DESCRIPTION

DESCRIPTION

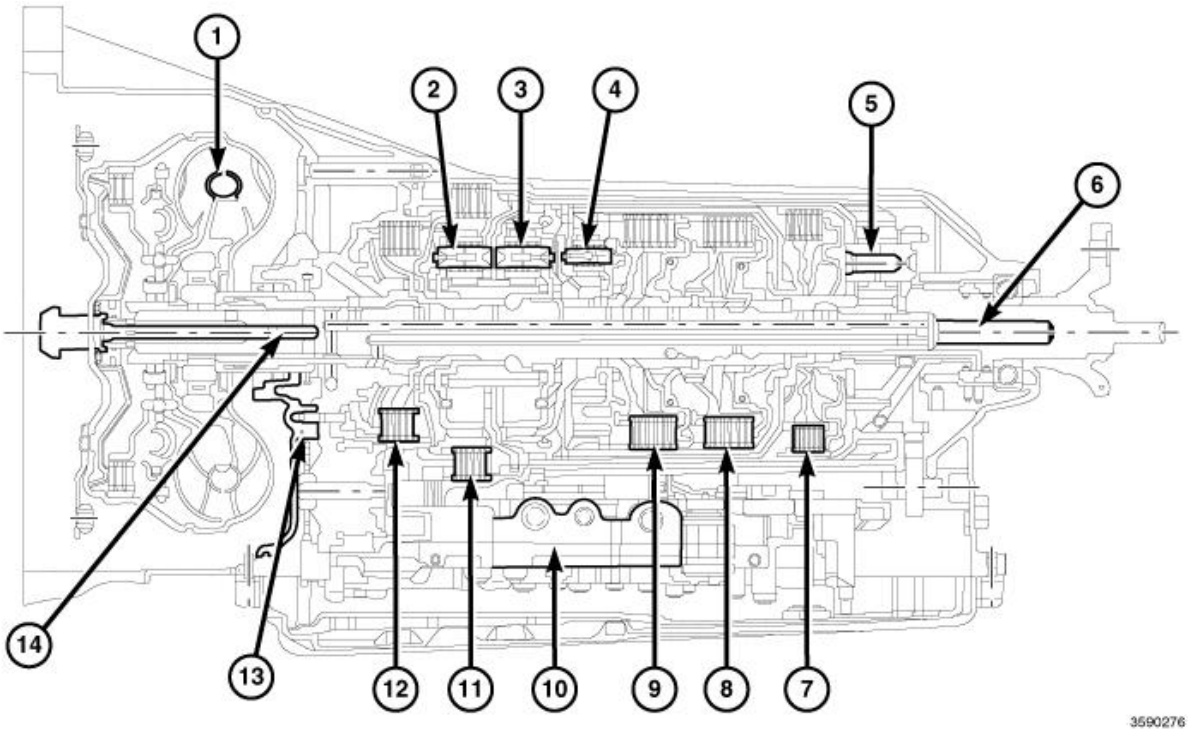


Fig. 1: 8HP70 Automatic Transmission
Courtesy of CHRYSLER GROUP, LLC

1 - TORQUE CONVERTER
2 -P1 PLANETARY
3 - P2 PLANETARY
4 - P3 PLANETARY
5 - P4 PLANETARY
6 - OUTPUT SHAFT
7 - D CLUTCH
8 - C CLUTCH
9 - E CLUTCH
10 - VALVE BODY
11 - B CLUTCH
12 - A CLUTCH
13 - OIL PUMP
14 - INPUT SHAFT

CAUTION: A unique transmission fluid has been developed for this transmission. This

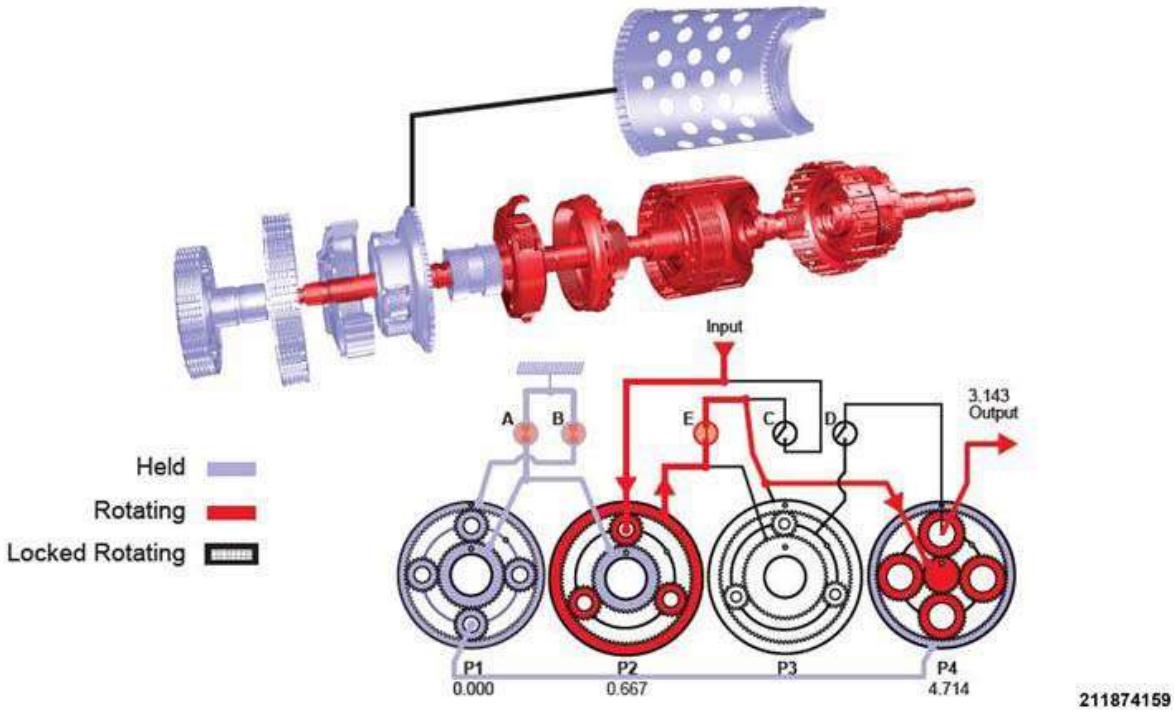


Fig. 4: Powerflow In Second Gear
Courtesy of CHRYSLER GROUP, LLC

SECOND GEAR POWERFLOW

Clutch A (1) holds the P1/P2 sun gear (17) and clutch B (2) holds the P1 annulus (3). As with 1st gear, the entire P1 gear set is stationary. The stationary P1 carrier (18) is connected to the P4 annulus (9), locking the annulus. The input shaft (19) drives the P2 carrier (16). The P2 carrier (16) drives the P2 annulus (4). The P2 annulus (4) drives the E clutch (14) through the P3 sun gear (5) connection. The E clutch (14) then drives the P4 sun gear (10). The P4 sun gear (10) drives the P4 carrier (11), whose pinions walk around the held P4 annulus (9).

Keyless Entry (RKE) transmitter or the Passive Entry Keyless Go (PEKG) FOB with Integrated Key (FOBIK); and relays the appropriate electronic messages to other electronic modules in the vehicle over the CAN data bus to support the features of the optional Vehicle Theft Alarm (VTA) system.

The RFHM is connected to a fused B(+) circuit and has a path to a clean ground at all times. These connections allow it to remain functional regardless of the ignition switch status. Any input to the RFHM that controls a vehicle system function that does not require that the ignition switch status be ON such as depressing a button on an RKE or FOBIK transmitter, prompts the RFHM to wake up and transmit on the CAN data bus.

RFHM uses On-Board Diagnostics (OBD) to monitor all of the Functions and circuits it controls, then sets active and stored Diagnostic Trouble Codes (DTC) for any monitored function faults it detects. RFHM will also send electronic message requests to the Instrument Cluster (IC) through the BCM for the display of certain textual warning messages related to some detected functions conditions or faults.

The hard wired inputs and outputs of the RFHM may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate SYSTEM WIRING DIAGRAMS article. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the RFHM electronic controls or the communication between modules and other devices that provide some features of the RFHM-controlled systems. The most reliable, efficient and accurate means to diagnose the RFHM or the electronic controls and communication related to RFHM-controlled systems operation requires the use of a diagnostic scan tool. Refer to the appropriate Diagnostic & Testing article.

REMOVAL

REMOVAL

1. Disconnect the negative battery cable.
2. Remove the rear shelf cover. Refer to **PANEL, REAR SHELF, REMOVAL** .

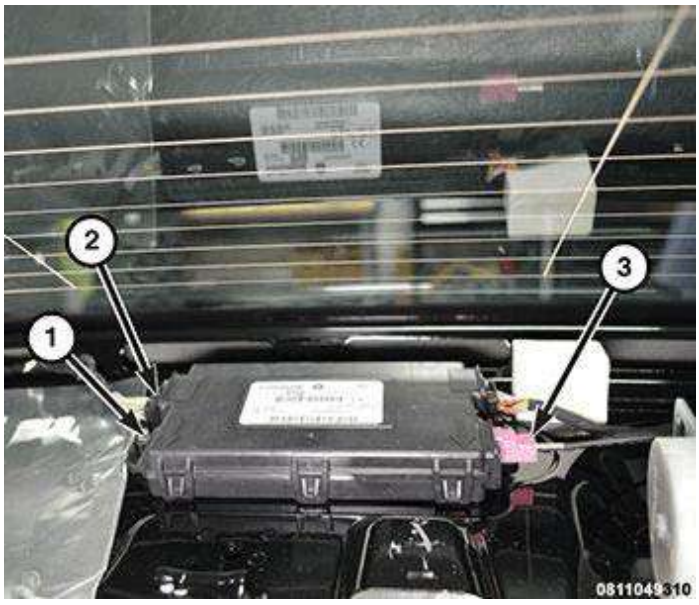


Fig. 71: Radio Frequency Hub Module Retainers, Connectors & Antenna
Courtesy of CHRYSLER GROUP, LLC

3. Remove the Remote Frequency Hub Module (RFHM) retainers (1).
4. Disconnect the electrical connectors (2).

...

Fig. 249: Shift Linkage Bolt & Retaining Pins
Courtesy of CHRYSLER GROUP, LLC

12. Remove the bolt (1) holding the shift linkage to the transmission shift rail.

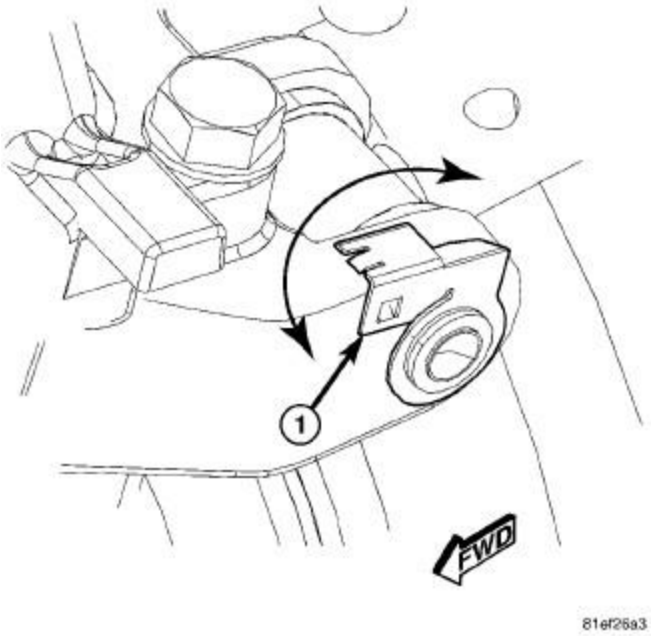


Fig. 250: Shifter Roll Pin Rotation
Courtesy of CHRYSLER GROUP, LLC

13. Rotate each of the locking tabs (1) to disengage them from the roll pins.

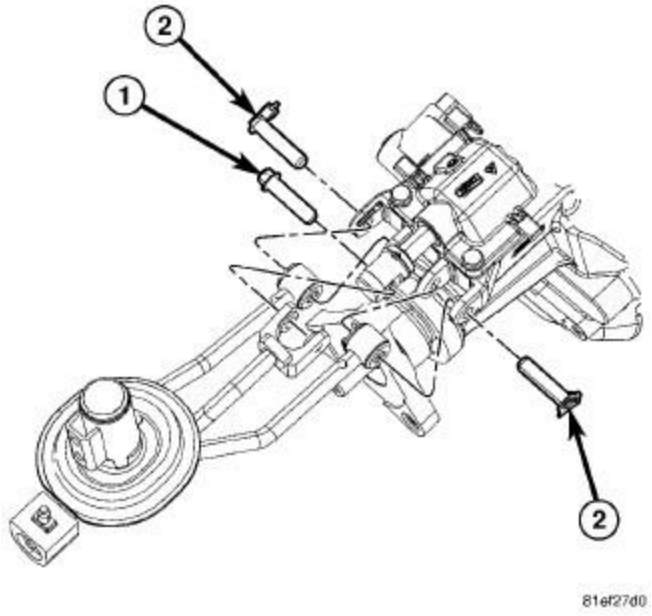
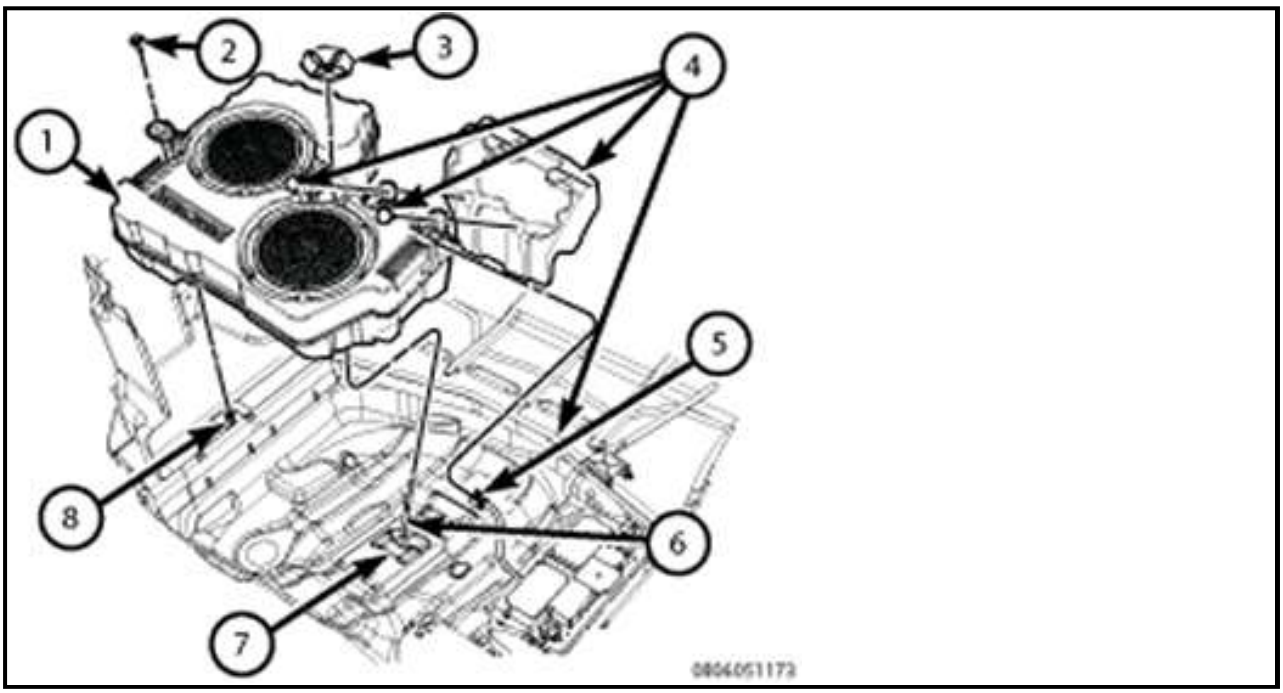


Fig. 251: Shift Linkage Bolt & Retaining Pins
Courtesy of CHRYSLER GROUP, LLC

4. Lift the subwoofer up from the shelf panel support far enough to access and disconnect the two wire harness connectors (3) from the subwoofer.
5. Remove the subwoofer from the shelf panel.

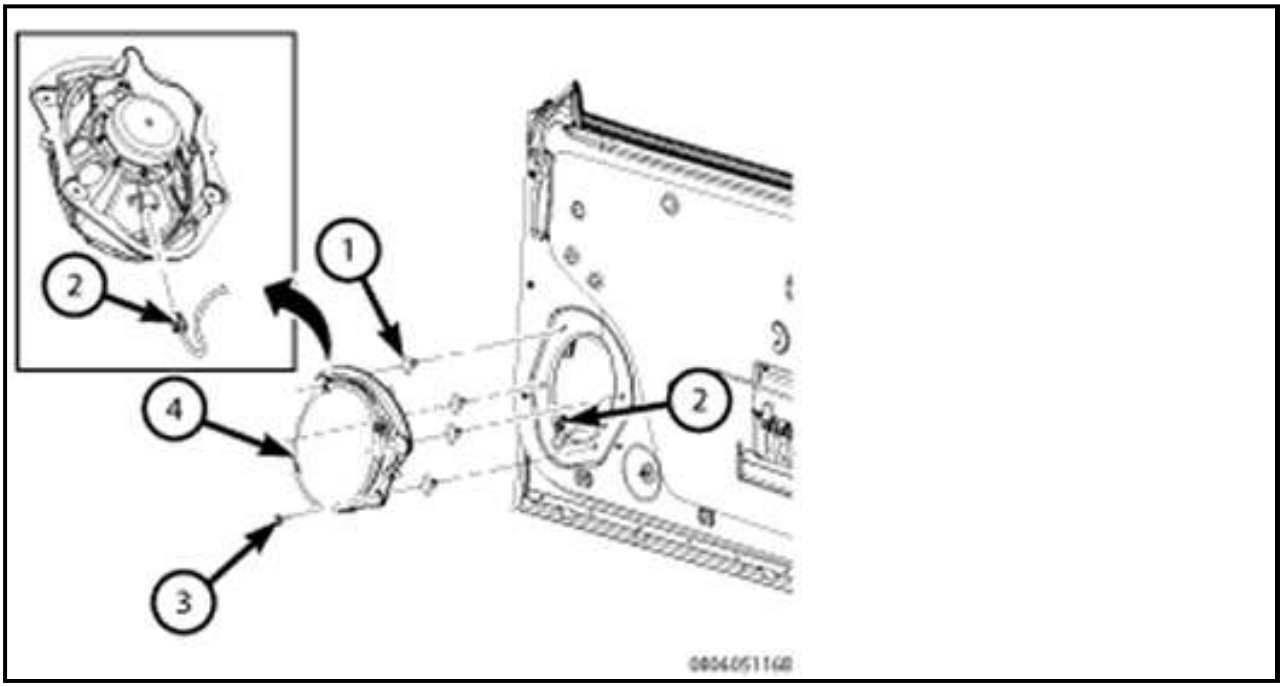
SUBWOOFER - TRUNK



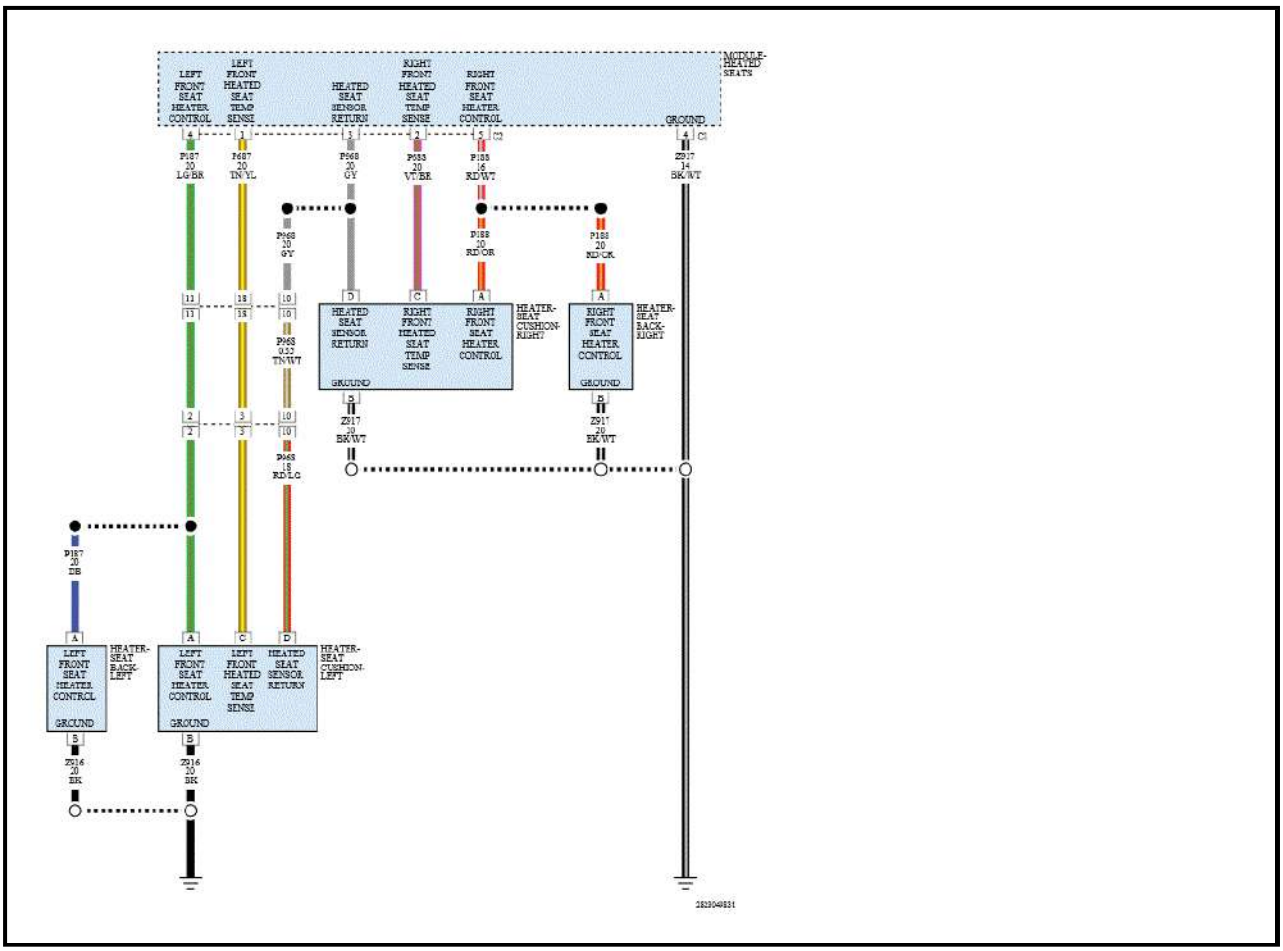
1. Disconnect and isolate the negative cable from the battery. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector before disconnecting the negative cable from the battery.
2. Remove the hold down retainer (3) that secures the subwoofer assembly (1) to the special bolt (6) in the hold down bracket (7) in the spare tire well of the trunk floor panel.
3. Remove the screw (2) that secures the subwoofer assembly to the rivet nut (8) in the left sill of the spare tire well.
4. Disconnect the wire harness connector (5) from the subwoofer assembly.
5. Remove the two push in plastic fasteners that secure the storage bin (4) to the subwoofer assembly.
6. Remove the subwoofer from the vehicle (2).

INSTALLATION

DOOR PANEL



B1E9A-13-FRONT RIGHT HEATER CONTROL - CIRCUIT OPEN



WHEN MONITORED

This diagnostic runs continuously when the following conditions are met:

- Engine running.
- Controller voltage between 9.0 and 16.0 volts.
- Heated seat is turned on.

SET CONDITION

- Module detects on the Right Front Seat Heater Control circuit a current below 0.5 of an amp for more than 2 seconds.

DEFAULT ACTION

- When the Right Front Heated Seat is turned on, the indicator turns on for 2 seconds and turns off.
- The Right Front Seat Heater output driver will be disabled.

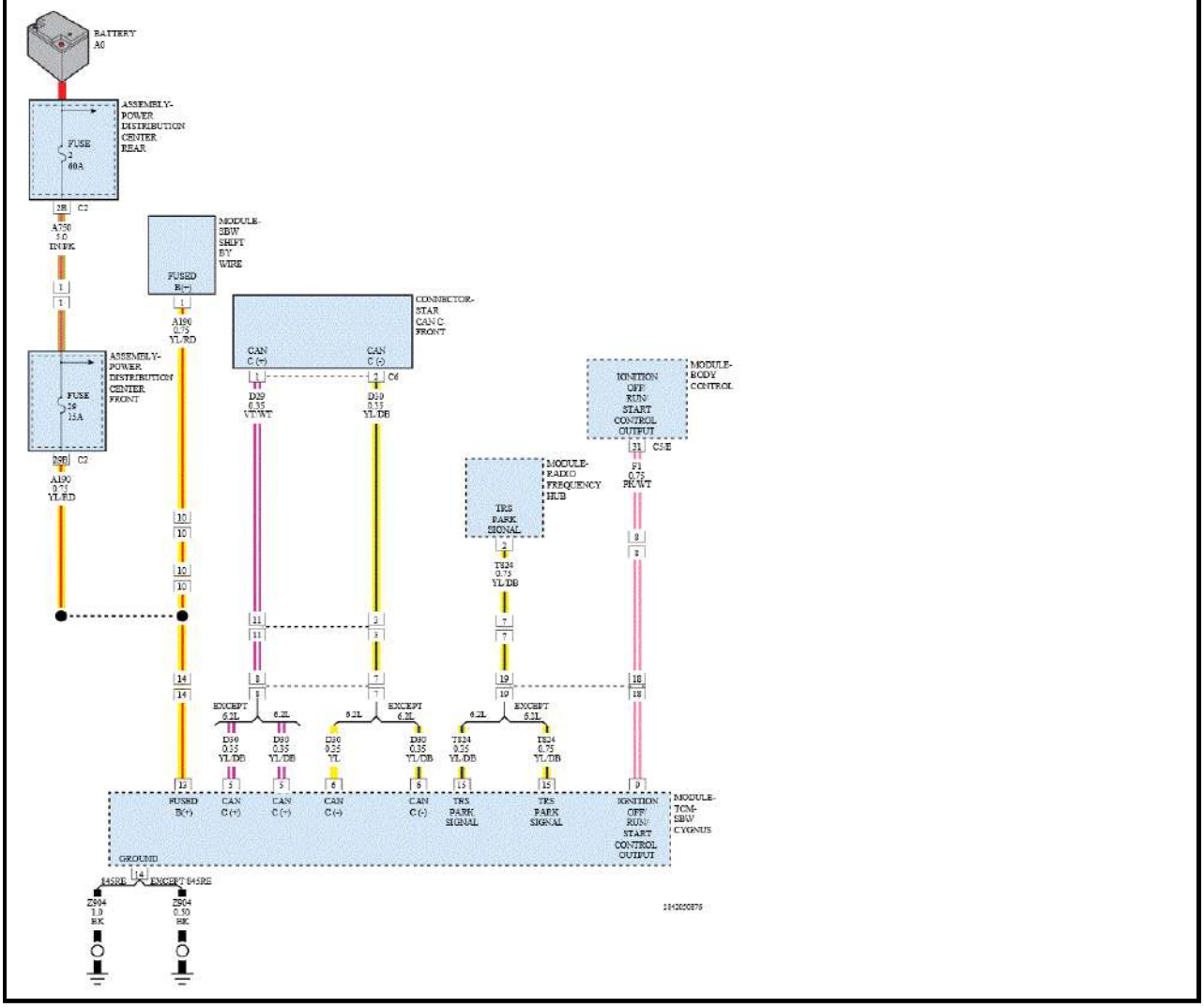
POSSIBLE CAUSES

Possible Causes
RIGHT FRONT SEAT HEATER CONTROL CIRCUIT OPEN OR HIGH RESISTANCE
GROUND CIRCUIT OPEN OR HIGH RESISTANCE
SEAT CUSHION HEATER ELEMENT
SEAT BACK HEATER ELEMENT
HEATED SEAT MODULE (HSM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding. Refer to PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE .

DIAGNOSTIC TEST

1. **CHECK FOR AN ACTIVE DTC**



THEORY OF OPERATION

The transmission monitoring system uses three temperature sensors. If any one of the sensors fail, the other two sensors are used for the control and temperature monitoring calculations and the Malfunction Indicator Lamp (MIL) will not be illuminated. The MIL will only illuminate when more than one temperature sensor has a failure.

NOTE: **If only one of the temperature sensors has failed and the MIL is not illuminated, do not perform any temperature sensor related repairs. The TCM will use the other two sensors to calculate the proper transmission operation.**

One of the sensors is located in the oil sump of the transmission and can be monitored with a scan tool under the Oil Temperature Sensor data parameter. This sensor is a 2-wire thermistor with a negative temperature coefficient. This means that as the temperature increases, the resistance of the sensor decreases.

The other two sensors are embedded on the Printed Circuit Board (PCB) in two separate areas of the Transmission Control Module (TCM). The TCM is attached to the valve body and therefore provides the three sensors with a strong temperature correlation. The embedded sensors can not be monitored with the scan tool and cannot be serviced separately.

The oil temperature sensor that is located in the oil sump is normally used exclusively for the transmission control calculations. The embedded sensors located in the TCM are normally used for over-temperature shutdown and temperature sensor rationality monitoring. The following table shows the relationship between temperature and resistance of the Oil Temperature Sensor located in the oil sump.

TEMPERATURE vs RESISTANCE	
TEMPERATURE	**RESISTANCE**
-30Ã‚Â°C (-22Ã‚Â°F)	37, 400 - 50, 600 Ohms
10Ã‚Â°C (50Ã‚Â°F)	5, 810 - 7, 100 Ohms

- During a gear shift:
  - The output speed and the output speed gradient must be higher than a calibrated value.
- When a gear is engaged:
  - The absolute value of the input speed gradient and pedal position must be lower than their respective calibrated values.

SET CONDITION

- After a calibrated number of failure symptoms are detected, a DTC is stored and the Transmission Control Module (TCM) commands a calibrated default gear. This gear is monitored as well and if a failure is detected for this gear, an alternative default gear is engaged and so on. The selection of alternative default gears follows a calibrated logic. This logic will detect a damaged clutch and to finally select an alternative gear that consists of a combination of clutches in which the damaged clutch is not involved. If a further failure symptom occurs in this final alternative default gear, a failure for general Transmission ratio malfunction is stored.

POSSIBLE CAUSES

Possible Causes
TRANSMISSION - INTERNAL COMPONENTS

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding. Refer to PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE .

DIAGNOSTIC TEST

1. **CHECK FOR AN ACTIVE DIAGNOSTIC TROUBLE CODE (DTC)**
   1. With the scan tool, read Transmission Control Module (TCM) DTCs and record on the repair order.
   2. Record the Event Data and Environmental Data.
   3. With the scan tool, erase DTCs.
   4. Using the recorded Event and Environmental Data, along with the When Monitored and Set Conditions above, operate the vehicle in the conditions that set the DTC.
   5. With the scan tool, read TCM DTCs.

      Did the DTC return?

      Yes

      - Remove the Transmission and perform the appropriate repair for this DTC in accordance with the Service Information. Refer to **REMOVAL** .
      - Perform the TRANSMISSION VERIFICATION TEST. Refer to **TRANSMISSION VERIFICATION TEST** .

      No

      - Go To 2
2. **CHECK WIRING AND CONNECTORS**
   1. The conditions necessary to set the DTC are not present at this time.
   2. Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.
   3. Wiggle the wires while checking for shorted and open circuits.
   4. Check for any Service Bulletins that may apply.

      Were any problems found?

      Yes

      - Repair as necessary.

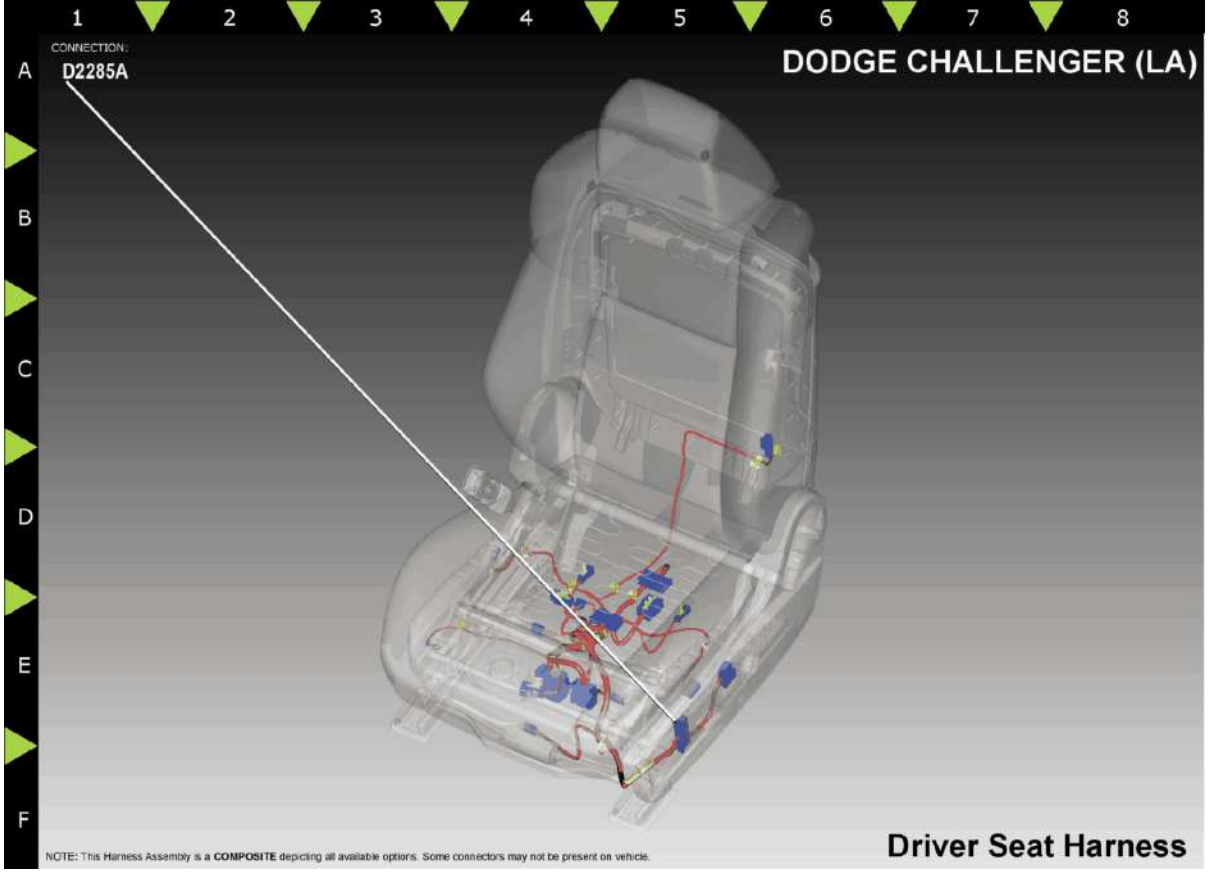


Fig. 8: Switch-Seat-Driver Component Location (Premium)
Courtesy of CHRYSLER

Pin	Circuit	Wire Color	Gauge/Size	Function	Option
1	P599	GN/BG	.5	DRIVER SEAT SWITCH MUX RETURN	N/A
4	P239	GN/WH	.5	DRIVER SEAT SWITCH REAR VERTICAL/HORIZONTAL SWITCH MUX	N/A
10	P9	GN/OG	.5	SEAT SWITCH B(+) SUPPLY	N/A
11	P339	GN/DB	.5	DRIVER SEAT SWITCH FRONT VERTICAL/RECLINER SWITCH MUX	N/A
(1) Pins not listed are not used for this connector					

SWITCH-STEERING WHEEL-LEFT

Harness-Family: Steering_Wheel

Color: WHITE

Gender: FEMALE

Part Number: PNIRP-10V-S

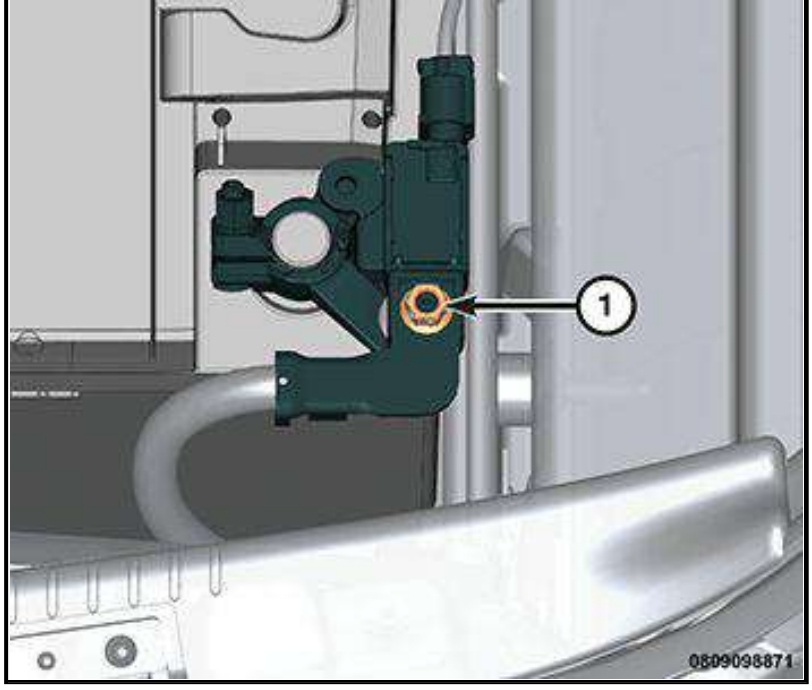
Part Description: Not Available

Connector No: D2577A

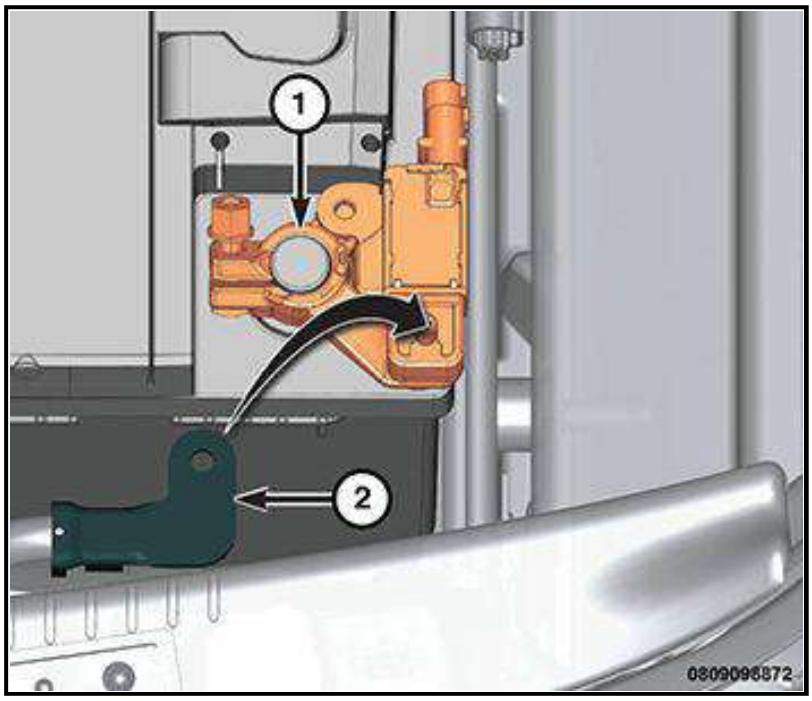
Option: Standard

Repair Kit Part Number: Not Available

Cavity Count: 10



4. Remove the ground terminal M8 hex nut (1).



5. Remove the negative battery cable eyelet (2) from the battery terminal (1).

NOTE: **Never pry the IBS to remove it from the pole clamp. This will damage the IBS and will need to be replaced.**

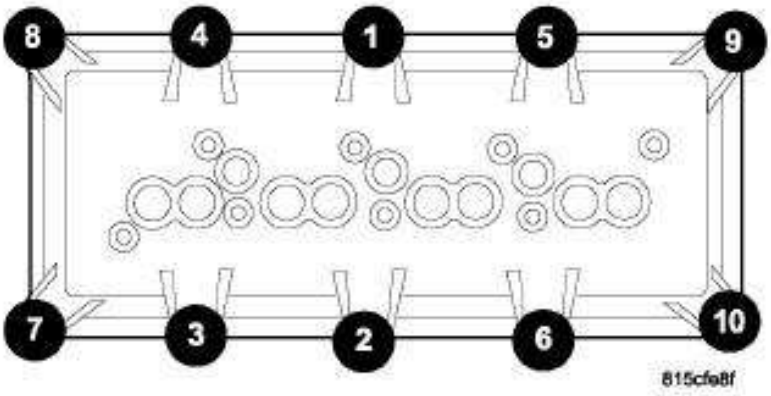
6. Using the appropriate battery terminal puller, remove the battery cable terminal from the negative battery post.

INSTALLATION

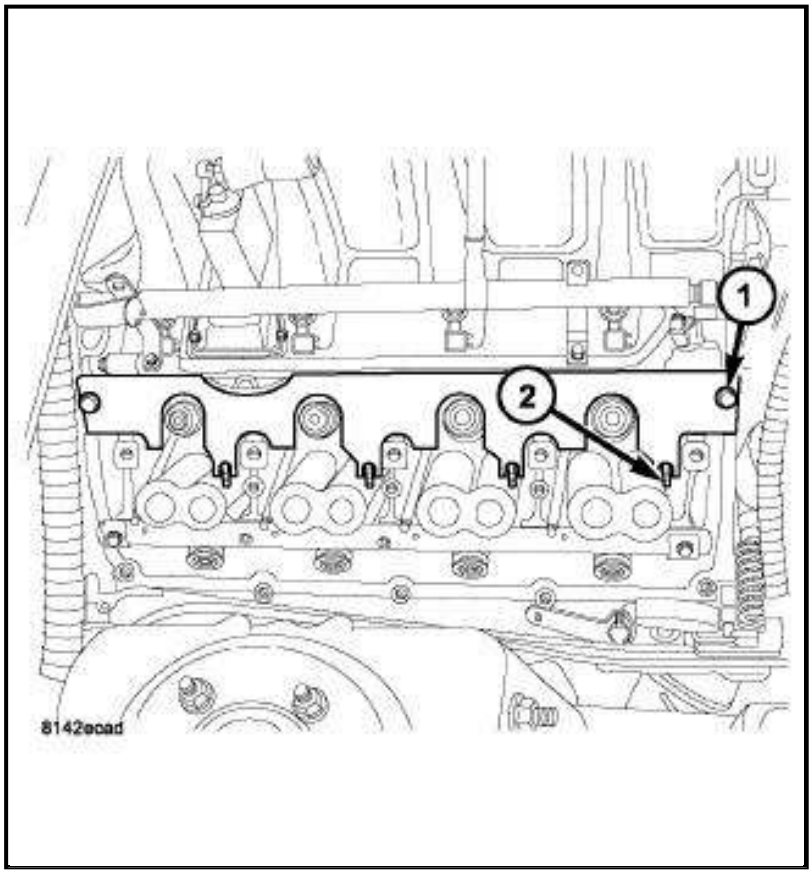
NOTE: **Connecting the negative battery cable to the Intelligent Battery Sensor (IBS) must be done before installing on the battery post.**

NOTE: **DO NOT use a hammer to tap down the sensor. Use a post spreader to open the post if reusing the existing sensor.**

NOTE: **Avoid IBS rotation during tightening of M8 nut as to avoid contact of 2 way connector breakage when rotating in to the battery.**



1. Remove the cylinder head cover. Refer to **COVER(S), CYLINDER HEAD, REMOVAL**.



2. Install Push Rod Retainer (special tool #9070, Retainer, Push Rod) (1).

- Go To 12

No

- Repair the open or short to ground in the ASD Relay Output circuit between the PDC and Coil on Plug harness connector.
- Perform the POWERTRAIN VERIFICATION TEST. Refer to **POWERTRAIN VERIFICATION TEST** .

NOTE: **Stop All Actuations.**

-

12. **IGNITION COIL**

WARNING: **When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts or fan. Do not wear loose clothing. Failure to follow these instructions may result in possible serious or fatal injury.**

1. Using a 12-volt test light connected to a 12 volt source, probe the Coil Control circuit at the Coil on Plug harness connector.
2. Crank the engine for 5.0 seconds while observing the test light.

   What is the condition of the test light while cranking the engine?

   Brightly blinking.

   - Replace the Ignition Coil in accordance with the Service Information.
   - Perform the POWERTRAIN VERIFICATION TEST. Refer to **POWERTRAIN VERIFICATION TEST** .

   ON constantly.

   - Go To 13

   OFF constantly.

   - Go To 14

13. **CHECK THE COIL CONTROL CIRCUIT FOR A SHORT TO GROUND**
    1. Turn the ignition off.
    2. Disconnect the PCM C2 harness connector.
    3. Check for continuity between ground and the Coil Control circuit in the Coil on Plug harness connector.

       Is there continuity between ground and the Coil Control circuit in the Coil?

       Yes

       - Go To 15

       No

       - Repair the Coil Control circuit for a short to ground.
       - Perform the POWERTRAIN VERIFICATION TEST. Refer to **POWERTRAIN VERIFICATION TEST** .
14. **CHECK THE COIL CONTROL CIRCUIT FOR AN OPEN/HIGH RESISTANCE**
    1. Turn the ignition off.
    2. Disconnect the PCM C2 harness connector.
    3. Measure the resistance of the Coil Control circuit between the Coil on Plug harness connector and the PCM C2 harness connector.

Possible Causes
EXHAUST LEAK
O2 SENSOR 1/2 SIGNAL CIRCUIT
O2 SENSOR 1/2 RETURN CIRCUIT
O2 SENSOR 1/2

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding. Refer to PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE .

DIAGNOSTIC TEST

1. **CHECK FOR AN ACTIVE DTC**

   NOTE: Check for contaminants that may have damaged the O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.

   1. Start the engine.
   2. Allow the engine to reach normal operating temperature.
   3. With the scan tool, read DTCs.

      NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

      Is the DTC active or pending?

      Yes

      - Go To 2

      No

      - Perform the INTERMITTENT CONDITION diagnostic procedure. Refer to **INTERMITTENT CONDITION** .

2. **CHECKING THE EXHAUST SYSTEM FOR LEAKS**
   1. Perform the CHECKING THE EXHAUST SYSTEM FOR LEAKS test procedure. Refer to **CHECKING THE EXHAUST SYSTEM FOR LEAKS** .

      Were any exhaust leaks found?

      Yes

      - Perform the appropriate repairs.
      - Perform the POWERTRAIN VERIFICATION TEST. Refer to **POWERTRAIN VERIFICATION TEST** .

      No

      - Go To 3

3. **CHECK THE (K141) O2 SENSOR 1/2 SIGNAL CIRCUIT**
   1. Turn the ignition off
   2. Disconnect the O2 Sensor 1/2 harness connector.
   3. Turn the ignition on.
   4. Measure the voltage between ground and the (K141) O2 Sensor 1/2 Signal circuit in the O2 Sensor 1/2 harness connector.

      Is the voltage between 4.1 and 5.0 volts?

      Yes

WARNING: **When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts or fan. Do not wear loose clothing. Failure to follow these instructions may result in possible serious or fatal injury.**

3. Start the engine.

   Is the voltage below 0.2 volt?

   Yes

   - Go To 7

   No

   - Repair the (K448) ETC Motor (-) for excessive resistance.
   - Perform the POWERTRAIN VERIFICATION TEST. Refer to **POWERTRAIN VERIFICATION TEST** .

7. **THROTTLE BODY**
   1. Turn the ignition off.
   2. Disconnect the C2 PCM harness connector.
   3. Measure the resistance of the ETC Motor by probing the GPEC Adaptor at the (K447) ETC Motor (+) circuit and the (K448) ETC Motor (-) circuit.

      Is the resistance between 2.5 and 25 Ohms at closed throttle?

      Yes

      - Go To 8

      No

      - Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors. Replace the Throttle Body Assembly if no problems were found in the connectors. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function. Refer to **6.4L - THROTTLE BODY, REMOVAL** .
      - Perform the POWERTRAIN VERIFICATION TEST. Refer to **POWERTRAIN VERIFICATION TEST** .
8. **POWERTRAIN CONTROL MODULE (PCM)**
   1. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Throttle Body and the Powertrain Control Module (PCM).
   2. Look for any chafed, pierced, pinched, or partially broken wires.
   3. Look for broken, bent, pushed out or corroded terminals.
   4. Perform any Service Bulletins that may apply.

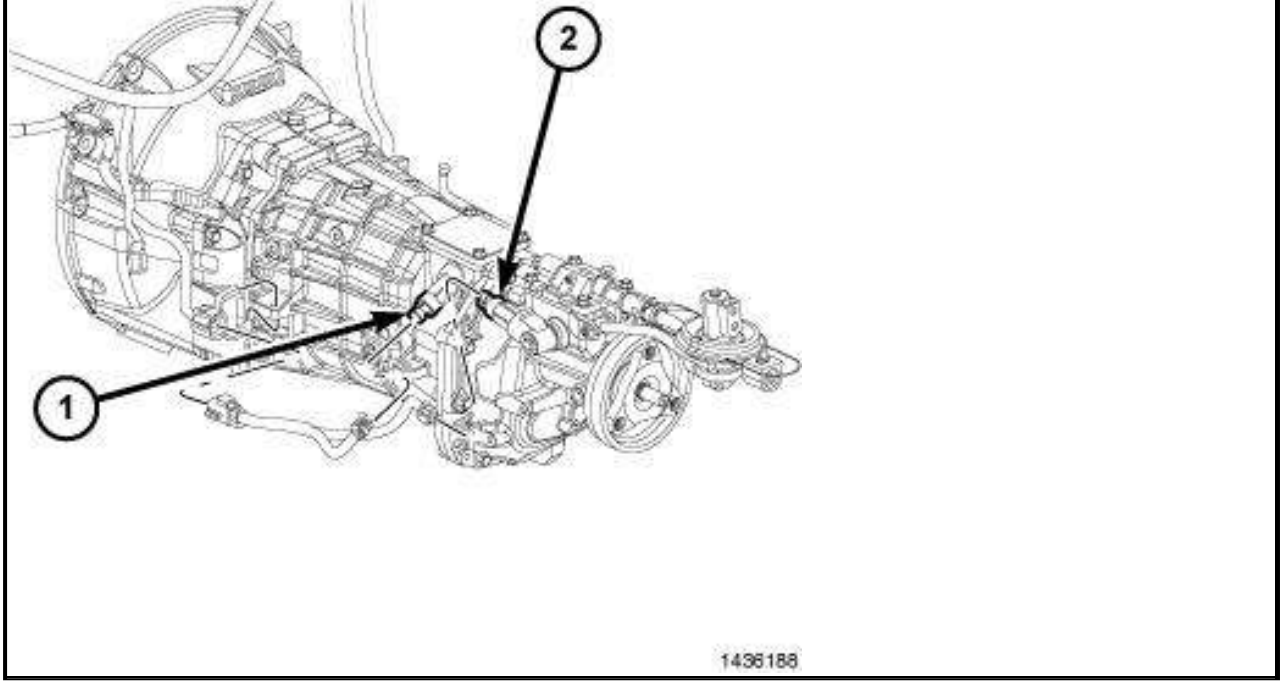
      Were any problems found?

      Yes

      - Repair as necessary.
      - Perform the POWERTRAIN VERIFICATION TEST. Refer to **POWERTRAIN VERIFICATION TEST** .

      No

      - Replace and program the Powertrain Control Module (PCM) in accordance with the Service Information. Refer to **MODULE, POWERTRAIN CONTROL (PCM), REMOVAL** , **MODULE, POWERTRAIN CONTROL (PCM), INSTALLATION** and **MODULE PROGRAMMING** .



The reverse inhibitor solenoid (2) helps the operator to avoid shifting into reverse when the vehicle speed is greater than 3 mph. The solenoid is mounted to the left/rear side of the transmission with a bolt.

OPERATION

If the vehicle speed is less than 3 mph, the PCM sends a ground to energize the solenoid, which provides a low spring load to the shift knob at the reverse gate and allows shifting the transmission into reverse. If the vehicle speed is greater than 3 mph, the solenoid is deactivated, which provides a high spring load to the shift knob at the reverse gate to help prevent shifting the transmission into reverse.
