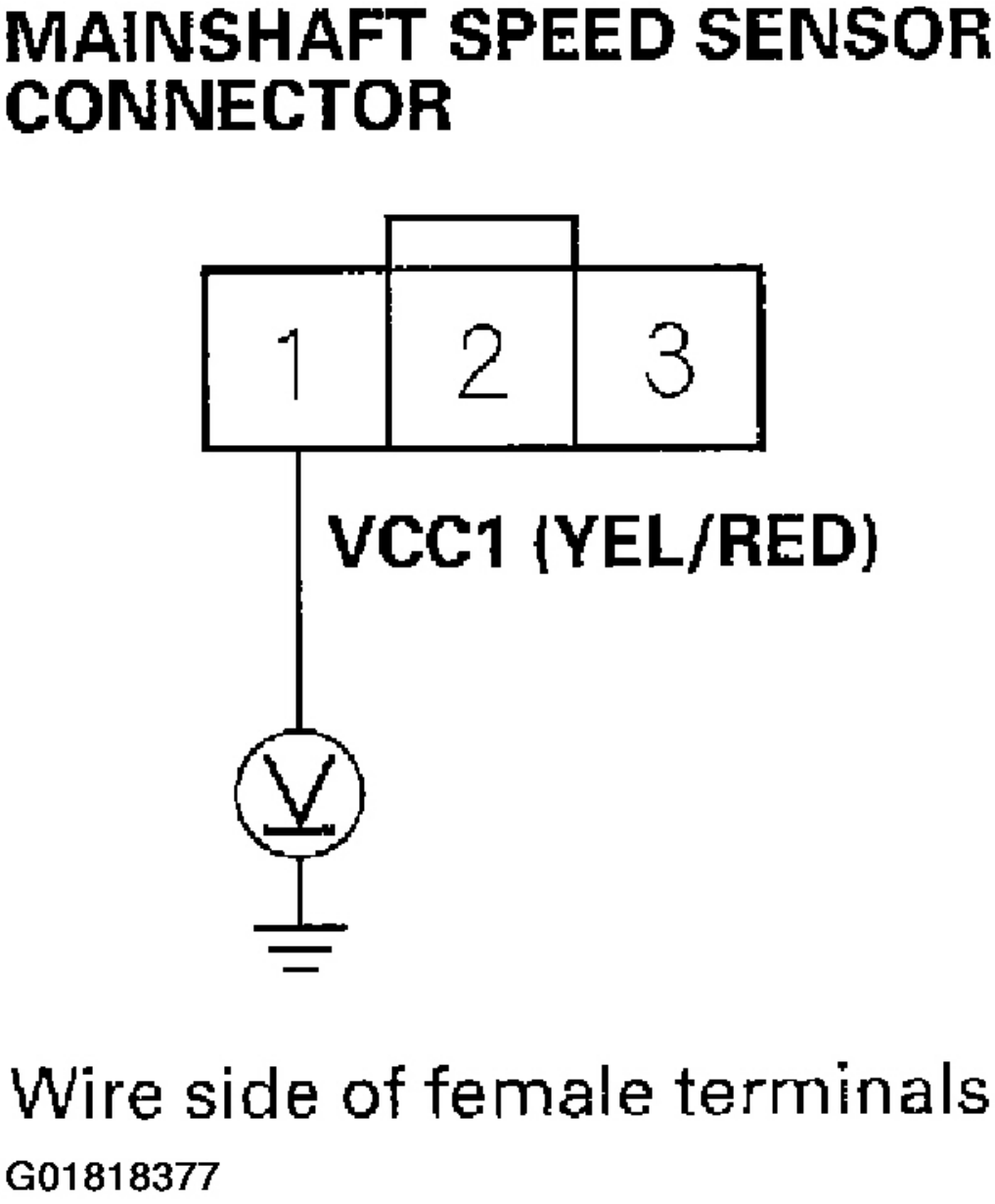


Fig. 121: Measuring The Voltage Between Mainshaft Speed Sensor Connector Terminal No. 1 & Body Ground

13. Turn the ignition switch OFF.
14. Disconnect PCM connector C (22P).
15. Check for continuity between mainshaft speed sensor connector terminal No. 2 and body ground.

Is there continuity?

YES: Repair short to ground in the wire between PCM connector terminal C19 and mainshaft speed sensor, then go to step 30 .

NO: Go to step 16.

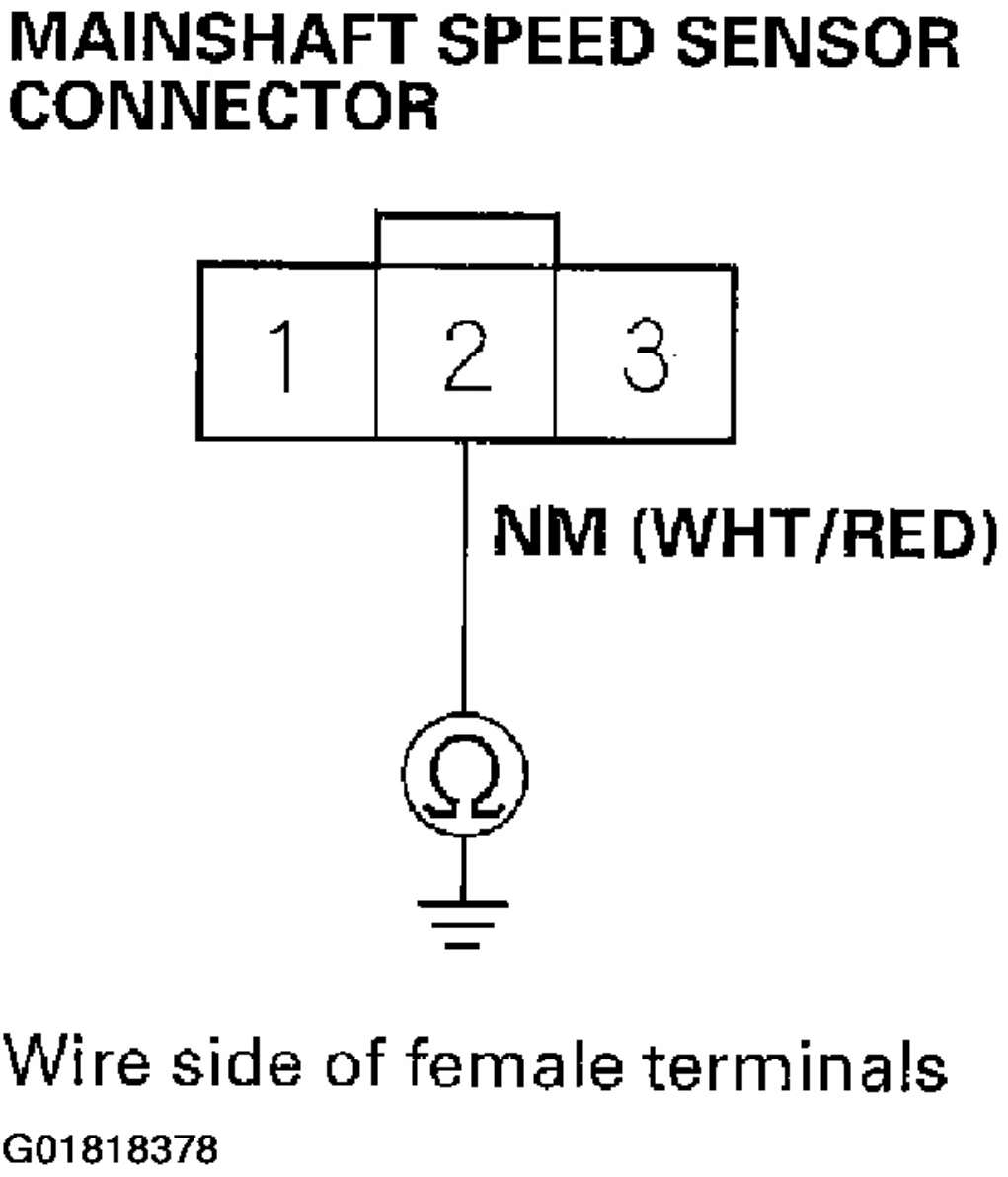


Fig. 122: Checking For Continuity Between Mainshaft Speed Sensor Connector Terminal No. 2 & Body Ground

16. Check for continuity between mainshaft speed sensor connector terminal No. 3 and body ground.

Is there continuity?

YES: Go to step 17.

NO: Repair open in the wire between the mainshaft speed sensor connector and ground (G101), then go to step 30 .

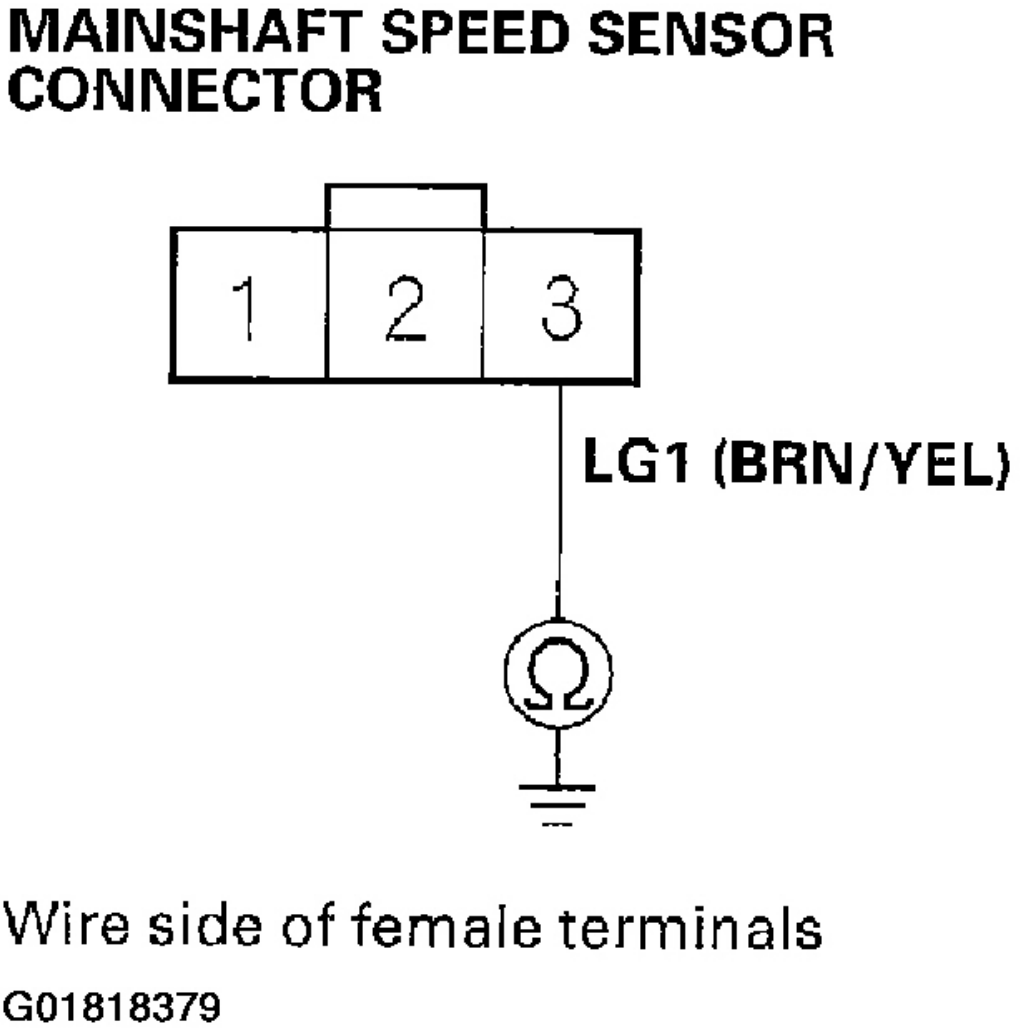


Fig. 123: Checking For Continuity Between Mainshaft Speed Sensor Connector Terminal No. 3 & Body Ground

17. Connect PCM connector C (22P).
18. Turn the ignition switch ON (II).

19. Measure the voltage between mainshaft speed sensor connector terminals No. 2 and No. 3.

Is there about 5 V?

YES: Go to step 20.

NO: Go to step 29 .

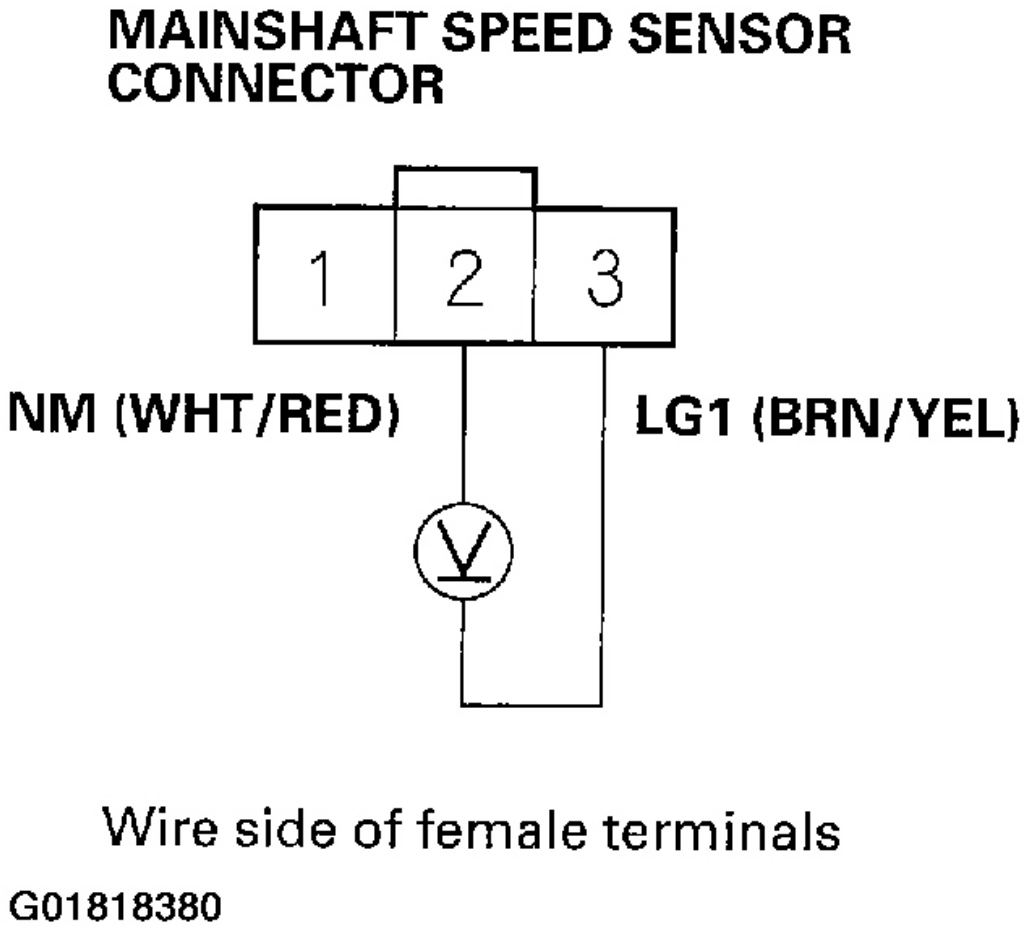


Fig. 124: Measuring The Voltage Between Mainshaft Speed Sensor Connector Terminals No. 2 & No. 3

20. Connect the mainshaft speed sensor connector.
21. Measure the voltage between PCM connector terminals C19 and A8 or A9.

Is there 0 V or about 5 V?

YES: Go to step 22.

NO: Replace the mainshaft speed sensor (see **MAINSHAFT SPEED SENSOR**

REPLACEMENT), then go to step 30 .

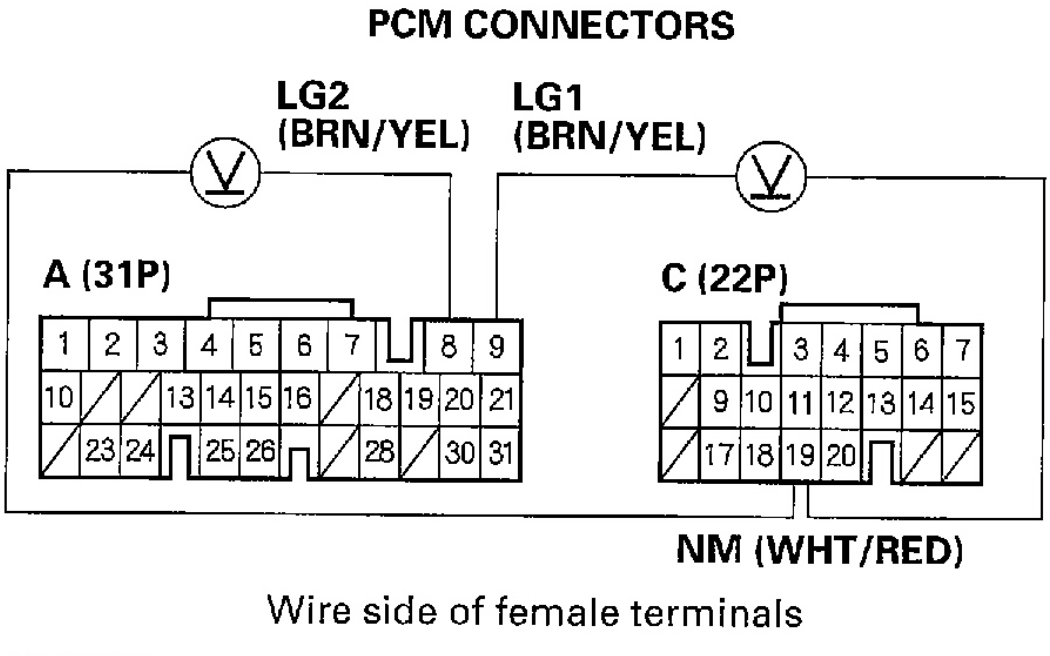


Fig. 125: Measuring The Voltage Between PCM Connector Terminals C19 & A8 Or A9

22. Shift to the **P** position. Start the engine, and let it idle.
23. With the engine idling, measure the voltage between PCM connector terminals C19 and A8 or A9.

Is there 1.5 V-3.5 V?

YES: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

NO: Replace the mainshaft speed sensor (see **MAINSHAFT SPEED SENSOR REPLACEMENT**), then go to step 30 .

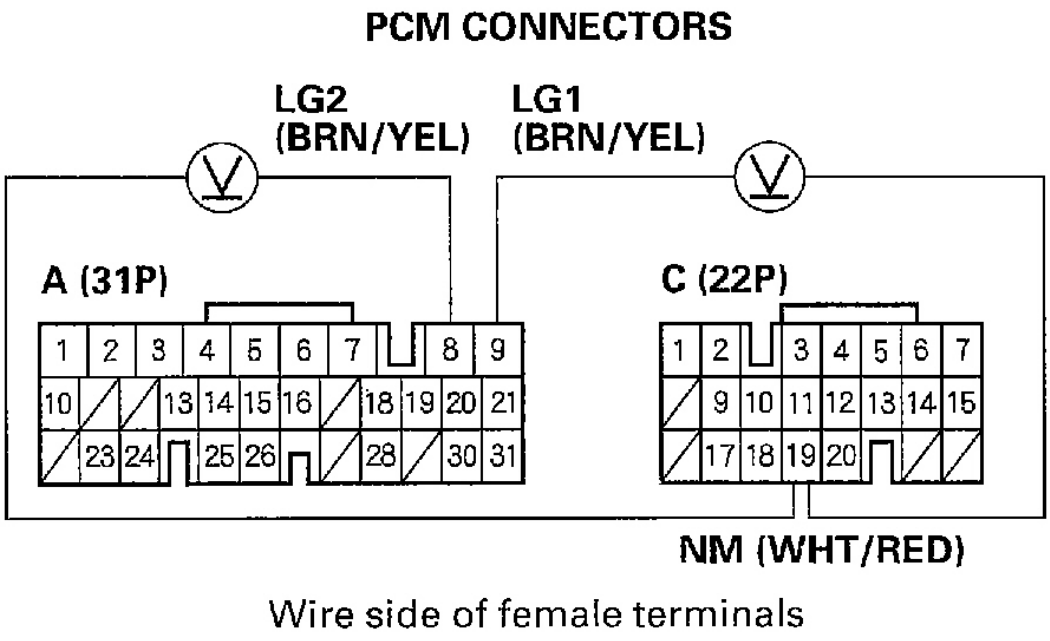


Fig. 126: Measuring The Voltage Between PCM Connector Terminals C19 & A8 Or A9

24. Measure the voltage between PCM connector terminals A21 and A8 or A9.

Is there 4.75 V-5.25 V?

YES: Repair open in the wire between PCM connector terminal A21 and the mainshaft speed sensor connector, then go to step 30 .

NO: Go to step 25.

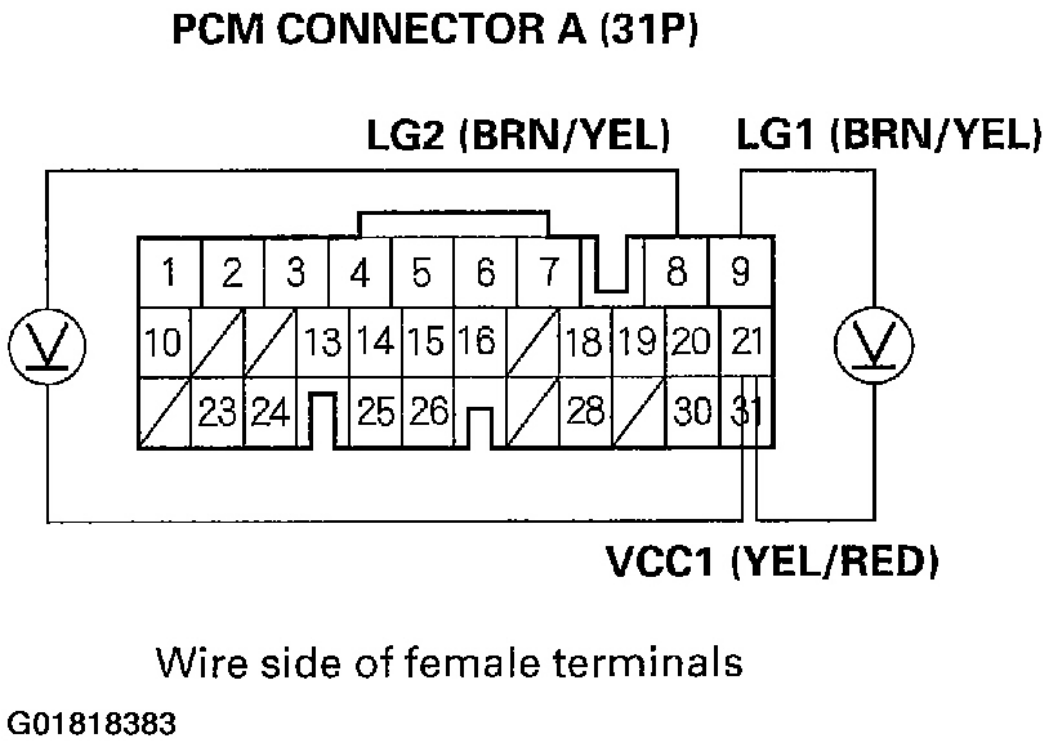


Fig. 127: Measuring The Voltage Between PCM Connector Terminals A21 & A8 Or A9

25. Turn the ignition switch OFF.
26. Jump the SCS line with the HDS.
27. Disconnect PCM connector A (31P).
28. Check for continuity between PCM connector terminal A21 and body ground.

Is there continuity?

YES: Repair short to ground in the wire between PCM connector terminal A21 and the mainshaft speed sensor connector, then go to step 30 .

NO: Check for loose or poor connections at PCM connector terminal A21. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

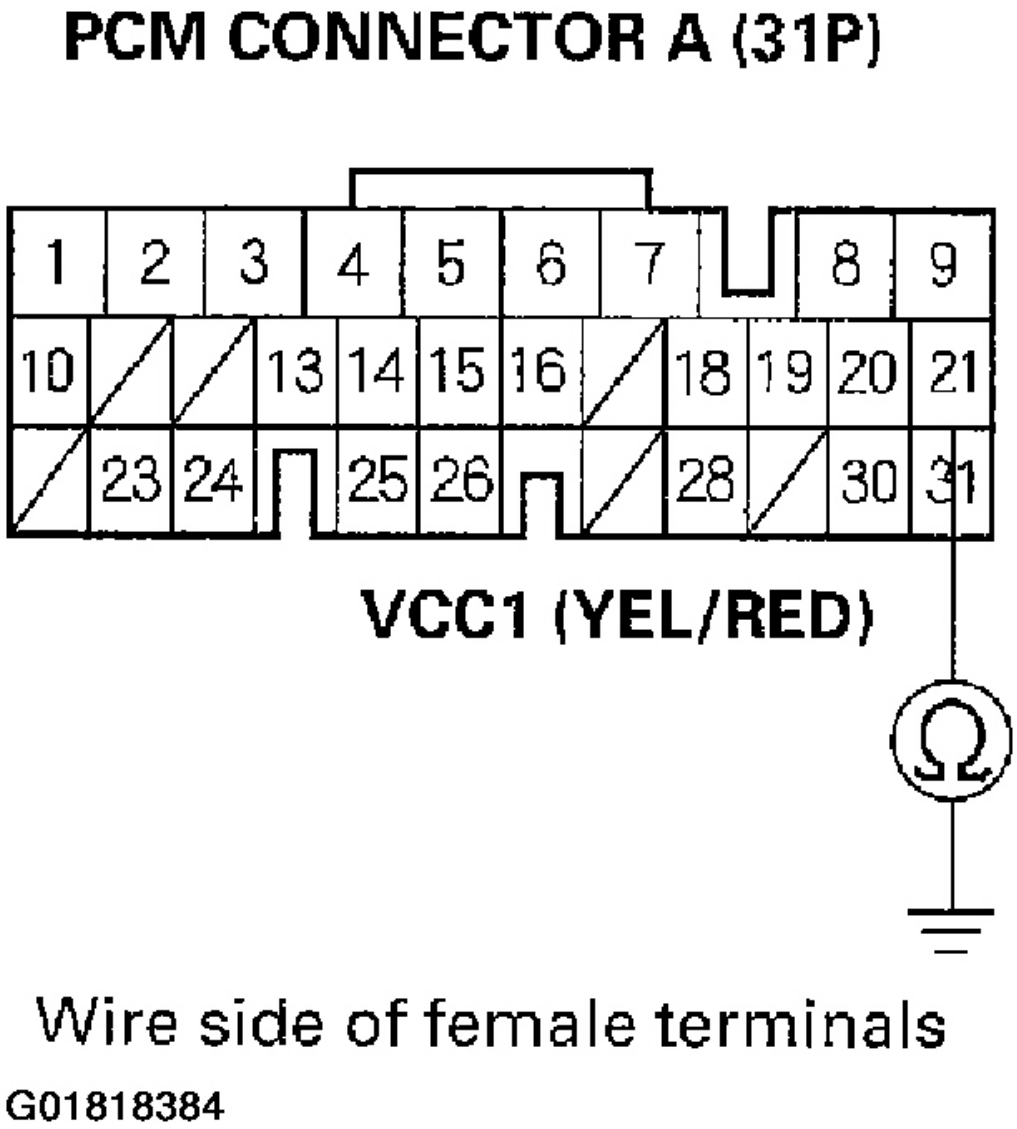


Fig. 128: Checking For Continuity Between PCM Connector Terminal A21 & Body Ground

29. Measure the voltage between PCM connector terminals C19 and A8 or A9.

    Is there about 5 V?

    YES: Repair open in the wire between PCM connector terminal C19 and the mainshaft speed sensor connector, then go to step 30.

    NO: Check for loose or poor connections at PCM connector terminal C19. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the

symptom/indication goes away with a known-good PCM, replace the original PCM.

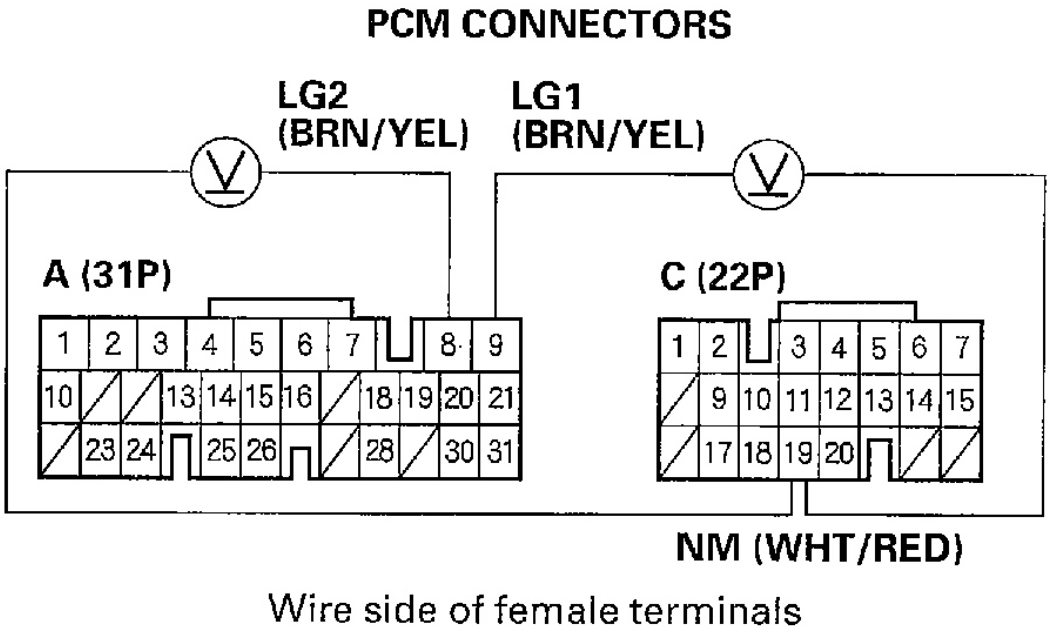


Fig. 129: Measuring The Voltage Between PCM Connector Terminals C19 & A8 Or A9

30. Clear the DTC with the HDS.
31. Test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data.
32. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0717.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0718: MAINSHAFT SPEED SENSOR INTERMITTENT FAILURE

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Test-drive the vehicle for several minutes in the **D** position in all five gears.

3. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0718.

   Did the result indicate a fall?

   YES: Go to step 4.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the mainshaft speed sensor and PCM. If the tester indicates NOT COMPLETE, return to step 2 and recheck.

4. Turn the ignition switch OFF.
5. Disconnect the mainshaft speed sensor connector, and inspect the connector and connector terminals to be sure they are making good contact.

   Are the connector terminals OK?

   YES: Go to step 6.

   NO: Repair the connector terminals, then go to step 6.

6. Connect the mainshaft speed sensor connector.
7. Test-drive the vehicle for several minutes, and check the OBD STATUS in DTCs MENU for a pass/fail test of code P0718.

   Did the result indicate a fail?

   YES: Go to step 8.

   NO: The problem has been corrected. If the tester indicates NOT COMPLETE, return to step 7 and recheck.

8. Turn the ignition switch OFF.
9. Jump the SCS line with the HDS.
10. Disconnect PCM connector C (22P).
11. Disconnect the mainshaft speed sensor connector.
12. Check for continuity between mainshaft speed sensor connector terminal No. 2 and body ground.

    Is there continuity?

    YES: Repair short to ground in the wire between PCM connector terminal C19 and the mainshaft speed sensor connector, then go to step 19 .

    NO: Go to step 13.

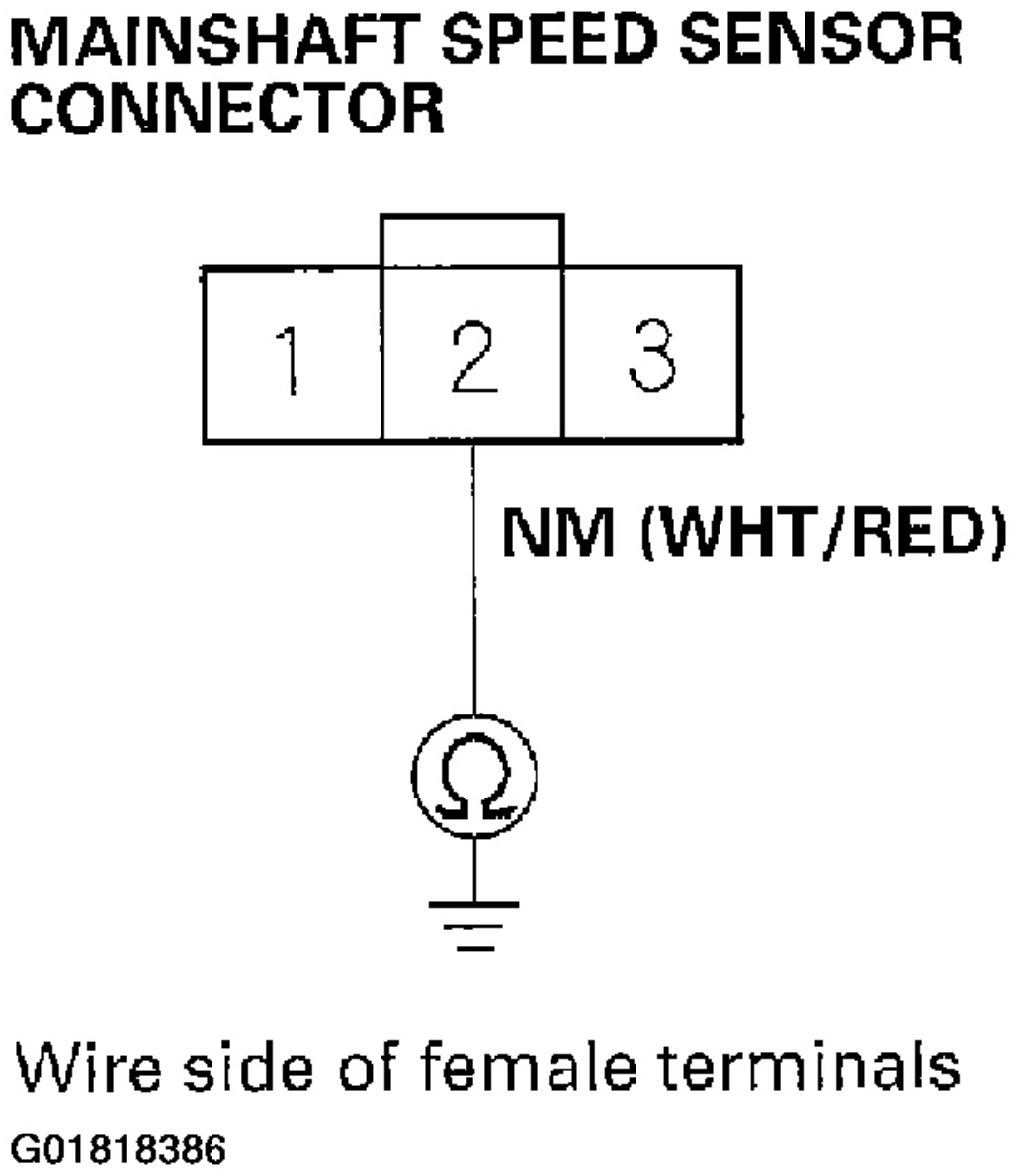


Fig. 130: Checking For Continuity Between Mainshaft Speed Sensor Connector Terminal No. 2 & Body Ground

13. Connect PCM connector C (22P).
14. Turn the ignition switch ON (II).
15. Measure the voltage between mainshaft speed sensor connector terminal No. 2 and body ground.

    Is there about 5 V?

YES: Replace the mainshaft speed sensor (see **MAINSHAFT SPEED SENSOR REPLACEMENT**), then go to step 19 .

NO: Go to step 16.

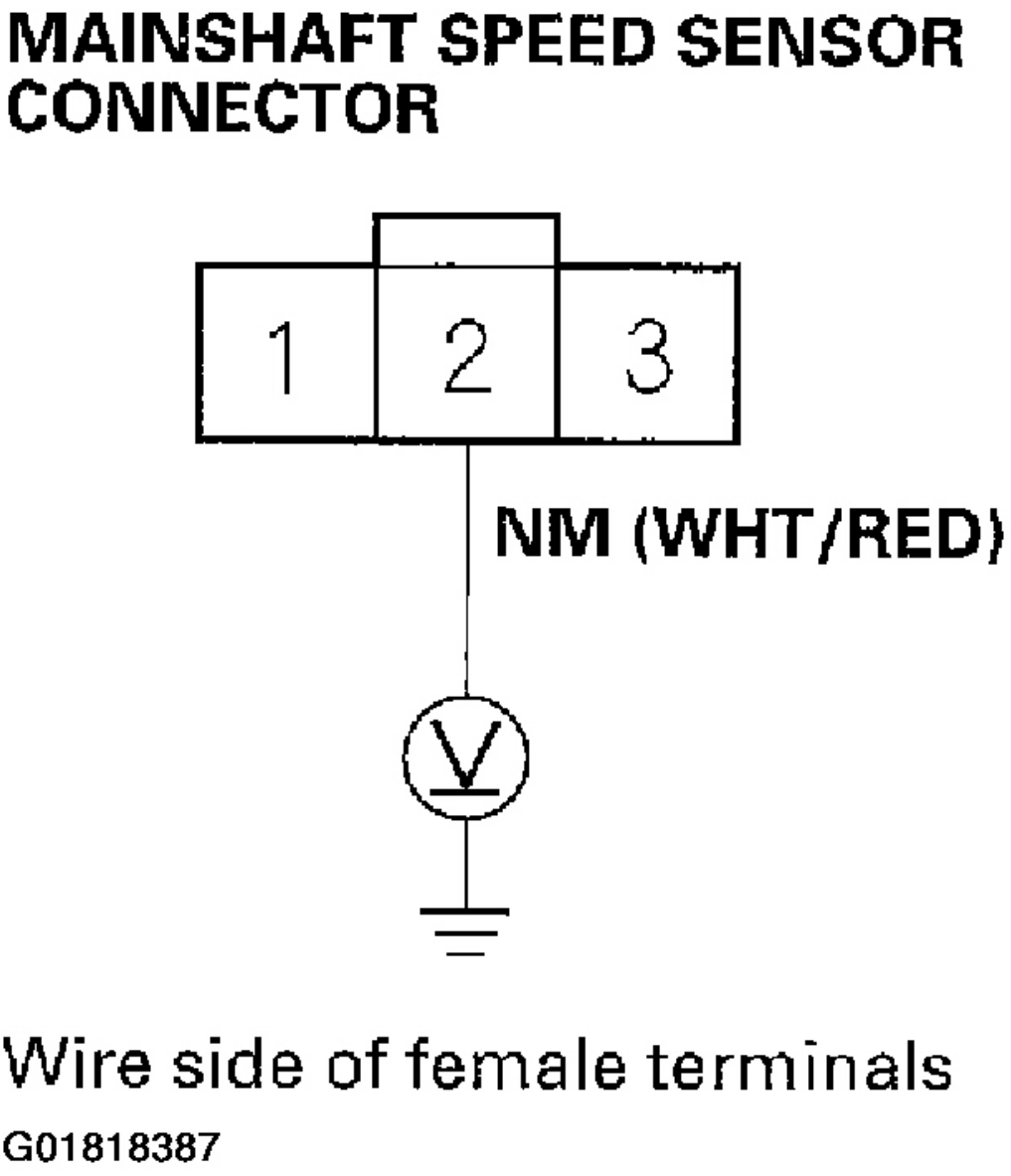


Fig. 131: Measuring The Voltage Between Mainshaft Speed Sensor Connector Terminal No. 2 & Body Ground

16. Turn the ignition switch OFF.

17. Disconnect PCM connector C (22P).
18. Check for continuity between PCM connector terminal C19 and mainshaft speed sensor connector terminal No. 2.

Is there continuity?

YES: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

NO: Repair open in the wire between PCM connector terminal C19 and the mainshaft speed sensor, then go to step 19.

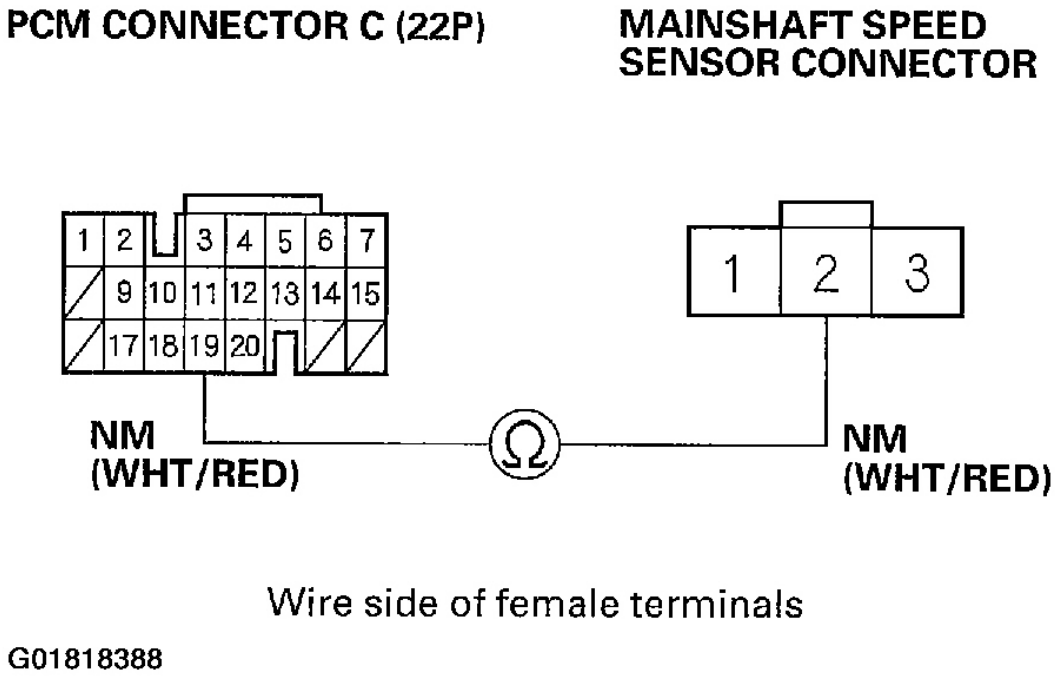


Fig. 132: Checking For Continuity Between PCM Connector Terminal C19 & Mainshaft Speed Sensor Connector Terminal No. 2

19. Clear the DTC with the HDS.
20. Test-drive the vehicle for several minutes in the **D** position in all five gears.
21. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0718.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0721: PROBLEM IN COUNTERSHAFT SPEED SENSOR CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Record all freeze data, and clear the DTC with the HDS.
2. Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.
3. Start the engine, drive the vehicle in the **D** position, and hold the vehicle at speeds over 30 mph (48 km/h) for more than 10 seconds. Slow down and stop the wheels.
4. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0721.

   Did the result indicate a fail?

   YES: Go to step 5.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the countershaft speed sensor and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck.
5. Turn the ignition switch OFF.
6. Jump the SCS line with the HDS.
7. Disconnect PCM connector A (31P) and countershaft speed sensor connector.
8. Check for continuity between PCM connector terminals A8 and body ground, and between A9 and body ground.

   Is there continuity?

   YES: Go to step 9.

   NO: Repair open in the wire between PCM connector terminals A8, A9 and ground (G101), or repair poor ground (G101), then go to step 29 .

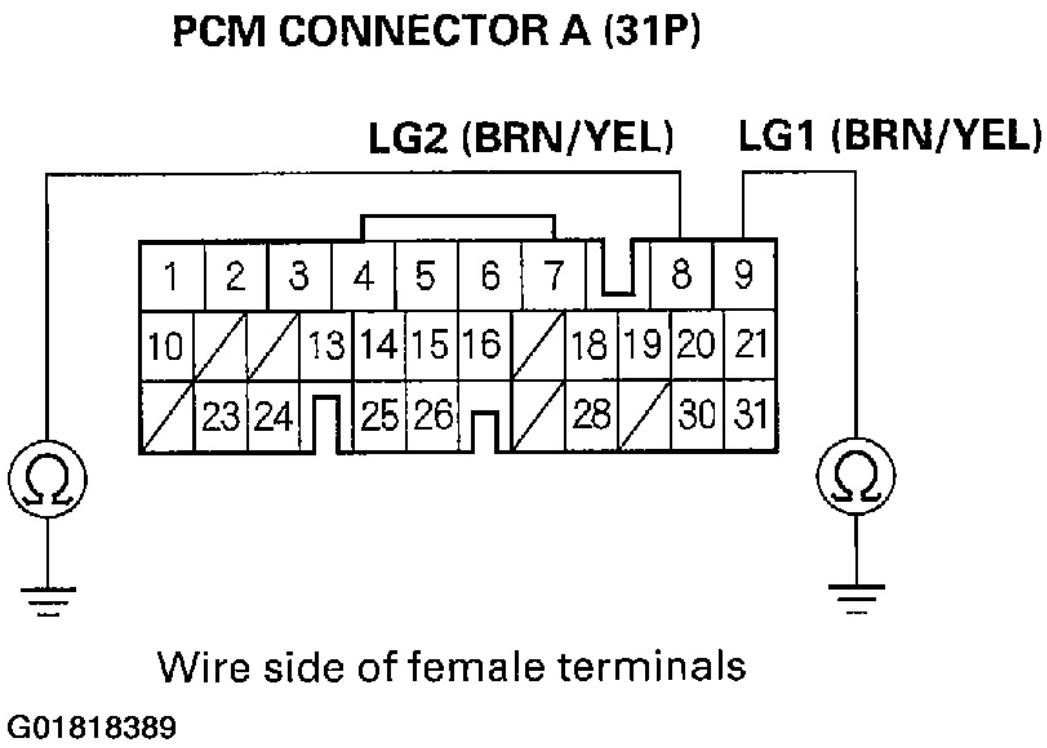


Fig. 133: Checking For Continuity Between PCM Connector Terminals A8 & Body Ground & Between A9 & Body Ground

9. Connect PCM connector A (31P).
10. Turn the ignition switch ON (II).
11. Measure the voltage between countershaft speed sensor connector terminal No. 1 and body ground.

Is there about 5 V?

YES: Go to step 12.

NO: Go to step 23 .

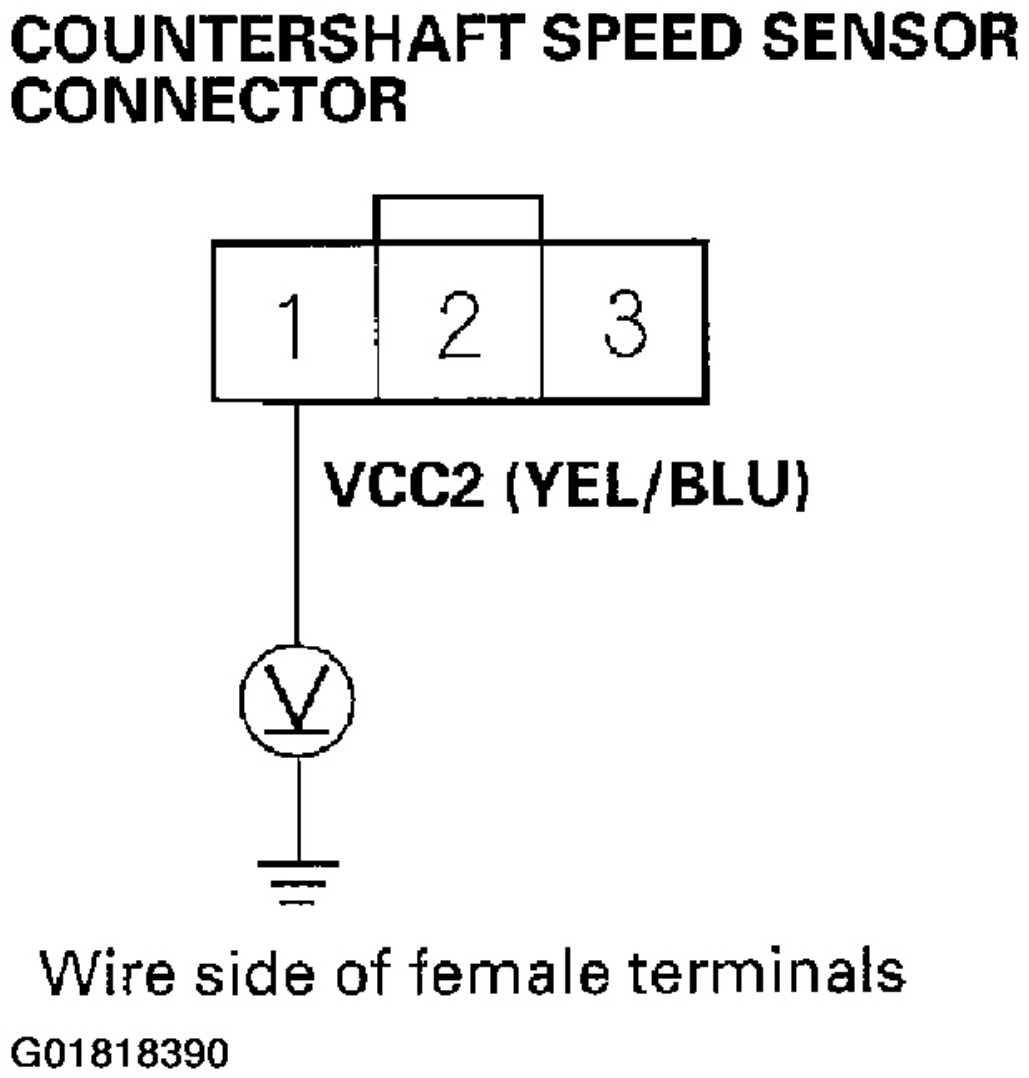


Fig. 134: Measuring The Voltage Between Countershaft Speed Sensor Connector Terminal No. 1 & Body Ground

12. Turn the ignition switch OFF.
13. Disconnect PCM connector A (31P).
14. Check for continuity between countershaft speed sensor connector terminal No. 2 and body ground.

Is there continuity?

YES: Repair short to ground in the wire between PCM connector terminal A18 and the countershaft speed sensor, then go to step 29 .

NO: Go to step 15.

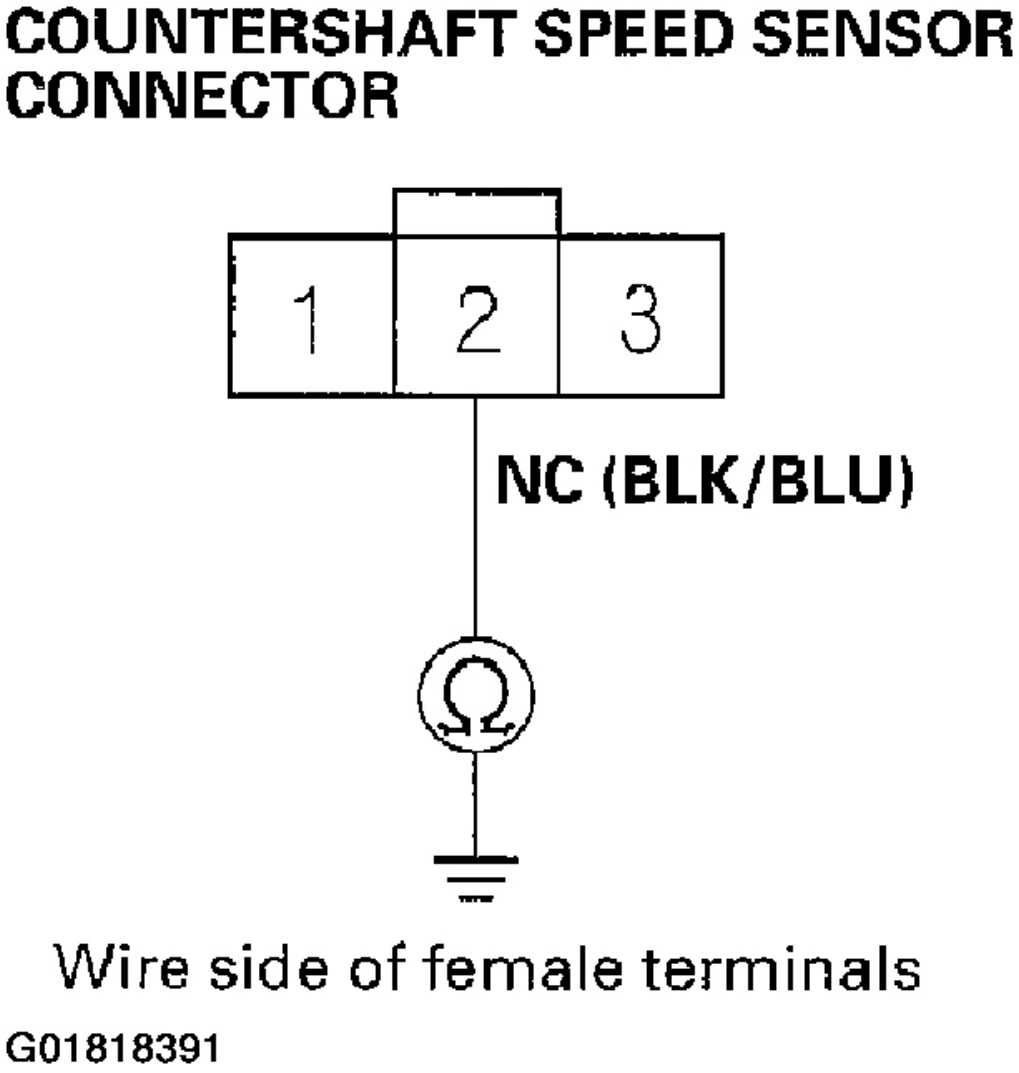


Fig. 135: Checking For Continuity Between Countershaft Speed Sensor Connector Terminal No. 2 & Body Ground

15. Check for continuity between countershaft speed sensor connector terminal No. 3 and body ground.

    Is there continuity?

    YES: Go to step 16.

    NO: Repair open in the wire between the countershaft speed sensor and ground (G101), or repair poor ground (G 101), then go to step 29 .

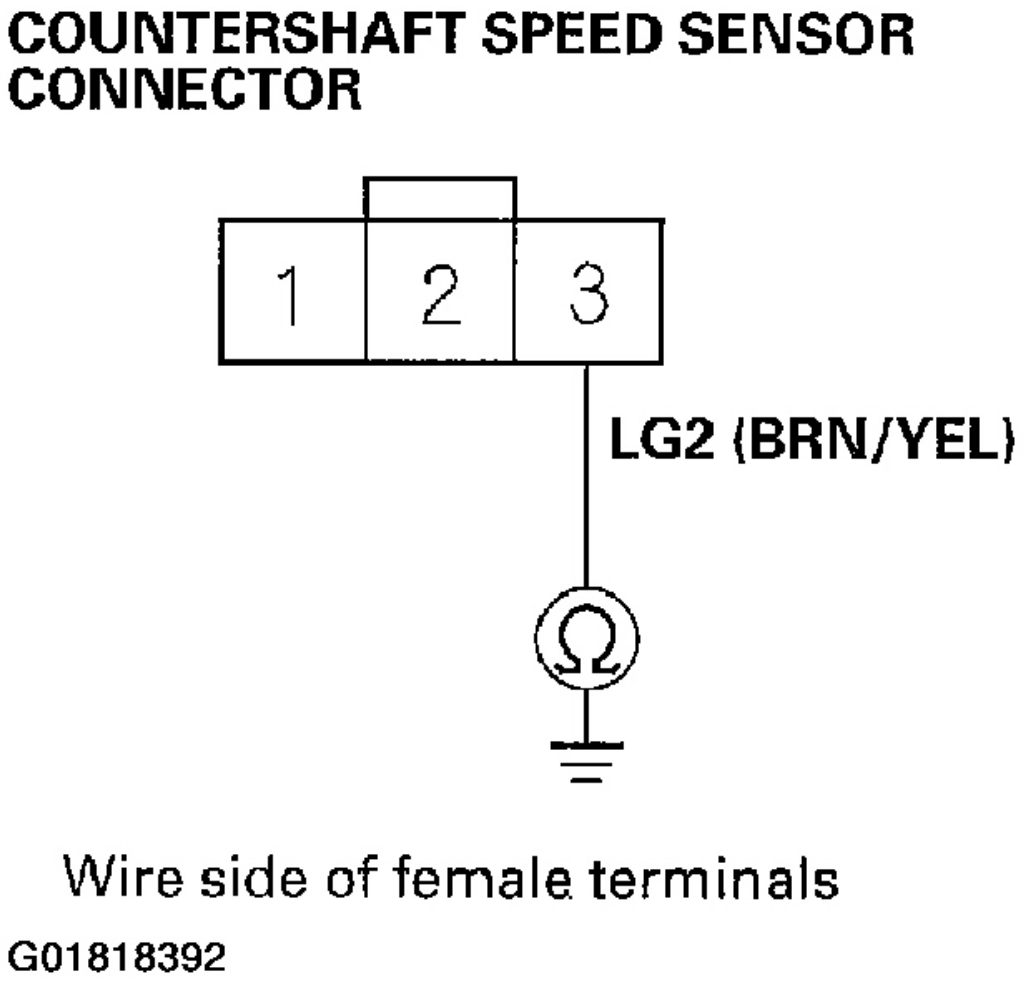


Fig. 136: Checking For Continuity Between Countershaft Speed Sensor Connector Terminal No. 3 & Body Ground

16. Connect PCM connector A (31P).
17. Turn the ignition switch ON (II).
18. Measure the voltage between countershaft speed sensor connector terminals No. 2 and No. 3.

    Is there about 5 V?

    YES: Go to step 19.

    NO: Go to step 28 .

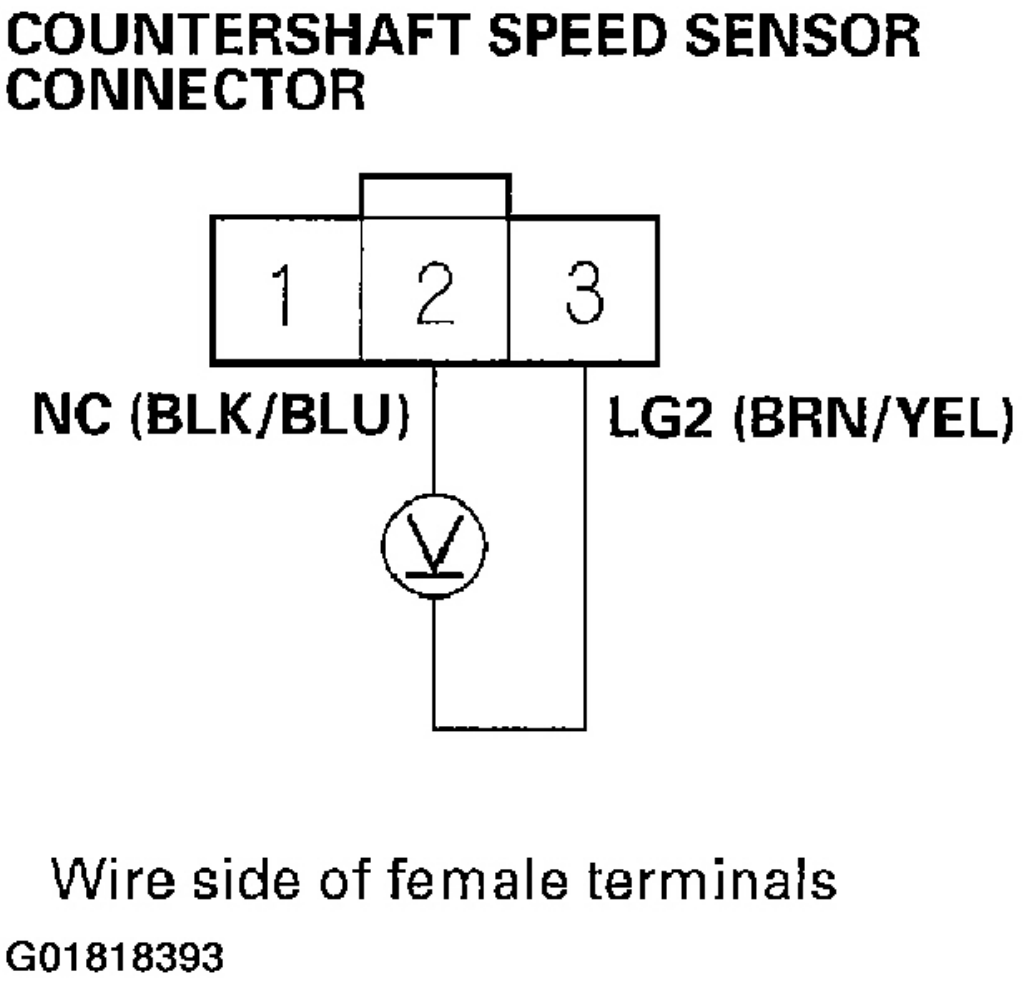


Fig. 137: Measuring The Voltage Between Countershaft Speed Sensor Connector Terminals No. 2 & No. 3

19. Connect countershaft speed sensor connector.
20. Measure the voltage between PCM connector terminals A18 and A8 or A9.

Is there 0 V or about 5 V?

YES: Go to step 21.

NO: Replace the countershaft speed sensor (see **COUNTERSHAFT SPEED SENSOR REPLACEMENT**), then go to step 29 .

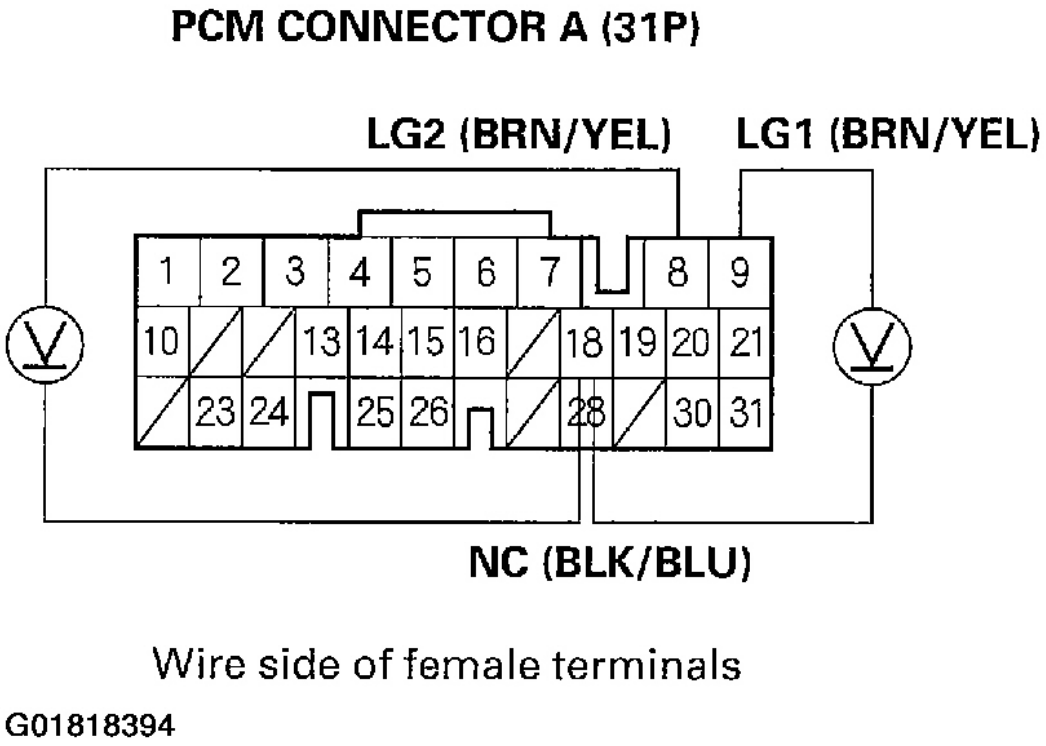


Fig. 138: Measuring The Voltage Between PCM Connector Terminals A18 & A8 Or A9

21. Shift to the **P** position. Start the engine, and let it idle.
22. Shift to the **D** position, and measure the voltage between PCM connector terminals A18 and A8 or A9.

Is there 1.5 V-3.5 V?

YES: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

NO: Replace the countershaft speed sensor (see **COUNTERSHAFT SPEED SENSOR REPLACEMENT**), then go to step 29 .

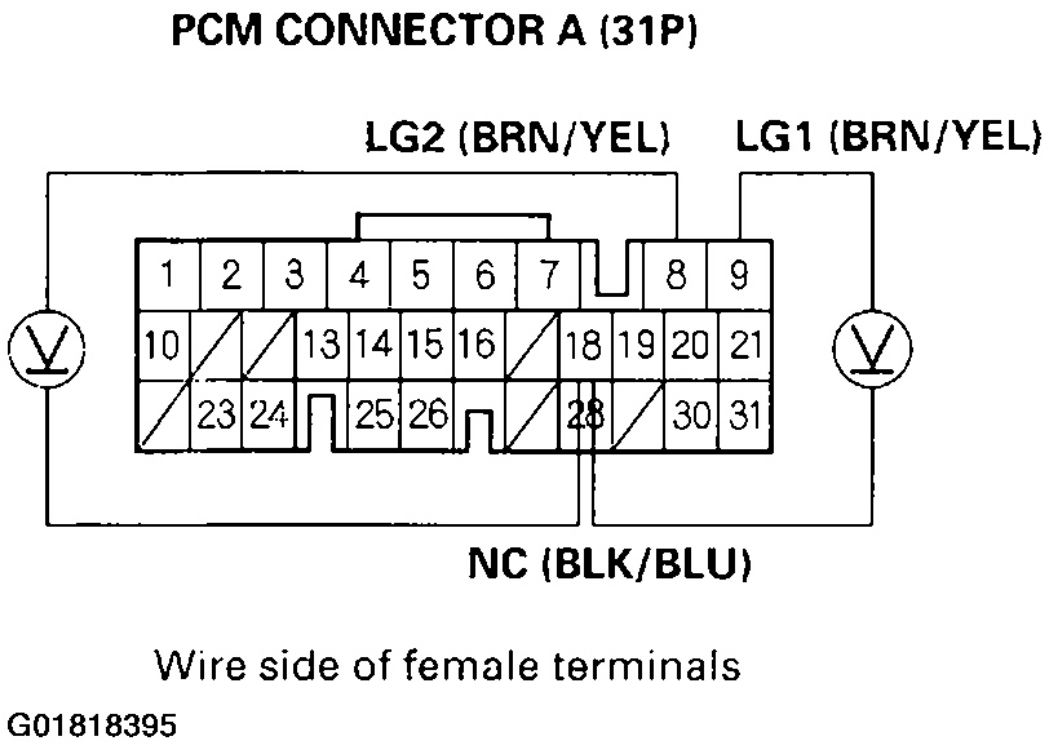


Fig. 139: Measuring The Voltage Between PCM Connector Terminals A18 & A8 Or A9

23. Measure the voltage between PCM connector terminals A20 and A8 or A9.

    Is there 4.75 V-5.25 V?

    YES: Repair open in the wire between PCM connector A20 and the countershaft speed sensor, then go to step 29 .

    NO: Go to step 24.

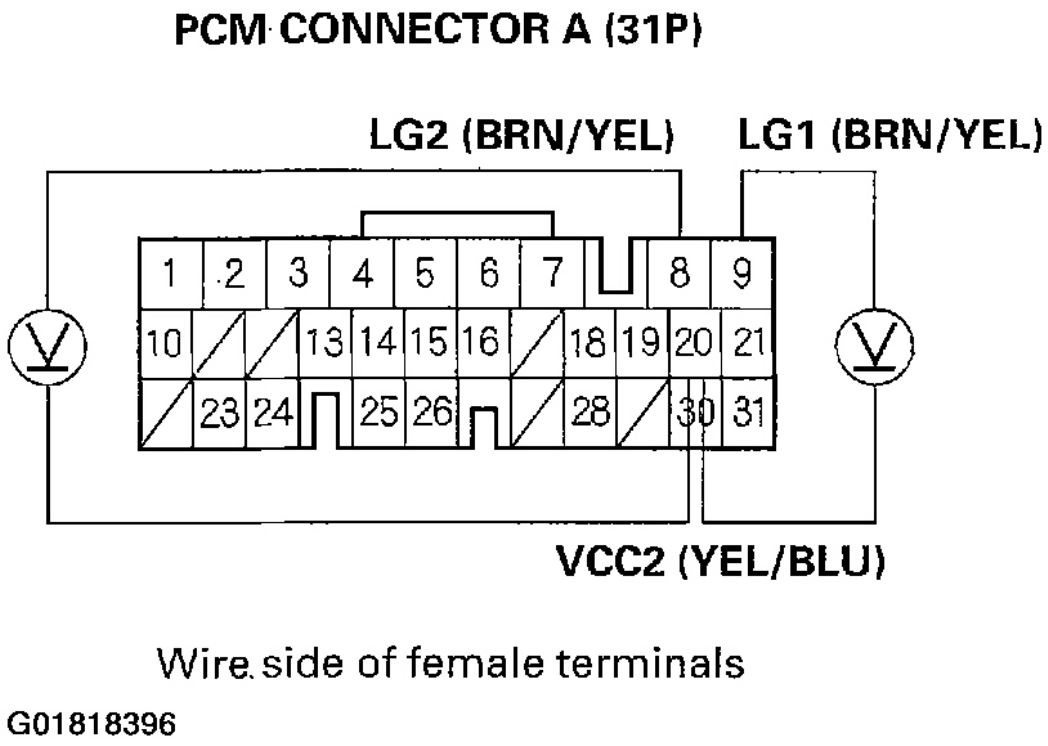


Fig. 140: Measuring The Voltage Between PCM Connector Terminals A20 & A8 Or A9

24. Turn the ignition switch OFF.
25. Jump the SCS line with the HDS.
26. Disconnect PCM connector A (31P).
27. Check for continuity between PCM connector terminal A20 and body ground.

Is there continuity?

YES: Repair short to ground in the wire between PCM connector terminal A20 and the countershaft speed sensor, then go to step 29 .

NO: Check for loose or poor connections at PCM connector terminal A20. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

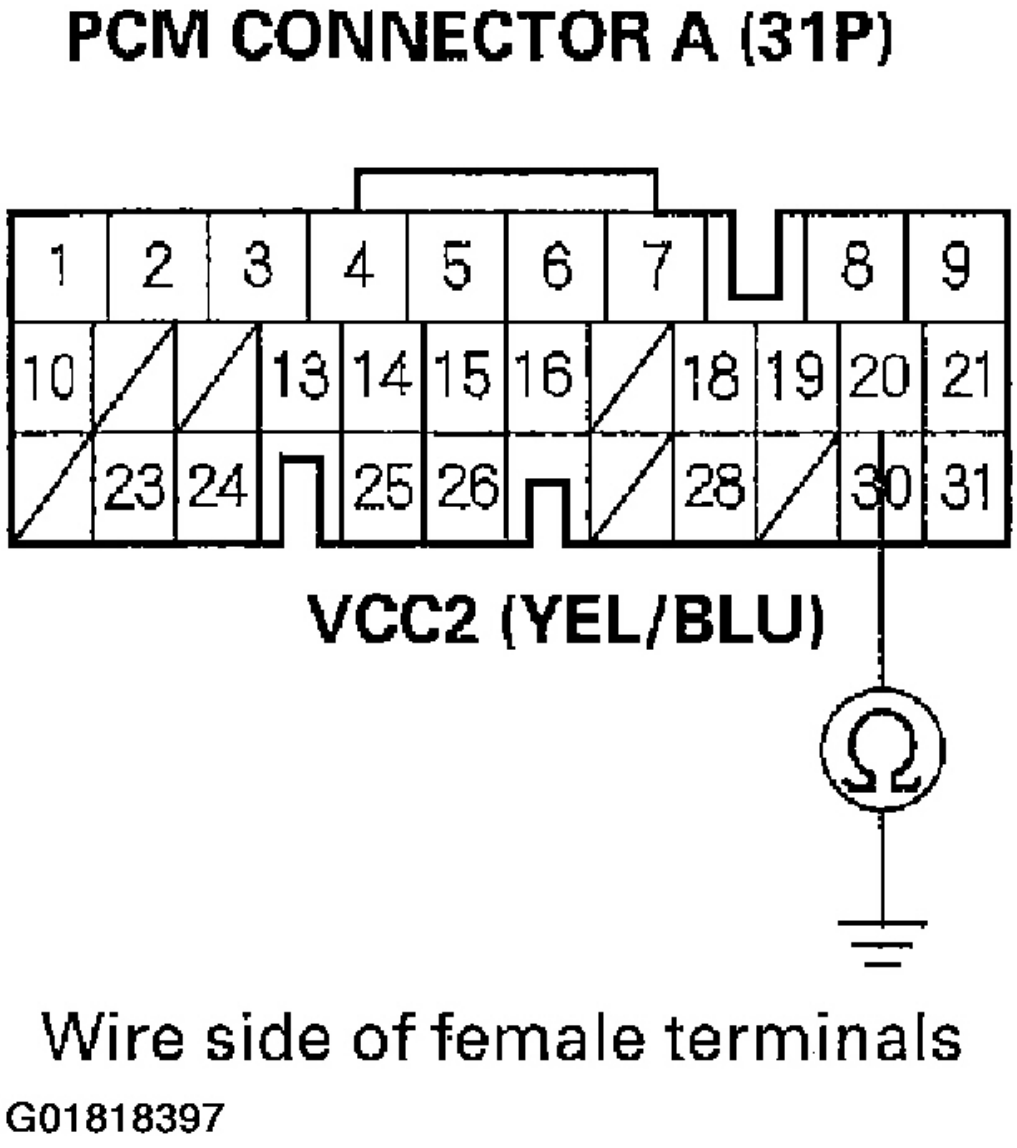


Fig. 141: Checking For Continuity Between PCM Connector Terminal A20 & Body Ground

28. Measure the voltage between PCM connector terminals A18 and A8 or A9.

Is there about 5 V?

YES: Repair open in the wire between PCM connector terminal A18 and the countershaft speed sensor, then go to step 29.

NO: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the

symptom/indication goes away with a known-good PCM, replace the original PCM.

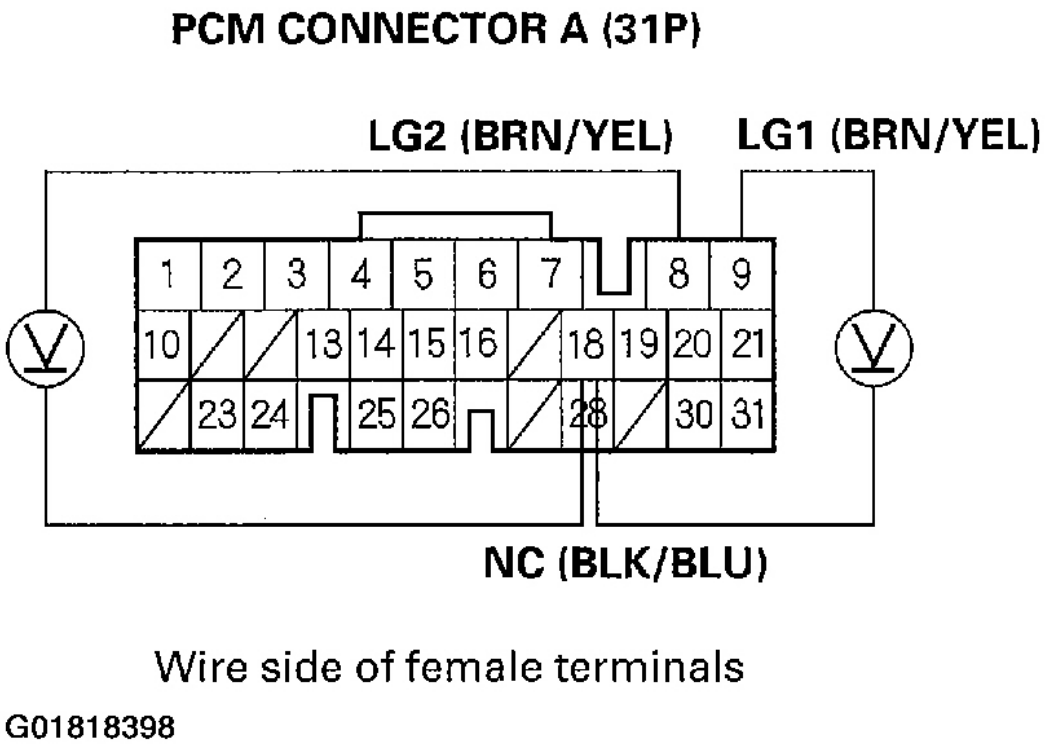


Fig. 142: Measuring The Voltage Between PCM Connector Terminals A18 & A8 Or A9

29. Clear the DTC with the HDS.
30. Test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data.
31. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0721.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0722: PROBLEM IN COUNTERSHAFT SPEED SENSOR CIRCUIT (NO SIGNAL INPUT)

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.
3. Start the engine, drive the vehicle in the **D** position, and hold the vehicle at speeds over 30 mph (48 km/h) for more than 10 seconds.
4. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0722.

   Did the result indicate a fail?

   YES: Go to step 5.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the countershaft speed sensor and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck.
5. Turn the ignition switch OFF.
6. Jump the SCS line with the HDS.
7. Disconnect PCM connector A (31P) and countershaft speed sensor connector.
8. Check for continuity between PCM connector terminals A8 and body ground, and between A9 and body ground.

   Is there continuity?

   YES: Go to step 9.

   NO: Repair open in the wires between PCM connector terminals A8, A9 and ground (G101), or repair poor ground (G 101), then go to step 30 .

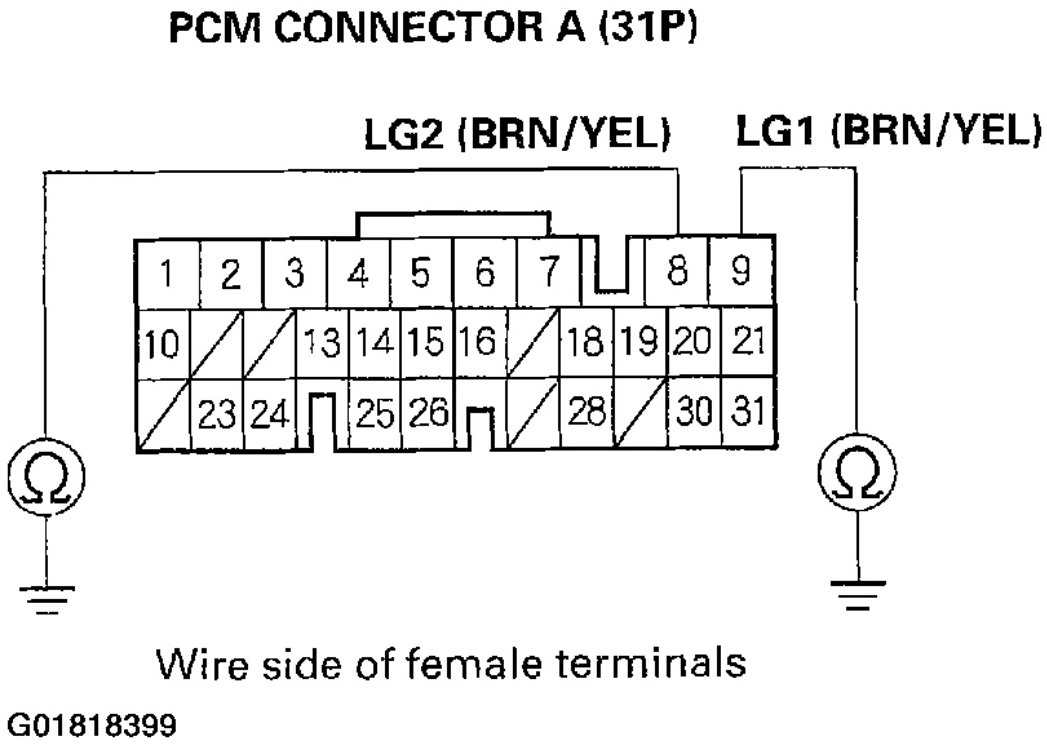


Fig. 143: Checking For Continuity Between PCM Connector Terminals A8 & Body Ground & Between A9 & Body Ground

9. Connect PCM connector A (31P).
10. Turn the ignition switch ON (II).
11. Measure the voltage between countershaft speed sensor connector terminal No. 1 and body ground.

Is there about 5 V?

YES: Go to step 12.

NO: Go to step 24 .

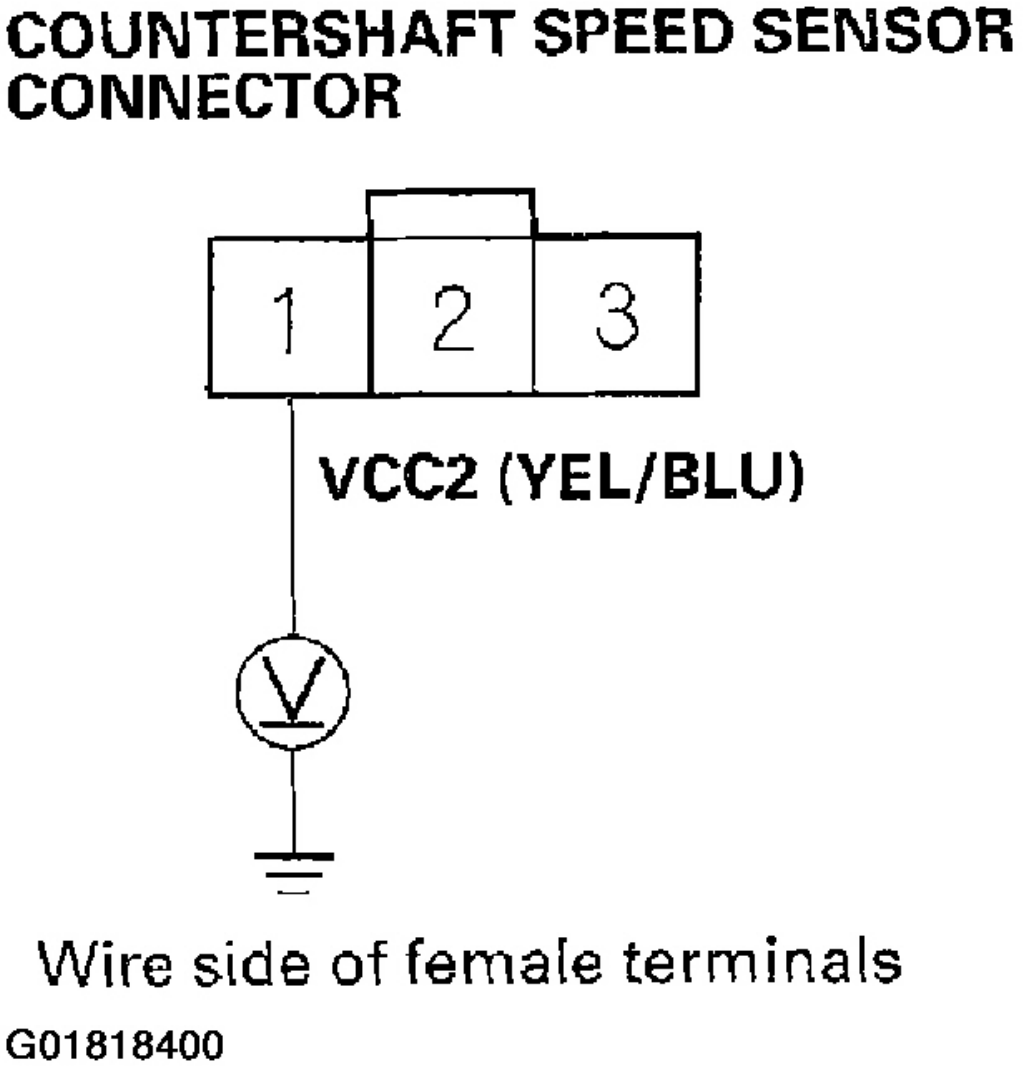


Fig. 144: Measuring The Voltage Between Countershaft Speed Sensor Connector Terminal No. 1 & Body Ground

12. Turn the ignition switch OFF.
13. Jump the SCS line with the HDS.
14. Disconnect PCM connector A (31P).
15. Check for continuity between countershaft speed sensor connector terminal No. 2 and body ground.

Is there continuity?

YES: Repair short to ground in the wire between PCM connector terminal A18 and countershaft speed sensor, then go to step 30 .

NO: Go to step 16.

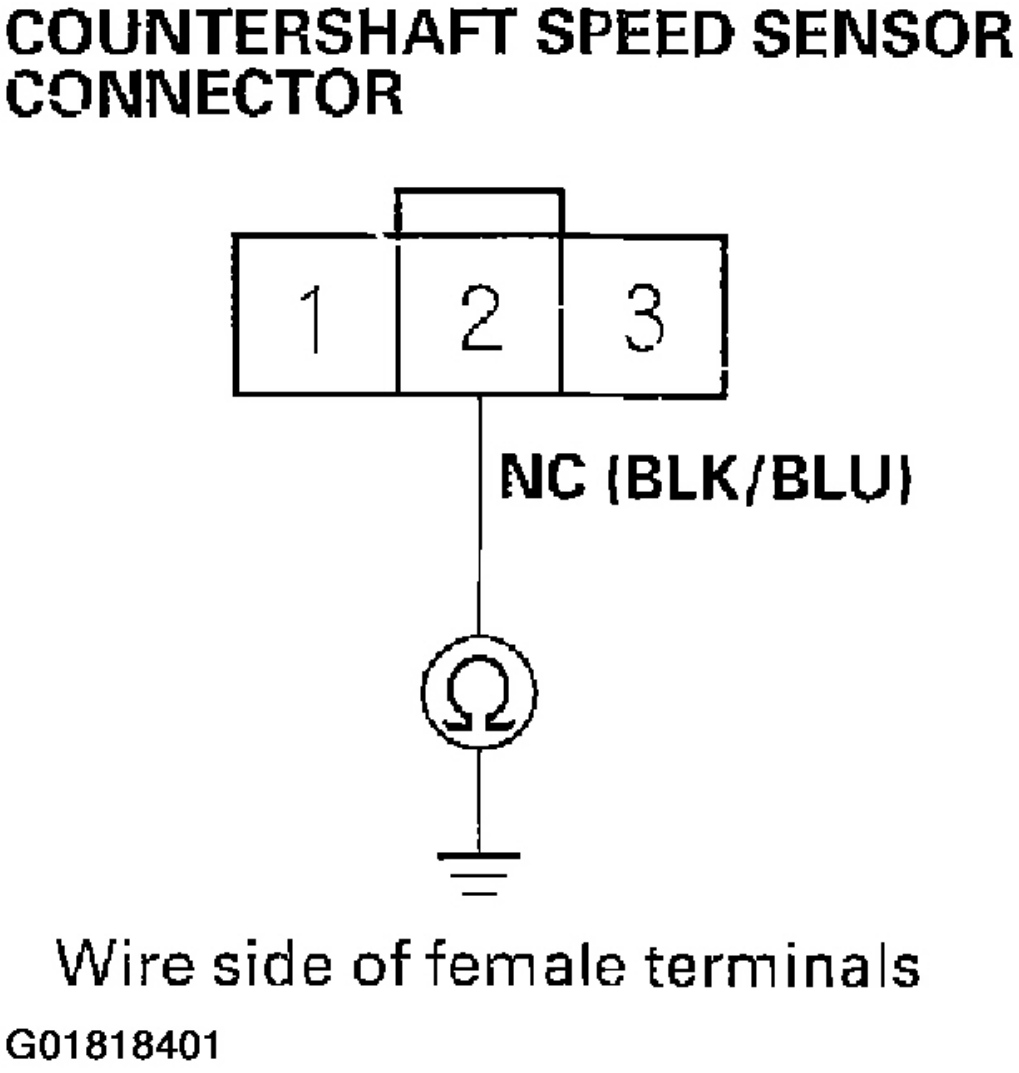


Fig. 145: Checking For Continuity Between Countershaft Speed Sensor Connector Terminal No. 2 & Body Ground

16. Check for continuity between countershaft speed sensor connector terminal No. 3 and body ground.

Is there continuity?

YES: Go to step 17.

NO: Repair open in the wire between the countershaft speed sensor connector and ground (G101), then go to step 30 .

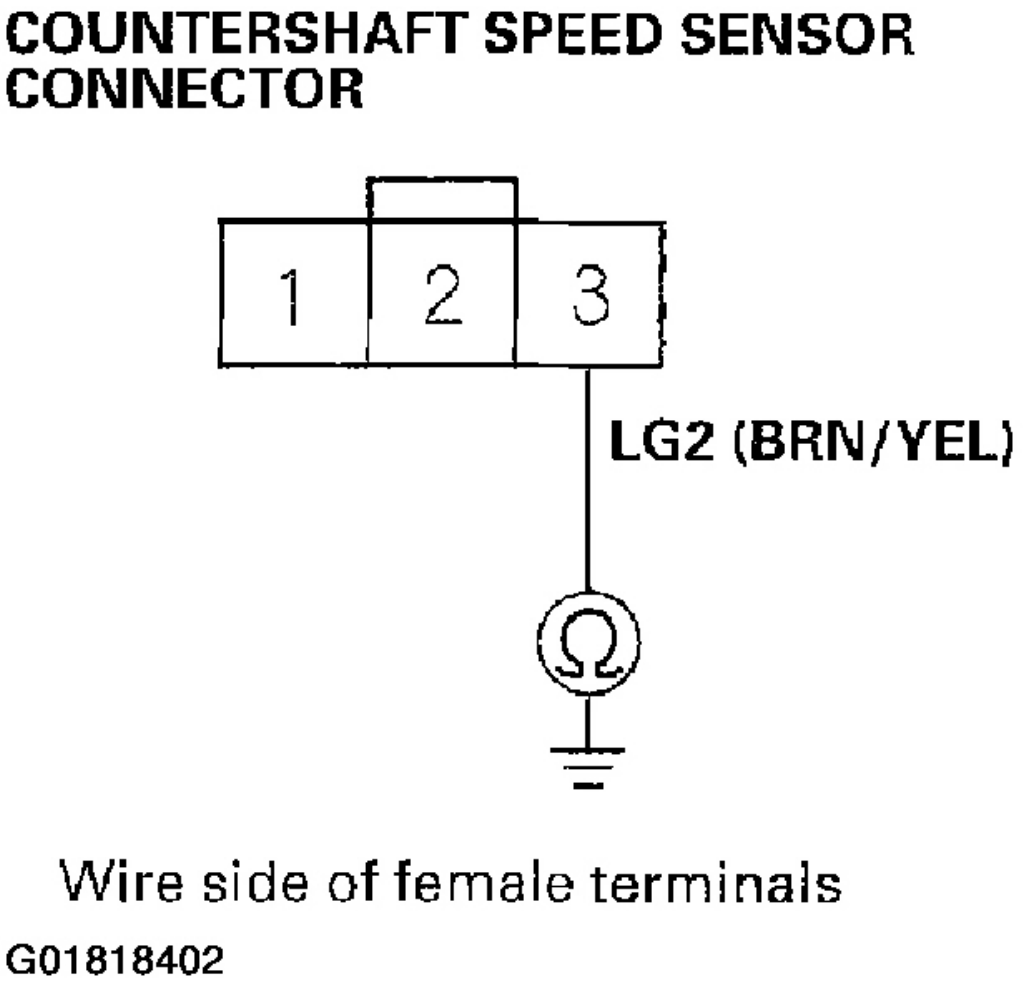


Fig. 146: Checking For Continuity Between Countershaft Speed Sensor Connector Terminal No. 3 & Body Ground

17. Reconnect PCM connector A (31P).
18. Turn the ignition switch ON (II).
19. Measure the voltage between countershaft speed sensor connector terminals No. 2 and No. 3.

    Is there about 5 V?

    YES: Go to step 20.

    NO: Go to step 29 .

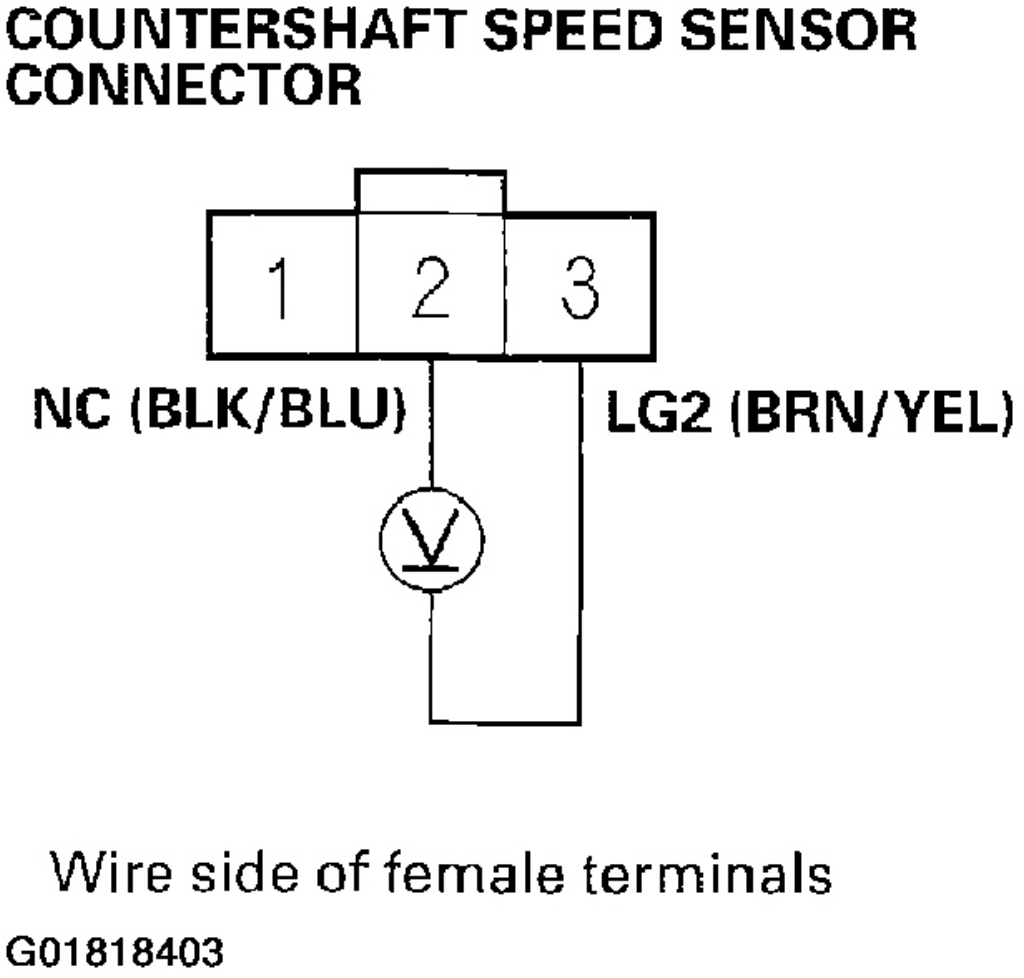


Fig. 147: Measuring The Voltage Between Countershaft Speed Sensor Connector Terminals No. 2 & No. 3

20. Connect the countershaft speed sensor connector.
21. Measure the voltage between PCM connector terminals A18 and A8 or A9.

Is the voltage 0 V or about 5 V?

YES: Go to step 22.

NO: Replace the countershaft speed sensor (see **COUNTERSHAFT SPEED SENSOR REPLACEMENT**), then go to step 30 .

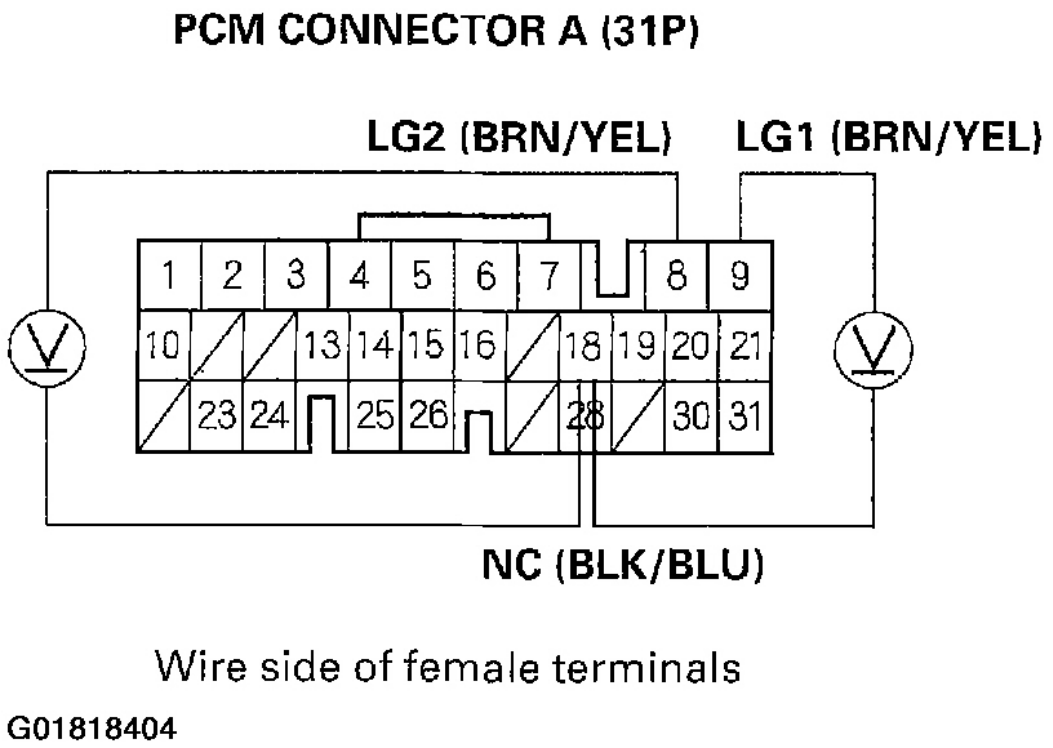


Fig. 148: Measuring The Voltage Between PCM Connector Terminals A18 & A8 Or A9

22. Shift to the **P** position. Start the engine, and let it idle.
23. Shift to the **D** position, and measure the voltage between PCM connector terminals A18 and A8 or A9.

    Is there 1.5 V-3.5 V?

    YES: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

    NO: Replace the countershaft speed sensor (see **COUNTERSHAFT SPEED SENSOR REPLACEMENT**), then go to step 30 .

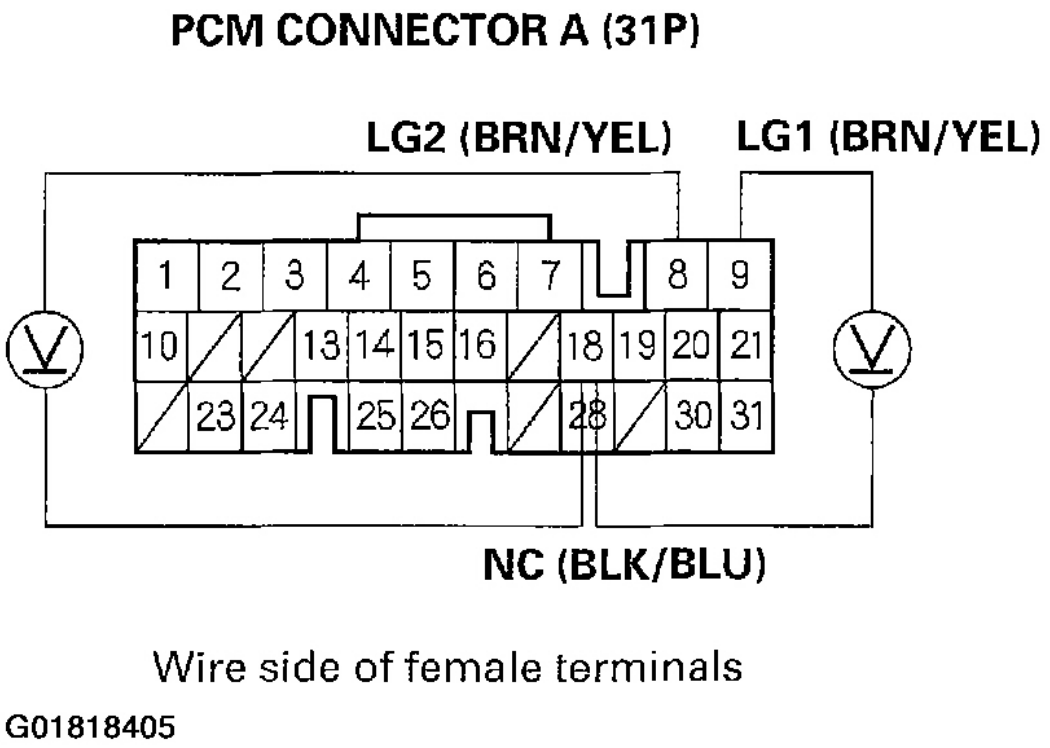


Fig. 149: Measuring The Voltage Between PCM Connector Terminals A18 & A8 Or A9

24. Measure the voltage between PCM connector terminals A20 and A8 or A9.

    Is there about 5 V?

    YES: Repair open in the wire between PCM connector terminal A20 and the countershaft speed sensor, then go to step 30 .

    NO: Go to step 25.

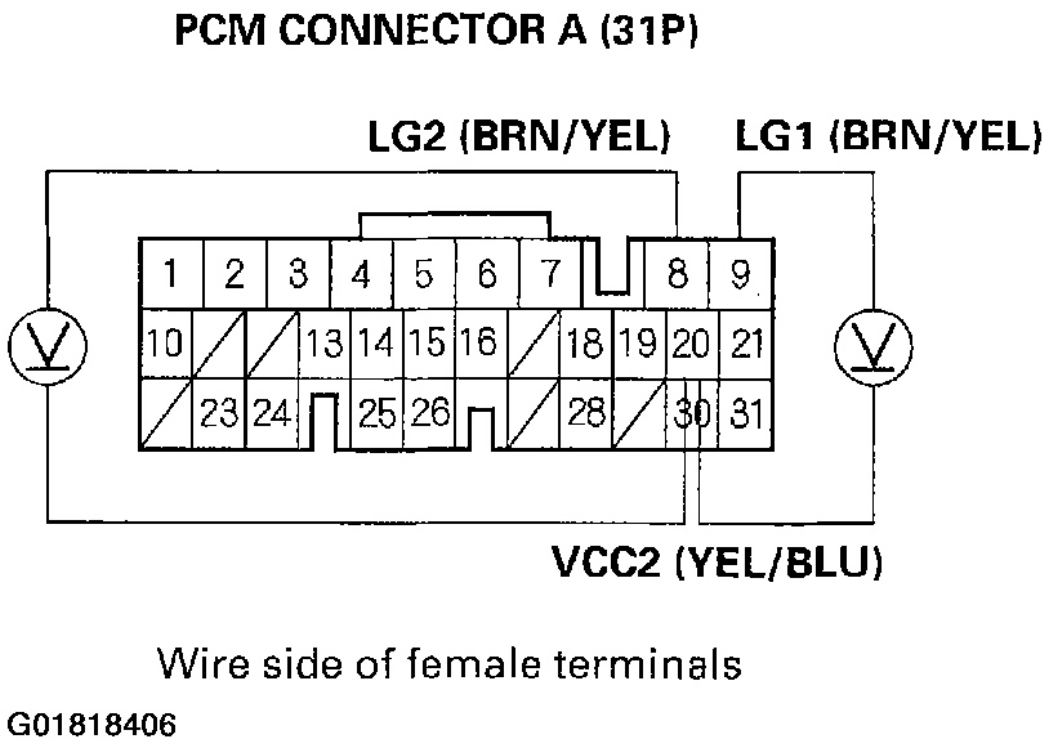


Fig. 150: Measuring The Voltage Between PCM Connector Terminals A20 & A8 Or A9

25. Turn the ignition switch OFF.
26. Jump the SCS line with the HDS.
27. Disconnect PCM connector A (31P).
28. Check for continuity between PCM connector terminal A20 and body ground.

Is there continuity?

YES: Repair short to ground in the wire between PCM connector terminal A20 and the countershaft speed sensor, then go to step 30 .

NO: Check for loose or poor connections at PCM connector terminal A20. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

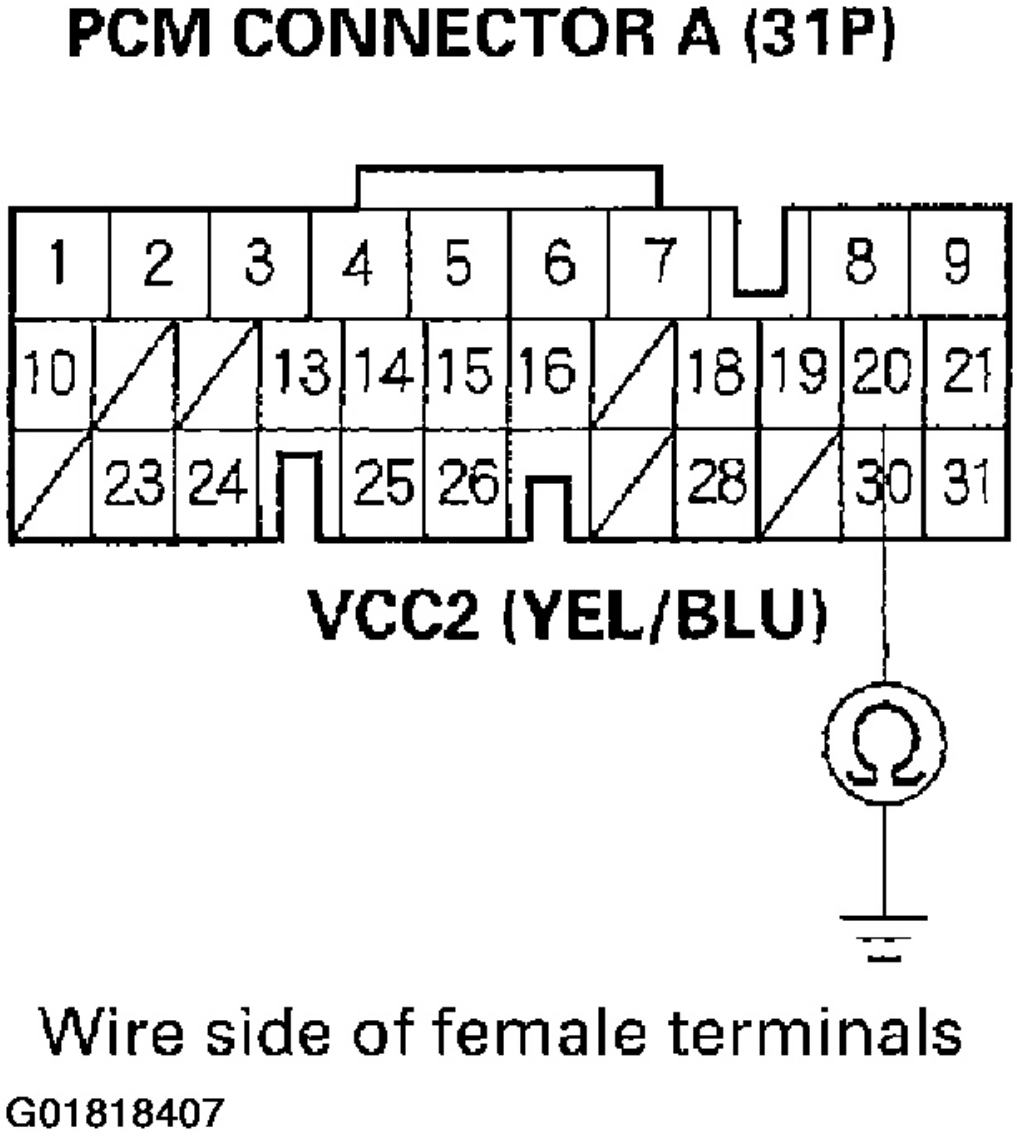


Fig. 151: Checking For Continuity Between PCM Connector Terminal A20 & Body Ground

29. Measure the voltage between PCM connector terminals A18 and A8 or A9.

Is there about 5 V?

YES: Repair open in the wire between PCM connector terminal A18 and the countershaft speed sensor, then go to step 30.

NO: Check for loose or poor connections at PCM connector terminal A18. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good

PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

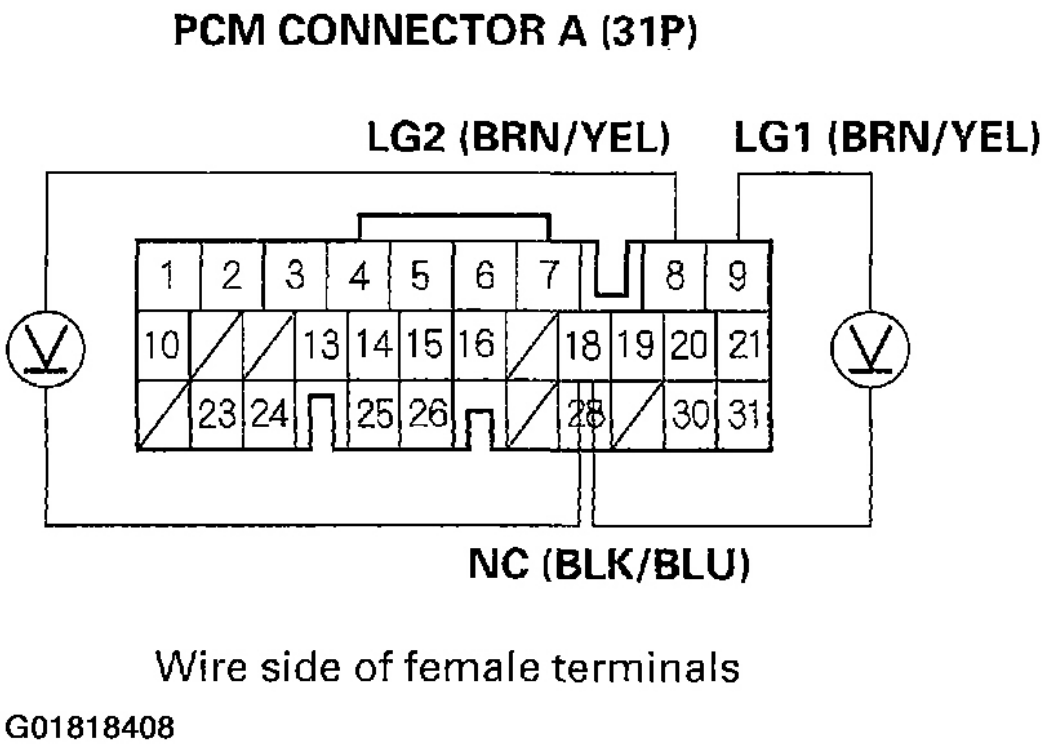


Fig. 152: Measuring The Voltage Between PCM Connector Terminals A18 & A8 Or A9

30. Clear the DTC with the HDS.
31. Test-drive the vehicle for several minutes in the **D** position in all five gears.
32. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0722.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0723: COUNTERSHAFT SPEED SENSOR INTERMITTENT FAILURE

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Record all freeze data, and clear the DTC with the HDS.
2. Test-drive the vehicle for 10 minutes under the same conditions as those indicated by the freeze data, and check the OBD STATUS in DTCs MENU for a pass/fail test of code P0723.

   Did the result indicate a fail?

   YES: Go to step 3.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the countershaft speed sensor and PCM. If the tester indicates NOT COMPLETE, return to step 2 and recheck.
3. Turn the ignition switch OFF.
4. Disconnect the countershaft speed sensor connector, and inspect the connector and connector terminals to be sure they are making good contact.

   Are the connector terminals OK?

   YES: Go to step 5.

   NO: Repair the connector terminals, then go to step 5.
5. Connect the countershaft speed sensor connector.
6. Test-drive the vehicle for several minutes, and check the OBD STATUS in DTCs MENU for a pass/fail test of code P0723.

   Did the result indicate a fail?

   YES: Go to step 7.

   NO: The problem has been corrected. If the tester indicates NOT COMPLETE, return to step 6 and recheck.
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connector A (31P).
10. Disconnect the countershaft speed sensor connector.
11. Check for continuity between countershaft speed sensor connector terminal No. 2 and body ground.

    Is there continuity?

    YES: Repair short to ground in the wire between PCM connector terminal A18 and the countershaft speed sensor, then go to step 18 .

    NO: Go to step 12.

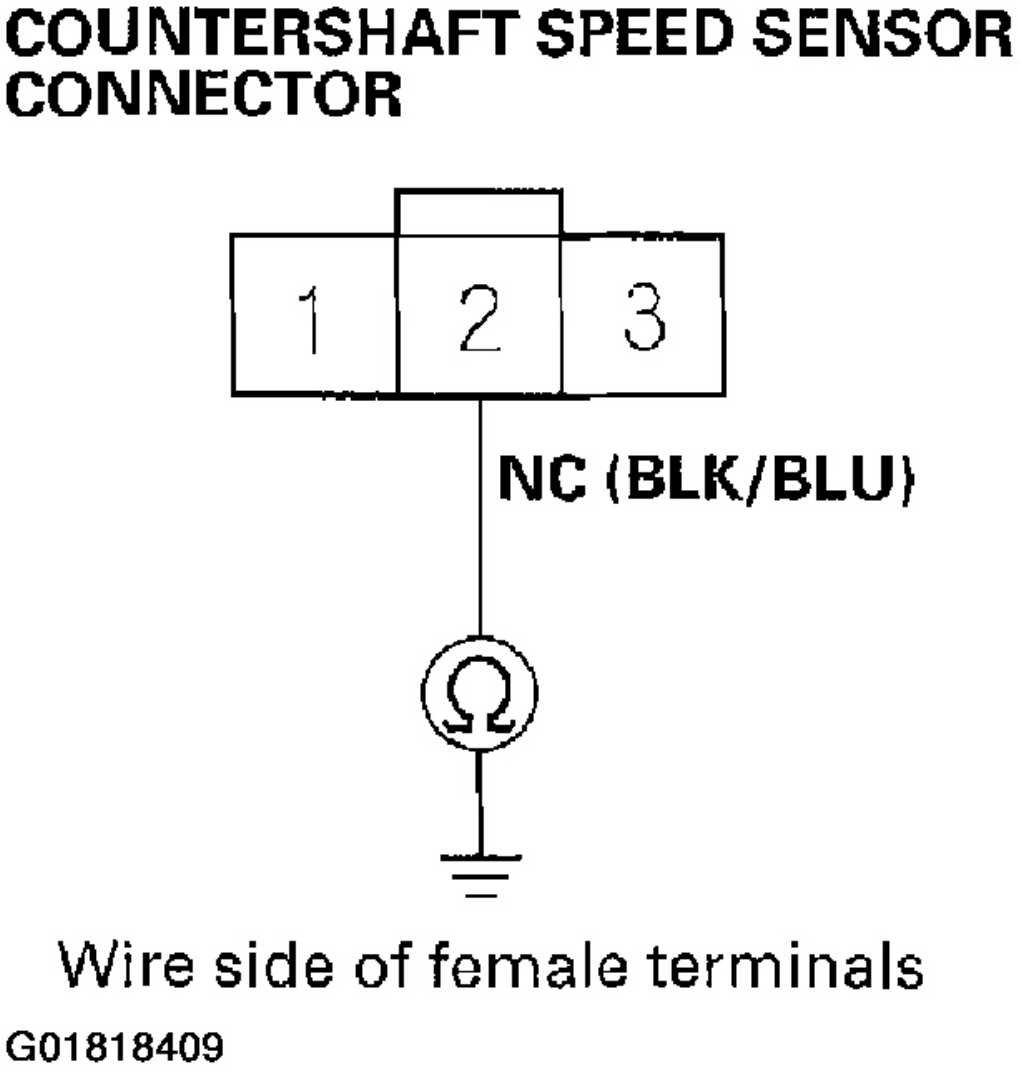


Fig. 153: Checking For Continuity Between Countershaft Speed Sensor Connector Terminal No. 2 & Body Ground

12. Connect PCM connector A (31P).
13. Turn the ignition switch ON (II).
14. Measure the voltage between countershaft speed sensor connector terminal No. 2 and body ground.

Is there about 5 V?

YES: Replace the countershaft speed sensor (see **COUNTERSHAFT SPEED SENSOR REPLACEMENT**), then go to step 18 .

NO: Go to step 15.

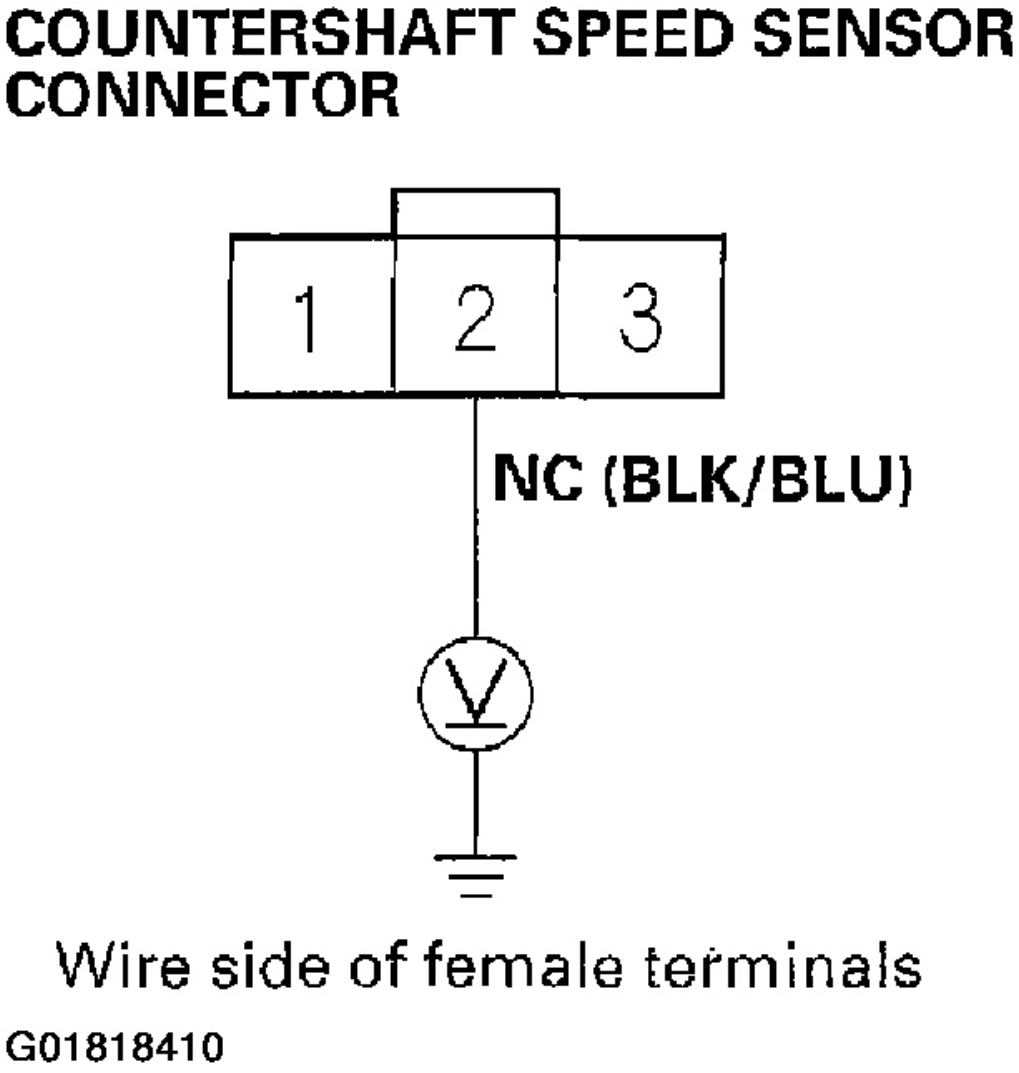


Fig. 154: Measuring The Voltage Between Countershaft Speed Sensor Connector Terminal No. 2 & Body Ground

15. Turn the ignition switch OFF.
16. Disconnect PCM connector A (31P).
17. Check for continuity between PCM connector terminal A18 and countershaft speed sensor connector terminal No. 2.

Is there continuity?

YES: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the

symptom/indication goes away with a known-good PCM, replace the original PCM.

NO: Repair open in the wire between PCM connector terminal A18 and the countershaft speed sensor, then go to step 18.

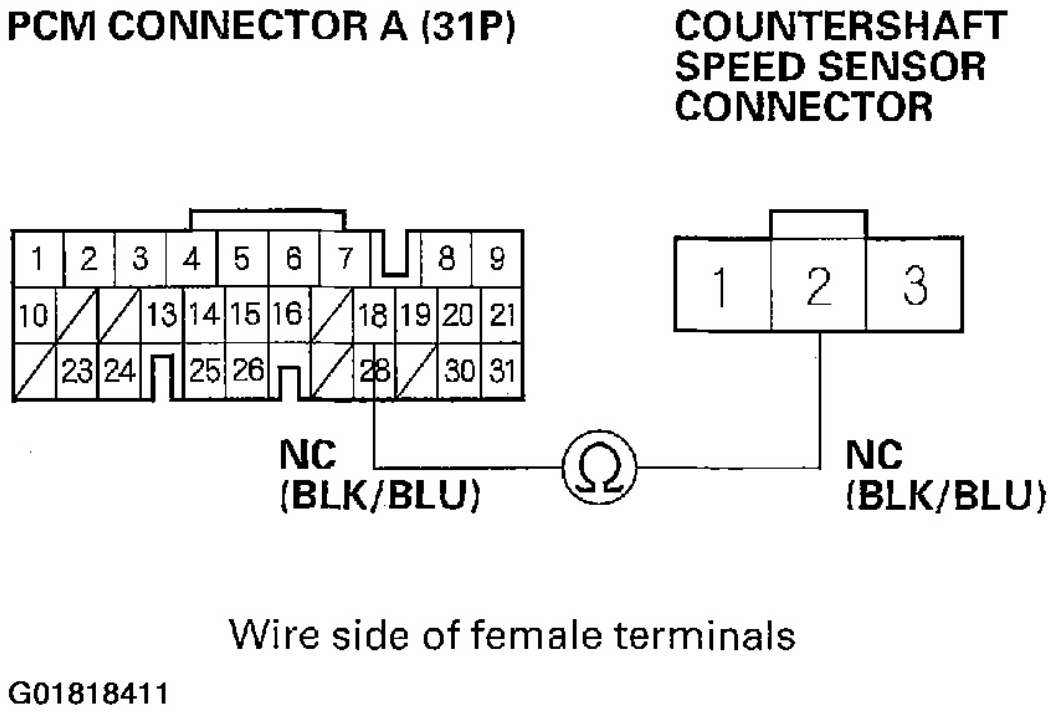


Fig. 155: Checking For Continuity Between PCM Connector Terminal A18 And Countershaft Speed Sensor Connector Terminal No. 2

18. Clear the DTC with the HDS.
19. Test-drive the vehicle for several minutes in the **D** position in all five gears.
20. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0723.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0731: PROBLEM IN 1ST CLUTCH & 1ST CLUTCH HYDRAULIC CIRCUIT

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

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

2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

   Has the ATF deteriorated?

   YES: Replace ATF (see **DRAINING & REFILLING**), and test-drive the vehicle under the same conditions as those indicated by the freeze data, then recheck.

   NO: Go to step 4.
4. Measure the line pressure (see **PRESSURE TEST**).

   Is the line pressure within service limits?

   YES: Go to step 5.

   NO: Repair the ATF pump and regulator valve, or replace the transmission.
5. Measure the 1st clutch pressure (see **PRESSURE TEST**).

   Is the 1st clutch pressure within service limits?

   YES: Go to step 6.

   NO: Shift valves B and Care stuck. Repair these valves and hydraulic circuit, or replace the transmission.
6. Clear the DTC with the HDS.
7. Test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, or drive in the 1st gear in the **D** position at 10 mph (16 km/h) for 20 seconds.
8. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0731.

   Did the result indicate a fail?

   YES: Repair the 1st clutch, or replace the transmission.

   NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 1 and recheck.

DTC P0732: PROBLEM IN 2ND CLUTCH & 2ND CLUTCH HYDRAULIC CIRCUIT

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

   Has the ATF deteriorated?

   YES: Replace ATF (see **DRAINING & REFILLING**), and test-drive the vehicle under the same conditions as those indicated by the freeze data, then recheck.

   NO: Go to step 4.
4. Measure the line pressure (see **PRESSURE TEST**).

   Is the line pressure within service limits?

YES: Go to step 5.

NO: Repair the ATF pump and regulator valve, or replace the transmission.

5. Measure the 2nd clutch pressure (see **PRESSURE TEST**).

   Is the 2nd clutch pressure within service limits?

   YES: Go to step 6.

   NO: Shift valves A and B are stuck. Repair these valves and hydraulic circuit, or replace the transmission.

6. Clear the DTC with the HDS.
7. Test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, or drive in the 2nd gear in the **M** position at 10 mph (16 km/h) for 20 seconds.
8. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0732.

   Did the result indicate a fail?

   YES: Repair the 2nd clutch, or replace the transmission.

   NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 1 and recheck.

DTC P0733: PROBLEM IN 3RD CLUTCH & 3RD CLUTCH HYDRAULIC CIRCUIT

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

   Has the ATF deteriorated?

   YES: Replace ATF (see **DRAINING & REFILLING**), and test-drive the vehicle under the same conditions as those indicated by the freeze data, then recheck.

   NO: Go to step 4.

4. Measure the line pressure (see **PRESSURE TEST**).

   Is the line pressure within service limits?

   YES: Go to step 5.

   NO: Repair the ATF pump and regulator valve, or replace the transmission.

5. Measure the 3rd clutch pressure (see **PRESSURE TEST**).

   Is the 3rd clutch pressure within service limits?

   YES: Go to step 6.

   NO: Shift valves A and D are stuck. Repair these valves and hydraulic circuit, or replace the transmission.

6. Clear the DTC with the HDS.
7. Test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data,

or drive in the 3rd gear in the **M** position at speeds over 10 mph (16 km/h) for 20 seconds.

8. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0733.

Did the result indicate a fail?

YES: Repair the 3rd clutch, or replace the transmission.

NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 1 and recheck.

DTC P0734: PROBLEM IN 4TH CLUTCH & 4TH CLUTCH HYDRAULIC CIRCUIT

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

Has the ATF deteriorated?

YES: Replace ATF (see **DRAINING & REFILLING**), and test-drive the vehicle under the same conditions as those indicated by the freeze data, then recheck.

NO: Go to step 4.

4. Measure the line pressure (see **PRESSURE TEST**).

Is the line pressure within service limits?

YES: Go to step 5.

NO: Repair the ATF pump and regulator valve, or replace the transmission.

5. Measure the 4th clutch pressure (see **PRESSURE TEST**).

Is the 4th clutch pressure within service limits?

YES: Go to step 6.

NO: Shift valve B, shift valve C, servo control valve, and servo valve are stuck. Repair these valves and hydraulic circuit, or replace the transmission.

6. Clear the DTC with the HDS.
7. Test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, or drive in the 4th gear in the **M** position at speeds over 10 mph (16 km/h) for 20 seconds.
8. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0734.

Did the result indicate a fail?

YES: Repair the 4th clutch, or replace the transmission.

NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 1 and recheck.

DTC P0735: PROBLEM IN 5TH CLUTCH & 5TH CLUTCH HYDRAULIC CIRCUIT

NOTE: Record all freeze data and review General Troubleshooting Information (see

GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

   Has the ATF deteriorated?

   YES: Replace ATF (see **DRAINING & REFILLING**), and test-drive the vehicle under the same conditions as those indicated by the freeze data, then recheck.

   NO: Go to step 4.
4. Measure the line pressure (see **PRESSURE TEST**).

   Is the line pressure within service limits?

   YES: Go to step 5.

   NO: Repair the ATF pump and regulator valve, or replace the transmission.
5. Measure the 5th clutch pressure (see **PRESSURE TEST**).

   Is the 5th clutch pressure within service limits?

   YES: Go to step 6.

   NO: Shift valves A, B, and/or Dare stuck. Repair these valves and hydraulic circuit, or replace the transmission.
6. Clear the DTC with the HDS.
7. Test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, or drive in the 5th gear in the **D** position at speeds over 10 mph (16 km/h) for 20 seconds.
8. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0735.

   Did the result indicate a fail?

   YES: Repair the 5th clutch, or replace the transmission.

   NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 1 and recheck.

DTC P0741: TORQUE CONVERTER CLUTCH HYDRAULIC CIRCUIT STUCK OFF

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

   Has the ATF deteriorated?

   YES: Replace ATF (see **DRAINING & REFILLING**), and test-drive the vehicle under the same conditions as those indicated by the freeze data, then recheck.

NO: Go to step 4.

4. Clear the DTC with the HDS.
5. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL E test in SHIFT SOL TEST MENU with the HDS.

   Is a clicking sound heard?

   YES: Go to step 6.

   NO: Replace shift solenoid valve E (see **SHIFT SOLENOID VALVE REPLACEMENT**), then go to step 10 .
6. Run the engine until the engine coolant temperature reaches 176°F (80°C).
7. Select LINEAR SOL TEST in MISC. TEST MENU, then carry out LINEAR SOL A TEST in LINEAR SOL TEST MENU.

   Is the system OK?

   YES: Go to step 8.

   NO: Follow instructions indicated on the HDS by the test result. Go to step 10 if any part was replaced.
8. Test-drive the vehicle at 55 mph (88 km/h) for 2 minutes while monitoring the vehicle speed with the HDS.
9. Cheek the OBD STATUS in DTCs MENU for a pass/fail test of code P0741.

   Did the result indicate a fail?

   YES: Faulty the torque converter mechanism, torque converter clutch hydraulic circuit, lock-up shift valve, or lock-up control valve, or replace the transmission.

   NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 8 and recheck.
10. Clear the DTC with the HDS.
11. Test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data.
12. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0741.

    Did the result indicate a pass?

    YES: The problem has been corrected.

    NO: Return to step 1 and recheck.

DTC P0747: A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A STUCK ON

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

   Has the ATF deteriorated?

YES: Replace ATF (see **DRAINING & REFILLING**), and go to step 4.

NO: Go to step 8 .

4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0747.

   Did the result indicate a fail?

   YES: Go to step 8.

   NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.
8. Clear the DTC with the HDS.
9. Select LINEAR SOL TEST in MISC. TEST MENU, then carry out LINEAR SOL A TEST in LINEAR SOL TEST MENU with the HDS.

   Is the system OK?

   YES: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 9 and recheck.

   NO: Follow instructions indicated on the HDS by the test result, but the tester has not determined the cause of the failure, go to step 10. If any part was replaced, go to step 11 .
10. Inspect A/T clutch pressure control solenoid valve A (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A TEST**).

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

    YES: Repair hydraulic system related with shift valve B and E, or replace the transmission, then go to step 11.

    NO: Replace A/T clutch pressure control solenoid valve A (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A REPLACEMENT**), then go to step 11.
11. Clear the DTC with the HDS.
12. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds. Slow down to a stop.
13. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
14. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0747.

    Did the result indicate a pass?

    YES: The problem has been corrected.

    NO: Return to step 1 and recheck.

DTC P0752: SHIFT SOLENOID VALVE A STUCK ON

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

   Has the ATF deteriorated?

   YES: Replace ATF (see **DRAINING & REFILLING**), and go to step 4.

   NO: Go to step 8 .
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0752.

   Did the result indicate a fail?

   YES: Go to step 8.

   NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.
8. Clear the DTC with the HDS.
9. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL A test in SHIFT SOL TEST MENU with the HDS.

   Is a clicking sound heard?

   YES: Go to step 10.

   NO: Replace shift solenoid valve A (see **SHIFT SOLENOID VALVE REPLACEMENT**), then go to step 13 .
10. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
11. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
12. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0752.

    Did the result indicate a fail?

    YES: Repair shift valve A, or replace the transmission, then go to step 13.

    NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 10 and recheck.
13. Clear the DTC with the HDS.
14. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
15. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down and to a stop.
16. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0752.

    Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0756: SHIFT SOLENOID VALVE B STUCK OFF

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

   Has the ATF deteriorated?

   YES: Replace ATF (see **DRAINING & REFILLING**), and go to step 4.

   NO: Go to step 8 .
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slowdown to a stop.
6. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0756.

   Did the result indicate a fail?

   YES: Go to step 8.

   NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.
8. Clear the DTC with the HDS.
9. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL B test in SHIFT SOL TEST MENU with the HDS.

   Is a clicking sound heard?

   YES: Go to step 10.

   NO: Replace shift solenoid valve B (see **SHIFT SOLENOID VALVE REPLACEMENT**), then go to step 13 .
10. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
11. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
12. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0756.

    Did the result indicate a fail?

    YES: Repair shift valve B, or replace the transmission, then go to step 13.

    NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 10 and recheck.

13. Clear the DTC with the HDS.
14. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
15. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
16. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0756.

    Did the result indicate a pass?

    YES: The problem has been corrected.

    NO: Return to step 1 and recheck.

DTC P0757: SHIFT SOLENOID VALVE B STUCK ON

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

    Has the ATF deteriorated?

    YES: Replace ATF (see **DRAINING & REFILLING**), and go to step 4.

    NO: Go to step 8 .
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0757.

    Did the result indicate a fail?

    YES: Go to step 8.

    NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.
8. Clear the DTC with the HDS.
9. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL B test in SHIFT SOL TEST MENU with the HDS.

    Is a clicking sound heard?

    YES: Go to step 10.

    NO: Replace shift solenoid valve B (see **SHIFT SOLENOID VALVE REPLACEMENT**), then go to step 13 .
10. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.

11. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
12. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0757.

    Did the result indicate a fail?

    YES: Repair shift valve B, or replace the transmission, then go to step 13.

    NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 10 and recheck.
13. Clear the DTC with the HDS.
14. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
15. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
16. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0757.

    Did the result indicate a pass?

    YES: The problem has been corrected.

    NO: Return to step 1 and recheck.

DTC P0761: SHIFT SOLENOID VALVE C STUCK OFF

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

    Has the ATF deteriorated?

    YES: Replace ATF (see **DRAINING & REFILLING**), and go to step 4.

    NO: Go to step 8 .
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0761.

    Did the result indicate a fail?

    YES: Go to step 8.

    NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.
8. Clear the DTC with the HDS.

9. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL C test in SHIFT SOL TEST MENU with the HDS.

   Is a clicking sound heard?

   YES: Go to step 10.

   NO: Replace shift solenoid valve C (see **SHIFT SOLENOID VALVE REPLACEMENT**), then go to step 13 .

10. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
11. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
12. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0761.

    Did the result indicate a fail?

    YES: Repair shift valve C, or replace the transmission, then go to step 13.

    NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 10 and recheck.

13. Clear the DTC with the HDS.
14. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
15. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
16. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0761.

    Did the result indicate a pass?

    YES: The problem has been corrected.

    NO: Return to step 1 and recheck.

DTC P0771: SHIFT SOLENOID VALVE E STUCK OFF

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF arid strainer for metal debris or burnt fluid.

   Has the ATF deteriorated?

   YES: Replace ATF (see **DRAINING & REFILLING**), and go to step 4.

   NO: Go to step 8 .

4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than

20 seconds, then slow down to a stop.

7. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0771.

   Did the result indicate a fail?

   YES: Go to step 8.

   NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.

8. Clear the DTC with the HDS.
9. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL E test in SHIFT SOL TEST MENU with the HDS.

   Is a clicking sound heard?

   YES: Go to step 10.

   NO: Replace shift solenoid valve E (see **SHIFT SOLENOID VALVE REPLACEMENT**), then go to step 13 .

10. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
11. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
12. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0771.

    Did the result indicate a fail?

    YES: Repair shift valve E, or replace the transmission then go to step 13.

    NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 10 and recheck.

13. Clear the DTC with the HDS.
14. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
15. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
16. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0771.

    Did the result indicate a pass?

    YES: The problem has been corrected.

    NO: Return to step 1 and recheck.

DTC P0776: A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B STUCK OFF

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

Has the ATF deteriorated?

YES: Replace ATF (see **DRAINING & REFILLING**), and go to step 4.

NO: Go to step 8 .

4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0776.

   Did the result indicate a fail?

   YES: Go to step 8.

   NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.
8. Clear the DTC with the HDS.
9. Select LINEAR SOL TEST in MISC. TEST MENU, then carry out LINEAR SOL B TEST in LINEAR SOL TEST MENU with the HDS.

   Is the system OK?

   YES: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 9 and recheck.

   NO: Follow instructions indicated on the HDS by the test result, but the tester has not determined the cause of the failure, go to step 10. If any part was replaced, go to step 11 .
10. Inspect A/T clutch pressure control solenoid valve B (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B & C TEST**).

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

    YES: Repair hydraulic system related with shift valve B, or replace the transmission, then go to step 11.

    NO: Replace A/T clutch pressure control solenoid valve B (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B & C REPLACEMENT**), then go to step 11.
11. Clear the DTC with the HDS.
12. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
13. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
14. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0776.

    Did the result indicate a pass?

    YES: The problem has been corrected.

    NO: Return to step 1 and recheck.

DTC P0777: A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B STUCK ON

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF through a strainer (see **DRAINING & REFILLING**). Inspect the ATF and strainer for metal debris or burnt fluid.

   Has the ATF deteriorated?

   YES: Replace ATF (see **DRAINING & REFILLING**), and go to step 4.

   NO: Go to step 8 .
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0777.

   Did the result indicate a fail?

   YES: Go to step 8.

   NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.
8. Clear the DTC with the HDS.
9. Select LINEAR SOL TEST in MISC. TEST MENU, then carry out LINEAR SOL B TEST in LINEAR SOL TEST MENU with the HDS.

   Is the system OK?

   YES: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 9 and recheck.

   NO: Follow instructions indicated on the HDS by the test result, but the tester has not determined the cause of the failure, go to step 10. If any part was replaced, go to step 11 .
10. Inspect A/T clutch pressure control solenoid valve B (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B & C TEST**).

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

    YES: Repair hydraulic system related with shift valve B, or replace the transmission, then go to step 11.

    NO: Replace A/T clutch pressure control solenoid valve B (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B & C REPLACEMENT**), then go to step 11.
11. Clear the DTC with the HDS.
12. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
13. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
14. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0777.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0780: SHIFT CONTROL SYSTEM

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Check for other DTCs indicated simultaneous with the code P0780.

NOTE: P0780 means there is one or more A/T DTCs about the shift control system.

Are there other DTCs?

YES: Go to step 2.

NO: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see PCM UPDATING & SUBSTITUTION FOR TESTING), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

2. Perform the troubleshooting flowchart for the indicated codes:
   - **P1730:** (see **DTC P1730: PROBLEM IN SHIFT CONTROL SYSTEM**).
   - **P1731:** (see **DTC P1731: PROBLEM IN SHIFT CONTROL SYSTEM**).
   - **P1732:** (see **DTC P1732: PROBLEM IN SHIFT CONTROL SYSTEM**).
   - **P1733:** (see **DTC P1733: PROBLEM IN SHIFT CONTROL SYSTEM**).
   - **P1734:** (see **DTC P1734: PROBLEM IN SHIFT CONTROL SYSTEM**).

DTC P0796: A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C STUCK OFF

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

Has the ATF deteriorated?

YES: Replace ATF (see **DRAINING & REFILLING**), and go to step 4.

NO: Go to step 8 .

4. Clear the DTC with the HDS.

5. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0796.

   Did the result indicate a fail?

   YES: Go to step 8.

   NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.
8. Clear the DTC with the HDS.
9. Select LINEAR SOL TEST in MISC. TEST MENU, then carry out LINEAR SOL C TEST in LINEAR SOL TEST MENU with the HDS.

   Is the system OK?

   YES: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 9 and recheck.

   NO: Follow instructions indicated on the HDS by the test result, but the tester has not determined the cause of the failure, go to step 10. If any part was replaced, go to step 11 .
10. Inspect A/T clutch pressure control solenoid valve C (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B & C TEST**).

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

    YES: Repair hydraulic system related with shift valve B and C, or replace the transmission, then go to step 11.

    NO: Replace A/T clutch pressure control solenoid valve C (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B & C REPLACEMENT**), then go to step 11.
11. Clear the DTC with the HDS.
12. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
13. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
14. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0796.

    Did the result indicate a pass?

    YES: The problem has been corrected.

    NO: Return to step 1 and recheck.

DTC P0797: A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C STUCK ON

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.

3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

   Has the ATF deteriorated?

   YES: Replace ATF (see **DRAINING & REFILLING**), and go to step 4.

   NO: Go to step 8 .
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0797.

   Did the result indicate a fail?

   YES: Go to step 8.

   NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.
8. Clear the DTC with the HDS.
9. Select LINEAR SOL TEST in MISC. TEST MENU, then carry out LINEAR SOL C TEST in LINEAR SOL TEST MENU with the HDS.

   Is the system OK?

   YES: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 9 and recheck.

   NO: Follow instructions indicated on the HDS by the test result, but the tester has not determined the cause of the failure, go to step 10. If any part was replaced, go to step 11 .
10. Inspect A/T clutch pressure control solenoid valve C (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B & C TEST**).

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

    YES: Repair hydraulic system related with shift valves B and C, or replace the transmission, then go to step 11.

    NO: Replace A/T clutch pressure control solenoid valve C (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B & C REPLACEMENT**), then go to step 11.
11. Clear the DTC with the HDS.
12. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
13. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
14. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0797.

    Did the result indicate a pass?

    YES: The problem has been corrected.

    NO: Return to step 1 and recheck.

DTC P0812: OPEN IN TRANSMISSION RANGE SWITCH ATP RVS SWITCH CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **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 ON (II).
2. Shift to the **R** position, 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: Inspect the end of the selector control shaft (see step 6 of **TRANSMISSION RANGE SWITCH TEST**), adjust the shift cable (see **SHIFT CABLE**), then recheck. If problem still exists, go to step 4 .
3. Check the REVERSE SWITCH signal with the HDS.

   Is the REVERSE SWITCH ON?

   YES: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the transmission range switch and PCM.

   NO: Go to step 4.
4. Turn the ignition switch OFF.
5. Check for continuity between PCM connector terminals A8 and body ground, and between A9 and body ground.

   Is there continuity?

   YES: Go to step 6.

   NO: Repair open in the wires between PCM connector terminals A8, A9, and ground (G101), and repair poor ground (G101), then go to step 12 .

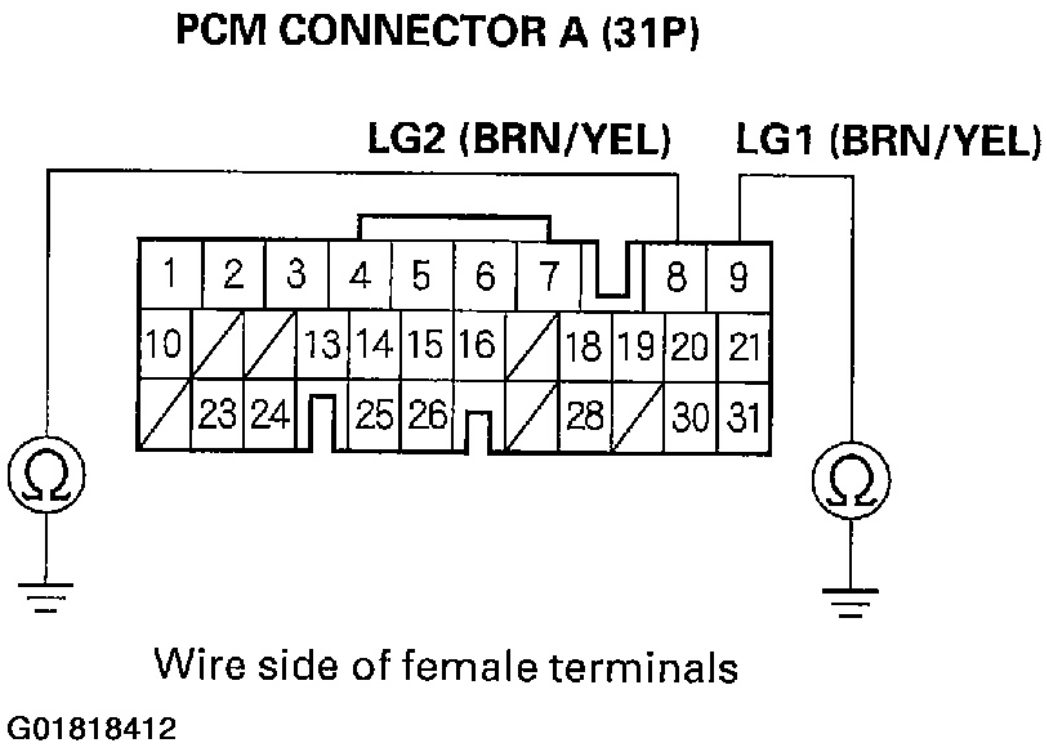


Fig. 156: Checking For Continuity Between PCM Connector Terminals A8 & Body Ground & Between A9 & Body Ground

6. Turn the ignition switch ON (II).
7. Shift to the **R** position.
8. Measure the voltage between PCM connector terminals C12 and A8 or A9.

Is there voltage?

YES: Go to step 9.

NO: Check for loose or poor connections at PCM connector terminal C12. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

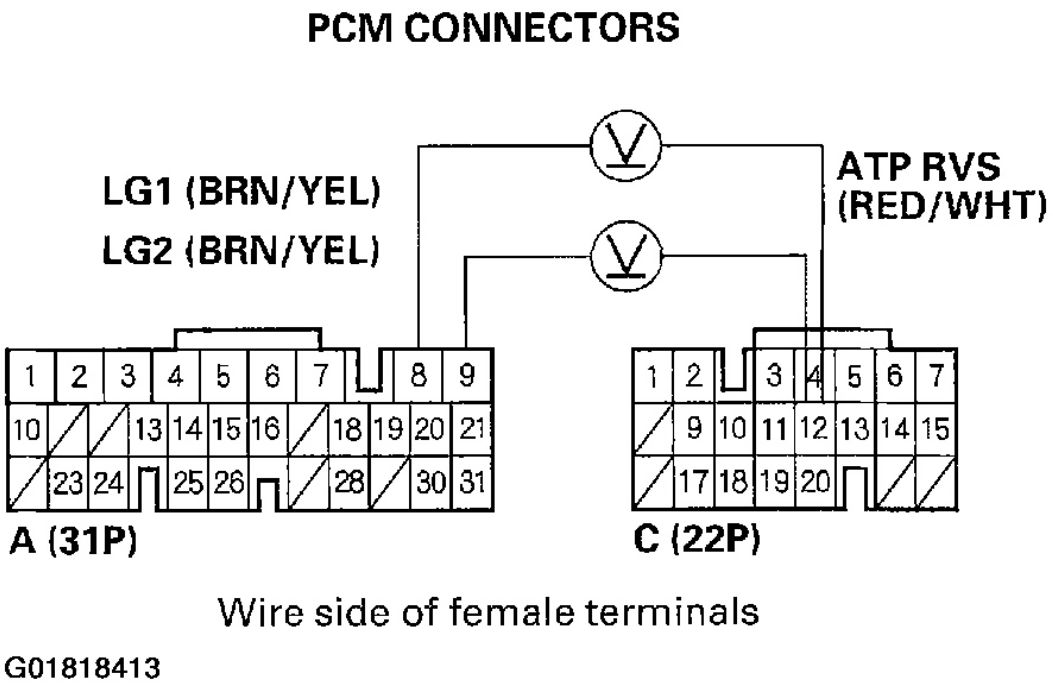


Fig. 157: Measuring The Voltage Between PCM Connector Terminals C12 & A8 Or A9

9. Turn the ignition switch OFF.
10. Disconnect the transmission range switch connector.
11. Check for continuity between the No. 1 and No. 10 terminals at the transmission range switch. The shift position must be **R** .

Is there continuity?

YES: Check for loose or poor connections at the transmission range switch connector terminal No. 1. If the connection is OK, repair open in the wire between PCM connector terminal C12 and the transmission range switch, then go to step 12.

NO: Replace the transmission range switch, then go to step 12.

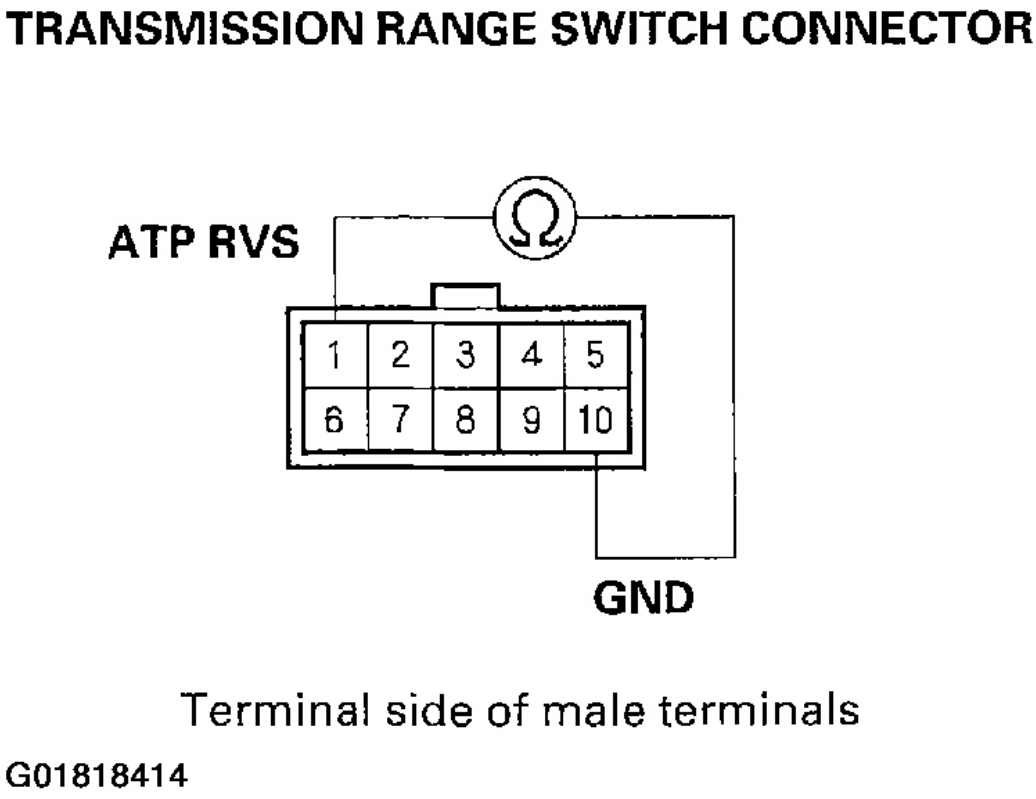


Fig. 158: Checking For Continuity Between The No. 1 & No. 10 Terminals At The Transmission Range Switch

12. Clear the DTC with the HDS.
13. Start the engine, and shift the shift lever slowly into the **P** , **R** , then **N** position.
14. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0812.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0815: SHORT IN TRANSMISSION GEAR SELECTION SWITCH UPSHIFT SWITCH CIRCUIT, OR TRANSMISSION GEAR SELECTION SWITCH UPSHIFT SWITCH STUCK ON

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **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 ON (II).
2. Shift to the **P** position.
3. Verify the transmission gear selection switch upshift switch inputs with the HDS in the A/T data list.

   Is UPSHIFT SW ON?

   YES: Go to step 4.

   NO: Intermittent failure, the system is OK at this time. Check the WHT/BLU wire for an intermittent short to ground between the transmission gear selection switch and PCM.
4. Turn the ignition switch OFF.
5. Disconnect the transmission gear selection switch connector.
6. Turn the ignition switch ON (II).
7. Verify the transmission gear selection switch upshift switch inputs with the HDS in the A/T data list.

   Is UPSHIFT SW ON?

   YES: Go to step 8.

   NO: Replace the transmission gear selection switch (see **TRANSMISSION GEAR SELECTION SWITCH REPLACEMENT**), then go to step 12 .
8. Turn the ignition switch OFF.
9. Jump the SCS line with the HDS.
10. Disconnect PCM connector D (17P).
11. Check for continuity between transmission gear selection switch connector terminal No. 7 and body ground.

    Is there continuity?

    YES: Repair short to ground in the wire between PCM connector terminal D3 and the transmission gear selection switch connector, then go to step 12.

    NO: Check for loose or poor connections at PCM connector terminal D3. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

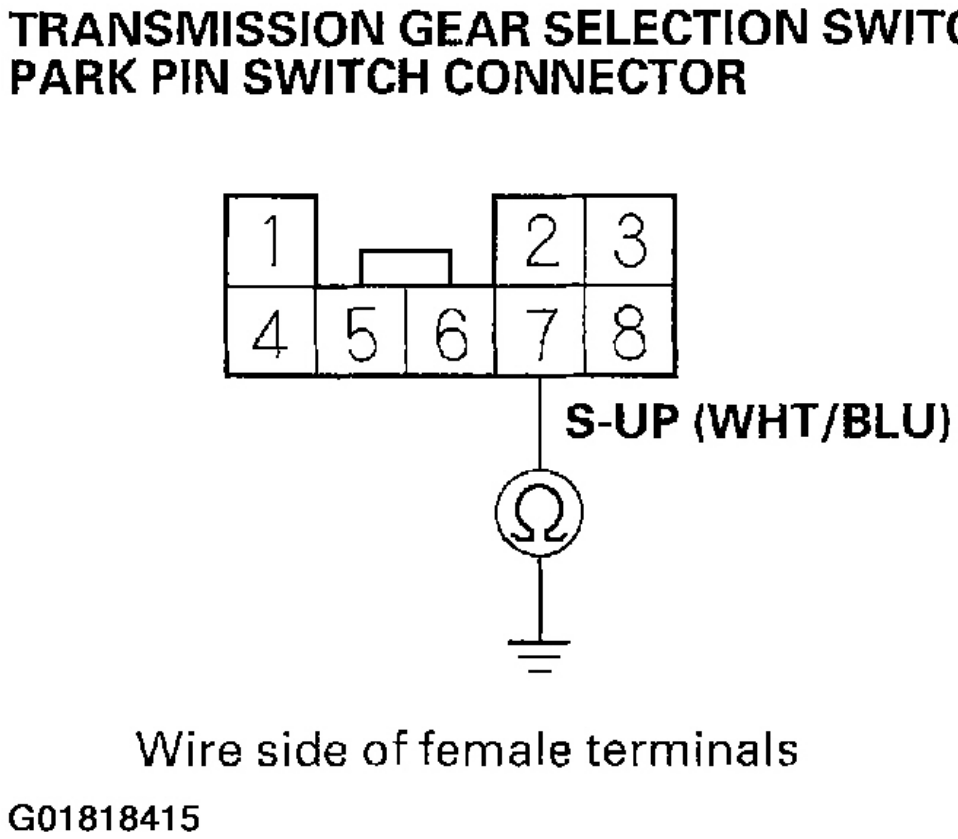


Fig. 159: Checking For Continuity Between Transmission Gear Selection Switch Connector Terminal No. 7 & Body Ground

12. Clear the DTC with the HDS.
13. Start the engine in the **P** position, wait for more than 10 seconds, then shift to the **M** position.
14. Push the shift lever toward shiftup position (+) slowly, and return to neutral position; repeat this test 10 times or more.
15. Pull the shift lever toward shiftdown position (-) slowly, and return to neutral position; repeat this test 10 times or more.
16. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0815.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0816: SHORT IN TRANSMISSION GEAR SELECTION SWITCH DOWNSHIFT SWITCH CIRCUIT, OR TRANSMISSION GEAR SELECTION SWITCH DOWNSHIFT SWITCH STUCK ON

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATIONGENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **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 ON (II).
2. Shift to the **P** position.
3. Verify the transmission gear selection switch downshift switch inputs with the HDS in the A/T data list.

   Is DOWNSHIFT SW ON?

   YES: Go to step 4.

   NO: Intermittent failure, the system is OK at this time. Check the ORN wire for an intermittent short to ground between the transmission gear selection switch and PCM.
4. Turn the ignition switch OFF.
5. Disconnect the transmission gear selection switch connector.
6. Turn the ignition switch ON (II).
7. Verify the transmission gear selection switch downshift switch inputs with the HDS in the A/T data list.

   Is DOWNSHIFT SW ON?

   YES: Go to step 8.

   NO: Replace the transmission gear selection switch (see **Transmission Gear Selection Switch Replacement**), then go to step 12 .
8. Turn the ignition switch OFF.
9. Jump the SCS line with the HDS.
10. Disconnect PCM connector D (17P).
11. Check for continuity between transmission gear selection switch connector terminal No. 8 and body ground.

    Is there continuity?

    YES: Repair short to ground in the wire between PCM connector terminal D9 and the transmission gear selection switch connector, then go to step 12.

    NO: Check for loose or poor connections at PCM connector terminal D9. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

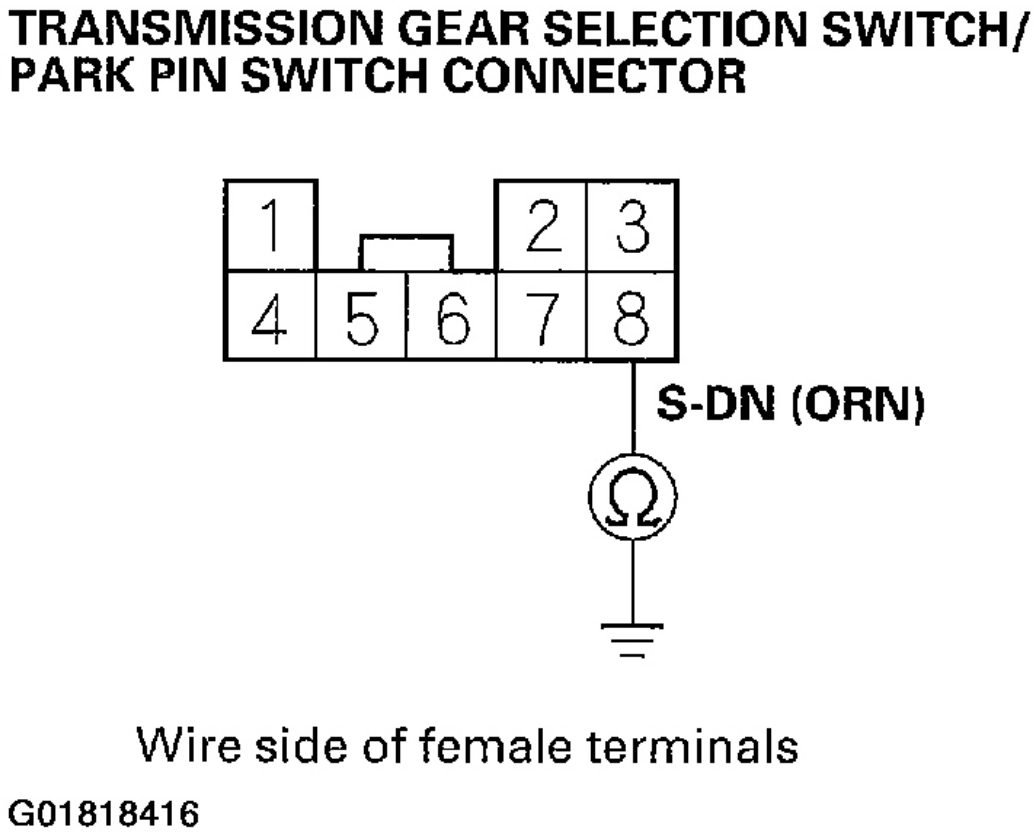


Fig. 160: Checking For Continuity Between Transmission Gear Selection Switch Connector Terminal No. 8 & Body Ground

12. Clear the DTC with the HDS.
13. Start the engine in the **P** position, wait for more than 10 seconds, then shift to the **M** position.
14. Push the shift lever toward shiftup position (+) slowly, and return to neutral position; repeat this test 10 times or more.
15. Pull the shift lever toward shiftdown position (-) slowly, and return to neutral position; repeat this test 10 times or more.
16. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0816.

    Did the result indicate a pass?

    YES: The problem has been corrected.

    NO: Return to step 1 and recheck.

DTC P0842: SHORT IN 2ND CLUTCH TRANSMISSION FLUID PRESSURE SWITCH CIRCUIT, OR 2ND CLUTCH TRANSMISSION FLUID PRESSURE SWITCH STUCK ON

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Check the 2nd PRES SWITCH signal with the HDS in the A/T data list when not in 2nd gear.

   Is the 2nd PRES SWITCH OFF?

   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). Drive the vehicle in 2nd gear in the **D** position for more than 5 seconds, then upshift to 4th gear, and drive in 4th gear for more than 5 seconds. Slow down to a stop.
4. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0842.

   Did the result indicate a fail?

   YES: Go to step 5.

   NO: Intermittent failure, the system is OK at this time. Check the BLU/RED wire for an intermittent short to ground between the 2nd clutch transmission fluid pressure switch and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck.
5. Turn the ignition switch OFF.
6. Disconnect the 2nd clutch transmission fluid pressure switch connector.
7. Turn the ignition switch ON (II).
8. Check the 2nd PRES SWITCH signal with the HDS in the A/T data list.

   Is the 2nd PRES SWITCH OFF?

   YES: Replace the 2nd clutch transmission fluid pressure switch (see **2ND CLUTCH TRANSMISSION FLUID PRESSURE SWITCH REPLACEMENT**), then go to step 13 .

   NO: Go to step 9.
9. Turn the ignition switch OFF.
10. Jump the SCS line with the HDS.
11. Disconnect PCM connector C (22P).
12. Check for continuity between PCM connector terminal C13 and body ground.

    Is there continuity?

    YES: Repair short to ground in the wire between PCM connector terminal C13 and the 2nd clutch transmission fluid pressure switch, then go to step 13.

    NO: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

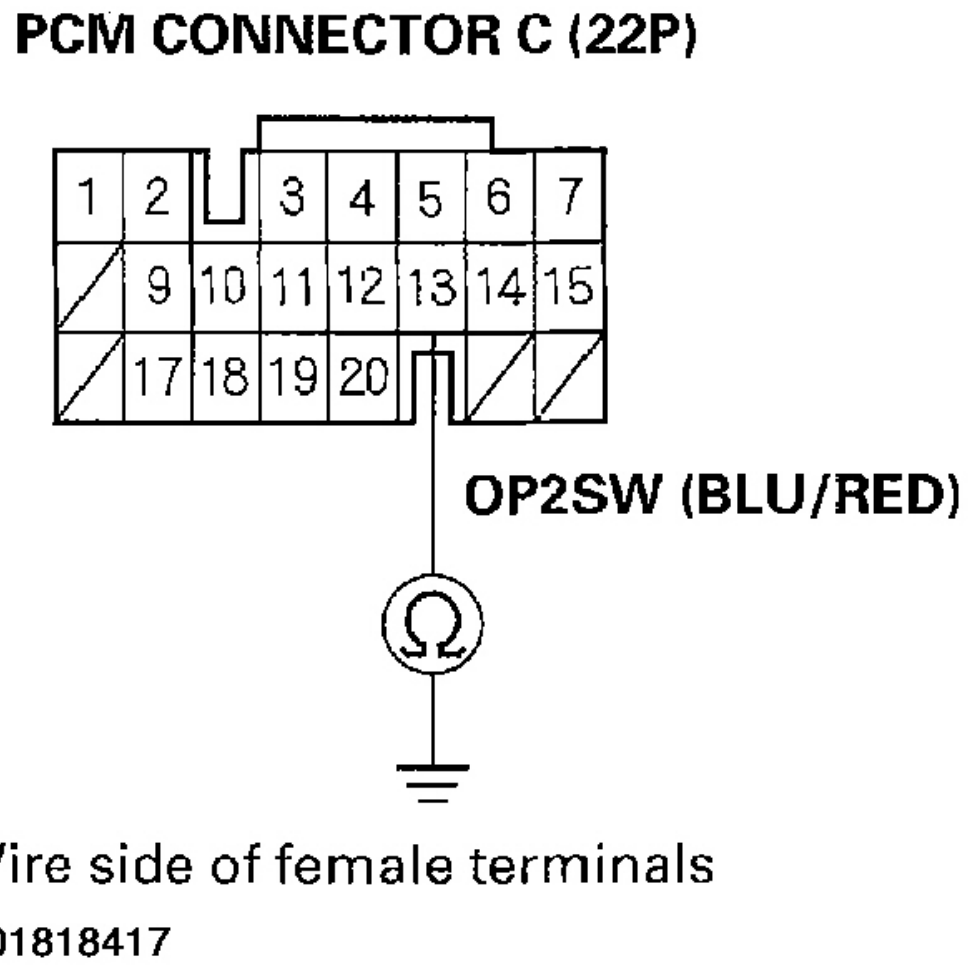


Fig. 161: Checking For Continuity Between PCM Connector Terminal C13 & Body Ground

13. Clear the DTC with the HDS.
14. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on). Drive the vehicle in 2nd gear in the **M** position for more than 5 seconds, then upshift to 4th gear, and drive in 4th gear for more than 5 seconds. Slow down to a stop.
15. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0842.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0843: OPEN IN 2ND CLUTCH TRANSMISSION FLUID PRESSURE SWITCH CIRCUIT, OR 2ND CLUTCH TRANSMISSION FLUID PRESSURE SWITCH STUCK OFF

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on). Shift into the **M** position 2nd gear while pressing the brake pedal, and verify that the SHIFT MAP NUMBER indicates 2nd with the HDS in the A/T data list.
3. Check the 2nd PRES SWITCH signal with the HDS in the A/T data list.

   Is the 2nd PRES SWITCH ON?

   YES: Go to step 4.

   NO: Go to step 6 .
4. Drive the vehicle in 2nd gear in the **M** position for more than 5 seconds, then upshift to 4th gear, and drive in 4th gear for more than 5 seconds. Slow down to a stop.
5. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0843.

   Did the result indicate a fail?

   YES: Go to step 6.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the 2nd clutch transmission fluid pressure switch and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.
6. Turn the ignition switch OFF.
7. Disconnect the 2nd clutch transmission fluid pressure switch connector.
8. Turn the ignition switch ON (II).
9. Measure the voltage between the 2nd clutch transmission fluid pressure switch connector terminal and body ground.

   Is there about 5 V?

   YES: Replace the 2nd clutch transmission fluid pressure switch (see **2ND CLUTCH TRANSMISSION FLUID PRESSURE SWITCH REPLACEMENT**), then go to step 11 .

   NO: Go to step 10.

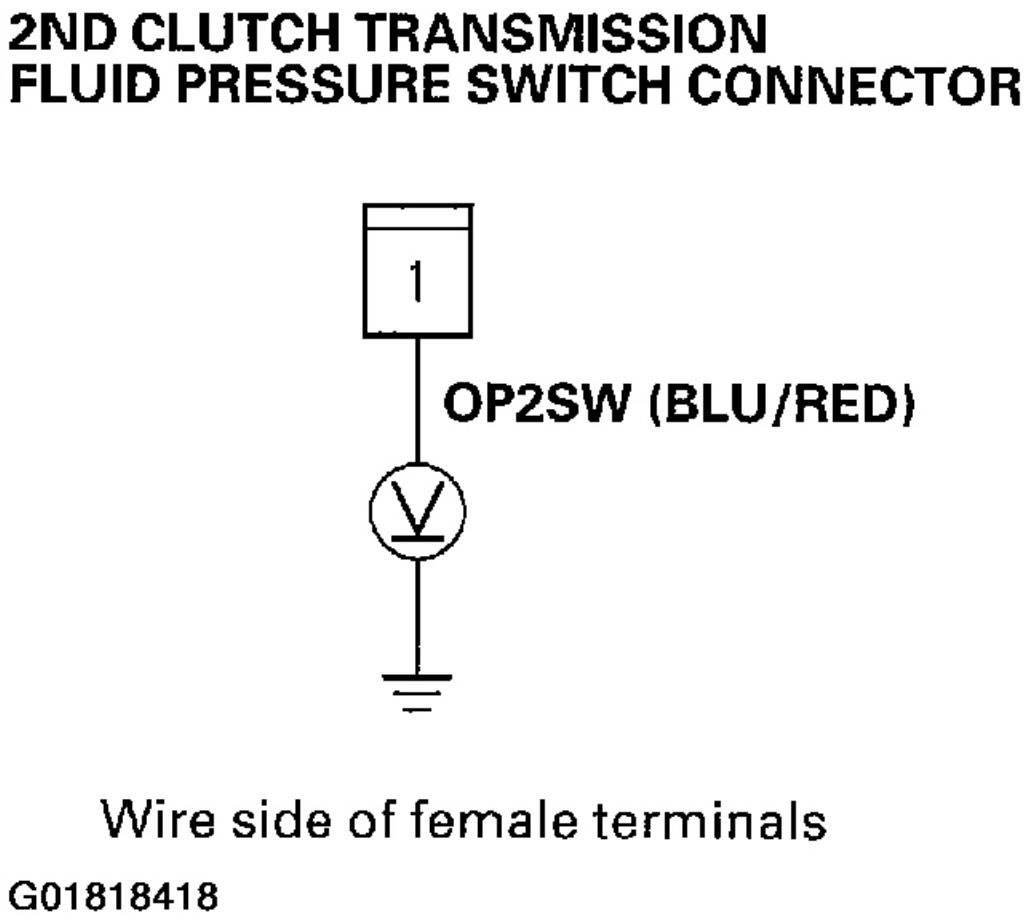


Fig. 162: Measuring The Voltage Between The 2nd Clutch Transmission Fluid Pressure Switch Connector Terminal & Body Ground

10. Measure the voltage between PCM connector terminal C13 and body ground.

    Is there about 5 V?

    YES: Repair open in the wire between PCM connector terminal C13 and the 2nd clutch transmission fluid pressure switch, go to step 11.

    NO: Check for loose or poor connections at PCM connector terminal C13. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

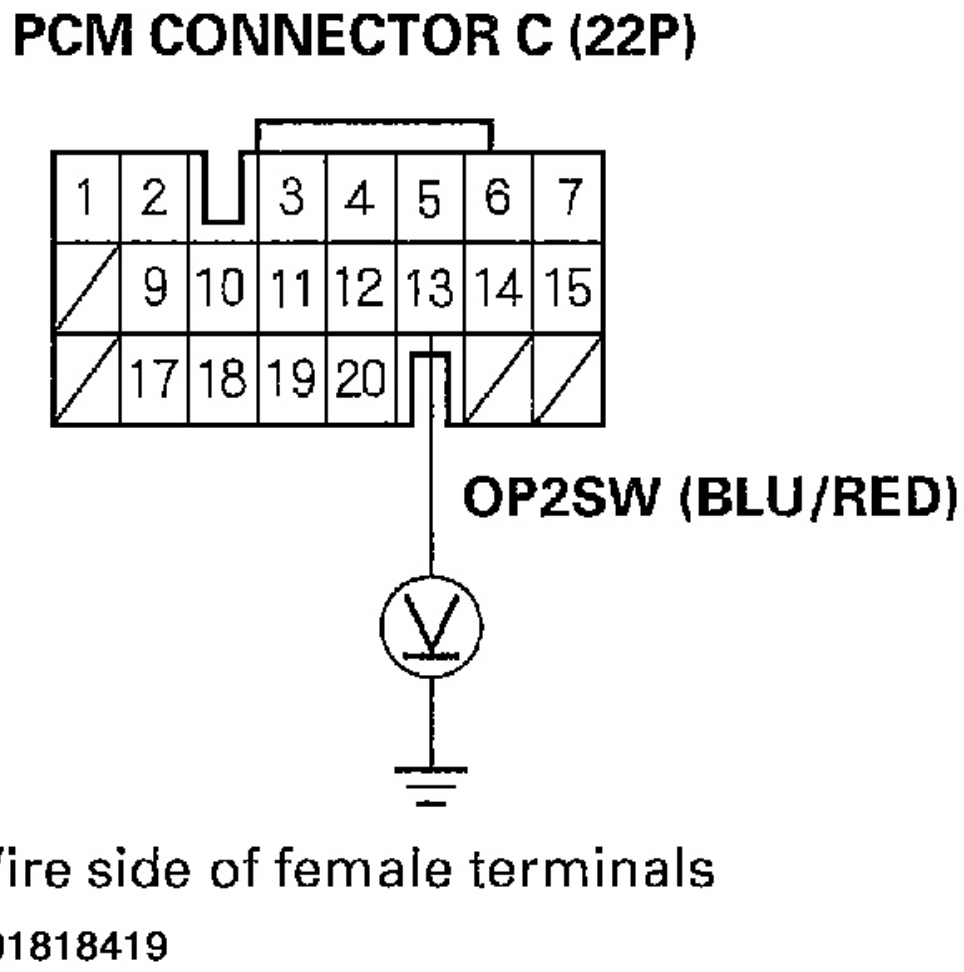


Fig. 163: Measuring The Voltage Between PCM Connector Terminal C13 & Body Ground

11. Clear the DTC with the HDS.
12. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on). Drive the vehicle in 2nd gear in the **M** position for more than 5 seconds, then upshift to 4th gear, and drive in 4th gear for more than 5 seconds. Slow down to a stop.
13. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0843.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0847: SHORT IN 3RD CLUTCH TRANSMISSION FLUID PRESSURE SWITCH CIRCUIT, OR 3RD CLUTCH TRANSMISSION FLUID PRESSURE SWITCH STUCK ON

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Check the 3rd PRES SWITCH signal with the HDS in the A/T data list when not in 3rd gear.

   Is the 3rd PRES SWITCH ON?

   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). Drive the vehicle in 3rd gear in the **M** position for more than 5 seconds, then upshift to 4th gear, and drive in 4th gear for more than 5 seconds. Slow down to a stop.
4. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0847.

   Did the result indicate a fail?

   YES: Go to step 5.

   NO: Intermittent failure, the system is OK at this time. Check the BLU/WHT wire for an intermittent short to ground between the 3rd clutch transmission fluid pressure switch and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck.
5. Turn the ignition switch OFF.
6. Disconnect the 3rd clutch transmission fluid pressure switch connector.
7. Turn the ignition switch ON (II).
8. Check the 3rd PRES SWITCH signal with the HDS in the A/T data list.

   Is the 3rd PRES SWITCH OFF?

   YES: Replace the 3rd clutch transmission fluid pressure switch (see **3RD CLUTCH TRANSMISSION FLUID PRESSURE SWITCH REPLACEMENT**), go to step 13 .

   NO: Go to step 9.
9. Turn the ignition switch OFF.
10. Jump the SCS line with the HDS.
11. Disconnect PCM connector C (22P).
12. Check for continuity between PCM connector terminal C10 and body ground.

    Is there continuity?

    YES: Repair short to ground in the wire between PCM connector terminal C10 and the 3rd clutch transmission fluid pressure switch, go to step 13.

    NO: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

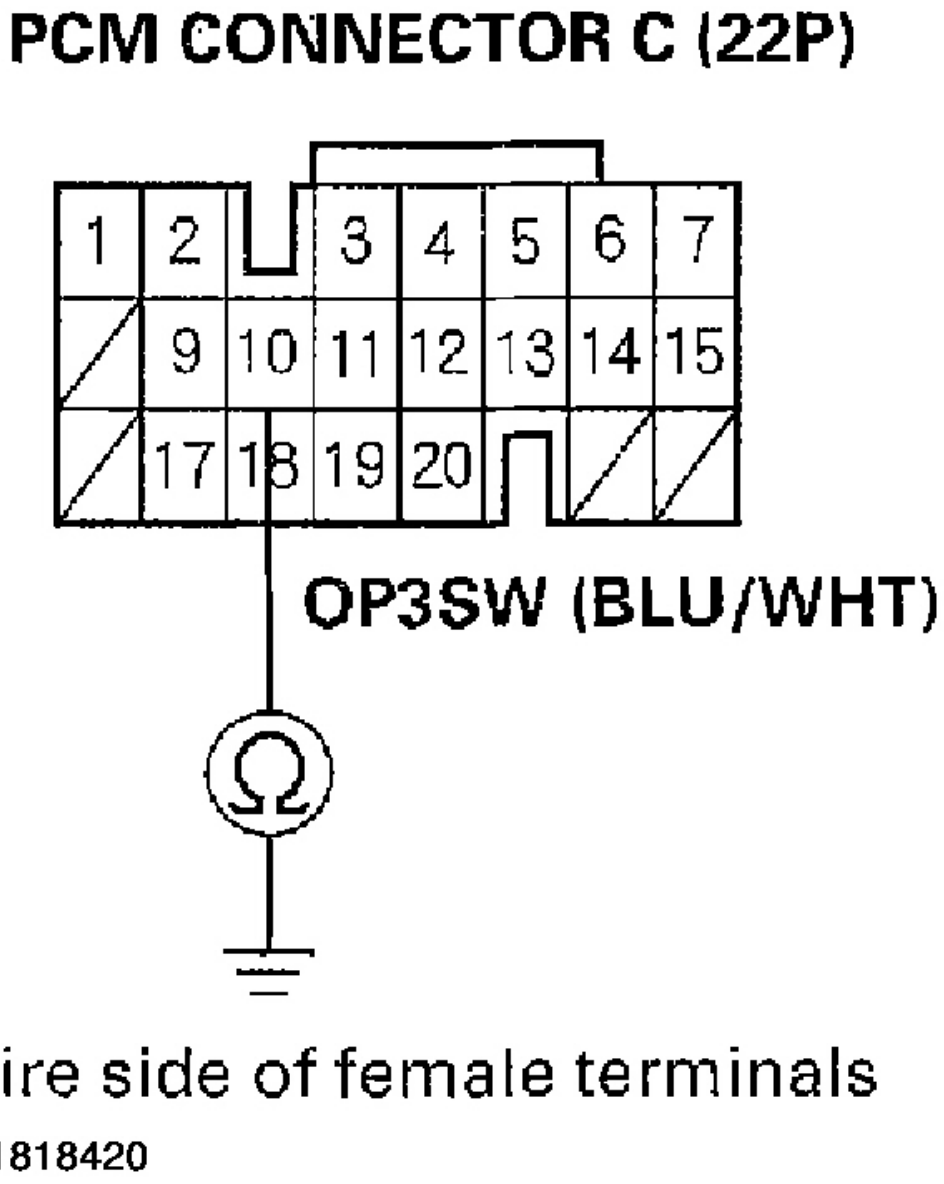


Fig. 164: Checking For Continuity Between PCM Connector Terminal C10 & Body Ground

13. Clear the DTC with the HDS.
14. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on). Drive the vehicle in 3rd gear in the **M** position for more than 5 seconds, then upshift to 4th gear, and drive in 4th gear for more than 5 seconds. Slow down to a stop.
15. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0847.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0848: OPEN IN 3RD CLUTCH TRANSMISSION FLUID PRESSURE SWITCH CIRCUIT, OR 3RD CLUTCH TRANSMISSION FLUID PRESSURE SWITCH STUCK OFF

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on). Drive the vehicle in the 3rd gear in the **M** position, and verify that the SHIFT MAP NUMBER indicates 3rd with the HDS in the A/T data list.
3. Check the 3rd PRES SWITCH signal with the HDS in the A/T data list.

   Is the 3rd PRES SWITCH ON?

   YES: Go to step 4.

   NO: Go to step 6 .
4. Drive the vehicle in 3rd gear in the **M** position for more than 5 seconds, then upshift to 4th gear, and drive in 4th gear for more than 5 seconds. Slow down to a stop.
5. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0848.

   Did the result indicate a fail?

   YES: Go to step 6.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the 3rd clutch transmission fluid pressure switch and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.
6. Turn the ignition switch OFF.
7. Disconnect the 3rd clutch transmission fluid pressure switch connector.
8. Turn the ignition switch ON (II).
9. Measure the voltage between the 3rd clutch transmission fluid pressure switch connector terminal and body ground.

   Is there about 5 V?

   YES: Replace the 3rd clutch transmission fluid pressure switch (see **3RD CLUTCH TRANSMISSION FLUID PRESSURE SWITCH REPLACEMENT**), then go to step 11 .

   NO: Go to step 10.

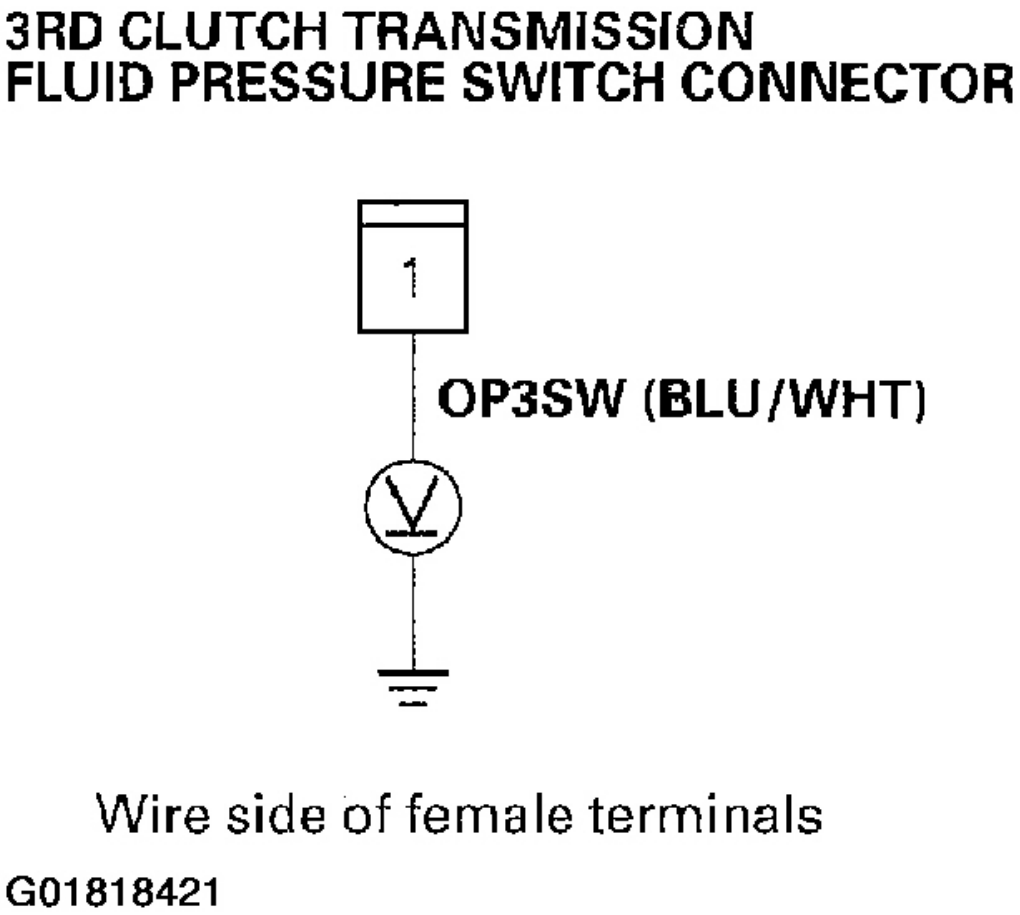


Fig. 165: Measuring The Voltage Between The 3rd Clutch Transmission Fluid Pressure Switch Connector Terminal & Body Ground

10. Measure the voltage between PCM connector terminal C10 and body ground.

    Is there about 5 V?

    YES: Repair open in the wire between PCM connector terminal C10 and the 3rd clutch transmission fluid pressure switch, then go to step 11.

    NO: Check for loose or poor connections at PCM connector terminal C10. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

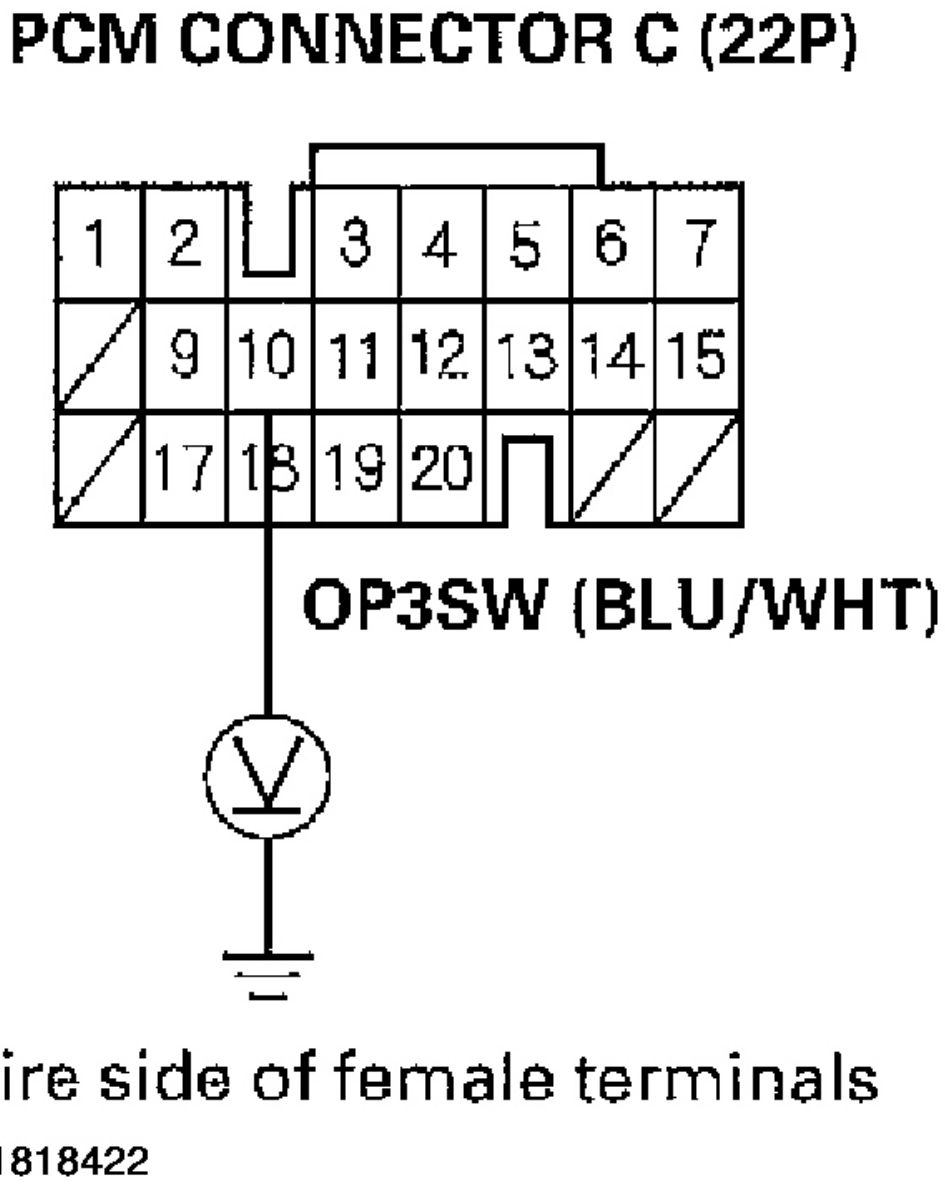


Fig. 166: Measuring The Voltage Between PCM Connector Terminal C10 & Body Ground

11. Clear the DTC with the HDS.
12. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on). Drive the vehicle in 3rd gear in the **M** position for more than 5 seconds, then upshift to 4th gear, and drive in 4th gear for more than 5 seconds. Slow down to a stop.
13. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0848.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0957: SHORT IN TRANSMISSION GEAR SELECTION SWITCH CIRCUIT, OR TRANSMISSION GEAR SELECTION SWITCH STUCK ON

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **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 ON (II).
2. Shift to the **P** position.
3. Verify the transmission gear selection switch sequential sportshift mode switch inputs with the HDS in the A/T data list.

   Is sequential sportshift mode SW ON?

   YES: Go to step 4.

   NO: Intermittent failure, the system is OK at this time. Check the BRN wire for an intermittent short to ground between the transmission gear selection switch and PCM.
4. Turn the ignition switch OFF.
5. Disconnect the transmission gear selection switch connector.
6. Turn the ignition switch ON (II).
7. Verify the transmission gear selection switch sequential sportshift mode switch inputs with the HDS in the A/T data list.

   Is sequential sportshift mode SW ON?

   YES: Go to step 8.

   NO: Replace the transmission gear selection switch (see **Transmission Gear Selection Switch Replacement**), then go to step 12 .
8. Turn the ignition switch OFF.
9. Jump the SCS line with the HDS.
10. Disconnect PCM connector D (17P).
11. Check for continuity between transmission gear selection switch connector terminal No. 3 and body ground.

    Is there continuity?

    YES: Repair short to ground in the wire between PCM connector terminal D2 and the transmission gear selection switch connector, then go to step 12.

    NO: Check for loose or poor connections at PCM connector terminal D2. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the

symptom/indication goes away with a known-good PCM, replace the original PCM.

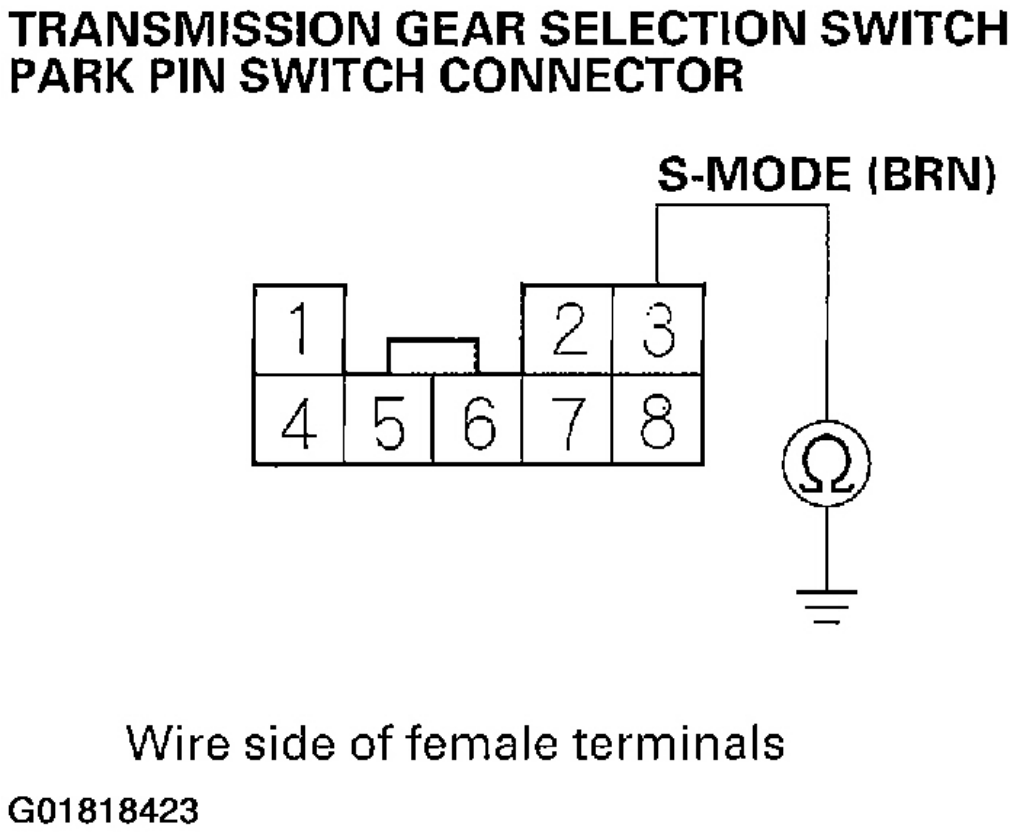


Fig. 167: Checking For Continuity Between Transmission Gear Selection Switch Connector Terminal No. 3 & Body Ground

12. Clear the DTC with the HDS.
13. Start the engine in the **P** position, wait for more than 10 seconds, then shift to the **M** position.
14. Push the shift lever toward shiftup position (+) slowly, and return to neutral position; repeat this test 10 times or more.
15. Pull the shift lever toward shiftdown position (-) slowly, and return to neutral position; repeat this test 10 times or more.
16. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0957.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0958: OPEN IN TRANSMISSION GEAR SELECTION SWITCH CIRCUIT, OR

TRANSMISSION GEAR SELECTION SWITCH STUCK OFF

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **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 ON (II).
2. Shift to the **M** position.
3. Verify the transmission gear selection switch sequential sportshift mode switch inputs with the HDS in the A/T data list.

   Is sequential sportshift mode SW OFF?

   YES: Go to step 4.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the transmission gear selection switch and PCM.
4. Turn the ignition switch OFF.
5. Disconnect the transmission gear selection switch connector.
6. Check for continuity between transmission gear selection switch connector terminals No. 2 and No. 3.

   Is there continuity when the shift lever is in M position, and no continuity when the shift lever is any other M position?

   YES: Go to step 7.

   NO: Replace the transmission gear selection switch (see **Transmission Gear Selection Switch Replacement**), then go to step 10 .

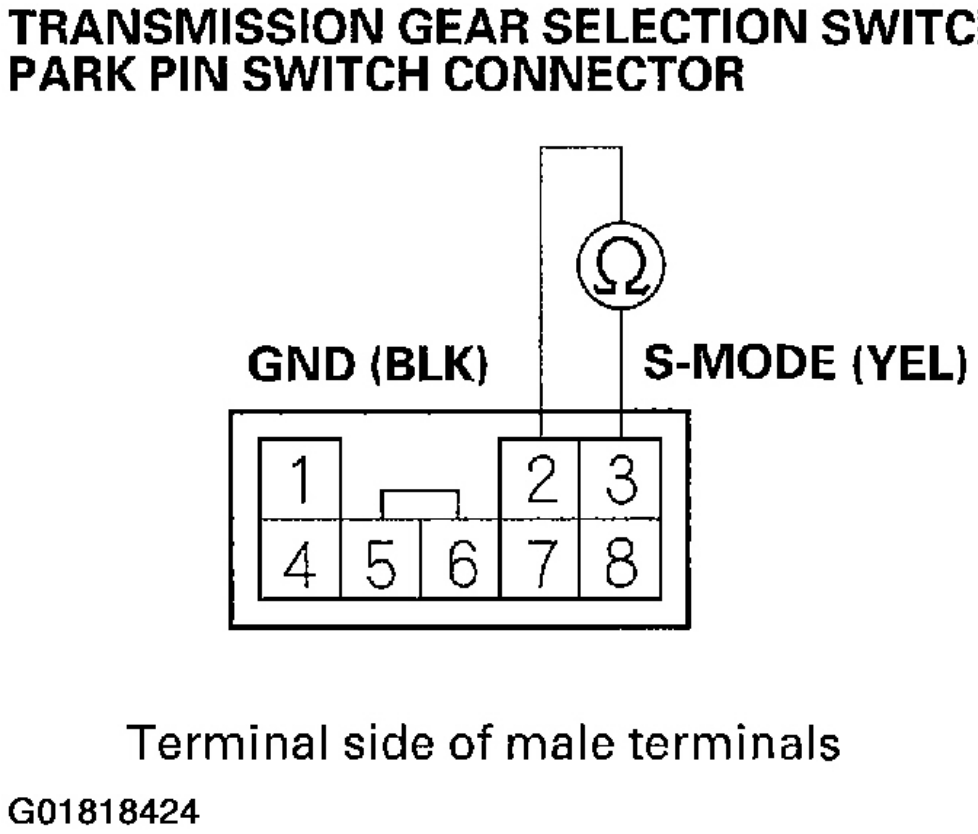


Fig. 168: Checking For Continuity Between Transmission Gear Selection Switch Connector Terminals No. 2 & No. 3

7. Turn the ignition switch ON (II).
8. Measure the voltage between transmission gear selection switch connector terminal No. 3 and body ground.

Is there about 5 V?

YES: Repair open in the wire between transmission gear selection switch connector terminal No. 2 and ground (G501), or repair poor ground (G501), then go to step 10 .

NO: Go to step 9.

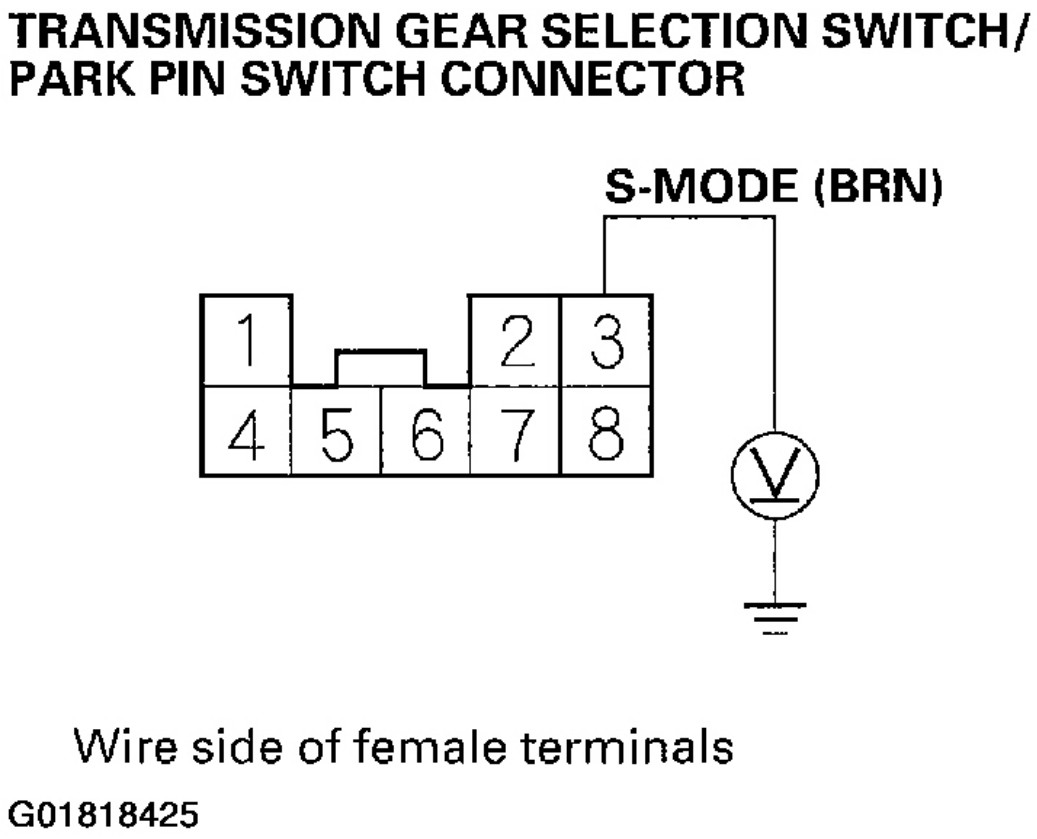


Fig. 169: Measuring The Voltage Between Transmission Gear Selection Switch Connector Terminal No. 3 & Body Ground

9. Measure the voltage between PCM connector terminal D2 and body ground.

   Is there about 5 V?

   YES: Repair open in the wire between PCM connector terminal D2 and the transmission gear selection switch connector, then go to step 10.

   NO: Check for loose or poor connections at PCM connector terminal D2. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

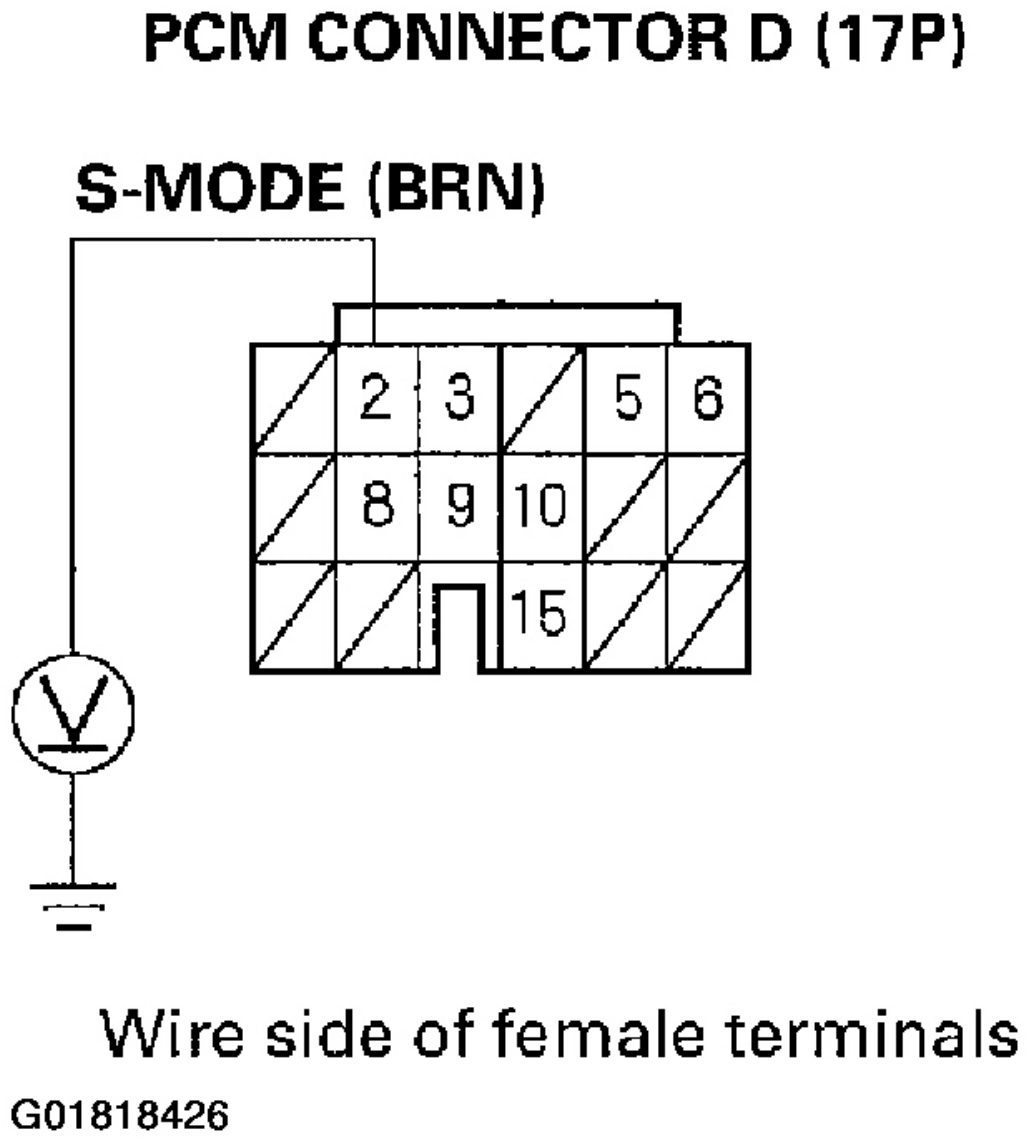


Fig. 170: Measuring The Voltage Between PCM Connector Terminal D2 & Body Ground

10. Clear the DTC with the HDS.
11. Start the engine in the **P** position, wait for more than 10 seconds, then shift to the **M** position.
12. Push the shift lever toward shiftup position (+) slowly, and return to neutral position; repeat this test 10 times or more.
13. Pull the shift lever toward shiftdown position (-) slowly, and return to neutral position; repeat this test 10 times or more.

14. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0958.

    Did the result indicate a pass?

    YES: The problem has been corrected.

    NO: Return to step 1 and recheck.

DTC P0962: PROBLEM IN A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Check that DTC P0962 recurs.

   Is DTC P0962 indicated?

   YES: Go to step 6 .

   NO: Go to step 3.
3. Select P CTRL SOL CONTROL in MISC. TEST MENU, then select P. CONTROL SOL A in P CTRL SOL CTRL MENU with the HDS.
4. Drive with the A/T clutch pressure control solenoid valve A at 1.0 A in SOL A CONTROL menu.
5. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0962.

   Did the result indicate a fail?

   YES: Go to step 6.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/T clutch pressure control solenoid valve A and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck.
6. Turn the ignition switch OFF.
7. Disconnect the A/T clutch pressure control solenoid valve A connector.
8. Measure A/T clutch pressure control solenoid valve A resistance at the solenoid connector.

   Is there 3-10 ohm?

   YES: Go to step 9.

   NO: Replace the A/T clutch pressure control solenoid valve A (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A REPLACEMENT**), then go to step 12 .

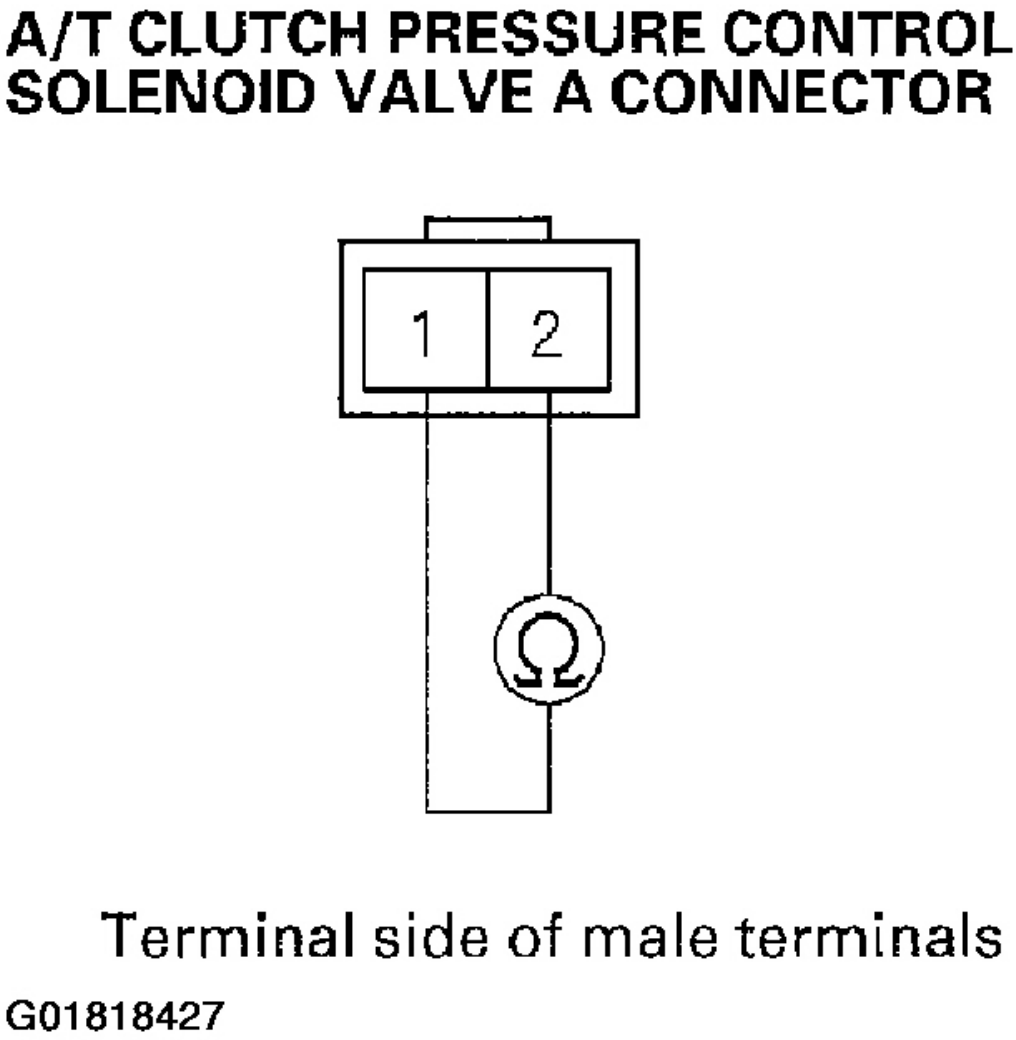


Fig. 171: Measuring A/T Clutch Pressure Control Solenoid Valve A Resistance At The Solenoid Connector

9. Check for continuity between A/T clutch pressure control solenoid valve A connector terminal No. 2 and body ground.

   Is there continuity?

   YES: Go to step 10.

   NO: Repair open in the wire between the A/T clutch pressure control solenoid valve A and ground (G101), or repair poor ground (G101), then go to step 12 .

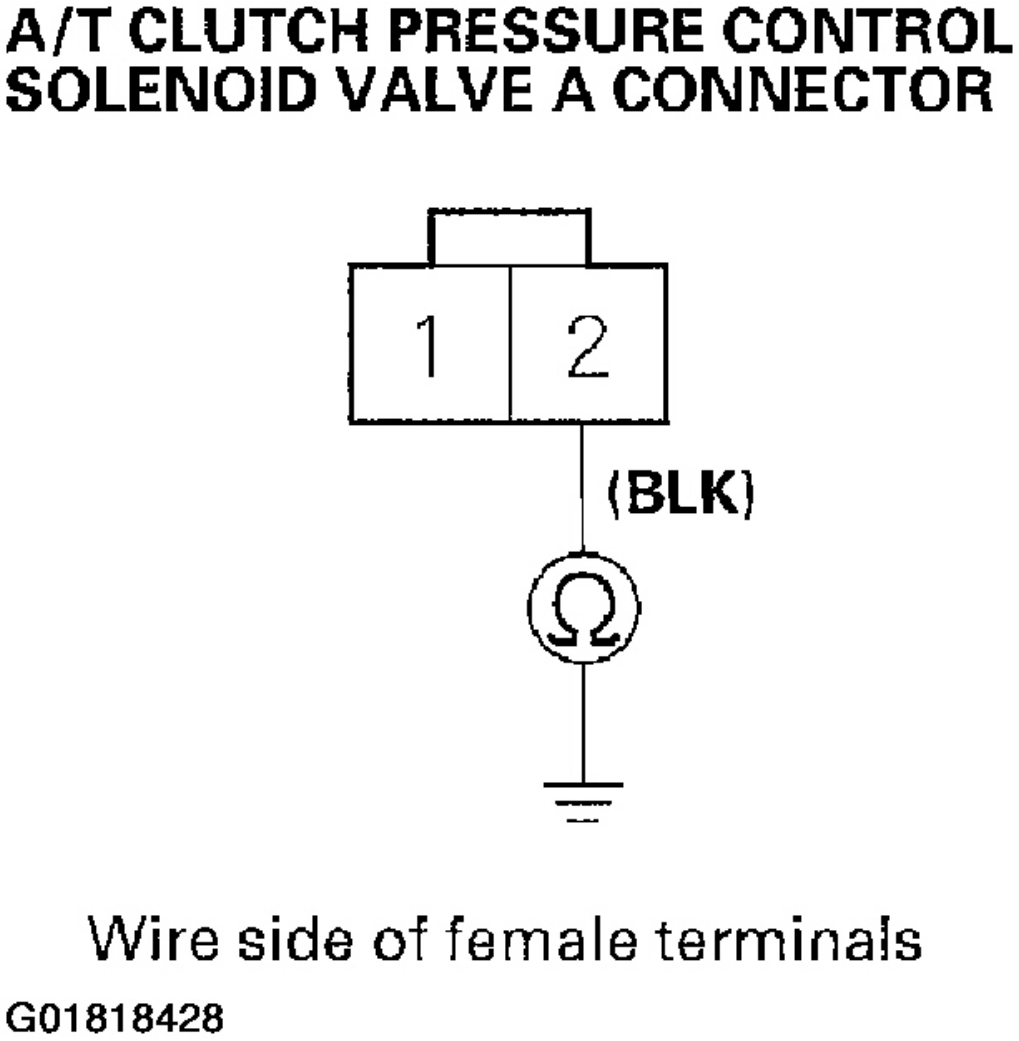


Fig. 172: Checking For Continuity Between A/T Clutch Pressure Control Solenoid Valve A Connector Terminal No. 2 & Body Ground

10. Turn the ignition switch ON (II).
11. Measure the voltage between A/T clutch pressure control solenoid valve A connector terminals No. 1 and No. 2.

Is there about 11 V as the ignition switch is turned to the ON (II) position?

YES: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

NO: Repair open or short in the wire between PCM connector terminal C1 and A/T clutch

pressure control solenoid valve A, then go to step 12.

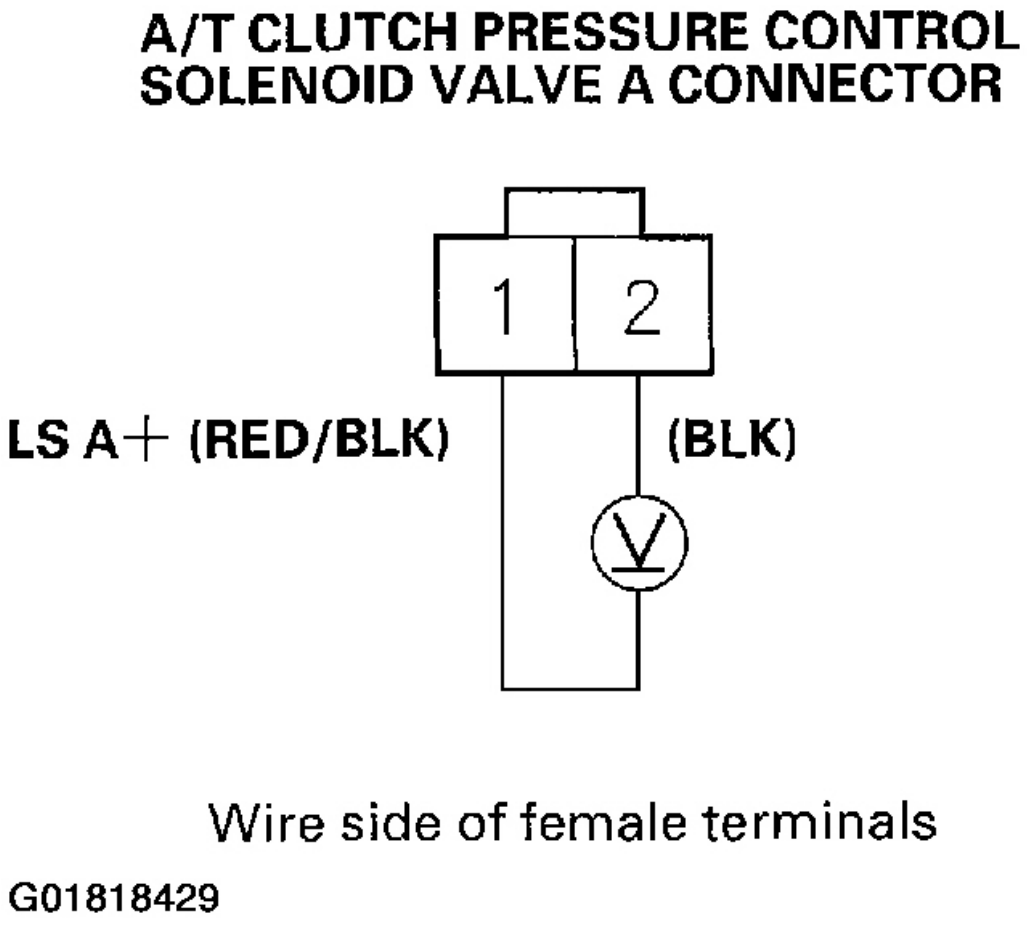


Fig. 173: Measuring The Voltage Between A/T Clutch Pressure Control Solenoid Valve A Connector Terminals No. 1 & No. 2

12. Clear the DTC with the HDS.
13. Test-drive the vehicle for several minutes in the **D** position in all five gears.
14. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0962.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0963: PROBLEM IN A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATIONGENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Check that DTC P0963 recurs.

   Is DTC P0963 indicated?

   YES: Go to step 6 .

   NO: Go to step 3.
3. Select P CTRL SOL CONTROL in MISC. TEST MENU, then select P. CONTROL SOL A in P CTRL SOL CTRL MENU with the HDS.
4. Drive with the A/T clutch pressure control solenoid valve A at 0.2 A in SOL A CONTROL menu.
5. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0963.

   Did the result indicate a fail?

   YES: Go to step 6.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/T clutch pressure control solenoid valve A and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck.
6. Turn the ignition switch OFF.
7. Disconnect the A/T clutch pressure control solenoid valve A connector.
8. Measure A/T clutch pressure control solenoid valve A resistance at the solenoid connector.

   Is there 3-10 ohm?

   YES: Go to step 9.

   NO: Replace the A/T clutch pressure control solenoid valve A (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A REPLACEMENT**), then go to step 12 .

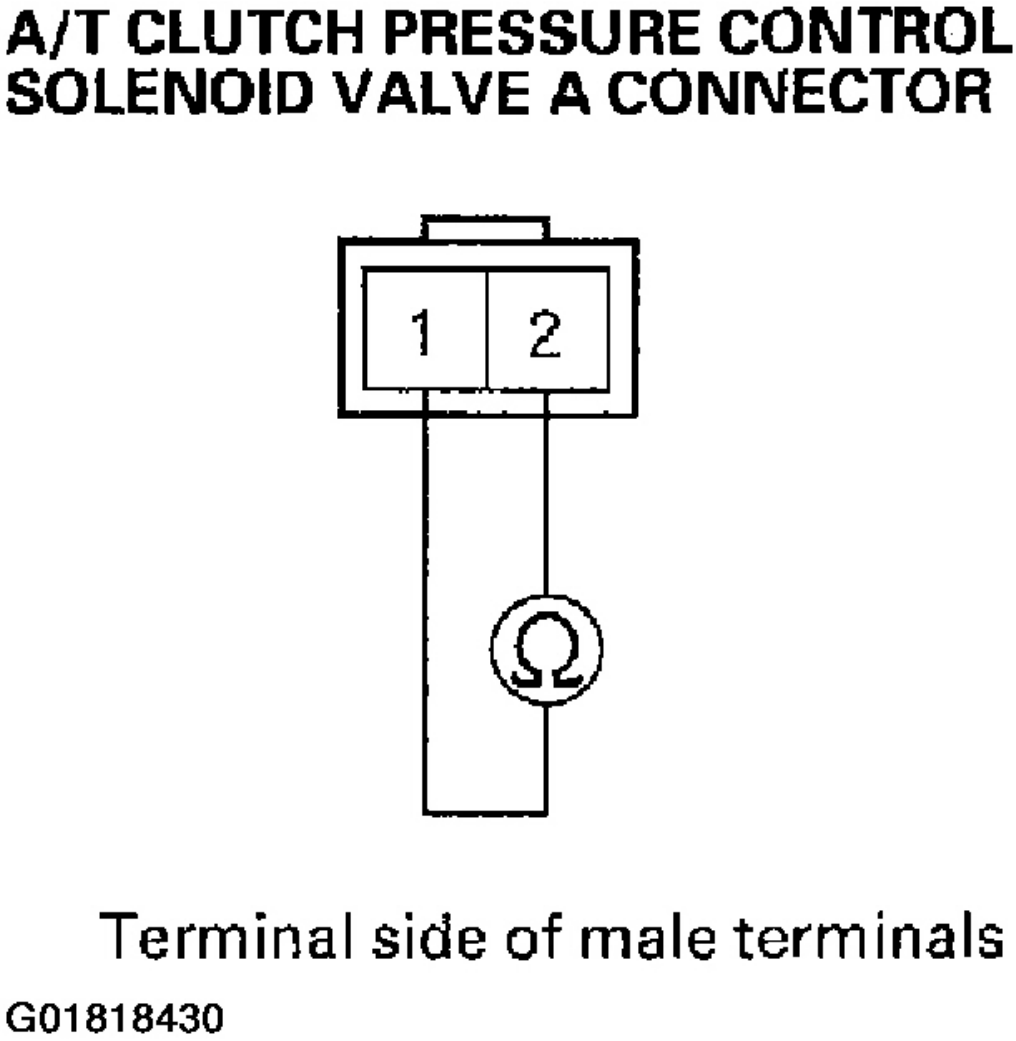


Fig. 174: Measuring A/T Clutch Pressure Control Solenoid Valve A Resistance At The Solenoid Connector

9. Check for continuity between A/T clutch pressure control solenoid valve A connector terminal No. 2 and body ground.

   Is there continuity?

   YES: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

   NO: Repair open in the wire between the A/T clutch pressure control solenoid valve A and ground (G101), or repair poor ground (G101), then go to step 12 .

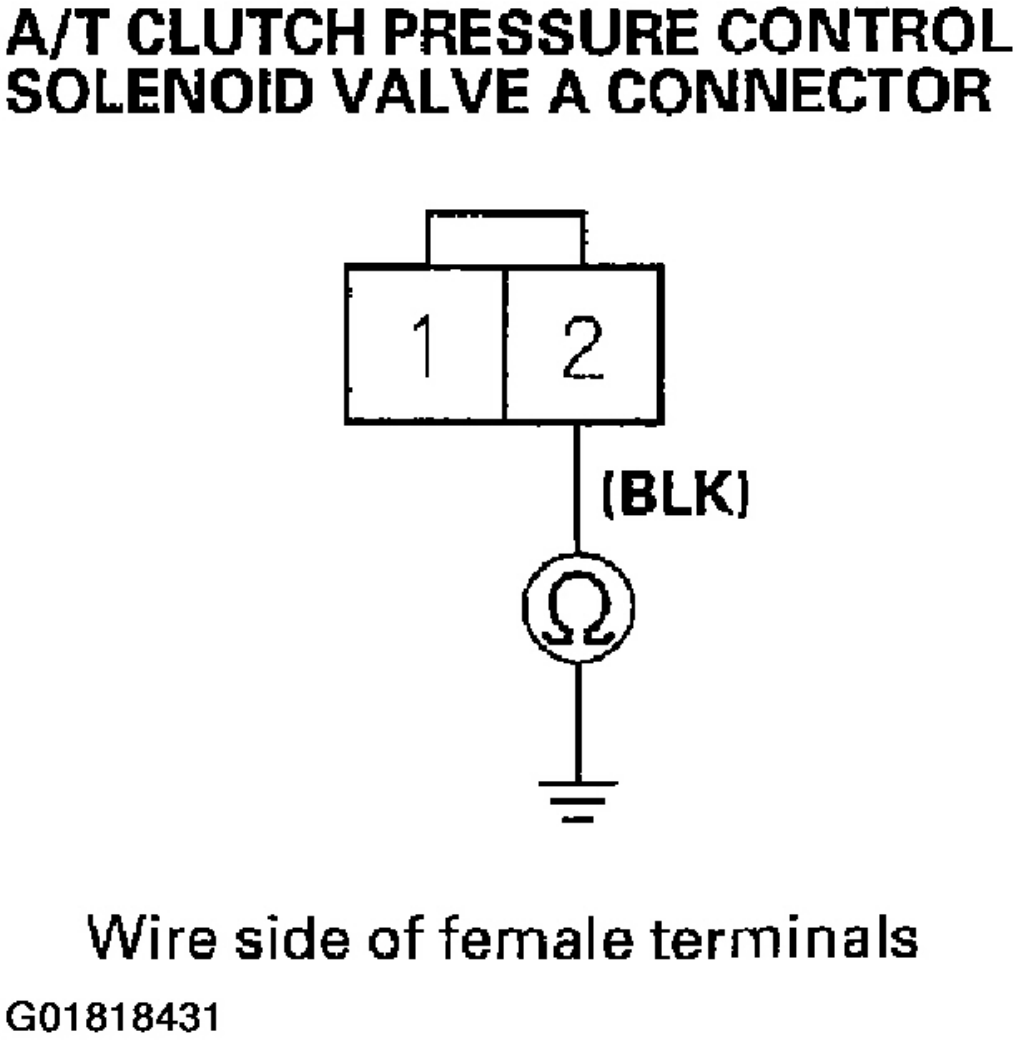


Fig. 175: Checking For Continuity Between A/T Clutch Pressure Control Solenoid Valve A Connector Terminal No. 2 & Body Ground

10. Clear the DTC with the HDS.
11. Test-drive the vehicle for several minutes in the **D** position in all five gears.
12. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0963.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0966: PROBLEM IN A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Check that DTC P0966 recurs.

   Is DTC P0966 indicated?

   YES: Go to step 6 .

   NO: Go to step 3.
3. Select P CTRL SOL CONTROL in MISC. TEST MENU, then select P. CONTROL SOL B in P CTRL SOL CTRL MENU with the HDS.
4. Drive with the A/T clutch pressure control solenoid valve B at 1.0 A in SOL B CONTROL menu.
5. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0966.

   Did the result indicate a fail?

   YES: Go to step 6.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections and loose terminals at the A/T clutch pressure control solenoid valve B and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck.
6. Turn the ignition switch OFF.
7. Disconnect the A/T clutch pressure control solenoid valve B connector.
8. Measure A/T clutch pressure control solenoid valve B resistance at the solenoid connector.

   Is there 3-10 ohm?

   YES: Go to step 9.

   NO: Replace the A/T clutch pressure control solenoid valve B (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B & C REPLACEMENT**), then go to step 12 .

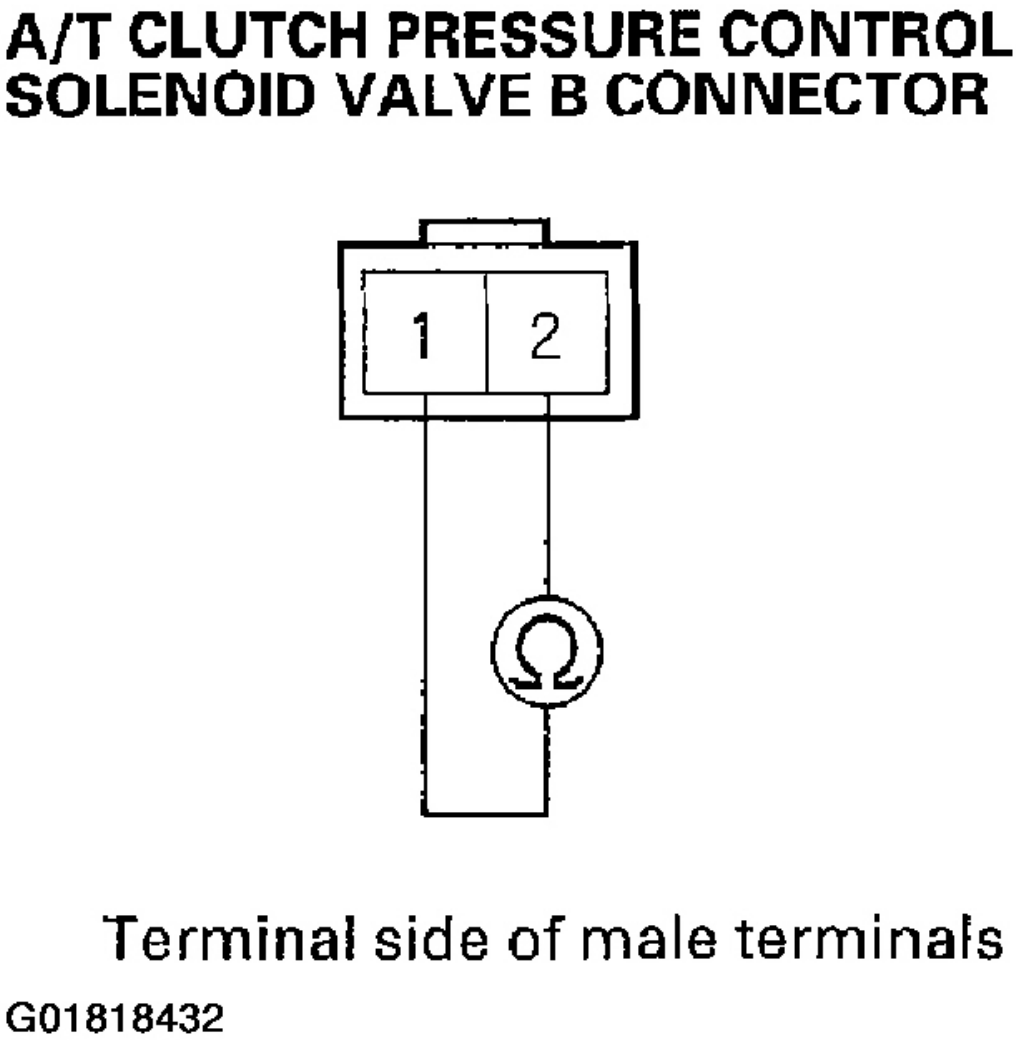


Fig. 176: Measuring A/T Clutch Pressure Control Solenoid Valve B Resistance At The Solenoid Connector

9. Check for continuity between A/T clutch pressure control solenoid valve B connector terminal No. 2 and body ground.

   Is there continuity?

   YES: Go to step 10.

   NO: Repair open in the wire between the A/T clutch pressure control solenoid valve B and ground (G101), or repair poor ground (G101), then go to step 12 .

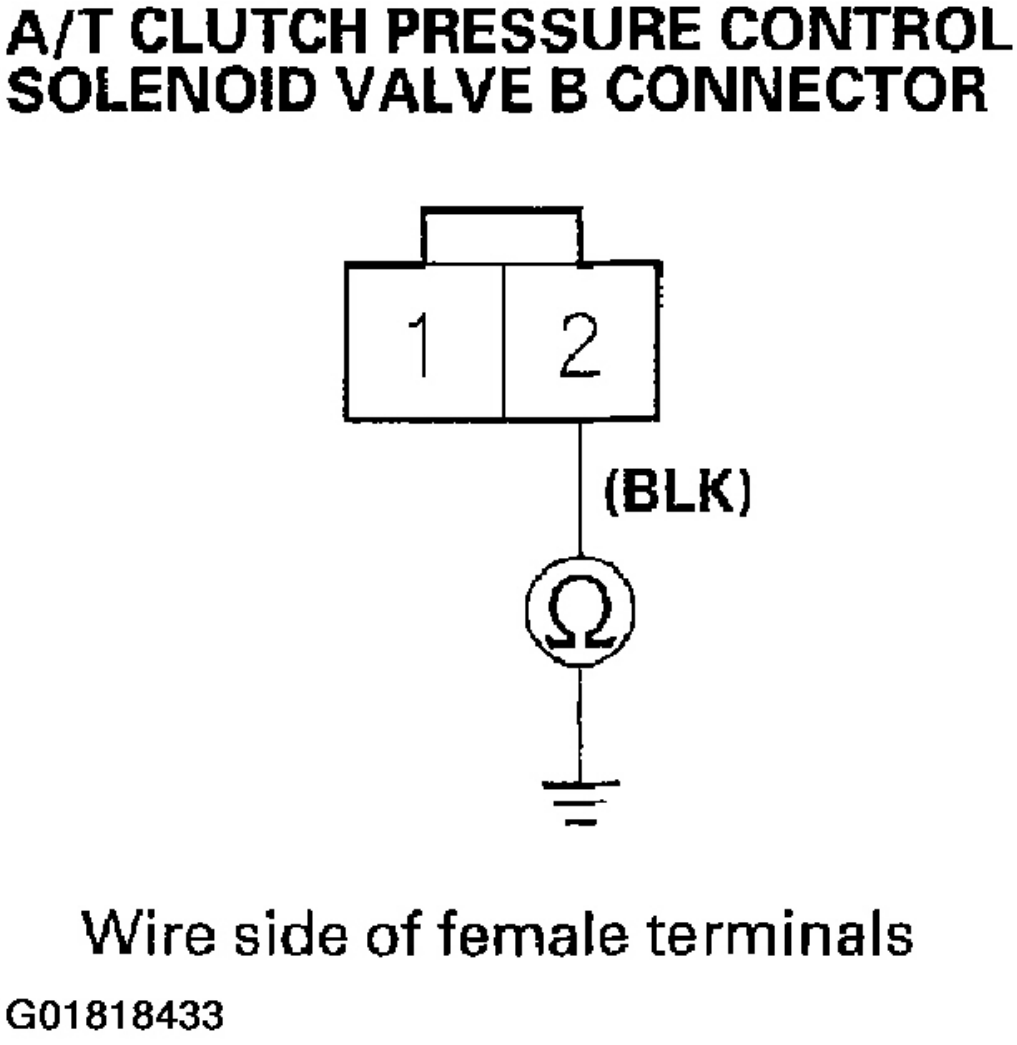


Fig. 177: Checking For Continuity Between A/T Clutch Pressure Control Solenoid Valve B Connector Terminal No. 2 & Body Ground

10. Turn the ignition switch ON (II).
11. Measure the voltage between A/T clutch pressure control solenoid valve B connector terminals No. 1 and No. 2.

Is there about 11 V as the ignition switch is turned to the ON (II) position?

YES: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

NO: Repair open or short in the wire between PCM connector terminal C15 and A/T clutch

pressure control solenoid valve B, then go to step 12.

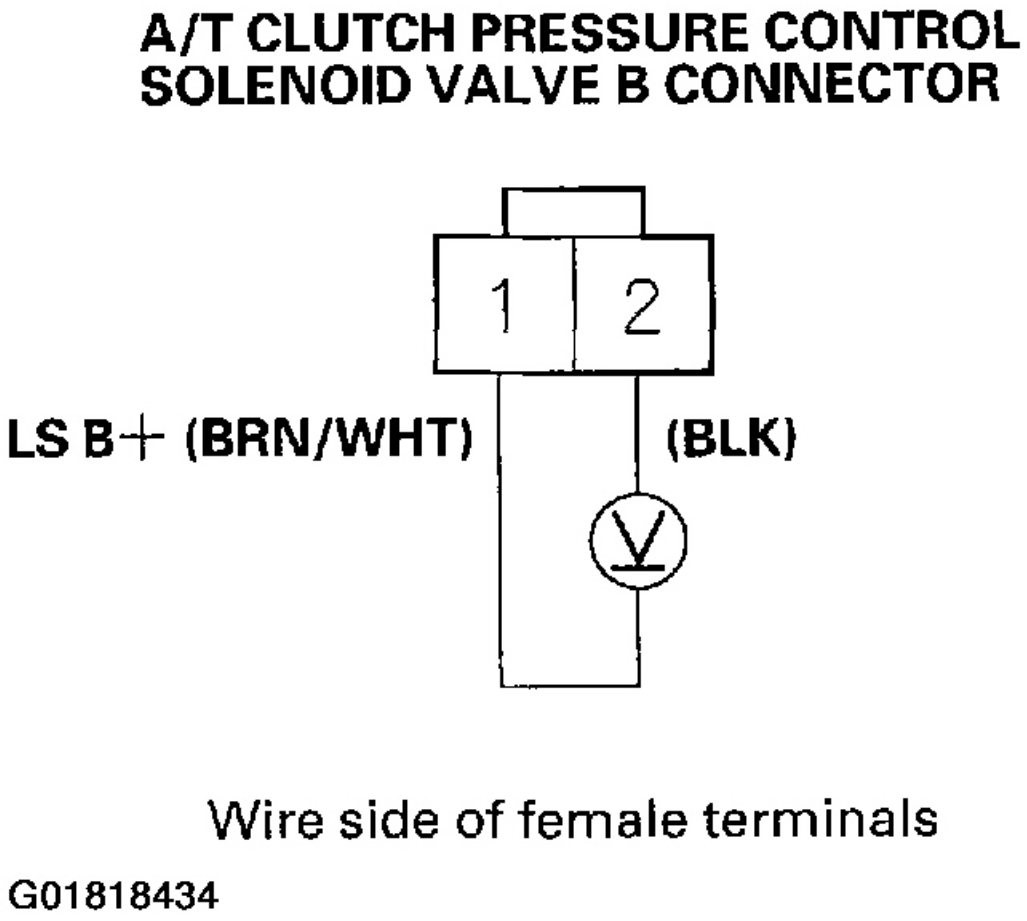


Fig. 178: Measuring The Voltage Between A/T Clutch Pressure Control Solenoid Valve B Connector Terminals No. 1 & No. 2

12. Clear the DTC with the HDS.
13. Test-drive the vehicle for several minutes in the **D** position in all five gears.
14. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0966.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0967: PROBLEM IN A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Check that DTC P0967 recurs.

   Is DTC P0967 indicated?

   YES: Go to step 6 .

   NO: Go to step 3.
3. Select P CTRL SOL CONTROL in MISC. TEST MENU, then select P. CONTROL SOL B in P CTRL SOL CTRL MENU with the HDS.
4. Drive with the A/T clutch pressure control solenoid valve B at 0.2 A in SOL B CONTROL menu.
5. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0967.

   Did the result indicate a fail?

   YES: Go to step 6.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/T clutch pressure control solenoid valve B and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck.
6. Turn the ignition switch OFF.
7. Disconnect the A/T clutch pressure control solenoid valve B connector.
8. Measure A/T clutch pressure control solenoid valve B resistance at the solenoid connector.

   Is there 3-10 ohm?

   YES: Go to step 9.

   NO: Replace the A/T clutch pressure control solenoid valve B (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B & C REPLACEMENT**), then go to step 12 .

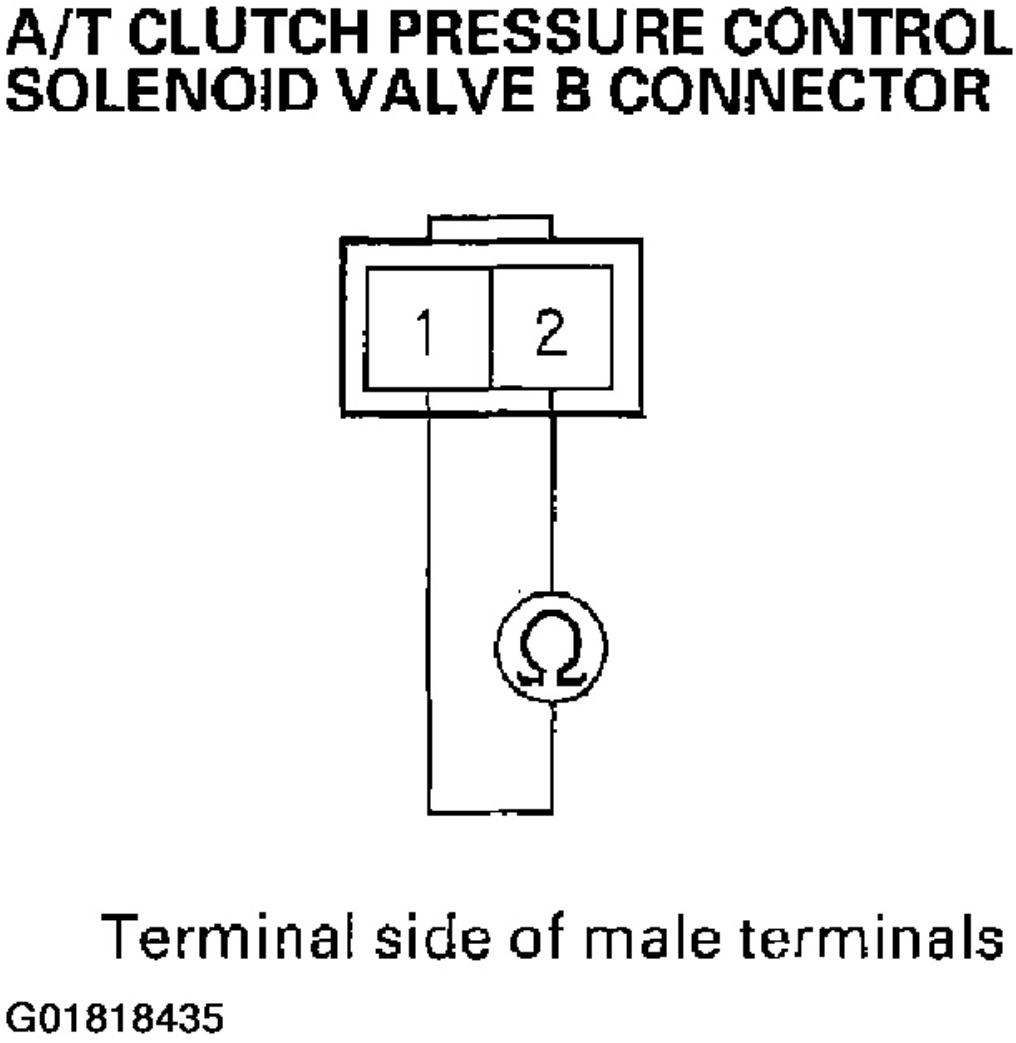


Fig. 179: Measuring A/T Clutch Pressure Control Solenoid Valve B Resistance At The Solenoid Connector

9. Check for continuity between A/T clutch pressure control solenoid valve B connector terminal No. 2 and body ground.

   Is there continuity?

   YES: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

   NO: Repair open in the wire between the A/T clutch pressure control solenoid valve B and ground (G101), or repair poor ground (G101), then go to step 12 .

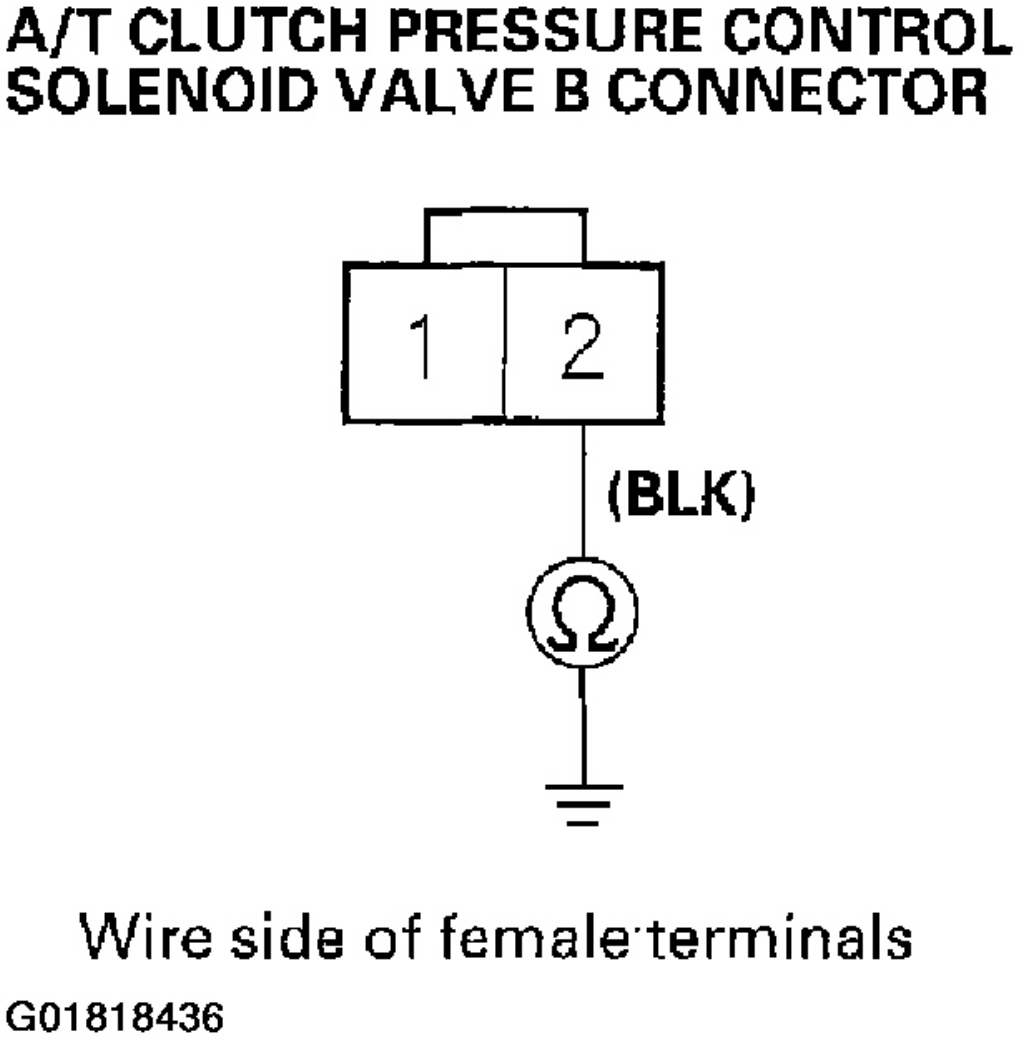


Fig. 180: Checking For Continuity Between A/T Clutch Pressure Control Solenoid Valve B Connector Terminal No. 2 & Body Ground

10. Clear the DTC with the HDS.
11. Test-drive the vehicle for several minutes in the **D** position in all five gears.
12. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0967.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0970: PROBLEM IN A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Check that DTC P0970 recurs.

   Is DTC P0970 indicated?

   YES: Go to step 6 .

   NO: Go to step 3.
3. Select P CTRL SOL CONTROL in MISC. TEST MENU, then select P. CONTROL SOL C in P CTRL SOL CTRL MENU with the HDS.
4. Drive with the A/T clutch pressure control solenoid valve C at 1.0 A in SOL C CONTROL menu.
5. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0970.

   Did the result indicate a fail?

   YES: Go to step 6.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/T clutch pressure control solenoid valve C and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck.
6. Turn the ignition switch OFF.
7. Disconnect the A/T clutch pressure control solenoid valve C connector.
8. Measure A/T clutch pressure control solenoid valve C resistance at the solenoid connector.

   Is there 3-10 ohm?

   YES: Go to step 9.

   NO: Replace the A/T clutch pressure control solenoid valve C (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B & C REPLACEMENT**), then go to step 12 .

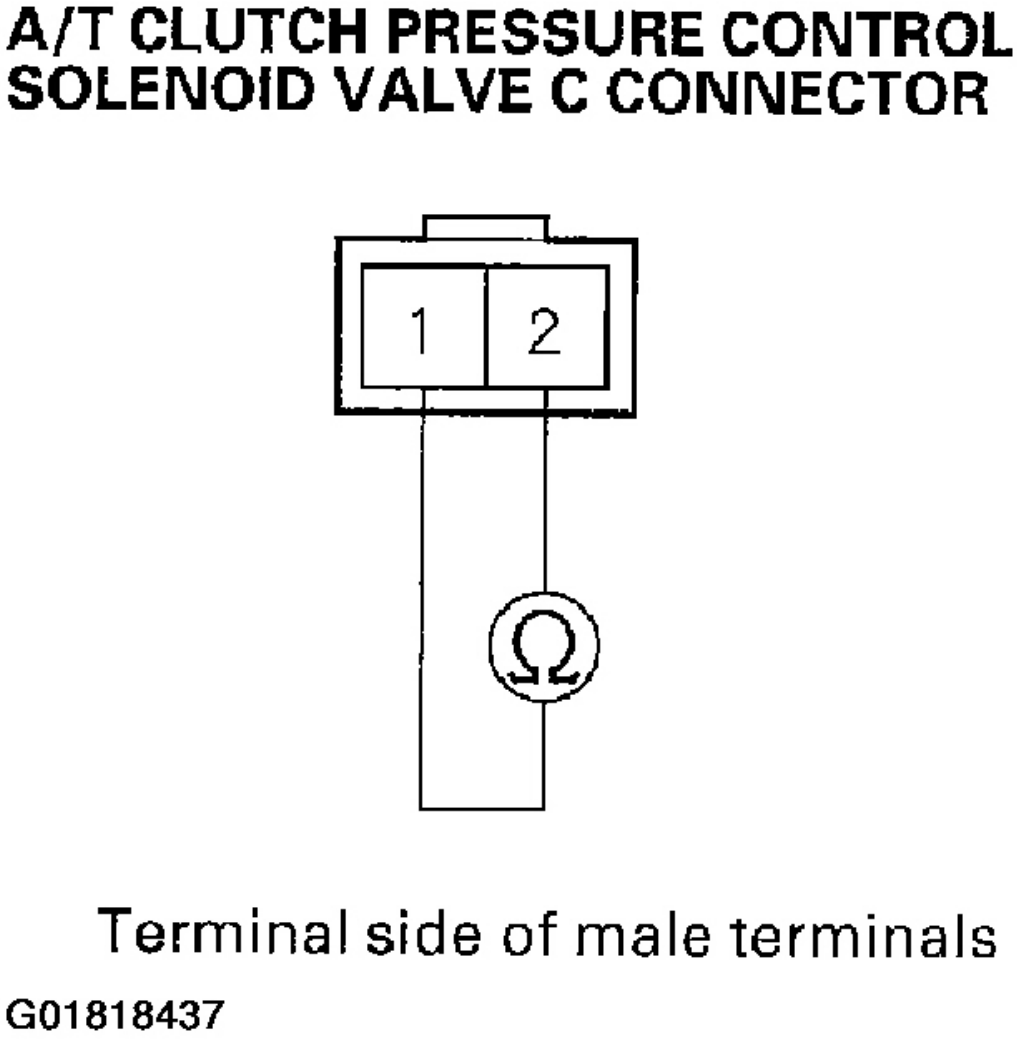


Fig. 181: Measuring A/T Clutch Pressure Control Solenoid Valve C Resistance At The Solenoid Connector

9. Check for continuity between A/T clutch pressure control solenoid valve C connector terminal No. 2 and body ground.

   Is there continuity?

   YES: Go to step 10.

   NO: Repair open in the wire between the A/T clutch pressure control solenoid valve C and ground (G101), or repair poor ground (G101), then go to step 12 .

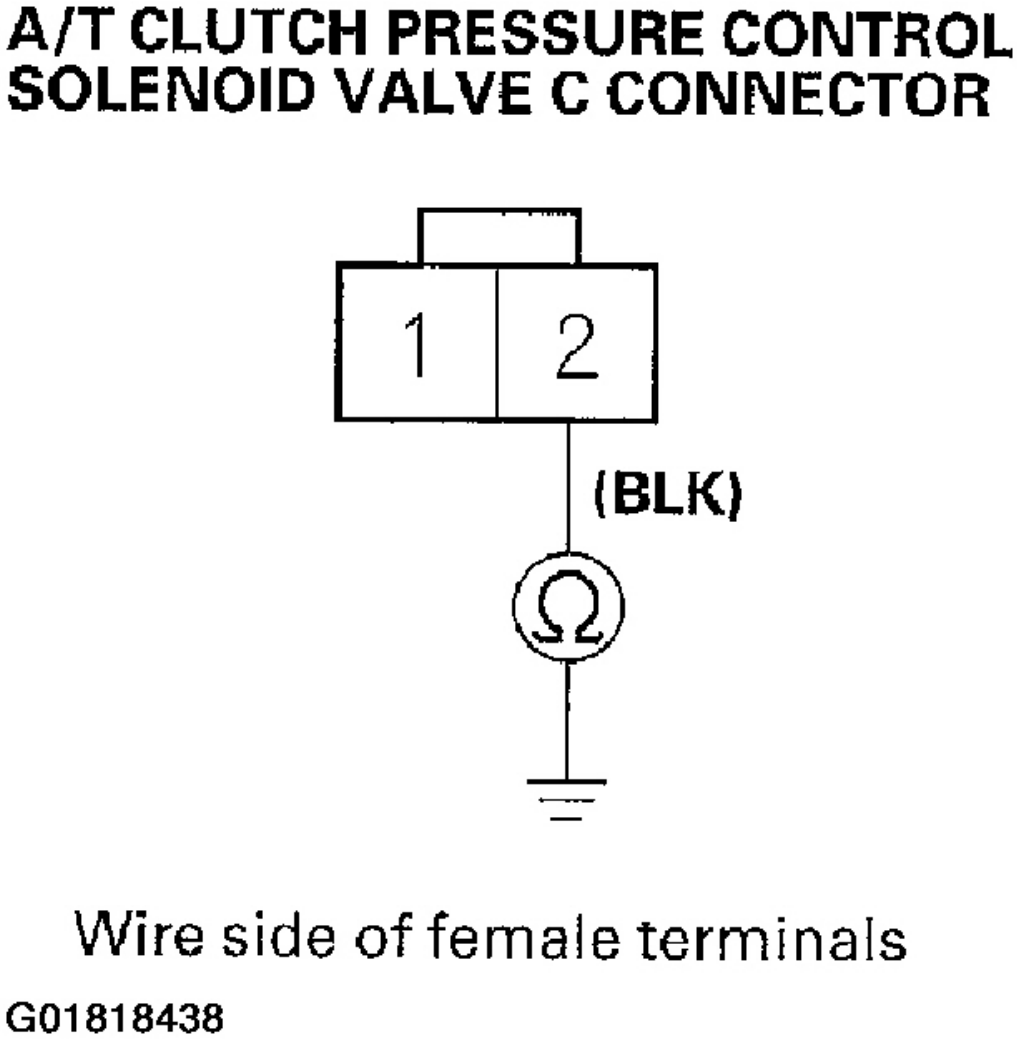


Fig. 182: Checking For Continuity Between A/T Clutch Pressure Control Solenoid Valve C Connector Terminal No. 2 & Body Ground

10. Turn the ignition switch ON (II).
11. Measure the voltage between A/T clutch pressure control solenoid valve C connector terminals No. 1 and No. 2.

Is there about 11 V as the ignition switch is turned to the ON (II) position?

YES: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

NO: Repair open or short in the wire between PCM connector terminal C7 and A/T clutch

pressure control solenoid valve C, then go to step 12.

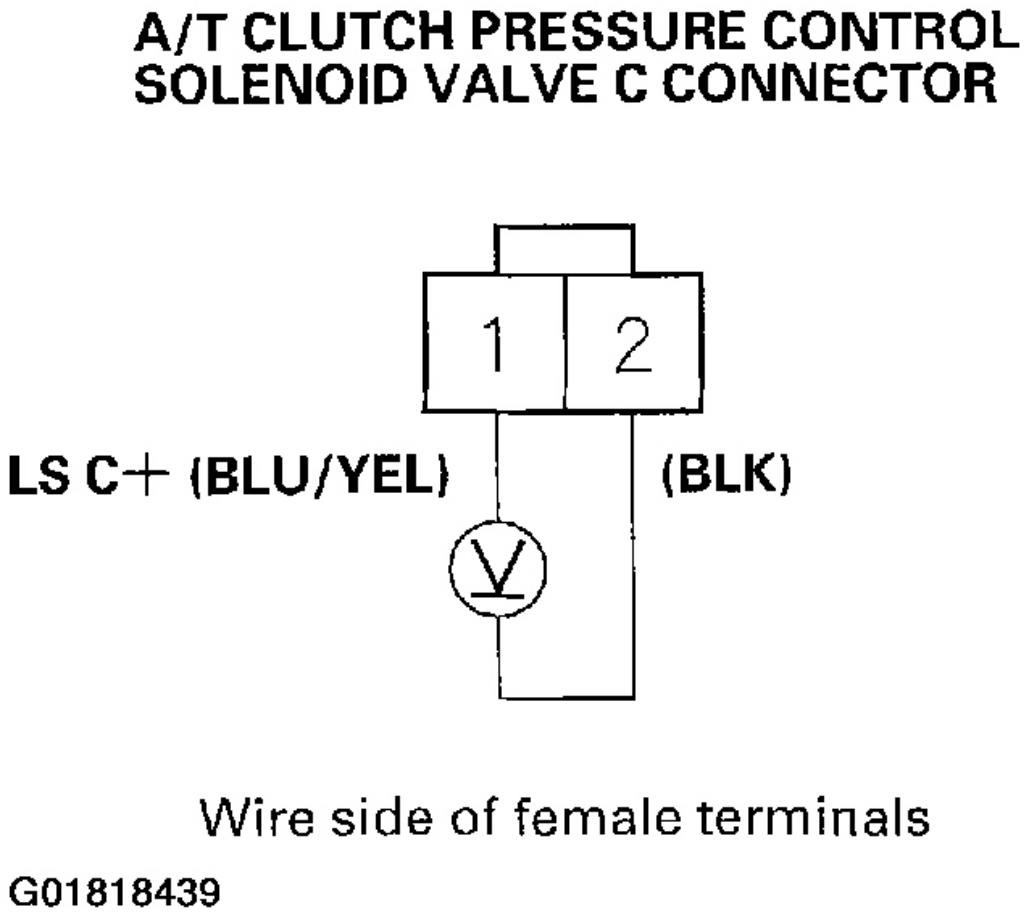


Fig. 183: Measuring The Voltage Between A/T Clutch Pressure Control Solenoid Valve C Connector Terminals No. 1 & No. 2

12. Clear the DTC with the HDS.
13. Test-drive the vehicle for several minutes in the **D** position in all five gears.
14. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0970.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0971: PROBLEM IN A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Check that DTC P0971 recurs.

   Is DTC P0971 indicated?

   YES: Go to step 6 .

   NO: Go to step 3.
3. Select P CTRL SOL CONTROL in MISC. TEST MENU, then select P. CONTROL SOL C in P CTRL SOL CTRL MENU with the HDS.
4. Drive with the A/T clutch pressure control solenoid valve C at 0.2 A in SOL C CONTROL menu.
5. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0971.

   Did the result indicate a fail?

   YES: Go to step 6.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/T clutch pressure control solenoid valve C and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck.
6. Turn the ignition switch OFF.
7. Disconnect the A/T clutch pressure control solenoid valve C connector.
8. Measure A/T clutch pressure control solenoid valve C resistance at the solenoid connector.

   Is there 3-10 ohm?

   YES: Go to step 9.

   NO: Replace the A/T clutch pressure control solenoid valve C (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B & C REPLACEMENT**), then go to step 10 .

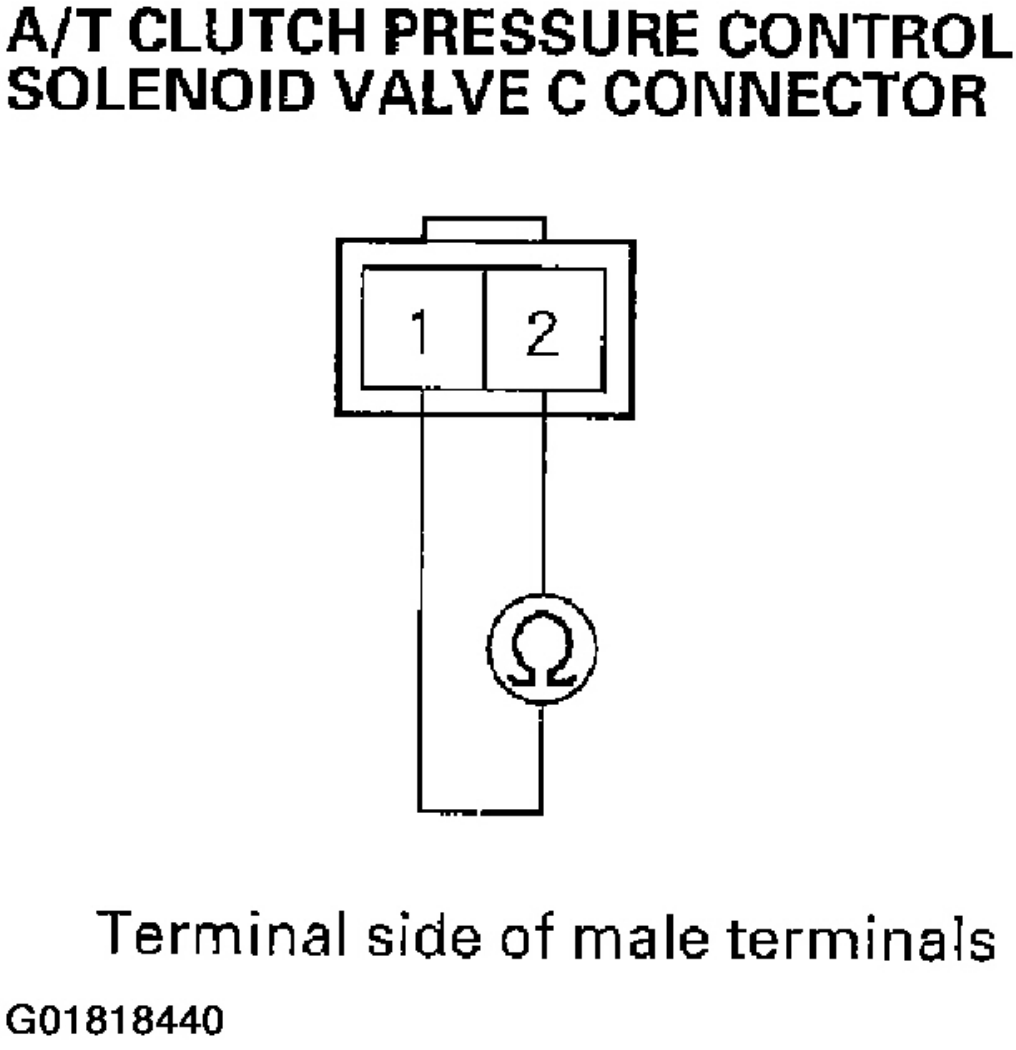


Fig. 184: Measuring A/T Clutch Pressure Control Solenoid Valve C Resistance At The Solenoid Connector

9. Check for continuity between A/T clutch pressure control solenoid valve C connector terminal No. 2 and body ground.

   Is there continuity?

   YES: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

   NO: Repair open in the wire between the A/T clutch pressure control solenoid valve C and ground (G101), or repair poor ground (G101), then go to step 10.

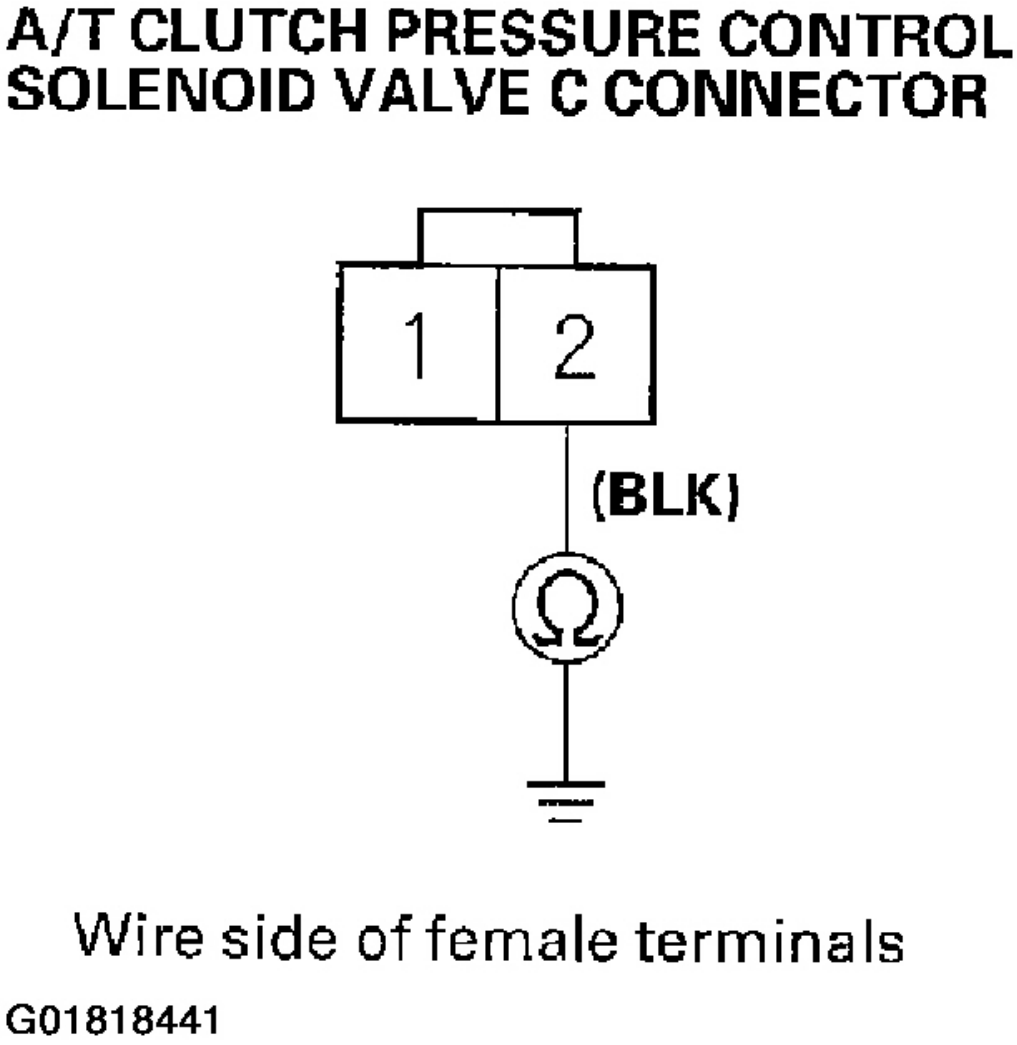


Fig. 185: Checking For Continuity Between A/T Clutch Pressure Control Solenoid Valve C Connector Terminal No. 2 & Body Ground

10. Clear the DTC with the HDS.
11. Test-drive the vehicle for several minutes in the **D** position in all five gears.
12. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0971.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 1 and recheck.

DTC P0973: SHORT IN SHIFT SOLENOID VALVE A CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Start the engine, and shift to the **D** position.
3. Check that DTC P0973 recurs.

   Is DTC P0973 indicated?

   YES: Go to step 7 .

   NO: Go to step 4.
4. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL A test in SHIFT SOL TEST MENU with the HDS.
5. Start the engine, and shift to the **D** position.
6. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0973.

   Did the result indicate a fail?

   YES: Go to step 7.

   NO: Intermittent failure, the system is OK at this time. Check the BLU/BLK wire for an intermittent short to ground between shift solenoid valve A and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connectors A (31P) and C (22P).
10. Measure the resistance between PCM connector terminals C6 and A8 or A9.

    Is there less than 12 ohm?

    YES: Go to step 11.

    NO: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

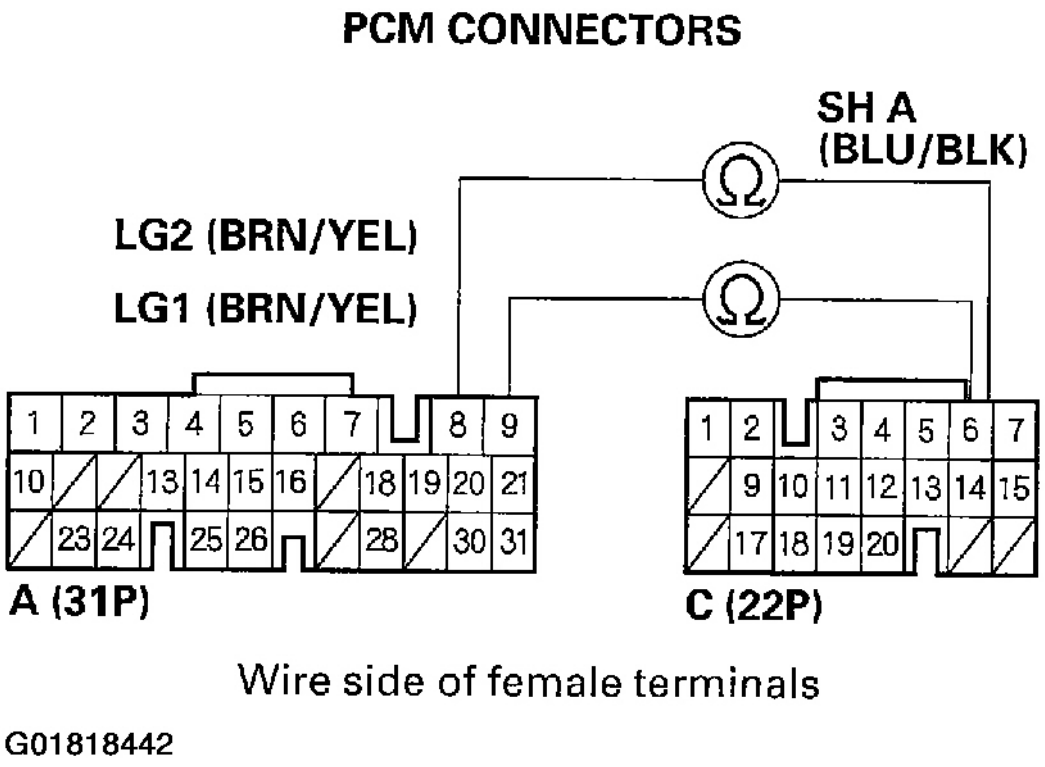


Fig. 186: Measuring The Resistance Between PCM Connector Terminals C6 & A8 Or A9

11. Disconnect the shift solenoid harness connector at the transmission housing.
12. Check for continuity between PCM connector terminals C6 and A8 or A9.

Is there continuity?

YES: Repair short to ground in the wire between PCM connector terminal C6 and the shift solenoid harness connector, then go to step 13.

NO: Check shift solenoid valve A, and check for a short in the shift solenoid harness in the transmission (see **SHIFT SOLENOID VALVE TEST**). Replace shift solenoid valve A and/or shift solenoid harness, then go to step 13.

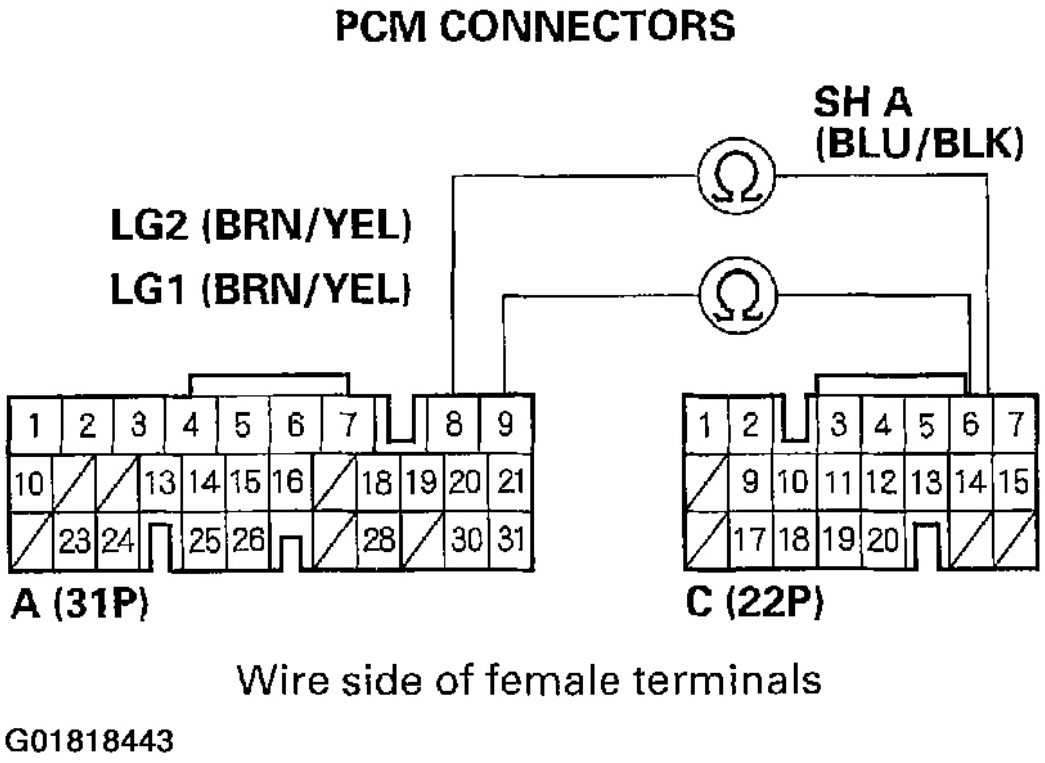


Fig. 187: Checking For Continuity Between PCM Connector Terminals C6 & A8 Or A9

13. Clear the DTC with the HDS.
14. Start the engine, and shift to the **D** position.
15. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0973.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0974: OPEN IN SHIFT SOLENOID VALVE A CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Start the engine in the **P** position.

3. Check that DTC P0974 recurs.

   Is DTC P0974 indicated?

   YES: Go to step 7 .

   NO: Go to step 4.

4. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL A test in SHIFT SOL TEST MENU with the HDS.
5. Start the engine in the **P** position.
6. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0974.

   Did the result indicate a fail?

   YES: Go to step 7.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the shift solenoid valve A and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.

7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connectors A (31P) and C (22P).
10. Measure the resistance between PCM connector terminals C6 and A8 or A9.

    Is there 12-25 ohm?

    YES: Check for loose or poor connections at PCM connector terminal C6. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

    NO: Go to step 11.

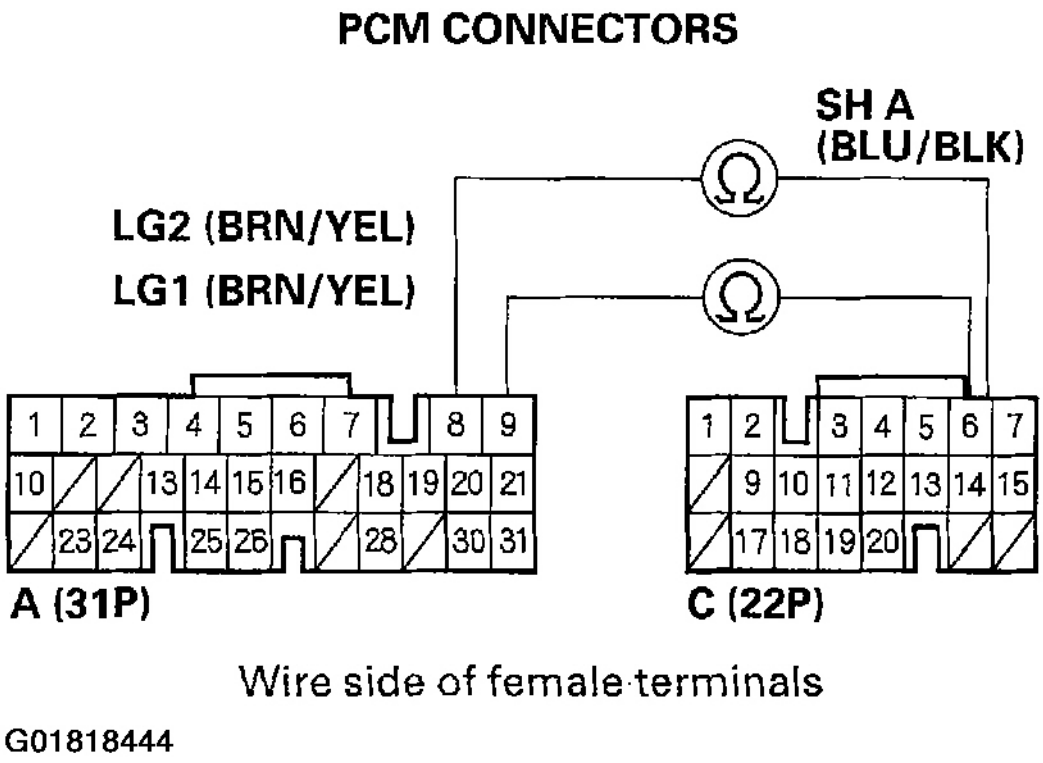


Fig. 188: Measuring The Resistance Between PCM Connector Terminals C6 & A8 Or A9

11. Disconnect the shift solenoid harness connector at the transmission housing.
12. Measure the resistance between shift solenoid harness connector terminal No. 5 and body ground.

Is there 12-25 ohm?

YES: Repair open in the wire between PCM connector terminal C6 and the shift solenoid harness connector, then go to step 13.

NO: Check shift solenoid valve A, and check for an open in the shift solenoid harness in the transmission (see **SHIFT SOLENOID VALVE TEST**). Replace shift solenoid valve A and/or shift solenoid harness, then go to step 13.

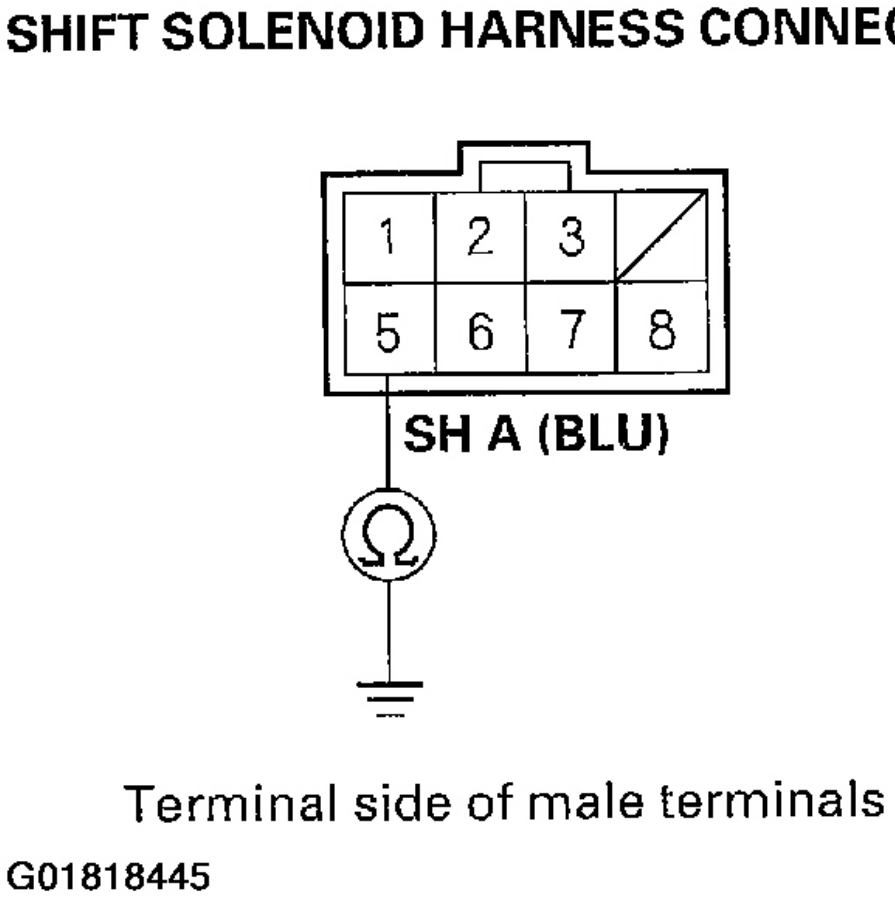


Fig. 189: Measuring The Resistance Between Shift Solenoid Harness Connector Terminal No. 5 & Body Ground

13. Clear the DTC with the HDS.
14. Start the engine in the **P** position
15. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0974.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0976: SHORT IN SHIFT SOLENOID VALVE B CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you**

troubleshoot.

- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Start the engine in the **P** position.
3. Check that DTC P0976 recurs.

   Is DTC P0976 indicated?

   YES: Go to step 7 .

   NO: Go to step 4.
4. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL B test in SHIFT SOL TEST MENU with the HDS.
5. Start the engine in the **P** position.
6. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0976.

   Did the result indicate a fail?

   YES: Go to step 7.

   NO: Intermittent failure, the system is OK at this time. Check the GRN/WHT wire for an intermittent short to ground between the shift solenoid valve B and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connectors A (31P) and C (22P).
10. Measure the resistance between PCM connector terminals C4 and A8 or A9.

    Is there less than 12 ohm?

    YES: Go to step 11.

    NO: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

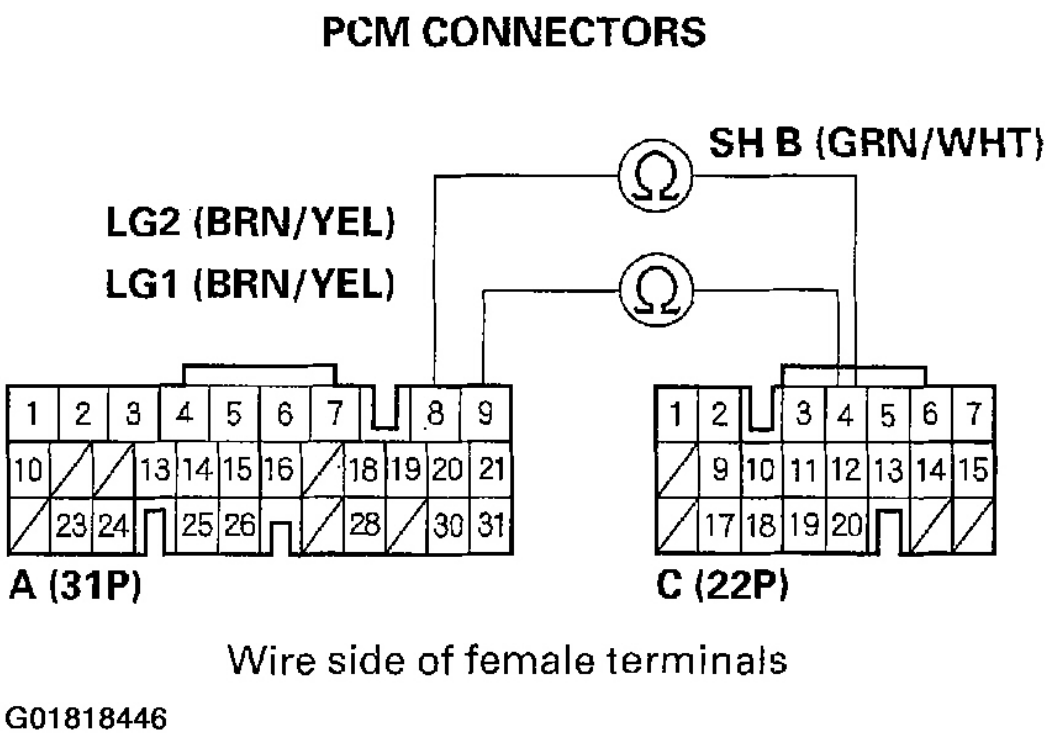


Fig. 190: Measuring The Resistance Between PCM Connector Terminals C4 & A8 Or A9

11. Disconnect the shift solenoid harness connector at the transmission housing.
12. Check for continuity between PCM connector terminals C4 and A8 or A9.

Is there continuity?

YES: Repair short to ground in the wire between PCM connector terminal C4 and the shift solenoid harness connector, then go to step 13.

NO: Check shift solenoid valve B, and check for a short in the shift solenoid harness in the transmission (see **SHIFT SOLENOID VALVE TEST**). Replace shift solenoid valve B and/or shift solenoid harness, then go to step 13.

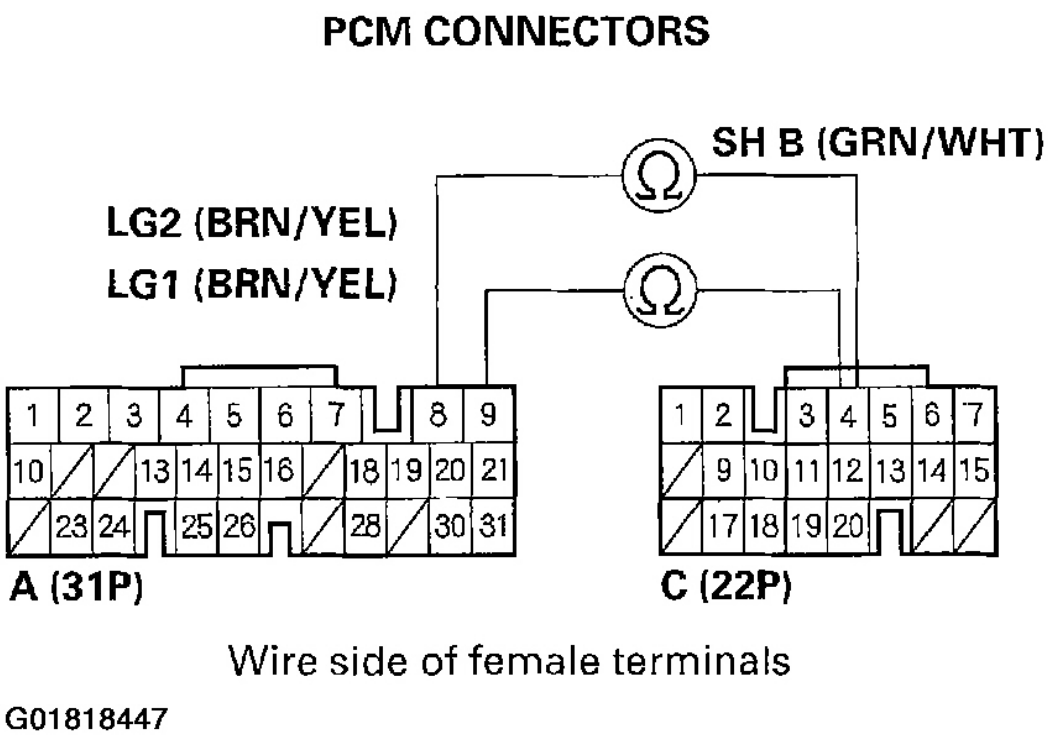


Fig. 191: Checking For Continuity Between PCM Connector Terminals C4 & A8 Or A9

13. Clear the DTC with the HDS.
14. Start the engine in the **P** position.
15. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0976.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0977: OPEN IN SHIFT SOLENOID VALVE B CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Test-drive the vehicle for several minutes in 1st, 2nd and 3rd gears in the $\mathbf{D}_3$ position.

3. Check that DTC P0977 recurs.

   Is DTC P0977 indicated?

   YES: Go to step 7 .

   NO: Go to step 4.

4. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL B test in SHIFT SOL TEST MENU with the HDS.
5. Test-drive the vehicle for several minutes in 1st, 2nd and 3rd gears in the $\mathbf{D}_3$ position.
6. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0977.

   Did the result indicate a fail?

   YES: Go to step 7.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the shift solenoid valve B and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.

7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connectors A (31P) and C (22P).
10. Measure the resistance between PCM connector terminals C4 and A8 or A9.

    Is there 12-25 ohm?

    YES: Check for loose or poor connections at PCM connector terminal C4. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

    NO: Go to step 11.

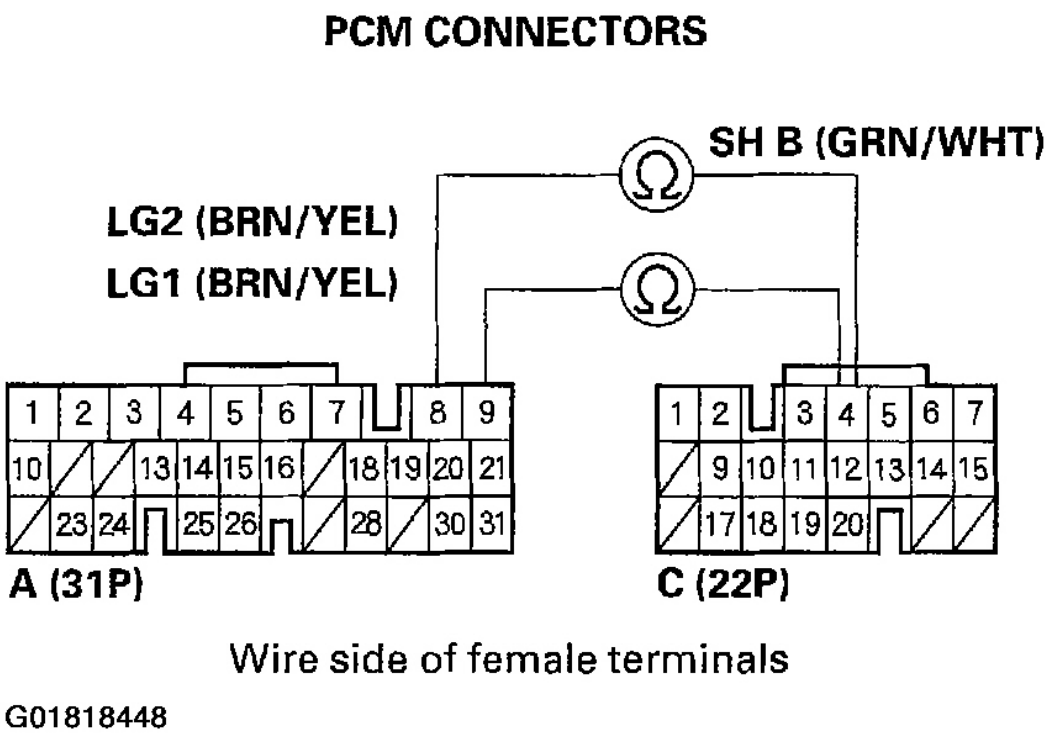


Fig. 192: Measuring The Resistance Between PCM Connector Terminals C4 & A8 Or A9

11. Disconnect the shift solenoid harness connector at the transmission housing.
12. Measure the resistance between shift solenoid harness connector terminal No. 2 and body ground.

Is there 12-25 ohm?

YES: Repair open in the wire between PCM connector terminal C4 and the shift solenoid harness connector, then go to step 13.

NO: Check shift solenoid valve B, and check for an open in the shift solenoid harness in the transmission (see **SHIFT SOLENOID VALVE TEST**). Replace shift solenoid valve B and/or shift solenoid harness, then go to step 13.

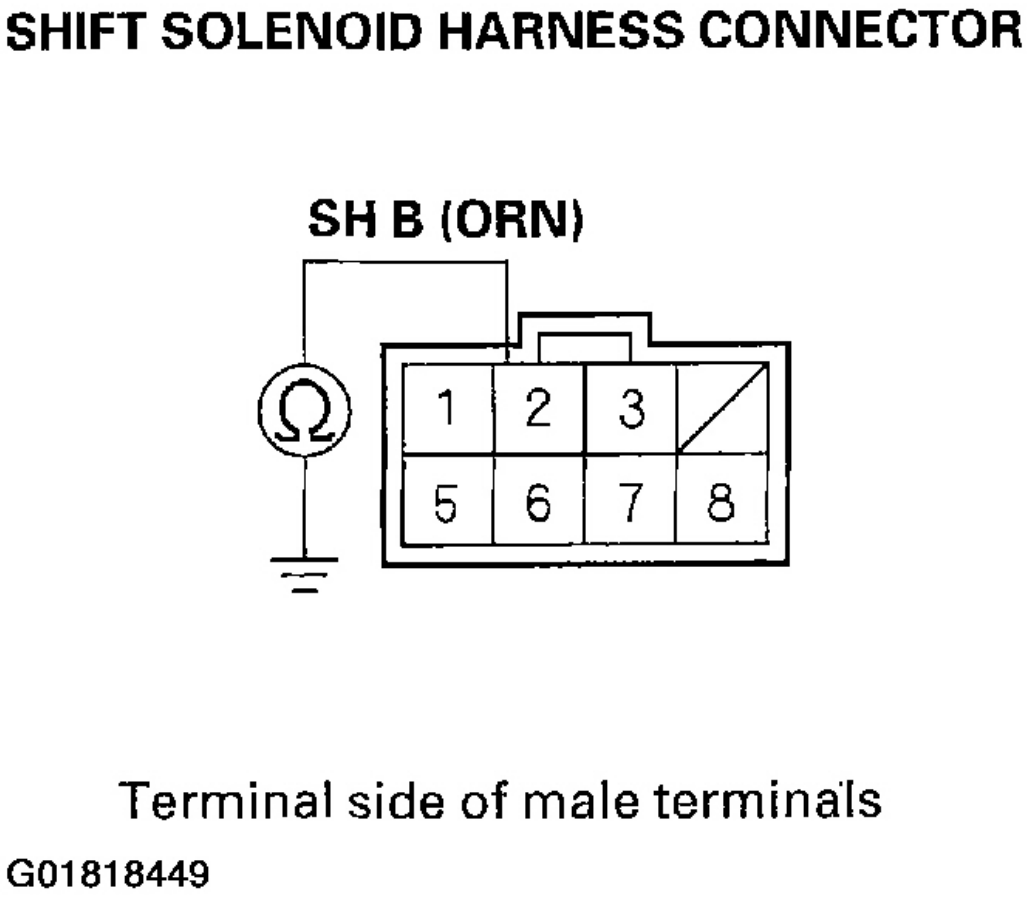


Fig. 193: Measuring The Resistance Between Shift Solenoid Harness Connector Terminal No. 2 & Body Ground

13. Clear the DTC with the HDS.
14. Test-drive the vehicle for several minutes in 1st, 2nd and 3rd gears in the **D_3** position.
15. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0977.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0979: SHORT IN SHIFT SOLENOID VALVE C CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you**

troubleshoot.

- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Start the engine, and shift to the **D** position.
3. Check that DTC P0979 recurs.

   Is DTC P0979 indicated?

   YES: Go to step 7 .

   NO: Go to step 4.
4. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL C test in SHIFT SOL TEST MENU with the HDS.
5. Start the engine, and shift to the **D** position.
6. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0979.

   Did the result indicate a fail?

   YES: Go to step 7.

   NO: Intermittent failure, the system is OK at this time. Check the GRN wire for an intermittent short to ground between the shift solenoid valve C and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connectors A (31P) and C (22P).
10. Measure the resistance between PCM connector terminals C2 and A8 or A9.

    Is there less than 12 ohm?

    YES: Go to step 11.

    NO: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

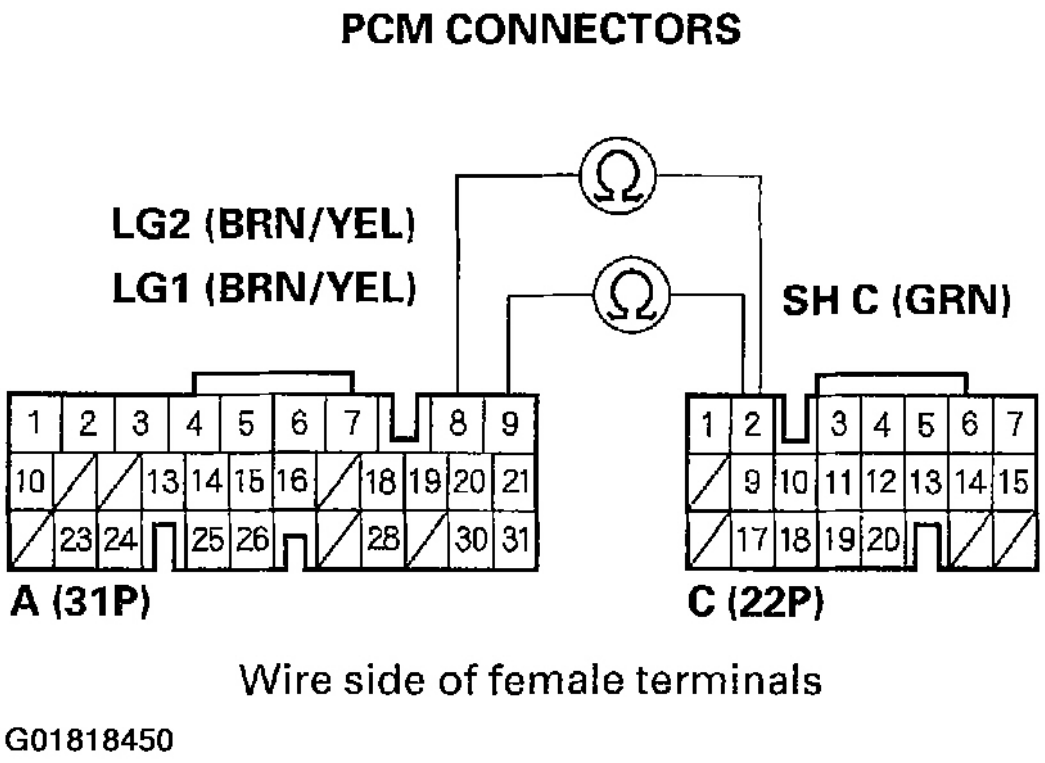


Fig. 194: Measuring The Resistance Between PCM Connector Terminals C2 & A8 Or A9

11. Disconnect the shift solenoid harness connector at the transmission housing.
12. Check for continuity between PCM connector terminals C2 and A8 or A9.

Is there continuity?

YES: Repair short to ground in the wire between PCM connector terminal C2 and the shift solenoid harness connector, then go to step 13.

NO: Check shift solenoid valve C, and check for a short in the shift solenoid harness in the transmission (see **SHIFT SOLENOID VALVE TEST**). Replace shift solenoid valve C and/or shift solenoid harness, then go to step 13.

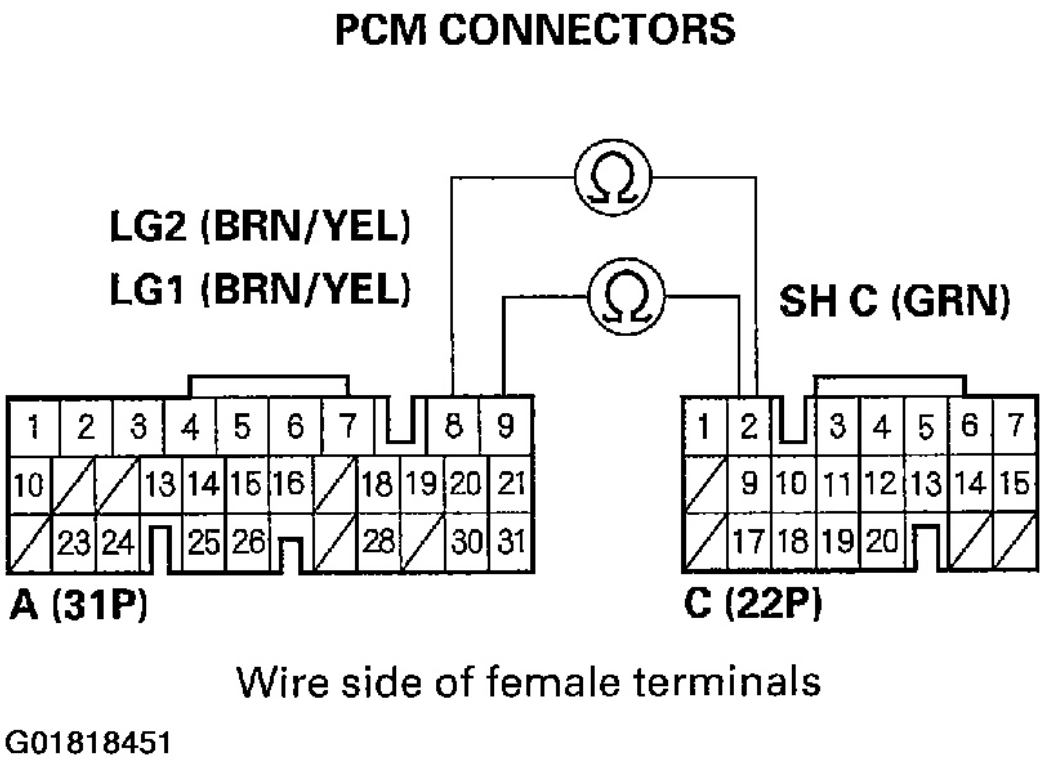


Fig. 195: Checking For Continuity Between PCM Connector Terminals C2 & A8 Or A9

13. Clear the DTC with the HDS.
14. Start the engine, and shift to the **D** position.
15. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0979.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0980: OPEN IN SHIFT SOLENOID VALVE C CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Start the engine in the **P** position.

3. Check that DTC P0980 recurs.

   Is DTC P0980 indicated?

   YES: Go to step 7 .

   NO: Go to step 4.

4. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL C test in SHIFT SOL TEST MENU with the HDS.
5. Start the engine in the **P** position.
6. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0980.

   Did the result indicate a fail?

   YES: Go to step 7.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the shift solenoid valve C and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.

7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connectors A (31P) and C (22P).
10. Measure the resistance between PCM connector terminals C2 and A8 or A9.

    Is there 12-25 ohm?

    YES: Check for loose or poor connections at PCM connector terminal C2. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

    NO: Go to step 11.

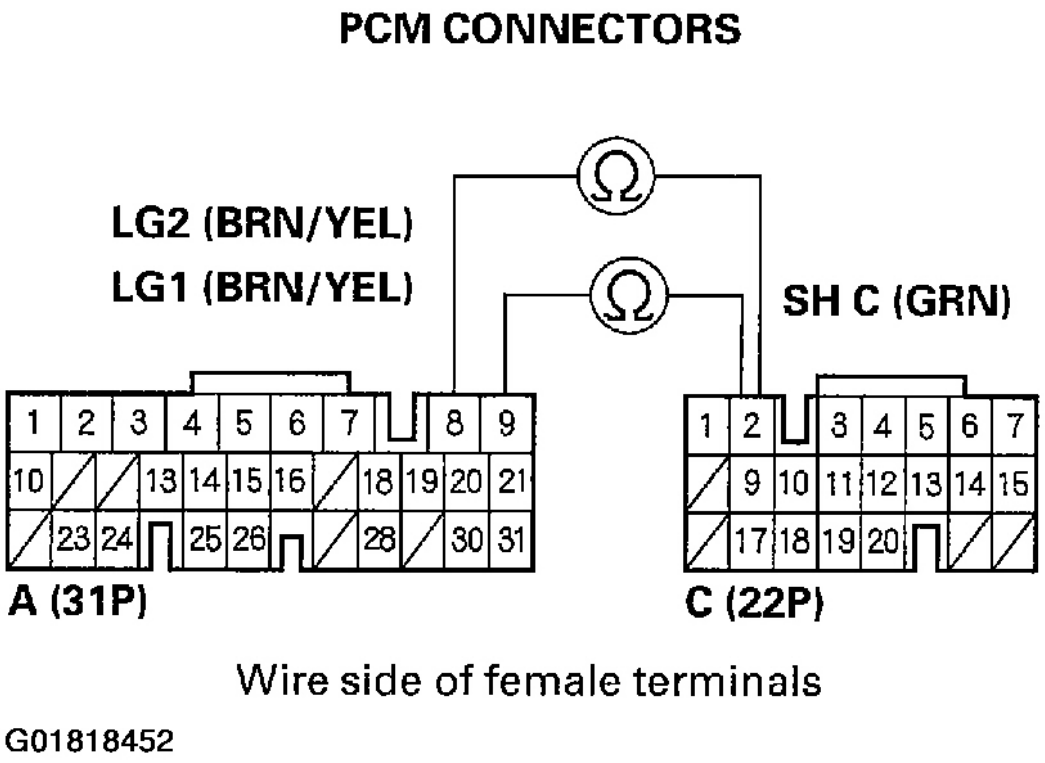


Fig. 196: Measuring The Resistance Between PCM Connector Terminals C2 & A8 Or A9

11. Disconnect the shift solenoid harness connector at the transmission housing.
12. Measure the resistance between shift solenoid harness connector terminal No. 1 and body ground.

Is there 12-25 ohm?

YES: Repair open in the wire between PCM connector terminal C2 and the shift solenoid harness connector, then go to step 13.

NO: Check shift solenoid valve C, and check for an open in the shift solenoid harness in the transmission (see **SHIFT SOLENOID VALVE TEST**). Replace shift solenoid valve C and/or shift solenoid harness, then go to step 13.

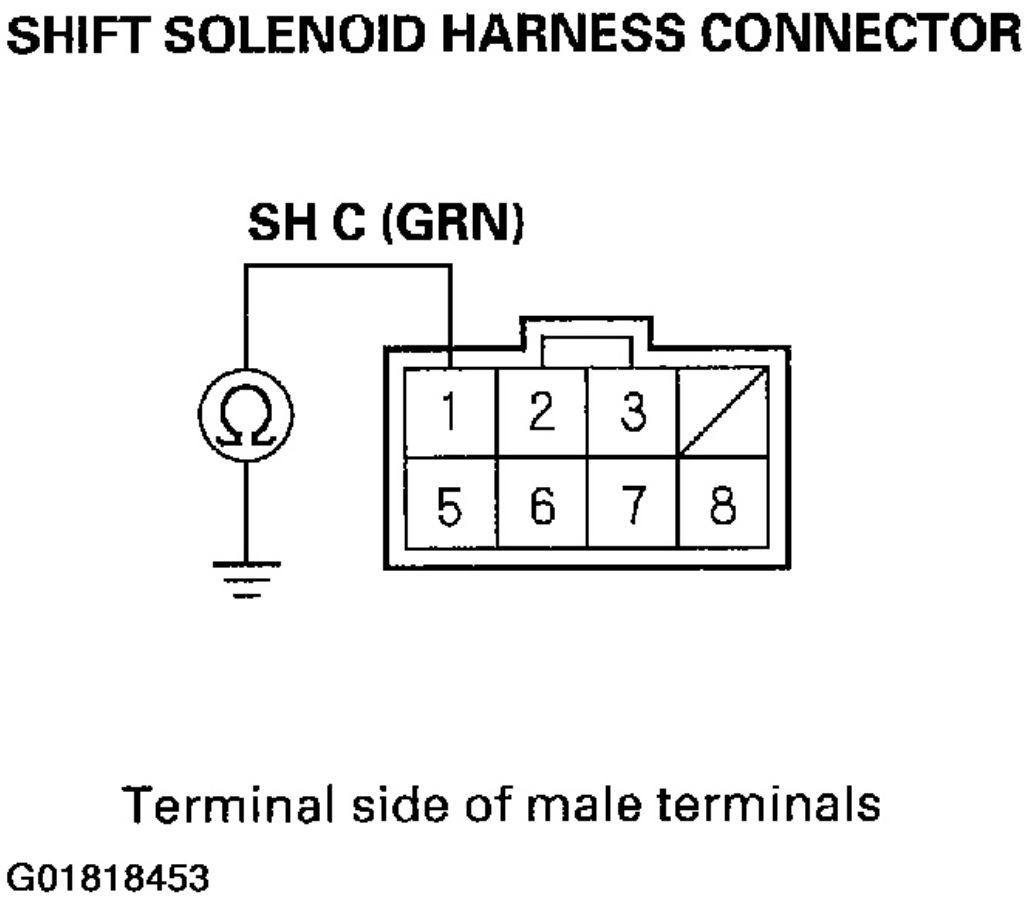


Fig. 197: Measuring The Resistance Between Shift Solenoid Harness Connector Terminal No. 1 & Body Ground

13. Clear the DTC with the HDS.
14. Start the engine in the **P** position.
15. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0980.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0982: SHORT IN SHIFT SOLENOID VALVE D CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you**

troubleshoot.

- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Start the engine, and shift the transmission in 2nd gear in the **M** position.
3. Check that DTC P0982 recurs.

   Is DTC P0982 indicated?

   YES: Go to step 7 .

   NO: Go to step 4.
4. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL D test in SHIFT SOL TEST MENU with the HDS.
5. Start the engine, and shift the transmission in 2nd gear in the **M** position.
6. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0982.

   Did the result indicate a fail?

   YES: Go to step 7.

   NO: Intermittent failure, the system is OK at this time. Check the GRN/RED wire for an intermittent short to ground between the shift solenoid valve D and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connectors A (31P) and C (22P).
10. Measure the resistance between PCM connector terminals C5 and A8 or A9.

    Is there less than 12 ohm?

    YES: Go to step 11.

    NO: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

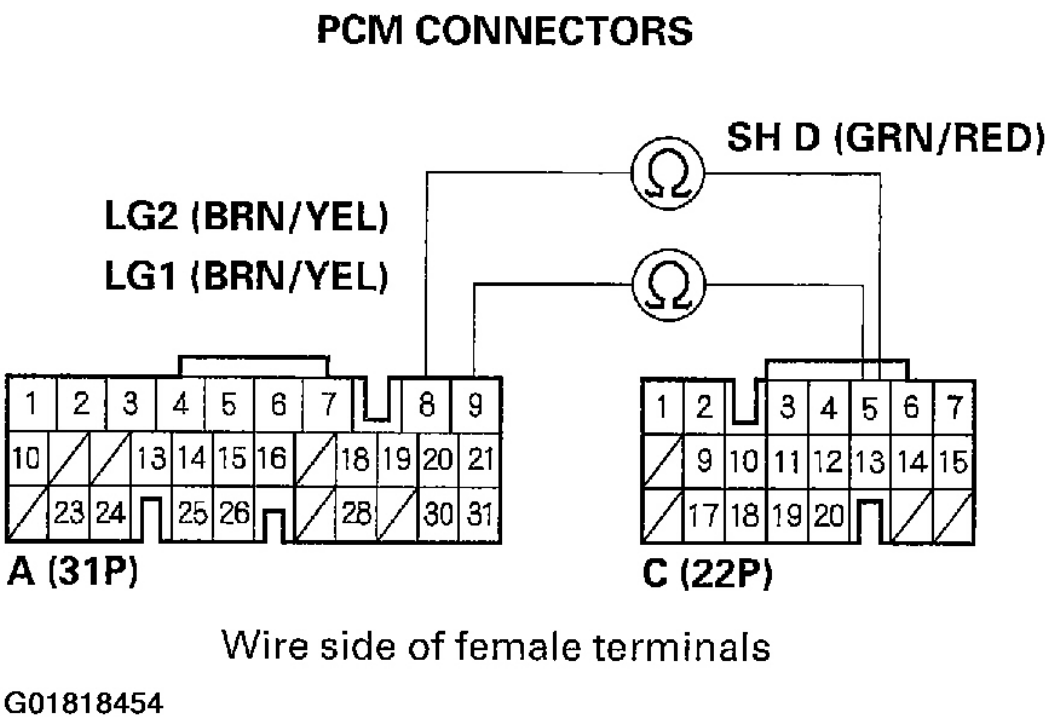


Fig. 198: Measuring The Resistance Between PCM Connector Terminals C5 & A8 Or A9

11. Disconnect the shift solenoid harness connector at the transmission housing.
12. Check for continuity between PCM connector terminals C5 and A8 or A9.

Is there continuity?

YES: Repair short to ground in the wire between PCM connector terminal C5 and the shift solenoid harness connector, then go to step 13.

NO: Check shift solenoid valve D, and check for a short in the shift solenoid harness in the transmission (see **SHIFT SOLENOID VALVE TEST**). Replace shift solenoid valve D and/or shift solenoid harness, then go step 13.

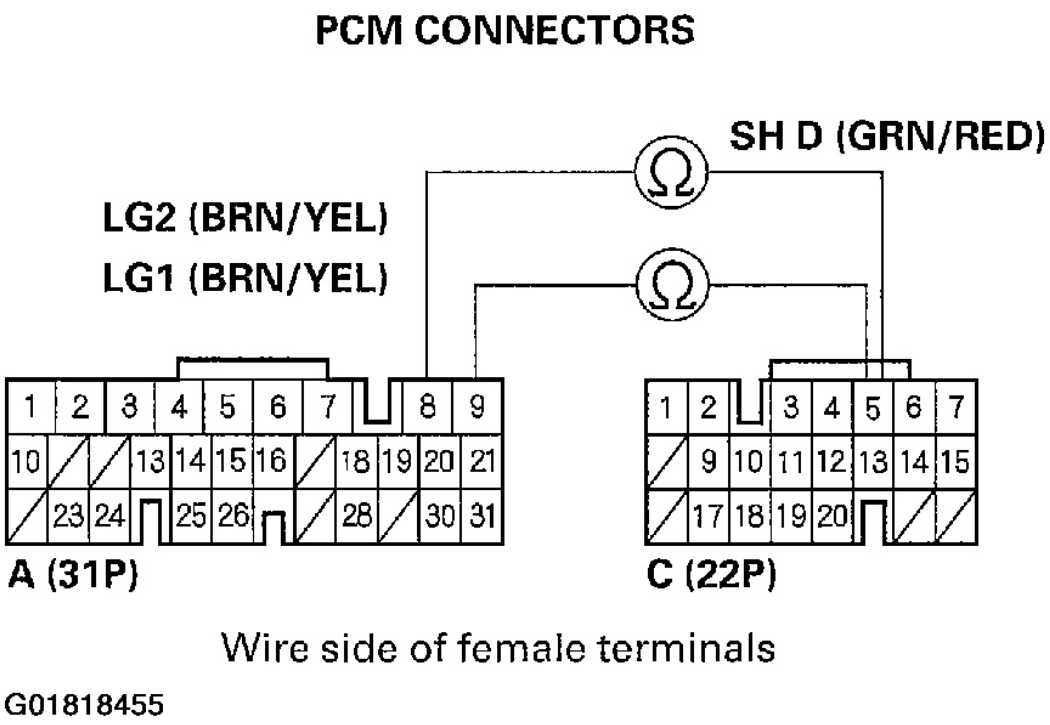


Fig. 199: Checking For Continuity Between PCM Connector Terminals C5 & A8 Or A9

13. Clear the DTC with the HDS.
14. Start the engine, and shift the transmission in 2nd gear in the **M** position.
15. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0982.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0983: OPEN IN SHIFT SOLENOID VALVE D CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Start the engine in the **P** position.
3. Check that DTC P0983 recurs.

Is DTC P0983 indicated?

YES: Go to step 7 .

NO: Go to step 4.

4. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL D test in SHIFT SOL TEST MENU with the HDS.
5. Start the engine in the **P** position.
6. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0983.

Did the result indicate a fail?

YES: Go to step 7.

NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the shift solenoid valve D and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.

7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connectors A (31P) and C (22P).
10. Measure the resistance between PCM connector terminals C5 and A8 or A9.

Is there 12-25 ohm?

YES: Check for loose or poor connections at PCM connector terminal C5. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

NO: Go to step 11.

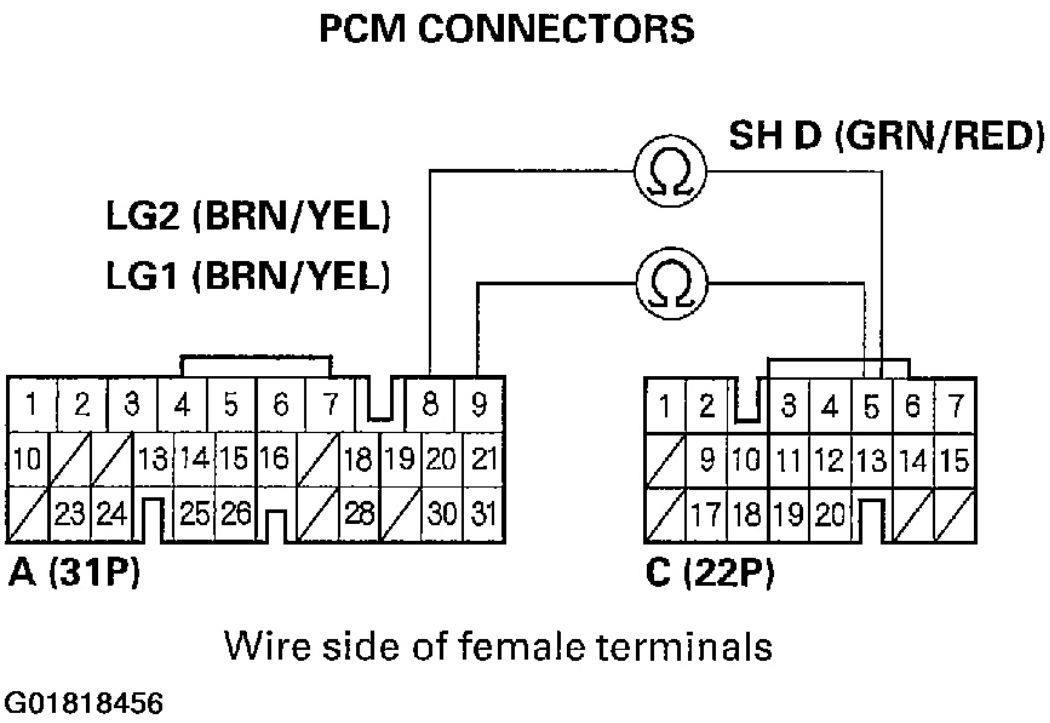


Fig. 200: Measuring The Resistance Between PCM Connector Terminals C5 & A8 Or A9

11. Disconnect the shift solenoid harness connector at the transmission housing.
12. Measure the resistance between shift solenoid harness connector terminal No. 8 and body ground.

Is there 12-25 ohm?

YES: Repair open in the wire between PCM connector terminal C5 and the shift solenoid harness connector, then go to step 13.

NO: Check shift solenoid valve D, and check for an open in the shift solenoid harness in the transmission (see **SHIFT SOLENOID VALVE TEST**). Replace shift solenoid valve D and/or shift solenoid harness, then go to step 13.

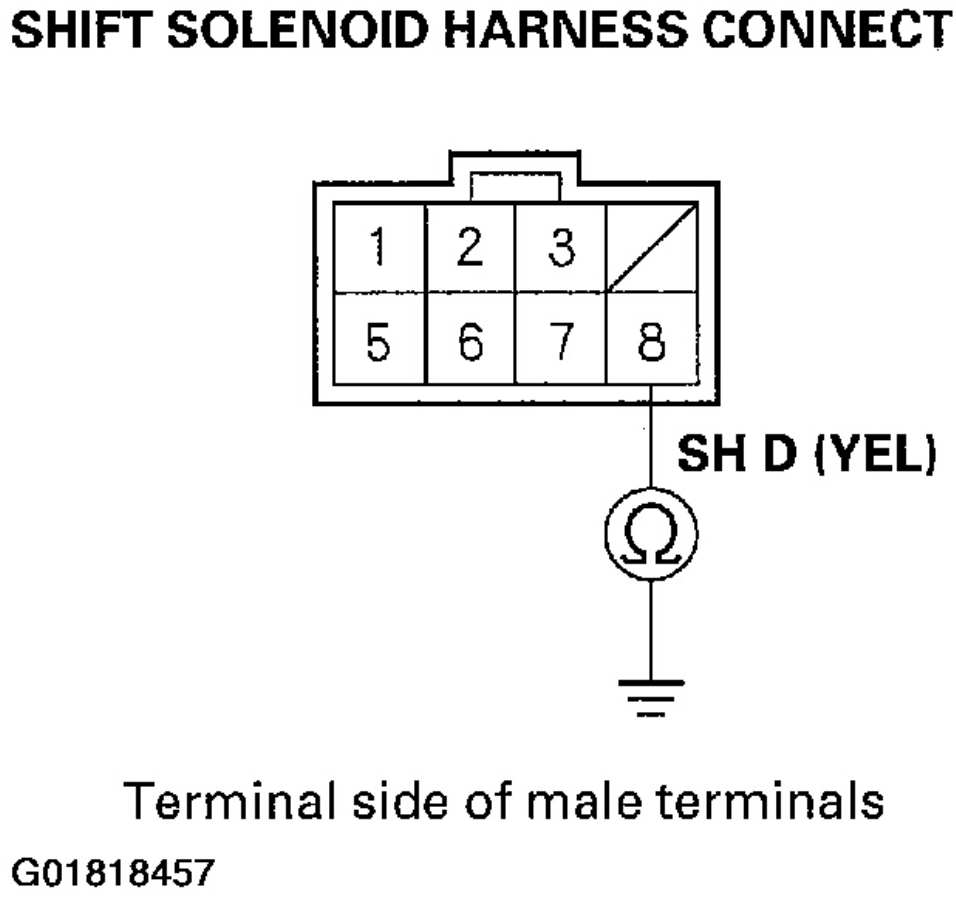


Fig. 201: Measuring The Resistance Between Shift Solenoid Harness Connector Terminal No. 8 & Body Ground

13. Clear the DTC with the HDS.
14. Start the engine in the **P** position.
15. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0983.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0985: SHORT IN SHIFT SOLENOID VALVE E CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you**

troubleshoot.

- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. Clear the DTC with the HDS.
2. Start the engine in the **P** position.
3. Check that DTC P0985 recurs.

   Is DTC P0985 indicated?

   YES: Go to step 7 .

   NO: Go to step 4.
4. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL E test in SHIFT SOL TEST MENU with the HDS.
5. Start the engine in the **P** position.
6. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0985.

   Did the result indicate a fail?

   YES: Go to step 7.

   NO: Intermittent failure, the system is OK at this time. Check the YEL wire for an intermittent short to ground between the shift solenoid valve E and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connectors A (31P) and C (22P).
10. Measure the resistance between PCM connector terminals C3 and A8 or A9.

    Is there less than 12 ohm ?

    YES: Go to step 11.

    NO: Update the PCM if it does not have the latest software, or substitute a known-good PCM (see **PCM UPDATING & SUBSTITUTION FOR TESTING**), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

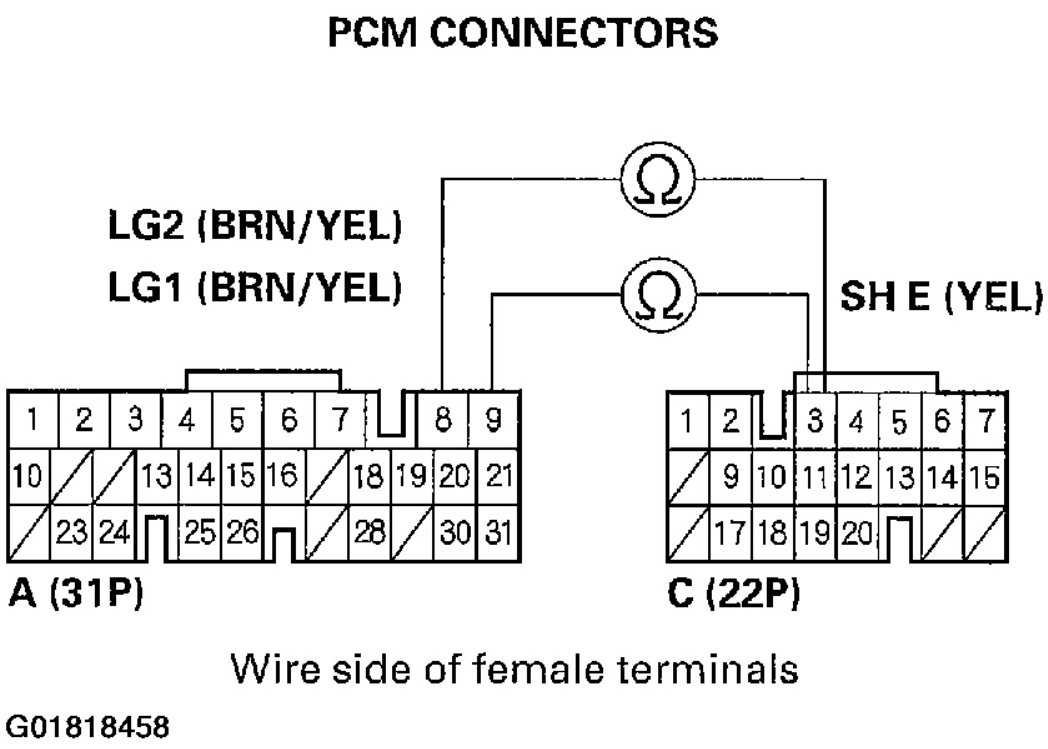


Fig. 202: Measuring The Resistance Between PCM Connector Terminals C3 & A8 Or A9

11. Disconnect the shift solenoid harness connector at the transmission housing.
12. Check for continuity between PCM connector terminals C3 and A8 or A9.

Is there continuity?

YES: Repair short to ground in the wire between PCM connector terminal C3 and the shift solenoid harness connector, then go to step 13.

NO: Check shift solenoid valve E, and check for a short in the shift solenoid harness in the transmission (see **SHIFT SOLENOID VALVE TEST**). Replace shift solenoid valve E and/or shift solenoid harness, then go to step 13.

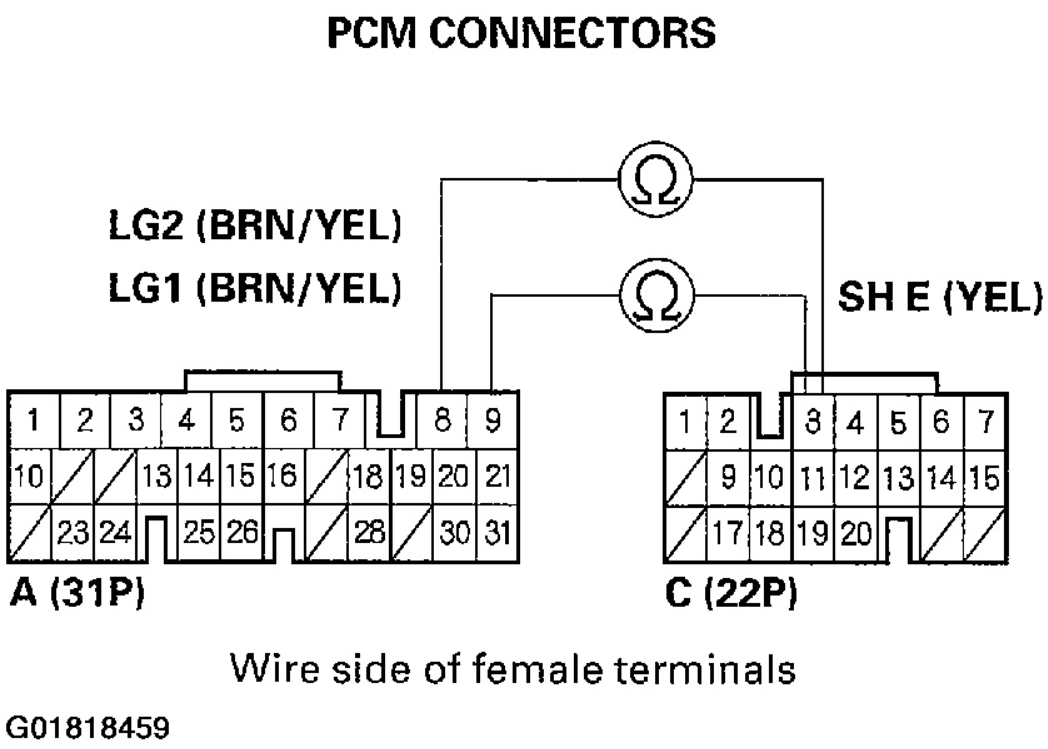


Fig. 203: Checking For Continuity Between PCM Connector Terminals C3 & A8 Or A9

13. Clear the DTC with the HDS.
14. Start the engine in the **P** position.
15. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0985.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P0986: OPEN IN SHIFT SOLENOID VALVE E CIRCUIT

NOTE:

- **Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.**
- **This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.**

1. **Clear the DTC with the HDS.**
2. **Start the engine, and shift the transmission in 2nd gear in the M position.**
3. **Check that DTC P0986 recurs.**

Is DTC P0986 indicated?

YES: Go to step 7 .

NO: Go to step 4.

4. **Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL E test in SHIFT SOL TEST MENU with the HDS.**
5. **Start the engine, and shift the transmission in 2nd gear in the M position.**
6. **Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0986.**

   Did the result indicate a fail?

   YES: Go to step 7.

   NO: Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the shift solenoid valve E and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.
7. **Turn the ignition switch OFF.**
8. **Jump the SCS line with the HDS.**
9. **Disconnect PCM connectors A (31P) and C (22P).**
10. **Measure the resistance between PCM connector terminals C3 and A8 or A9.**

    Is there 12-25 ohm ?

    YES: Check for loose or poor connections at PCM connector terminal C3. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see PCM UPDATING & SUBSTITUTION FOR TESTING), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.

    NO: Go to step 11.

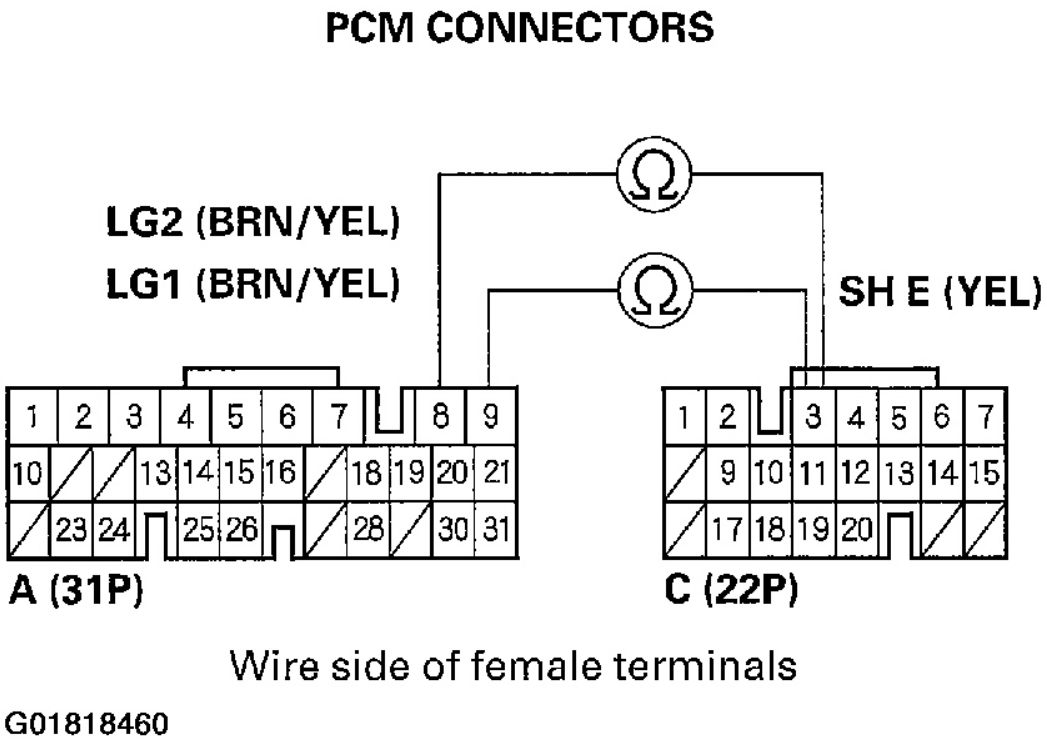


Fig. 204: Measuring The Resistance Between PCM Connector Terminals C3 & A8 Or A9

11. **Disconnect the shift solenoid harness connector at the transmission housing.**
12. **Check for continuity between shift solenoid harness connector terminal No. 3 and body ground.**

    Is there 12-25 ohm ?

    YES: Repair open in the wire between PCM connector terminal C3 and the shift solenoid harness connector, then go to step 13.

    NO: Check shift solenoid valve E, and check for an open in the shift solenoid harness in the transmission (see SHIFT SOLENOID VALVE TEST). Replace shift solenoid valve E and/or shift solenoid harness, then go to step 13.

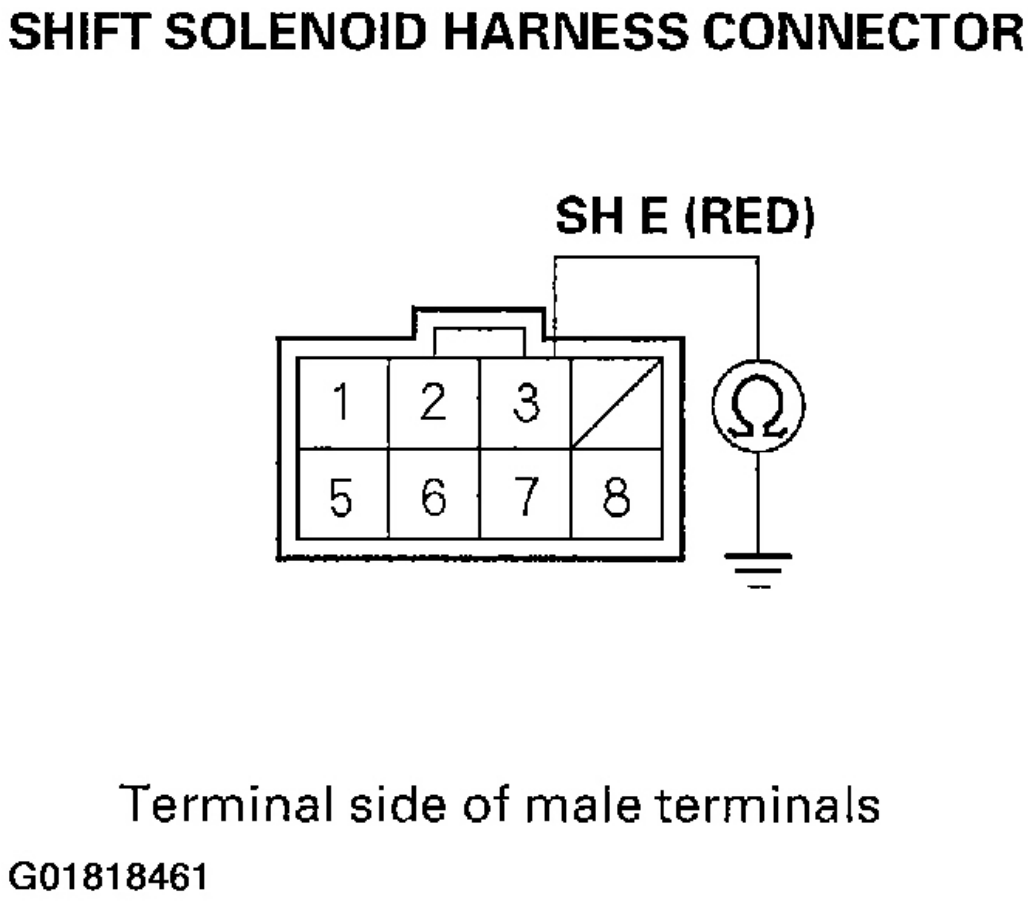


Fig. 205: Checking For Continuity Between Shift Solenoid Harness Connector Terminal No. 3 & Body Ground

13. **Clear the DTC with the HDS.**
14. **Start the engine, and shift the transmission in 2nd gear in the M position.**
15. **Check the OBD STATUS in DTCs MENU for a pass/fail test of code P0986.**

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P1730: PROBLEM IN SHIFT CONTROL SYSTEM:

- Shift Solenoid Valves A or D Stuck OFF
- Shift Solenoid Valve B Stuck ON

- Shift Valves A, B, or D Stuck

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

   Has the ATF deteriorated?

   YES: Replace ATF (see **DRAINING & REFILLING**), and go to step 4.

   NO: Go to step 8 .
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P1730.

   Did the result indicate a fail?

   YES: Go to step 8.

   NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.
8. Clear the DTC with the HDS.
9. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL A test in SHIFT SOL TEST MENU with the HDS.

   Is a clicking sound heard?

   YES: Go to step 10.

   NO: Replace shift solenoid valve A (see **SHIFT SOLENOID VALVE REPLACEMENT**), then go to step 15 .
10. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL B test in SHIFT SOL TEST MENU with the HDS.

    Is a clicking sound heard?

    YES: Go to step 11.

    NO: Replace shift solenoid valve B (see **SHIFT SOLENOID VALVE REPLACEMENT**), then go to step 15 .
11. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL D test in SHIFT SOL TEST MENU with the HDS.

    Is a clicking sound heard?

    YES: Go to step 12.

    NO: Replace shift solenoid valve D (see **SHIFT SOLENOID VALVE**

REPLACEMENT), then go to step 15 .

12. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
13. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
14. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P1730.

    Did the result indicate a fail?

    YES: Repair hydraulic system related with shift valves A, B and D, or replace the transmission, then go to step 15.

    NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 12 and recheck.
15. Clear the DTC with the HDS.
16. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
17. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
18. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P1730.

    Did the result indicate a pass?

    YES: The problem has been corrected.

    NO: Return to step 1 and recheck.

DTC P1731: PROBLEM IN SHIFT CONTROL SYSTEM:

- Shift Solenoid Valve E Stuck ON
- Shift Valve E Stuck
- A/T Clutch Pressure Control Solenoid Valve A Stuck OFF

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF through a strainer (see **DRAINING & REFILLING**). Inspect the ATF and strainer for metal debris or burnt fluid.

    Has the ATF deteriorated?

    YES: Replace ATF (see **DRAINING & REFILLING**), and go to step 4.

    NO: Go to step 8 .
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than

20 seconds, then slow down to a stop.

7. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P1731.

   Did the result indicate a fail?

   YES: Go to step 8.

   NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.

8. Clear the DTC with the HDS.
9. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL E test in SHIFT SOL TEST MENU with the HDS.

   Is a clicking sound heard?

   YES: Go to step 10.

   NO: Replace shift solenoid valve E (see **SHIFT SOLENOID VALVE REPLACEMENT**), then go to step 12 .

10. Select LINEAR SOL TEST in MISC. TEST MENU, then carry out LINEAR SOL A TEST in LINEAR SOL TEST MENU with the HDS.

    Is the system OK?

    YES: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 10 and recheck.

    NO: Follow instructions indicated on the HDS by the test result, but the tester has not determined the cause of the failure, go to step 11. If any part was replaced, go to step 12 .

11. Inspect A/T clutch pressure control solenoid valve A (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A TEST**).

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

    YES: Repair hydraulic system related with shift valve E, or replace the transmission, then go to step 12.

    NO: Replace A/T clutch pressure control solenoid valve A (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A REPLACEMENT**), then go to step 12.

12. Clear the DTC with the HDS.
13. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
14. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
15. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P1731.

    Did the result indicate a pass?

    YES: The problem has been corrected.

    NO: Return to step 1 and recheck.

DTC P1732: PROBLEM IN SHIFT CONTROL SYSTEM:

- Shift Solenoid Valves B or C Stuck ON
- Shift Valves B or C Stuck

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

   Has the ATF deteriorated?

   YES: Replace ATF (see **DRAINING & REFILLING**), and go to step 4.

   NO: Go to step 8 .
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P1732.

   Did the result indicate a fail?

   YES: Go to step 8.

   NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.
8. Clear the DTC with the HDS.
9. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL B test in SHIFT SOL TEST MENU with the HDS.

   Is a clicking sound heard?

   YES: Go to step 10.

   NO: Replace shift solenoid valve B (see **SHIFT SOLENOID VALVE REPLACEMENT**), then go to step 14 .
10. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL C test in SHIFT SOL TEST MENU with the HDS.

    Is a clicking sound heard?

    YES: Go to step 11.

    NO: Replace shift solenoid valve C (see **SHIFT SOLENOID VALVE REPLACEMENT**), then go to step 14 .
11. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
12. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
13. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P1732.

    Did the result indicate a fail?

    YES: Repair hydraulic system related with shift valves B and C, or replace the transmission,

then go to step 14.

NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 14 and recheck.

14. Clear the DTC with the HDS.
15. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
16. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
17. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P1732.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

DTC P1733: PROBLEM IN SHIFT CONTROL SYSTEM

- Shift Solenoid Valve D Stuck ON
- Shift Valve D Stuck
- A/T Clutch Pressure Control Solenoid Valve C Stuck OFF

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

Has the ATF deteriorated?

YES: Replace ATF (see **DRAINING & REFILLING**), and go to step 4.

NO: Go to step 8 .

4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P1733.

Did the result indicate a fail?

YES: Go to step 8.

NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.

8. Clear the DTC with the HDS.
9. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL D test in SHIFT SOL

TEST MENU with the HDS.

Is a clicking sound heard?

YES: Go to step 10.

NO: Replace shift solenoid valve D (see **SHIFT SOLENOID VALVE REPLACEMENT**), then go to step 15 .

10. Select LINEAR SOL TEST in MISC. TEST MENU, then carry out LINEAR SOL CTEST in LINEAR SOL TEST MENU with the HDS.

    Is the system OK?

    YES: Go to step 11.

    NO: Follow instructions indicated on the HDS by the test result, but the tester has not determined the cause of the failure, go to step 14. If any part was replaced, go to step 15 .

11. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
12. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
13. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P1733.

    Did the result indicate a fail?

    YES: Repair hydraulic system related with shift valve D, or replace the transmission, then go to step 15 .

    NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 11 and recheck.

14. Inspect A/T clutch pressure control solenoid valve C (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B & C TEST**).

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

    YES: Repair hydraulic system related with shift valve D, or replace the transmission, then go to step 15.

    NO: Replace A/T clutch pressure control solenoid valve C (see **A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B & C REPLACEMENT**), then go to step 15.

15. Clear the DTC with the HDS.
16. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
17. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
18. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P1733.

    Did the result indicate a pass?

    YES: The problem has been corrected.

    NO: Return to step 1 and recheck.

DTC P1734: PROBLEM IN SHIFT CONTROL SYSTEM

- Shift Solenoid Valves B or C Stuck OFF

- Shift Valves B or C Stuck

NOTE: Record all freeze data and review General Troubleshooting Information (see GENERAL TROUBLESHOOTING INFORMATION) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check to be sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see **DRAINING & REFILLING**) through a strainer. Inspect the ATF and strainer for metal debris or burnt fluid.

   Has the ATF deteriorated?

   YES: Replace ATF (see **DRAINING & REFILLING**), and go to step 4.

   NO: Go to step 8 .
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P1734.

   Did the result indicate a fail?

   YES: Go to step 8.

   NO: Intermittent failure, the system is OK at this time, if the tester indicates NOT COMPLETE, return to step 5 and recheck.
8. Clear the DTC with the HDS.
9. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL B test in SHIFT SOL TEST MENU with the HDS.

   Is a clicking sound heard?

   YES: Go to step 10.

   NO: Replace shift solenoid valve B (see **SHIFT SOLENOID VALVE REPLACEMENT**), then go to step 14 .
10. Select SHIFT SOL TEST in MISC. TEST MENU, then carry out A/T SHIFT SOL C test in SHIFT SOL TEST MENU with the HDS.

    Is a clicking sound heard?

    YES: Go to step 11.

    NO: Replace shift solenoid valve C (see **SHIFT SOLENOID VALVE REPLACEMENT**), then go to step 14 .
11. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
12. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
13. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P1734.

Did the result indicate a fail?

YES: Repair hydraulic system related with shift valves B and C, or replace the transmission, then go to step 14.

NO: Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 11 and recheck.

14. Clear the DTC with the HDS.
15. Test-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
16. Retest-drive the vehicle in the **D** position in all five gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
17. Check the OBD STATUS in DTCs MENU for a pass/fail test of code P1734.

Did the result indicate a pass?

YES: The problem has been corrected.

NO: Return to step 1 and recheck.

ROAD TEST

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Apply the parking brake, and block both rear wheels. Start the engine, then shift to the **D** position while pressing the brake pedal. Press the accelerator pedal, and release it suddenly. The engine should not stall.
3. Repeat step 2 in the $\mathbf{D}_3$ position.
4. Connect the HDS to the DLC (A), and go to the A/T data list.

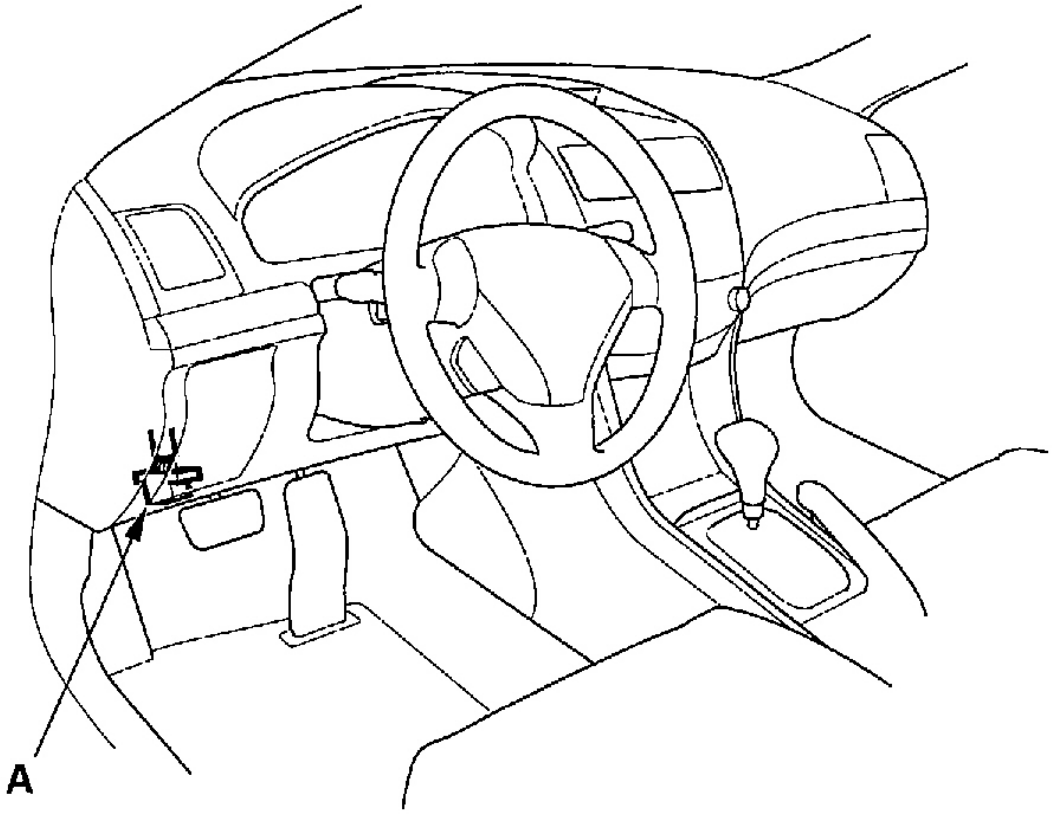


Fig. 206: Connecting The HDS To The DLC

5. Test-drive the vehicle on a flat road in the **D** position. Check for abnormal noise and clutch slippage. While driving, check that the shift points occur at the proper speeds by monitoring the throttle position sensor voltage with the HDS and comparing your shift point speeds and voltage to those in the table. (The throttle position sensor voltage represents the throttle opening.)

Throttle position sensor voltage: 0.8 V	
1st→2nd	9 – 12 mph (15 – 19 km/h)
2nd→3rd	18 – 21 mph (28 – 33 km/h)
3rd→4th	27 – 32 mph (44 – 51 km/h)
4th→5th	39 – 44 mph (63 – 70 km/h)
Lock-up ON	48 – 55 mph (78 – 88 km/h)
Throttle position sensor voltage: 2.25 V	
1st→2nd	21 – 25 mph (34 – 40 km/h)
2nd→3rd	42 – 47 mph (67 – 75 km/h)
3rd→4th	65 – 71 mph (105 – 114 km/h)
4th→5th	110 – 116 mph (176 – 185 km/h)
Lock-up ON	106 – 117 mph (170 – 187 km/h)
Fully-opened throttle Throttle position sensor voltage: 4.5 V	
1st→2nd	38 – 44 mph (62 – 70 km/h)
2nd→3rd	70 – 79 mph (113 – 126 km/h)
3rd→4th	103 – 114 mph (165 – 182 km/h)
4th→5th	———
Lock-up ON	119 – 130 mph (191 – 208 km/h)

G01818463

Fig. 207: D Position Upshift Table

Throttle position sensor voltage: 0.8 V	
Lock-up OFF	47 — 53 mph (76 — 86 km/h)
5th→4th	31 — 34 mph (50 — 55 km/h)
4th→3rd	17 — 21 mph (28 — 33 km/h)
3rd→1st	5 — 8 mph (8 — 13 km/h)
Throttle position sensor voltage: 2.25 V	
Lock-up OFF	78 — 86 mph (125 — 138 km/h)
Fully-opened throttle Throttle position sensor voltage: 4.5 V	
Lock-up OFF	116 — 127 mph (186 — 203 km/h)
5th→4th	120 — 130 mph (192 — 208 km/h)
4th→3rd	79 — 89 mph (127 — 143 km/h)
3rd→2nd	53 — 60 mph (85 — 96 km/h)
2nd→1st	27 — 32 mph (44 — 52 km/h)

G01818464

Fig. 208: D Position Downshift Table

6. Accelerate to about 35 mph (57 km/h) so the transmission is in 4th or 5th gear in **M** position, then shift to 2nd gear. The vehicle should immediately begin to slow down from engine braking.
7. Check for abnormal noise and clutch slippage in the **R** position. Accelerate from a stop at full throttle, and check for abnormal noise and clutch slippage.
8. Test in **P** (Park) Position.

   Park the vehicle on a slope (about 16°), apply the brake, and shift into the **P** position. Release the brake; the vehicle should not move.

NOTE: Always use the brake to hold the vehicle, when stopped on an incline in gear. Depending on the grade of the incline, the vehicle could roll backwards if the brake is released.

STALL SPEED TEST

1. Engage the parking brake, and block all four wheels.
2. Connect the HDS to the DLC (A), and go to the A/T data list.

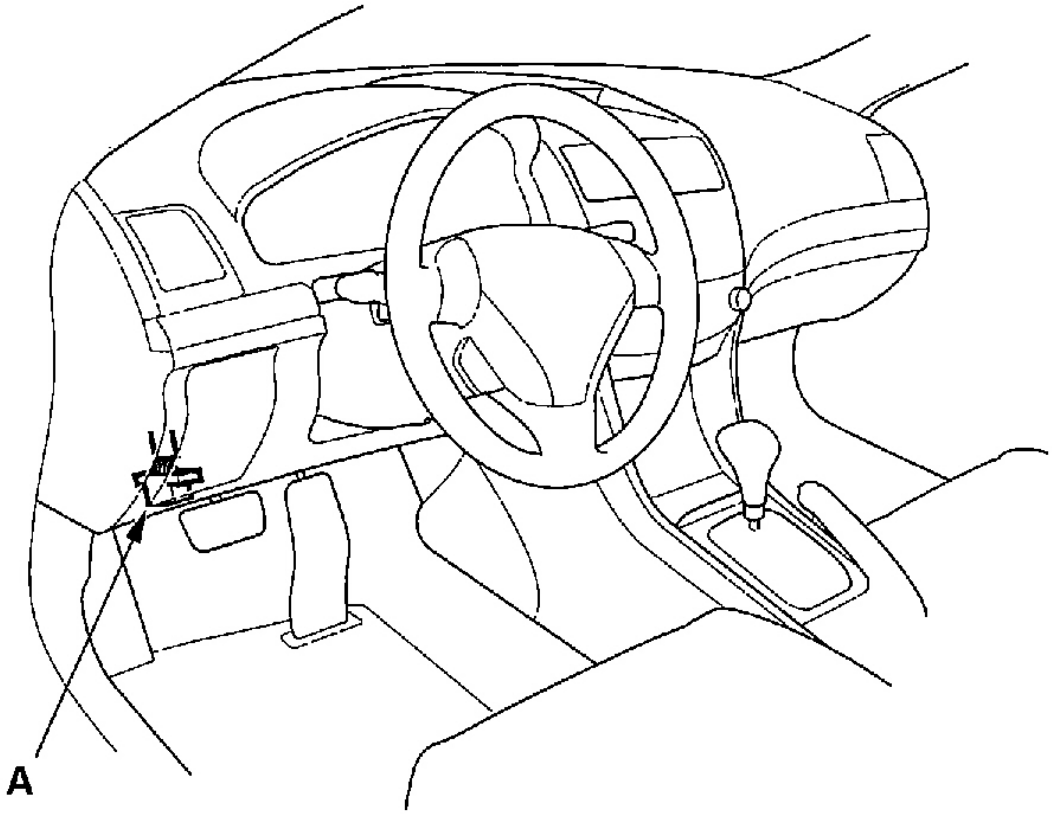


Fig. 209: Connecting The HDS To The DLC

3. Make sure the A/C switch is OFF.
4. After the engine has warmed up to normal operating temperature (the radiator fan comes on), shift to the **D** position.
5. Fully press the brake pedal and accelerator pedal for 6 to 8 seconds, and note the maximum engine speed. Do not move the shift lever while raising engine speed.
6. Allow 2 minutes for cooling, then repeat the test in the **R** position.

NOTE:

- **Do not test stall speed for more than 10 seconds at a time.**
- **Stall speed tests should be used for diagnostic purposes only.**
- **Stall speed should be the same in D and R positions.**
- **Do not test stall speed with the A/T pressure gauges installed.**

Stall Speed RPM:

Specification: 2,000 RPM

Service Limit: 1,850-2,150 RPM

7. If the measurements are out of the service limit, problems and probable causes are listed in the table below:

Problem	Probable causes
Stall speed rpm high in the D and R positions	• Low fluid level • ATF pump output low • Clogged ATF strainer • Regulator valve stuck • Slipping clutch
Stall speed rpm high in the R position	Slippage 4th clutch
Stall speed rpm low in the D and R positions	• Engine output low • Engine throttle valve closed • Torque converter one-way clutch slipping

G01818466

Fig. 210: Stall Speed Symptoms & Causes Table

PRESSURE TEST

Special Tools Required:

- A/T clutch pressure gauge set 07406-0020400 or 07406-0020401
- A/T pressure hose, 2210 mm 07MAJ-PY4011A
- A/T pressure hose adapter 07MAJ-PY40120

1. Before testing, be sure the transmission fluid is filled to the proper level.
2. Lift the vehicle up on a lift or apply the parking brake, block rear wheels, and raise the front of the vehicle. Make sure it is securely supported.

3. Allow the front wheels to rotate freely.
4. Warm up the engine (the radiator fan comes on), then stop it and connect the HDS to the DLC.
5. Connect the oil pressure gauges to the line pressure inspection hole (A) and 4th clutch pressure inspection hole (B). Do not allow dust or other foreign particles to enter the holes while connecting the gauges.

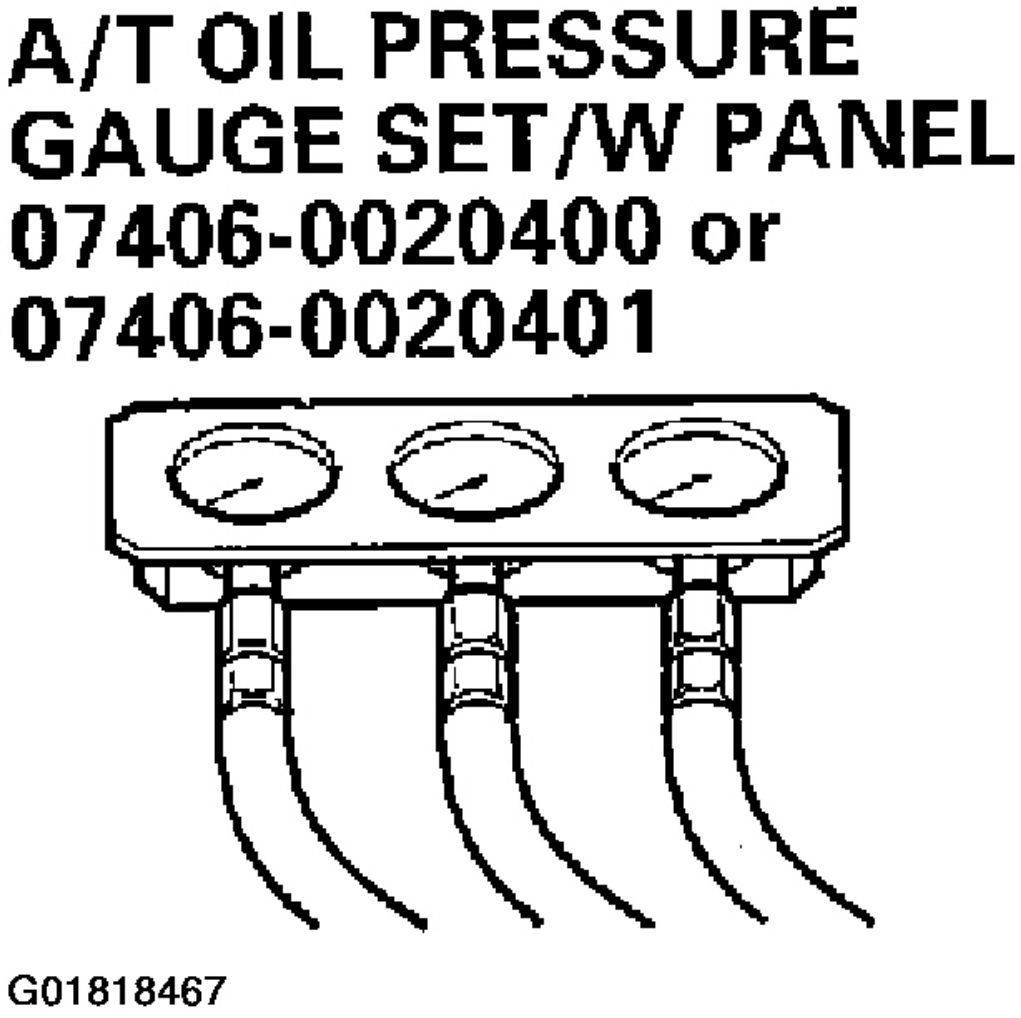


Fig. 211: Identifying Oil Pressure Gauge

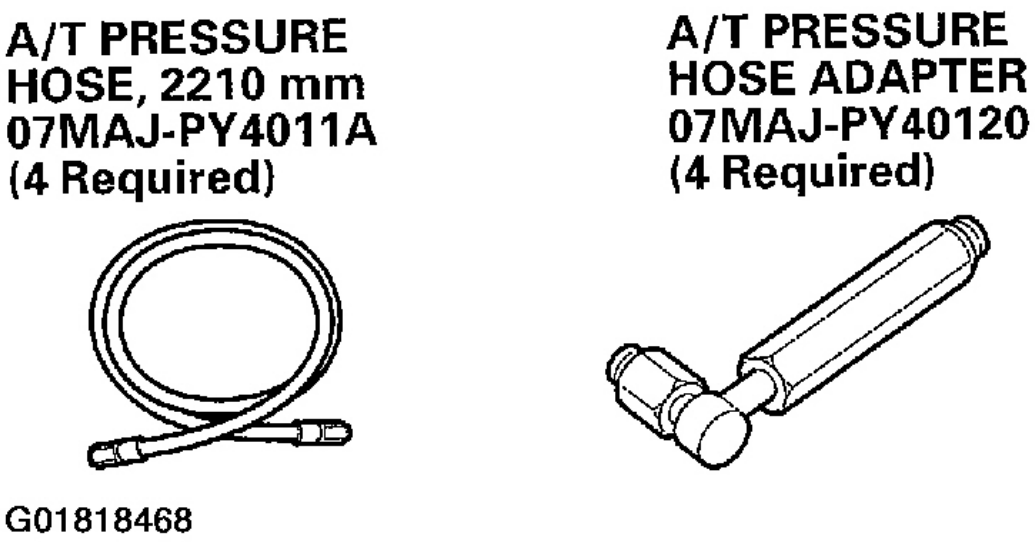


Fig. 212: Identifying Oil Pressure Gauge Hose & Adapter

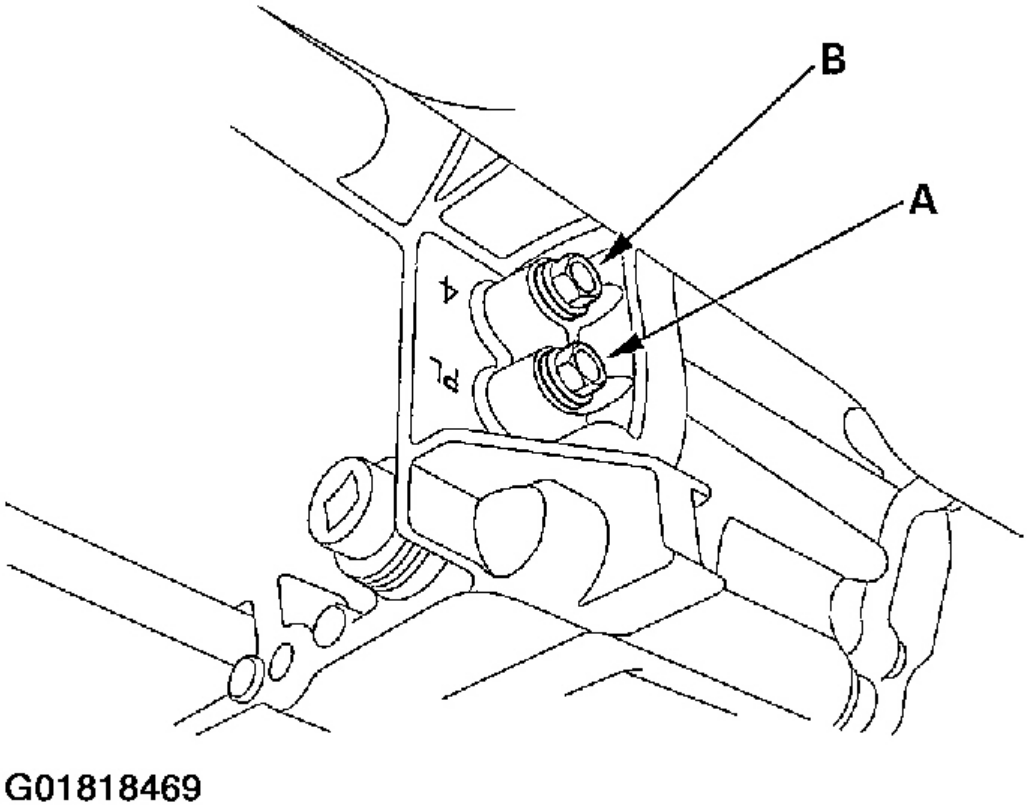


Fig. 213: Connecting The Oil Pressure Gauges To The Line Pressure Inspection Hole & 4th Clutch Pressure Inspection Hole

6. Remove the intake air duct and air cleaner housing, and connect the oil pressure gauges to the 2nd clutch pressure inspection hole (C). Then temporarily install the air cleaner housing and intake air duct.

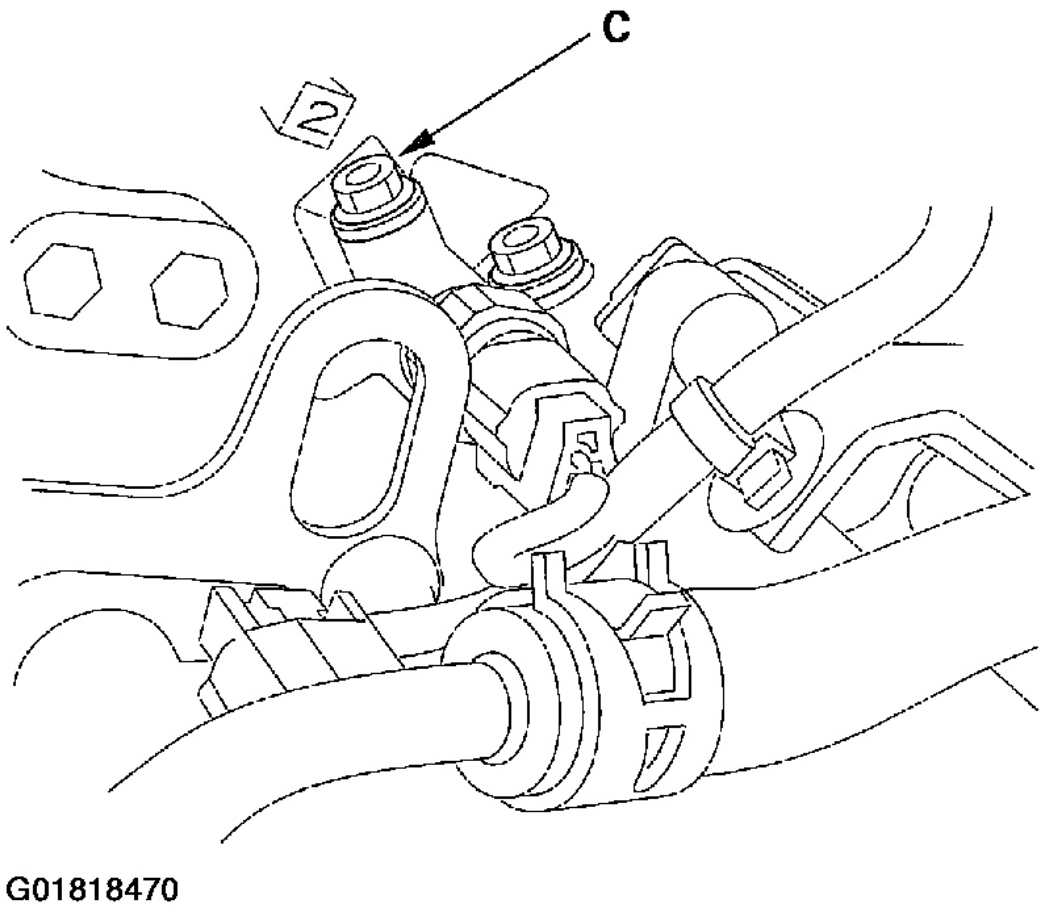


Fig. 214: Connecting The Oil Pressure Gauges To The 2nd Clutch Pressure Inspection Hole

7. Connect the oil pressure gauge to the 1st clutch pressure inspection hole (D), 3rd clutch pressure inspection hole (E), and 5th clutch pressure inspection hole (F).

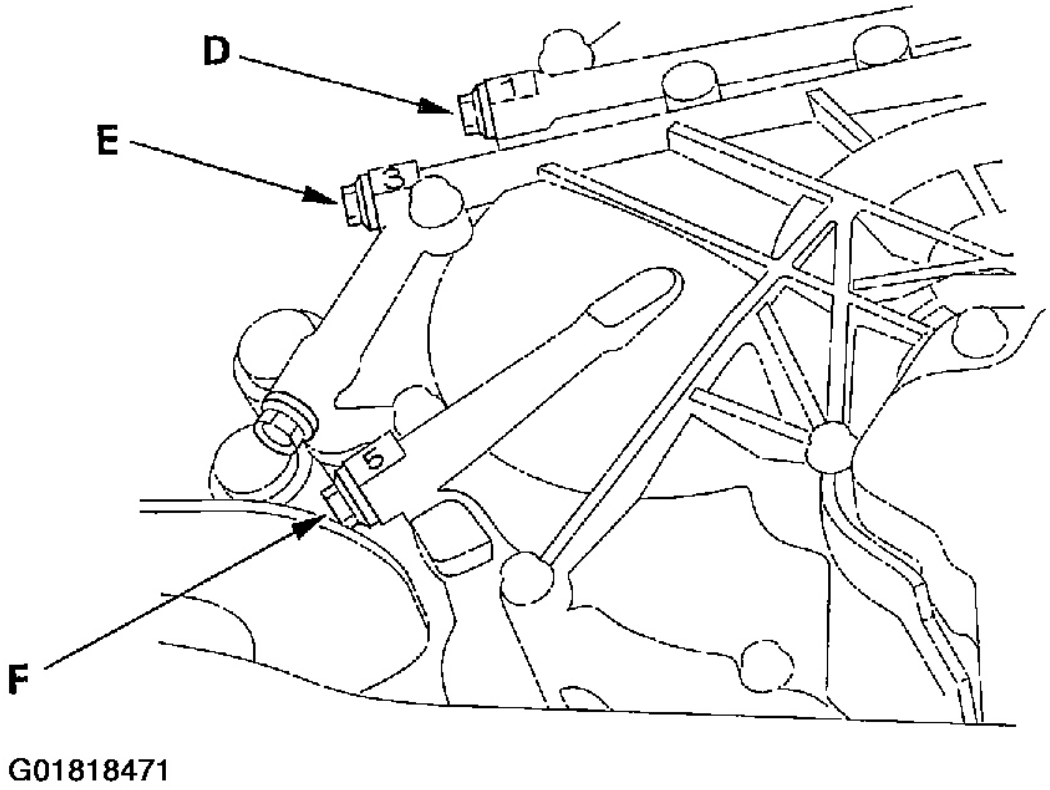


Fig. 215: Connecting The Oil Pressure Gauge To The 1st Clutch Pressure Inspection Hole, 3rd Clutch Pressure Inspection Hole & 5th Clutch Pressure Inspection Hole

8. Start the engine, and run it at 2,000 RPM in the **P** or **N** position.
9. Measure line pressure at the line pressure inspection hole (A).

NOTE: Higher pressure may be indicated if measurements are made in shift lever position other than N or P .

Pressure	Fluid Pressure	
	Standard	Service Limit
Line (A)	927 — 985.6 kPa (9.45 — 10.05 kgf/cm^2, 134 — 142.9 psi)	878 kPa (8.95 kgf/cm^2, 127 psi)

G01818472

Fig. 216: Line Pressure Table

10. Shift to the **M** position.
11. Shift to 1st gear, and measure 1st clutch pressure at the 1st clutch pressure inspection hole (D) while holding engine speed at 2,000 RPM.
12. Shift up to 2nd gear, and measure 2nd clutch pressure at the 2nd clutch pressure inspection hole (C) while holding engine speed at 2,000 RPM.
13. Shift up to 3rd gear, and measure 3rd clutch pressure at the 3rd clutch pressure inspection hole (E) while holding engine speed at 2,000 RPM.
14. Shift up to 4th gear, and measure 4th clutch pressure at the 4th clutch pressure inspection hole (B) while holding engine speed at 2,000 RPM.
15. Shift up to 5th gear, and measure 5th clutch pressure at the 5th clutch pressure inspection hole (F) while holding engine speed at 2,000 RPM.
16. Bring the engine back to an idle, then apply the brake to stop the wheels from rotating.
17. Shift to the **R** position. Raise the engine RPM to 2,000 RPM, and measure 4th clutch pressure at the 4th clutch pressure inspection hole (B).

Pressure	Fluid Pressure	
	Standard	Service Limit
1st clutch (D) 2nd clutch (C) 3rd clutch (D) 4th clutch (B) 5th clutch (F)	917 — 995.4 kPa (9.35 — 10.15 kgf/cm², 133 — 144.3 psi)	868 kPa (8.85 kgf/cm², 126 psi)

G01818473

Fig. 217: Clutch Pressure Table

18. If the measurements are out of service limit, problems and probable causes are listed in the table below:

Problem	Probable causes
No or low line pressure	• Torque converter • ATF pump • Regulator valve • Torque converter check valve • Low fluid level • 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 4th clutch pressure in the R position	• Servo valve • 4th clutch • O-rings

G01818474

Fig. 218: Pressure Symptoms & Causes Table

19. Install the sealing bolts with the new sealing washers, and tighten the bolts to the specified torque. Do not reuse old sealing washers.

    Torque: 18 N.m (1.8 kgf.m, 13 lbf.ft)

20. Install the air cleaner housing and intake air duct.

SHIFT SOLENOID VALVE TEST

1. Connect the HDS to the DLC (A).

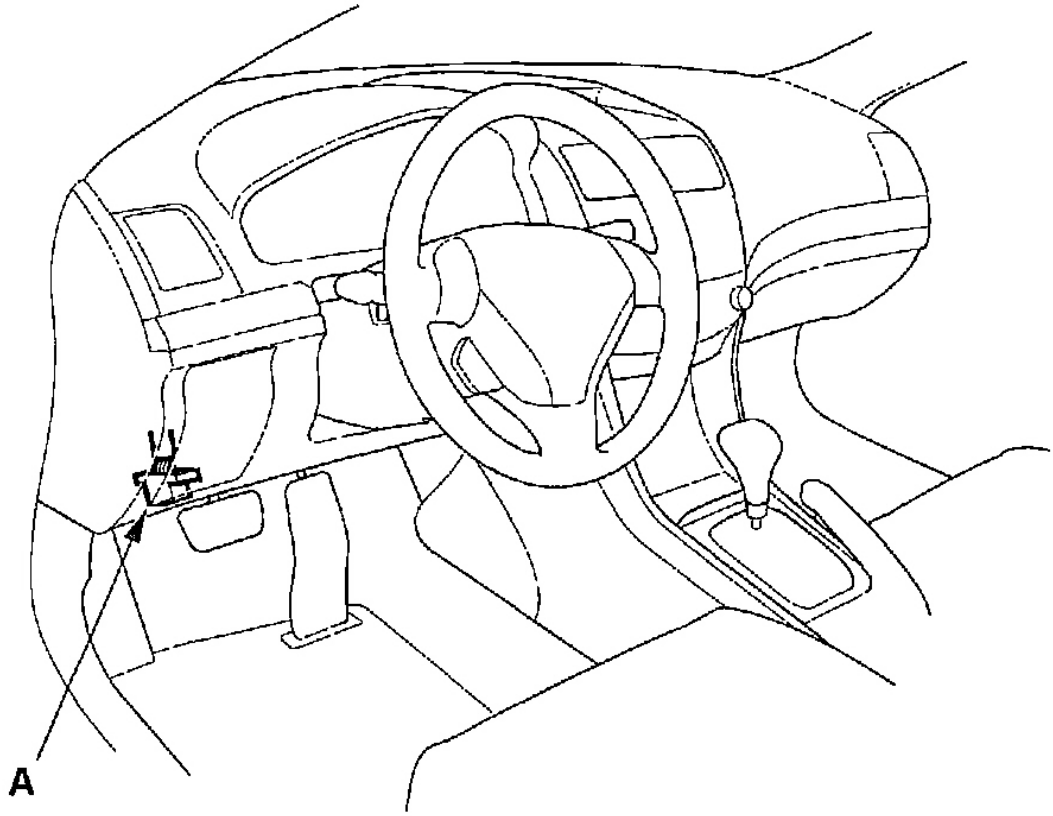


Fig. 219: Connecting The HDS To The DLC

2. Select SHIFT SOL TEST in MISC. TEST MENU on the HDS.
3. Carry out A/T SHIFT SOL A, B, C, D, and E tests in SHIFT SOL TEST MENU with the HDS. A clicking sound should be heard.
4. Shift solenoid valves test has finished if the test results are OK. If no sound is heard, remove the shift solenoid valves and test.
5. Remove the splash shield.
6. Remove the drain plug (A), and drain the automatic transmission fluid (ATF). Then reinstall the drain plug with a new sealing washer (B).

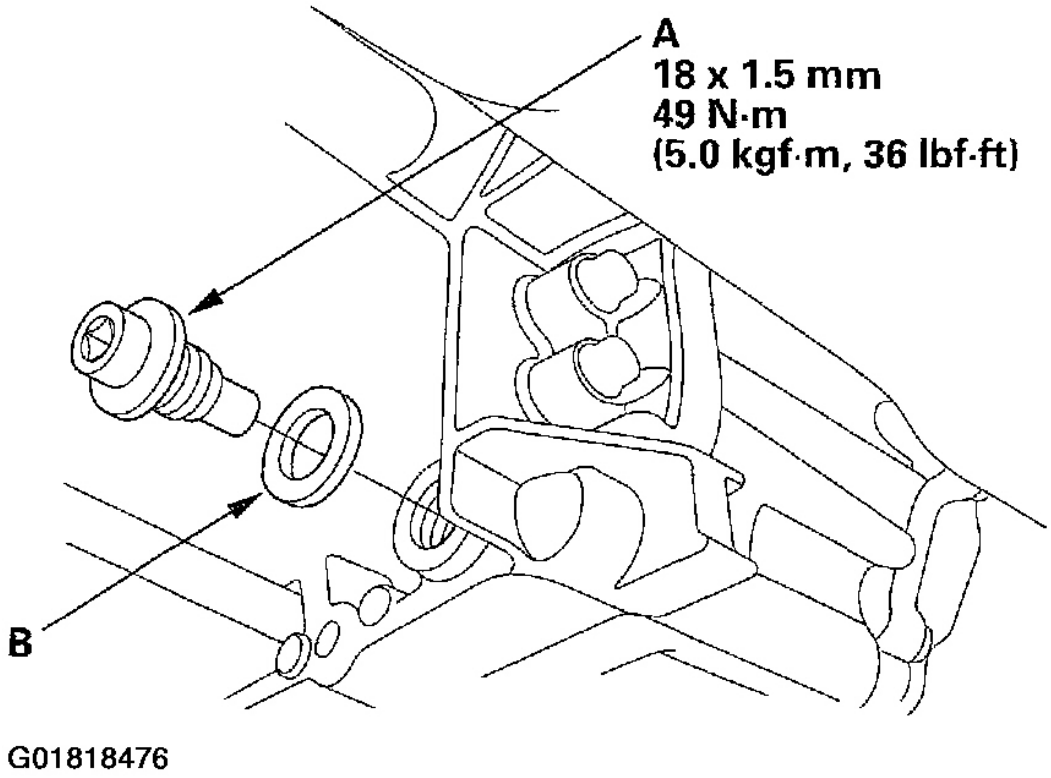


Fig. 220: Removing The Drain Plug

7. Disconnect the battery negative terminal, then disconnect the battery positive terminal.
8. Remove the battery hold-down bracket, then remove the battery cover, battery, and battery tray.
9. Remove the intake air duct and air cleaner housing.
10. Loosen the two bolts securing the battery base from under the vehicle, and remove the two bolts securing the battery base in the engine compartment, then remove the battery base.
11. Remove the ground cable (A), transmission upper mount bracket (B), and bracket plate (C).

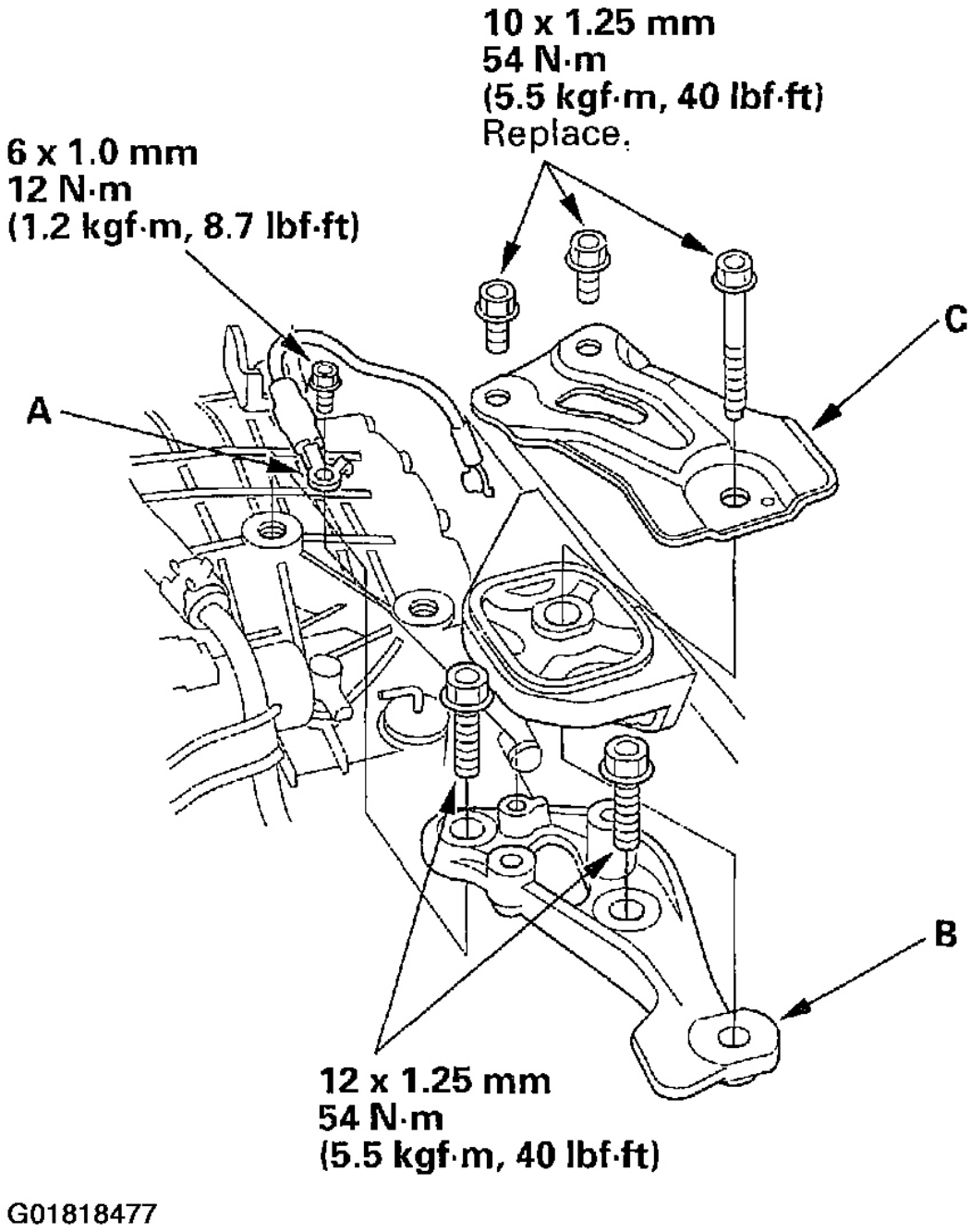


Fig. 221: Removing The Ground Cable, Transmission Upper Mount Bracket & Bracket Plate

12. Place a transmission jack under the transmission, and remove the transmission lower mount nuts.

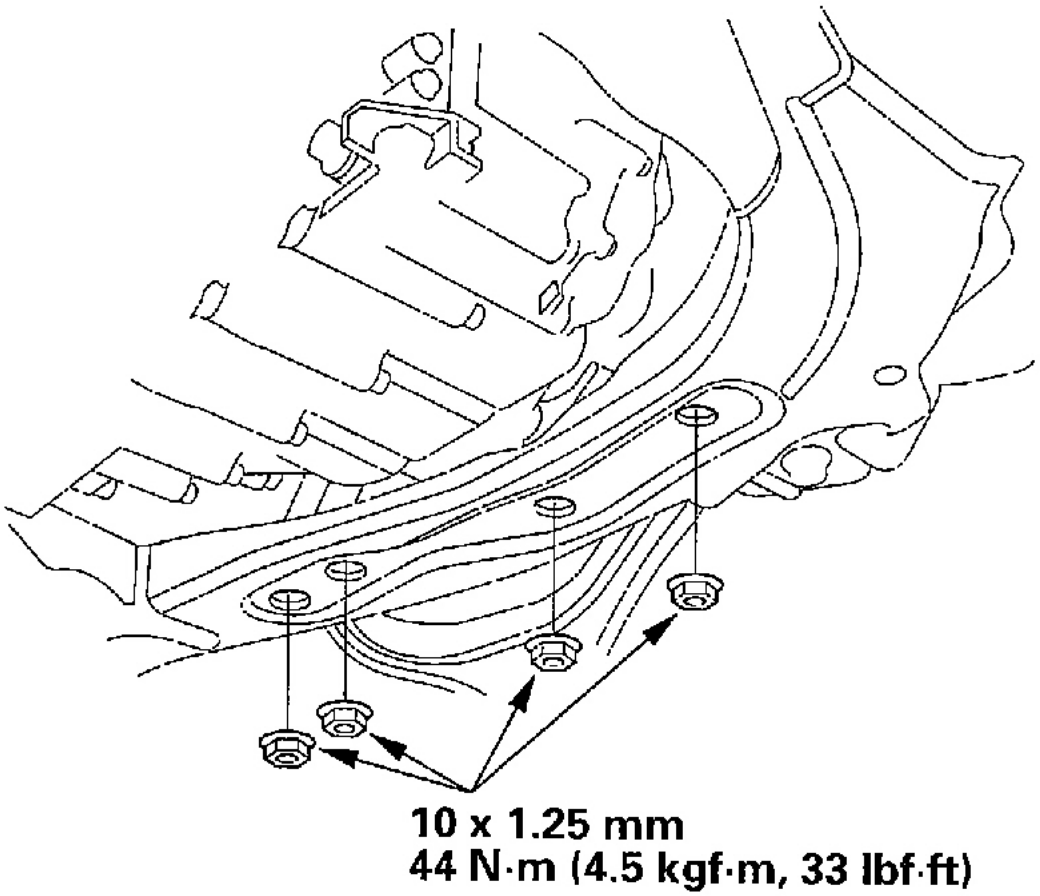


Fig. 222: Removing The Transmission Lower Mount Nuts

13. Lift the transmission up to create clearance between the transmission and front subframe with the jack.
14. Remove the ATF dipstick, and remove the bolts securing the ATF cooler inlet line brackets (A) and ATF dipstick guide pipe (B) from the transmission hanger (C).

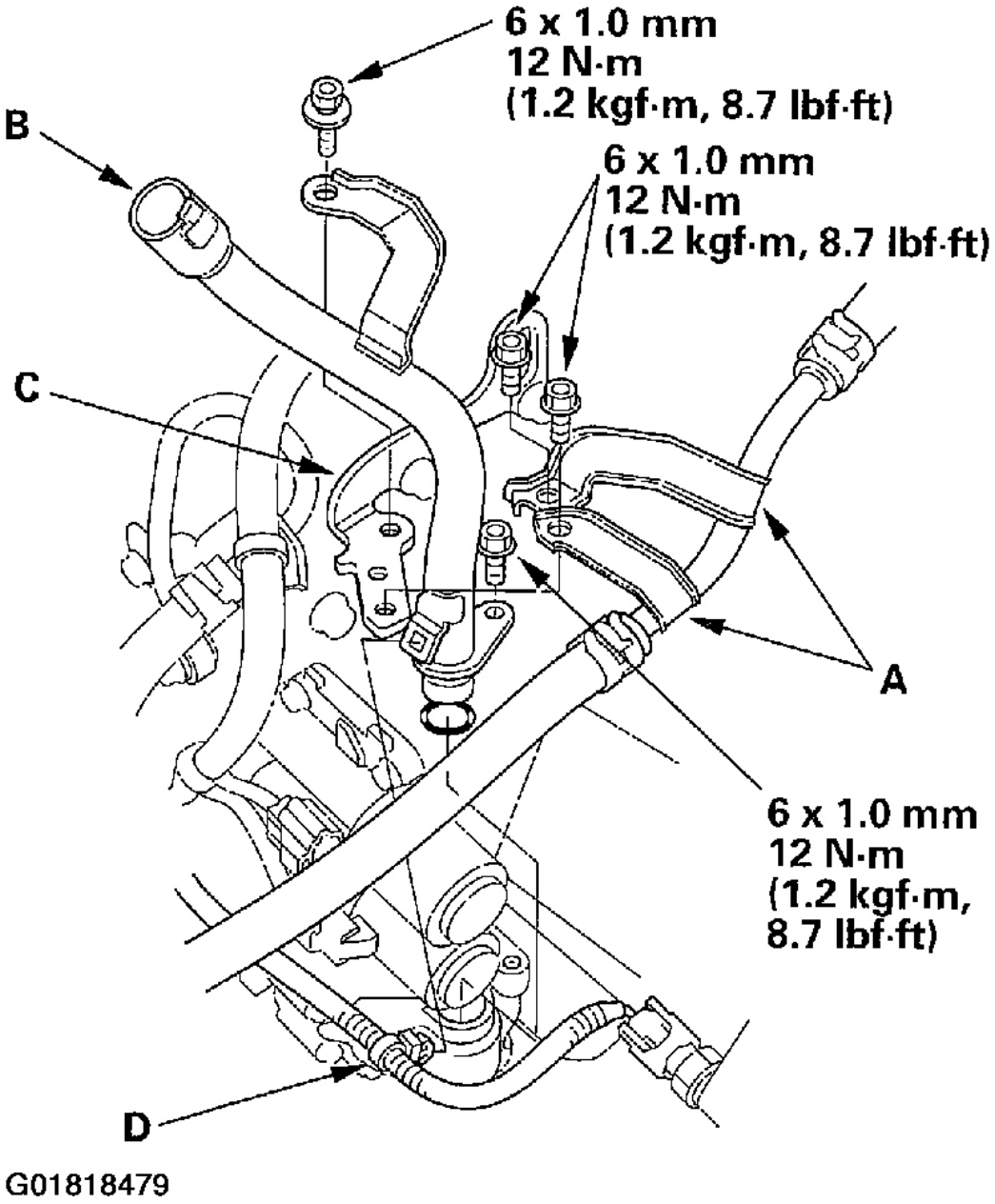


Fig. 223: Removing Components

15. Remove the harness clamp (D), than remove the ATF dipstick guide pipe.
16. Disconnect the shift solenoid harness connector.

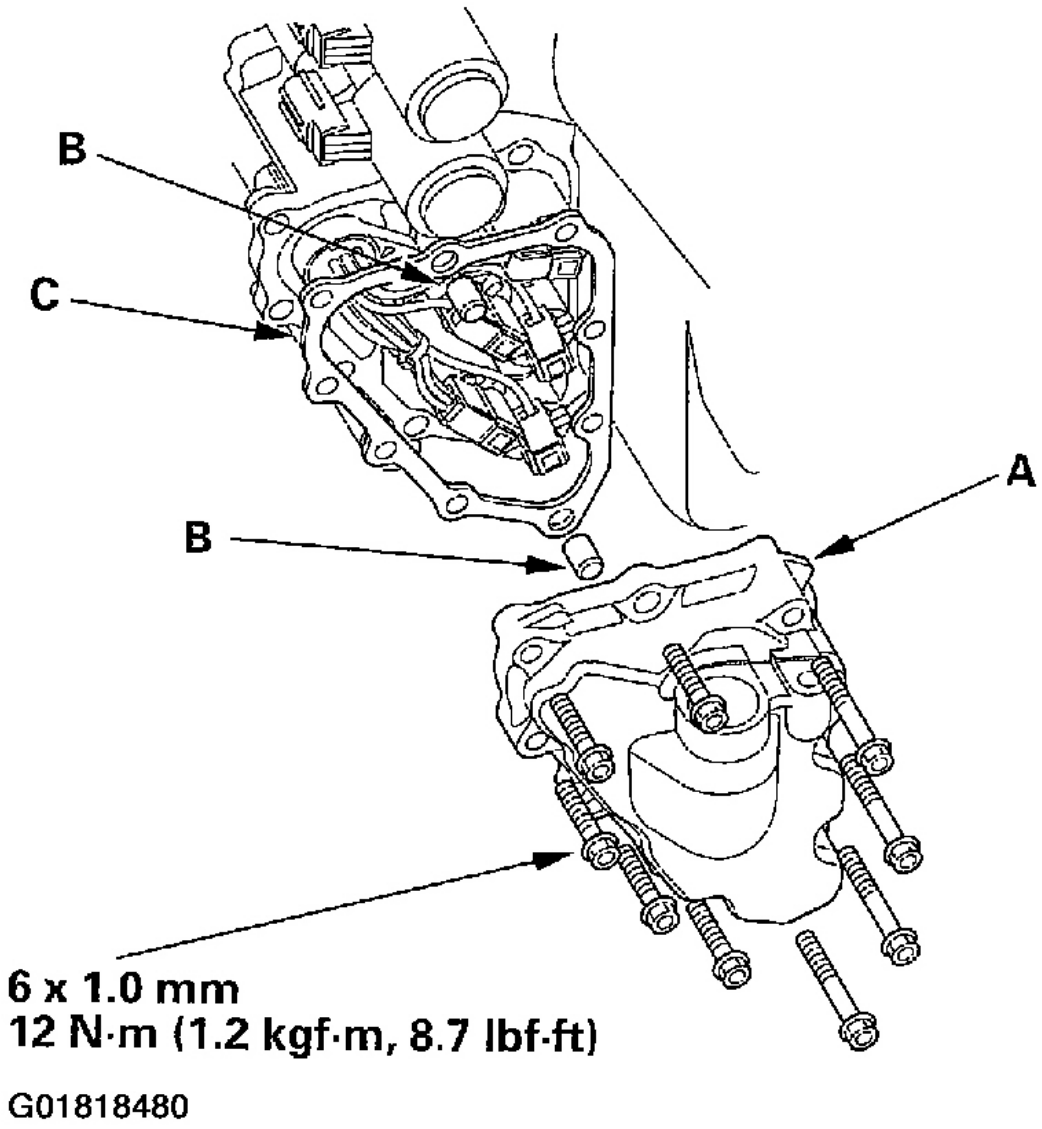


Fig. 224: Removing The Shift Solenoid Valve Cover, Dowel Pins & Gasket

17. Remove the shift solenoid valve cover (A), dowel pins (B), and gasket (C).
18. Remove the shift solenoid harness connector.

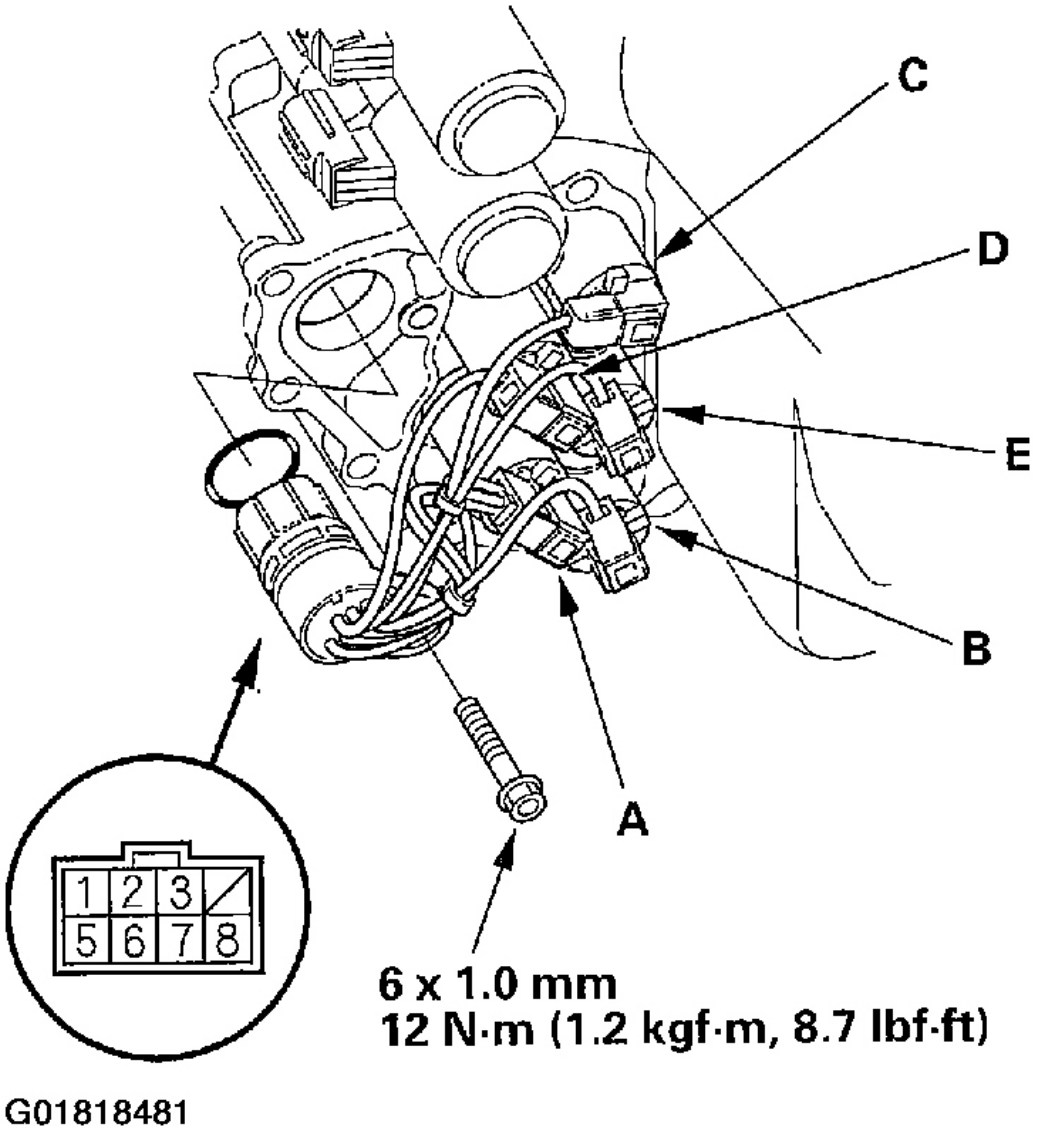


Fig. 225: Removing The Shift Solenoid Harness Connector & Identifying Valves

19. Measure shift solenoid valves resistance between shift solenoid harness connector terminals below and body ground:
    - **No. 1 (GRN):** Shift Solenoid Valve C
    - **No. 2 (ORN):** Shift Solenoid Valve B
    - **No. 3 (RED):** Shift Solenoid Valve E
    - **No. 5 (BLU):** Shift Solenoid Valve A
    - **No. 8 (YEL):** Shift Solenoid Valve D

Standard Resistance: 12-25 ohm

20. If the resistance is out of standard, disconnect the shift solenoid valve connector, and measure its resistance at the solenoid valve terminal. Replace the shift solenoid valve if the resistance is out of standard.
21. Connect the battery negative terminal to body ground, and connect the battery positive terminal to the shift solenoid valve terminal individually. A clicking sound should be heard.
22. If no sound is heard, connect the battery positive terminal to the shift solenoid valve terminal, and check for a clicking sound. Replace the shift solenoid valve if no clicking sound is heard.
23. Replace the shift solenoid harness if the test results are OK.
24. Install a new O-ring on the shift solenoid harness connector, and install the connector in the transmission housing.
25. Install the shift solenoid valve cover, dowel pins and a new gasket.
26. Install the new O-ring on the ATF dipstick guide pipe, and install the ATF dipstick guide pipe, then install the harness clamp on the ATF dipstick guide pipe.
27. Secure the ATF cooler line brackets on the transmission hanger with the bolts.
28. Check the connector for rust, dirt, or oil, then connect the connector securely.
29. Install the transmission lower mount nuts.
30. Install the transmission upper mount bracket, bracket plate, and ground cable, then remove the transmission jack.
31. Refill the transmission with ATF (see **DRAINING & REFILLING**).
32. Install the battery base, then install the air cleaner housing and intake air duct.
33. Install the battery tray, battery, and battery cover, then secure the battery with its hold-down bracket. Connect the battery terminals.
34. Install the splash shield.

SHIFT SOLENOID VALVE REPLACEMENT

1. Remove the splash shield.
2. Remove the drain plug (A), and drain the automatic transmission fluid (ATF). Then reinstall the drain plug with a new sealing washer (B).

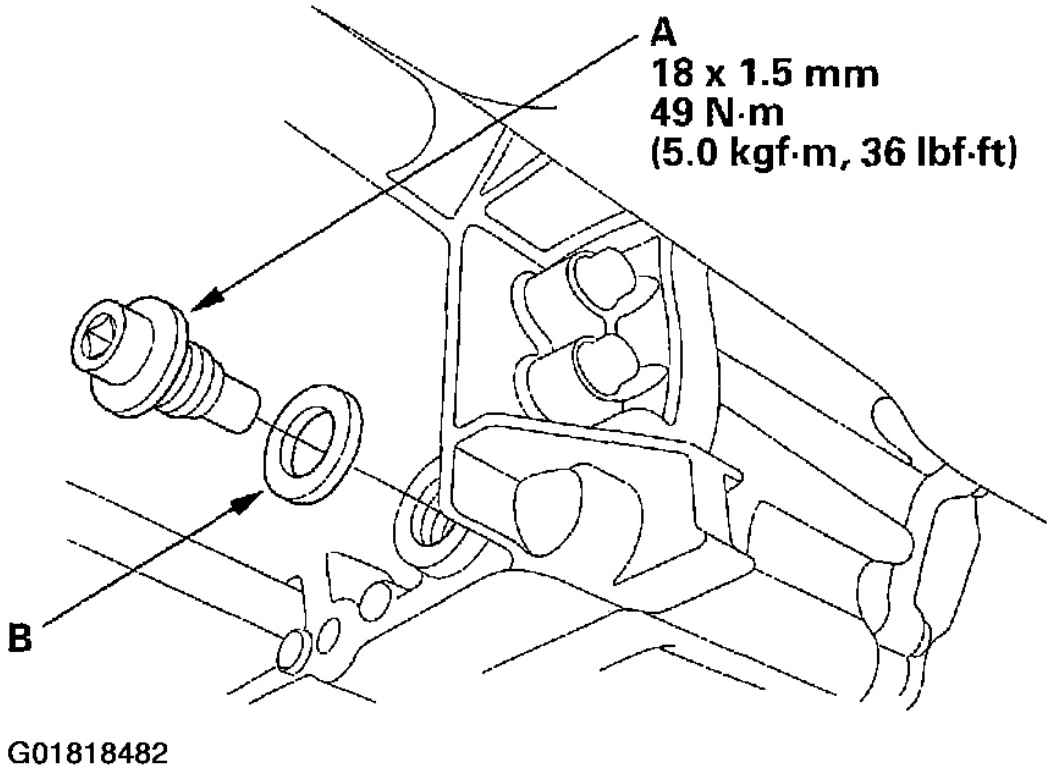


Fig. 226: Removing The Drain Plug

3. Disconnect the battery negative terminal, then disconnect the battery positive terminal.
4. Remove the battery hold-down bracket, then remove the battery cover, battery, and battery tray.
5. Remove the intake air duct and air cleaner housing.
6. Loosen the two bolts securing the battery base from under the vehicle, and remove the two bolts securing the battery base in the engine compartment, then remove the battery base.
7. Remove the ground cable (A), transmission upper mount bracket (B), and bracket plate (C).

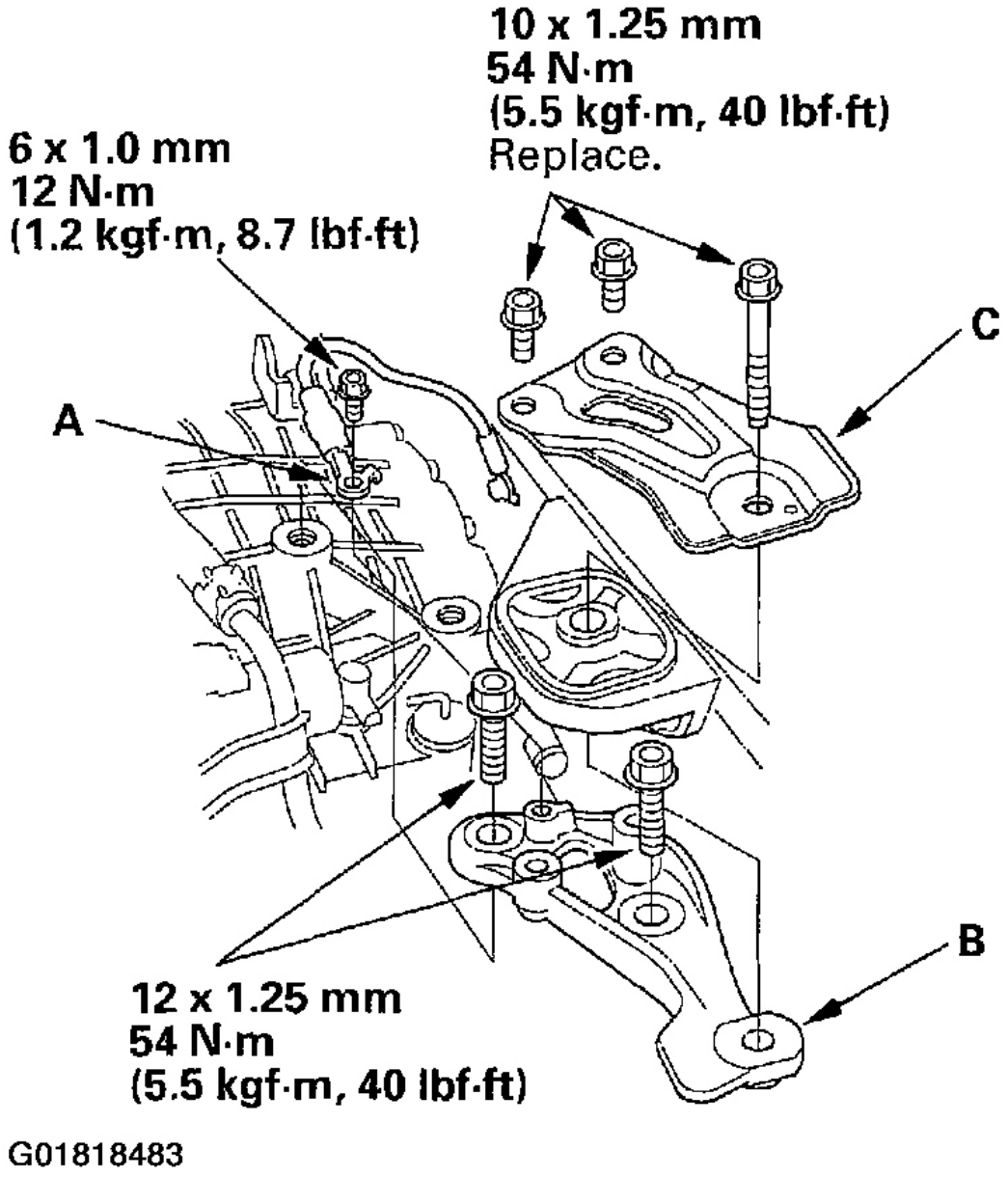


Fig. 227: Removing The Ground Cable, Transmission Upper Mount Bracket & Bracket Plate

8. Place the transmission jack under the transmission, and remove the transmission lower mount nuts.

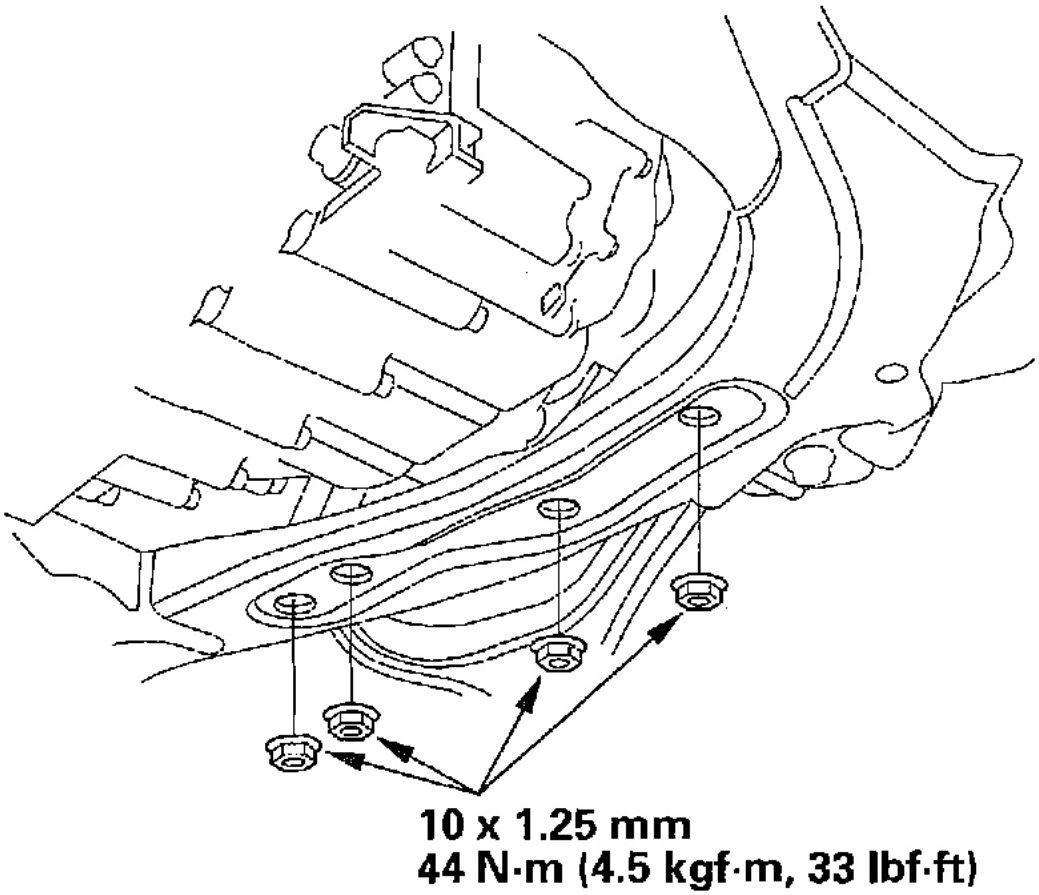


Fig. 228: Removing The Transmission Lower Mount Nuts

9. Lift the transmission up to create clearance between the transmission and front subframe with the jack.
10. Remove the ATF dipstick, and remove the bolts securing the ATF cooler inlet line brackets (A) and ATF dipstick guide pipe (B) from the transmission hanger (C).

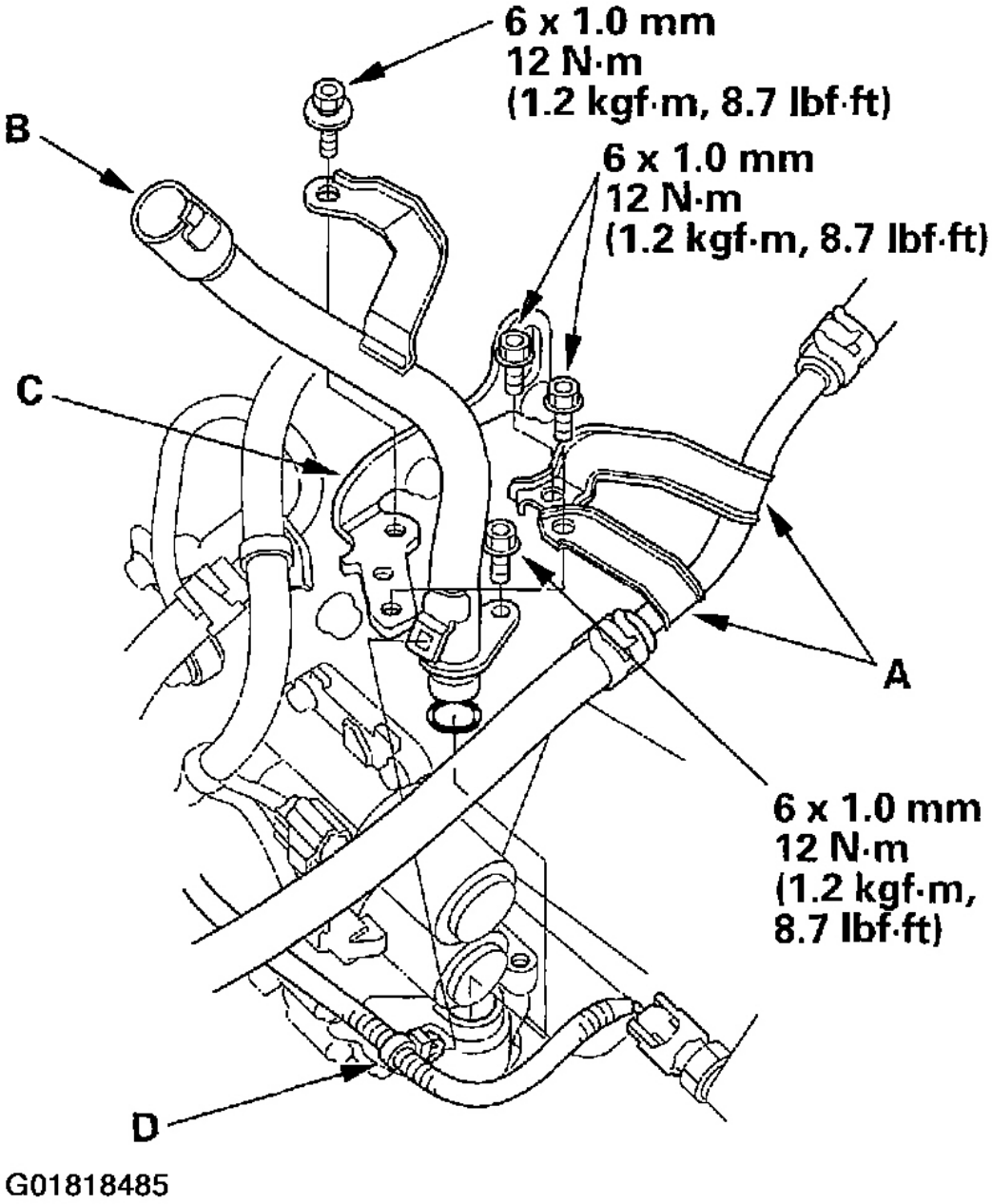


Fig. 229: Removing Components

11. Remove the harness clamp (D), then remove the ATF dipstick guide pipe.
12. Remove the shift solenoid valve cover (A), dowel pins (B), and gasket (C).

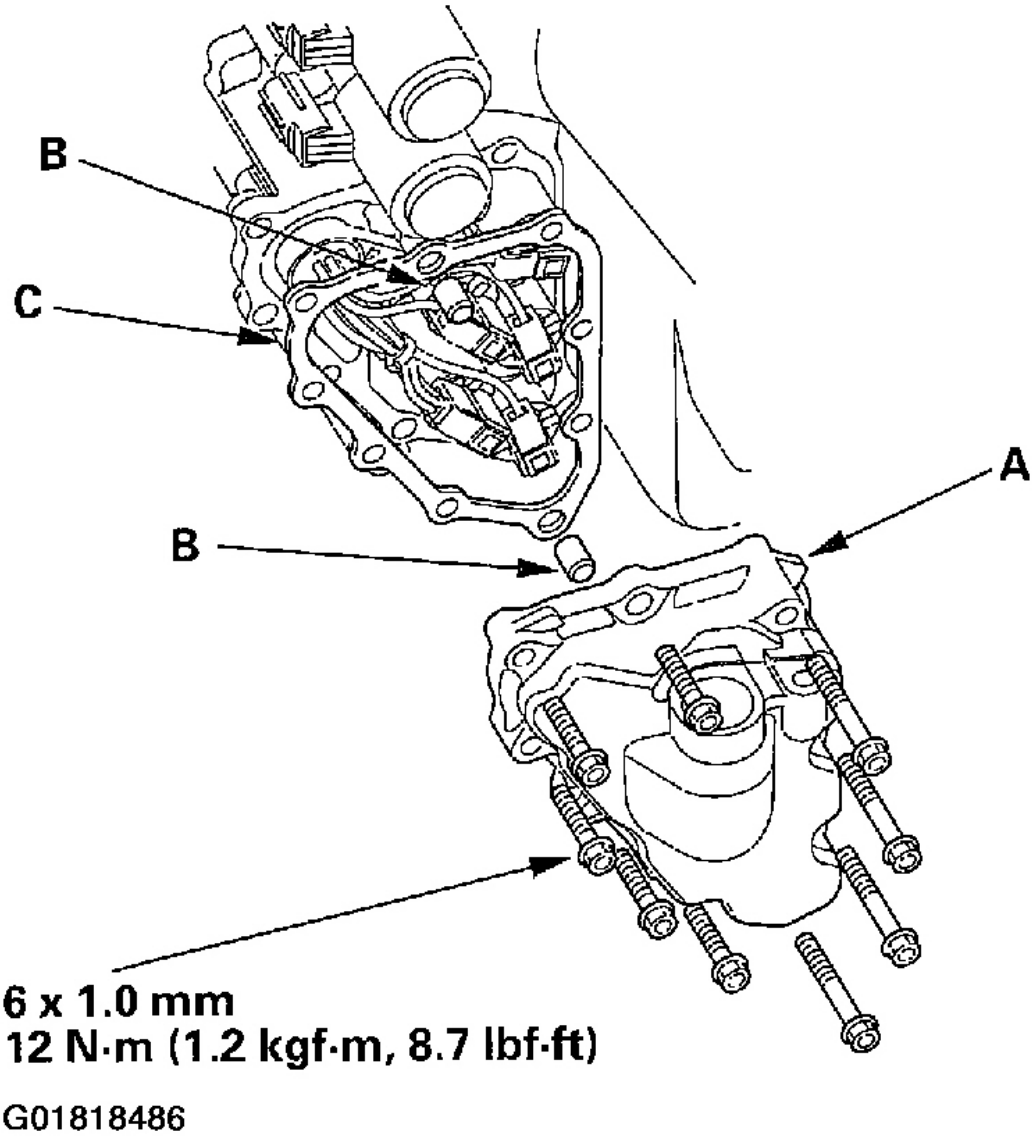


Fig. 230: Removing The Shift Solenoid Valve Cover, Dowel Pins & Gasket

13. Disconnect the shift solenoid valve connectors, remove the solenoid mounting bolts (H), then hold the solenoid valve body and remove the shift solenoid valves. Do not hold the connector to remove the shift solenoid valve.

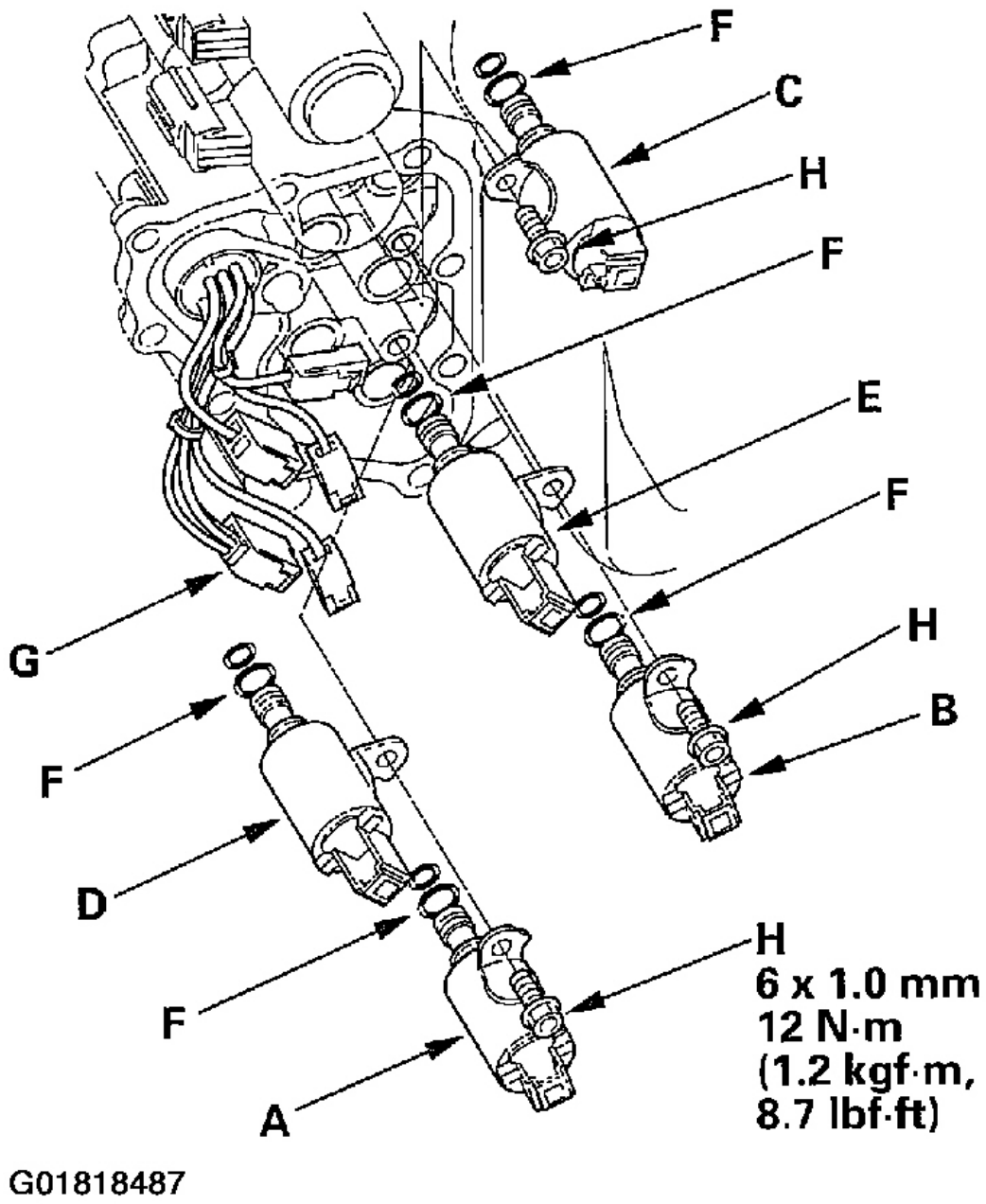


Fig. 231: Removing The Shift Solenoid Valves

14. Install the new O-rings (two O-rings per solenoid valve) (F) on the replacement solenoid valve.
15. Install the shift solenoid valves C, D, and E. While holding the shift solenoid valve body, be sure to install the solenoid valves until their mounting brackets contact the servo body.
16. Install the shift solenoid valves A and B. While holding the shift solenoid valve body, be sure to install

the solenoid valves until their mounting brackets contact the bracket of the installed solenoid. Install the solenoid mounting bolts (H) and tighten them.

NOTE: Do not install the solenoid valves A and B before installing the shift solenoid valves D and E. If solenoid valves A and B are installed before solenoid valves D and E, it may damage the hydraulic control system.

17. Connect the shift solenoid valve D connector (G) with the ATF temperature sensor.
18. Connect the solenoid valve A connector (BLU wire), solenoid valve B connector (ORN wire), solenoid valve C connector (GRN wire), and solenoid valve E connector (RED wire).
19. Install the shift solenoid valve cover, dowel pins and a new gasket.
20. Install the new O-ring on the ATF dipstick guide pipe, and install the ATF dipstick guide pipe, then install the harness clamp on the ATF dipstick guide pipe.
21. Secure the ATF cooler line brackets on the transmission hanger with the bolts.
22. Install the transmission lower mount nuts.
23. Install the transmission upper mount bracket, bracket plate, and ground cable, then remove the transmission jack.
24. Refill the transmission with ATF (see **DRAINING & REFILLING**).
25. Install the battery base, then install the air cleaner housing and intake air duct.
26. Install the battery tray, battery, and battery cover, then secure the battery with its hold-down bracket. Connect the battery terminals.
27. Install the splash shield.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A TEST

1. Connect the HDS to the DLC (A).

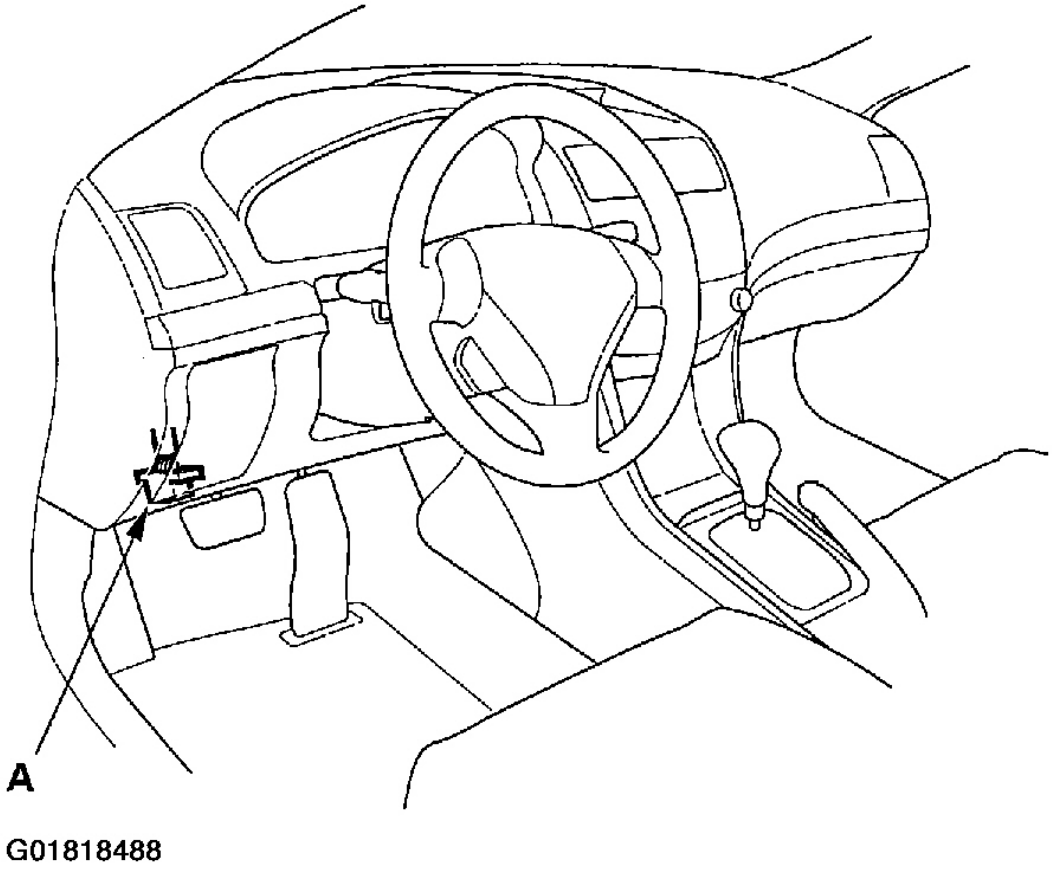


Fig. 232: Connecting The HDS To The DLC

2. Select LINEAR SOL TEST in MISC. TEST MENU on the HDS.
3. Carry out LINEAR SOL A TEST in LINEAR SOL TEST MENU with the HDS.
4. Follow instructions indicated on the HDS by the test result. If the HDS has not determined the cause of the failure, remove A/T clutch pressure control solenoid valve A and test.
5. Remove the intake air duct.
6. Disconnect the A/T clutch pressure control solenoid valve A connector.

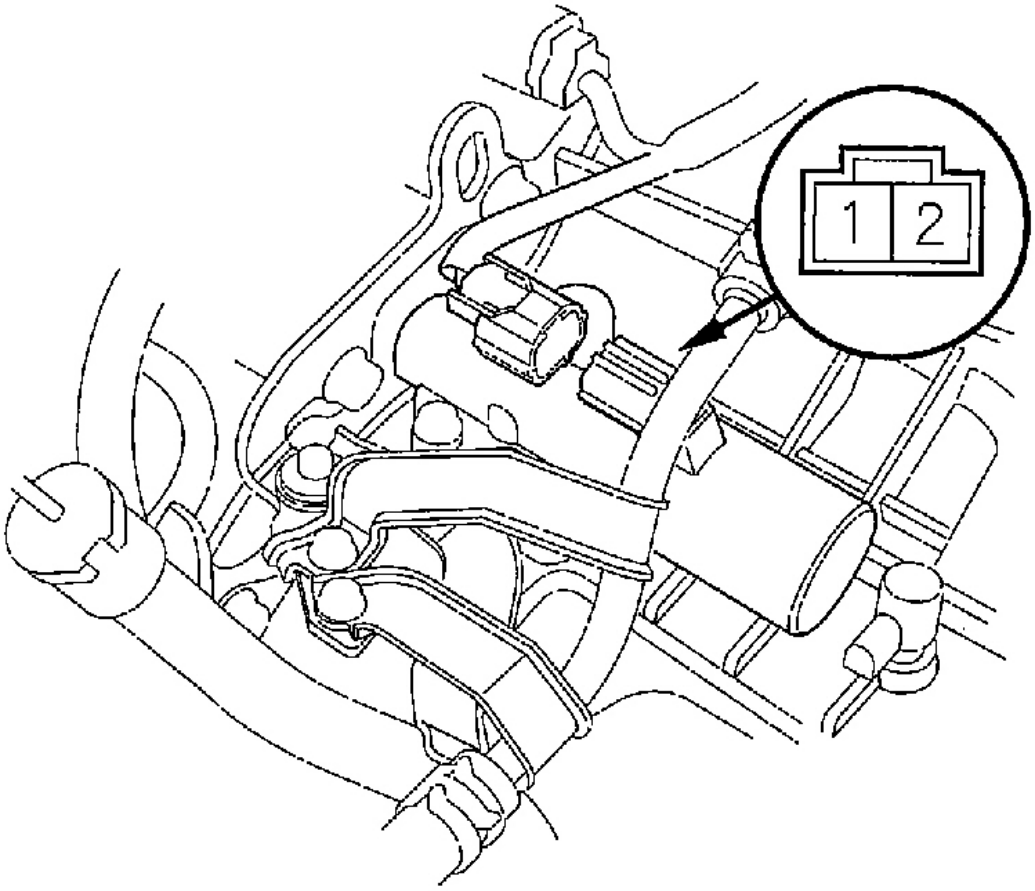


Fig. 233: Disconnecting The A/T Clutch Pressure Control Solenoid Valve A Connector

7. Measure A/T clutch pressure control solenoid valve A resistance at the solenoid valve A connector.
   Standard: 3-10 ohm
8. If the resistance is out of standard, replace the A/T clutch pressure control solenoid valve A.
9. Connect the battery positive terminal to the No. 1 terminal of the A/T clutch pressure control solenoid valve A connector, and connect the battery negative terminal to the No. 2 terminal. A clicking sound should be heard.
10. If no sound is heard, remove the A/T clutch pressure control solenoid valve A.
11. Check the fluid passage of the A/T clutch pressure control solenoid valve for dust or dirt.
12. Connect the No. 1 terminal of the A/T clutch pressure control solenoid valve A connector to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. Make sure the A/T clutch pressure control solenoid valve moves.

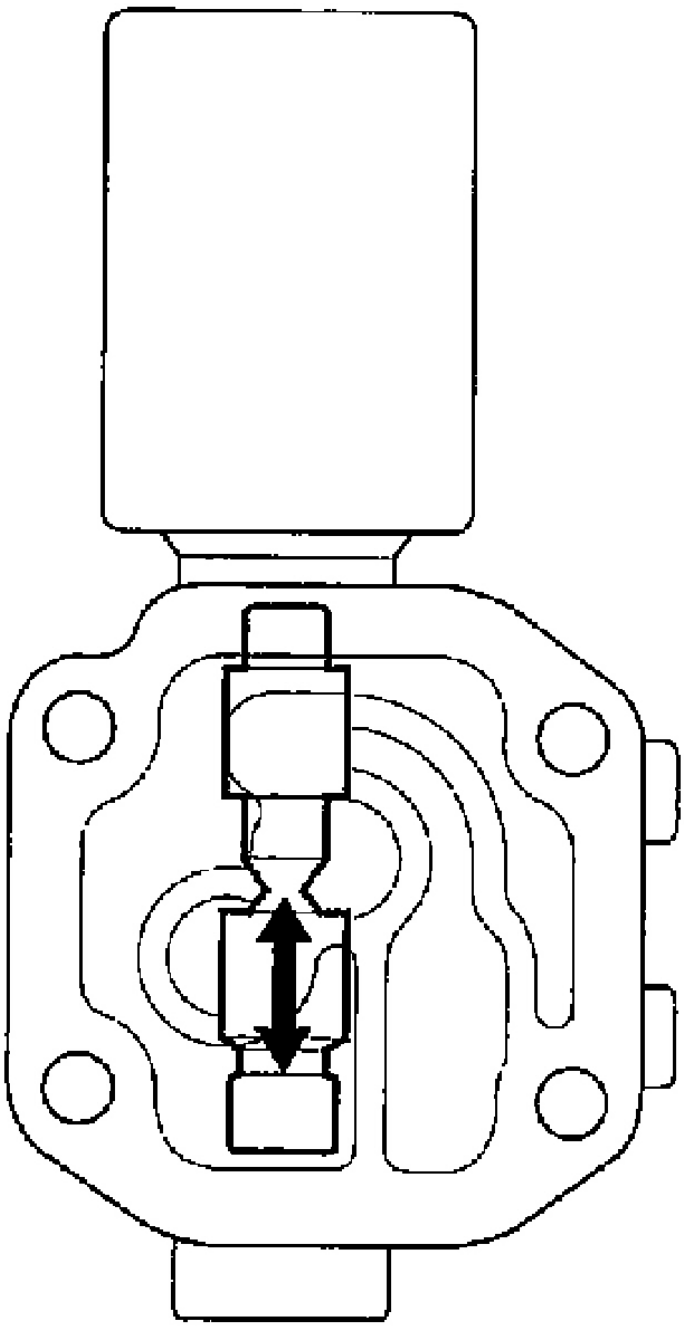


Fig. 234: Checking A/T Clutch Pressure Control Solenoid Valve Movement

13. Disconnect one of the battery terminals and check for valve movement.

NOTE: You can see valve movement through the fluid passage in the mounting surface of the A/T clutch pressure control solenoid valve A body.

14. If the valve binds or moves sluggishly, or if the solenoid valve does not operate, replace the A/T clutch pressure control solenoid valve A.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A REPLACEMENT

1. Remove the intake air duct.
2. Disconnect the A/T clutch pressure control solenoid valve A connector.
3. Remove the bolts securing the ATF cooler inlet line brackets (B) from the transmission hanger (C).

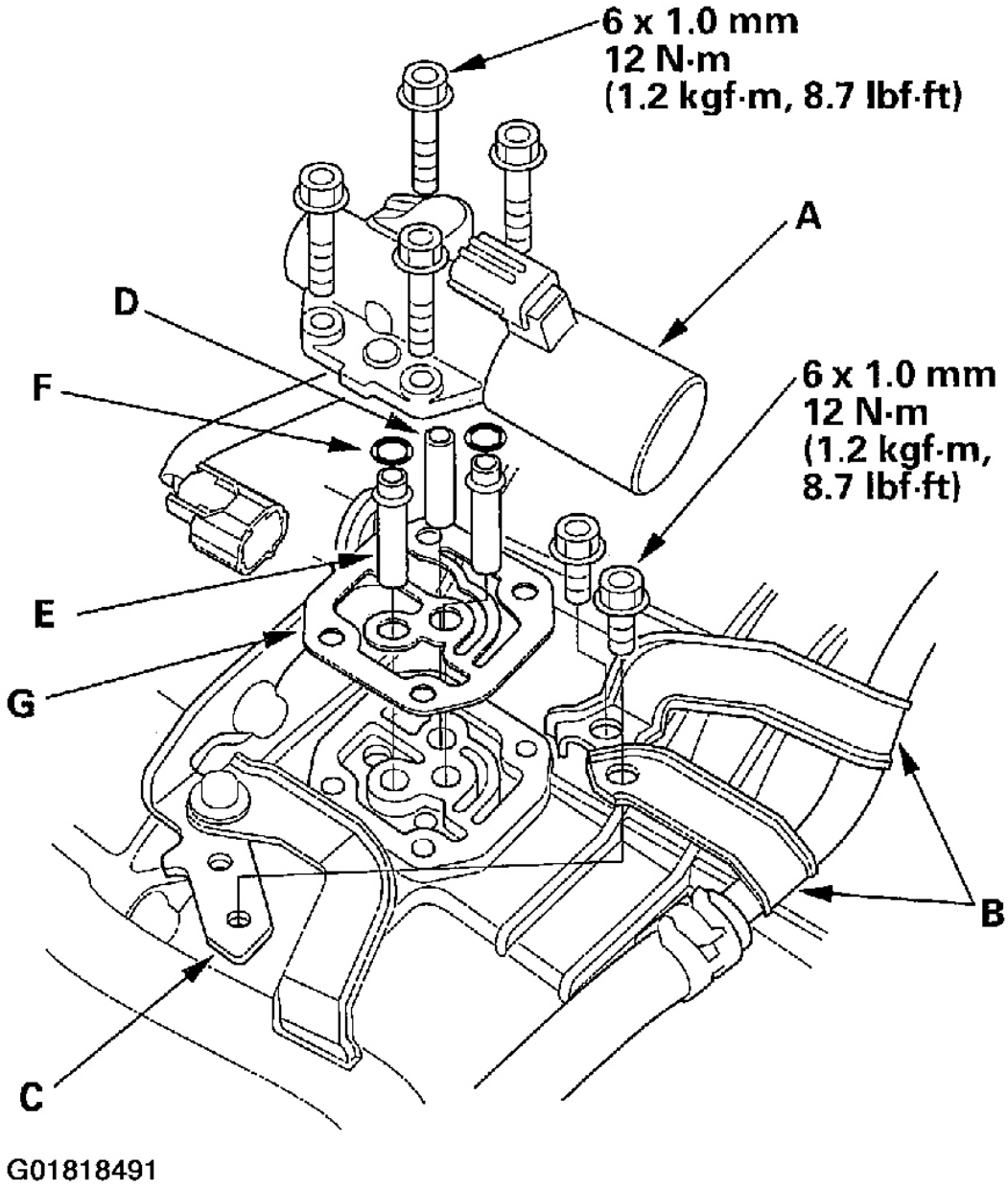


Fig. 235: Removing Components

4. Remove the mounting bolts and the A/T clutch pressure control solenoid valve A.
5. Remove the ATF pipe (D), ATF joint pipes (E), O-rings (F), and gasket (G).
6. Clean the mounting surface and fluid passages of the transmission housing.
7. Install the new gasket on the transmission housing, and install the ATF pipe and ATF joint pipes.
8. Install the new O-rings over the ATF joint pipes.

9. Install the new A/T clutch pressure control solenoid valve A.
10. Secure the ATF cooler inlet line brackets with the bolts on the transmission hanger.
11. Check the A/T clutch pressure control solenoid valve A connector for rust, dirt, or oil, and clean if necessary, then connect the connector securely.
12. Install the intake air duct.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B & C TEST

1. Connect the HDS to the DLC (A).

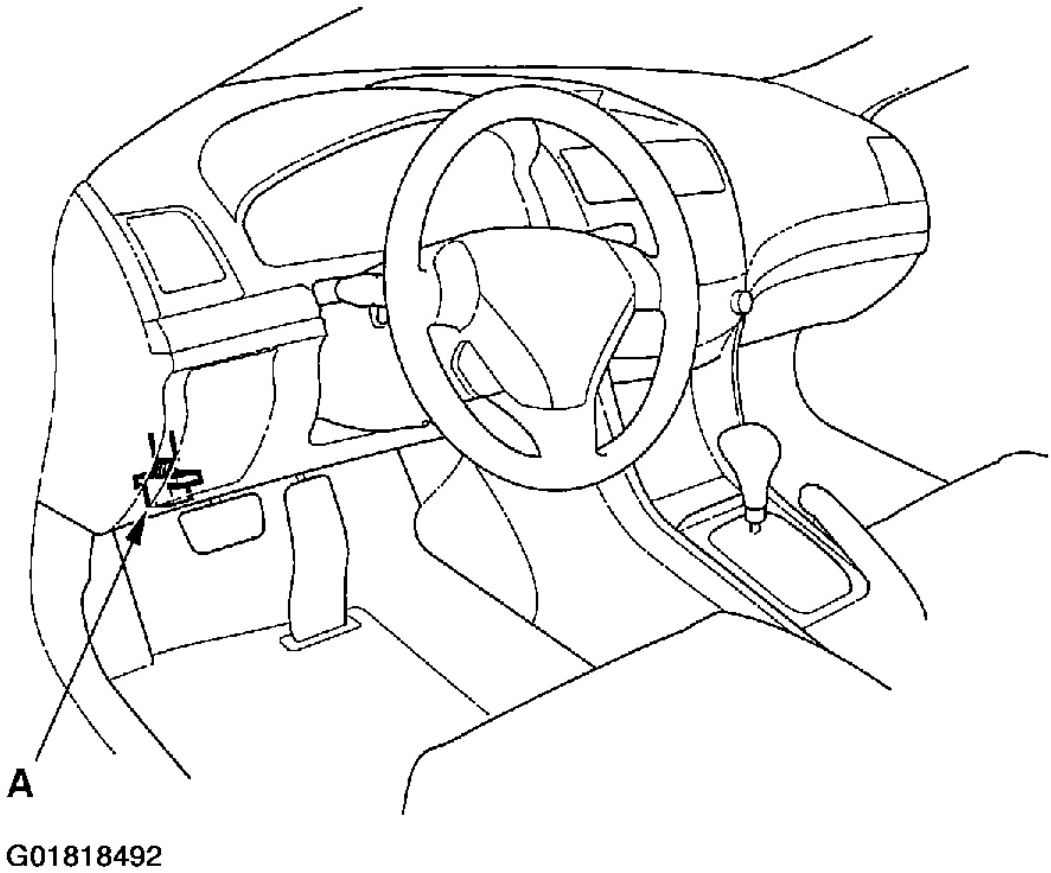


Fig. 236: Connecting The HDS To The DLC

2. Select LINEAR SOL TEST in MISC. TEST MENU on the HDS.
3. Carry out LINEAR SOL B TEST, SOL C TEST in LINEAR SOL TEST MENU with the HDS.
4. Follow instructions indicated on the HDS by the test result. If the HDS has not determined the cause of the failure, remove A/T clutch pressure control solenoid valve B, C and test.

5. Disconnect the A/T clutch pressure control solenoid valves B and C connectors.

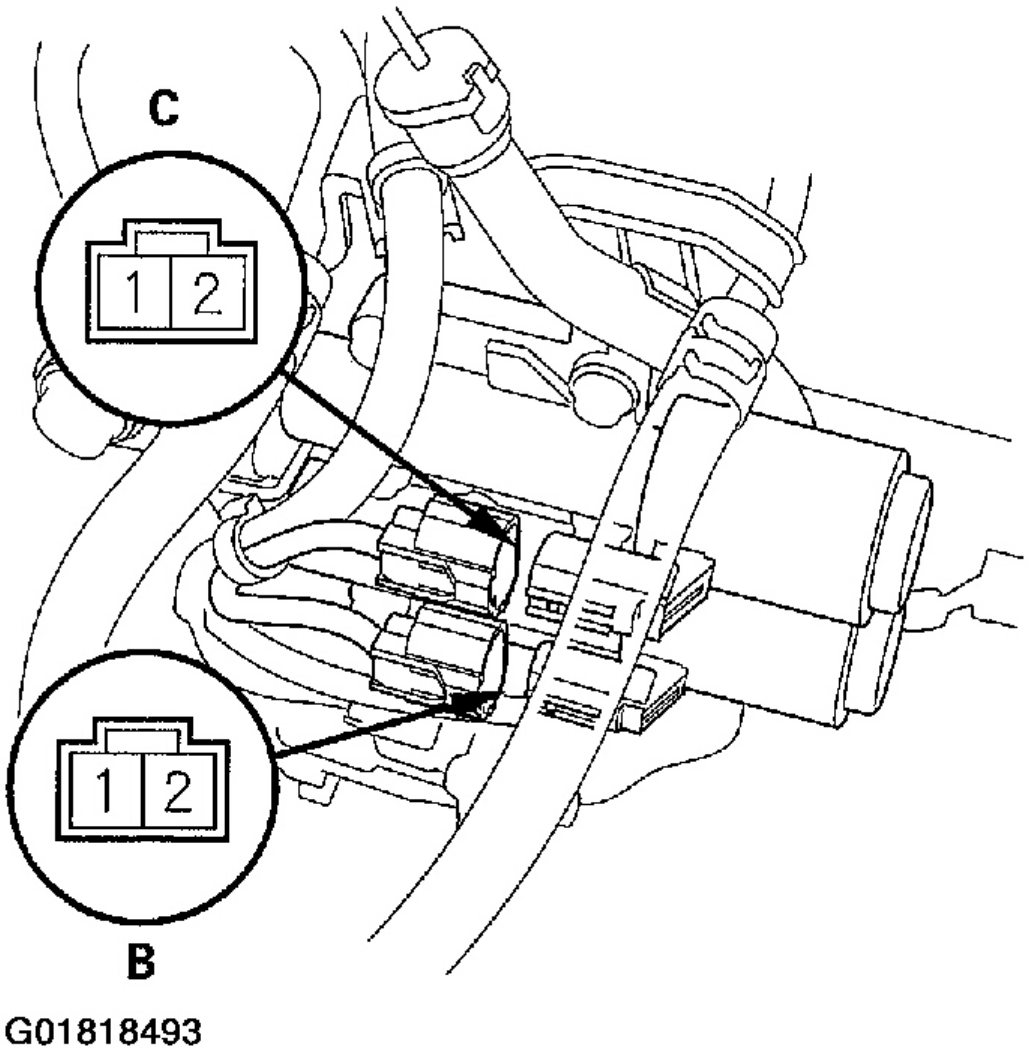


Fig. 237: Disconnecting The A/T Clutch Pressure Control Solenoid Valves B & C Connectors

6. Measure A/T clutch pressure control solenoid valve B resistance between the solenoid valve B terminals No. 1 and No. 2, and measure A/T clutch pressure control solenoid valve C resistance between the solenoid valve C terminals No. 1 and No. 2.

   Standard: 3-10 ohm
7. If the resistance of either A/T clutch pressure control solenoid valve is out of standard, replace the A/T clutch pressure control solenoid valves B and C.
8. Connect the battery positive terminal to the No. 1 terminal of the A/T clutch pressure control solenoid

valves B and C connectors, and connect the battery negative terminal to the No. 2 terminal. A clicking sound should be heard.

9. If no sound is heard, remove the A/T clutch pressure control solenoid valves B and C.
10. Check the fluid passage of the A/T clutch pressure control solenoid valve for dust or dirt.
11. Connect the No. 1 terminal of the A/T clutch pressure control solenoid valves B and C connectors to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. Make sure the A/T clutch pressure control solenoid valves B and C move.

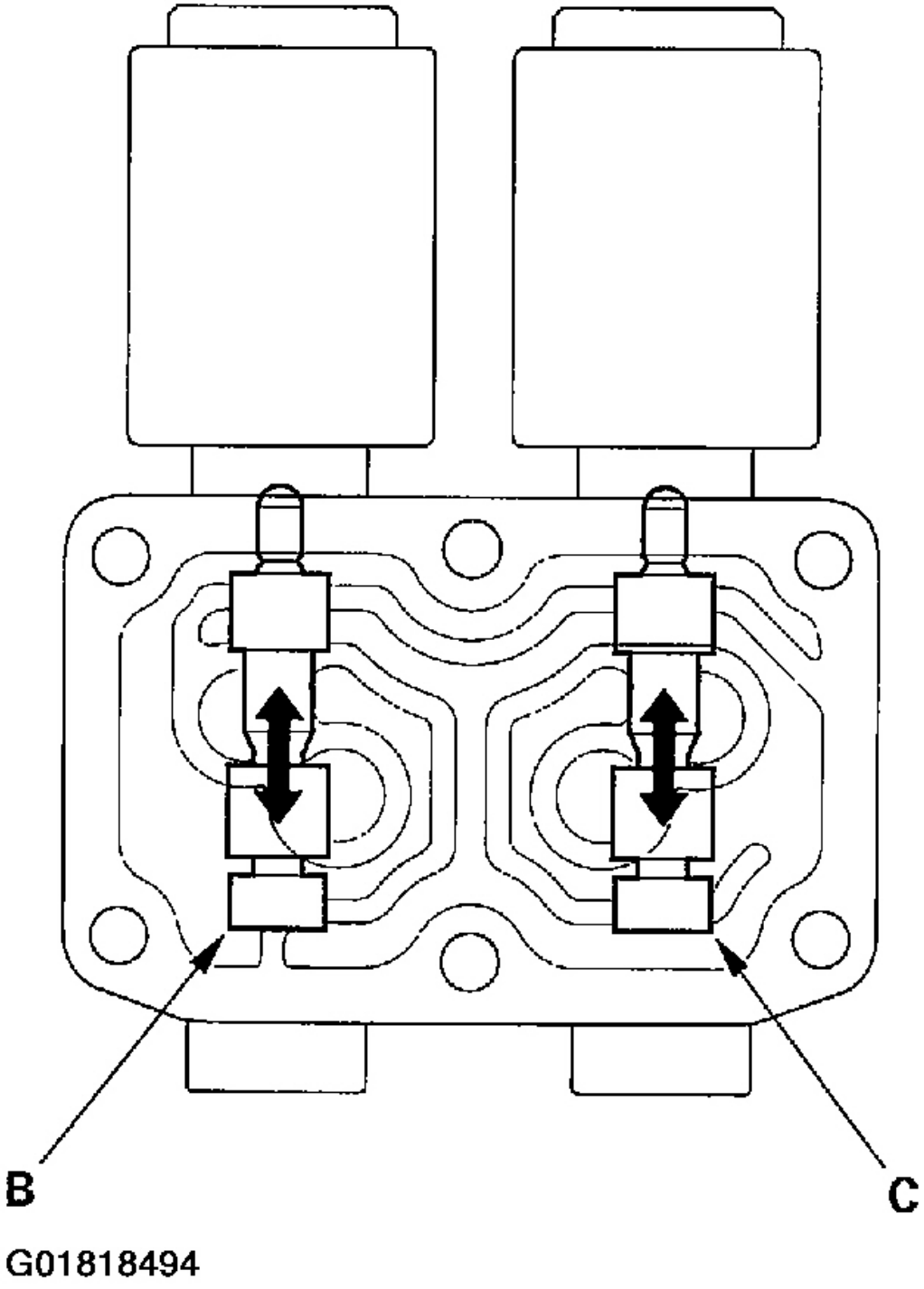


Fig. 238: Checking A/T Clutch Pressure Control Solenoid Valves B & C Movement

12. Disconnect one of the battery terminals, and check valve movement.

NOTE: You can see valve movement through the fluid passage in the mounting surface of the A/T clutch pressure control solenoid valves B and C body.

13. If either valve binds or moves sluggishly, or if the solenoid valve does not operate, replace the A/T clutch pressure control solenoid valves B and C.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B & C REPLACEMENT

1. Disconnect the A/T clutch pressure control solenoid valves B and C connectors.
2. Remove the A/T clutch pressure control solenoid valves B and C.

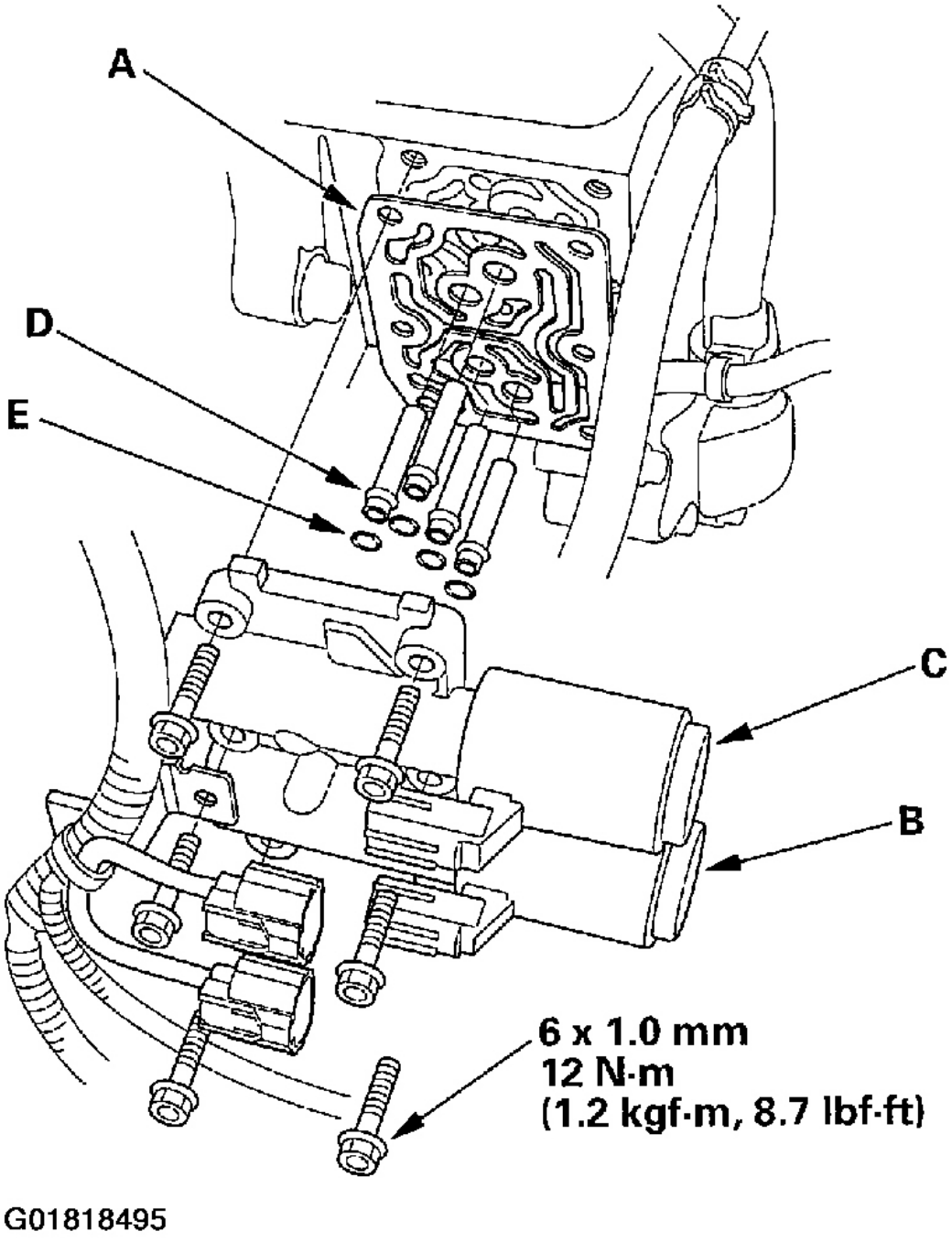


Fig. 239: Removing The A/T Clutch Pressure Control Solenoid Valves B & C

3. Remove the ATF joint pipes (D), O-rings (E), and gasket (A).
4. Clean the mounting surface and fluid passages of the transmission housing.

5. Install the new gasket on the transmission housing, and install the ATF joint pipes.
6. Install new O-rings over the ATF joint pipes.
7. Install new A/T clutch pressure control solenoid valves B and C.
8. Check A/T clutch pressure control solenoid valves B and C connectors for rust, dirt, or oil, and clean if necessary, then connect the connectors securely.

MAINSHAFT SPEED SENSOR REPLACEMENT

1. Remove the intake air duct and air cleaner housing.
2. Disconnect the mainshaft speed sensor connector, and remove the mainshaft speed sensor.

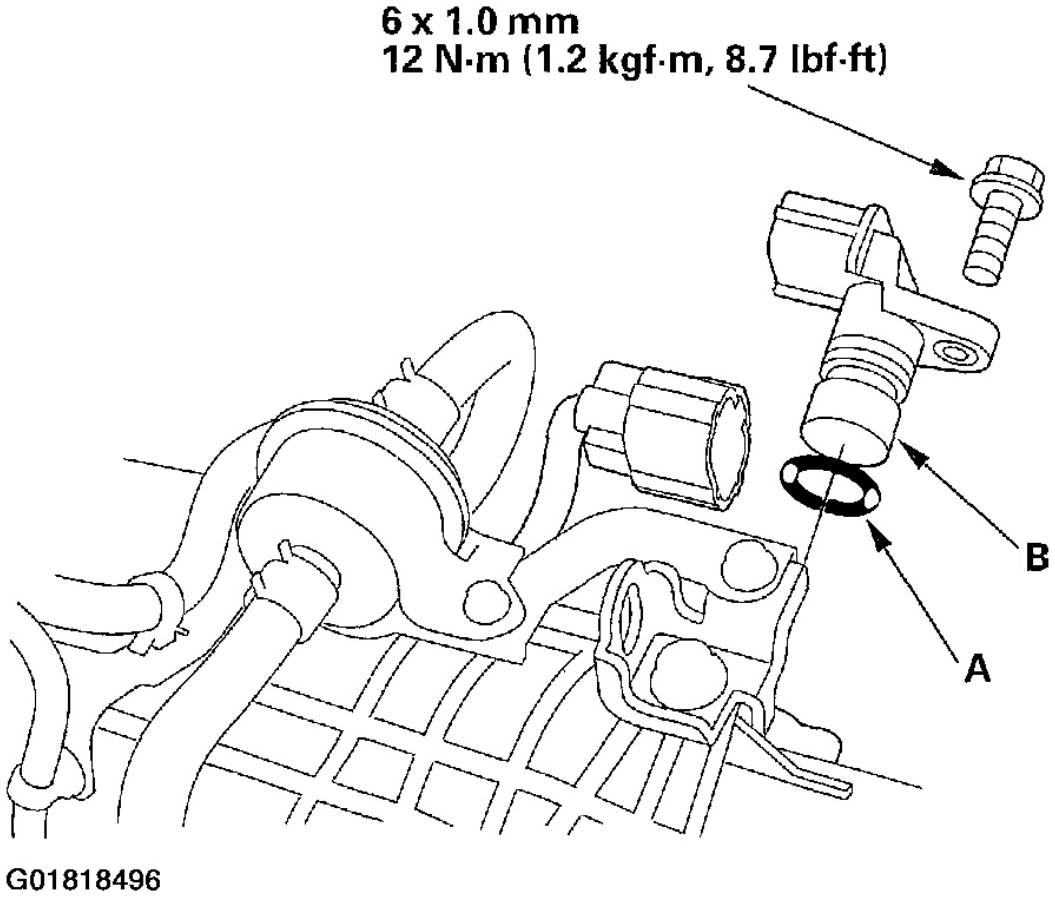


Fig. 240: Removing The Mainshaft Speed Sensor

3. Install the new O-ring (A) on the new mainshaft speed sensor (B), then install the mainshaft speed sensor in the transmission housing.
4. Check the connector for rust, dirt, or oil, and clean if necessary, then connect the connector securely.

5. Install the intake air duct and air cleaner housing.

COUNTERSHAFT SPEED SENSOR REPLACEMENT

1. Disconnect the countershaft speed sensor connector, and remove the countershaft speed sensor.

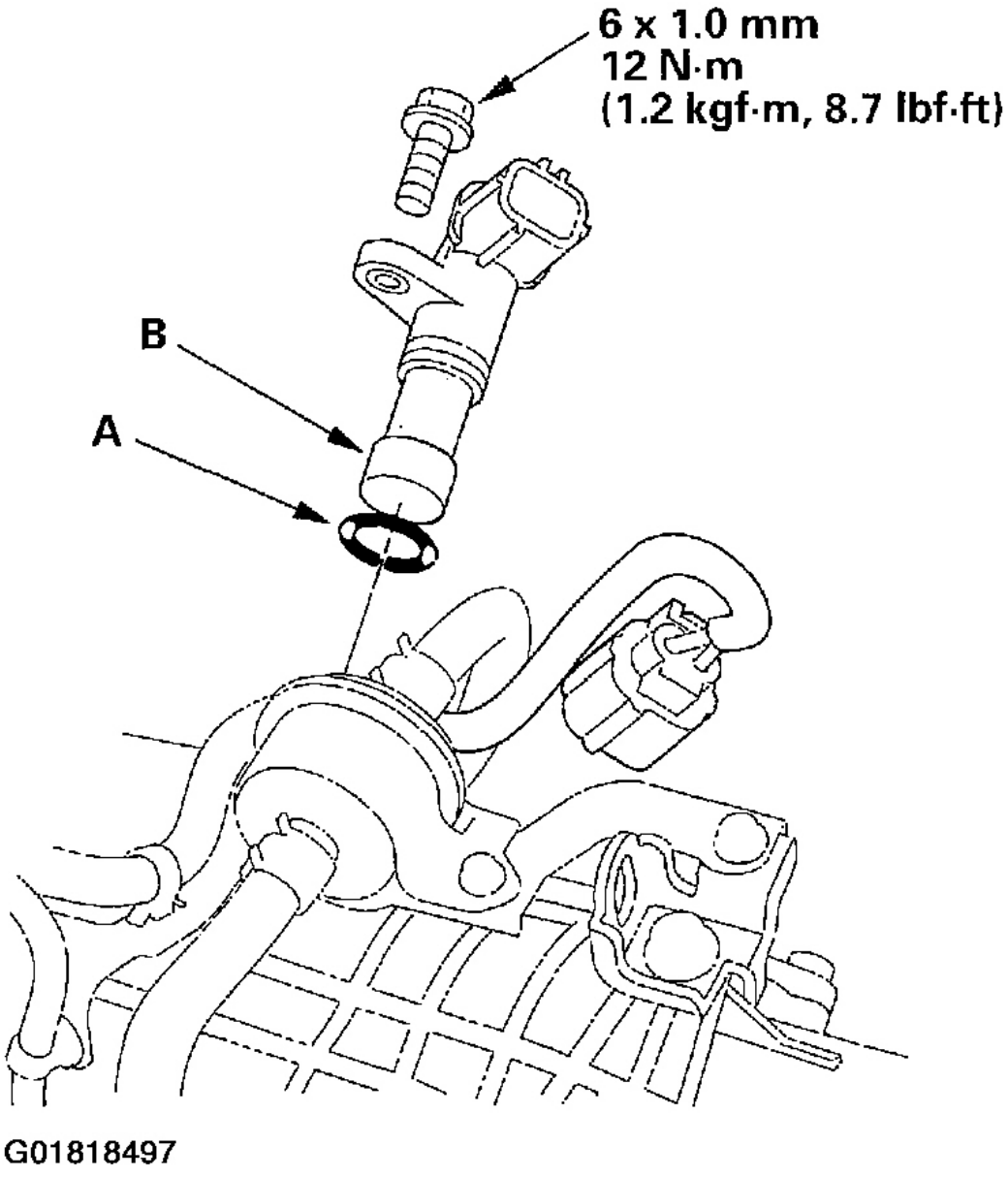


Fig. 241: Removing The Countershaft Speed Sensor

2. Install the new O-ring (A) on the new countershaft speed sensor (B), then install the countershaft speed sensor in the transmission housing.
3. Check the connector for rust, dirt, or oil, and clean if necessary, then connect the connector securely.

2ND CLUTCH TRANSMISSION FLUID PRESSURE SWITCH REPLACEMENT

1. Remove the intake air duct.
2. Disconnect the connector from the 2nd clutch transmission fluid pressure switch (A), and remove the switch.

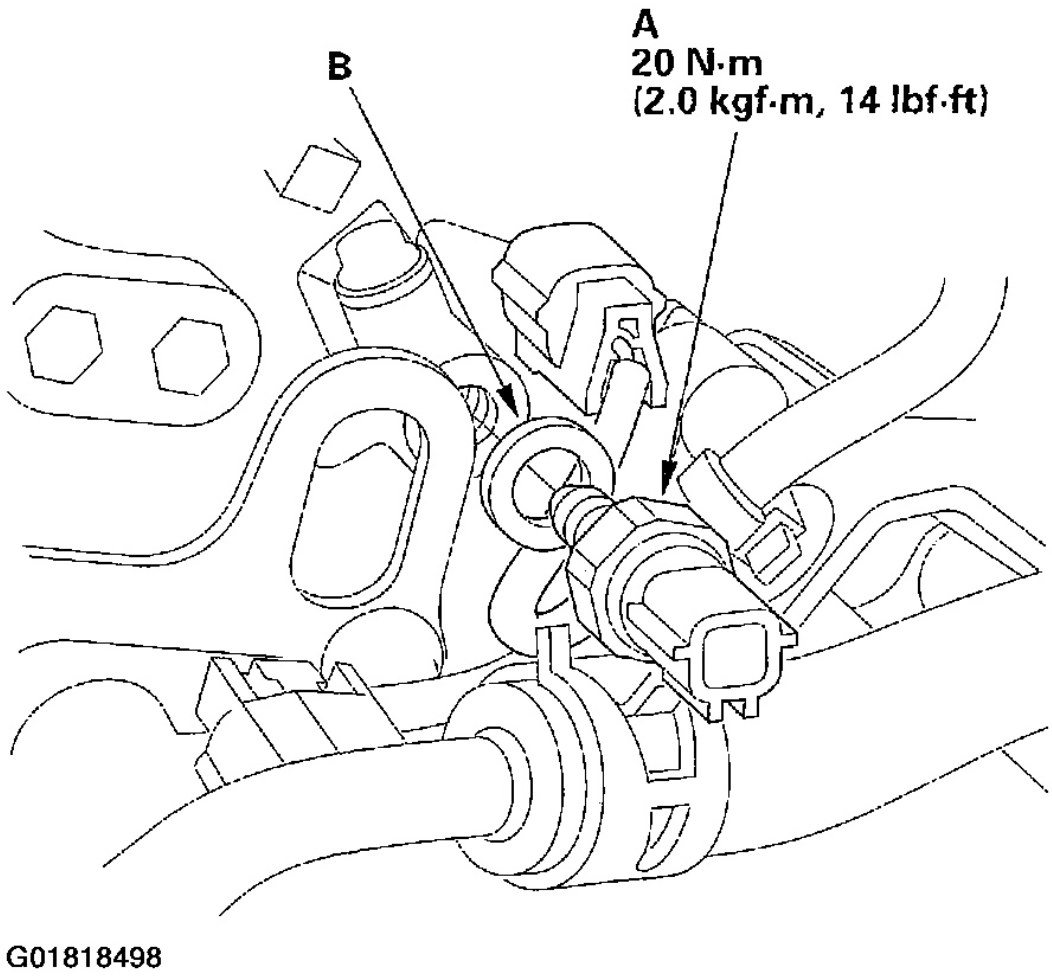


Fig. 242: Removing 2nd Clutch Transmission Fluid Pressure Switch

3. Make sure there is no water, oil, dust, or foreign particles inside the connector.
4. Install the new 2nd clutch transmission fluid pressure switch with a new sealing washer (B), and tighten

the switch to the specified torque.

5. Connect the connector securely.
6. Install the intake air duct.

3RD CLUTCH TRANSMISSION FLUID PRESSURE SWITCH REPLACEMENT

1. Disconnect the battery negative terminal, then disconnect the battery positive terminal.
2. Remove the battery hold-down bracket, then remove the battery cover, battery, and battery tray.
3. Remove the intake air duct and air cleaner housing.
4. Loosen the two bolts securing the battery base from under the vehicle, and remove the two bolts securing the battery base in the engine compartment, then remove the battery base.
5. Disconnect the connector from the 3rd clutch transmission fluid pressure switch (A), then remove the switch.

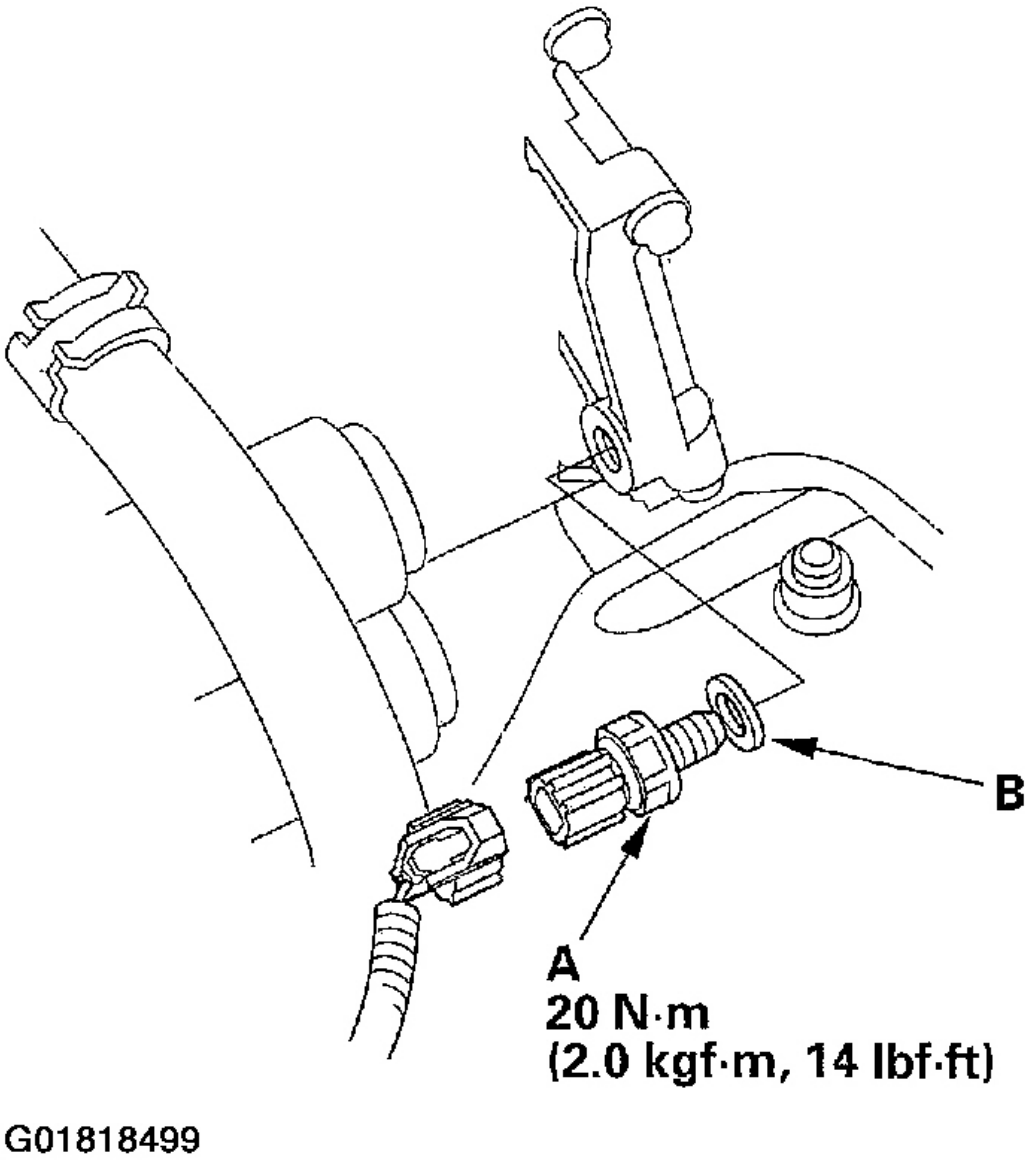


Fig. 243: Removing 3rd Clutch Transmission Fluid Pressure Switch

6. Make sure there is no water, oil, dust, or foreign particles inside the connector.
7. Install the 3rd clutch new transmission fluid pressure switch with a new sealing washer (B), and tighten the switch to the specified torque.
8. Connect the connector securely.
9. Install the battery base, then install the air cleaner housing and intake air duct.
10. Install the battery tray, battery, and battery cover, then secure the battery with its hold-down bracket.

Connect the battery terminals.

ATF TEMPERATURE SENSOR TEST & REPLACEMENT

1. Remove the splash shield.
2. Remove the drain plug (A), and drain the automatic transmission fluid (ATF). Then reinstall the drain plug with a new sealing washer (B).

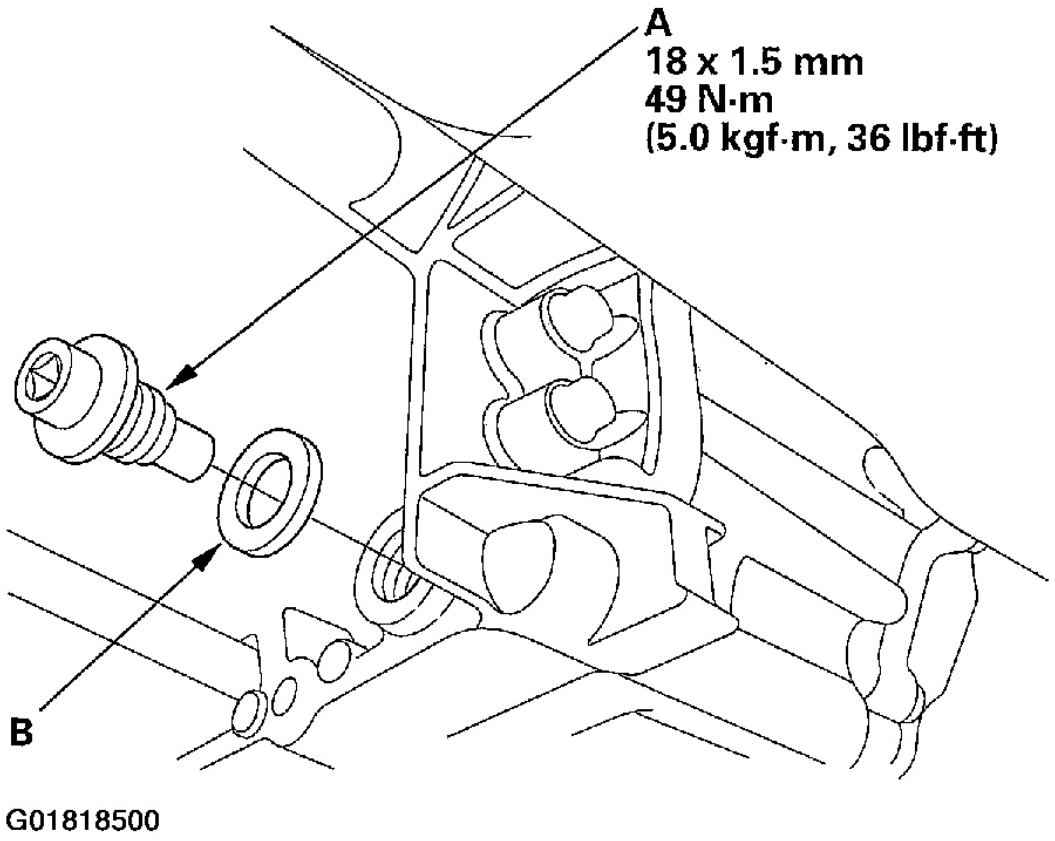


Fig. 244: Removing The Drain Plug

3. Disconnect the battery negative terminal, then disconnect the battery positive terminal.
4. Remove the battery hold-down bracket, then remove the battery cover, battery, and battery tray.
5. Remove the intake air duct and air cleaner housing.
6. Loosen the two bolts securing the battery base from under the vehicle, and remove the two bolts securing the battery base in the engine compartment, then remove the battery base.
7. Remove the ground cable (A), transmission upper mount bracket (B), and bracket plate (C).

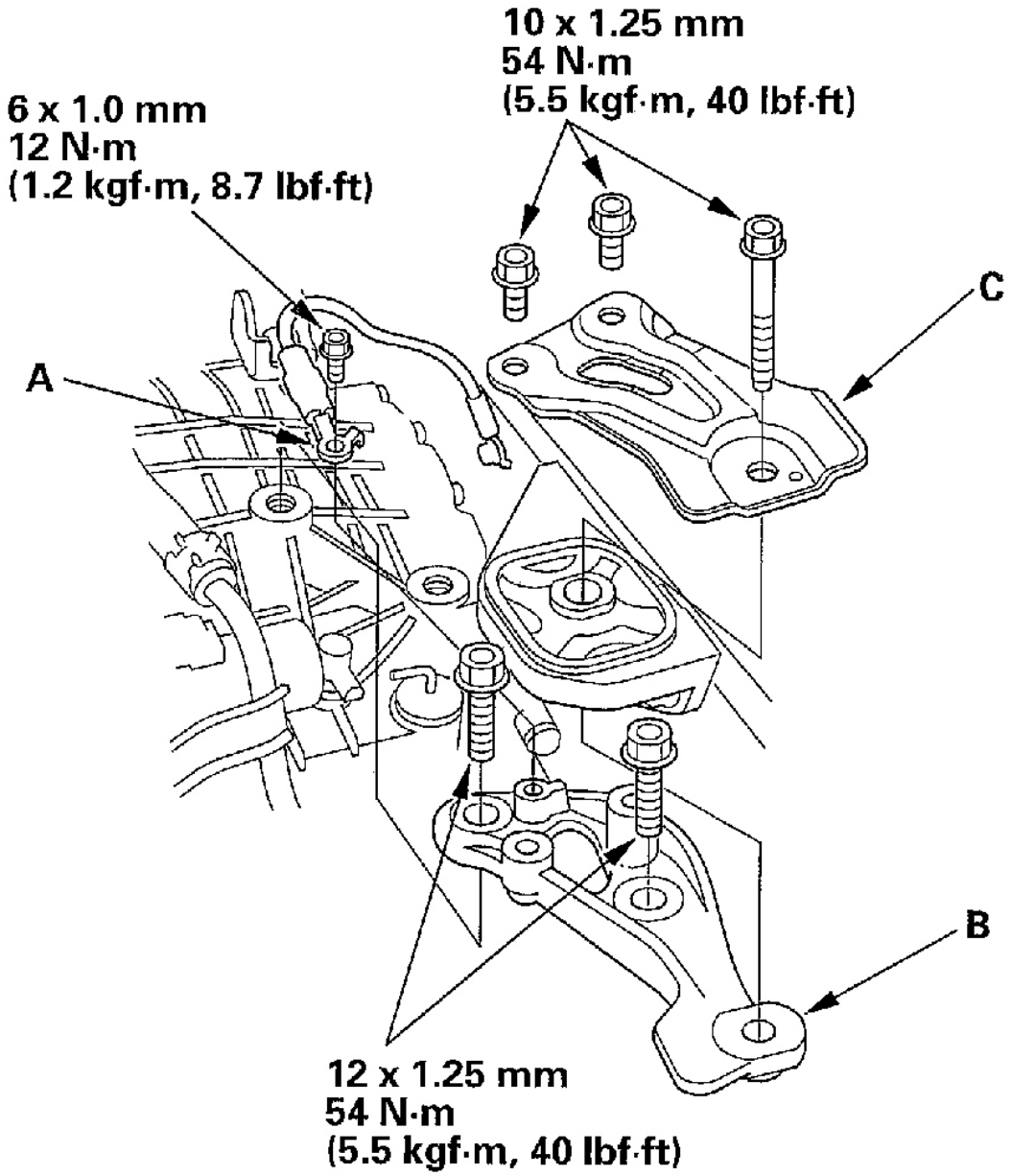


Fig. 245: Removing The Ground Cable, Transmission Upper Mount Bracket & Bracket Plate

8. Place the transmission jack under the transmission, and remove the transmission lower mount nuts.

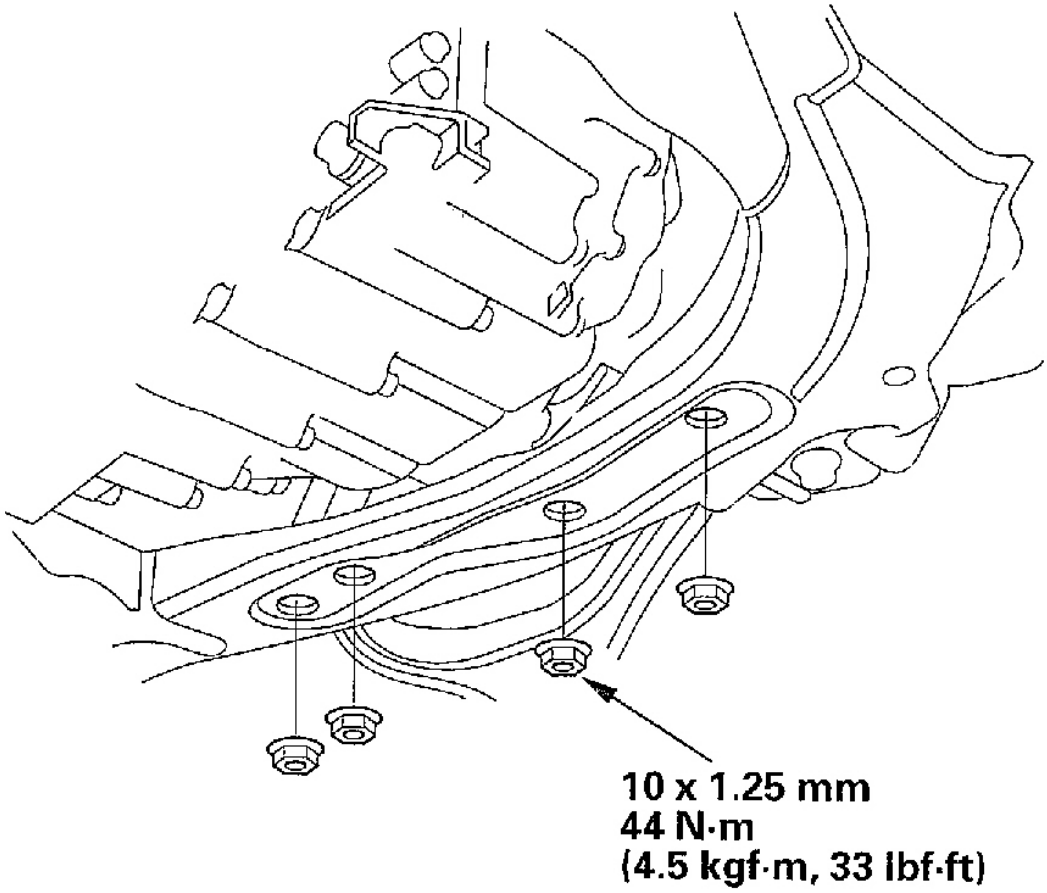


Fig. 246: Removing The Transmission Lower Mount Nuts

9. Lift the transmission up to create clearance between the transmission and front subframe with the jack.
10. Remove the ATF dipstick, and remove the bolts securing the ATF cooler inlet line brackets (A) and ATF dipstick guide pipe (B) from the transmission hanger (C).

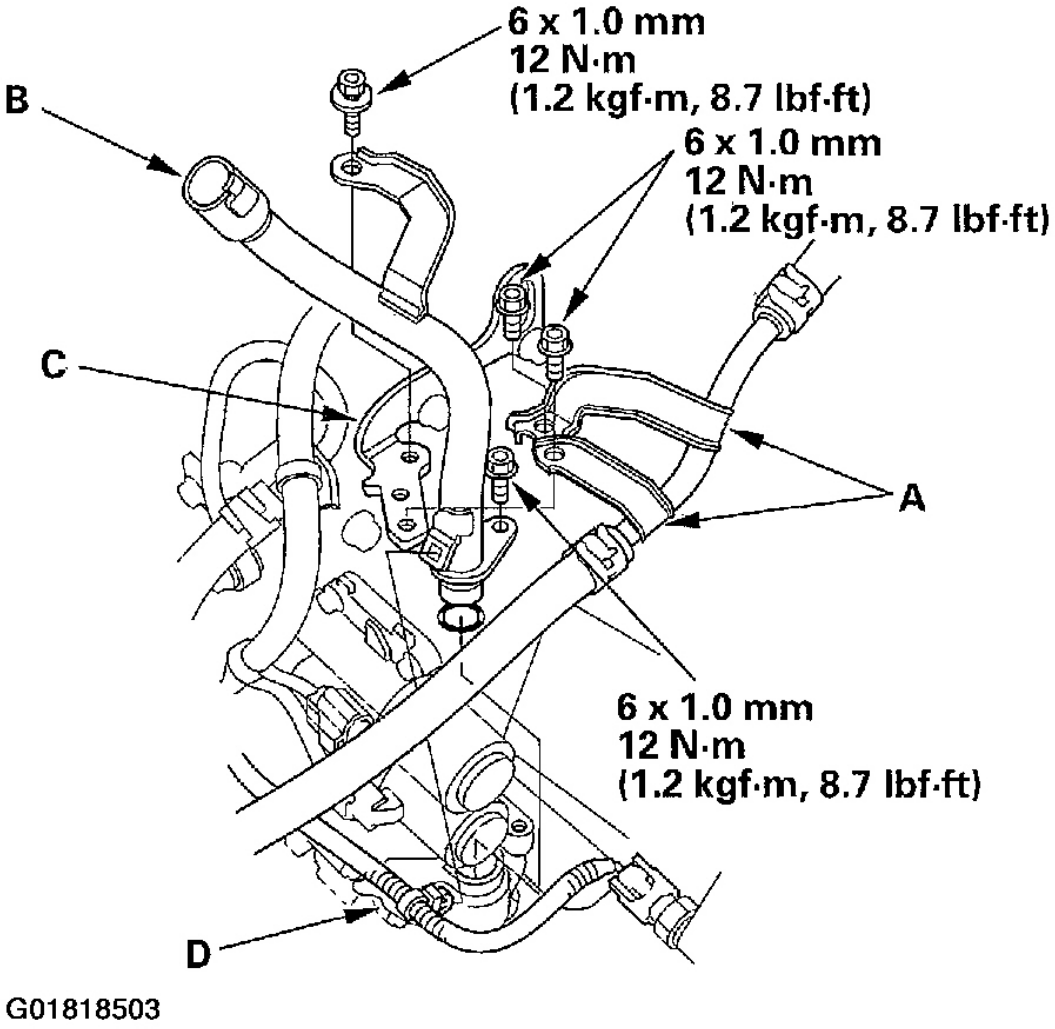


Fig. 247: Removing Components

11. Remove the harness clamp (D), then remove the ATF dipstick guide pipe.
12. Disconnect the shift solenoid harness connector.

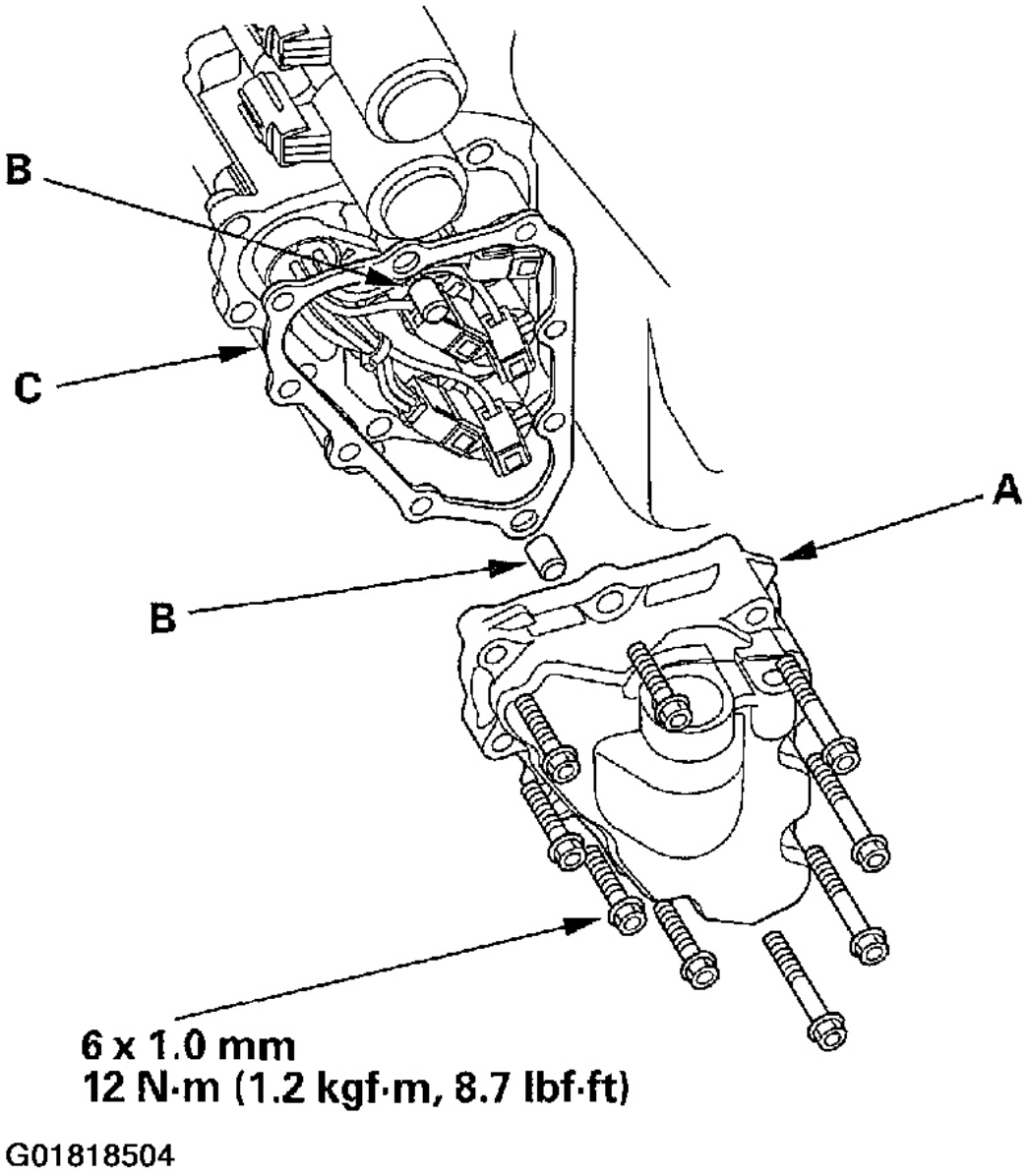


Fig. 248: Removing The Shift Solenoid Valve Cover, Dowel Pins & Gasket

13. Remove the shift solenoid valve cover (A), dowel pins (B), and gasket (C).
14. Remove the shift solenoid harness connector.

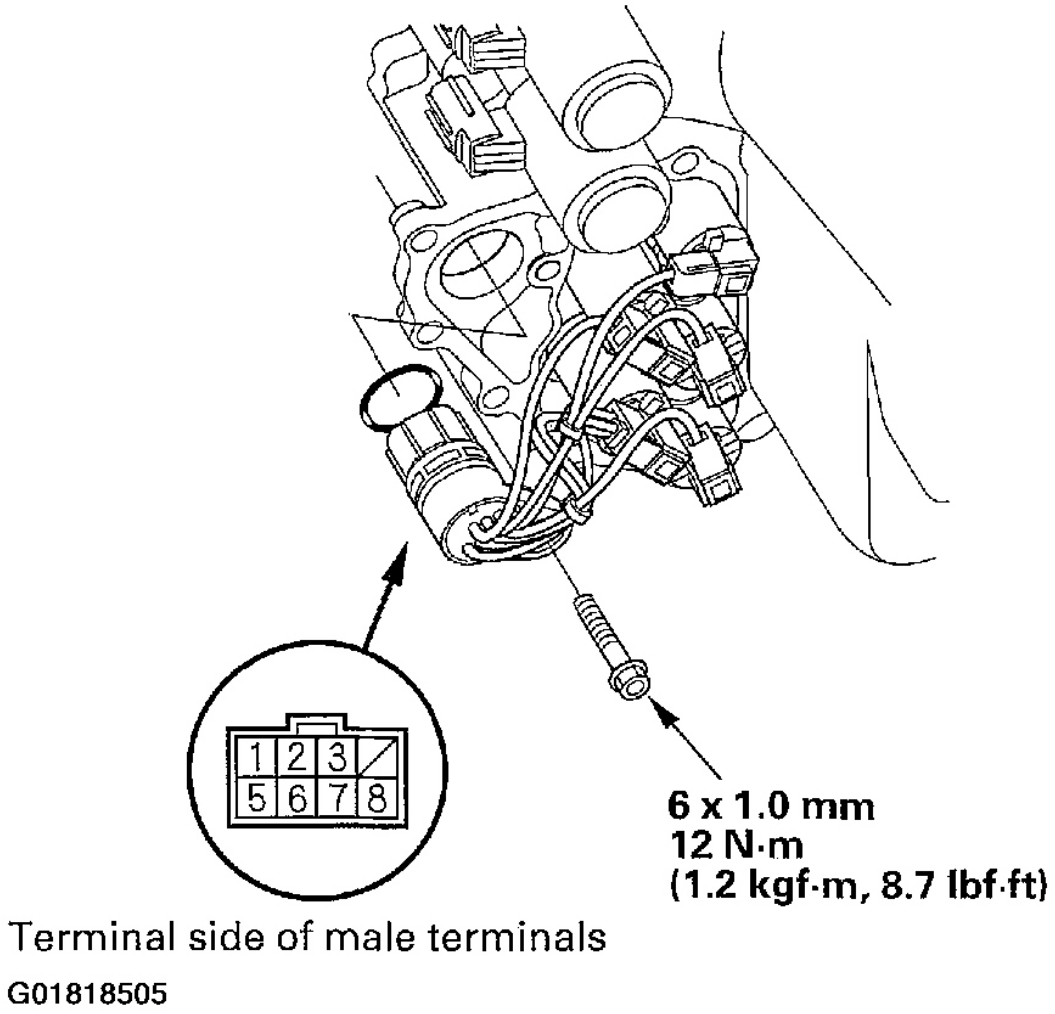


Fig. 249: Removing The Shift Solenoid Harness Connector & Identifying Terminals

15. Measure ATF temperature sensor resistance between shift solenoid harness connector terminals No. 6 and No. 7.

    Standard: 50-25k ohm

16. If the resistance is out of standard, replace the ATF temperature sensor and solenoid harness; go to step 17. The ATF temperature sensor is not available separately from the solenoid harness. If the measurement is within the standard, install the removed parts; go to step 20 .
17. Disconnect the connectors from the shift solenoid valves.
18. Connect the shift solenoid valve D connector with the ATF temperature sensor (F) on the shift solenoid harness.

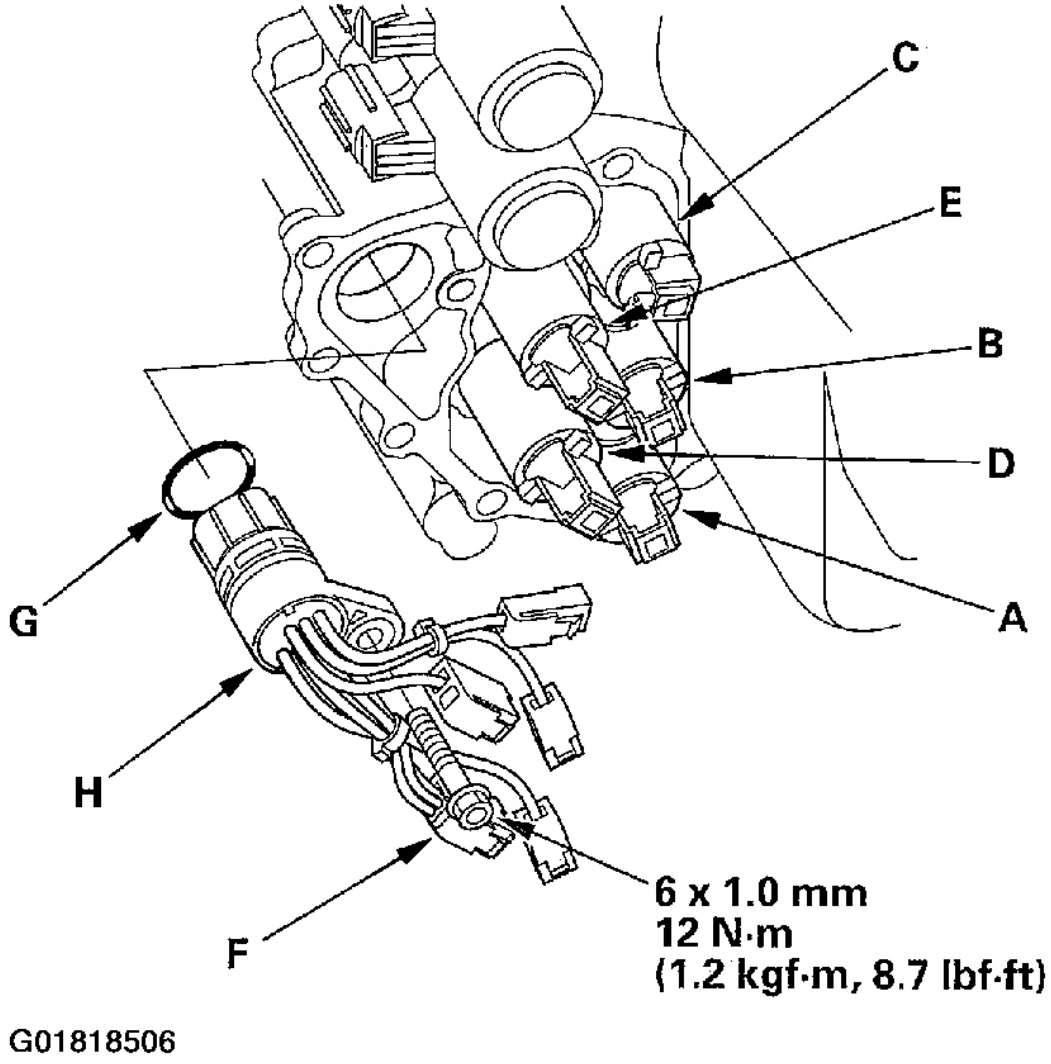


Fig. 250: Disconnecting The Connectors From The Shift Solenoid Valves

19. Connect the solenoid valve A connector (BLU wire), solenoid valve B connector (ORN wire), solenoid valve C connector (GRN wire), and solenoid valve E connector (RED wire).
20. Install the new O-ring (G) on the shift solenoid harness connector (H), and install the connector in the transmission housing.
21. Install the shift solenoid valve cover, dowel pins and a new gasket.
22. Install the new O-ring on the ATF dipstick guide pipe, and install the ATF dipstick guide pipe, then install the harness clamp on the ATF dipstick guide pipe.
23. Secure the ATF cooler line brackets on the transmission hanger with the bolts.
24. Check the connector for rust, dirt, or oil, and clean if necessary, then connect the connector securely.

25. Install the transmission lower mount nuts.
26. Install the transmission upper mount bracket, bracket plate, and ground cable, then remove the transmission jack.
27. Refill the transmission with ATF (see step 4 on **DRAINING & REFILLING**).
28. Install the battery base, then install the air cleaner housing and intake air duct.
29. Install the battery tray, battery, and battery cover, then secure the battery with its hold-down bracket. Connect the battery terminals.
30. Install the splash shield.

TRANSMISSION GEAR SELECTION SWITCH TEST

1. Remove the center console cover (see **CENTER CONSOLE REMOVAL/INSTALLATION**).
2. Disconnect transmission gear selection switch/park pin switch connector.

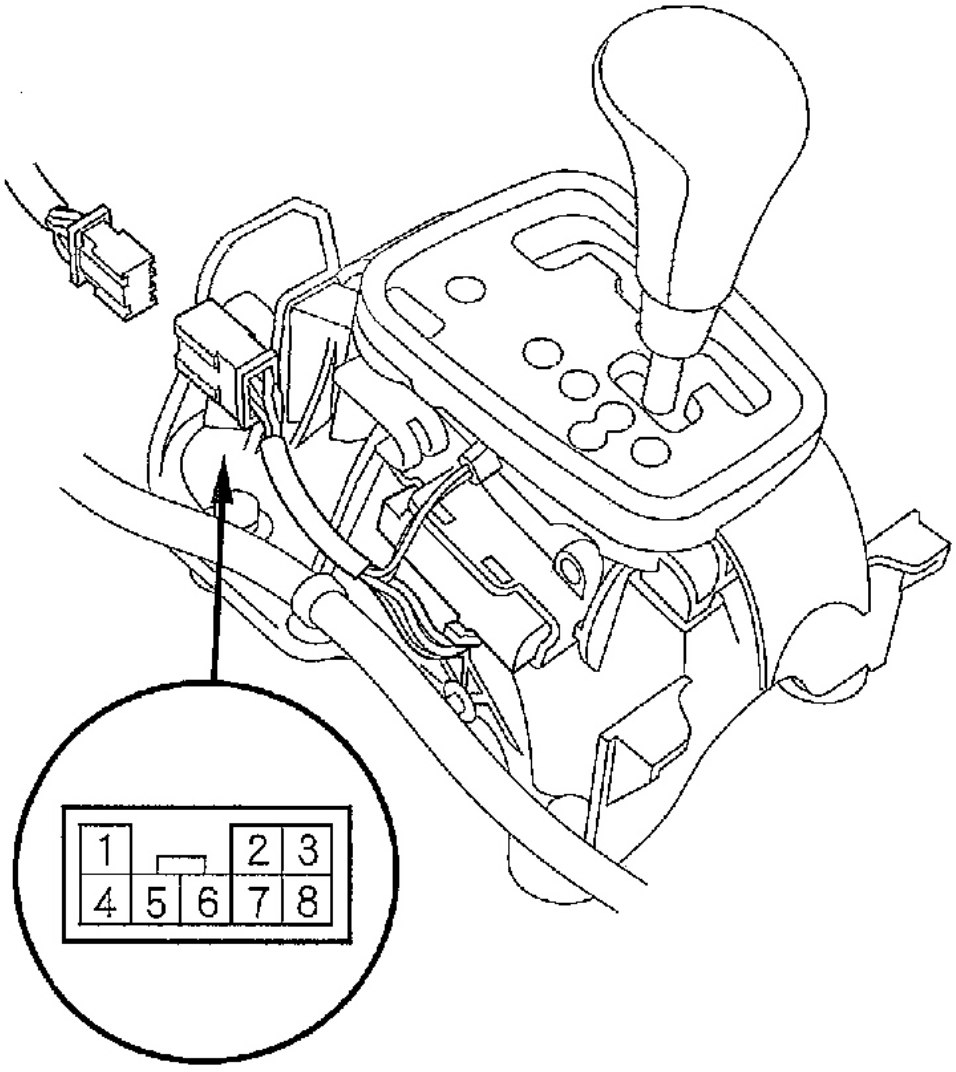


Fig. 251: Disconnecting Transmission Gear Selection Switch/Park Pin Switch Connector

3. Check for continuity between connector terminals No. 3 and No. 2. There should be continuity when shift lever in **M** position, and no continuity when shift lever in any position other than **M** .
4. Check for continuity between connector terminals No. 7 and No. 2. There should be continuity when shift lever pushed toward to upshift position (+), and no continuity with released shift lever to neutral position.
5. Check for continuity between connector terminals No. 8 and No. 2.
6. There should be continuity when shift lever pulled toward to downshift position (-), and no continuity

with released shift lever to neutral position.

7. Replace the transmission gear selection switch/park pin switch assembly if the switch test was failed.

TRANSMISSION GEAR SELECTION SWITCH REPLACEMENT

1. Remove the shift lever assembly (see **SHIFT LEVER**).
2. Disconnect transmission gear selection switch/park pin switch connector (A), then remove the connector from the shift lever bracket base.

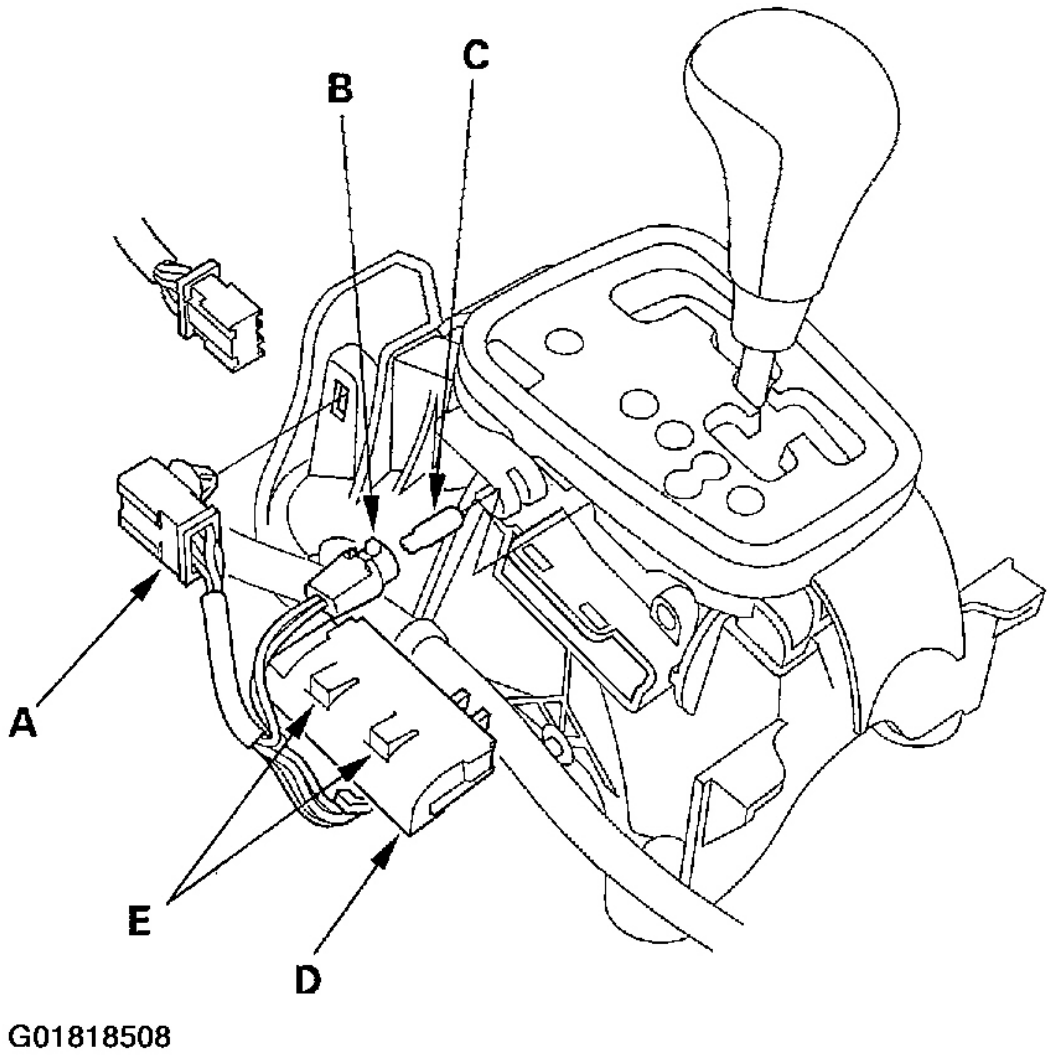


Fig. 252: Disconnecting Transmission Gear Selection Switch/Park Pin Switch Connector

3. Remove the A/T gear position indicator panel light bulb socket (B), then remove the bulb (C) from the

socket.

4. Remove the transmission gear selection switch/park pin switch (D) by releasing the lock tabs (E).
5. Install the new switch assembly in the shift lever bracket base.
6. Install the bulb in the socket, then install the socket in the bracket base.
7. Install the switch connector on the bracket base, then connect the connector.
8. Install the shift lever assembly (see **SHIFT LEVER**).

A/T GEAR POSITION INDICATOR

COMPONENT LOCATION INDEX

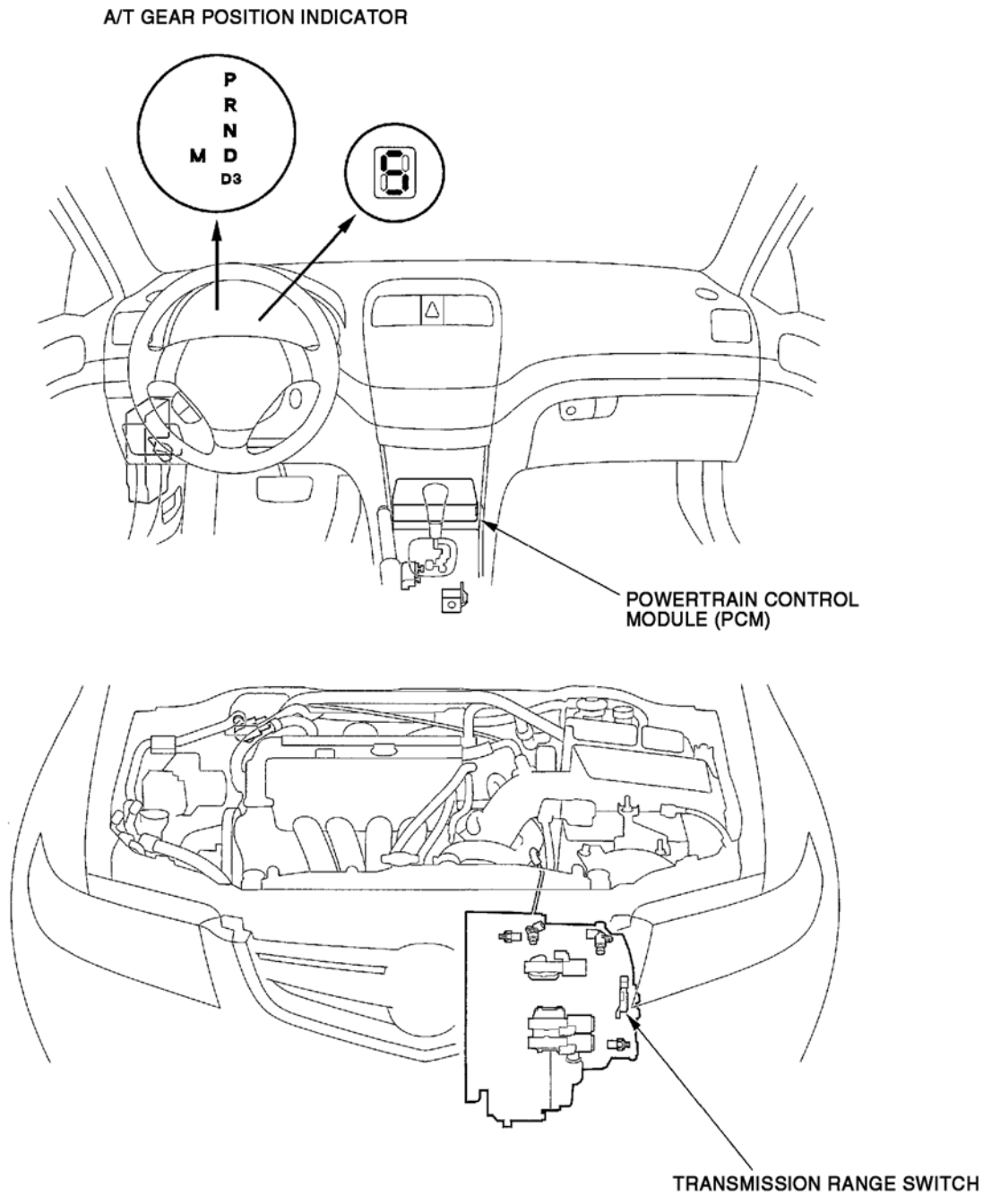


Fig. 253: Locating A/T Gear Position Indicator Components

CIRCUIT DIAGRAM

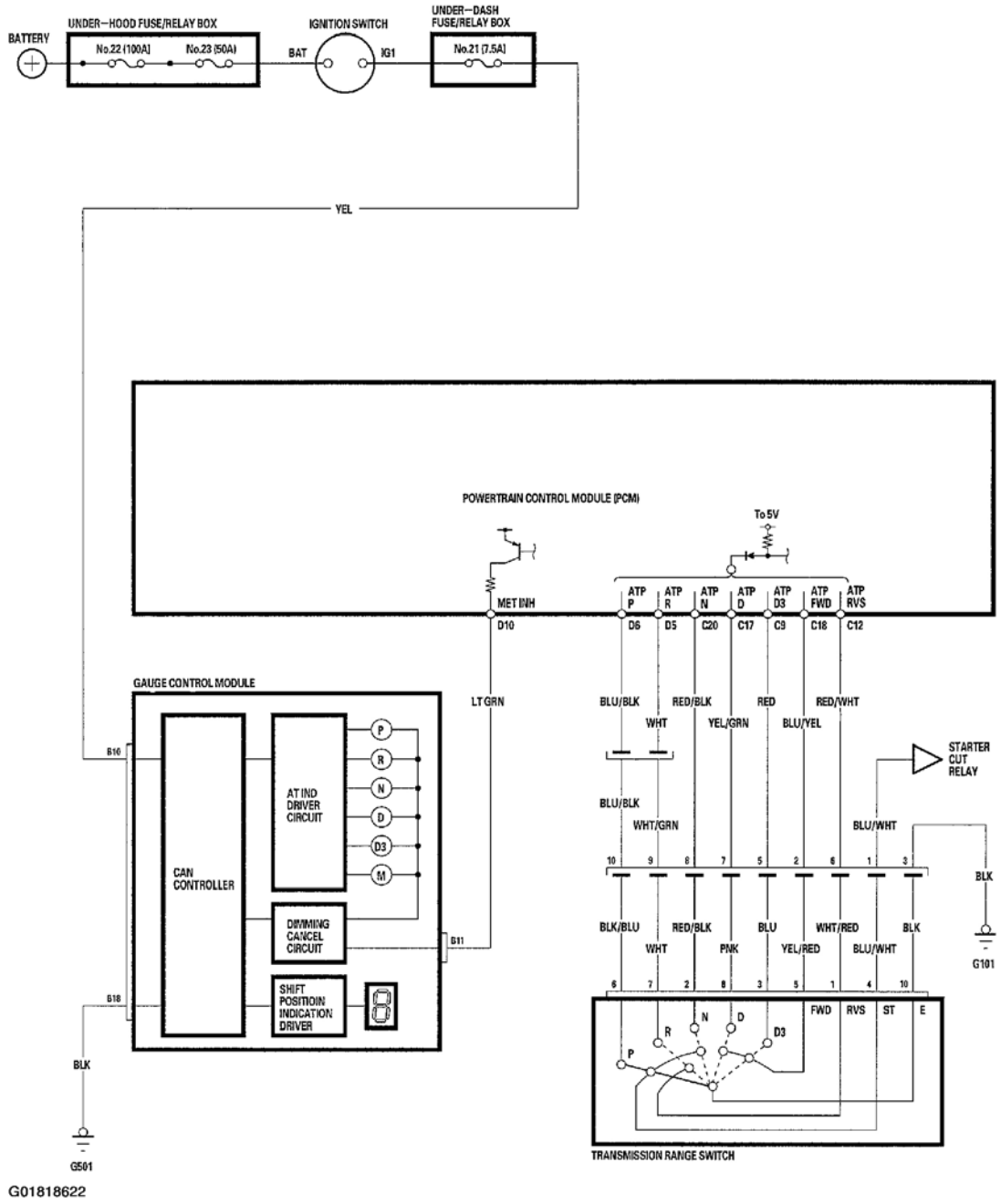


Fig. 254: A/T Gear Position Indicator Wiring Diagrams

A/T GEAR POSITION INDICATOR CIRCUIT TROUBLESHOOTING

Symptom: A/T gear position indicator does not indicate the shift lever position, the D indicator does not blink, and no transmission range switch DTCs are indicated.

1. Turn the ignition switch ON (II).

2. Measure the voltage between gauge control module connector terminal B11 and body ground. The shift lever can be in any position.

Is there battery voltage?

YES: Faulty A/T gear position indicator in the gauge control module, replace the gauge control module.

NO: Go to step 3.

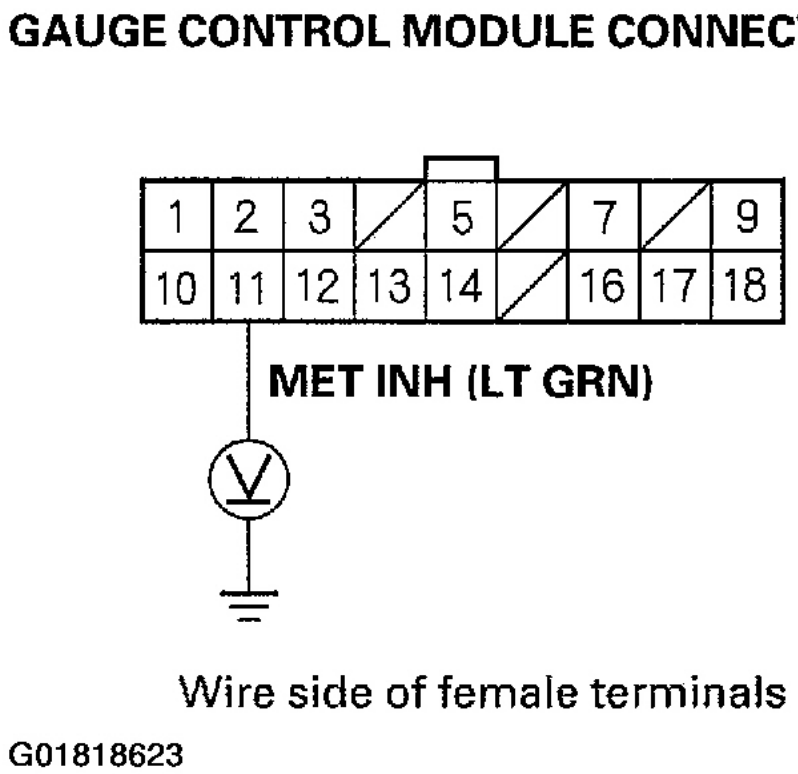


Fig. 255: Measuring The Voltage Between Gauge Control Module Connector Terminal B11 & Body Ground

3. Measure the voltage between PCM connector terminal D10 and body ground.

Is there battery voltage?

YES: Repair open or short in the wire between PCM connector terminal D10 and the gauge control module connector terminal B11.

NO: Check for loose terminal fit in the PCM connectors. Check the LT GRN wire for a short to ground between the gauge control module and PCM. If necessary, substitute a known-good PCM and recheck.

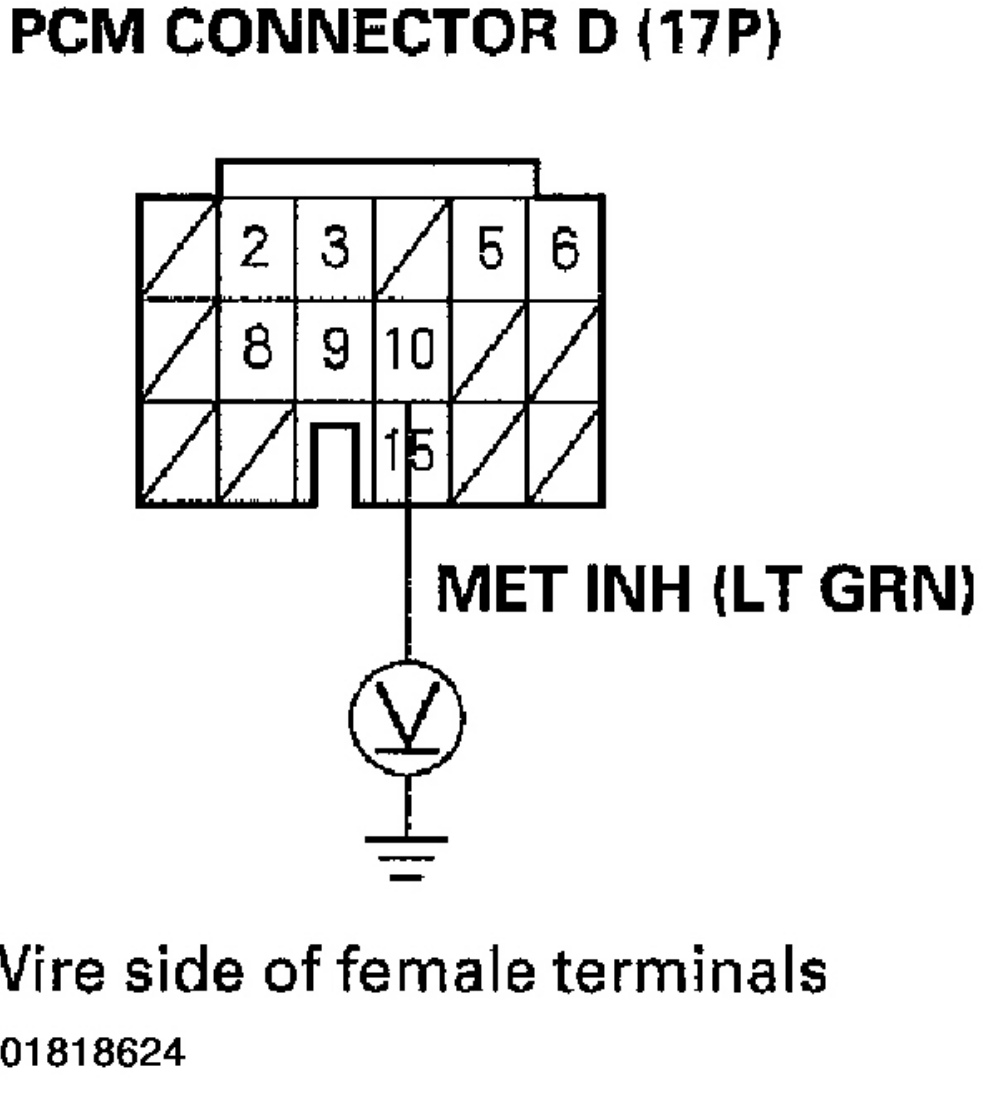


Fig. 256: Measuring The Voltage Between PCM Connector Terminal D10 & Body Ground

TRANSMISSION RANGE SWITCH TEST

1. Remove the transmission range switch harness connector (A) from the connector bracket (B), then disconnect the connector.

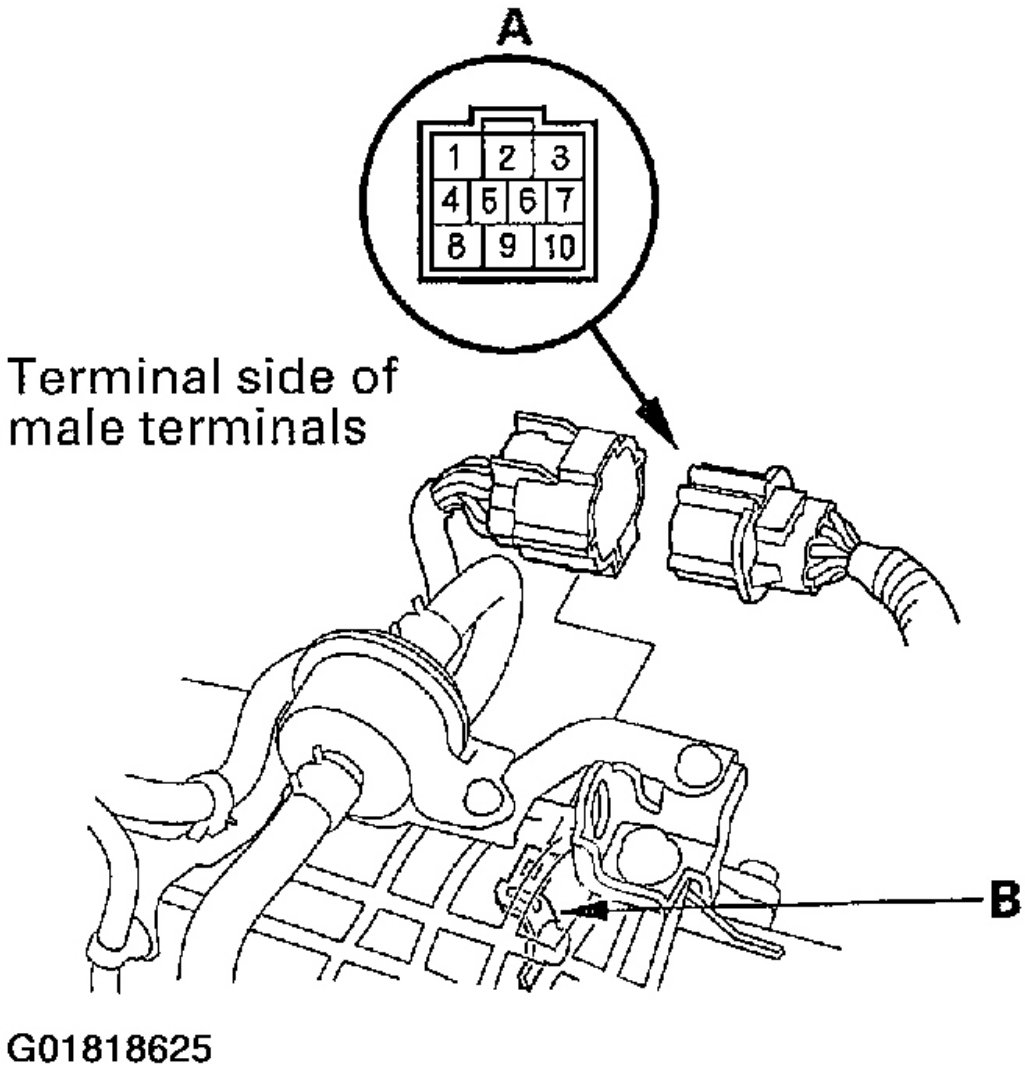


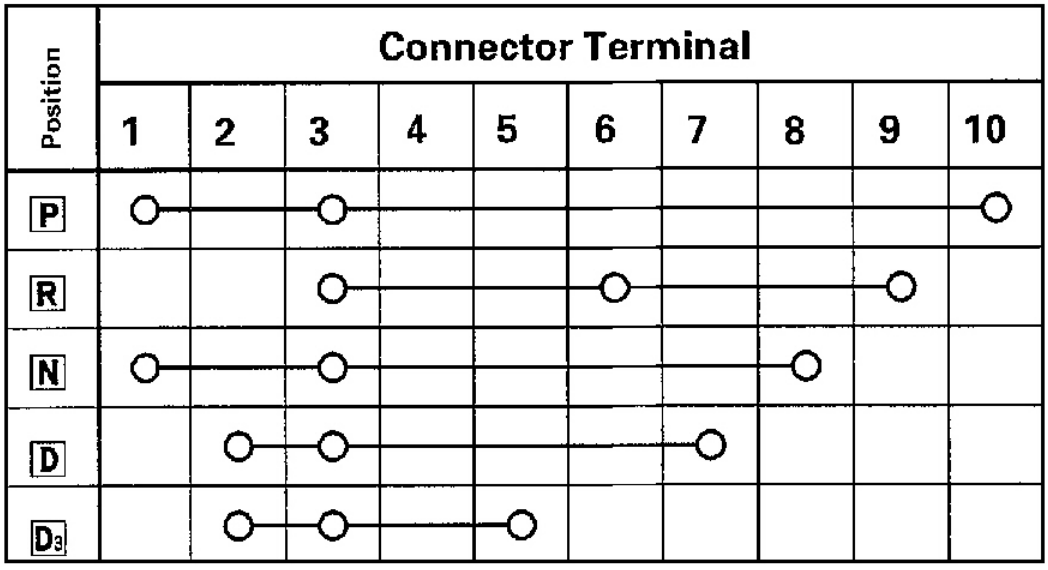
Fig. 257: Removing The Transmission Range Switch Harness Connector From The Connector Bracket

Terminal	Signal	Terminal	Signal
1	ATP NP (ST)	6	ATP RVS
2	ATP FWD	7	D
3	Ground (E)	8	N
4	———	9	R
5	D_3	10	P

G01818626

Fig. 258: Transmission Range Switch Harness Connector Terminal Specifications

2. Check for continuity between terminals at the harness connector. There should be continuity between the terminals in the following table for each switch position.



G01818627

Fig. 259: Transmission Range Switch Harness Connector Continuity Test Table

3. If there is no continuity between any terminals, remove the transmission range switch cover, and disconnect the connector at the switch.

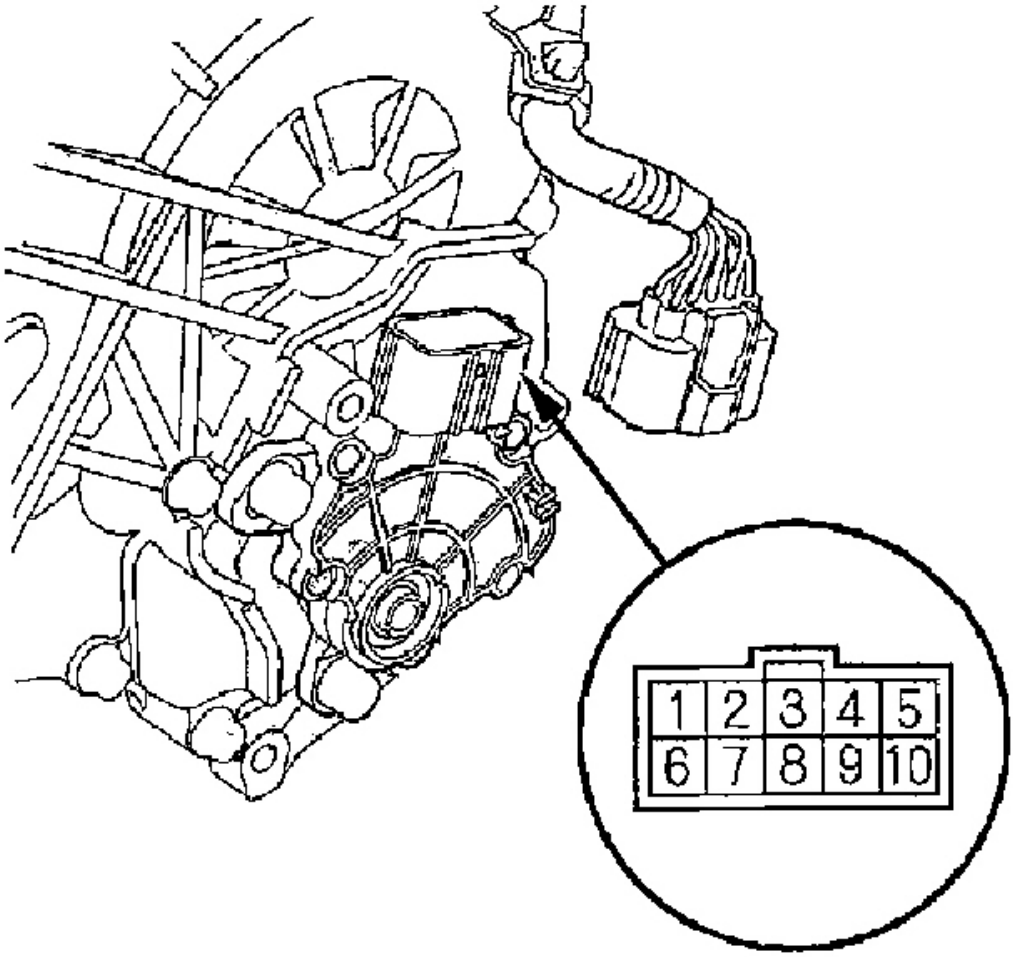


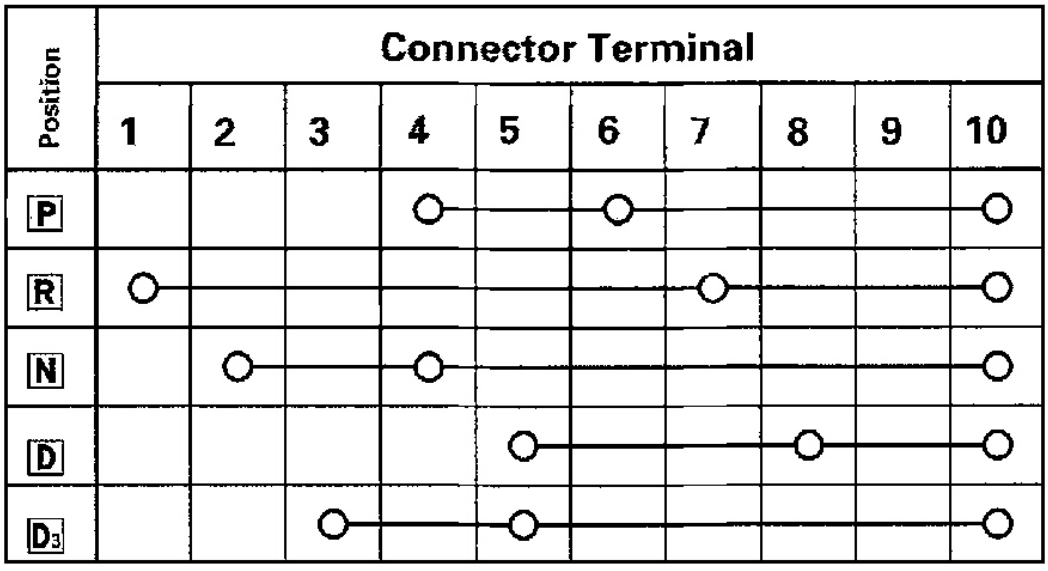
Fig. 260: Identifying Transmission Range Switch Terminals

Terminal	Signal	Terminal	Signal
1	ATP RVS	6	P
2	N	7	R
3	D3	8	D
4	ATP NP (ST)	9	———
5	ATP FWD	10	Ground (E)

G01818629

Fig. 261: Transmission Range Switch Terminal Specifications

4. Check for continuity between terminals at the switch connector. There should be continuity between the terminals in the following table for each switch position.



G01818630

Fig. 262: Transmission Range Switch Continuity Test Table

5. If the transmission range switch continuity check is OK, replace the faulty transmission range switch harness.
6. If there is no continuity between any terminals, remove the transmission range switch, and check the end of the selector control shaft (A).

Standard:

Control Shaft Width (B): 6.1-6.2 mm (0.240-0.244 in.)

Control Shaft End Gap (C): 1.8-2.0 mm (0.07-0.08 in.)

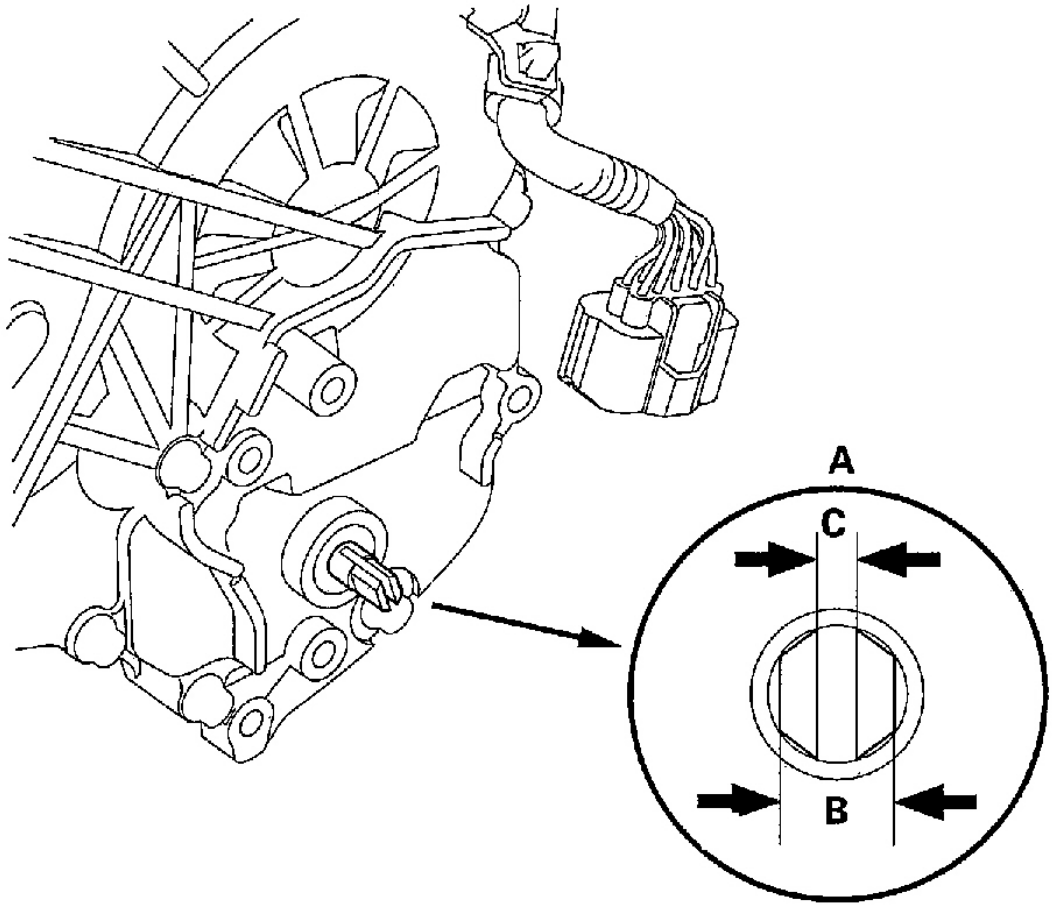


Fig. 263: Checking The End Of The Selector Control Shaft

7. The measurement of the control shaft end is within the standard, replace the transmission range switch. If the measurement is out of the standard, repair the control shaft end, and recheck the transmission range switch continuity.

TRANSMISSION RANGE SWITCH REPLACEMENT

1. Raise the vehicle, and make sure it is securely supported.
2. Shift to the **N** position.
3. Remove the transmission range switch cover.

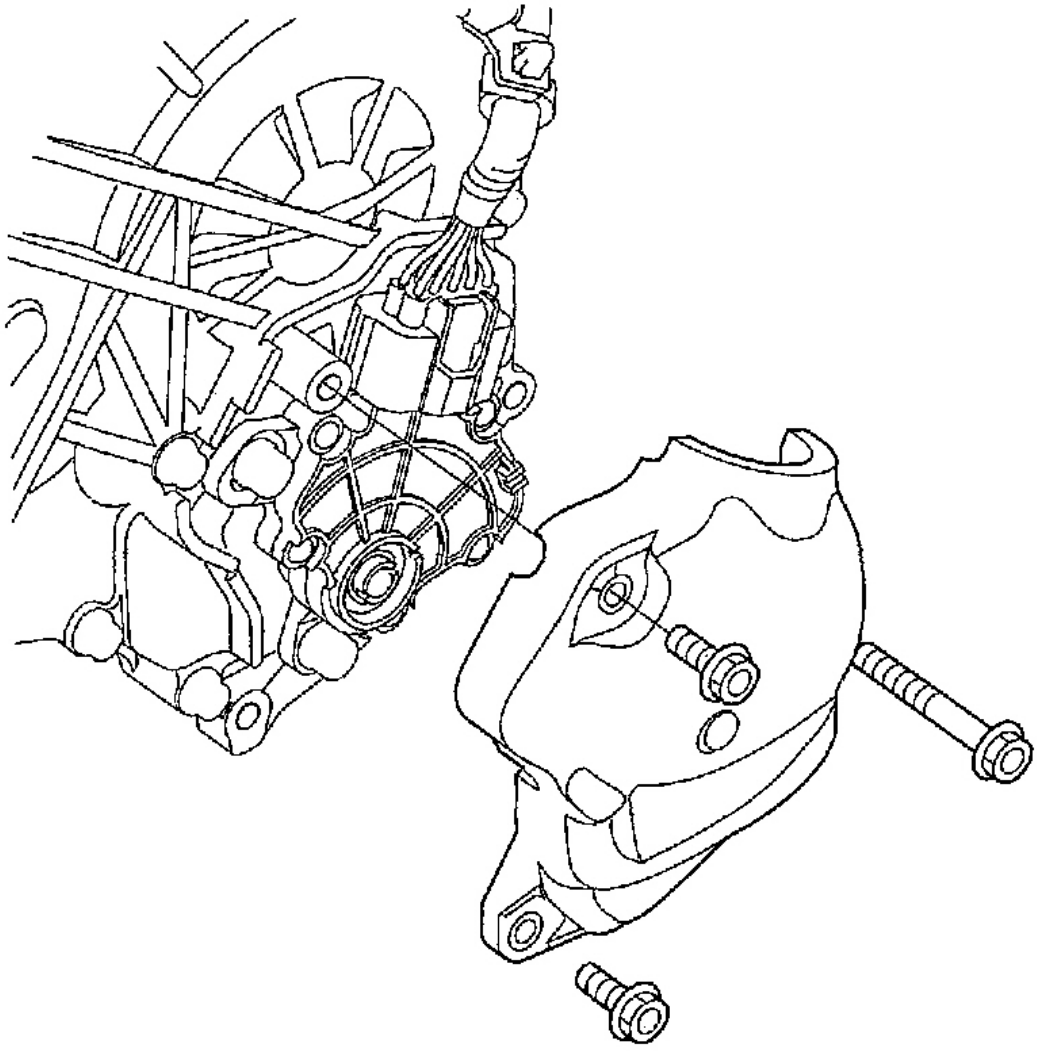


Fig. 264: Removing The Transmission Range Switch Cover

4. Disconnect the transmission range switch connector.

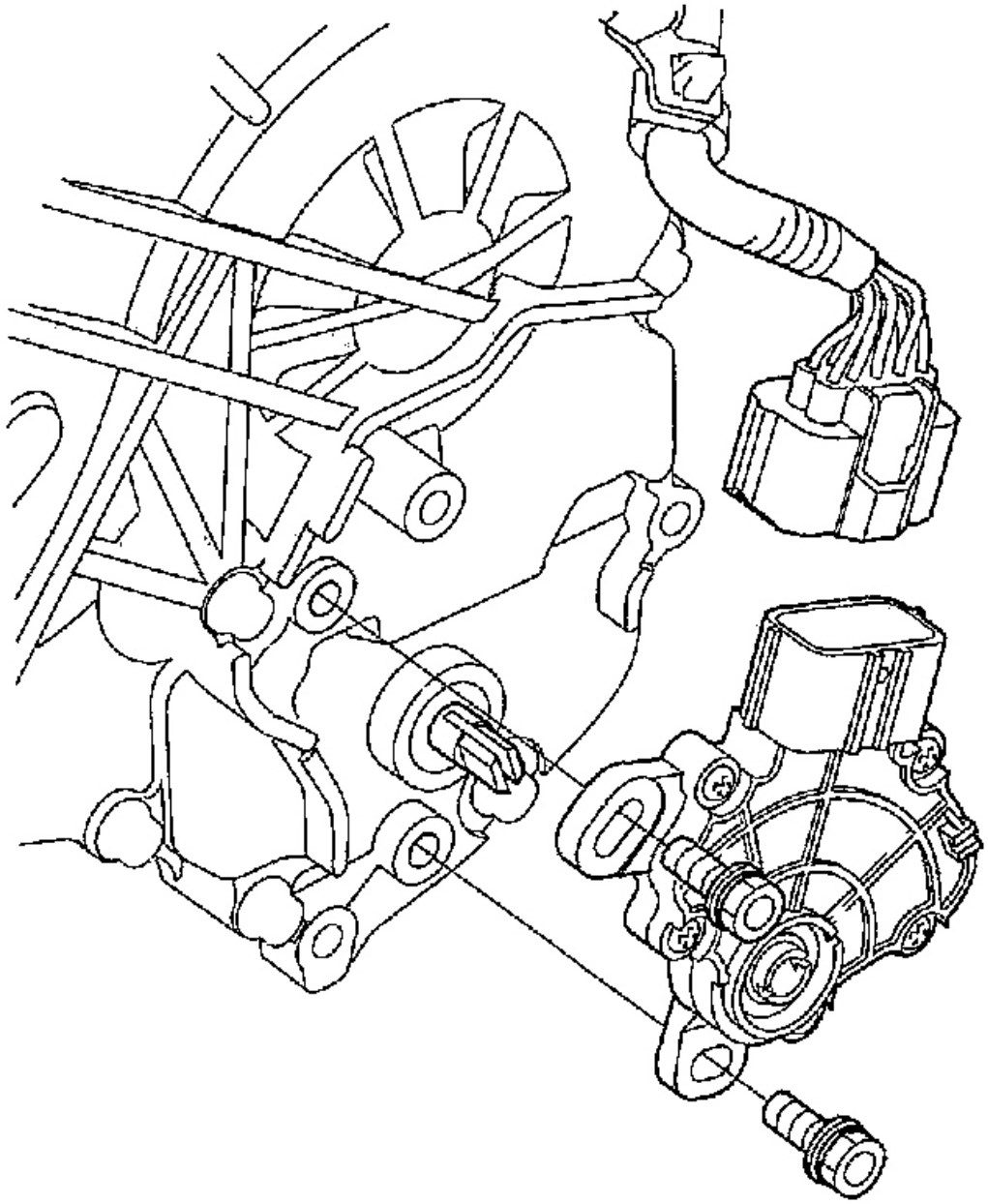


Fig. 265: Disconnecting The Transmission Range Switch Connector

5. Remove the transmission range switch, and install the new switch.
6. Make sure the control shaft is in the **N** position. If necessary, move the shift lever to the **N** position.

NOTE: **Do not use the control shaft to adjust the shift position. If the control shaft tips are squeezed together it will cause a faulty signal or position due to play between the control shaft and the switch.**

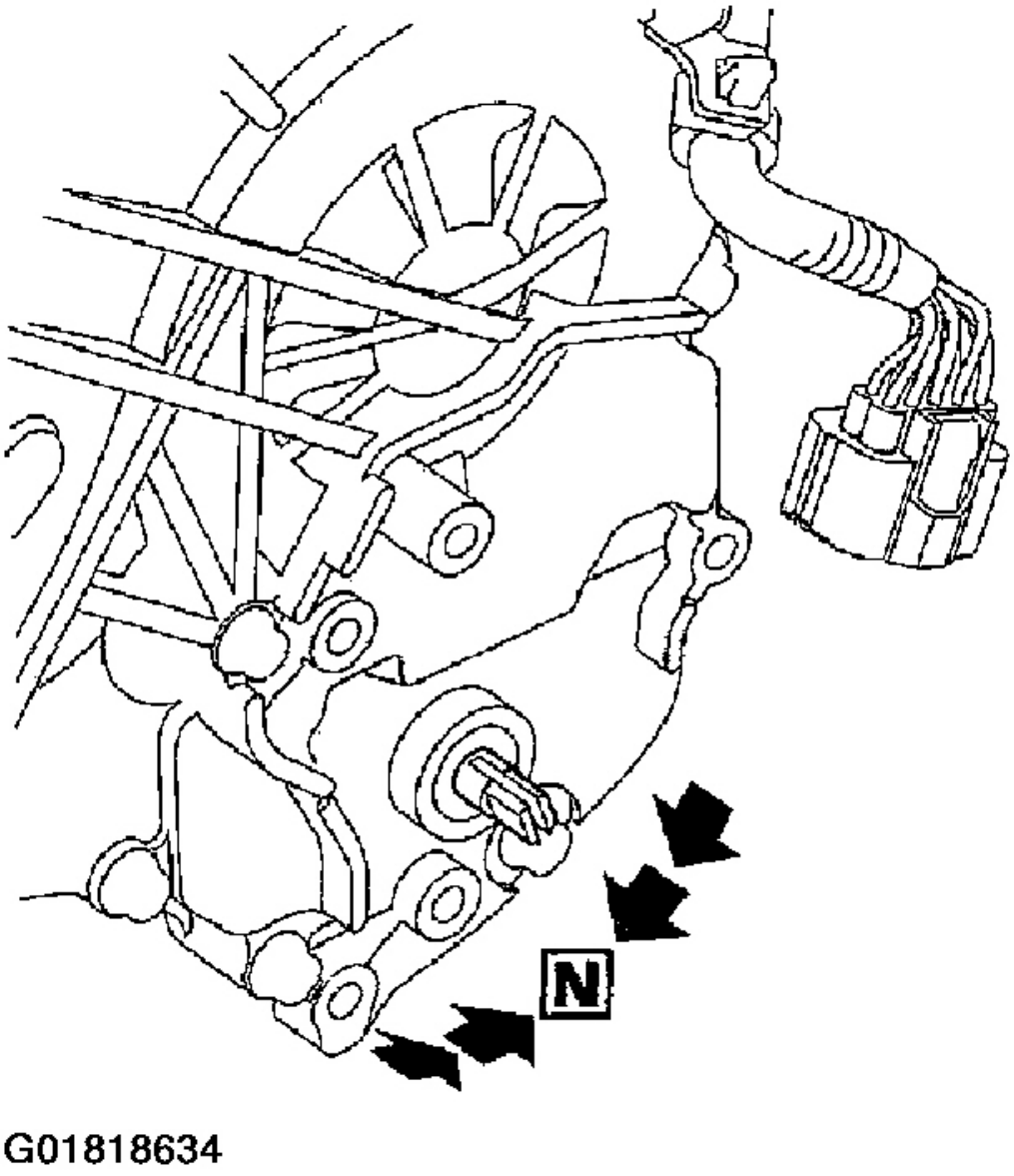


Fig. 266: Moving The Shift Lever To The N Position

7. Align the cutouts (A) on the rotary-frame with the neutral positioning cutouts (B) on the transmission range switch (C), then put a 2.0 mm (0.08 in.) feeler gauge blade (D) in the cutouts to hold the switch in

the **N** position.

NOTE: Be sure to use a 2.0 mm (0.08 in.) blade or equivalent to hold the switch in the N position.

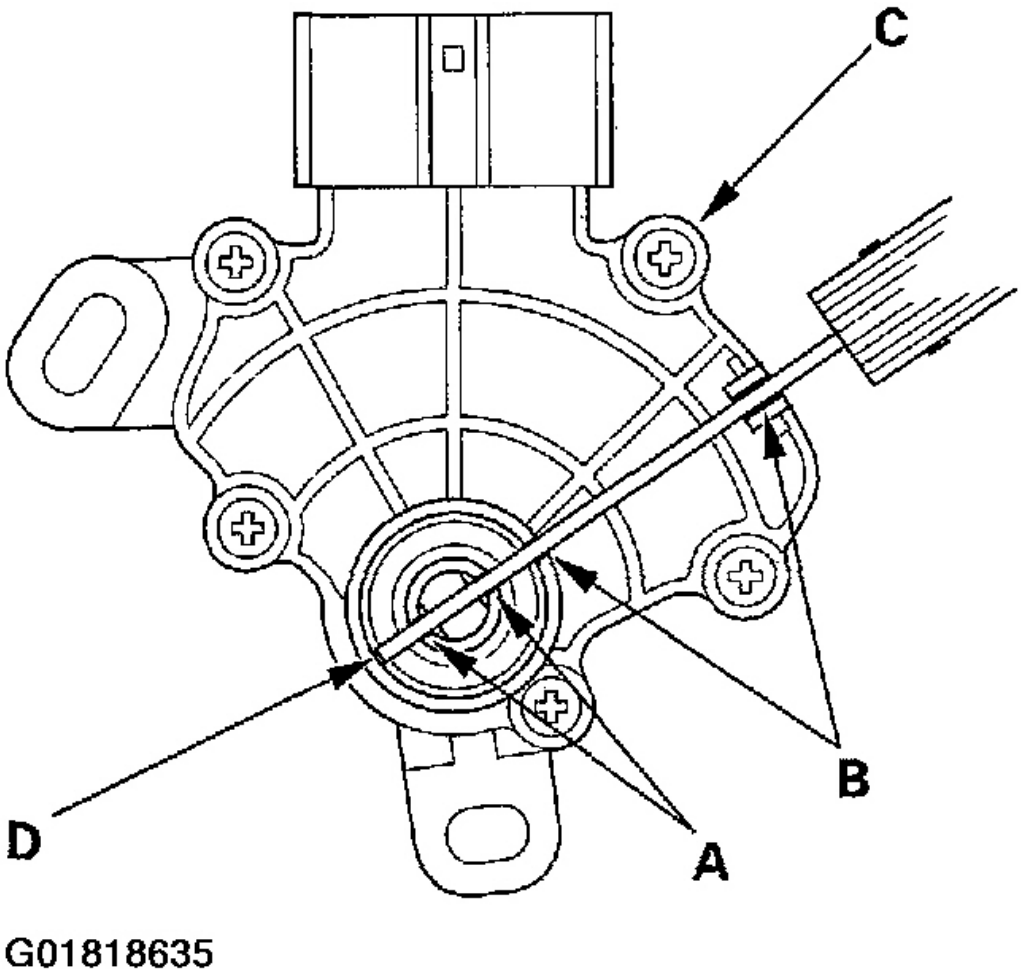


Fig. 267: Aligning The Cutouts On The Rotary-Frame With The Neutral Positioning Cutouts On The Transmission Range Switch

8. Install the transmission range switch (A) gently on the control shaft (B) with holding it in the **N** position with the 2.0 mm (0.08 in.) blade (C).

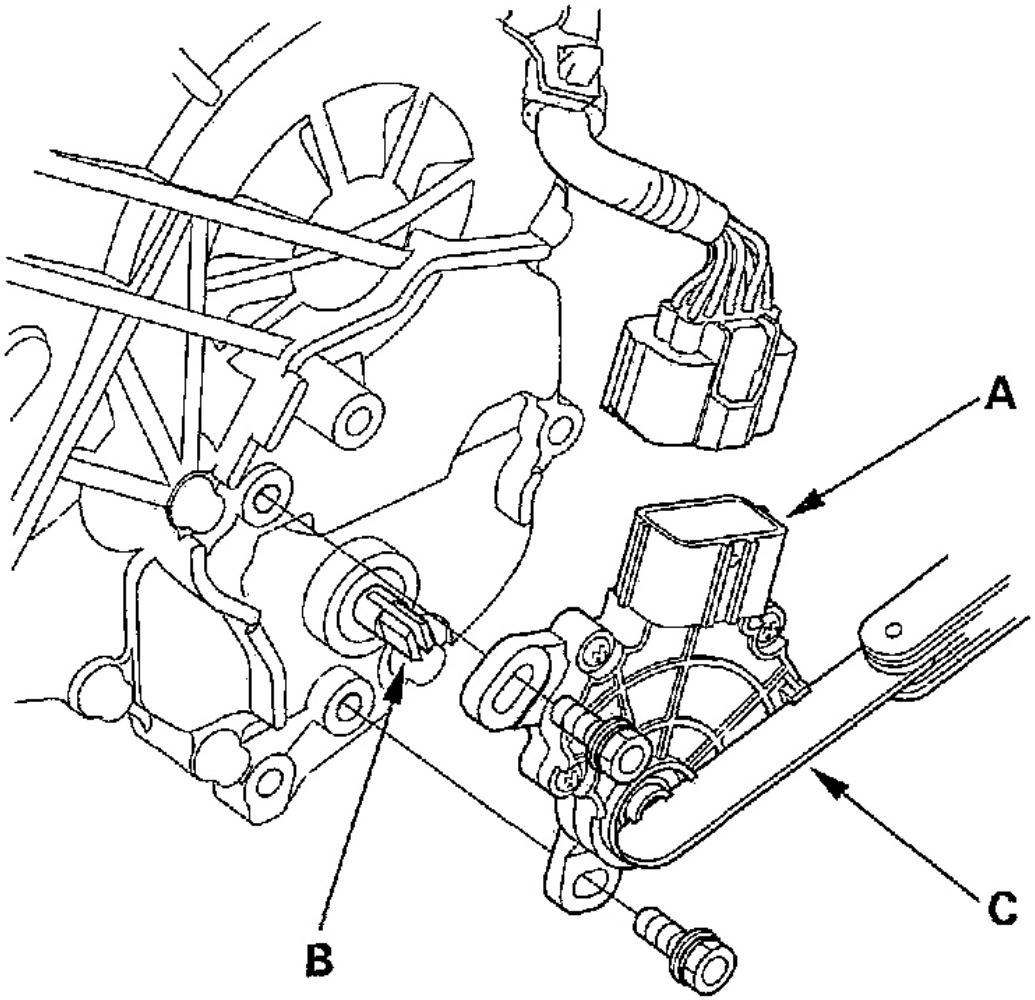


Fig. 268: Installing The Transmission Range Switch On The Control Shaft

9. Tighten the bolts on the transmission range switch while you continue to hold the **N** position. Do not move the transmission range switch when tightening the bolts. Remove the feeler gauge.

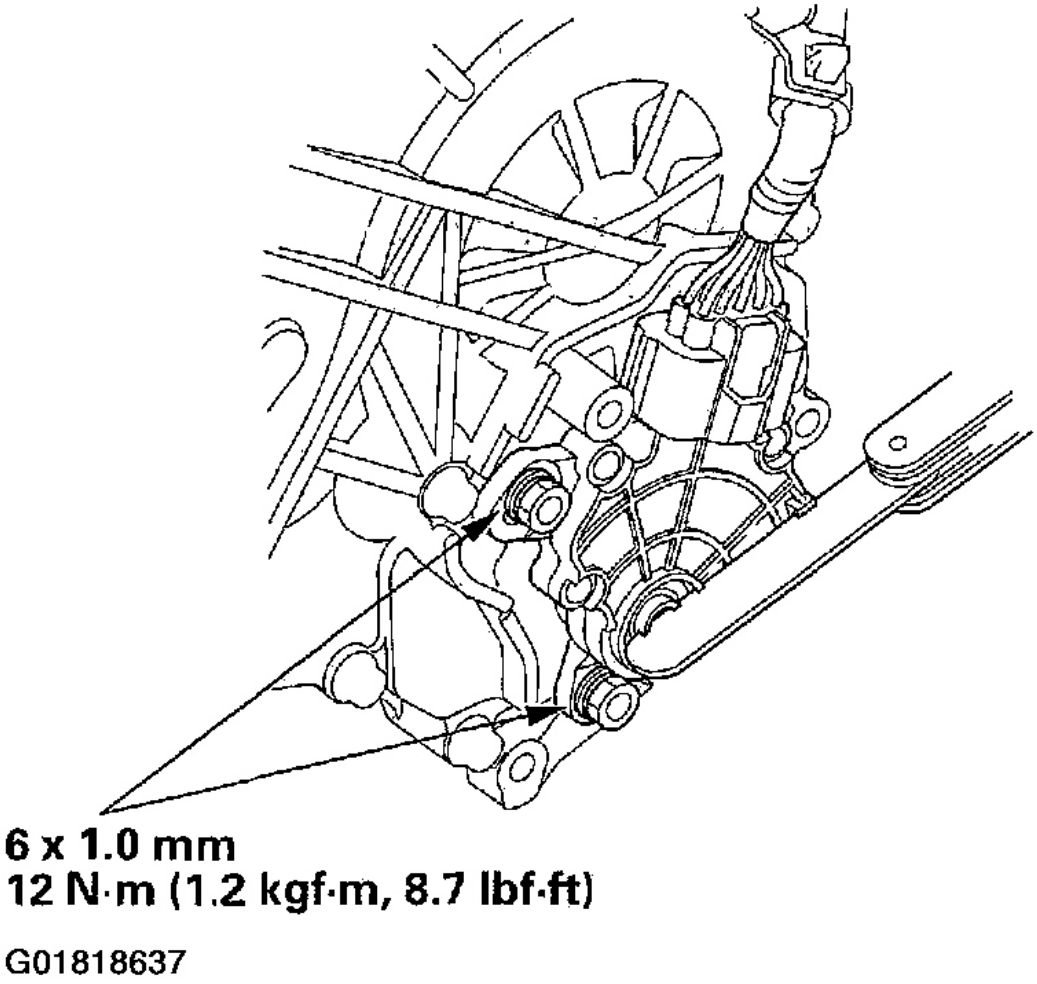


Fig. 269: Tightening The Bolts On The Transmission Range Switch

10. Connect the connector securely, then install the transmission range switch cover (A).

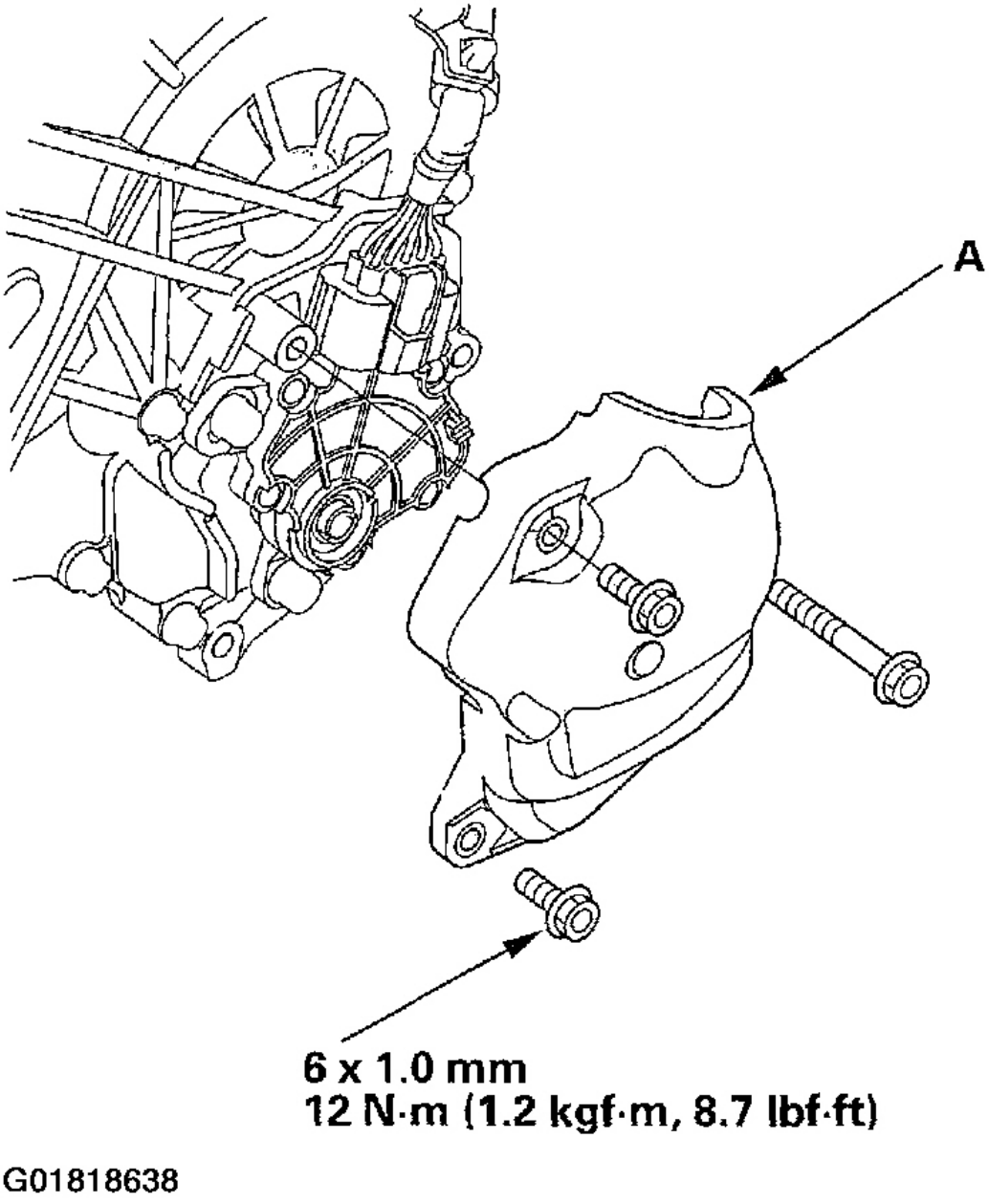


Fig. 270: Installing The Transmission Range Switch Cover

11. Turn the ignition switch ON (II). Move the shift lever through all positions, and check the transmission range switch synchronization with the A/T gear position indicator.
12. Check that the engine will start in **P** and **N** positions, and will not start in any other shift lever position.
13. Check that the back-up lights come on when the shift lever is in **R** position.

14. Allow the front wheels to rotate freely, then start the engine, and check the shift lever operation.