# AUTOMATIC TRANSMISSION 42RLE - ELECTRICAL DIAGNOSTICS

## TABLE OF CONTENTS

# AUTOMATIC TRANSMISSION 42RLE - ELECTRICAL DIAGNOSTICS

## DIAGNOSIS AND TESTING

## P0122-TPS/APP CIRCUIT LOW

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Continuously with the ignition on and engine running.
- **Set Condition:**
  This DTC will set if the monitored TPS voltage drops below .078 volts for the period of 0.48 seconds.

| Possible Causes |
|---|
| RELATED TPS ENGINE DTCS PRESENT |
| POWERTRAIN CONTROL MODULE |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The powertrain controller receives the throttle position signal from the Throttle Position Sensor (TPS). The controller provides the TPS with a 5 volt pull up and a sensor ground. The signal is checked for being out of range as well as for intermittent operation (excessive signal changes). The engine controller transmits the throttle value onto the Bus. Most engine controllers will calculate the throttle value if the throttle signal is lost. If an error is detected by the transmission controller and the throttle value is available on the Bus, the Bus value will be used, normal operation will continue, and a TPS code will be set. If an error is detected and the throttle value is not available on the Bus, normal operation will be discontinued, a TPS DTC will be set, and the MIL will be turned on after 5 minutes of calculated operation.

## Diagnostic Test

### 1. DETERMINING IF RELATED ENGINE TPS DTCS ARE PRESENT

With the scan tool, check Engine DTCs, including pending DTCs and one trip failures.

**Are there any Engine TPS DTCs present?**

**Yes** >> Refer to the Driveability category and perform the appropriate diagnostic procedure.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 2

### 2. CHECK IF THE DTC IS CURRENT

With the scan tool, record the DTC EVENT DATA to help identify the conditions in which the DTC was set.
With the scan tool, erase Transmission DTCs.

**NOTE: To erase EVENT DATA information, a BATTERY DISCONNECT must be performed. Performing a BATTERY DISCONNECT will reset all learned Transmission values to controller defaults which may lead to erratic shift schedules.**
Drive the vehicle and try to duplicate the conditions in which the DTC was reported by the DTC EVENT DATA.
With the scan tool, read Transmission DTCs.

**Does this DTC reset?**

**Yes** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 3

## 3. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.
Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.
Wiggle the wires while checking for shorted and open circuits.
Pay particular attention to the TPS signal and sensor ground circuits.
With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.
Check for any Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0123-TPS/APP CIRCUIT HIGH

For a complete wiring diagram **Refer to Section 8W**

- **When Monitored:**
  Continuously with the ignition on and engine running.
- **Set Condition:**
  This DTC will set if the monitored TPS voltage rises above 4.94 volts for the period of 0.48 seconds.

| Possible Causes |
|---|
| RELATED TPS ENGINE DTCS PRESENT |
| POWERTRAIN CONTROL MODULE |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The powertrain controller receives the throttle position signal from the Throttle Position Sensor (TPS). The controller provides the TPS with a 5 volt pull up and a sensor ground. The signal is checked for being out of range as well as for intermittent operation (excessive signal changes). The engine controller transmits the throttle value onto the Bus. Most engine controllers will calculate the throttle value if the throttle signal is lost. If an error is detected by the transmission controller and the throttle value is available on the Bus, the Bus value will be used, normal operation will continue, and a TPS code will be set. If an error is detected and the throttle value is not available on the Bus, normal operation will be discontinued, a TPS DTC will be set, and the MIL will be turned on after 5 minutes of calculated operation.

## Diagnostic Test

### 1. DETERMINING IF RELATED ENGINE TPS DTCS ARE PRESENT

With the scan tool, check Engine DTCs, including pending DTCs and one trip failures.

**Are there any Engine TPS DTCs present?**

**Yes** >> Refer to the Driveability category and perform the appropriate diagnostic procedure.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 2

### 2. CHECK TO SEE IF DTC IS CURRENT

With the scan tool, record the DTC EVENT DATA to help identify the conditions in which the DTC was set.
With the scan tool, erase Transmission DTCs.

**NOTE: To erase DTC EVENT DATA information, a BATTERY DISCONNECT must be performed. Performing a BATTERY DISCONNECT will reset all learned Transmission values to controller defaults which may lead to erratic shift schedules.**
Drive the vehicle and try to duplicate the conditions in which the DTC was reported by the DTC EVENT DATA.
With the scan tool, read Transmission DTCs.

**Does this DTC reset?**

**Yes** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 3

## 3. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.
Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.
Wiggle the wires while checking for shorted and open circuits.
Pay particular attention to the TPS signal and sensor ground circuits.
With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.
Check for any Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0124-TPS/APP INTERMITTENT

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Continuously with the ignition on and engine running.
- **Set Condition:**
  This DTC will set if the monitored TPS throttle angle between the angles of 6° and 120° and the degree change is greater than 5° within a period of less than 7.0 ms.

| Possible Causes |
|---|
| RELATED TPS ENGINE DTCS PRESENT |
| THROTTLE POSITION SENSOR |
| POWERTRAIN CONTROL MODULE |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The powertrain controller receives the throttle position signal from the Throttle Position Sensor (TPS). The controller provides the TPS with a 5 volt pull up and a sensor ground. The signal is checked for being out of range as well as for intermittent operation (excessive signal changes). The engine controller transmits the throttle value onto the Bus. Most engine controllers will calculate the throttle value if the throttle signal is lost. If an error is detected by the transmission controller and the throttle value is available on the Bus, the Bus value will be used, normal operation will continue, and a TPS code will be set. If an error is detected and the throttle value is not available on the Bus, normal operation will be discontinued, a TPS DTC will be set, and the MIL will be turned on after 5 minutes of calculated operation.

## Diagnostic Test

### 1. CHECK IF RELATED ENGINE TPS DTCS ARE PRESENT

With the scan tool, check Engine DTCs, including pending DTCs and one trip failures.

**Are there any Engine TPS DTCs present?**

**Yes** >> Refer to the Driveability category and perform the appropriate diagnostic procedure.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 2

### 2. CHECK IF THE DTC IS CURRENT

With the scan tool, record the DTC EVENT DATA to help identify the conditions in which the DTC was set.
With the scan tool, erase Transmission DTCs.

**NOTE: To erase DTC EVENT DATA information, a BATTERY DISCONNECT must be performed. Performing a BATTERY DISCONNECT will reset all learned Transmission values to controller defaults which may lead to erratic shift schedules.**
Drive the vehicle and try to duplicate the conditions in which the DTC was reported by the DTC EVENT DATA.
With the scan tool, read Transmission DTCs.

**Does this DTC reset?**

**Yes** >> Go To 3

**No** >> Go To 4

## 3. CHECK THE THROTTLE POSITION SENSOR OPERATION

Ignition on, engine not running.

With the scan tool, under Transmission Sensors, monitor the TPS voltage in the following step.

Slowly open and close the throttle while checking for erratic voltage changes.

**Did the TPS voltage change smooth and consistent?**

**Yes** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Replace the Throttle Position Sensor per the Service Information.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 4. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

Pay particular attention to the TPS signal and sensor ground circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

**Were there any problems found?**

**Yes** >> Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0218-HIGH TEMPERATURE OPERATION ACTIVATED

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Whenever the engine is running.
- **Set Condition:**
  Immediately when a Overheat shift schedule is activated when the Transmission Oil Temperature reaches 155° C or 240° F.

| Possible Causes |
|---|
| ENGINE COOLING SYSTEM OPERATION |
| TRANSMISSION OIL COOLER PLUGGED |
| HIGH TEMPERATURE OPERATIONS ACTIVATED |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

If the transmission oil temperature rises above 115° C (240° F), the overheat shift schedule is activated refer to Transmission Operation as a function of Transmission Oil Temperature and the code is set. The DTC is an informational code only and is being set to aid the technician in determining root cause of a customer driveability issue. The code is also intended to alert the technician to determine if a cooling system malfunction has occurred or if an additional transmission air to oil cooler should be added to the vehicle if the customer regularly drives in a manner that overheats the transmission. Extended operation above 115° C (240° F) will reduce the durability of the transmission and should be avoided. Correcting the cooling system malfunction or installing an additional transmission oil cooler will improve transmission durability especially for customers who operate in city/construction stop and go traffic, tow trailers regularly, drive aggressively in low gear or drive regularly in mountainous areas.

## Diagnostic Test

### 1. CHECK ENGINE COOLING SYSTEM

Perform Engine Cooling System diagnostics per the Service Information.

**Is the Engine Cooling System functioning properly?**

**Yes** >> Go To 2

**No** >> Repair the cause of the engine overheating. Refer to the Service Information for the related diagnostic or repair procedures.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

### 2. TRANSMISSION OIL COOLER RESTRICTED

Check the Transmission Oil Cooler Flow in accordance with the Service Information.

**Is the transmission oil cooler restricted or plugged?**

**Yes** >> Go To 3

**No** >> Repair the cause of the plugged Transmission Oil Cooler as necessary and repair or replace the Transmission Oil Cooler per the Service Information.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 3. HIGH TEMPERATURE OPERATION

This DTC is an informational DTC designed to aid the Technician in diagnosing shift quality complaints.

This DTC indicates that the transmission has been operating in the ″Overheat″ shift schedule which may generate a customer complaint.

The customer driving patterns may indicate the need for an additional transmission oil cooler.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Check for any Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

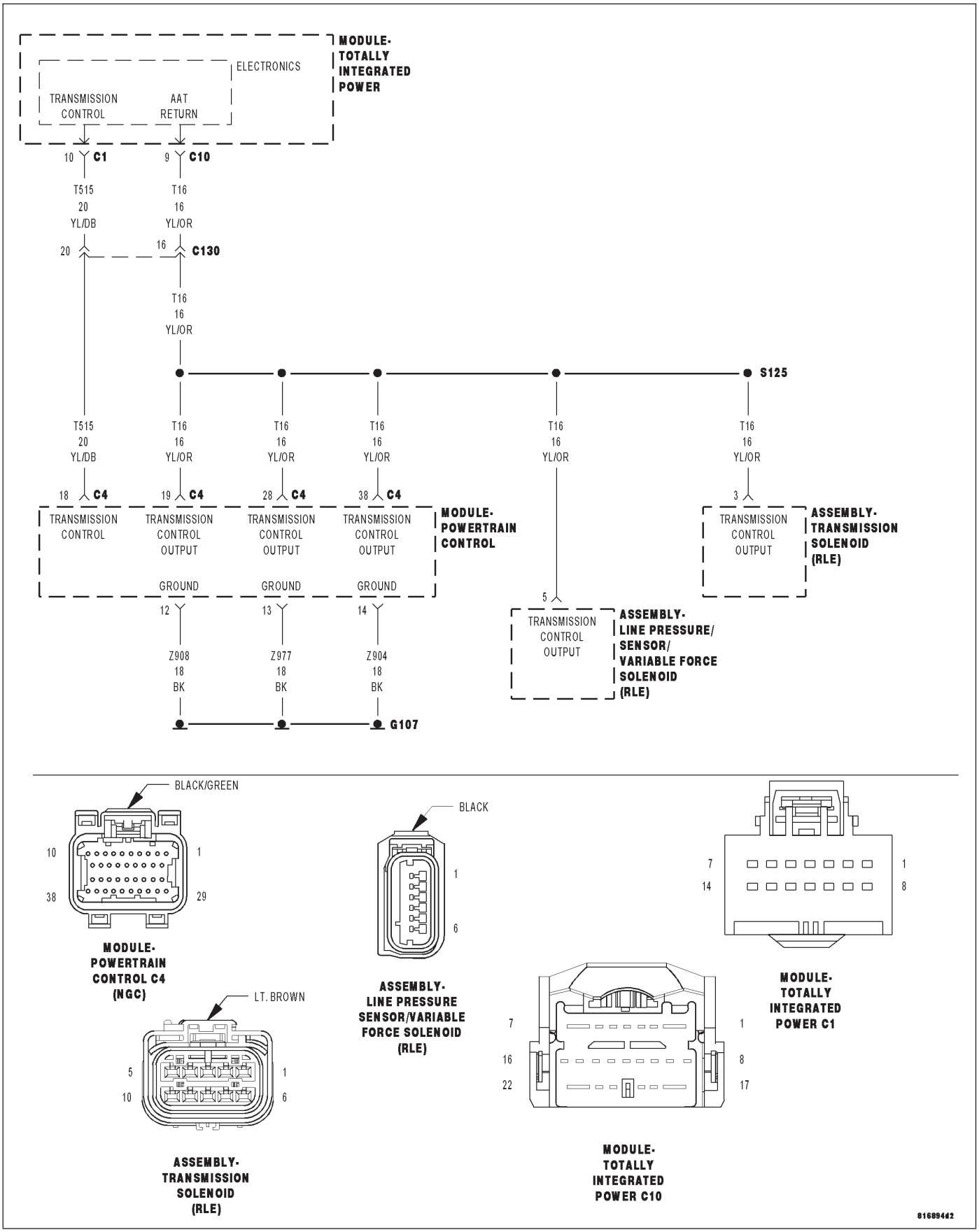
**If there are no possible causes remaining, view repair.**

**Repair**

Repair the cause of transmission overheating per the Service Information.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## P0562-BATTERY VOLTAGE LOW




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  With the engine running and the PCM has closed the Transmission Control Relay.
- **Set Condition:**
  If the battery voltage of the Transmission Control Relay Output Sense circuit(s) to the PCM is less than 10.0 volts for the period of 15 seconds. Note: P0562 generally indicates a gradually falling battery voltage or a resistive connection(s) to the PCM. The DTC will also set if the battery voltage sensed at the PCM is less than 6.5 volts for 200ms or when Transmission Control Relay Output circuits are less than 7.2 volts for 200ms.

| Possible Causes |
|---|
| RELATED CHARGING SYSTEM DTC'S |
| (Z908) OR (Z977) GROUND CIRCUIT OPEN OR HIGH RESISTANCE |
| (A104) FUSED B(+) CIRCUIT OPEN OR HIGH RESISTANCE |
| (T16) TRANSMISSION CONTROL OUTPUT TO TCM OPEN OR HIGH RESISTANCE |
| TOTALLY INTEGRATED POWER MODULE (TIPM) |
| POWERTRAIN CONTROL MODULE |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

Transmission damage may occur if there is insufficient supply voltage to properly control the solenoids. To prevent this possibility, the battery voltage is monitored and the system is placed in logical limp-in if the battery voltage drops below the limit.

## Diagnostic Test

### 1. CHECK FOR RELATED CHARGING SYSTEM DTC'S

With the scan tool, read the Engine DTC's.

**Are there any Charging System related DTCs present?**

**Yes** >> Refer to the Charging System category and repair any Charging System DTCs before proceeding. After repairing the Charging System DTCs, perform the Transmission Verification test to verify the transmission and or controller was not damaged.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 2

### 2. CHECK FOR TIPM DTCS

**NOTE: Generator, battery, and charging system must be fully functional before performing this test.**
With the scan tool, read TIPM DTCs.

**Are there any TIPM TCM Power Control Circuit DTCs present also?**

**Yes** >> Refer to the Transmission category and perform the appropriate symptom.

**No** >> Go To 3

## 3. CONDITION P0562 PRESENT

With the scan tool, read Transmission DTCs.

With the scan tool, Check the STARTS SINCE SET counter for P0562.

**NOTE: This counter only applies to the last DTC set.**

**Is the STARTS SINCE SET counter set at 0?**

**Yes** >> Go To 4

**No** >> Go To 6

## 4. CHECK THE (Z908) AND (Z977) GROUND CIRCUITS FOR AN OPEN

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

**NOTE: Check connectors - Clean/repair as necessary.**

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Using a 12-volt test light connected to 12-volts, check the (Z908) and (Z977) Ground circuits in the appropriate terminals of Miller tool #8815.

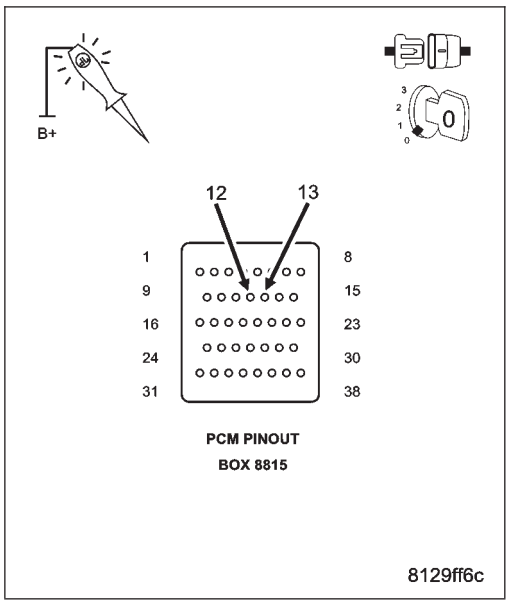
**NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.**

**Does the test light illuminate brightly for all the Ground circuits?**

**Yes** >> Go To 5

**No** >> Repair the (Z908) and/or (Z977) Ground circuit for an open circuit or high resistance.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)



## 5. CHECK THE (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT FOR AN OPEN

Turn the ignition off to the lock position.

Disconnect the Transmission Solenoid/pressure Switch Assembly harness connector.

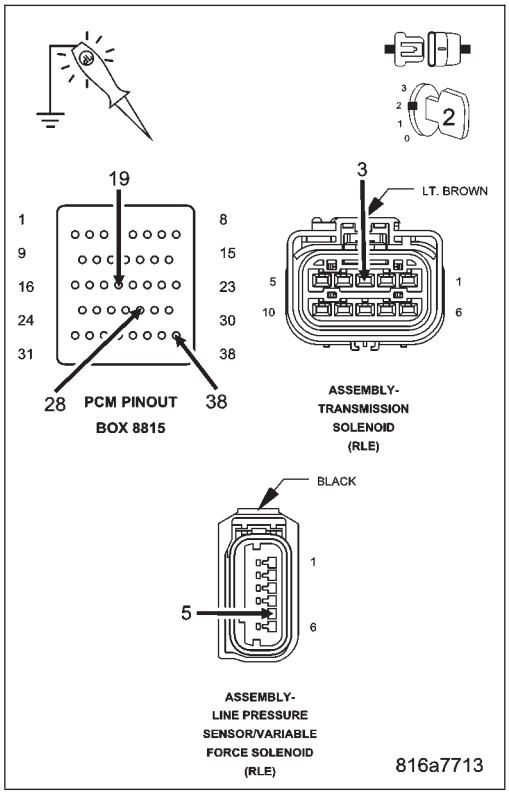
Disconnect the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector (if equipped).

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Using a 12-volt test light connected to ground, check all (T16) Transmission Control Output circuits.

**NOTE: The (T16) Transmission Control Output circuit branches off to both Transmission Solenoid/Pressure Switch Assembly, PCM and (if equipped) the Line Pressure Sensor/Variable Force Solenoid Assembly.**




**Does the test light illuminate brightly while cycling on and off on all (T16) Transmission Control Output circuits?**

**Yes** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Repair the (T16) Transmission Control Relay Output circuit(s) for an open or high resistance.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wiring and connectors while checking for shorts and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

**Were there any problems found?**

**Yes** >> Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0602-CONTROL MODULE PROGRAMMING ERROR/NOT PROGRAMMED

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Check for generic software is made at power-up.
- **Set Condition:**
  If generic software is found, the MIL will light immediately. This DTC is designed to signal the technician that the controller still has generic software installed.

| Possible Causes |
|---|
| PCM - PROGRAMMING ERROR |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The controller is programmed during manufacturing with generic software to facilitate testing. This software does not have the proper calibrations to control a transmission in a vehicle. The check for generic software is made at power-up. If generic software is found, the MIL will light immediately and the MIL will stay on even if the fault is cleared, until the proper software is installed. Note: Transmission will be placed in limp-in mode.

## Diagnostic Test

### 1. CONTROL MODULE PROGRAMMING ERROR

**NOTE: Controller is programmed with generic software and will not allow the correct vehicle Powertrain management.**

Record the controller part number.

Update the controller with the correct software in accordance with the Service Information.

**Verify that the controller updated successfully.**

**Test Complete**

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## P0604-INTERNAL CONTROL MODULE RAM

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  One time after the ignition key is turned to the run position.
- **Set Condition:**
  The read value does not match the written value in any RAM location.

| Possible Causes |
| --- |
| PCM - INTERNAL ERROR |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

After the controller is reset, the microprocessor checks the integrity of each RAM location by writing to it and reading back from it. The read value should be the same as the written value. MIL on after 10 seconds of vehicle operation and transmission will be placed in limp-in.

## Diagnostic Test

### 1. PCM - INTERNAL ERROR

**If there are no possible causes remaining, view repair.**

**Repair**

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## P0605-INTERNAL CONTROL MODULE ROM

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  One time after the ignition key is turned to the run position.
- **Set Condition:**
  If the ROM checksum does not match a known constant.

| Possible Causes |
| --- |
| PCM - INTERNAL ERROR |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

After the controller is reset, the microprocessor checks the integrity of the program memory (ROM). A checksum is calculated by adding all used bytes in the program memory. The sum should be the same as a known constant stored in memory. MIL on after 10 seconds of vehicle operation and transmission will be placed in limp-in.

## Diagnostic Test

### 1. PCM - INTERNAL ERROR

Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits.

**If there are no possible causes remaining, view repair.**

**Repair**

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## P0613-INTERNAL TRANSMISSION PROCESSOR

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  After the ignition key is turned to the run position and 60 seconds thereafter.
- **Set Condition:**
  Either of the following conditions occur 3 times in less than 590 milliseconds: The watchdog line remains high after the watchdog test or the transmission relay coil is energized and remains on after the watchdog delay expires.

| Possible Causes |
|---|
| PCM - INTERNAL ERROR |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The internal watchdog is a separate hardware circuit which continuously monitors the microprocessor. To make sure the transmission is operating properly, the watchdog must receive a signal from the microprocessor within a specific time window. MIL on after 10 seconds of vehicle operation and transmission will be placed in limp-in.

## Diagnostic Test

### 1. PCM - INTERNAL ERROR

Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits.

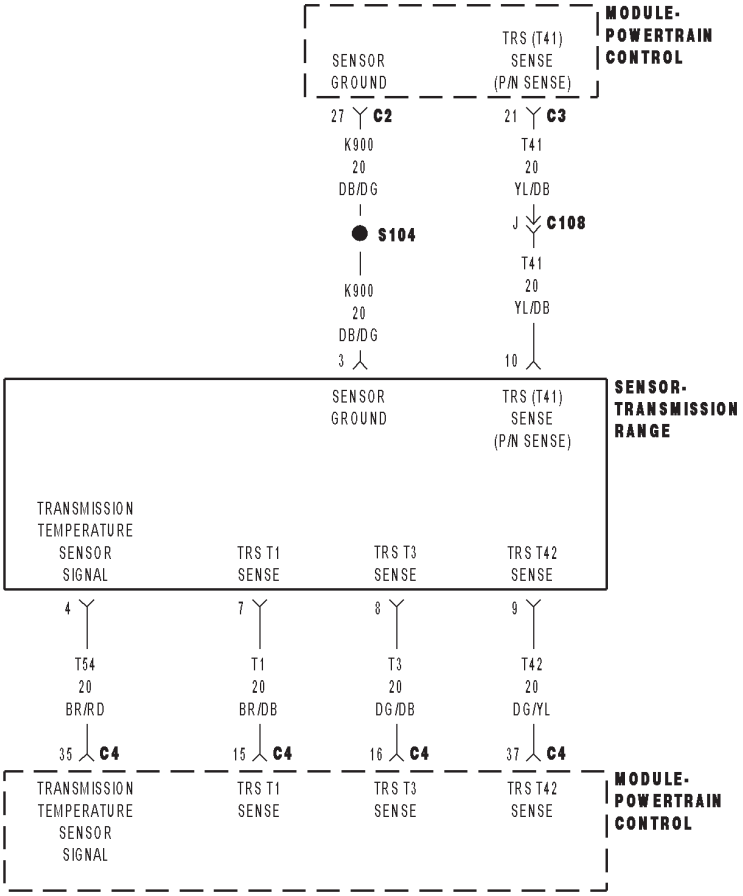
**If there are no possible causes remaining, view repair.**

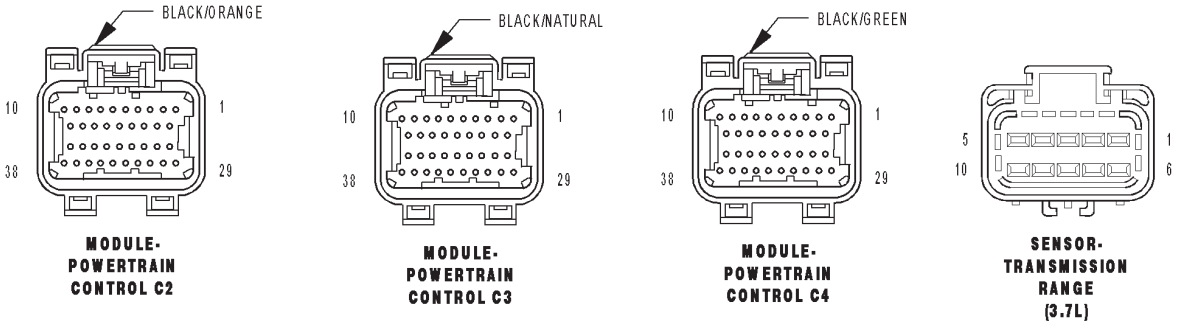
**Repair**

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## P0706-TRANSMISSION RANGE SENSOR RATIONALITY




814AE826

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Continuously with the ignition on.
- **Set Condition:**
  The DTC will set if the controller detects an invalid PRNDL code which lasts for more than 0.042 seconds.

| Possible Causes |
|---|
| SHIFTER OUT OF ADJUSTMENT |
| TRS SENSE CIRCUIT OPEN |
| TRS SENSE CIRCUIT SHORT TO GROUND |
| TRS SENSE CIRCUIT SHORT TO VOLTAGE |
| METAL DEBRIS IN OIL PAN |
| TRANSMISSION RANGE SENSOR |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The C1 through C4 (T1, T3, T41, and T42) sense circuits communicate the shift lever position to the PCM. Each circuit is terminated at the transmission with a switch. Each switch can be either open or closed, depending on the shift lever position. The PCM can decode this information and determine the shift lever position. Each shift lever position has a certain combination of switches, which will be open and closed, this is called a PRNDL code. There are 4 switches, therefore: there are many possible combinations of open and closed switches (codes). However, there are only 9 valid codes (8 for AutoStick), one for each gear position and three recognized between gear codes. The remainder of the codes should never occur, these are called invalid codes. The following chart shows the normal switch states for each shift lever position.

**TRS SWITCH STATES**

| SLP | T42 | T41 | T3 | T1 |
|---|---|---|---|---|
| **P** | CLOSED | CLOSED | CLOSED | OPEN |
| **R** | CLOSED | OPEN | OPEN | OPEN |
| **N** | CLOSED | CLOSED | OPEN | CLOSED |
| **OD** | OPEN | OPEN | OPEN | CLOSED |
| **3** | OPEN | OPEN | CLOSED | OPEN |
| **L** | CLOSED | OPEN | CLOSED | CLOSED |

## Diagnostic Test

### 1. CHECK TO SEE IF P0706 DTC IS CURRENT

With the scan tool, perform the Shift Lever Position Test.

**Select the test outcome from the following:**

**Test passes:**
Go To 6

**Test fails with Error Code:**
Go To 2

**Test fails without Error Code:**
Perform the Gearshift Adjustment Procedure per the Service Information.
Perform the PRNDL Fault Clearing Procedure – Go To 7

## 2. CHECK THE TRANSMISSION SOLENOID/TRS ASSEMBLY

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the scan tool, perform the Shift Lever Position Test.

When the scan tool instructs you to put the Gear Selector in a particular position, you must do so using the selector switch on the Transmission Simulator.

The LED for the gear position in question must be illuminated on the Transmission Simulator prior to pressing ″ENTER″ on the scan tool.

**NOTE: When the scan tool requests the O/D off button be depressed, you must use the O/D OFF button in the vehicle or you will fail the Shift Lever Position Test with an error code 11 or OD-TOW/HALL STUCK OPEN.**

**NOTE: If the Shift Lever Position test fails, make sure to note the identification of the TRS Sense circuit for future reference.**

**Did the Shift Lever Position test pass?**

**Yes** >> Remove the Oil Pan and Main Valve Body Assembly per the Service Information. Check for metal debris on top of the TRS Assembly. If debris is present, determine the cause of the debris and repair the transmission as necessary. If no problems are found, replace the Transmission TRS Assembly per the Service Information.
Perform the PRNDL Fault Clearing Procedure – Go To 7

**No** >> Go To 3

## 3. TRS SENSE CIRCUIT OPEN

Turn the ignition off to the lock position.

Disconnect the Transmission Simulator, Miller tool #8333.

Disconnect the PCM harness connectors and install Miller tool #8815.

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Measure the resistance of the identified (T1, T3, T41, or T42) TRS Sense circuit, from the Transmission Solenoid/ TRS Assembly harness connector to the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the identified (T1, T3, T41, or T42) TRS Sense circuit for an open.
Perform the PRNDL Fault Clearing Procedure – Go To 7

**No** >> Go To 4

## 4. TRS SENSE CIRCUIT SHORT TO GROUND

Measure the resistance between ground and the identified (T1, T3, T41, or T42) TRS Sense circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the identified (T1, T3, T41, or T42) TRS Sense circuit for a short to ground.
Perform the PRNDL Fault Clearing Procedure – Go To 7

**No** >> Go To 5

## 5. TRS SENSE CIRCUIT SHORT TO OTHER CIRCUITS

Measure the resistance between the identified (T1, T3, T41, or T42) TRS Sense circuit and all other circuits in the Transmission Solenoid/TRS Assembly harness connector.

**Is the resistance below 100k ohms between the identified (T1, T3, T41, or T42) TRS Sense circuit and any other circuit(s) in the Transmission Solenoid/TRS Assembly harness connector?**

**Yes** >> Repair the identified (T1, T3, T41, or T42) TRS Sense circuit for a short to other circuit(s).
Perform the PRNDL Fault Clearing Procedure – Go To 7

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.
Perform the PRNDL Fault Clearing Procedure – Go To 7

## 6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wiring and connectors while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform the PRNDL Fault Clearing Procedure – Go To 7

**No** >> Test Complete.

## 7. PRNDL FAULT CLEARING PROCEDURE

With the scan tool, erase Transmission DTCs.

Cycle the ignition off, then start the vehicle.

Firmly apply the brakes and shift into Overdrive.

**NOTE: Vehicle must remain in Overdrive for at least 3.0 seconds.**
With the brakes firmly applied, shift slowly through all gears (PRNDL) as least three times, pausing momentarily in each gear.

**NOTE: If all the PRNDL lights box individually then the error was cleared.**
Shift into park and turn the ignition off to the lock position.

Ignition on, engine not running.

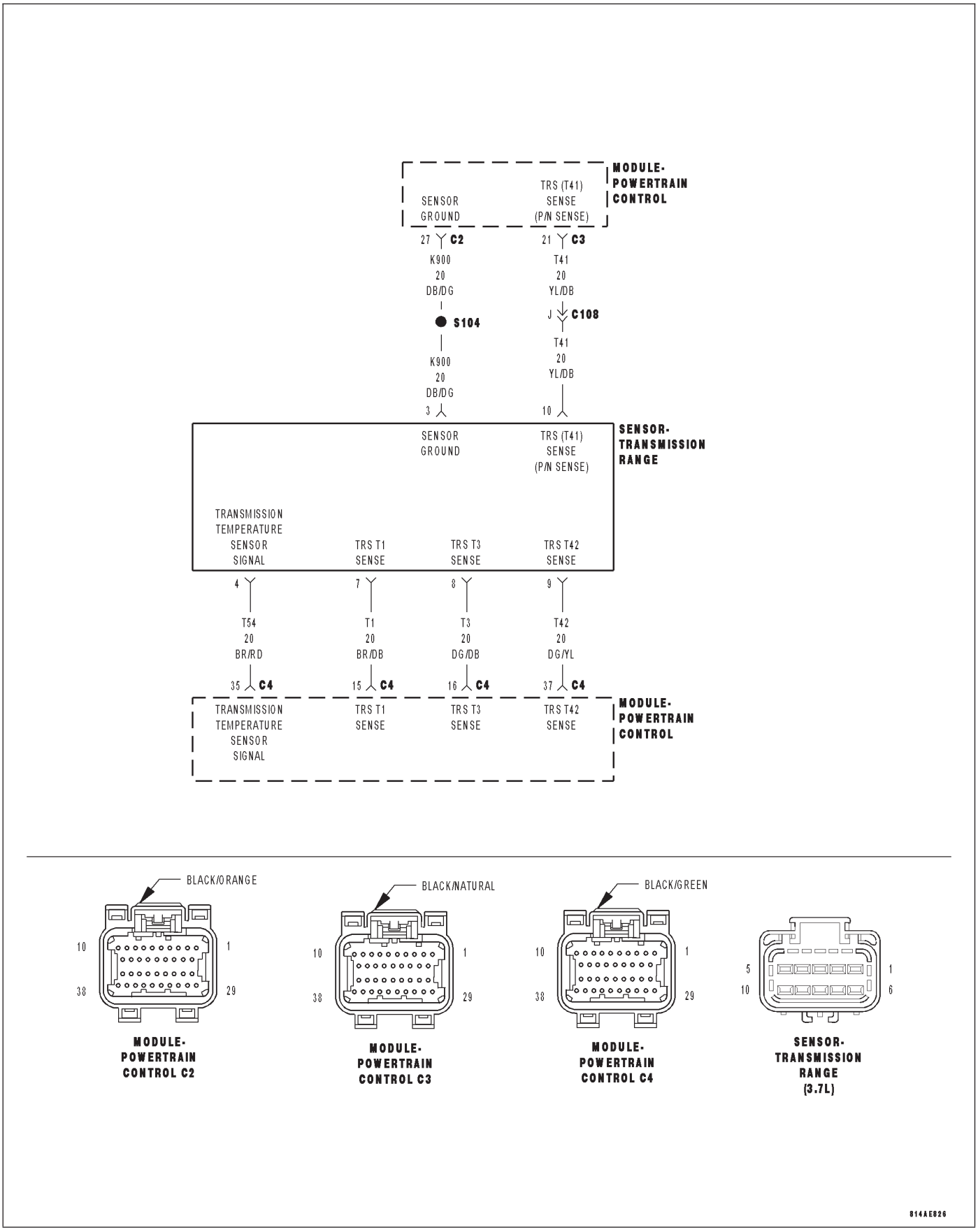
With the scan tool, read Transmission DTCs.

**Does the DTC P0706 reset, or do all the PRNDL indicators remain boxed in park or neutral?**

**Yes** >> Return to the symptom list and perform diagnostics for P0706-TRANSMISSION RANGE SENSOR RATIONALITY.
Go To 1

**No** >> Test Complete.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## P0711-TRANSMISSION TEMPERATURE SENSOR PERFORMANCE




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Continuously with the ignition on and engine running.
- **Set Condition:**
  DTC will set when the transmission temperature does not reach a normal operating temperature within a given time frame. Time is variable due to ambient temperature. Approximate DTC set time is 10 to 35 minutes. The following are starting temperature to warm up times to set this DTC: starting temperature -40° C (-40° F) warm up time 35 minutes, starting temperature -28° C ( -20° F) 25 minutes, starting temperature -6.6° C (20° F) 20 minutes, starting temperature 15.5 ° C (60° F) 10 minutes. When the fault is set, calculated temperature is substituted for measured temperature, however the DTC is stored only after three consecutive occurrences.

| Possible Causes |
|---|
| RELATED TRANSMISSION TEMPERATURE DTC'S PRESENT |
| TRANSMISSION TEMPERATURE SENSOR |
| POWERTRAIN CONTROL MODULE |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The temperature sensor is used to sense the temperature of the transmission fluid. Transmission fluid temperature can affect shift quality, torque converter operation and when or if some diagnostics are run. A failed temperature sensor could affect the OBD diagnostics. If a problem occurs in the transmission temperature sensor circuit, transmission temperature will be based on a calculated value.

## Diagnostic Test

### 1. DETERMINE IF RELATED TRANSMISSION TEMPERATURE DTCS ARE PRESENT

With the scan tool, check Transmission DTCs.

**Are there any other Transmission Temperature Sensor related DTCs present?**

**Yes** >> Refer to the Transmission category and perform the appropriate diagnostic procedure.

**No** >> Go To 2

### 2. CHECK TO SEE IF DTC IS ACTIVE

With the scan tool, view DTCs.

**Is the status Active for this DTC or is the STARTS SINCE SET counter 2 or less?**

**Yes** >> Go To 3

**No** >> Go To 4

### 3. PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Input/Output switch to OFF.

With the scan tool, monitor the TRANS TEMP VOLTS while turning the Thermistor Voltage switch to all three positions on the Transmission Simulator.

Compare the scan tool readings with the numbers listed on the Transmission Simulator.

**Do the readings on the Transmission Simulator match the scan tool readings ± 0.2 volts?**

**Yes** >> Replace Transmission Solenoid/TRS Assembly per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for any Service Bulletins and S.T.A.R. ON-LINE for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 4. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

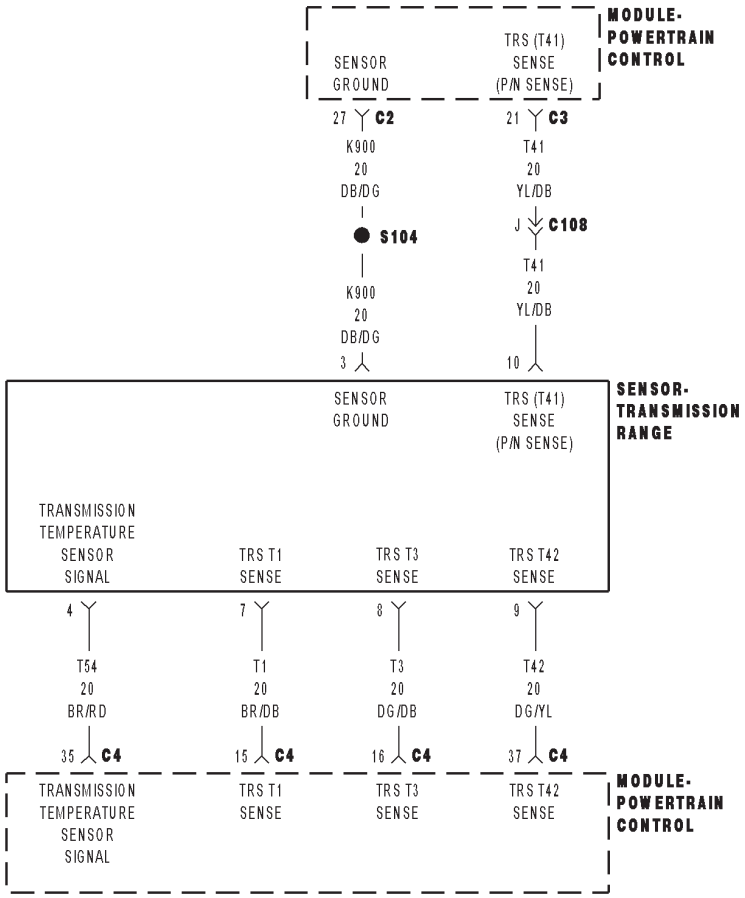
With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

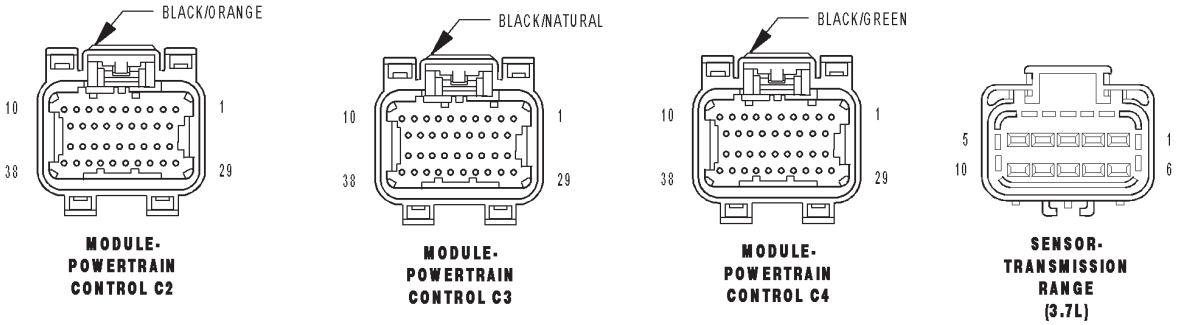
**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0712-TRANSMISSION TEMPERATURE SENSOR LOW

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For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Continuously with the ignition on and engine running.
- **Set Condition:**
  The DTC will set when the monitored Temperature Sensor voltage drops below 0.078 volts for the period of 1.45 seconds. When the fault is set, calculated temperature is substituted for measured temperature, however the fault code is stored only after three consecutive occurrences of the fault.

| Possible Causes |
|---|
| RELATED DTCS PRESENT |
| (T54) TRANSMISSION TEMPERATURE SENSOR SIGNAL CIRCUIT SHORT TO GROUND |
| TRANSMISSION TEMPERATURE SENSOR |
| POWERTRAIN CONTROL MODULE |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The temperature sensor is used to sense the temperature of the transmission fluid. Transmission fluid temperature can affect shift quality, torque converter operation and when or if some diagnostics are run. A failed temperature sensor could affect the OBD diagnostics. If a problem occurs in the transmission temperature sensor circuit, transmission temperature will be based on a calculated value.

## Diagnostic Test

### 1. DETERMINE IF RELATED DTCS ARE PRESENT

With the scan tool, check Transmission DTCs.

**Are there any Speed Sensor DTCs present?**

**Yes** >> Refer to the Transmission category and perform the appropriate diagnostic procedure.

**No** >> Go To 2

### 2. CHECK TO SEE IF DTC IS ACTIVE

With the scan tool, view DTCs.

**Is the status Active for this DTC or is the STARTS SINCE SET counter 2 or less?**

**Yes** >> Go To 3

**No** >> Go To 5

### 3. CHECK THE PCM AND WIRING WITH THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Input/Output switch to OFF.

With the scan tool, monitor the TRANS TEMP VOLTS while turning the Thermistor Voltage switch to all three positions on the Transmission Simulator.

Compare the scan tool readings with the numbers listed on the Transmission Simulator.

**Do the readings on the Transmission Simulator match the scan tool readings ± 0.2 volts?**

**Yes** >> Replace Transmission Solenoid Assembly per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 4

## 4. CHECK THE (T54) TRANSMISSION TEMPERATURE SENSOR SIGNAL CIRCUIT FOR A SHORT TO GROUND

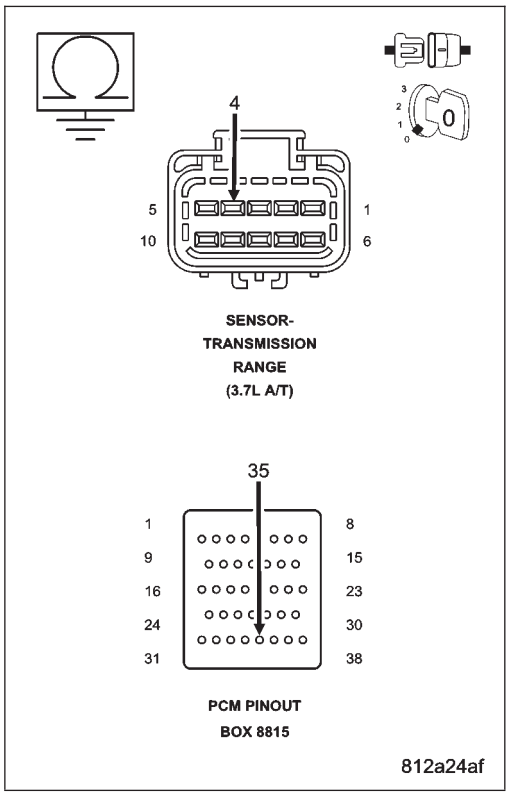
Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the TRS harness connector.

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Measure the resistance between ground and the (T54) Transmission Temperature Sensor Signal circuit.




**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (T54) Transmission Temperature Sensor Signal circuit for a short to ground.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

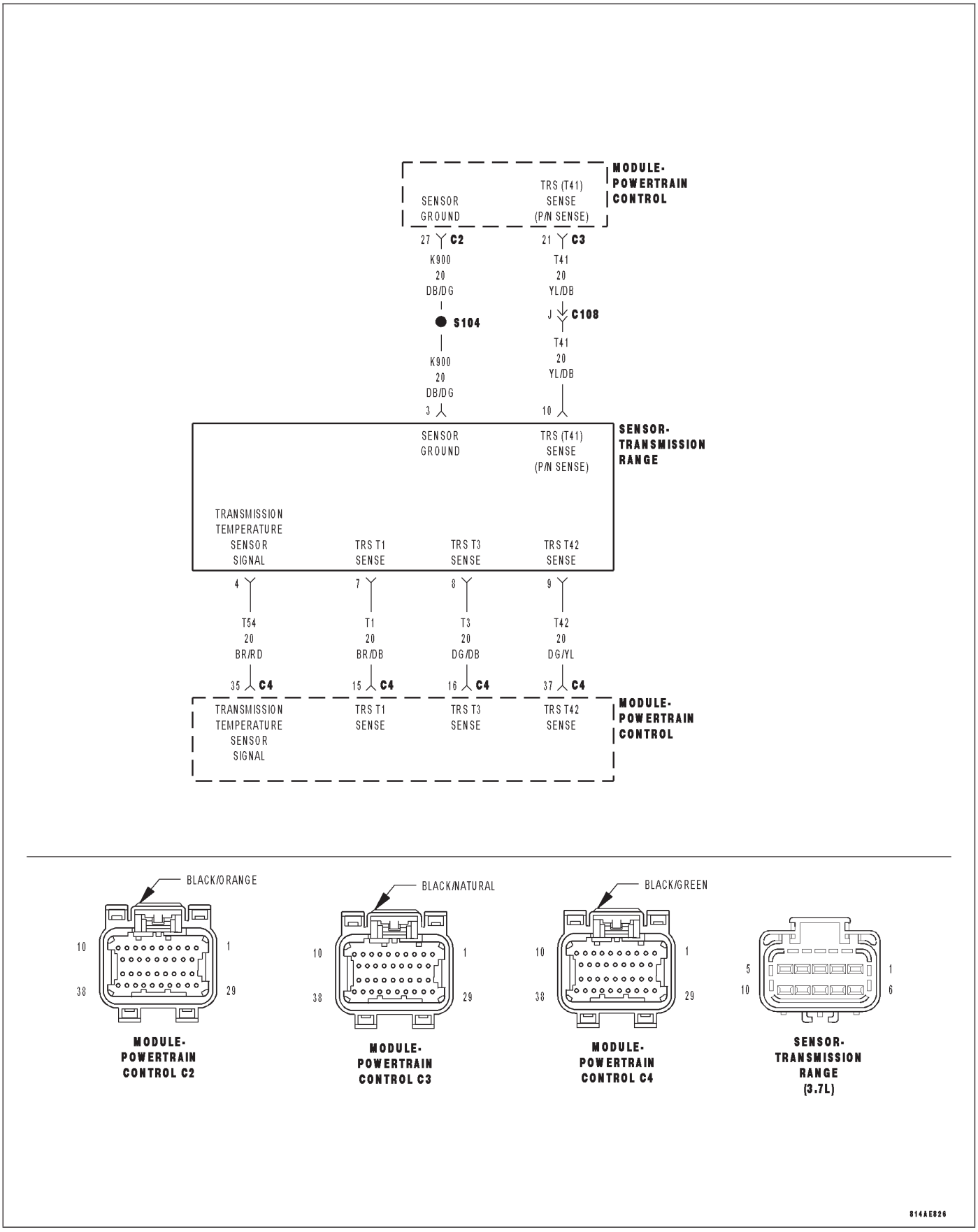
Check for any Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0713-TRANSMISSION TEMPERATURE SENSOR HIGH




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Continuously with the ignition on and engine running.
- **Set Condition:**
  The DTC will set when the monitored Temperature Sensor voltage rises above 4.94 volts for the period of 1.45 seconds. When the fault is set, calculated temperature is substituted for measured temperature, however the fault code is stored only after three consecutive occurrences of the fault.

| Possible Causes |
|---|
| (K900) SENSOR GROUND OPEN |
| (T54) TRANSMISSION TEMPERATURE SENSOR SIGNAL CIRCUIT OPEN |
| (T54) TRANSMISSION TEMPERATURE SENSOR SIGNAL CIRCUIT SHORT TO VOLTAGE |
| TRANSMISSION TEMPERATURE SENSOR |
| POWERTRAIN CONTROL MODULE |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The temperature sensor is used to sense the temperature of the transmission fluid. Transmission fluid temperature can affect shift quality, torque converter operation and when or if some diagnostics are run. A failed temperature sensor could affect the OBD diagnostics. If a problem occurs in the transmission temperature sensor circuit, transmission temperature will be based on a calculated value.

### 1. CHECK TO SEE IF DTC IS CURRENT

With the scan tool, view DTCs.

**Is the status Active for this DTC or is STARTS SINCE SET counter 2 or less?**

**Yes** >> Go To 2

**No** >> Go To 6

### 2. CHECK THE PCM AND WIRING WITH THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A.

Ignition on, engine not running.

With the Transmission Simulator, turn the Input/Output switch to OFF.

With the scan tool, monitor the TRANS TEMP VOLTS while turning the Thermistor Voltage switch to all three positions on the Transmission Simulator.

Compare the scan tool readings with the numbers listed on the Transmission Simulator.

**Do the readings on the Transmission Simulator match the scan tool readings ± 0.2 volts?**

**Yes** >> Replace Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 3

## 3. CHECK THE (T54) TRANSMISSION TEMPERATURE SENSOR SIGNAL CIRCUIT FOR AN OPEN

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the TRS harness connector

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

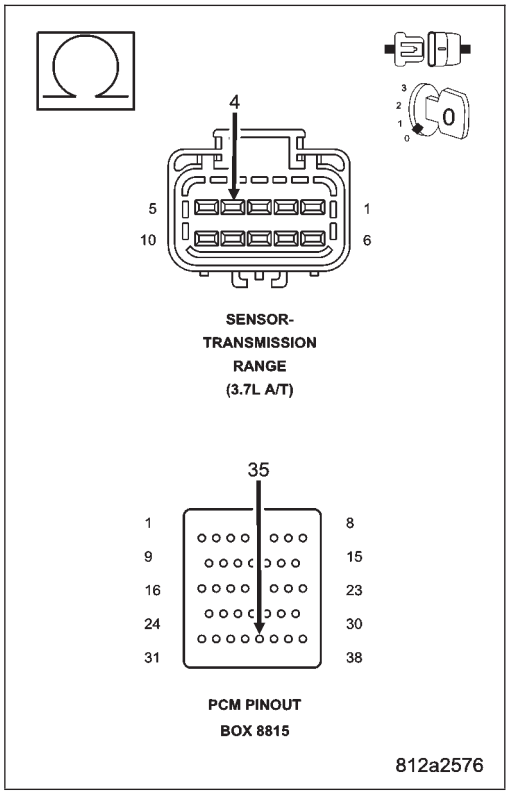
Measure the resistance of the Transmission Temperature Sensor Signal circuit between the TRS harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the Transmission Temperature Sensor Signal circuit for an open.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 4




## 4. CHECK THE (K900) SENSOR GROUND CIRCUIT FOR AN OPEN

Disconnect the PCM C2 harness connector.

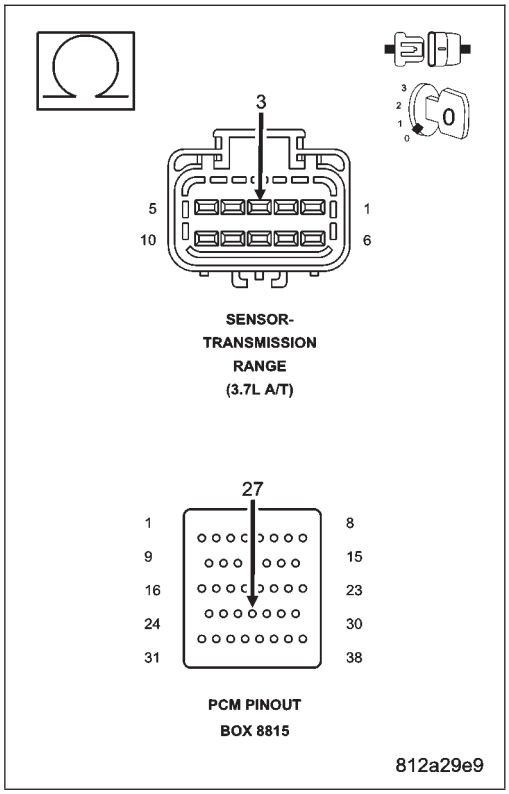
Measure the resistance of the (K900) Sensor Ground circuit between the TRS harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (K900) Sensor Ground circuit for an open.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 5

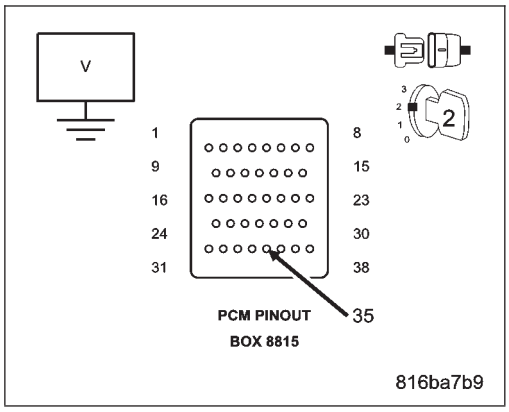


## 5. CHECK THE (T54) TRANSMISSION TEMPERATURE SENSOR SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T54) Transmission Temperature Sensor Signal circuit in the appropriate terminal of Miller tool #8815.




**Is the voltage above 0.5 volts?**

**Yes** >> Repair the (T54) Transmission Temperature Sensor Signal circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Check for any Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

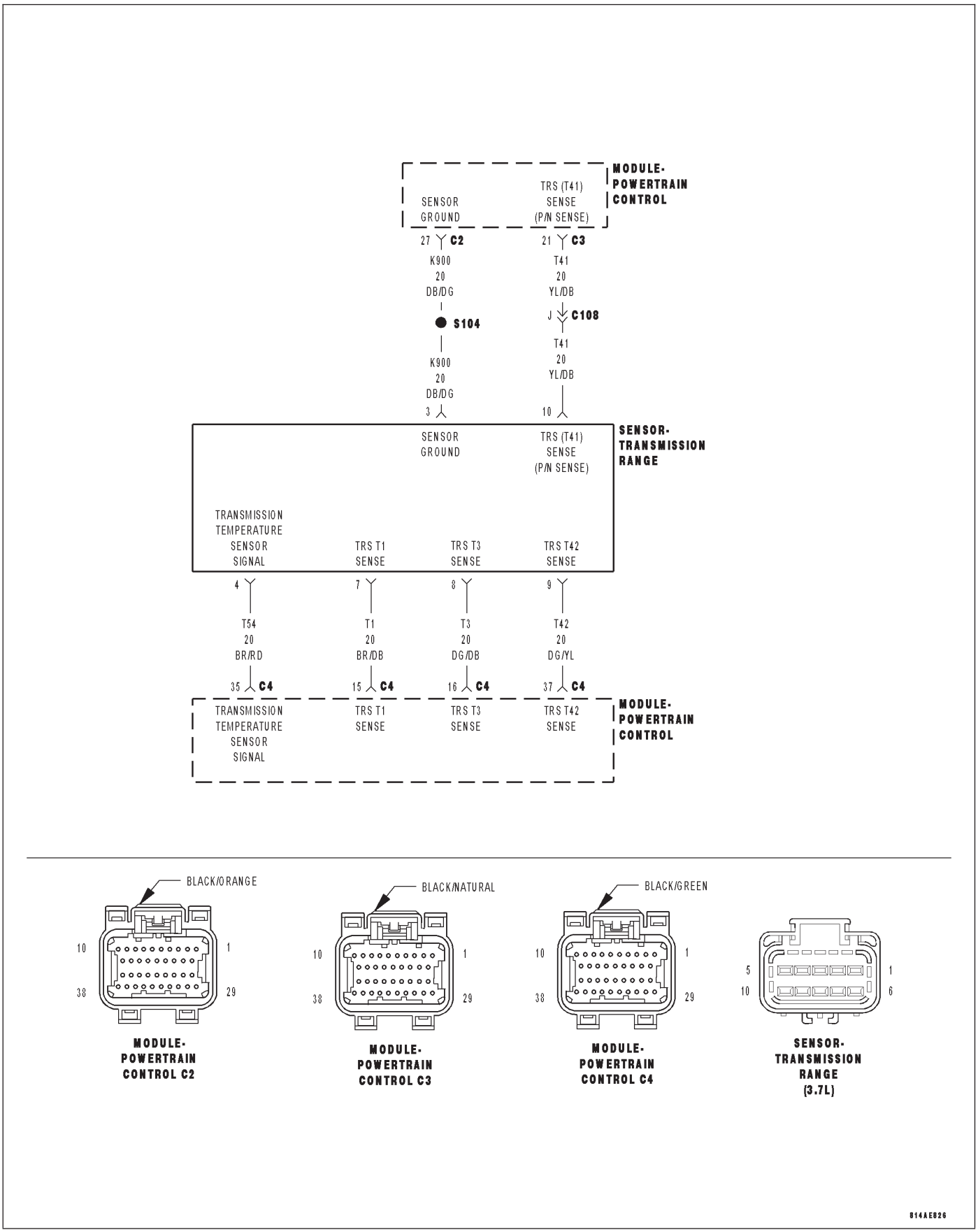
**Were there any problems found?**

**Yes** >> Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0714-TRANSMISSION TEMPERATURE SENSOR INTERMITTENT




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Continuously with the ignition on and engine running.
- **Set Condition:**
  The DTC will set when the monitored Temperature Sensor voltage fluctuates or changes abruptly within a predetermined period of time.

| Possible Causes |
|---|
| TRANSMISSION TEMPERATURE SENSOR |
| POWERTRAIN CONTROL MODULE |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The temperature sensor is used to sense the temperature of the transmission fluid. Transmission fluid temperature can affect shift quality, torque converter operation and when or if some diagnostics are run. A failed temperature sensor could affect the OBD diagnostics. If a problem occurs in the transmission temperature sensor circuit, transmission temperature will be based on a calculated value.

### 1. CHECK TO SEE IF DTC IS CURRENT

With the scan tool, view DTCs.

**Is the status Active for this DTC or is the STARTS SINCE SET counter 2 or less?**

**Yes** >> Go To 2

**No** >> Go To 3

### 2. CHECK THE PCM AND WIRING WITH THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Input/Output switch to OFF.

With the scan tool , monitor the TRANS TEMP VOLTS while turning the Thermistor Voltage switch to all three positions on the Transmission Simulator.

Compare the scan tool readings with the numbers listed on the Transmission Simulator.

**Do the readings on the Transmission Simulator match a non-fluctuating scan tool reading ± 0.2 volts?**

**Yes** >> Replace Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for any Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 3. INTERMITTENT WIRING AND CONNECTORS

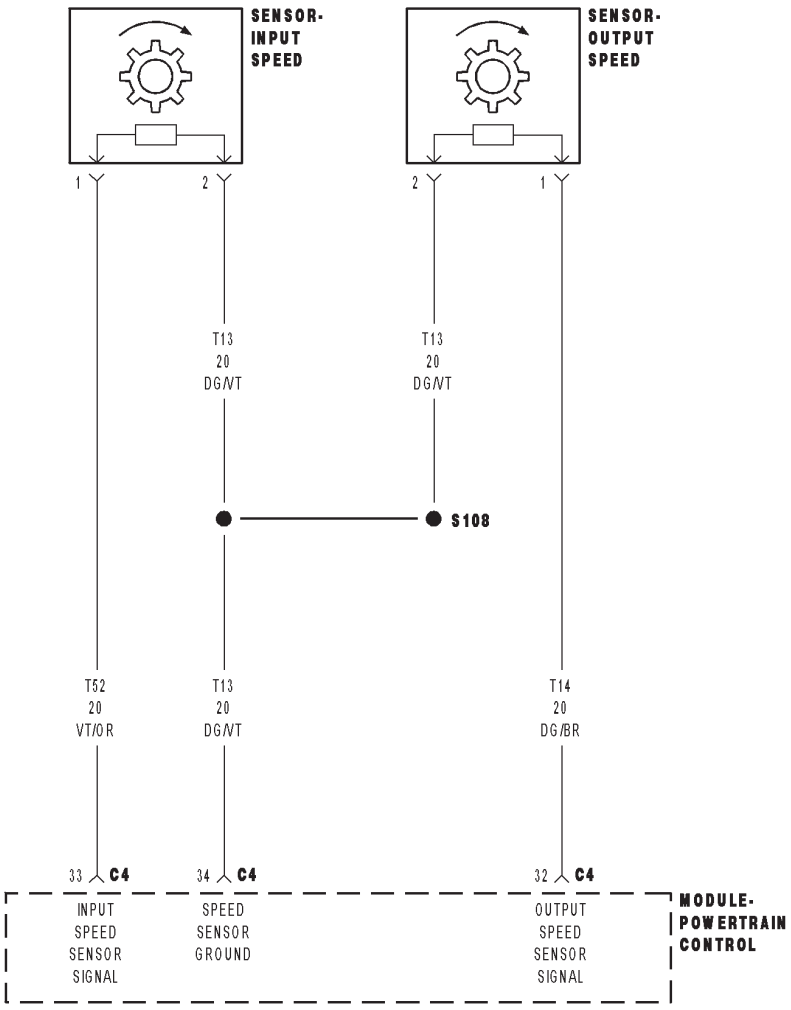
The conditions necessary to set this DTC are not present at this time.
Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.
Wiggle the wires while checking for shorted and open circuits.
With the scan tool , check the DTC EVENT DATA to help identify the conditions in which the DTC was set.
Check for any Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

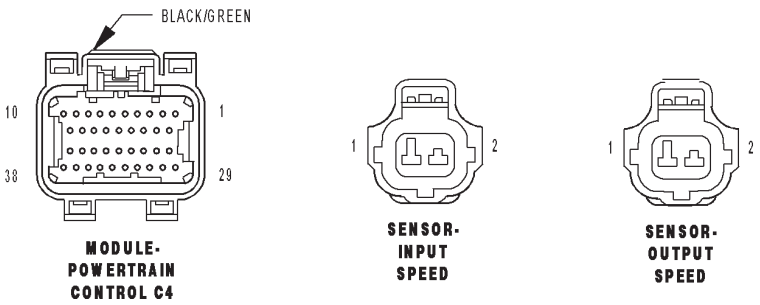
**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0715-INPUT SPEED SENSOR 1 CIRCUIT

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For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  The transmission gear ratio is monitored continuously while the transmission is in gear.
- **Set Condition:**
  If there is an excessive change in the Input RPM in any valid gear (R, 1st, 2nd, 3rd, or 4th).

| Possible Causes |
|---|
| (T52) INPUT SPEED SENSOR SIGNAL CIRCUIT OPEN |
| (T13) SPEED SENSOR GROUND CIRCUIT OPEN |
| (T52) INPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO GROUND |
| (T52) INPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO VOLTAGE |
| (T13) SPEED SENSOR GROUND CIRCUIT SHORT TO VOLTAGE |
| INPUT SPEED SENSOR |
| POWERTRAIN CONTROL MODULE |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The transmission control system uses two speed sensors, one to measure input RPM and one to measure output RPM. These inputs are essential for proper transmission operation. Therefore, the integrity of this data is verified through system checks.

## Diagnostic Test

### 1. CHECK TO SEE IF DTC P0715 IS CURRENT

Start the engine.

Place the shifter in park.

With the scan tool , read the Input Speed Sensor RPM.

**Is the Input Speed Sensor reading below 400 RPM?**

**Yes** >> Go To 2

**No** >> Go To 8

### 2. CHECK THE PCM AND WIRING WITH THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, set the ″Input/Output Speed″ switch to ″ON″ and the rotary switch to the ″3000/1250″ position.

With the scan tool, read the Input and Output RPM.

**Does the Input speed read 3000 RPM and the Output speed read 1250 RPM ± 50 RPM?**

**Yes** >> Replace the Input Speed Sensor per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 3

## 3. CHECK THE (T52) INPUT SPEED SENSOR SIGNAL CIRCUIT FOR AN OPEN

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Input Speed Sensor harness connector.

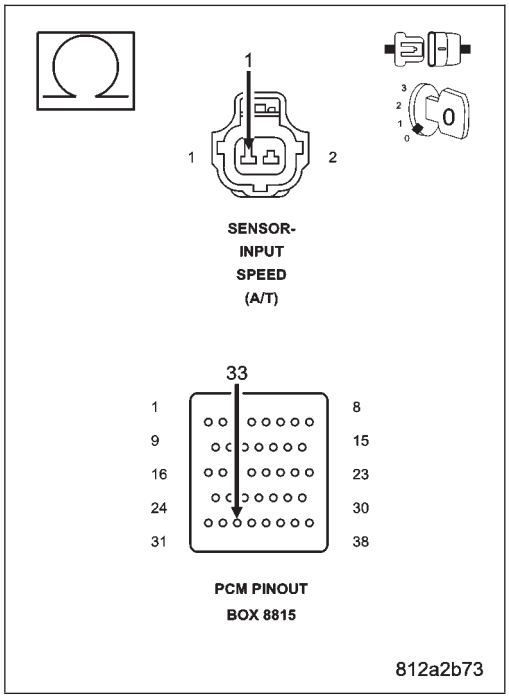
**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Measure the resistance of the (T52) Input Speed Sensor Signal circuit between the Input Speed Sensor harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T52) Input Speed Sensor Signal circuit for an open.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 4



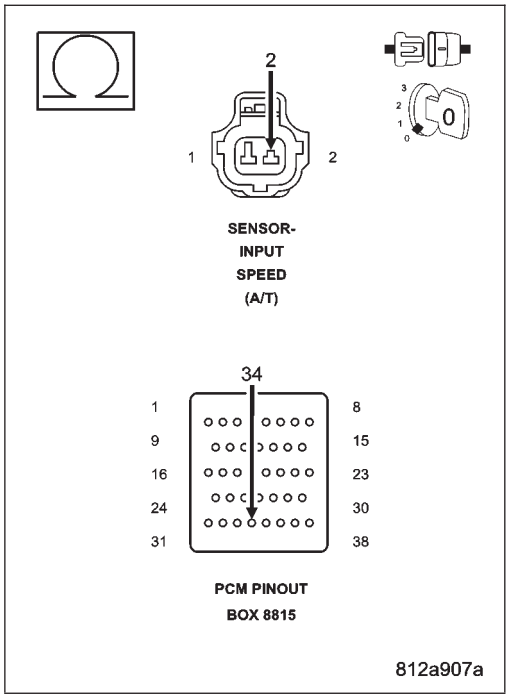

## 4. CHECK THE (T13) SPEED SENSOR GROUND CIRCUIT FOR AN OPEN

Measure the resistance of the (T13) Speed Sensor Ground circuit between the Input Speed Sensor harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T13) Speed Sensor Ground circuit for an open.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 5



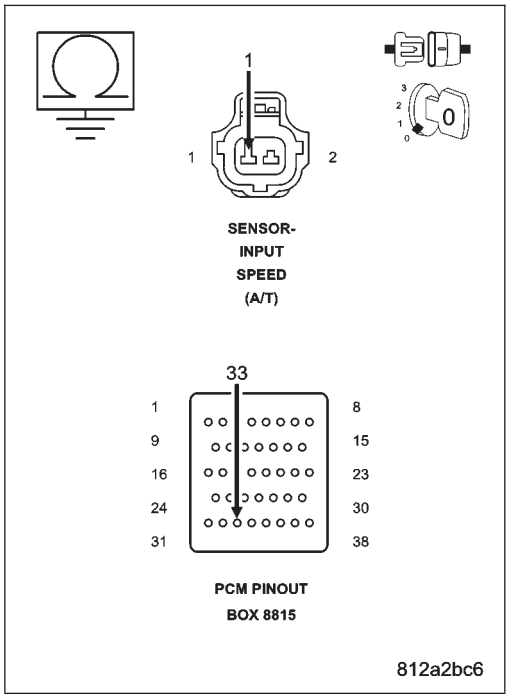
## 5. CHECK THE (T52) INPUT SPEED SENSOR SIGNAL CIRCUIT FOR A SHORT TO GROUND

Measure the resistance between ground and the (T52) Input Speed Sensor Signal circuit.

**Is the resistance Below 5.0 ohms?**

**Yes** >> Repair the (T52) Input Speed Sensor Signal circuit for a short to ground.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 6



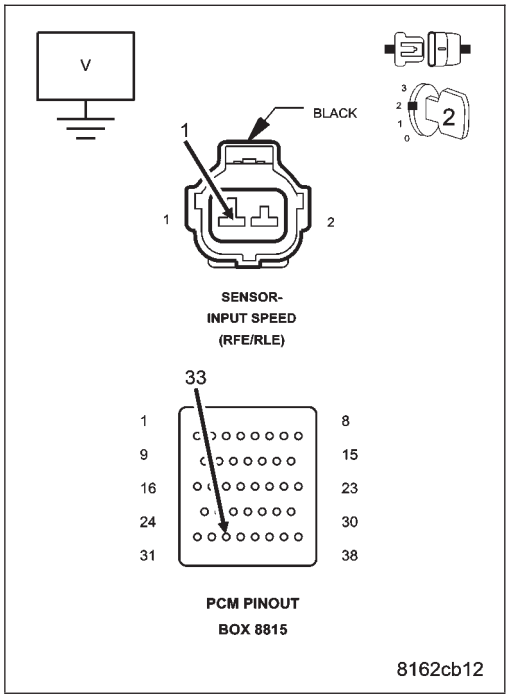

## 6. CHECK THE (T52) INPUT SPEED SENSOR SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE

Disconnect the Output Speed Sensor harness connector.
Ignition on, engine not running.
With the scan tool under TIPM, actuate the Transmission.
Measure the voltage of the (T52) Input Speed Sensor Signal circuit.

**Is the voltage above 0.5 volt?**

**Yes** >> Repair the (T52) Input Speed Sensor Signal circuit for a short to voltage.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

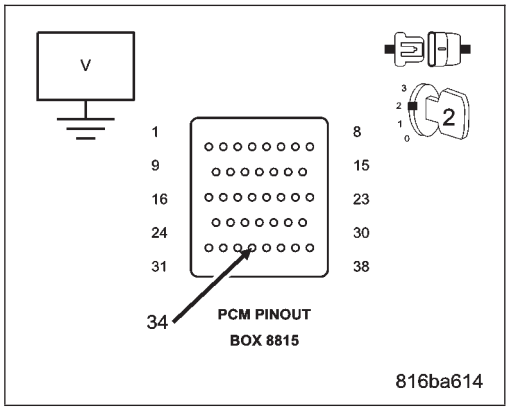
**No** >> Go To 7



## 7. CHECK THE (T13) SPEED SENSOR GROUND CIRCUIT FOR A SHORT TO VOLTAGE

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T13) Speed Sensor Ground circuit.




**Is the voltage above 0.5 volts?**

**Yes** >> Repair the (T13) Speed Sensor Ground circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1.

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 8. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wiring and connectors while checking for shorted and open circuits.

With the scan tool , check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

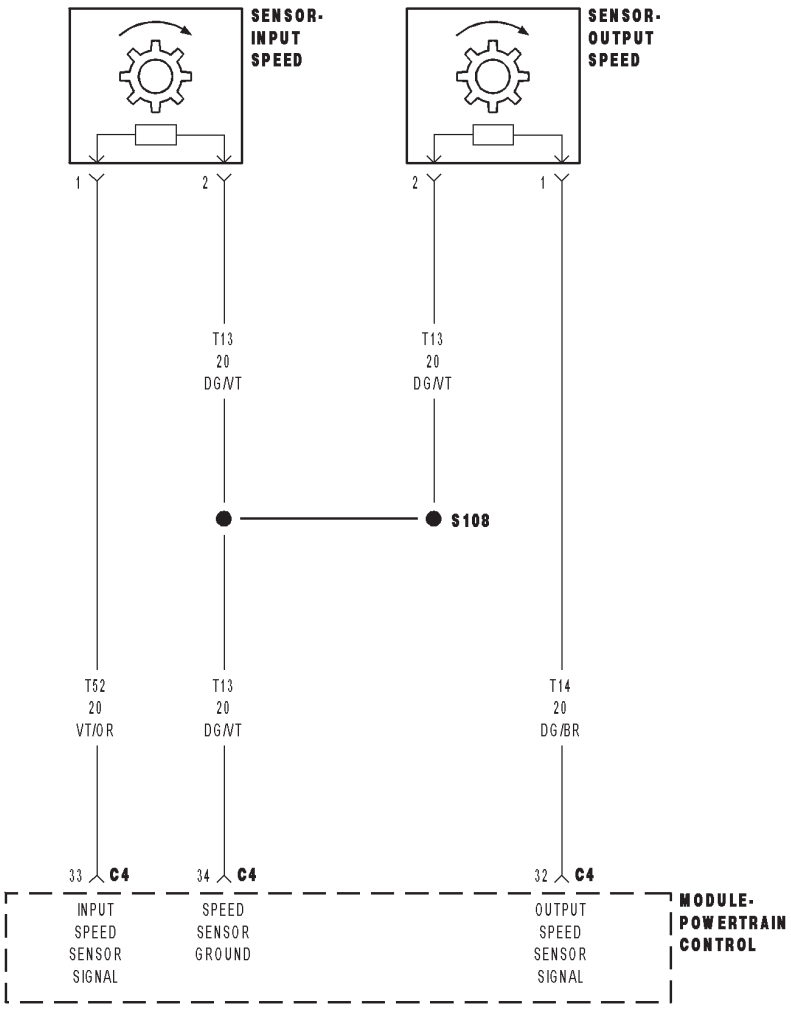
**Were there any problems found?**

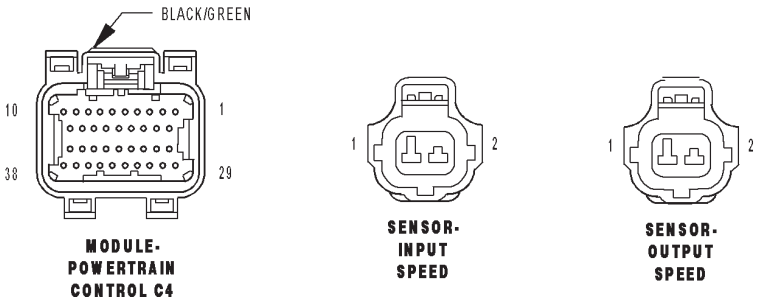
**Yes** >> Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0720-OUTPUT SPEED SENSOR CIRCUIT

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For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  The transmission gear ratio is monitored continuously while the transmission is in gear.
- **Set Condition:**
  If there is an excessive change in the Output RPM in any gear.

| Possible Causes |
|---|
| (T14) OUTPUT SPEED SENSOR SIGNAL CIRCUIT OPEN |
| (T13) SPEED SENSOR GROUND CIRCUIT OPEN |
| (T14) OUTPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO GROUND |
| (T14) OUTPUT SPEED SENSOR SIGNAL CIRCUIT SHORT TO VOLTAGE |
| (T13) SPEED SENSOR GROUND CIRCUIT SHORT TO VOLTAGE |
| OUTPUT SPEED SENSOR |
| POWERTRAIN CONTROL MODULE |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The transmission system uses two speed sensors, one to measure input RPM and one to measure output RPM. These inputs are essential for proper transmission operation. Therefore, the integrity of this data is verified through system checks.

## Diagnostic Test

### 1. CHECK IF THE DTC IS CURRENT

Start the engine in park.

Raise the drive wheels off of the ground.

**WARNING: Properly support the vehicle.**
Firmly apply the brakes and place the transmission selector in drive.

**WARNING: Be sure to keep hands and feet clear of rotating wheels.**
Release the brakes and allow the drive wheels to spin freely.

**NOTE: The drive wheels must be turning at this point.**
With the scan tool, read the Output RPM

**Is the Output RPM below 100?**

**Yes** >> Go To 2

**No** >> Go To 8

### 2. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**
Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, set the ″Input/Output Speed″ switch to ″ON″ and the rotary switch to the ″3000/1250″ position.

With the scan tool , read the Input and Output RPM.

**Does the Input RPM read 3000 and the Output RPM read 1250 (within 50 RPM)?**

**Yes** >> Replace the Output Speed Sensor per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 3

## 3. CHECK THE (T14) OUTPUT SPEED SENSOR SIGNAL CIRCUIT FOR AN OPEN

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Output Speed Sensor harness connector.

**NOTE: Check connectors - Clean/repair as necessary.**

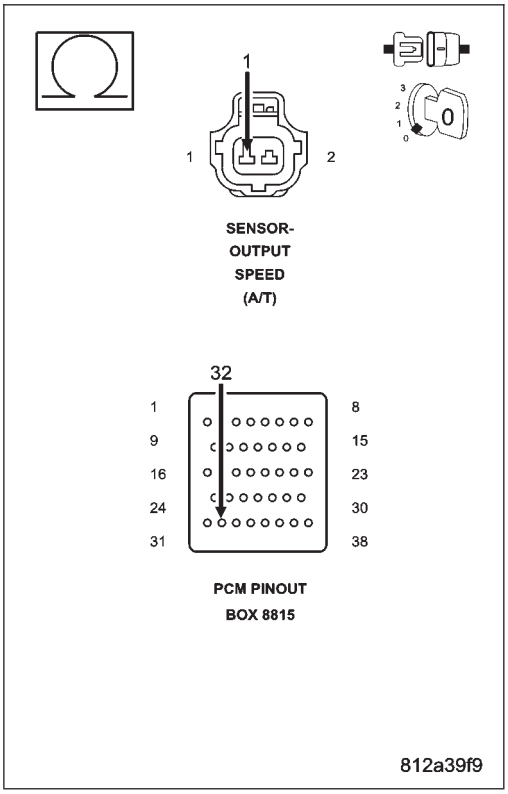
**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Measure the resistance of the (T14) Output Speed Sensor Signal circuit between the Output Speed Sensor harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T14) Output Speed Sensor Signal circuit for an open.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 4



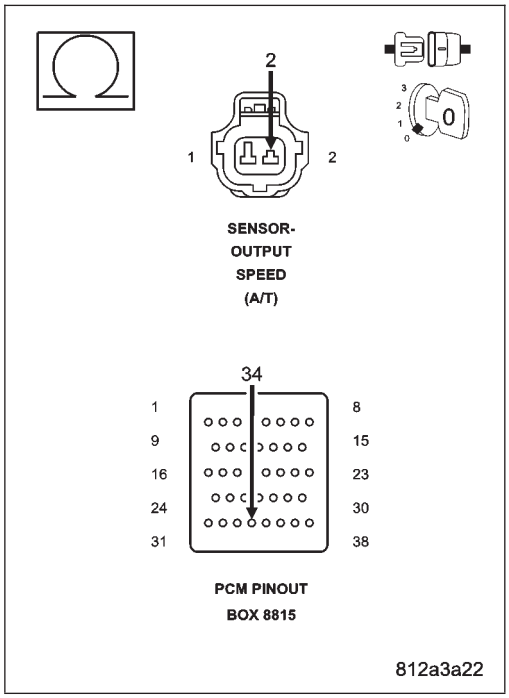
## 4. CHECK THE (T13) SPEED SENSOR GROUND CIRCUIT FOR AN OPEN

Measure the resistance of the Speed Sensor Ground circuit between the Output Speed Sensor harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T13) Speed Sensor Ground circuit for an open.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 5



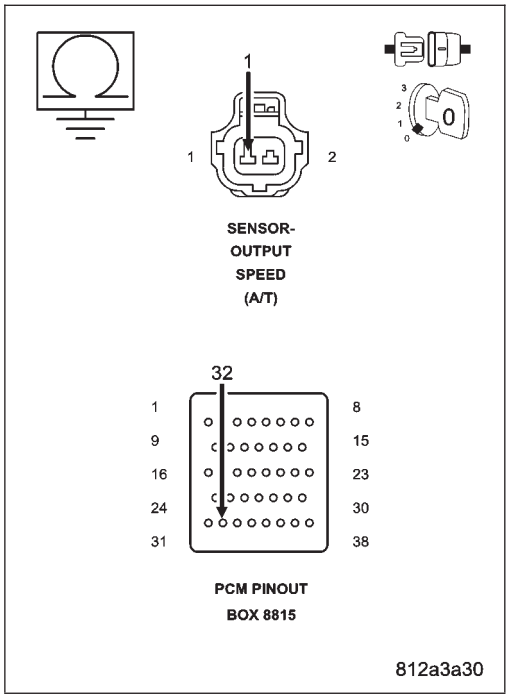

## 5. CHECK THE (T14) OUTPUT SPEED SENSOR SIGNAL CIRCUIT FOR A SHORT TO GROUND

Measure the resistance between ground and the (T14) Output Speed Sensor Signal circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (T14) Output Speed Sensor Signal circuit for a short to ground.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 6



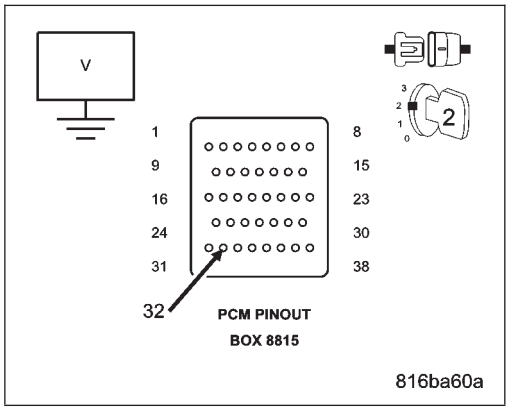
## 6. CHECK THE (T14) OUTPUT SPEED SENSOR SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE

Ignition on, engine not running.
With the scan tool under TIPM, actuate the Transmission.
Measure the voltage of the (T14) Output Speed Sensor Signal circuit.

**Is the voltage above 0.5 volt?**

**Yes** >> Repair the (T14) Output Speed Sensor Signal circuit for a short to voltage.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 7



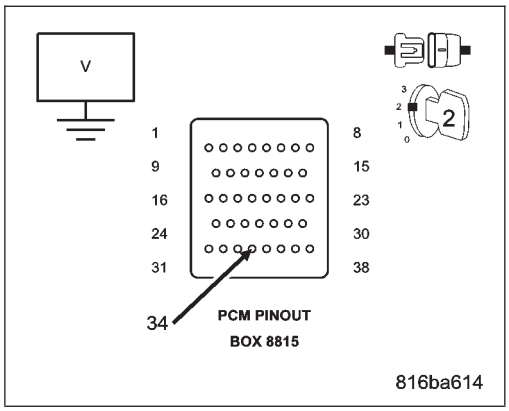

## 7. CHECK THE (T13) SPEED SENSOR GROUND CIRCUIT FOR A SHORT TO VOLTAGE

With the scan tool under TIPM, actuate the Transmission.
Measure the voltage of the (T13) Speed Sensor Ground circuit.

**Is the voltage above 0.5 volts?**

**Yes** >> Repair the (T13) Speed Sensor Ground circuit for a short to voltage.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)




## 8. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.
Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.
Wiggle the wiring and connectors while checking for shorted and open circuits.
With the scan tool , check the DTC EVENT DATA to help identify the conditions in which the DTC was set.
Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0725-ENGINE SPEED SENSOR CIRCUIT

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Whenever the engine is running.
- **Set Condition:**
  The Engine RPM is less than 390 or greater than 8000 for more than 2 seconds while the engine is running.

| Possible Causes |
|---|
| ENGINE DTCS PRESENT |
| POWERTRAIN CONTROL MODULE |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The PCM uses a dual port RAM internal to the controller to send the engine speed signal to the Transmission Control System. The calculated engine RPM is compared to a minimum and maximum value. If the PCM interprets this signal to be out of range when the engine is running the code is set. The MIL illuminates after 10 seconds of vehicle operation and the transmission system defaults to Limp-in mode.

## Diagnostic Test

### 1. CHECK IF THE DTC IS CURRENT

Start the engine.

**NOTE: This DTC is not a Transmission Input Speed Sensor DTC.**
With the scan tool, read transmission DTCs.

**Is the status Active for this DTC or is the STARTS SINCE SET counter set at 0?**

**Yes** >> Go To 2

**No** >> Go To 3

### 2. CHECK IF ENGINE DTCS ARE PRESENT

With the scan tool, read engine DTCs.

**Are there any engine DTC's present?**

**Yes** >> Refer to Section 9 – Engine Electrical Diagnostics and perform the appropriate diagnostic procedure.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 3. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.
Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.
Wiggle the wiring and connectors while checking for shorted and open circuits.
With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.
Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0731-GEAR RATIO ERROR IN 1ST

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  The Transmission gear ratio is monitored continuously while the transmission is in gear.
- **Set Condition:**
  If the ratio of the Input RPM to the Output RPM does not match the current gear ratio when compared to the known gear ratio.

| Possible Causes |
|---|
| RELATED TRANSMISSION DTCS PRESENT |
| INTERMITTENT GEAR RATIO ERRORS |
| INTERNAL TRANSMISSION |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The transmission system uses two speed sensors, one to measure input RPM and one to measure output RPM. These inputs are essential for proper transmission operation. Therefore, the integrity of this data is verified through data checks. When in gear, if the gear ratio does not compare to a known gear ratio, the corresponding gear ratio error trouble code is set. The transmission will go into Limp-in mode after four gear ratio error events occur in a given driving cycle.

## Diagnostic Test

### 1. DETERMINING IF RELATED TRANSMISSION DTCS ARE PRESENT

With the scan tool, read Transmission DTCs.

If any of these DTCs are present, perform their respective tests first.

**Are there any Loss of Prime, Line Pressure Sensor and/or Speed Sensor DTCs present?**

**Yes** >> Refer to appropriate diagnostic procedure in the Transmission category. If any of these DTC's are present, they will cause a gear ratio error. Perform the test for Loss of Prime first if it is present.

**No** >> Go To 2

### 2. CHECK TO SEE IF P0731 IS CURRENT

With the scan tool, perform the 1st gear clutch test. Follow the instructions on the scan tool.

Increase the throttle angle or TPS Degree to 30° for no more than a few seconds.

**CAUTION: Do not overheat the transmission.**

**Did the Clutch Test pass, Input Speed remain at zero?**

**Yes** >> Go To 3

**No** >> Repair internal Transmission as necessary. Check all of the components related to the UD and LR clutches. Inspect the Oil Pump and repair or replace as necessary. Refer to the Service Information for the proper repair procedures.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 3. CHECK FOR INTERMITTENT OPERATION

The conditions to set this DTC are not current at this time.

Check the gearshift linkage adjustment.

Gear ratio DTCs can be set by problems in the Input and Output Speed Sensor circuits. If the vehicle passes the Clutch Test and still sets Gear Ratio DTC, check the Speed Sensors for proper operation.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Check the wiring and connectors for the Speed Sensors for a good connection, then perform a wiggle test using the Transmission Simulator.

This DTC can also be set under extreme temperature conditions. This is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0732-GEAR RATIO ERROR IN 2ND

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  The Transmission gear ratio is monitored continuously while the transmission is in gear.
- **Set Condition:**
  If the ratio of the Input RPM to the Output RPM does not match the current gear ratio when compared to the known gear ratio.

| Possible Causes |
|---|
| RELATED TRANSMISSION DTCS PRESENT |
| TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY |
| INTERMITTENT GEAR RATIO ERRORS |
| INTERNAL TRANSMISSION |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The transmission system uses two speed sensors, one to measure input RPM and one to measure output RPM. These inputs are essential for proper transmission operation. Therefore, the integrity of this data is verified through data checks. When in gear, if the gear ratio does not compare to a known gear ratio, the corresponding gear ratio error trouble code is set. The transmission will go into Limp-in mode after four gear ratio error events occur in a given driving cycle.

## Diagnostic Test

### 1. CHECK IF RELATED TRANSMISSION DTCS ARE PRESENT

With the scan tool, read Transmission DTCs.

If any of these DTCs are present, perform their respective tests first.

**Are there any Loss of Prime, Line Pressure Sensor and/or Speed Sensor DTCs present?**

**Yes** >> Refer to appropriate diagnostic procedure in the Transmission category. If any of these DTCs are present, they will cause a gear ratio error. Perform the test for Loss of Prime first if it is present.

**No** >> Go To 2

### 2. CHECK IF THE DTC IS CURRENT

With the scan tool, perform the 2nd gear clutch test. Follow the instructions on the scan tool.

Increase the throttle angle or TPS Degree to 30° for no more than a few seconds.

**CAUTION: Do not overheat the transmission.**

**Did the Clutch Test pass, Input Speed remain at zero?**

**Yes** >> Go To 3

**No** >> Go To 4

## 3. CHECK FOR INTERMITTENT OPERATION

The conditions to set this DTC are not current at this time.

Check the gearshift linkage adjustment.

Gear ratio DTCs can be set by problems in the Input and Output Speed Sensor circuits. If the vehicle passes the Clutch Test and still sets Gear Ratio DTC, check the Speed Sensors for proper operation.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Check the wiring and connectors to the Speed Sensors for a good connection, then perform a wiggle test using the Transmission Simulator.

This DTC can also be set under extreme temperature conditions. This is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## 4. CHECK FOR RELATED PRESSURE SWITCH DTCS

With the scan tool, read Transmission DTC's.

**Are the DTCs P0845 and/or P0846 present also?**

**Yes** >> Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Repair internal Transmission per the Service Information. Check all of the components related to the UD and 2/4 clutches. Inspect the Oil Pump and repair or replace as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## P0733-GEAR RATIO ERROR IN 3RD

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  The Transmission gear ratio is monitored continuously while the transmission is in gear.
- **Set Condition:**
  If the ratio of the Input RPM to the Output RPM does not match the current gear ratio when compared to the known gear ratio.

| Possible Causes |
|---|
| RELATED TRANSMISSION DTCS PRESENT |
| INTERMITTENT GEAR RATIO ERRORS |
| TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY |
| INTERNAL TRANSMISSION |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The transmission system uses two speed sensors, one to measure input RPM and one to measure output RPM. These inputs are essential for proper transmission operation. Therefore, the integrity of this data is verified through data checks. When in gear, if the gear ratio does not compare to a known gear ratio, the corresponding gear ratio error trouble code is set. The transmission will go into Limp-in mode after four gear ratio error events occur in a given driving cycle.

## Diagnostic Test

### 1. CHECK IF RELATED TRANSMISSION DTCS ARE PRESENT

With the scan tool, read Transmission DTCs.

If any of these DTCs are present, perform their respective tests first.

**Are there any Loss of Prime, Line Pressure Sensor and/or Speed Sensor DTCs present?**

**Yes** >> Refer to appropriate diagnostic procedure in the Transmission category. If any of these DTCs are present, they will cause a gear ratio error. Perform the test for Loss of Prime first if it is present.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 2

### 2. CHECK IF THE DTC IS CURRENT

With the scan tool, perform the 3rd gear clutch test. Follow the instructions on the scan tool.

Increase the throttle angle or TPS Degree to 30° for no more than a few seconds.

**CAUTION: Do not overheat the transmission.**

**Did the Clutch Test pass, Input Speed remain at zero?**

**Yes** >> Go To 3

**No** >> Go To 4

## 3. CHECK FOR INTERMITTENT OPERATION

The conditions to set this DTC are not current at this time.

Check the gearshift linkage adjustment.

Gear ratio DTCs can be set by problems in the Input and Output Speed Sensor circuits. If the vehicle passes the Clutch Test and still sets Gear Ratio DTC, check the Speed Sensors for proper operation.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Check the wiring and connectors for the Speed Sensors for a good connection, then perform a wiggle test using the Transmission Simulator.

This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## 4. CHECK FOR RELATED PRESSURE SWITCH DTCS

With the scan tool, read Transmission DTCs.

**Are the DTCs P0870 and/or P0871 present also?**

**Yes** >> Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1.

**No** >> Repair internal Transmission per the Service Information. Check all of the components related to the UD and O/D clutches. Inspect the Oil Pump and repair or replace as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## P0734-GEAR RATIO ERROR IN 4TH

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  The Transmission gear ratio is monitored continuously while the transmission is in gear.
- **Set Condition:**
  If the ratio of the Input RPM to the Output RPM does not match the current gear ratio when compared to the known gear ratio.

| Possible Causes |
|---|
| RELATED TRANSMISSION DTCS PRESENT |
| INTERMITTENT GEAR RATIO ERRORS |
| TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY |
| INTERNAL TRANSMISSION |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The transmission system uses two speed sensors, one to measure input RPM and one to measure output RPM. These inputs are essential for proper transmission operation. Therefore, the integrity of this data is verified through data checks. When in gear, if the gear ratio does not compare to a known gear ratio, the corresponding gear ratio error trouble code is set. The transmission will go into Limp-in mode after four gear ratio error events occur in a given driving cycle.

## Diagnostic Test

### 1. CHECK IF RELATED TRANSMISSION DTCS ARE PRESENT

With the scan tool, read Transmission DTCs.

If any of these DTCs are present, perform their respective tests first.

**Are there any Loss of Prime, Line Pressure Sensor and/or Speed Sensor DTCs present?**

**Yes** >> Refer to appropriate diagnostic procedure in the Transmission category. If any of these DTCs are present, they will cause a gear ratio error. Perform the test for Loss of Prime first if it is present.

**No** >> Go To 2

### 2. CHECK IF THE DTC IS CURRENT

With the scan tool, perform the 4th gear clutch test. Follow the instructions on the scan tool.

Increase the throttle angle or TPS Degree to 30° for no more than a few seconds.

**CAUTION: Do not overheat the transmission.**

**Did the Clutch Test pass, Input Speed remain at zero?**

**Yes** >> Go To 3

**No** >> Go To 4

## 3. CHECK FOR INTERMITTENT OPERATION

The conditions to set this DTC are not current at this time.

Check the gearshift linkage adjustment.

Gear ratio DTC's can be set by problems in the Input and Output Speed Sensor circuits. If the vehicle passes the Clutch Test and still sets a Gear Ratio DTC, check the Speed Sensors for proper operation.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Check the wiring and connectors for the Speed Sensors for a good connection, then perform a wiggle test using the Transmission Simulator.

This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## 4. CHECK FOR RELATED PRESSURE SWITCH DTCS

With the scan tool, read Transmission DTC's.

**Are the DTC's P0870 and/or P0871 present also?**

**Yes** >> Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Repair internal Transmission per the Service Information. Check all of the components related to the O/D and 2/4 clutches. Inspect the Oil Pump and repair or replace as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## P0736-GEAR RATIO ERROR IN REVERSE

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  The Transmission gear ratio is monitored continuously while the transmission is in gear.
- **Set Condition:**
  If the ratio of the Input RPM to the Output RPM does not match the current gear ratio when compared to the known gear ratio.

| Possible Causes |
|---|
| RELATED TRANSMISSION DTCS PRESENT |
| INTERMITTENT GEAR RATIO ERRORS |
| INTERNAL TRANSMISSION |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The transmission system uses two speed sensors, one to measure input RPM and one to measure output RPM. These inputs are essential for proper transmission operation. Therefore, the integrity of this data is verified through data checks. When in gear, if the gear ratio does not compare to a known gear ratio, the corresponding gear ratio error trouble code is set. The transmission will go into Limp-in mode after four gear ratio error events occur in a given driving cycle.

## Diagnostic Test

### 1. DETERMINING IF RELATED TRANSMISSION DTCS ARE PRESENT

With the scan tool, read Transmission DTCs.

If any of these DTCs are present, perform their respective tests first.

**Are there any Loss of Prime, Line Pressure Sensor and/or Speed Sensor DTCs present?**

**Yes** >> Refer to appropriate diagnostic procedure in the Transmission category. If any of these DTCs are present, they will cause a gear ratio error. Perform the test for Loss of Prime first if it is present.

**No** >> Go To 2

### 2. CHECK TO SEE IF P0731 IS CURRENT

With the scan tool, perform the Reverse gear clutch test. Follow the instructions on the scan tool.

Increase the throttle angle or TPS Degree to 30° for no more than a few seconds.

**CAUTION: Do not overheat the transmission.**

**Did the Clutch Test pass, Input Speed remain at zero?**

**Yes** >> Go To 3

**No** >> Repair internal Transmission per the Service Information. Check all of the components related to the Reverse and LR clutches. Inspect the Oil Pump and repair or replace as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 3. CHECK FOR INTERMITTENT OPERATION

The conditions to set this DTC are not current at this time.

Check the gearshift linkage adjustment.

Gear ratio DTCs can be set by problems in the Input and Output Speed Sensor circuits. If the vehicle passes the Clutch Test and still sets Gear Ratio DTC, check the Speed Sensors for proper operation.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Check the wiring and connectors related to the Speed Sensors for a good connection, then perform a wiggle test using the Transmission Simulator.

This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0740-TCC OUT OF RANGE

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  The Torque Converter Clutch (TCC) is in FEMCC or PEMCC, Transmission temperature is hot, Engine temperature is greater than 38° C or 100° F, Transmission Input Speed greater than engine speed, TPS less than 30°, and brake not applied.
- **Set Condition:**
  The TCC is modulated by controlling the duty cycle of the L/R Solenoid until the difference between the Engine RPM and the Transmission Input Speed RPM or duty cycle is within a desired range. The DTC is set after the period of 10 seconds and 3 occurrences of either: FEMCC - with slip greater than 100 RPM or PEMCC - duty cycle greater than 85%.

| Possible Causes |
|---|
| RELATED L/R SOLENOID OR PRESSURE SWITCH DTCS PRESENT |
| INTERNAL TRANSMISSION |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

When in 2nd, 3rd, or 4th gear, the torque converter clutch (TCC) can be locked or partially locked when certain conditions are met. The TCC piston is electronically modulated by increasing the duty cycle of the LR/TCC solenoid until the torque converter slip difference (difference between engine and turbine speed) is within 60 RPM. Then the LR/TCC solenoid is fully energized (FEMCC / 100% duty cycle). Torque converter slip is monitored in FEMCC to ensure adequate clutch capacity. The transmission will attempt normal EMCC operation (not in Limp-in) even after the MIL is illuminated. MIL will illuminate after 5 minutes of accumulated slip in FEMCC.

## Diagnostic Test

### 1. CHECK IF RELATED DTCS ARE PRESENT

With the scan tool, read Transmission DTCs

**Are the DTCs P0750 and/or P0841 present also?**

**Yes** >> Refer to the Transmission category and perform the appropriate symptom.

**No** >> Go To 2

### 2. CHECK IF THE DTC IS CURRENT

Ignition on, engine not running.

With the scan tool, record and erase DTCs.

Drive the vehicle until it is fully warmed up to at least 43° C (110° F).

Perform the following step 3 times.

Drive the vehicle at 50 mph and allow 4th gear to engage for at least 10 seconds. Close the throttle, then tip back in until the throttle angle is between 25 and 29 degrees. Note that if you go over 30 degrees, you must back off of the throttle and retry.

**Did the TCC engage during any of the attempts?**

**Yes** >> Go To 3

**No** >> Perform the Hydraulic Pressure test per the Service Information and repair the internal transmission components and Torque convertor as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 3. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wiring and connectors while checking for shorted and open circuits.

This DTC can also be set under extreme temperature conditions. This is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

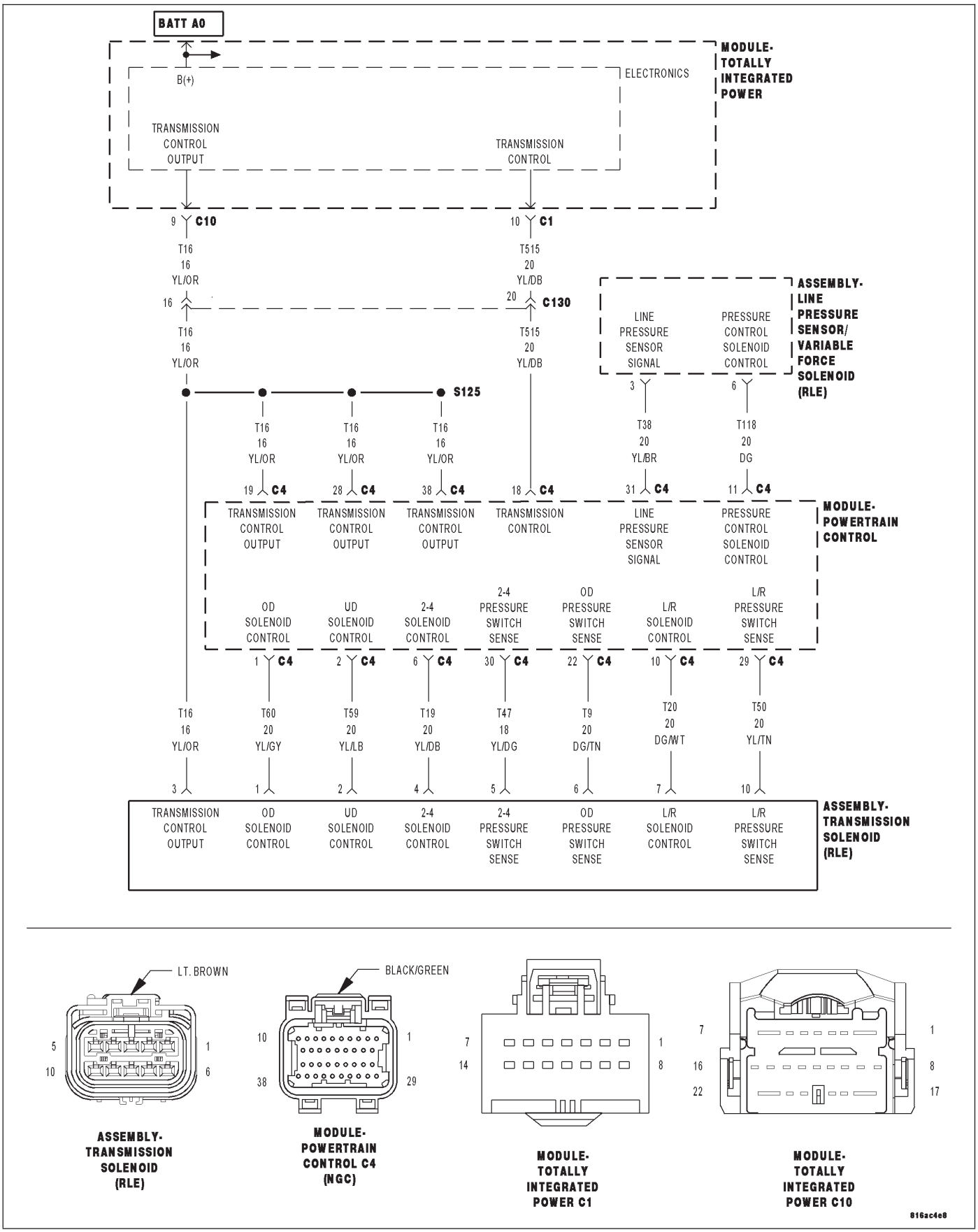
Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0750-LR SOLENOID CIRCUIT




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Initially at ignition on, then every 10 seconds thereafter. The solenoids will also be tested immediately after a gear ratio error or pressure switch error is detected.
- **Set Condition:**
  Three consecutive solenoid continuity test failures, or one failure if test is run in response to a gear ratio or pressure switch error.

| Possible Causes |
|---|
| RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT |
| (T20) L/R SOLENOID CONTROL CIRCUIT OPEN |
| (T20) L/R SOLENOID CONTROL CIRCUIT SHORT TO GROUND |
| (T20) L/R SOLENOID CONTROL CIRCUIT SHORT TO VOLTAGE |
| TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY |
| POWERTRAIN CONTROL MODULE |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

Four solenoids are used to control the friction elements (clutches). The continuity of the solenoids circuits are periodically tested. Each solenoid is turned on or off depending on its current state. An inductive spike should be detected by the PCM during this test. If no spike is detected, the circuit is tested again to verify the failure. In addition to the periodic testing, the solenoid circuits are tested if a gear ratio or pressure switch error occurs. In this case, one failure will result in the appropriate DTC being set. The MIL will illuminate and the transmission goes into neutral, if the DTC is set above 35 Kmh (22 mph), Limp-in mode when vehicle speed is below 35 Kmh (22 mph).

## Diagnostic Test

### 1. DETERMINING IF RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT

With the scan tool, read TIPM DTCs.

**Are there any TIPM TCM Power Control Circuit DTCs present also?**

**Yes** >> Refer to the Transmission category and perform the appropriate diagnostic procedure.

**No** >> Go To 2

### 2. CHECK IF THE DTC IS CURRENT

With the scan tool, view DTCs.

**Is the status Active or is STARTS SINCE SET counter set at 0 for this DTC?**

**Yes** >> Go To 3

**No** >> Go To 7

### 3. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the scan tool, actuate the L/R Solenoid.

Monitor the L/R Solenoid LED on the Transmission Simulator.

**Did the L/R Solenoid LED on the Transmission Simulator blink on and off during actuation?**

**Yes** >> Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 4

## 4. CHECK THE (T20) L/R SOLENOID CONTROL CIRCUIT FOR AN OPEN

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

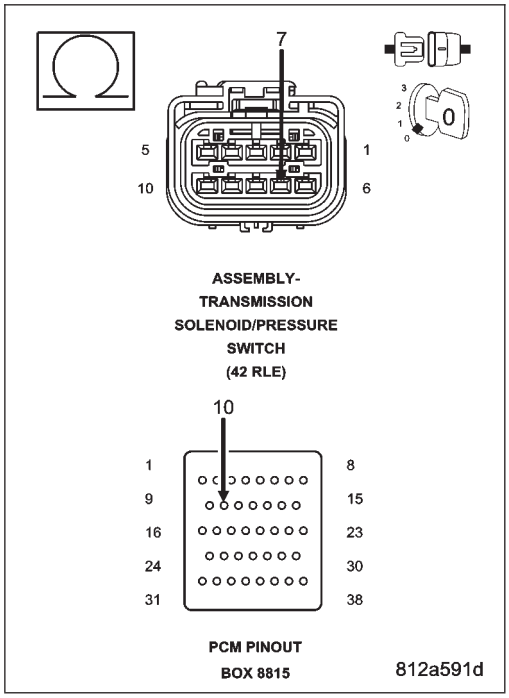
**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Measure the resistance of the (T20) L/R Solenoid Control circuit between the Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T20) L/R Solenoid Control circuit for an open.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 5



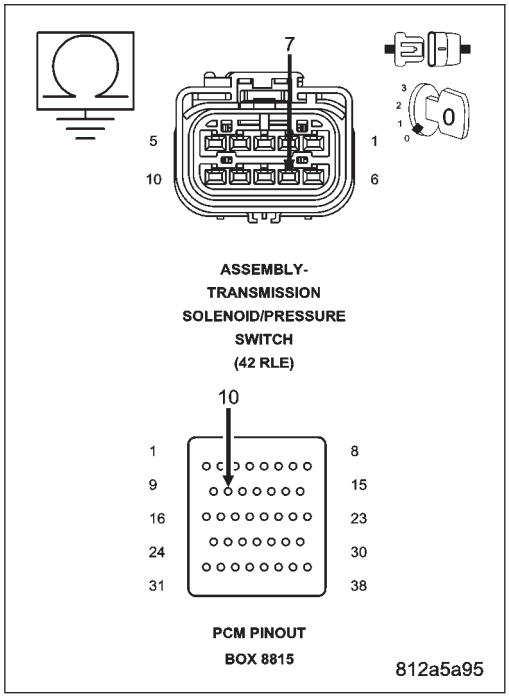

## 5. CHECK THE (T20) L/R SOLENOID CONTROL CIRCUIT FOR A SHORT TO GROUND

Measure the resistance between ground and the (T20) L/R Solenoid Control circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (T20) L/R Solenoid Control circuit for a short to ground.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 6

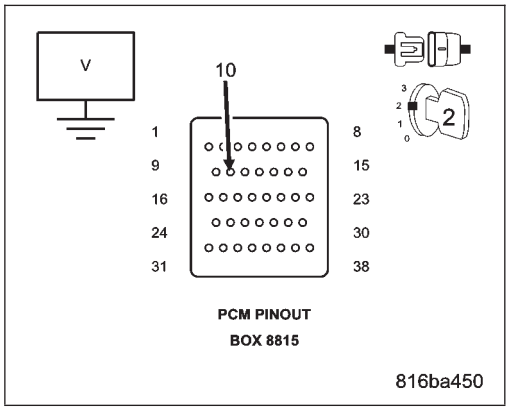


## 6. CHECK THE (T20) L/R SOLENOID CONTROL CIRCUIT FOR A SHORT TO VOLTAGE

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T20) L/R Solenoid Control circuit.




**Is the voltage above 0.5 volts?**

**Yes** >> Repair the (T20) L/R Solenoid Control circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 7. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

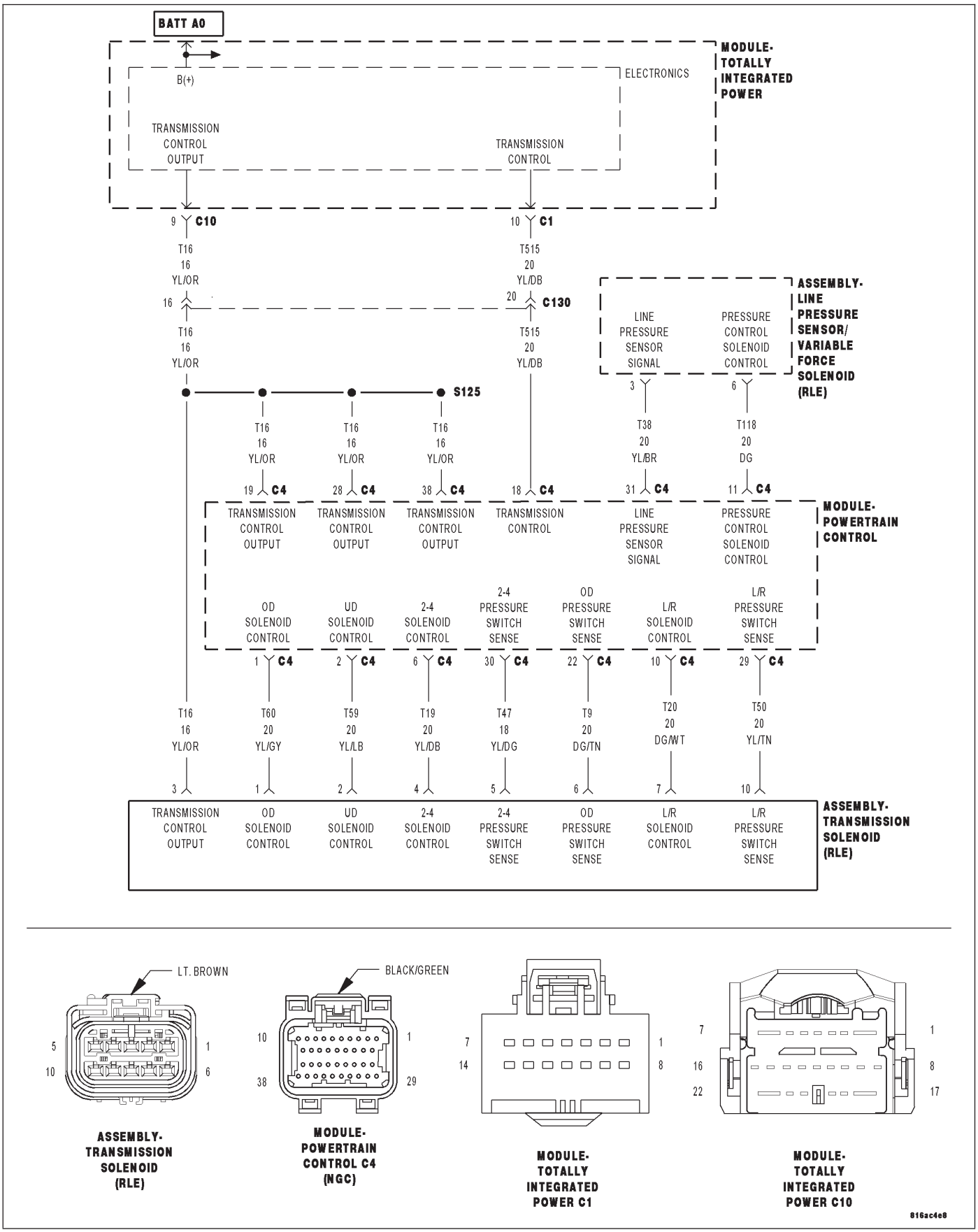
**Were there any problems found?**

**Yes** >> Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0755-2/4 SOLENOID CIRCUIT




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Initially at ignition on, then every 10 seconds thereafter. The solenoids will also be tested immediately after a gear ratio error or pressure switch error is detected.
- **Set Condition:**
  Three consecutive solenoid continuity test failures, or one failure if test is run in response to a gear ratio or pressure switch error.

| Possible Causes |
|---|
| RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT |
| (T19) 2/4 SOLENOID CONTROL CIRCUIT OPEN |
| (T19) 2/4 SOLENOID CONTROL CIRCUIT SHORT TO GROUND |
| (T19) 2/4 SOLENOID CONTROL CIRCUIT SHORT TO VOLTAGE |
| TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY |
| POWERTRAIN CONTROL MODULE |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

Four solenoids are used to control the friction elements (clutches). The continuity of the solenoids circuits are periodically tested. Each solenoid is turned on or off depending on its current state. An inductive spike should be detected by the PCM during this test. If no spike is detected, the circuit is tested again to verify the failure. In addition to the periodic testing, the solenoid circuits are tested if a gear ratio or pressure switch error occurs. In this case, one failure will result in the appropriate DTC being set. The MIL will illuminate and the transmission goes into neutral, if the DTC is set above 35 Kmh (22 mph), Limp-in mode when vehicle speed is below 35 Kmh (22 mph).

## Diagnostic Test

### 1. DETERMINING IF RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT

With the scan tool, read TIPM DTCs.

**Are there any TIPM TCM Power Control Circuit DTCs present also?**

**Yes** >> Refer to the Transmission category and perform the appropriate diagnostic procedure.

**No** >> Go To 2

### 2. CHECK TO SEE IF P0755 IS CURRENT

With the scan tool, view DTCs.

**Is the status Active or is the STARTS SINCE SET counter set at 0 for this DTC?**

**Yes** >> Go To 3

**No** >> Go To 7

### 3. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the scan tool, actuate the 2/4 Solenoid.

Monitor the 2/4 Solenoid LED on the Transmission Simulator.

**Did the 2/4 Solenoid LED on the Transmission Simulator blink on and off during actuation?**

**Yes** >> Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 4

## 4. CHECK THE (T19) 2/4 SOLENOID CONTROL CIRCUIT FOR AN OPEN

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

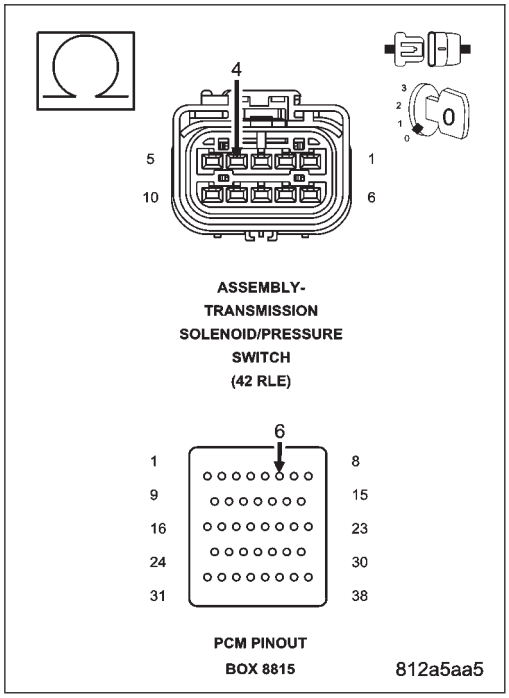
**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Measure the resistance of the (T19) 2/4 Solenoid Control circuit between the Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T19) 2/4 Solenoid Control circuit for an open.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 5



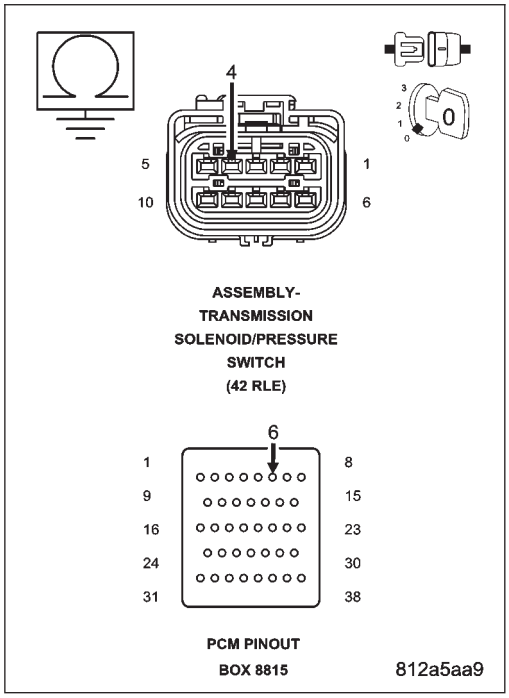

## 5. CHECK THE (T19) 2/4 SOLENOID CONTROL CIRCUIT FOR A SHORT TO GROUND

Measure the resistance between ground and the (T19) 2/4 Solenoid Control circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (T19) 2/4 Solenoid Control circuit for a short to ground.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 6

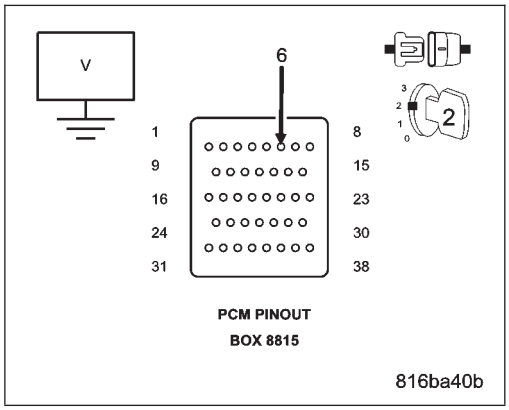


## 6. CHECK THE (T19) 2/4 SOLENOID CONTROL CIRCUIT FOR A SHORT TO VOLTAGE

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T19) 2/4 Solenoid Control circuit.




**Is the voltage above 0.5 volts?**

**Yes** >> Repair the (T19) 2/4 Solenoid Control circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 7. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

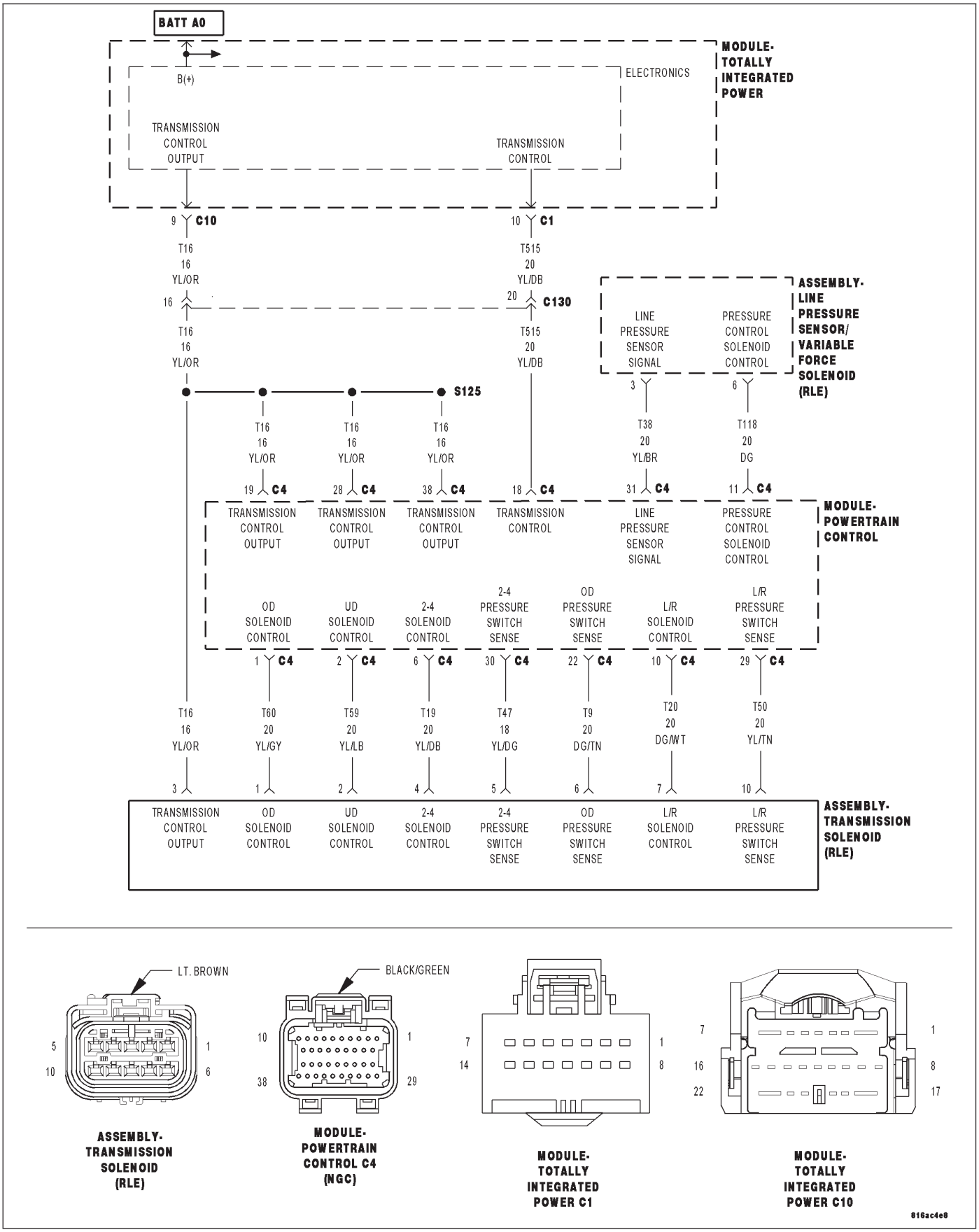
**Were there any problems found?**

**Yes** >> Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0760-OD SOLENOID CIRCUIT




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Initially at ignition on, then every 10 seconds thereafter. The solenoids will also be tested immediately after a gear ratio error or pressure switch error is detected.
- **Set Condition:**
  Three consecutive solenoid continuity test failures, or one failure if test is run in response to a gear ratio or pressure switch error.

| Possible Causes |
|---|
| RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT |
| (T60) OD SOLENOID CONTROL CIRCUIT OPEN |
| (T60) OD SOLENOID CONTROL CIRCUIT SHORT TO GROUND |
| (T60) OD SOLENOID CONTROL CIRCUIT SHORT TO VOLTAGE |
| TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

Four solenoids are used to control the friction elements (clutches). The continuity of the solenoid circuits is periodically tested. Each solenoid is turned on or off depending on its current state. An inductive spike should be detected by the PCM during this test. If no spike is detected, the circuit is tested again to verify the failure. In addition to the periodic testing, the solenoid circuits are tested if a gear ratio or pressure switch error occurs. In this case, one failure will result in the appropriate DTC being set. The MIL will illuminate and the transmission goes into neutral, if the DTC is set above 35 Kmh (22 mph), Limp-in mode when vehicle speed is below 35 Kmh (22 mph).

## Diagnostic Test

### 1. DETERMINING IF RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT

With the scan tool, read TIPM DTCs.

**Are there any TIPM TCM Power Control Circuit DTCs present also?**

**Yes** >> Refer to the Transmission category and perform the appropriate diagnostic procedure.

**No** >> Go To 2

### 2. CHECK IF DTC IS CURRENT

With the scan tool, view DTCs.

**Is the status Active or is the STARTS SINCE SET counter set at 0 for this DTC?**

**Yes** >> Go To 3

**No** >> Go To 7

### 3. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the scan tool, actuate the OD Solenoid.

Monitor the OD Solenoid LED on the Transmission Simulator.

**Did the OD Solenoid LED on the Transmission Simulator blink on and off during actuation?**

**Yes** >> Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 4

## 4. CHECK THE (T60) OD SOLENOID CONTROL CIRCUIT FOR AN OPEN

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

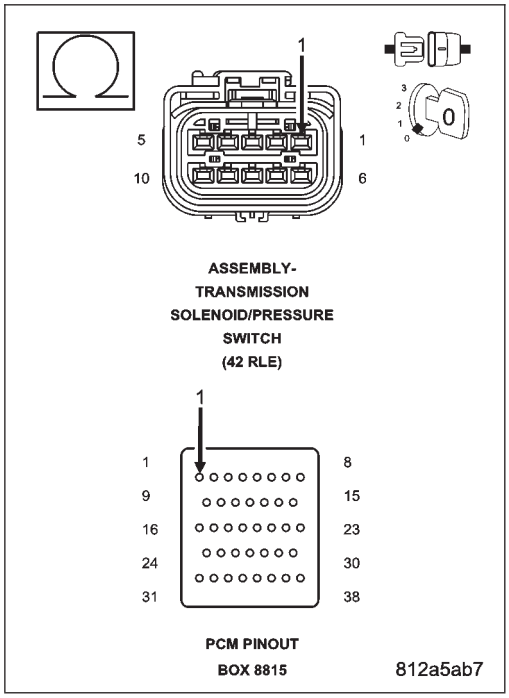
**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Measure the resistance of the (T60) OD Solenoid Control circuit between the Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T60) OD Solenoid Control circuit for an open.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 5



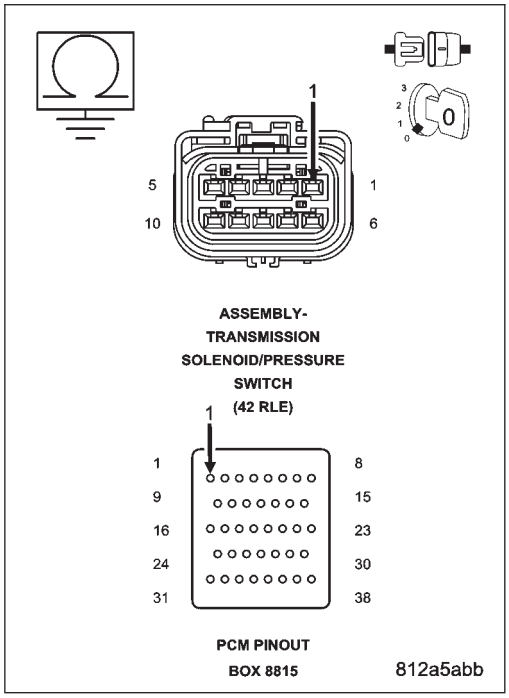

## 5. CHECK THE (T60) OD SOLENOID CONTROL CIRCUIT FOR A SHORT TO GROUND

Measure the resistance between ground and the (T60) OD Solenoid Control circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (T60) OD Solenoid Control circuit for a short to ground.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 6

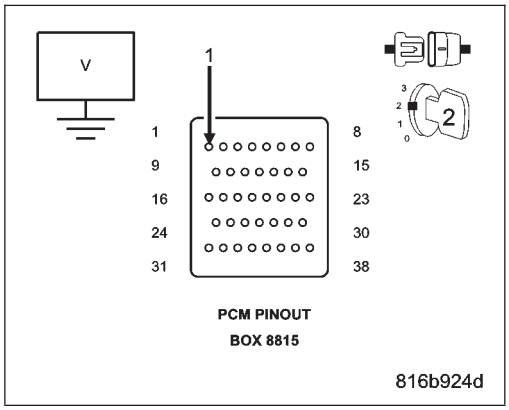


## 6. CHECK THE (T60) OD SOLENOID CONTROL CIRCUIT FOR A SHORT TO VOLTAGE

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T60) OD Solenoid Control circuit.




**Is the voltage above 0.5 volts?**

**Yes** >> Repair the (T60) OD Solenoid Control circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 7. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

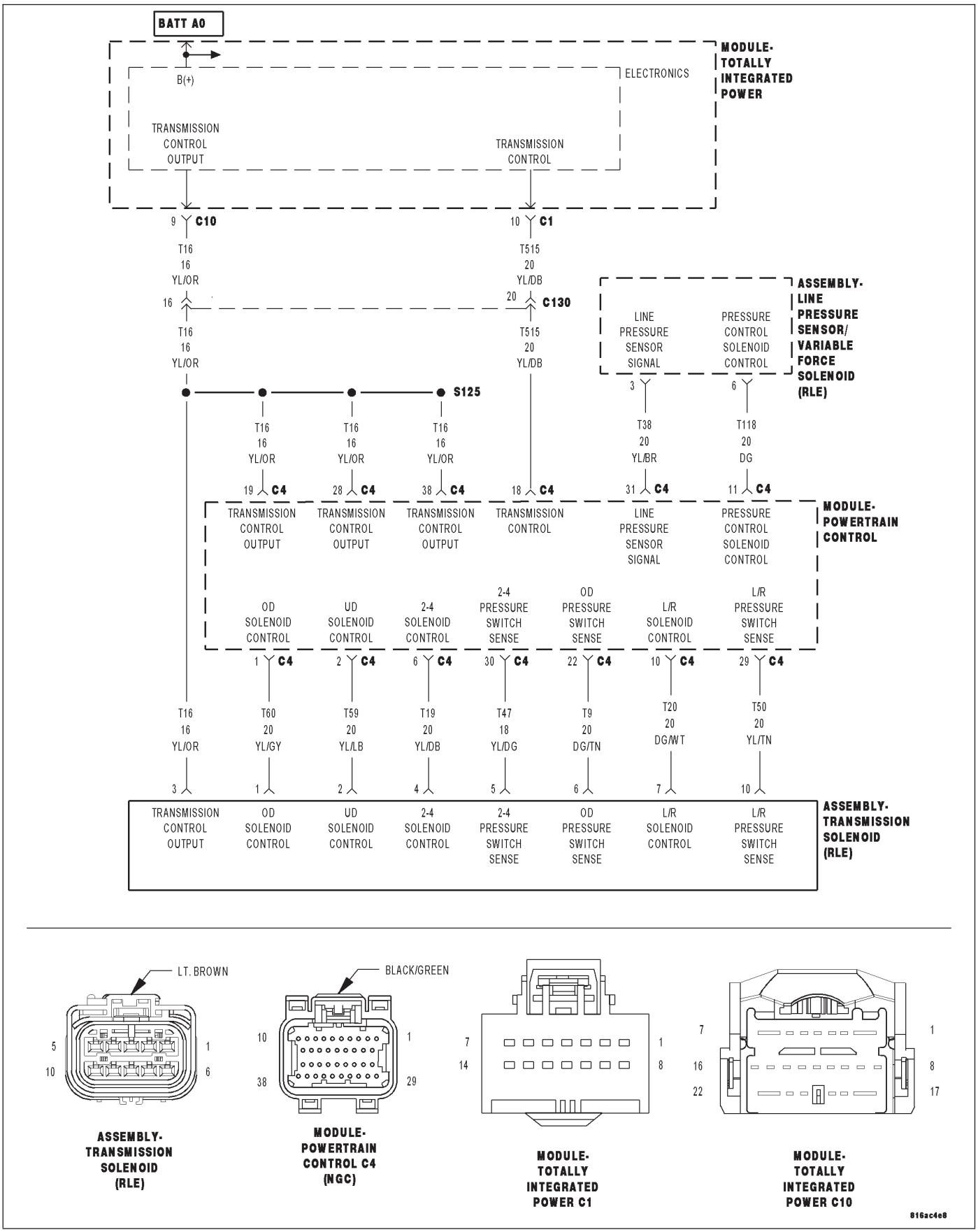
**Were there any problems found?**

**Yes** >> Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0765-UD SOLENOID CIRCUIT




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Initially at ignition on, then every 10 seconds thereafter. The solenoids will also be tested immediately after a gear ratio error or pressure switch error is detected.
- **Set Condition:**
  Three consecutive solenoid continuity test failures, or one failure if test is run in response to a gear ratio or pressure switch error.

| Possible Causes |
|---|
| RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT |
| (T59) UD SOLENOID CONTROL CIRCUIT OPEN |
| (T59) UD SOLENOID CONTROL CIRCUIT SHORT TO GROUND |
| (T59) UD SOLENOID CONTROL CIRCUIT SHORT TO VOLTAGE |
| TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

Four solenoids are used to control the friction elements (clutches). The continuity of the solenoid circuits is periodically tested. Each solenoid is turned on or off depending on its current state. An inductive spike should be detected by the PCM during this test. If no spike is detected, the circuit is tested again to verify the failure. In addition to the periodic testing, the solenoid circuits are tested if a gear ratio or pressure switch error occurs. In this case, one failure will result in the appropriate DTC being set. The MIL will illuminate and the transmission goes into neutral, if the DTC is set above 35 Kmh (22 mph), Limp-in mode when vehicle speed is below 35 Kmh (22 mph).

## Diagnostic Test

### 1. DETERMINING IF RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT

With the scan tool, read TIPM DTCs.

**Are there any TIPM TCM Power Control Circuit DTCs present also?**

**Yes** >> Refer to the Transmission category and perform the appropriate symptom.

**No** >> Go To 2

### 2. CHECK IF THE DTC IS CURRENT

With the scan tool, view DTCs.

**Is the status Active or is the STARTS SINCE SET counter set at 0 for this DTC?**

**Yes** >> Go To 3

**No** >> Go To 7

### 3. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the scan tool, actuate the UD Solenoid.

Monitor the UD Solenoid LED on the Transmission Simulator.

**Did the UD Solenoid LED on the Transmission Simulator blink on and off during actuation?**

**Yes** >> Replace Transmission Solenoid/Pressure Switch Assembly per the Service Information. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - DISASSEMBLY)
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 4

## 4. CHECK THE (T59) UD SOLENOID CONTROL CIRCUIT FOR AN OPEN

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

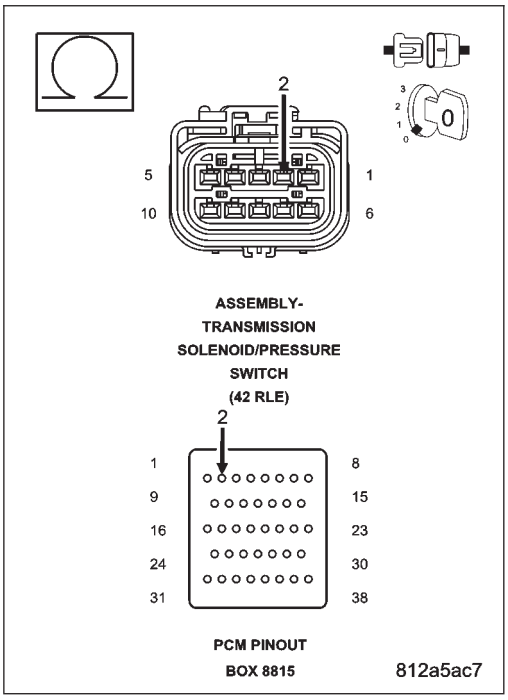
**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Measure the resistance of the (T59) UD Solenoid Control circuit between the Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T59) UD Solenoid Control circuit for an open.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 5



## 5. CHECK THE (T59) UD SOLENOID CONTROL CIRCUIT FOR A SHORT TO GROUND

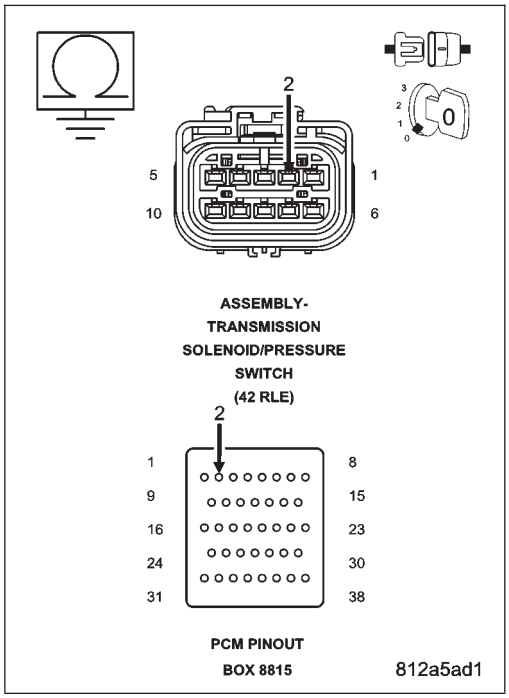
Measure the resistance between ground and the (T59) UD Solenoid Control circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (T59) UD Solenoid Control circuit for a short to ground.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 6




## 6. CHECK THE (T59) UD SOLENOID CONTROL CIRCUIT FOR A SHORT TO VOLTAGE

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T59) UD Solenoid Control circuit.

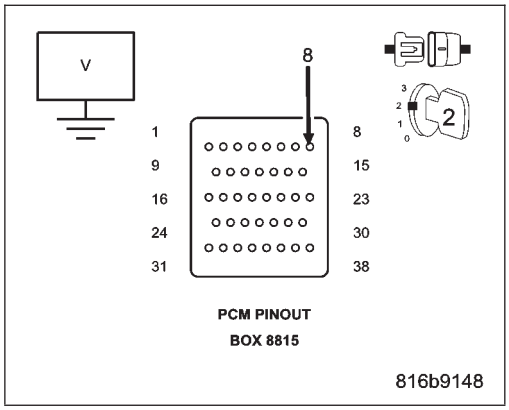
**Is the voltage above 0.5 volts?**

**Yes** >> Repair the (T59) UD Solenoid Control circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)



## 7. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

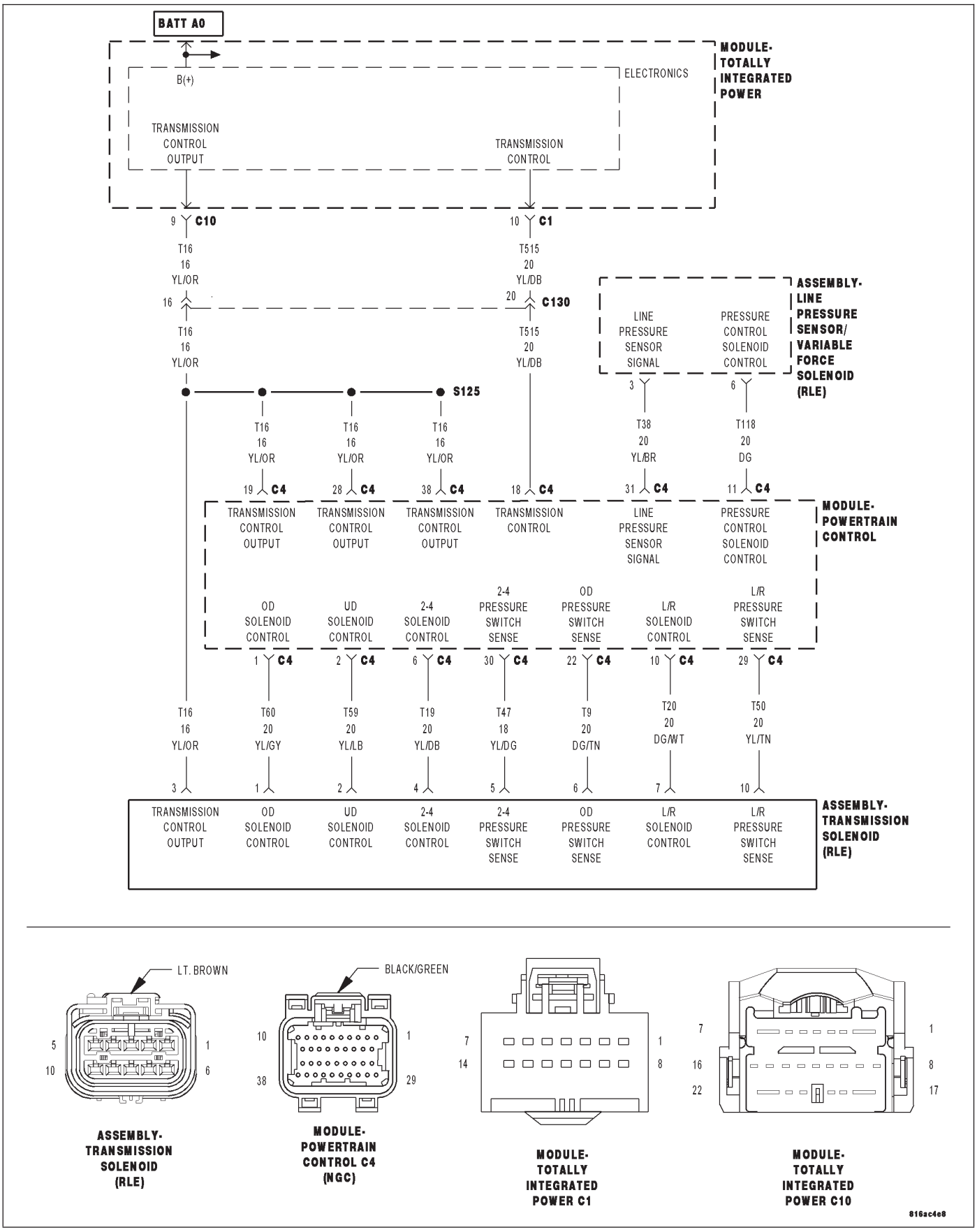
With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0841-LR PRESSURE SWITCH RATIONALITY




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Whenever the engine is running.
- **Set Condition:**
  The DTC is set if one of the pressure switches are open or closed at the wrong time in a given gear. If the problem is identified for 3 successive key starts, the transmission will go into Limp-in mode and the MIL will turn on after 10 seconds of vehicle operation.

| Possible Causes |
|---|
| RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT |
| LOSS OF PRIME DTC PRESENT |
| (T50) L/R PRESSURE SWITCH SENSE CIRCUIT OPEN |
| (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND |
| (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE |
| TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The Transmission system uses three pressure switches to monitor the fluid pressure in the LR, 2/4, and OD elements. The pressure switches are continuously monitored for the correct states in each gear. If a set condition is identified, 1st gear and torque converter lock-up (EMCC) will be inhibited. The vehicle will launch in 2nd gear and shift normally through the gears without allowing EMCC. If during the same key start, the set condition is no longer valid, the transmission will return to normal operation (1st and EMCC available). Limp-in will not occur unless DTC P0841 is accompanied by a code P0706 and the MIL will illuminate after 5 minutes of substituted operation.

**PRESSURE SWITCH STATES**

| GEAR | L/R | 2/4 | OD |
|---|---|---|---|
| R | OP | OP | OP |
| P/N | CL | OP | OP |
| 1st | CL | OP | OP |
| 2nd | OP | CL | OP |
| D | OP | OP | CL |
| OD | OP | CL | CL |

**OP = OPEN**

**CL = CLOSED**

## Diagnostic Test

### 1. DETERMINING IF RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT

With the scan tool, read TIPM DTCs.

**Are there any TIPM TCM Power Control Circuit DTCs present also?**

**Yes** >> Refer to the Transmission category and perform the appropriate symptom.

**No** >> Go To 2

## 2. CHECK FOR LOSS OF PRIME DTC

With the scan tool, check for other Transmission DTCs.

**Is the DTC P0944 present also?**

**Yes** >> Refer to the Transmission category and perform the appropriate symptom.

**No** >> Go To 3

## 3. CHECK TO SEE IF P0841 IS CURRENT

With the scan tool, view DTCs.

**Is the status active for this DTC or is the STARTS SINCE SET counter 2 or less?**

**Yes** >> Go To 4

**No** >> Go To 8

## 4. PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Pressure Switch selector to L/R.

With the scan tool , monitor the L/R Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator.

**Did the L/R Pressure Switch state change?**

**Yes** >> Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 5

## 5. (T50) L/R PRESSURE SWITCH SENSE CIRCUIT OPEN

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

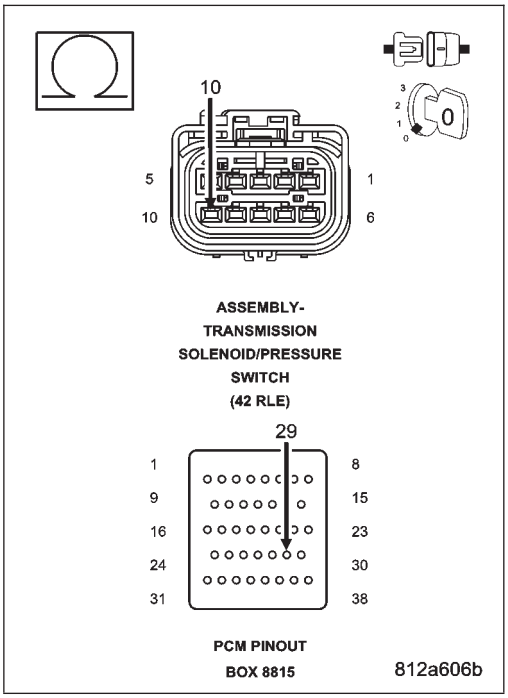
Measure the resistance of the (T50) L/R Pressure Switch Sense circuit between the Transmission Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T50) L/R Pressure Switch Sense circuit for an open.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 6




## 6. (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND

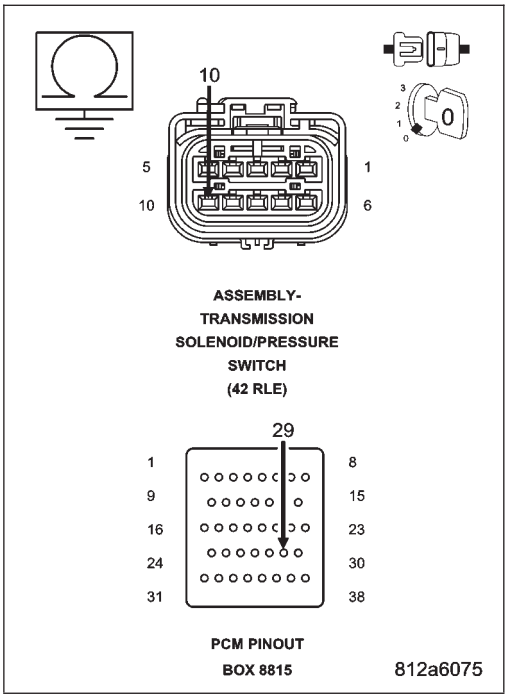
Measure the resistance between ground and the (T50) L/R Pressure Switch Sense circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (T50) L/R Pressure Switch Sense circuit for a short to ground.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 7



## 7. (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T50) L/R Pressure Switch Sense circuit.

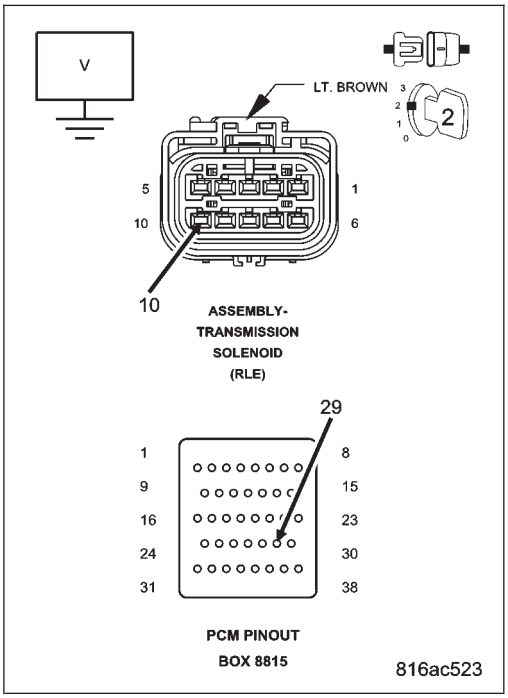
**Is the voltage above 0.5 volts?**

**Yes** >> Repair the (T50) L/R Pressure Switch Sense circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)




## 8. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

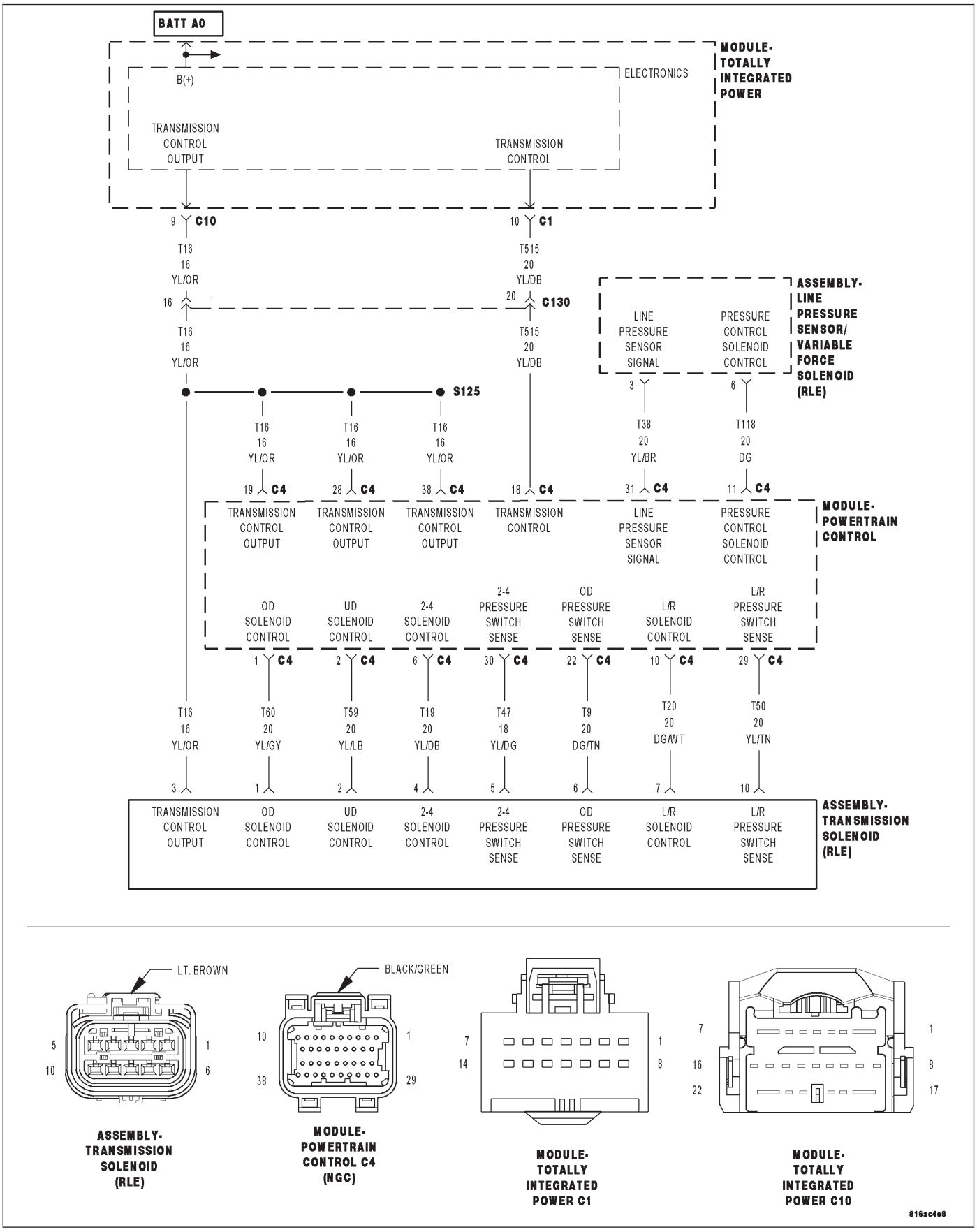
**Were there any problems found?**

**Yes** >> Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0845-2/4 HYDRAULIC PRESSURE TEST




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  In any forward gear with engine speed above 1000 RPM, shortly after a shift and every minute thereafter.
- **Set Condition:**
  After a shift into a forward gear, with engine speed greater than 1000 RPM, the PCM momentarily turns on element pressure to the clutch circuits that don't have pressure to verify that the correct pressure switch closes. If the pressure switch does not close 2 times the DTC sets

| Possible Causes |
|---|
| LOSS OF PRIME P0944 PRESENT |
| (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT OPEN |
| (T47) 2/4 PRESSURE SWITCH SENSE CIRCUIT OPEN |
| (T47) 2/4 PRESSURE SWITCH CIRCUIT SHORT TO GROUND |
| (T47) 2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE |
| TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY |
| INTERNAL TRANSMISSION |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

Pressure switches are normally off or open (no pressure applied) and read high (+12 volts). When an element is applied, the corresponding pressure switch closes to ground (0 volts) or turns on. The controller tests the OD and 24 pressure switches when they are off (when the corresponding friction element is not applied) by briefly applying the OD and 24 elements which will cause the corresponding pressure switch to close. The test verifies that the switches are operational and that the switch will close when the corresponding element is applied. If a switch fails to respond, it is re-tested. The MIL illuminates and the transmission system defaults to Limp-in mode.

## Diagnostic Test

### 1. CHECKING FOR LOSS OF PRIME DTC

With the scan tool, check for other Transmission DTCs.

**Is the DTC P0944 present also?**

**Yes** >> Refer to the Transmission category and perform the appropriate symptom.

**No** >> Go To 2

### 2. CHECK FOR RELATED TRANSMISSION DTCS

With the scan tool, read Transmission DTCs.

**Are any of the DTCs P0732, P0734 and/or P0846 present also?**

**Yes** >> Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 3

## 3. CHECK TO SEE IF DTC P0845 IS CURRENT

With the scan tool, view DTCs.

**Is the status Active for this DTC or is the STARTS SINCE SET counter 2 or less?**

**Yes** >> Go To 4

**No** >> Go To 9

## 4. PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Pressure Switch selector switch to 2/4.

With the scan tool, monitor the UD Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator.

Wiggle the wires leading to the PCM while pressing and holding the Pressure Switch Test button.

**Did the 2/4 Pressure Switch state change to closed and remain closed while wiggling the wires?**

**Yes** >> Disassemble and inspect the Valve Body per the Service Information and repair or replace as necessary. If no problems are found in the Valve Body, replace the Transmission Solenoid/Pressure Switch Assembly.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 5

## 5. (T47) 2/4 PRESSURE SWITCH SENSE CIRCUIT OPEN

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

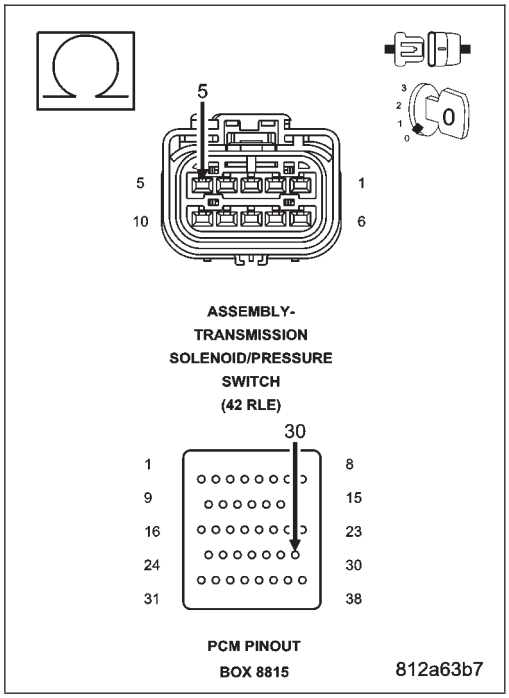
Measure the resistance of the (T47) 2/4 Pressure Switch Sense circuit between the Transmission Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T47) 2/4 Pressure Switch Sense circuit for an open.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 6



## 6. (T47) 2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND

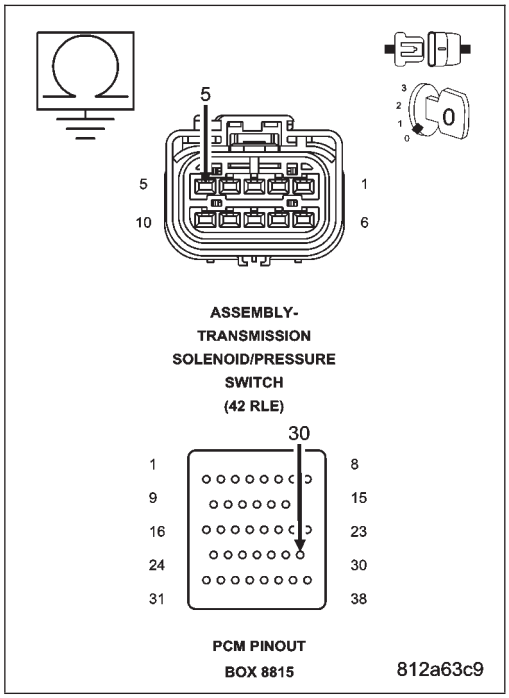
Measure the resistance between ground and the (T47) 2/4 Pressure Switch Sense circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (T47) 2/4 Pressure Switch Sense circuit for a short to ground.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 7




## 7. (T47) 2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

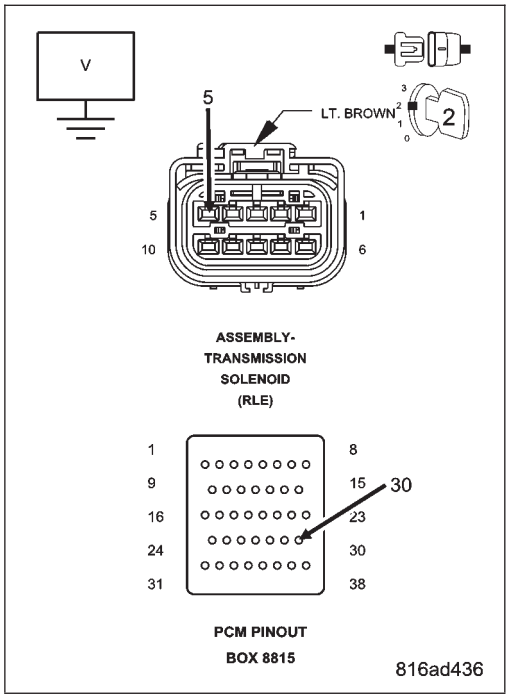
Measure the voltage of the (T47) 2/4 Pressure Switch Sense circuit.

**Is the voltage above 0.5 volts?**

**Yes** >> Repair the (T47) 2/4 Pressure Switch Sense circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 8



## 8. TRANSMISSION CONTROL OUTPUT CIRCUIT OPEN

With the scan tool under TIPM, actuate the Transmission.

Using a 12-volt test light connected to ground, check (T16) Transmission Control Relay Output circuit in the Transmission Solenoid/Pressure Switch Assembly harness connector.

**NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.**

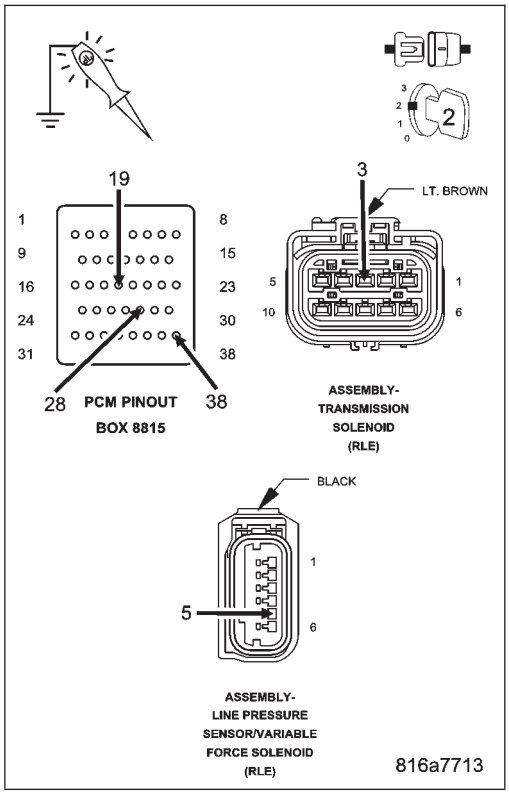
**Does the test light illuminate brightly?**

**Yes** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Repair the Transmission Control Relay Output circuit for an open or high resistance. If the fuse is open make sure to check for a short to ground.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)




## 9. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

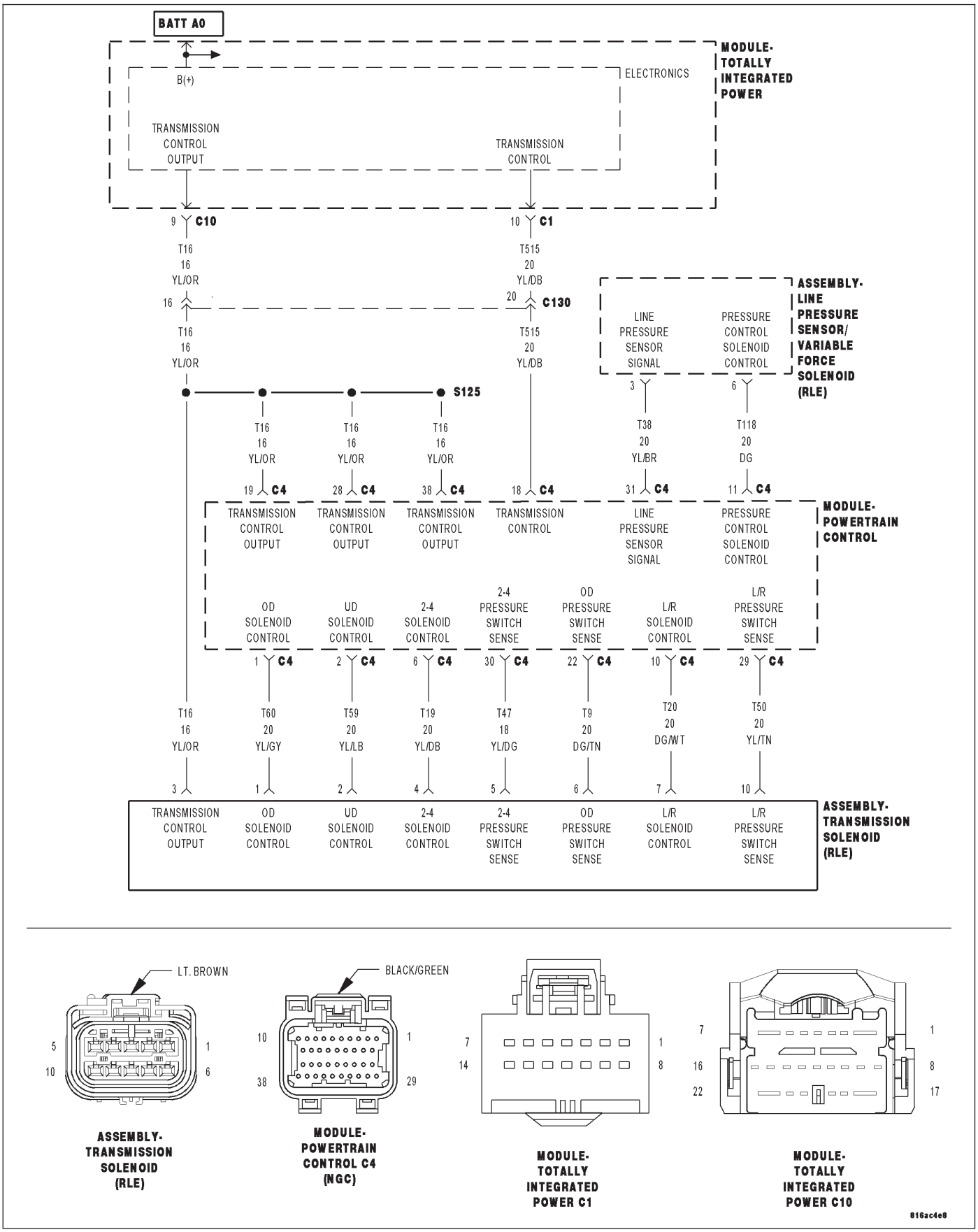
**Were there any problems found?**

**Yes** >> Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0846-2/4 PRESSURE SWITCH RATIONALITY




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Whenever the engine is running.
- **Set Condition:**
  The DTC is set if one of the pressure switches are open or closed at the wrong time in a given gear. If the problem is identified for 3 successive key starts, the transmission will go into Limp-in mode and the MIL will turn on after 10 seconds of vehicle operation.

| Possible Causes |
|---|
| RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT |
| LOSS OF PRIME DTC PRESENT |
| (T47) 2/4 PRESSURE SWITCH SENSE CIRCUIT OPEN |
| (T47) 2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND |
| (T47) 2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE |
| TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The Transmission system uses three pressure switches to monitor the fluid pressure in the LR, 2/4, and OD elements. The pressure switches are continuously monitored for the correct states in each gear. The 2/4 pressure switch monitors the fluid pressure to the 2/4 clutch to confirm proper operation of the 2/4 solenoid. If the 2/4 pressure switch is identified as closed in P or N, the code will immediately be set and normal operation will be allowed for that given key start. If the problem is identified for 3 successive ignition cycles, the transmission will go into Limp-in mode.

**PRESSURE SWITCH STATES**

| GEAR | L/R | 2/4 | OD |
|---|---|---|---|
| R | OP | OP | OP |
| P/N | CL | OP | OP |
| 1st | CL | OP | OP |
| 2nd | OP | CL | OP |
| D | OP | OP | CL |
| OD | OP | CL | CL |

**OP = OPEN**

**CL = CLOSED**

## Diagnostic Test

### 1. DETERMINING IF RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT

With the scan tool, read TIPM DTCs.

**Are there any TIPM TCM Power Control Circuit DTCs present also?**

**Yes** >> Refer to the Transmission category and perform the appropriate symptom.

**No** >> Go To 2

## 2. CHECK FOR LOSS OF PRIME DTC

With the scan tool, check for other Transmission DTCs.

**Is the DTC P0944 present also?**

**Yes** >> Refer to the Transmission category and perform the appropriate diagnostic procedure.

**No** >> Go To 3

## 3. CHECK TO SEE IF P0846 IS CURRENT

With the scan tool, view DTCs.

**Is the status Active for this DTC or is the STARTS SINCE SET counter 2 or less?**

**Yes** >> Go To 4

**No** >> Go To 8

## 4. PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Pressure Switch selector to 2/4.

With the scan tool , monitor the 2/4 Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator.

**Did the 2/4 Pressure Switch state change?**

**Yes** >> Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 5

## 5. (T47) 2/4 PRESSURE SWITCH SENSE CIRCUIT OPEN

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

**NOTE: Check connectors - Clean/repair as necessary.**

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

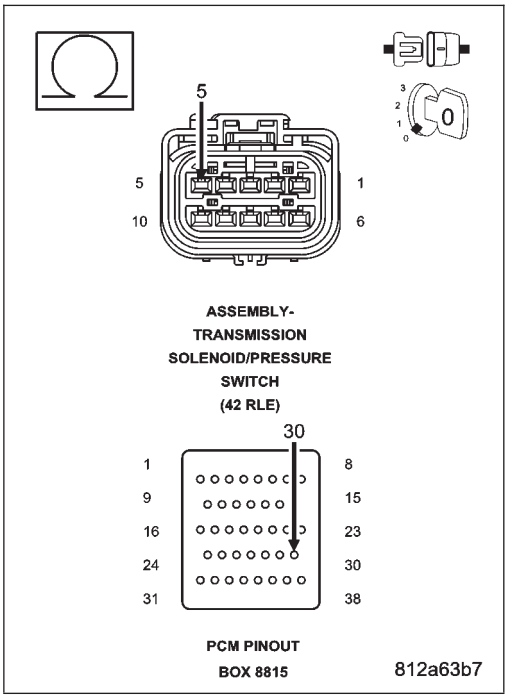
Measure the resistance of the (T47) 2/4 Pressure Switch Sense circuit between the Transmission Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T47) 2/4 Pressure Switch Sense circuit for an open.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 6




## 6. (T47) 2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND

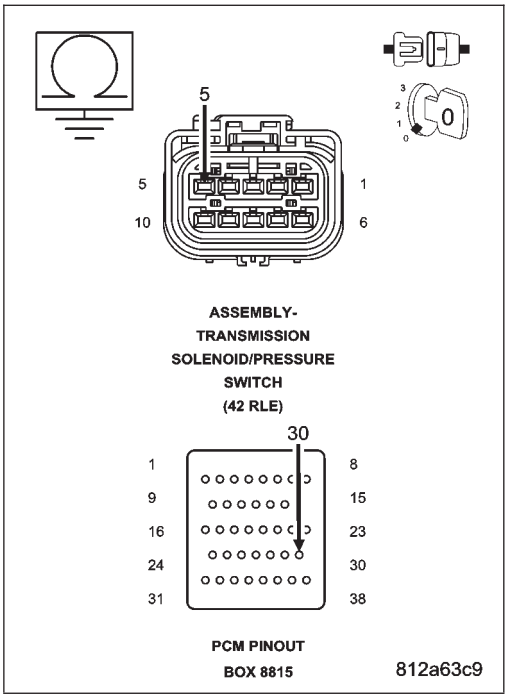
Measure the resistance between ground and the (T47) 2/4 Pressure Switch Sense circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (T47) 2/4 Pressure Switch Sense circuit for a short to ground.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 7



## 7. (T47) 2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T47) 2/4 Pressure Switch Sense circuit.

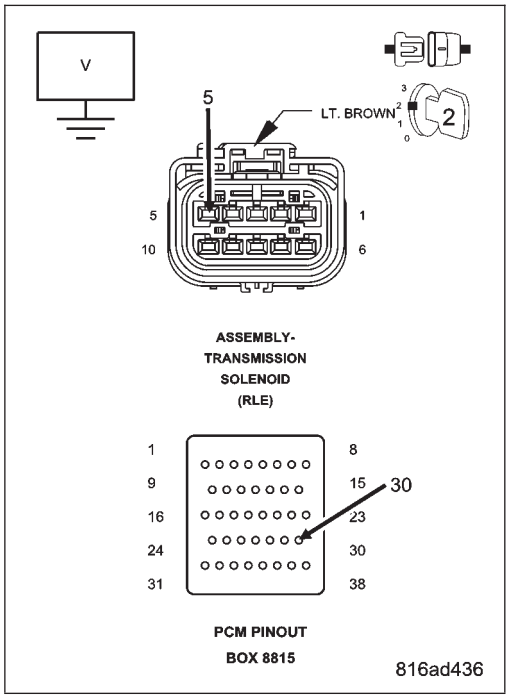
**Is the voltage above 0.5 volts?**

**Yes** >> Repair the (T47) 2/4 Pressure Switch Sense circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)




## 8. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

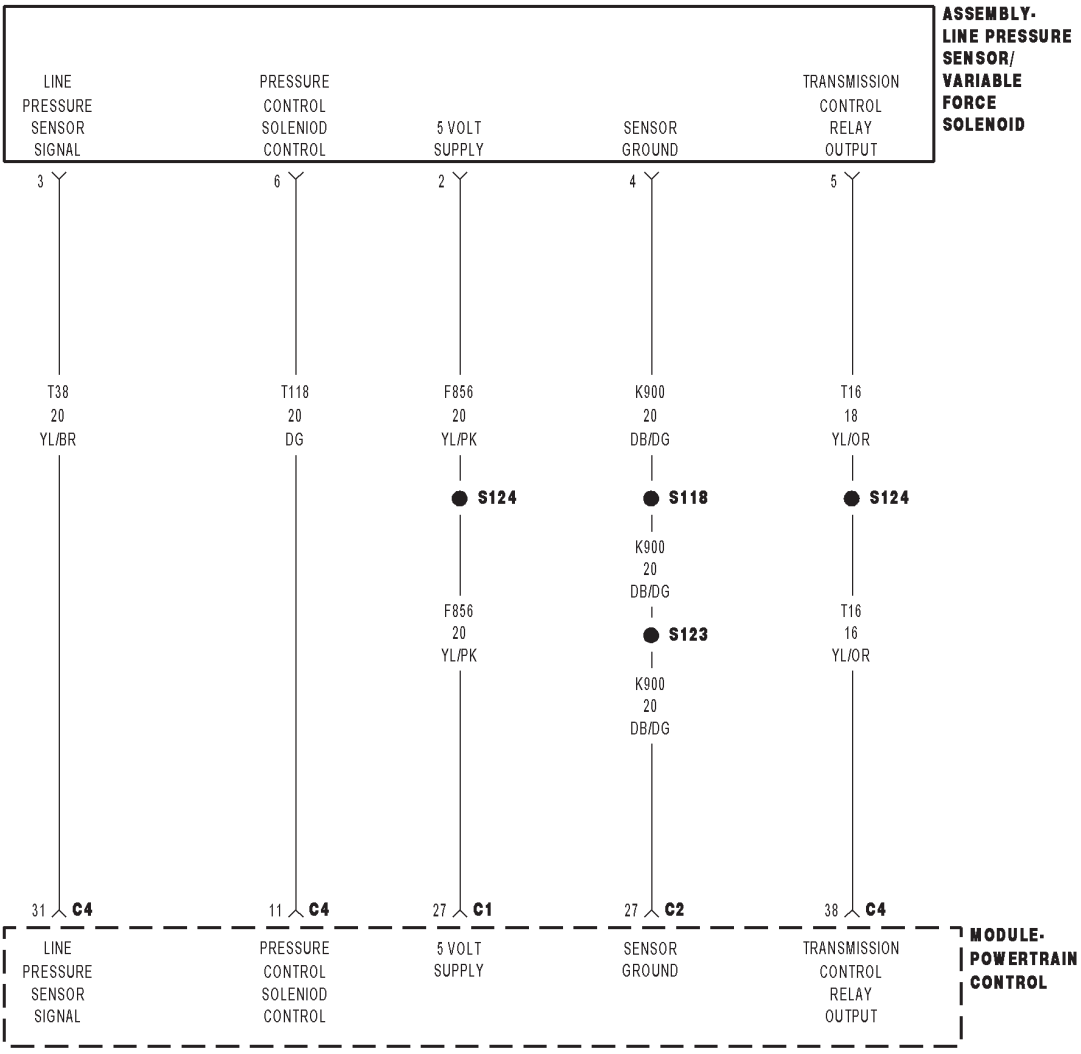
**Were there any problems found?**

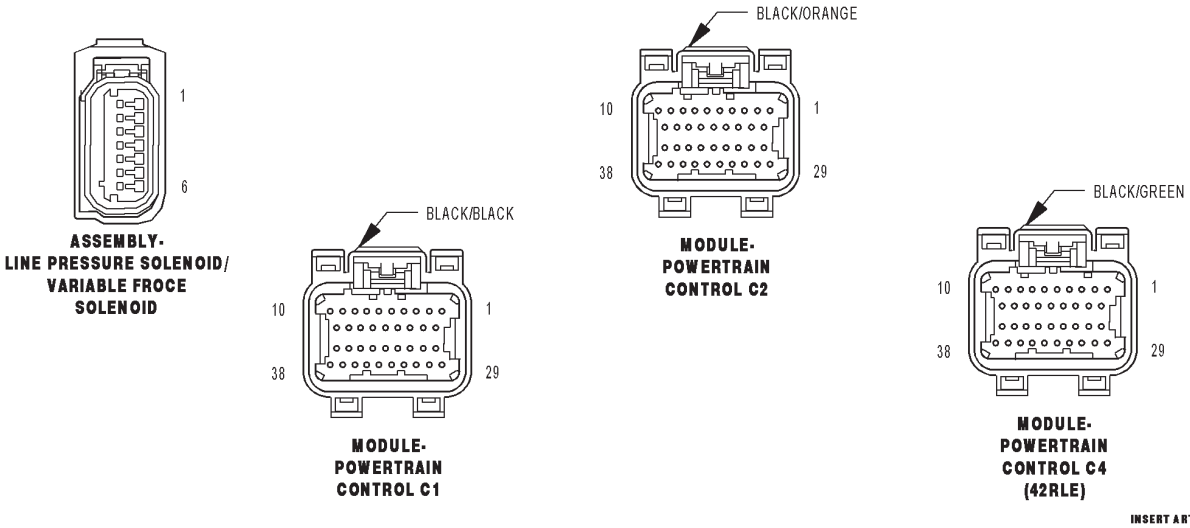
**Yes** >> Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0868-LINE PRESSURE LOW




For a complete wiring diagram **Refer to Section 8W**

- **When Monitored:**
  Continuously while driving in a forward gear.
- **Set Condition:**
  The PCM continuously monitors Actual Line Pressure and compares it to Desired Line Pressure. If the Actual Line Pressure is more than 10 psi below Desired Line Pressure, this DTC will set.

| Possible Causes |
|---|
| CHECK FOR RELATED DTC'S |
| LOW FLUID LEVEL |
| (F856) 5-VOLT SUPPLY CIRCUIT OPEN |
| (F856) 5-VOLT SUPPLY CIRCUIT SHORT TO GROUND |
| (F856) 5-VOLT SUPPLY CIRCUIT SHORT TO VOLTAGE |
| (T118) PRESSURE CONTROL SOLENOID CONTROL CIRCUIT SHORT TO ANOTHER CIRCUIT |
| INTERNAL TRANSMISSION |
| LINE PRESSURE SENSOR |
| CRACKED, PLUGGED, OR MIS-INSTALLED PRIMARY OIL FILTER |
| STUCK OR STICKING MAIN REGULATOR VALVE |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

Line pressure is measured by the Line Pressure Sensor (LPS) and regulation is achieved by changing the duty cycle of the Pressure Control Solenoid (PCS) controlled by the Transmission Control System. (5% duty cycle = solenoid off = Max line pressure, 62% duty cycle = solenoid on = Min line pressure). The Transmission Control System calculates the desired line pressure based on inputs from both the engine and transmission.

The Transmission Control System calculates torque input to the transmission and uses it as the primary input to the desired line pressure calculation. This is called Torque Based Line Pressure. In addition, the line pressure is set to a preset level 827 or 931 kPa (120 or 135 psi) during shifts and in Park and Neutral to ensure consistent shift quality. The desired line pressure is continuously being compared to the actual line pressure. If the actual line pressure is consistently lower than the target while driving, the line pressure low DTC P0868 will set.

## Diagnostic Test

### 1. CHECK FOR RELATED DTCS

With the scan tool, check for other transmission DTCs

**Is the DTC P0932 present also?**

**Yes** >> Refer to the Transmission category and perform the appropriate symptom.

**No** >> Go To 2

## 2. CHECK IF THE DTC IS CURRENT

With the scan tool, check the STARTS SINCE SET counter for P0868.

**NOTE: This counter only applies to the last DTC set.**

**Is the STARTS SINCE SET COUNTER 2 or less?**

**Yes** >> Go To 3

**No** >> Go To 10

## 3. CHECK THE PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

On the Transmission Simulator select the ″OFF″ position of the ″Input/Output Speed″ switch.

Ignition on, engine not running.

With the scan tool, monitor the Line Pressure during the following steps.

Using the Transmission Simulator, set the rotary knob to each of the 3 line pressure positions.

**NOTE: All three scan tool Line Pressure readings should be steady and ± 14 kPa or 2.0 psi of the reading specified on the Transmission Simulator.**

**Did the Line Pressure read within ± 14 kPa or 2.0 psi in all three positions?**

**Yes** >> Go To 4

**No** >> Go To 6

## 4. CHECK THE LINE PRESSURE SENSOR

Turn the ignition off to the lock position.

Disconnect the Transmission Simulator, Miller tool #8333 and reconnect all previously disconnected connectors.

Install a Pressure Gauge, 0 to 2000 kPa or 0 to 300 psi to the L/R test port.

Start the engine in park.

Monitor the line pressure readings of both the scan tool and the pressure gauge and compare the two readings.

**Is the line pressure gauge reading within 34 kPa or 5 psi of the scan tool reading?**

**Yes** >> Go To 5

**No** >> Replace the Line Pressure Sensor per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 5. CHECK FOR A PLUGGED TRANSMISSION OIL FILTER

Turn the ignition off to the lock position.

Remove and inspect the Transmission Oil Pan for excessive debris per the Service Information.

Remove and inspect the Transmission Oil Filter per the Service Information.

**Does the Oil Pan contain excessive debris and/or is the Transmission Oil Filter plugged?**

**Yes** >> Repair as necessary. If the Transmission Oil Filter is plugged or there is excessive debris, refer to the Service Information for the proper Hydraulic repair procedure.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Repair internal transmission and inspect the Transmission Oil Pump per the Service Information and replace if necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 6. CHECK THE (F856) 5-VOLT SUPPLY CIRCUIT FOR A SHORT TO VOLTAGE

Disconnect the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Reconnect all previously disconnected connectors except the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector.

Ignition on, engine not running.

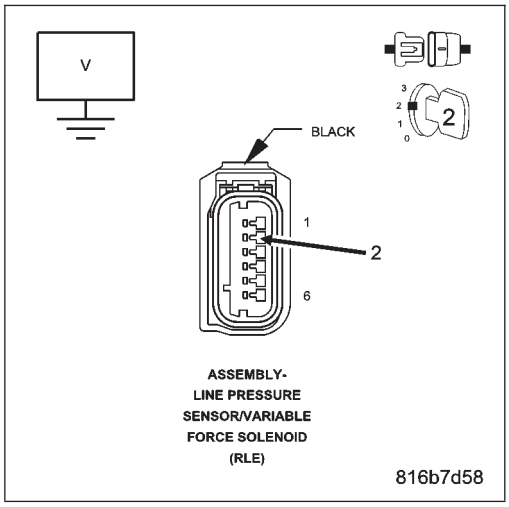
Measure the voltage of the (F856) 5-volt Supply circuit.

**Is the voltage above 5.5 volts?**

**Yes** >> Repair the (F856) 5-volt Supply circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 7



## 7. CHECK THE (F856) 5-VOLT SUPPLY CIRCUIT FOR AN OPEN

Turn the ignition off to the lock position.

Disconnect the PCM C1 harness connector and connect Miller tool #8815.

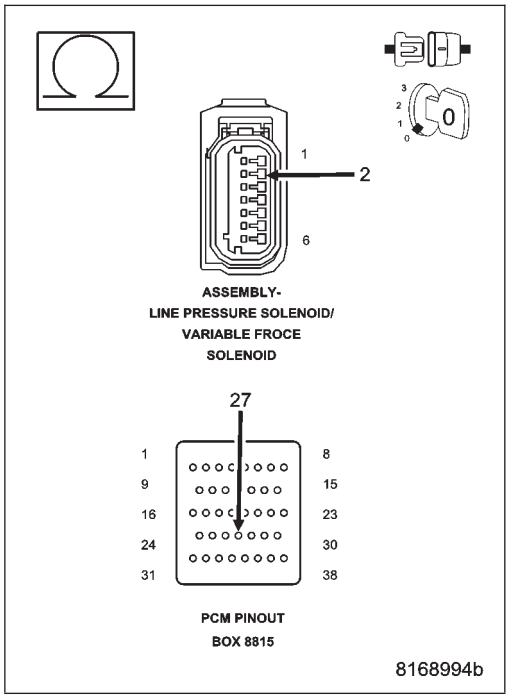
**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Measure the resistance of the (F856) 5-volt Supply circuit between the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (F856) 5-volt Supply circuit for an open.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 8



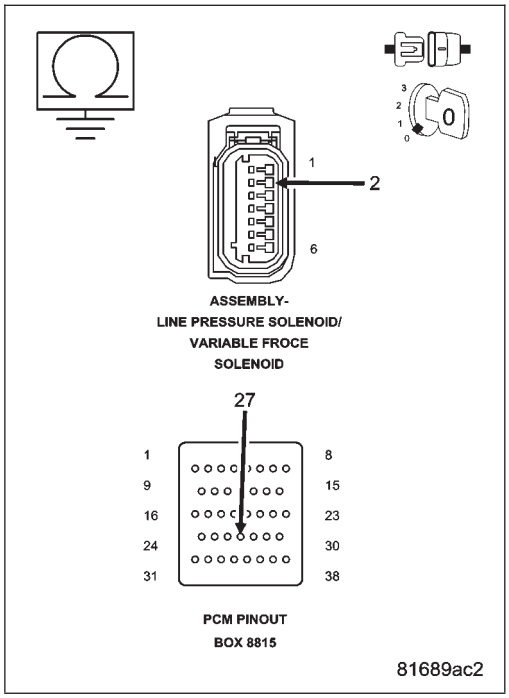

## 8. CHECK THE (F856) 5-VOLT SUPPLY CIRCUIT FOR A SHORT TO GROUND

Measure the resistance between ground and the (F856) 5-volt Supply circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (F856) 5-volt Supply circuit for a short to ground.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 9



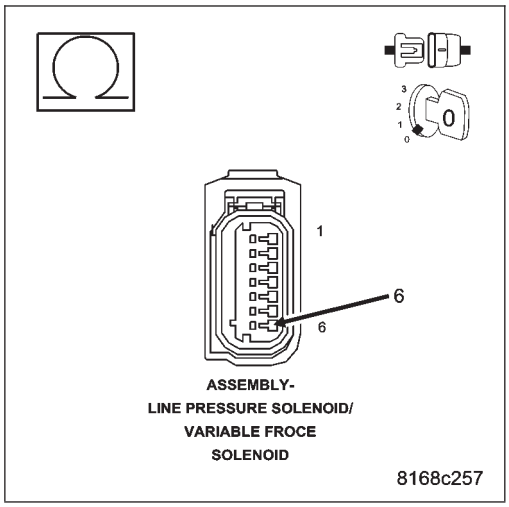
## 9. CHECK THE (T118) PRESSURE CONTROL SOLENOID CONTROL CIRCUIT FOR A SHORT TO ANOTHER CIRCUIT

Turn the ignition off to the lock position.

Disconnect the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector.

Disconnect all PCM harness connectors.

Measure the resistance between the (T118) Pressure Control Solenoid Control circuit and all other circuits in the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector.




**Is the resistance below 5.0 ohms between the (T118) Pressure Control Solenoid Control circuit and any other circuit(s) in the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector?**

**Yes** >> Repair the (T118) Pressure Control Solenoid Control circuit for a short to another circuit(s).

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 10. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

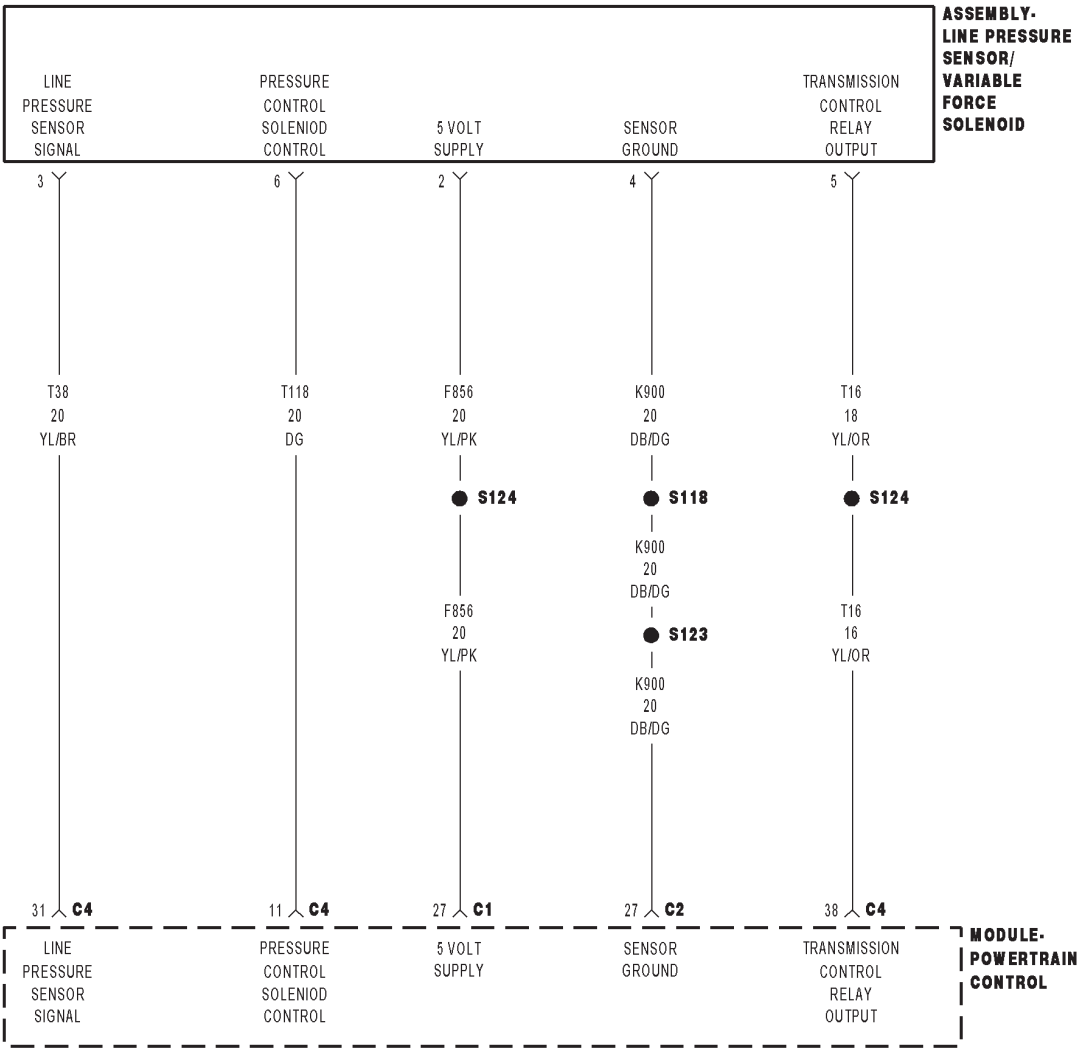
**Where there any problems found?**

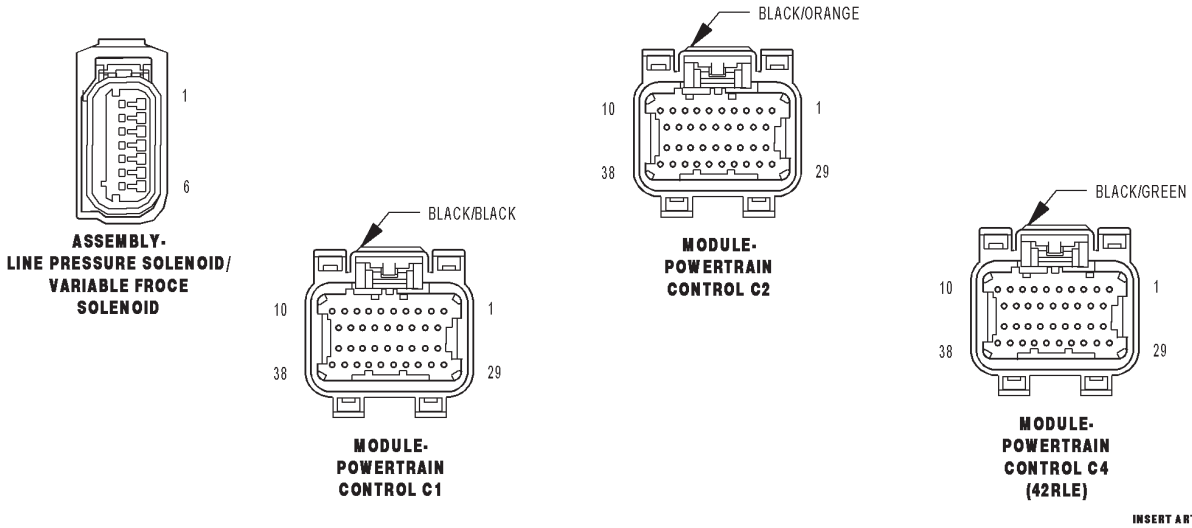
**Yes** >> Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0869-LINE PRESSURE HIGH




For a complete wiring diagram **Refer to Section 8W**

- **When Monitored:**
  Continuously while driving in a forward gear.
- **Set Condition:**
  The PCM continuously monitors Actual Line Pressure. If the Actual Line Pressure reading is greater than the highest Desired Line Pressure ever used in the current gear, while the Pressure Control Solenoid duty cycle is at or near its maximum value (which should result in minimum line pressure), the DTC will set.

| Possible Causes |
|---|
| (F856) 5-VOLT SUPPLY CIRCUIT OPEN |
| LINE PRESSURE SENSOR CONNECTION |
| (T118) PRESSURE CONTROL SOLENOID CONTROL CIRCUIT OPEN |
| (F856) 5-VOLT SUPPLY CIRCUIT SHORT TO GROUND |
| (T118) PRESSURE CONTROL SOLENOID CONTROL CIRCUIT SHORT TO GROUND |
| TRANSMISSION CONTROL OUTPUT CIRCUIT |
| LINE PRESSURE SENSOR |
| STUCK OR STICKING MAIN REGULATOR VALVE |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

Line pressure is measured by the Line Pressure Sensor (LPS) and regulation is achieved by changing the duty cycle of the Pressure Control Solenoid (PCS) controlled by the Transmission Control System. (5% duty cycle = solenoid off = Max line pressure, 62% duty cycle = solenoid on = Min line pressure). The Transmission Control System calculates the desired line pressure based on inputs from both the engine and transmission.

The Transmission Control System calculates torque input to the transmission and uses it as the primary input to the desired line pressure calculation. This is called Torque Based Line Pressure. In addition, the line pressure is set to a preset level 827 or 931 kPa (120 or 135 psi) during shifts and in Park and Neutral to ensure consistent shift quality. The desired line pressure is continuously being compared to the actual line pressure. If the actual line pressure is consistently higher than the highest desired line pressure ever used in the current gear, the line pressure high DTC P0869 will set.

## Diagnostic Test

### 1. CHECK FOR RELATED DTC'S

With the scan tool, check for other Transmission DTC's

**Are there any line pressure sensor or transmission relay output DTCs present also?**

**Yes** >> Refer to the Transmission category and perform the appropriate symptom.

**No** >> Go To 2

### 2. CHECK IF THE DTC IS CURRENT

With the scan tool, check the STARTS SINCE SET counter for P0869.

**Is the STARTS SINCE SET COUNTER 2 or less?**

**Yes** >> Go To 3

**No** >> Go To 9

## 3. CHECK THE PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

With the Transmission Simulator select the ″OFF″ position on the ″Input/Output Speed″ switch.

Ignition on, engine not running.

With the scan tool, monitor the Line Pressure during the following step.

Using the Transmission Simulator, set the rotary switch to each of the 3 line pressure positions.

**NOTE: All three scan tool Line Pressure readings should be steady and ± 14 kPa or 2.0 psi of the reading specified on the Transmission Simulator.**

**Did the Line Pressure read within ± 14 kPa or 2.0 psi in all three positions?**

**Yes** >> Go To 4

**No** >> Go To 5

## 4. CHECK THE LINE PRESSURE SENSOR CALIBRATION

Turn the ignition off to the lock position.

Disconnect the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit and reconnect all previously disconnected connectors.

Install the Line Pressure Gauge, Miller tool #C-3293, 0 to 2000 kPa or 0 to 300 psi in the L/R pressure port.

Start the engine in park.

Monitor the Line Pressure readings on the scan tool and the pressure gauge.

Compare the Line Pressure readings between the scan tool and the pressure gauge.

**Is the pressure gauge reading within 34 kPa or 5 psi of the scan tool reading?**

**Yes** >> Repair the internal transmission and inspect the Transmission Oil Pump per the Service Information and replace if necessary. If no problem is found, replace the Pressure Control Solenoid.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Replace the Line Pressure Sensor per the Service information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 5. CHECK THE (T118) PRESSURE CONTROL SOLENOID CONTROL CIRCUIT FOR AN OPEN

Turn the ignition off to the lock position.

Disconnect the Transmission Simulator, Miller tool #8333.

Disconnect the Powertrain Control Module C4 harness connector.

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

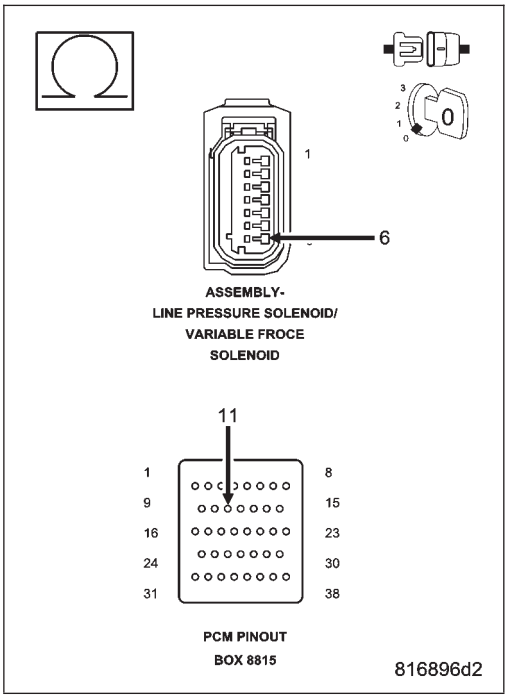
Measure the resistance of the (T118) Pressure Control Solenoid Control circuit between the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T118) Pressure Control Solenoid Control circuit for an open.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 6




## 6. CHECK THE (T118) PRESSURE CONTROL SOLENOID CONTROL CIRCUIT FOR A SHORT TO GROUND

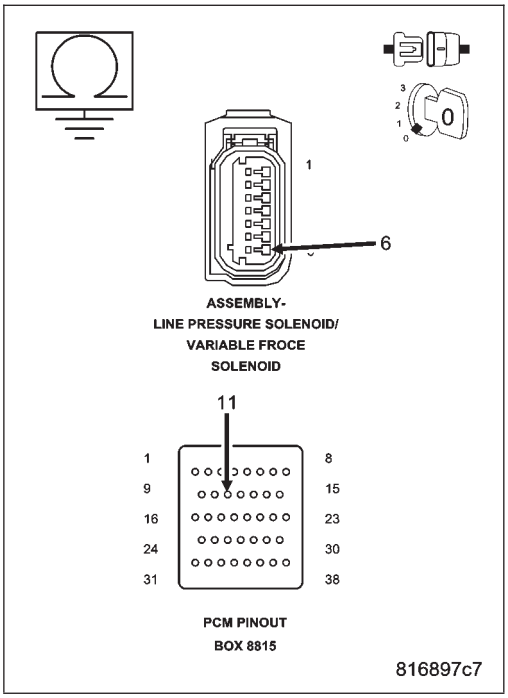
Measure the resistance between ground and the (T118) Pressure Control Solenoid Control circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (T118) Pressure Control Solenoid Control circuit for a short to ground.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 7



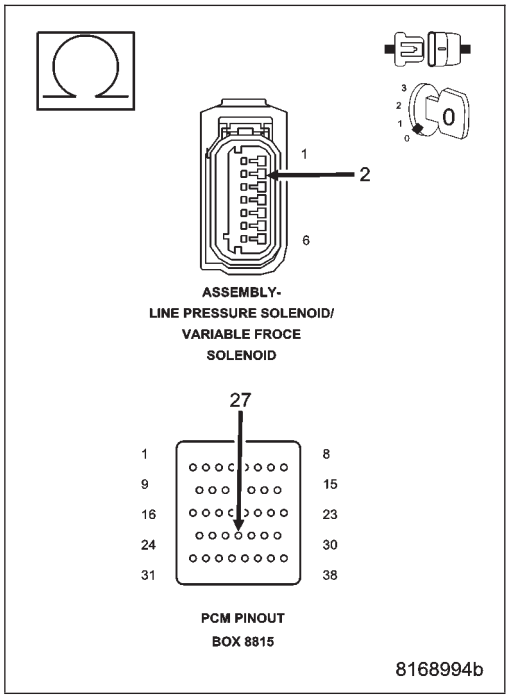
## 7. CHECK THE (F856) 5-VOLT SUPPLY CIRCUIT FOR AN OPEN

Measure the resistance of the (F856) 5-volt Supply circuit between the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (F856) 5-volt Supply circuit for an open.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 8




## 8. CHECK THE (F856) 5-VOLT SUPPLY CIRCUIT FOR A SHORT TO GROUND

Disconnect the PCM C1 harness connector.

Disconnect the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector.

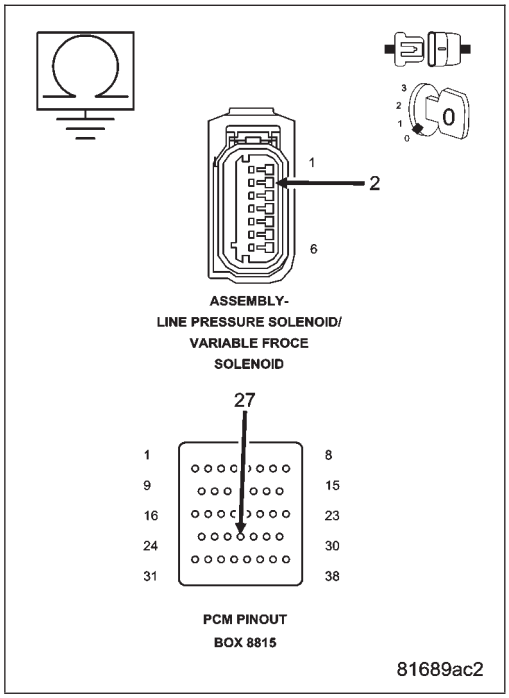
**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Measure the resistance between ground and the (F856) 5-volt Supply circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (F856) 5-volt Supply circuit for a short to ground.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)



## 9. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

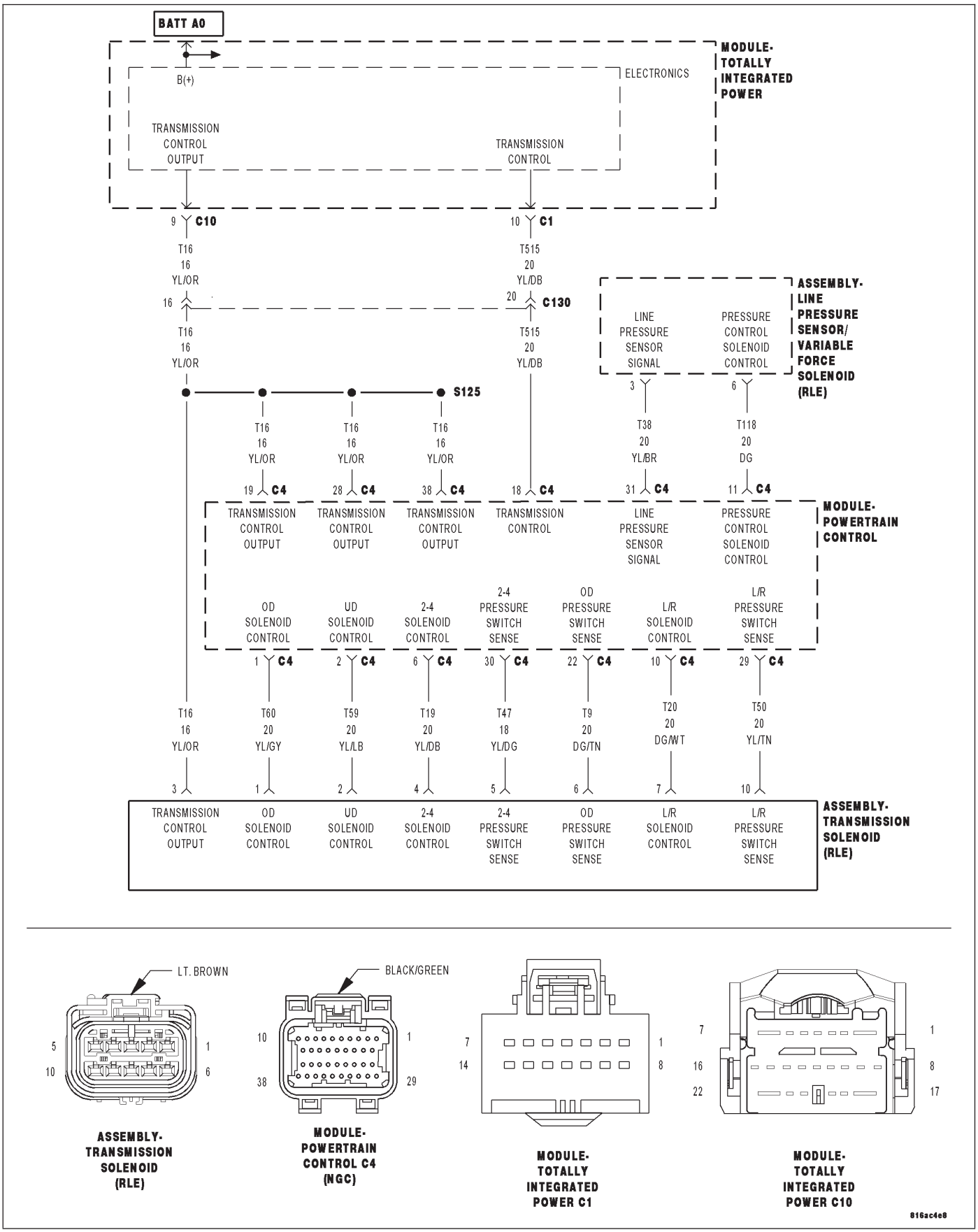
With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

**Where there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0870-OD HYDRAULIC PRESSURE TEST




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  In any forward gear with engine speed above 1000 RPM, shortly after a shift and every minute thereafter.
- **Set Condition:**
  After a shift into a forward gear, with engine speed greater than 1000 RPM, the PCM momentarily turns on element pressure to the clutch circuits that don't have pressure to identify the correct pressure switch closes. If the pressure switch does not close 2 times the DTC sets.

| Possible Causes |
|---|
| LOSS OF PRIME P0944 PRESENT |
| (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT OPEN |
| (T9) OD PRESSURE SWITCH SENSE CIRCUIT OPEN |
| (T9) OD PRESSURE SWITCH CIRCUIT SHORT TO GROUND |
| (T9) OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE |
| TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY |
| INTERNAL TRANSMISSION |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

Pressure switches are normally off or open (no pressure applied) and read high (+12 volts). When an element is applied, the corresponding pressure switch closes to ground (0 volts) or turns on. The controller tests the OD and 2/4 pressure switches when they are off (when the corresponding friction element is not applied) by briefly applying the OD and 2/4 elements which will cause the corresponding pressure switch to close. The test verifies that the switches are operational and that the switch will close when the corresponding element is applied. If a switch fails to respond, it is re-tested. The MIL illuminates and the transmission system defaults to Limp-in mode.

## Diagnostic Test

### 1. CHECKING FOR LOSS OF PRIME DTC

With the scan tool, check for other Transmission DTCs.

**Is the DTC P0944 present also?**

**Yes** >> Refer to the Transmission category and perform the appropriate diagnostic procedure.

**No** >> Go To 2

### 2. CHECK FOR RELATED TRANSMISSION DTCS

With the scan tool, read Transmission DTCs.

**Are any of the DTCs P0732, P0734 and/or P0846 present also?**

**Yes** >> Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 3

## 3. CHECK TO SEE IF DTC P0870 IS CURRENT

With the scan tool, view DTCs.

**Is the status Active for this DTC or is the STARTS SINCE SET counter 2 or less?**

**Yes** >> Go To 4

**No** >> Go To 9

## 4. PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Pressure Switch selector switch to OD.

With the scan tool, monitor the UD Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator.

Wiggle the wires leading to the PCM while pressing and holding the Pressure Switch Test button.

**Did the OD Pressure Switch state change to closed and remain closed while wiggling the wires?**

**Yes** >> Disassemble and inspect the Valve Body per the Service Information and repair or replace as necessary. If no problems are found in the Valve Body, replace the Transmission Solenoid/Pressure Switch Assembly.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 5

## 5. (T9) OD PRESSURE SWITCH SENSE CIRCUIT OPEN

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

**NOTE: Check connectors - Clean/repair as necessary.**

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

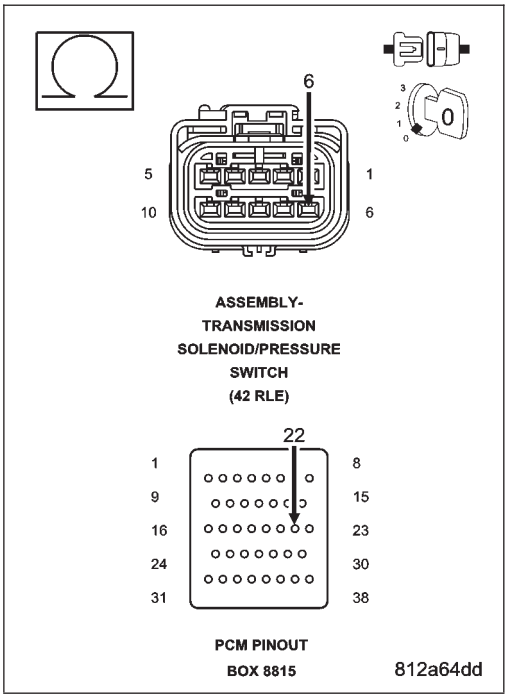
Measure the resistance of the (T9) OD Pressure Switch Sense circuit between the Transmission Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T9) OD Pressure Switch Sense circuit for an open.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 6



## 6. (T9) OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND

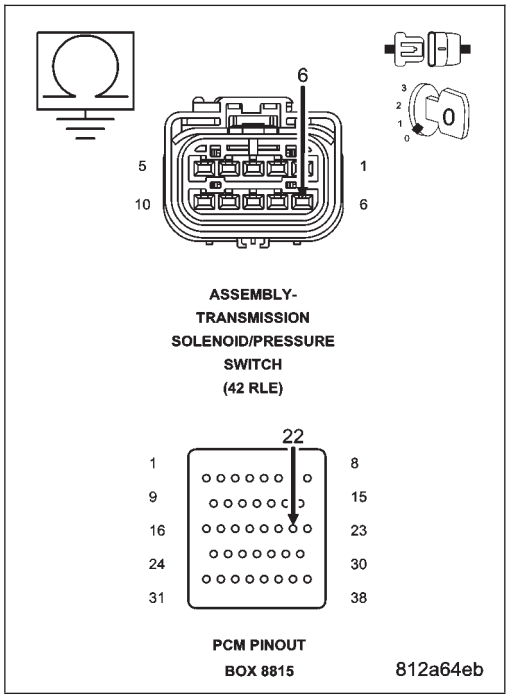
Measure the resistance between ground and the (T9) OD Pressure Switch Sense circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (T9) OD Pressure Switch Sense circuit for a short to ground.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 7




## 7. (T9) OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

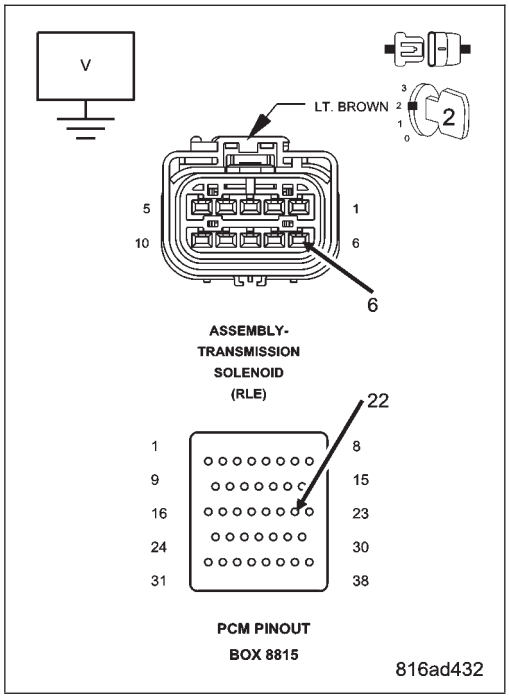
Measure the voltage of the (T9) OD Pressure Switch Sense circuit.

**Is the voltage above 0.5 volts?**

**Yes** >> Repair the (T9) OD Pressure Switch Sense circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 8



## 8. (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT OPEN

With the scan tool under TIPM, actuate the Transmission.

Using a 12-volt test light connected to ground, check (T16) Transmission Control Output circuit in the Transmission Solenoid/Pressure Switch Assembly harness connector.

**NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.**

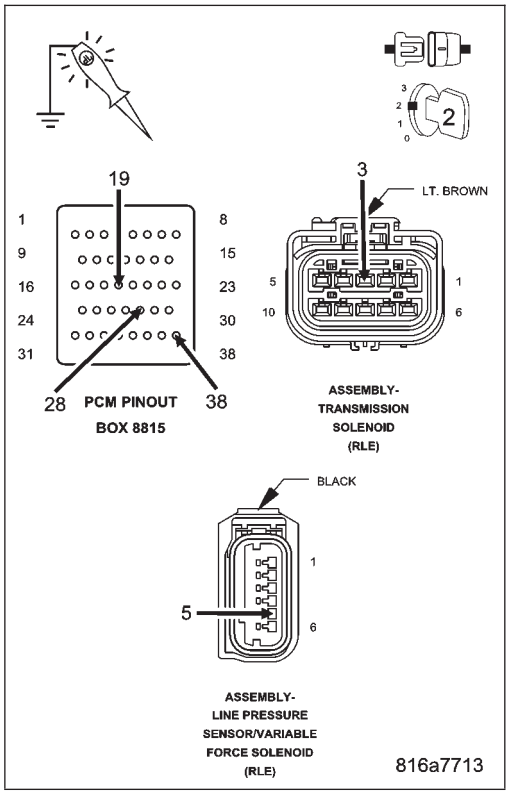
**Does the test light illuminate brightly?**

**Yes** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Repair the (T16) Transmission Control Relay Output circuit for an open. If the fuse is open make sure to check for a short to ground.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)




## 9. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

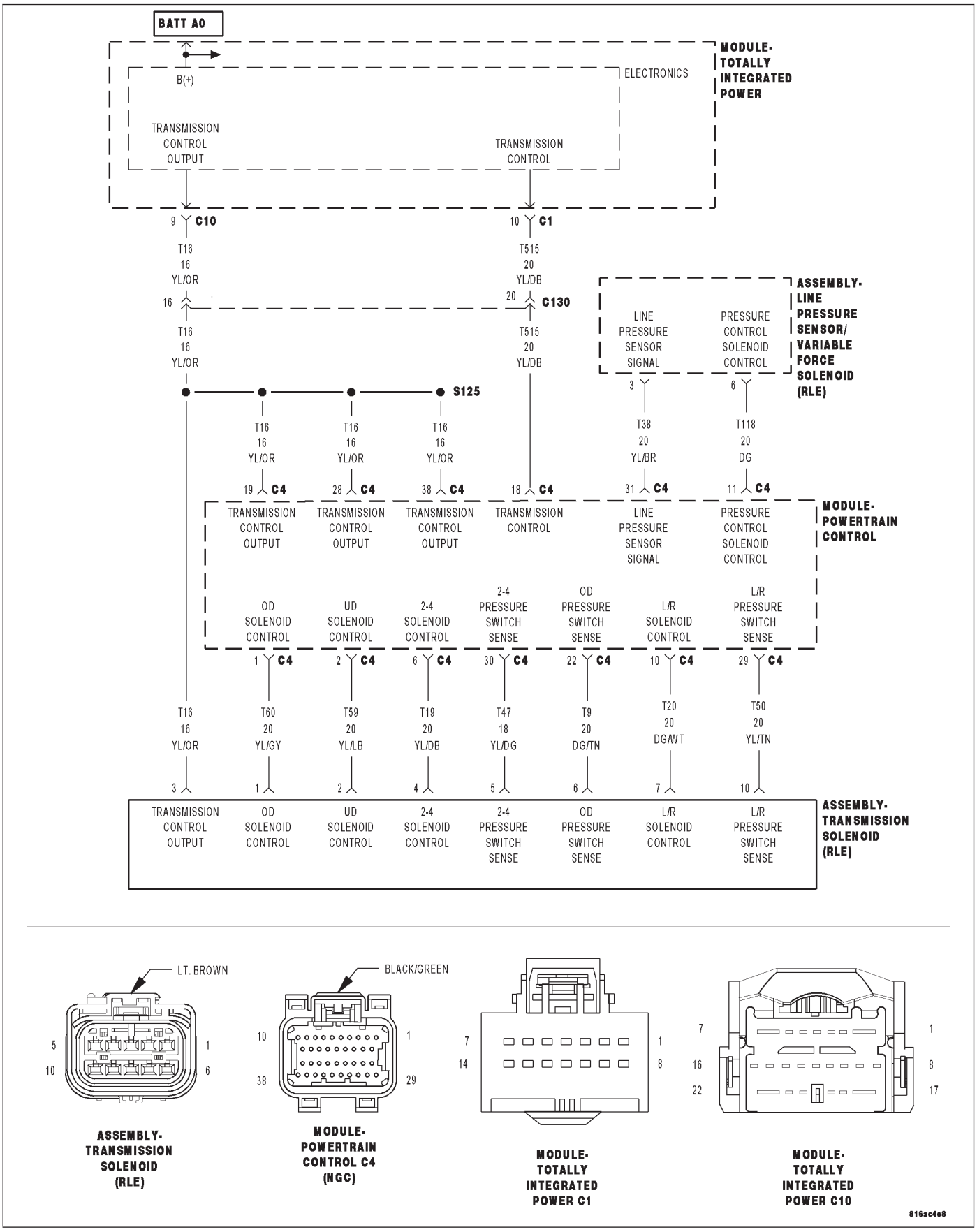
**Were there any problems found?**

**Yes** >> Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0871-OD PRESSURE SWITCH RATIONALITY




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Whenever the engine is running.
- **Set Condition:**
  The DTC is set if one of the pressure switches are open or closed at the wrong time in a given gear. If the problem is identified for 3 successive key starts, the transmission will go into Limp-in mode and the MIL will turn on after 10 seconds of vehicle operation.

| Possible Causes |
|---|
| RELATED TIPM TCM POWER INPUT DTCS PRESENT |
| LOSS OF PRIME DTC PRESENT |
| (T9) OD PRESSURE SWITCH SENSE CIRCUIT OPEN |
| (T9) OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND |
| (T9) OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE |
| TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The Transmission system uses three pressure switches to monitor the fluid pressure in the LR, 2/4, and OD elements. The pressure switches are continuously monitored for the correct states in each gear. Normal operation will be experienced if no other codes are present. Transmission Control System will ignore the code. Limp-in condition will only occur if DTC P0871 is present with a DTC P0706.

**PRESSURE SWITCH STATES**

| GEAR | L/R | 2/4 | OD |
|---|---|---|---|
| R | OP | OP | OP |
| P/N | CL | OP | OP |
| 1st | CL | OP | OP |
| 2nd | OP | CL | OP |
| D | OP | OP | CL |
| OD | OP | CL | CL |

**OP = OPEN**

**CL = CLOSED**

## Diagnostic Test

### 1. CHECK FOR TIPM TCM POWER INPUT DTCS

With the scan tool under TIPM, check for TCM Power Input DTCs.

**Are there any TIPM TCM Power Input DTCs present?**

**Yes** >> Refer to the Transmission category and perform the appropriate diagnostic procedure.

**No** >> Go To 2

## 2. CHECK FOR LOSS OF PRIME DTC

With the scan tool, check for other Transmission DTCs.

**Is the DTC P0944 present also?**

**Yes** >> Refer to the Transmission category and perform the appropriate diagnostic procedure.

**No** >> Go To 3

## 3. CHECK TO SEE IF P0841 IS CURRENT

With the scan tool, view DTCs.

**Is the status Active for this DTC or is the STARTS SINCE SET counter 2 or less?**

**Yes** >> Go To 4

**No** >> Go To 8

## 4. PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Pressure Switch selector to OD.

With the scan tool , monitor the OD Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator.

**Did the OD Pressure Switch state change?**

**Yes** >> Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 5

## 5. (T9) OD PRESSURE SWITCH SENSE CIRCUIT OPEN

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

**NOTE: Check connectors - Clean/repair as necessary.**

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Tool #8815 to perform diagnosis.**

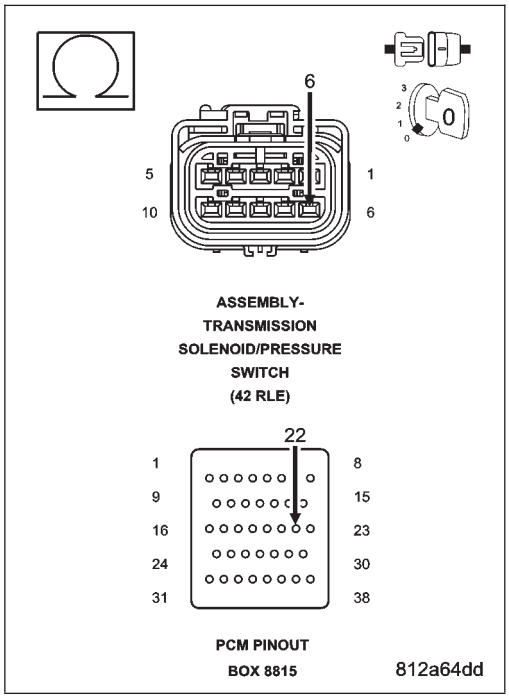
Measure the resistance of the (T9) OD Pressure Switch Sense circuit between the Transmission Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T9) OD Pressure Switch Sense circuit for an open.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 6




## 6. (T9) OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND

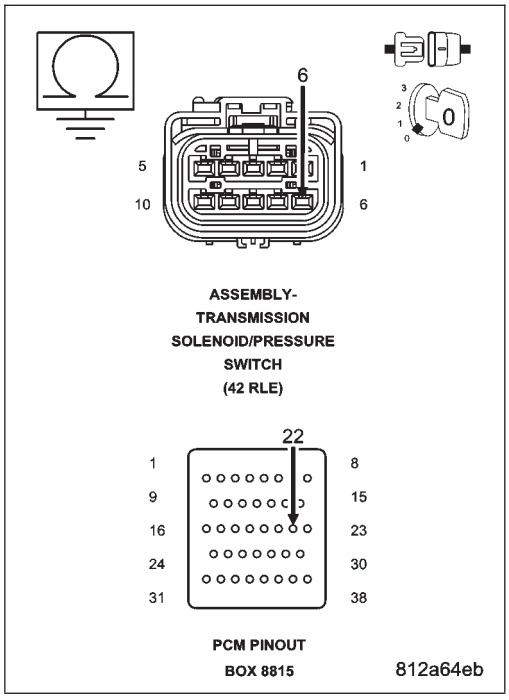
Measure the resistance between ground and the (T9) OD Pressure Switch Sense circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (T9) OD Pressure Switch Sense circuit for a short to ground.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 7



## 7. (T9) OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T9) OD Pressure Switch Sense circuit.

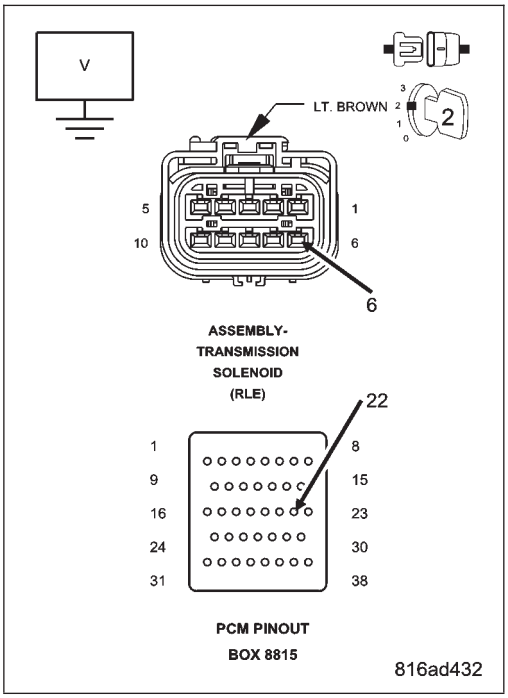
**Is the voltage above 0.5 volts?**

**Yes** >> Repair the (T9) OD Pressure Switch Sense circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)




## 8. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

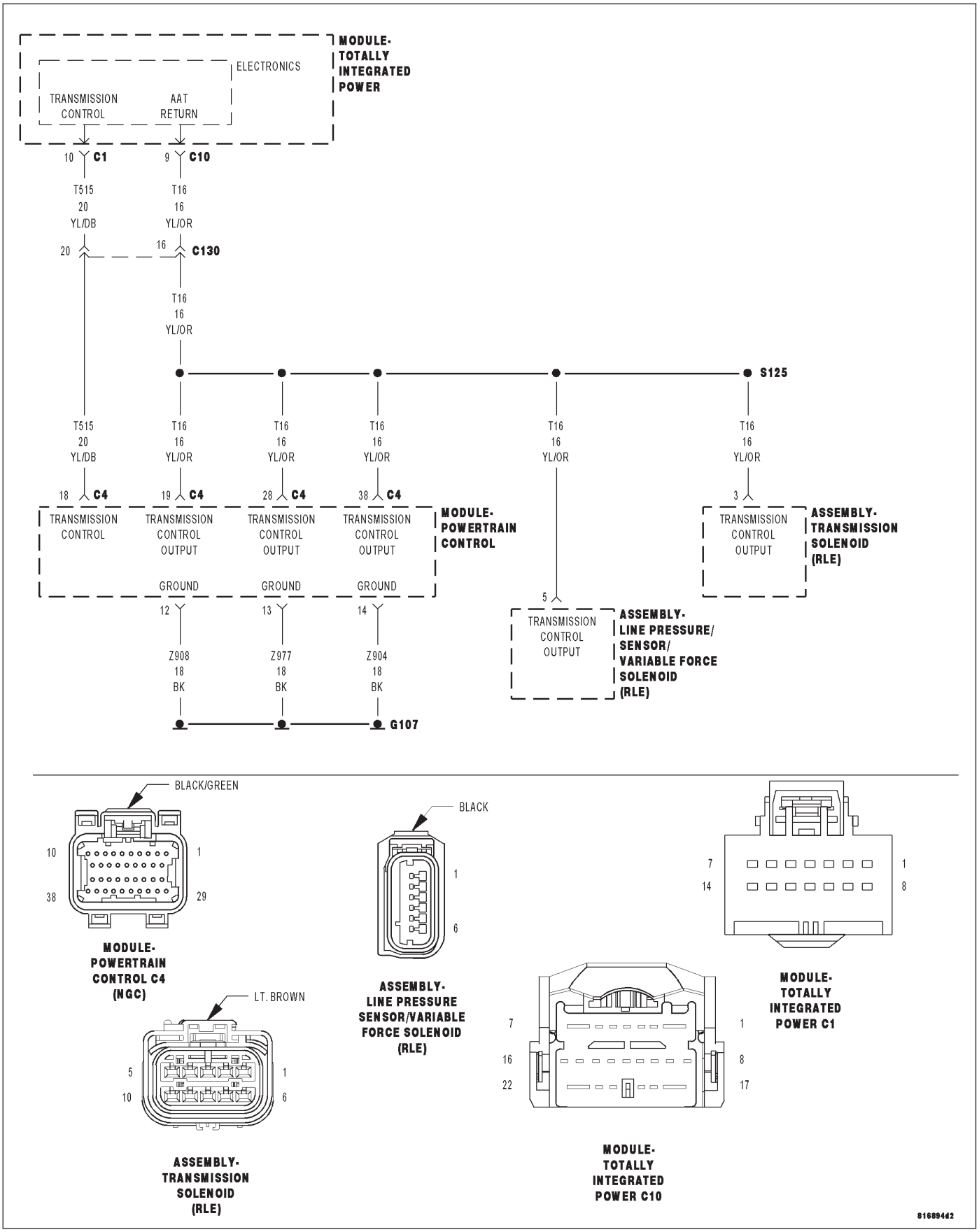
**Were there any problems found?**

**Yes** >> Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0882-TCM POWER INPUT LOW




For a complete wiring diagram **Refer to Section 8W**

- **When Monitored:**
  When the ignition is turned from ″OFF″ position to ″RUN″ position and/or the ignition is turned from ″START″ position to ″RUN″ position.
- **Set Condition:**
  This DTC is set when there is less than 3.0 volts present at the transmission control output circuits located in the Powertrain Control Module (PCM) when the Transmission Control System request the power up of those circuits. **Note: Due to the integration of the Transmission Control Module and the Powertrain Control Module, both systems have their own power and ground circuits.**.

| Possible Causes |
|---|
| RELATED TIPM DTCS |
| (T515) TRANSMISSION CONTROL CIRCUIT SHORT TO GROUND |
| (T515) TRANSMISSION CONTROL CIRCUIT OPEN |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The Transmission Control Output circuit is used to supply power to the Transmission Solenoid/TRS Assembly and to the PCM when in normal operating mode. The purpose of the Transmission Output circuit is to allow the Transmission Control System to turn off the power to the Transmission Solenoid/TRS Assembly in event that the transmission should need to be placed into “limp-in” mode due to a DTC.

After a PCM reset, (ignition switch turned to the run position, or after cranking the engine) the Transmission Control System verifies that the Transmission Output circuit is open by checking for voltage on the Transmission Output circuits before the Transmission Control System request for the circuit to be powered up. The request is sent by a direct circuit control from the PCM to the TIPM. If the Transmission Control System detects less that 3.0 volts when the output is commanded on, the DTC will set.**Note: Inadequate Transmission Control Output voltage can also cause DTCs P0846, P0869, or P0871 to set. Repairing the P0882 fault should also eliminate the related DTCs.**

## Diagnostic Test

### 1. CHECK IF THE DTC P0882 IS CURRENT

With the scan tool, Check the STARTS SINCE SET counter for P0882.

**NOTE: This counter only applies to the last DTC set.**

**Is the STARTS SINCE SET counter equal to 0?**

**Yes** >> Go To 2

**No** >> Go To 5

### 2. CHECK FOR TIPM RELATED DTCS

With the scan tool, check TIPM DTCs.

**Are there any TIPM TCM Power Control circuit DTCs present?**

**Yes** >> Refer to the Transmission category and perform the appropriate symptom.

**No** >> Go To 3

## 3. CHECK THE (T515) TRANSMISSION CONTROL CIRCUIT FOR A SHORT TO GROUND

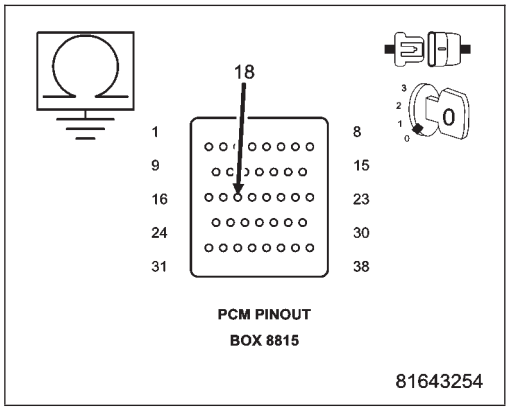
Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector and connect Miller tool #8815.

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Disconnect the TIPM C1 harness connector.

Measure the resistance between ground and the (T515) Transmission Control circuit.




**Is the resistance below 5.0 ohms?**

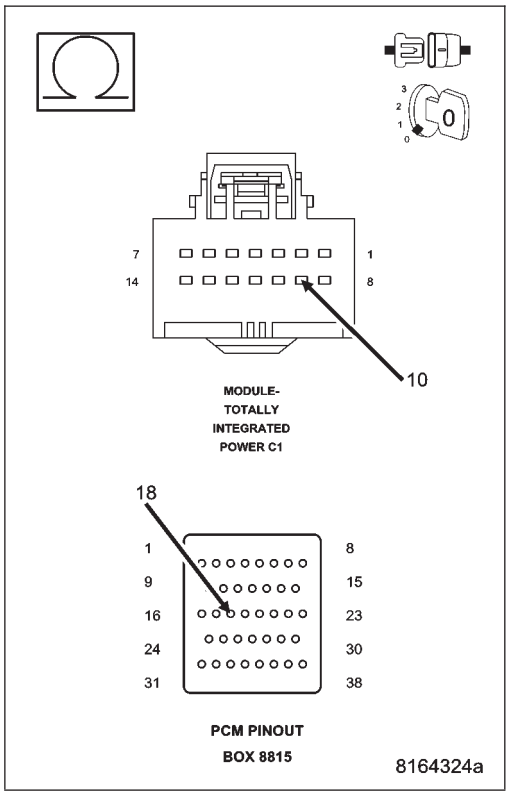
**Yes** >> Repair the (T515) Transmission Control circuit for a short to ground.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 4

## 4. CHECK THE (T515) TRANSMISSION CONTROL CIRCUIT FOR AN OPEN

Measure the resistance of the (T515) Transmission Control circuit between the TIPM C1 harness connector and the appropriate terminal of Miller tool #8815.




**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T515) Transmission Control circuit for an open.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 5. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

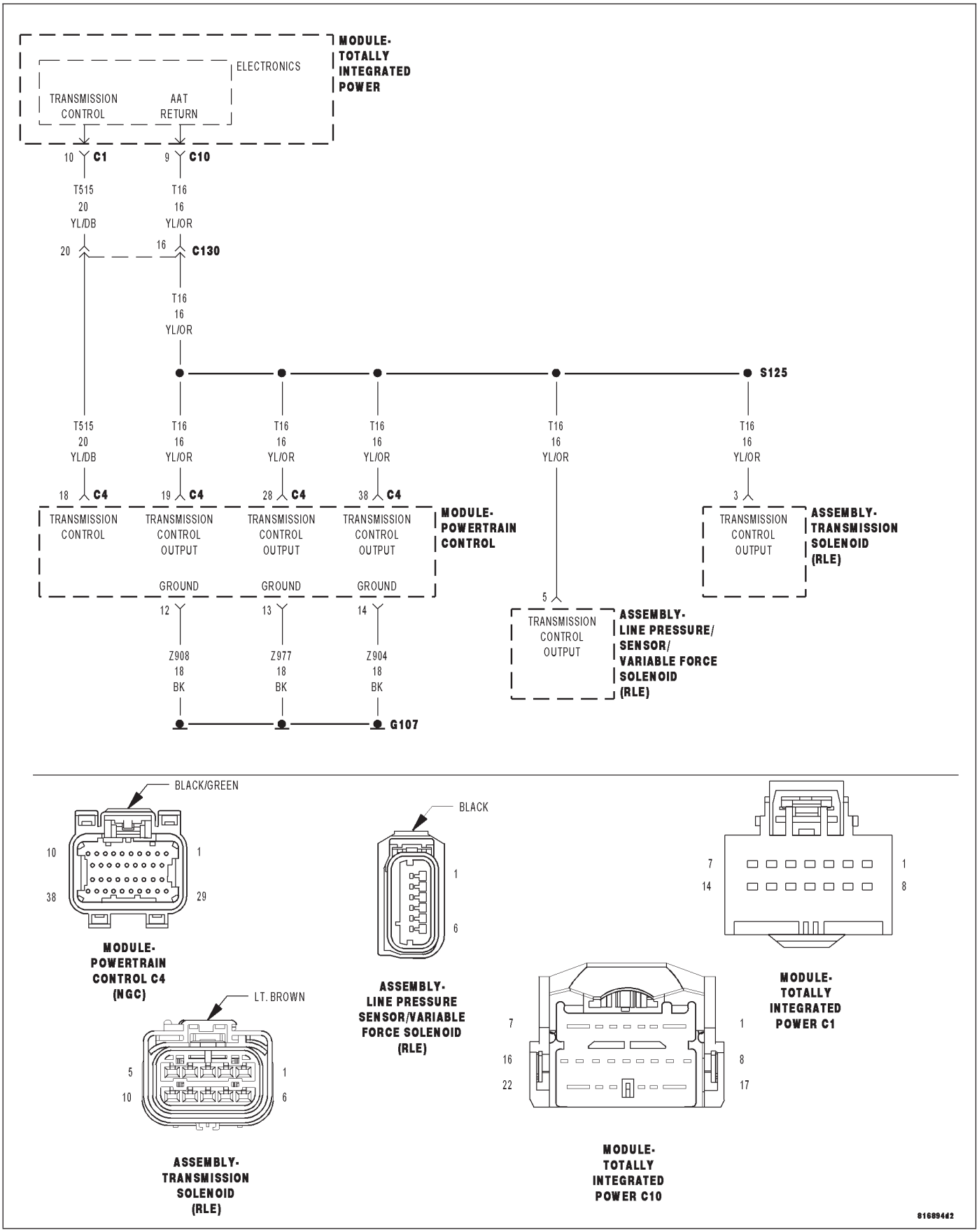
With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

**Where there any problems found?**

**Yes** >> Repair as necessary.
Perform 45RFE/545RFE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 45RFE/545RFE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0883-TCM POWER INPUT HIGH




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  When the ignition is turned from ″OFF″ position to ″RUN″ position and/or the ignition is turned from ″START″ position to ″RUN″ position.
- **Set Condition:**
  This DTC is set if the Powertrain Control Module senses greater than 3.0 volts on the Transmission Control Relay Output circuits prior to a request from the PCM to TIPM to energize the Transmission Output circuits.

| Possible Causes |
|---|
| TIPM DTCS PRESENT |
| (T515) TRANSMISSION CONTROL CIRCUIT SHORT TO VOLTAGE |
| (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT SHORT VOLTAGE |
| TRANSMISSION SOLENOID/TRS ASSEMBLY |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The Transmission Control Output circuit is used to supply power to the Transmission Solenoid/TRS Assembly and to the PCM when in normal operating mode. The purpose of the Transmission Output circuit is to allow the Transmission Control System to turn off the power to the Transmission Solenoid/TRS Assembly in event that the transmission should need to be placed into “limp-in” mode due to a DTC.

After a PCM reset, (ignition switch turned to the run position, or after cranking the engine) the Transmission Control System verifies that the Transmission Output circuit is open by checking for voltage on the Transmission Output circuits before the Transmission Control System request for the circuit to be powered up. The request is sent by a direct circuit control from the PCM to the TIPM. If voltage is detected on the Transmission Output circuits before the request is sent, the DTC will set.

## Diagnostic Test

### 1. CHECK FOR TCM TIPM DTCS

With the scan tool under TIPM, check for TCM Power Control circuit DTCs.

**Are there any TIPM TCM Power Control circuit DTCS present?**

**Yes** >> Refer to the Transmission category and perform the appropriate symptom.

**No** >> Go To 2

### 2. CHECK TO SEE IF DTC P0883 IS CURRENT

With the scan tool, check the STARTS SINCE SET counter.

**NOTE: This counter only applies to the last DTC set.**

**Is the STARTS SINCE SET counter set to 0?**

**Yes** >> Go To 3

**No** >> Go To 6

## 3. (T16) TRANSMISSION OUTPUT CIRCUIT SHORT TO VOLTAGE

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector and connect Miller tool #8815.

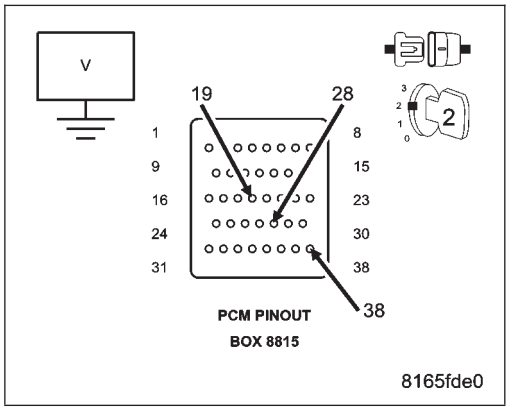
Disconnect the TIPM C10 harness connector.

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Ignition on, engine not running.

Measure the voltage of the (T16) Transmission Control Output circuits in the Miller tool #8815.

**Is the voltage above 0.5 volts on any (T16) Transmission Control Output circuit?**




**Yes** >> Go To 4

**No** >> Go To 5

## 4. CHECK THE TRANSMISSION SOLENOID/TRS ASSEMBLY

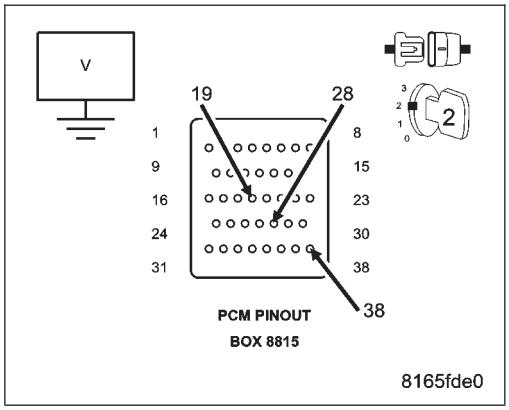
Turn the ignition off to the lock position.

Disconnect the Transmission Solenoid/TRS Assembly harness connector.

Ignition on, engine not running.

Measure the voltage of the (T16) Transmission Control Output circuits in the Miller tool #8815.

**Is the voltage above 0.5 volts?**




**Yes** >> Repair the (T16) Transmission Control Output circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

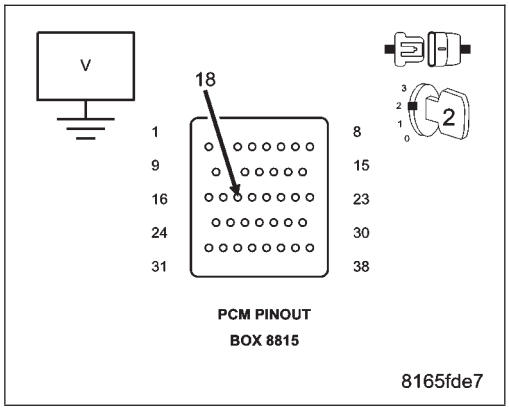
**No** >> Replace the Transmission Solenoid/TRS Assembly per the Service Information.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 5. CHECK THE (T515) TRANSMISSION CONTROL CIRCUIT FOR A SHORT TO VOLTAGE

Measure the voltage of the (T515) Transmission Control circuit.

**Is the voltage above 0.5 volts?**




**Yes** >> Repair the (T515) Transmission Control circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM

per the Service Information. With the scan tool, perform QUICK LEARN

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 6. CHECK WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

**Where there any problems found?**

**Yes** >> Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0884-POWER UP AT SPEED

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  One time after each controller reset. Note: the Transmission Control Module is integrated with Powertrain Control Module. The Transmission Control Module has separate powers and grounds specifically to its portion of the PCM.
- **Set Condition:**
  This DTC will set if the PCM powers up and senses the vehicle in a valid forward gear (no PRNDL DTCs) with a output speed above 800 RPM, approximately 32 Kmh or 20 mph.

| Possible Causes |
|---|
| INTERMITTENT POWER AND GROUND CIRCUITS |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

If a vehicle loses power to the PCM, the vehicle will go to the 2nd gear mode since there is no power available to control the transmission solenoids. However if power is restored, the PCM will power-up and normal operation will be restored. This DTC identifies that power to the PCM was restored when the gear selector was in a ″Drive″ position while the vehicle was moving at speeds above 32 Kmh (20 mph). If a customer shifts to Neutral and cycles the ignition key and quickly shifts to ″Drive″ while moving before the PCM comes out of its START ROUTINE, the DTC can be set. Therefore it is critical that this DTC diagnosis repair procedure should only be used if the vehicle is experiencing intermittent 2nd gear operation and subsequently a return to normal operation during normal driving. The transmission will not be placed in Limp-in. This is an informational DTC to be used when attempting to diagnose an intermittent 2nd gear operation and subsequent return to normal transmission operation.

## Diagnostic Test

### 1. CHECK THE POWER AND GROUND CIRCUITS

This DTC is set when the PCM is initialized while the vehicle is moving in a valid forward gear. This is usually caused by a momentary loss of power to the Transmission portion of the PCM.

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

**NOTE: Due to the integration of the Powertrain and Transmission Control Modules, the transmission part of the PCM has its own specific power and ground circuits.**

Check all of the Fused B(+), Fused Ignition Switch Output, and Ground circuits related to the PCM for an intermittent open or short to ground.

Perform a wiggle test on all wiring and connectors pertaining to the PCM while looking for shorted or open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

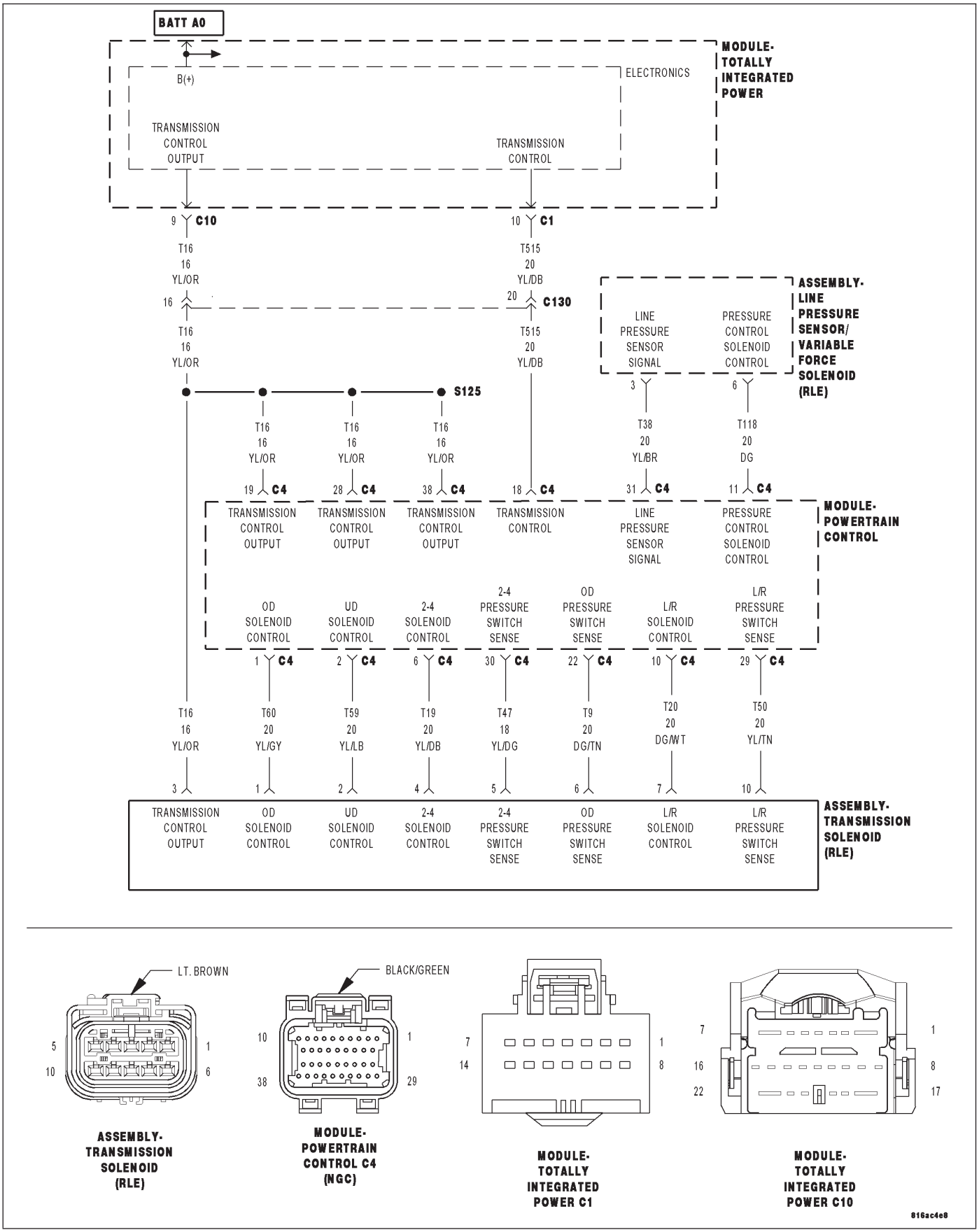
**If there are no possible causes remaining, view repair.**

**Repair**

Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## P0890-SWITCHED BATTERY




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  One time after a reset (ignition key turned to the RUN position or after cranking engine).
- **Set Condition:**
  A fault is set if voltage greater than 4.5 volts is detected for 7 msec on any of the pressure switch circuits before the relay is energized. The transmission is placed in Limp-In. The MIL is on after 10 seconds. of vehicle operation.

| Possible Causes |
| --- |
| (T47) 2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE |
| (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE |
| (T9) OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The transmission relay is used to supply power to the solenoid pack when in normal operating mode and to turn off power to produce transmission ″limp-in″ mode. The relay output (which supplies power to the solenoid pack) is fed back to the controller. It is referred to as SWITCHED BATTERY. After a controller reset (ignition key turned to the RUN position or after cranking engine), the controller verifies that the relay contacts are open by checking for no voltage on Switched battery line (transmission control relay output) before the relay is energized. After switched battery is verified for no voltage, the voltage of each of the solenoid pack pressure switches is also checked. Since the solenoid pack is not powered up, there should be no voltage on any of the pressure switches.

## Diagnostic Test

### 1. CHECK TO SEE IF DTC P0890 IS PRESENT

With the scan tool, view DTCs.

**Is the status Active for this DTC or is the STARTS SINCE SET counter set at 0?**

**Yes** >> Go To 2

**No** >> Go To 5

## 2. (T9) OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.**

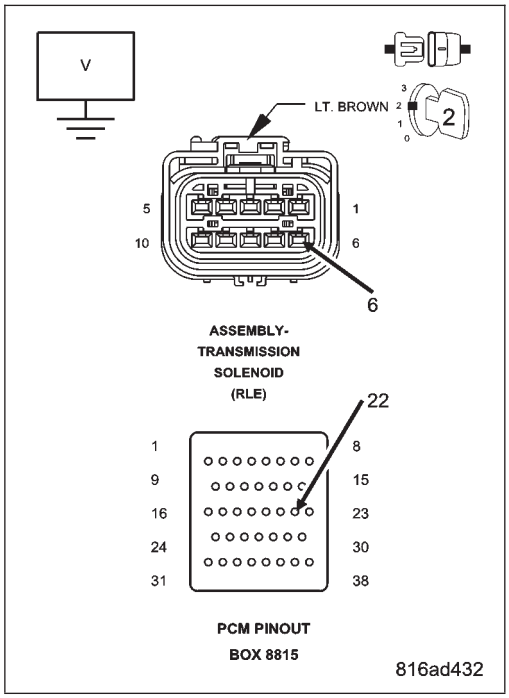
Measure the voltage of the (T9) OD Pressure Switch Sense circuit.

**Is the voltage above 0.5 volt?**

**Yes** >> Repair the (T9) OD Pressure Switch Sense circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 3




## 3. (T47) 2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE

With the scan tool under TIPM, actuate the Transmission.

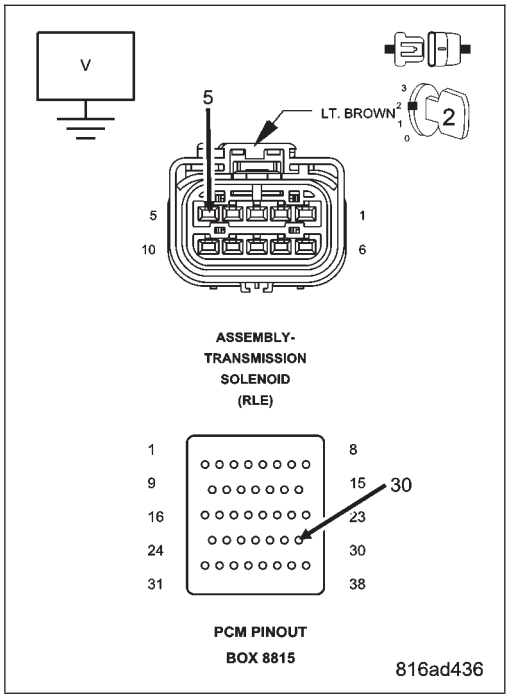
Measure the voltage of the (T47) 2/4 Pressure Switch Sense circuit.

**Is the voltage above 0.5 volt?**

**Yes** >> Repair the (T47) 2/4 Pressure Switch Sense circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 4



## 4. (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T50) L/R Pressure Switch Sense circuit.

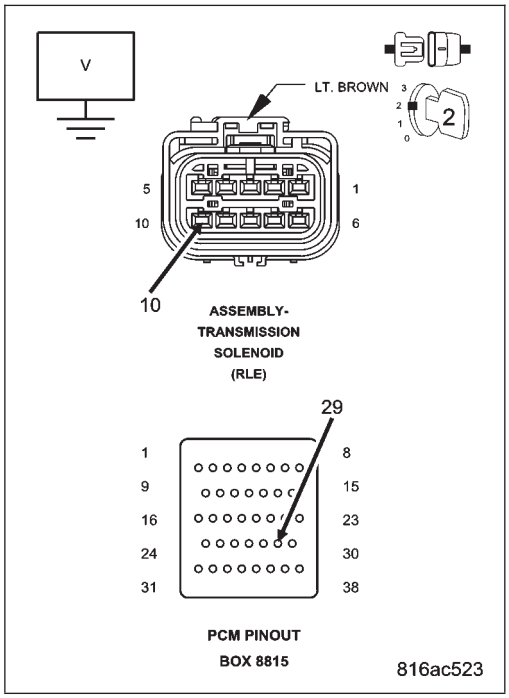
**Is the voltage above 0.5 volts?**

**Yes** >> Repair the (T50) L/R Pressure Switch Sense circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)




## 5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wiring and connectors while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

**Were there any problems found?**

**Yes** >> Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0897-TRANSMISSION FLUID DETERIORATED

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Each transition from full EMCC to partial EMCC for A/C bump prevention.
- **Set Condition:**
  DTC set if 20 occurrences of a turbine acceleration sum. Fault Set Time: 20 transitions from full EMCC to partial EMCC. Transmission will not use partial EMCC. Established for A/C bump prevention.

| Possible Causes |
|---|
| WORN OUT/ BURNT TRANSAXLE FLUID |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

To prevent a bump due to A/C clutch engagement, a temporary torque converter partial EMCC condition is established prior to A/C clutch engagement. A message is received over the bus indicating that A/C clutch engagement is imminent. Partial EMCC is then established and a reply message, ″OK to engage A/C clutch″ is sent via the bus. Partial EMCC will be held for 450 ms before returning to full EMCC. During the transition from full to partial EMCC, a turbine acceleration sum is calculated, if this value exceeds a threshold value for several transitions, degraded transmission fluid is indicated.

## Diagnostic Test

### 1. WORN OUT/ BURNT TRANSMISSION FLUID

Turn the ignition off to the lock position.

Flush the Transmission Oil Cooler and lines, replace the Transmission Oil Filter, refill with new Transmission Fluid, start the engine, and adjust the fluid per the Service Information.

**NOTE: The Transmission Cooler must be flushed before proceeding.**
Allow the engine to idle for 10 minutes, in Park.

Turn the ignition off to the lock position.

Again, flush the Transmission Oil Cooler and lines, replace the Transmission Oil Filter, refill with new Transmission Fluid, start the engine, and adjust the fluid per the Service Information.

With the scan tool, perform a Battery Disconnect.

**NOTE: The Battery Disconnect must be done to re-enable EMCC during an A/C Clutch engagement.**

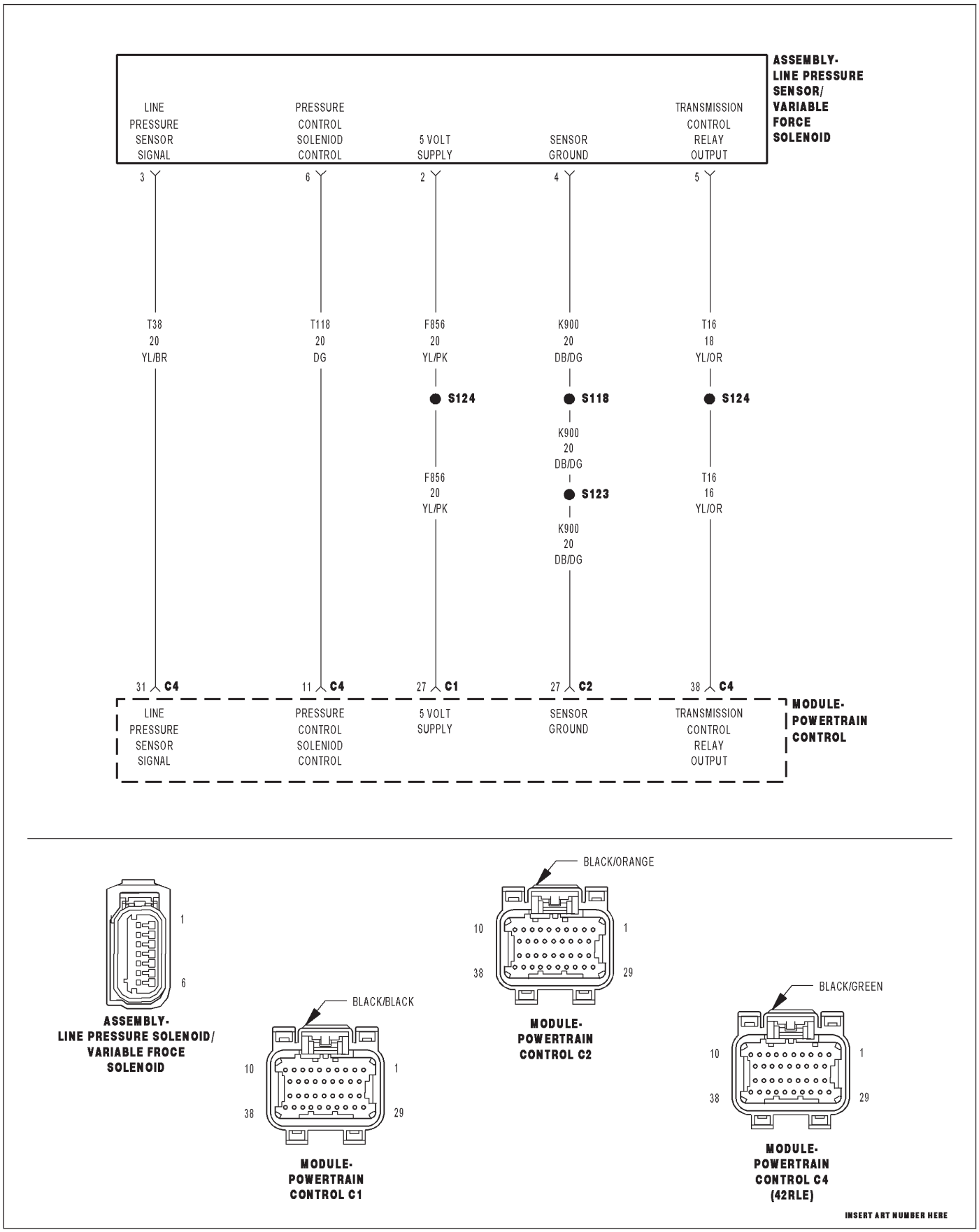
**NOTE: The vehicle may exhibit intermittent shudder during the first few hundred miles. The new Transmission Fluid will gradually penetrate the Torque Convertor Clutch friction material and the shudder should disappear.**
Erase the DTC and return the vehicle to the customer.

**Did the DTC reset and/or does the vehicle still shudder after a few thousand miles?**

**Yes** >> Replace the Torque Converter per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0932-LINE PRESSURE SENSOR CIRCUIT




For a complete wiring diagram **Refer to Section 8W**

- **When Monitored:**
  Continuously with the ignition on, engine running, with the transmission in gear.
- **Set Condition:**
  The PCM continuously monitors Actual Line Pressure and compares it to Desired Line Pressure. If the Actual Line Pressure reading is more than 172.4 kPa (25 psi) higher than the Desired Line Pressure, but is less than the highest Line Pressure ever used in the current gear, the DTC sets.

| Possible Causes |
|---|
| RELATED DTC'S PRESENT |
| LINE PRESSURE CONNECTOR AND WIRING |
| INTERNAL TRANSMISSION |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

Line pressure is electronically controlled by the Transmission Control System and is measured by the Line Pressure Sensor (LPS). The desired line pressure is continuously being compared to the actual line pressure and is regulated by electronically changing the duty cycle of the Pressure Control Solenoid (PCS). (5% duty cycle = solenoid off = max line pressure, 62% duty cycle = solenoid on = min line pressure).

The Transmission Control System calculates the desired line pressure based on inputs from the transmission and engine. A calculated torque input to the transmission is used as the primary input of the desired line pressure calculation and is called Torque Based Line Pressure. In addition, the line pressure is set to a preset level 827 to 931 kPa (120 to 135 psi) during shifts and in Park and Neutral to ensure consistent shift quality.

## Diagnostic Test

### 1. DETERMINING IF RELATED DTCS ARE PRESENT

With the scan tool, check for other transmission DTCs.

**Are there any other line pressure related DTCs present?**

**Yes** >> Refer to the Transmission category and perform the appropriate symptom. Perform the test for P0934 and/or P0935 first if present.

**No** >> Go To 2

### 2. COMPARE ACTUAL LINE PRESSURE TO DESIRED LINE PRESSURE

**CAUTION: Apply Parking Brake**
Start the engine.

**CAUTION: Firmly apply the brakes.**
With the scan tool, monitor the Line Pressure, Desired Line Pressure and the TPS degrees.

While firmly applying the brakes, place the shifter in reverse, then slowly press the accelerator pedal to a TPS degree of 15°.

Compare the Line Pressure reading to the Desired Line Pressure reading on the scan tool.

**Does the Line Pressure stay within ± 34 kPa or 5 psi of the Desired Line Pressure?**

**No** >> Go To 3

**Yes** >> Go To 5

## 3. CHECK LINE PRESSURE CONNECTOR AND WIRING

Ignition on, engine not running.

With the scan tool, monitor the Line Pressure Sensor voltage while wiggling the wiring harness and connectors pertaining to the Line Pressure Sensor/Variable Force Solenoid Assembly.

**Did the voltage remain steady while wiggling the wiring harness and connectors?**

**Yes** >> Go To 4

**No** >> Disconnect and properly reconnect the Line Pressure Sensor/Variable Force Solenoid Assembly connector. Inspect terminals and repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 4. CHECK PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

With the Transmission Simulator select the ″OFF″ position on the ″Input/Output Speed″ switch.

Ignition on, engine not running.

With the scan tool, monitor the Line Pressure during the following step.

With the Transmission Simulator, turn the selector switch to each of the 3 Line Pressure positions.

**NOTE: All three scan tool Line Pressure readings should be steady and ± 14 kPa or 2.0 psi of the reading specified on the Transmission Simulator.**

**Did the Line Pressure read within ± 14 kPa or 2.0 psi in all three positions?**

**Yes** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Repair internal transmission and inspect the oil pump per the Service information and replace if necessary. If no problems are found, replace the Line Pressure Sensor/Variable Force Solenoid Assembly — possible cause is the Pressure Control Solenoid is stuck.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 5. CHECK WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

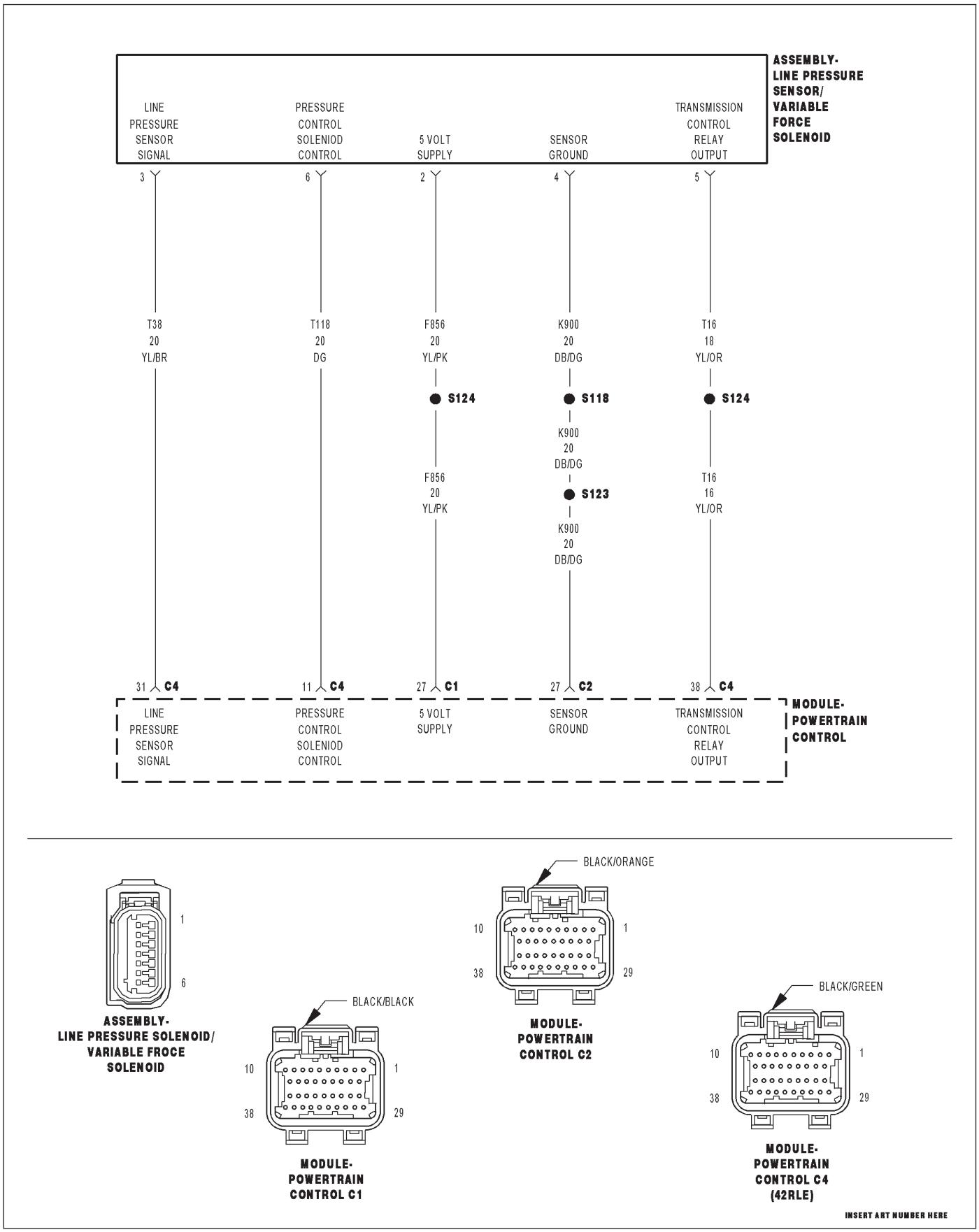
**Where there any problems found?**

**Yes** >> Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0934-LINE PRESSURE SENSOR CIRCUIT LOW




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Continuously with the ignition on and engine running.
- **Set Condition:**
  This DTC will set when the monitored Line Pressure Sensor voltage is less than or equal to 0.35 volts for 0.18 seconds.

| Possible Causes |
| --- |
| (F856) 5-VOLT SUPPLY CIRCUIT OPEN |
| (F856) 5-VOLT SUPPLY CIRCUIT SHORT TO GROUND |
| (T38) LINE PRESSURE SENSOR SIGNAL CIRCUIT SHORT TO GROUND |
| LINE PRESSURE SENSOR |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

Line pressure is electronically controlled by the Transmission Control System and is measured by the Line Pressure Sensor (LPS). The desired line pressure is continuously being compared to the actual line pressure and is regulated by electronically changing the duty cycle of the Pressure Control Solenoid (PCS). (5% duty cycle = solenoid off = max line pressure, 62% duty cycle = solenoid on = min line pressure).

The Transmission Control System calculates the desired line pressure based on inputs from the transmission and engine. A calculated torque input to the transmission is used as the primary input of the desired line pressure calculation and is called Torque Based Line Pressure. In addition, the line pressure is set to a preset level 827 to 931 kPa (120 to 135 PSI) during shifts and in Park and Neutral to ensure consistent shift quality.

The monitored Line Pressure Sensor voltage should always be between 0.35 and 4.75 volts. Any monitored voltages outside these parameters indicate an Line Pressure Sensor or wiring problem and will cause either DTC P0934 or P0935 to set.

## Diagnostic Test

### 1. CHECK IF DTC IS CURRENT

With the scan tool, check the STARTS SINCE SET counter for P0934.

**NOTE: This counter only applies to the last DTC set.**

**Is the STARTS SINCE SET counter 2 or less?**

**Yes** >> Go To 2

**No** >> Go To 6

### 2. CHECK THE PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the scan tool, under Transmission Sensors, monitor the Line Pressure.

Using the Transmission Simulator, set the rotary switch to each of the 3 line pressure positions.

**NOTE: All three scan tool Line Pressure readings should be steady and ± 14 kPa or 2.0 psi of the reading specified on the Transmission Simulator.**

**Did the Line Pressure read within ± 14 kPa or 2.0 psi in all three positions?**

**Yes** >> Replace the Line Pressure Sensor per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 3

## 3. CHECK THE (T38) LINE PRESSURE SENSOR SIGNAL CIRCUIT FOR A SHORT TO GROUND

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector and connect Miller tool #8815.

Disconnect the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

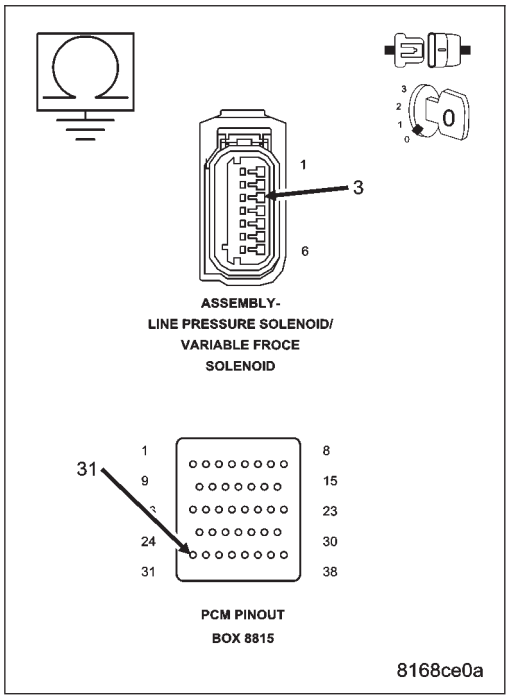
**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Measure the resistance between ground and the (T38) Line Pressure Sensor Signal circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (T38) Line Pressure Sensor Signal circuit for a short to ground.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 4



## 4. CHECK THE (F856) 5-VOLT SUPPLY CIRCUIT FOR AN OPEN

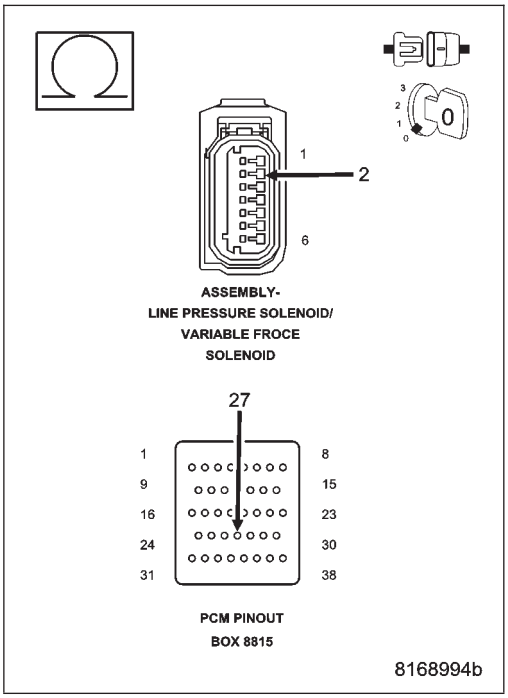
Disconnect the PCM C1 harness connector and connect Miller tool #8815.

Measure the resistance of the (F856) 5-volt Supply circuit between Line Pressure Sensor/Variable Force Solenoid Assembly harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance below 5.0 ohms?**

**Yes** >> Go To 5

**No** >> Repair the (F856) 5-volt Supply circuit for an open.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)




## 5. CHECK THE (F856) 5-VOLT SUPPLY CIRCUIT FOR A SHORT TO GROUND

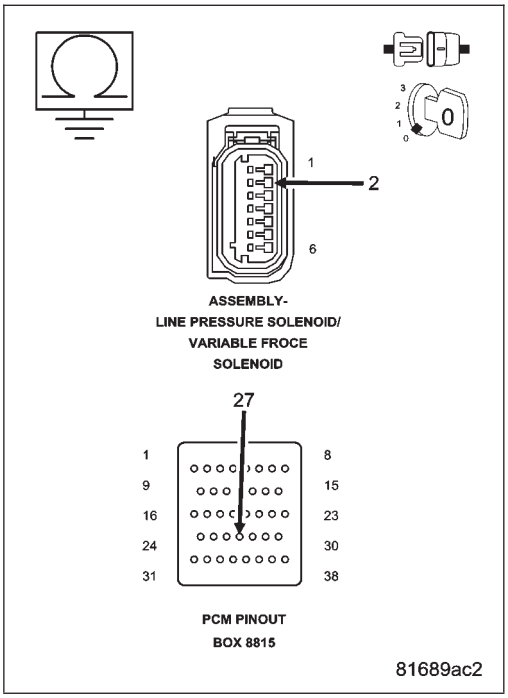
Disconnect the PCM C1 harness connector and connect Miller tool #8815.

Measure the resistance between ground and the (F856) 5-volt Supply circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (F856) 5-volt Supply circuit for a short to ground.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)



## 6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

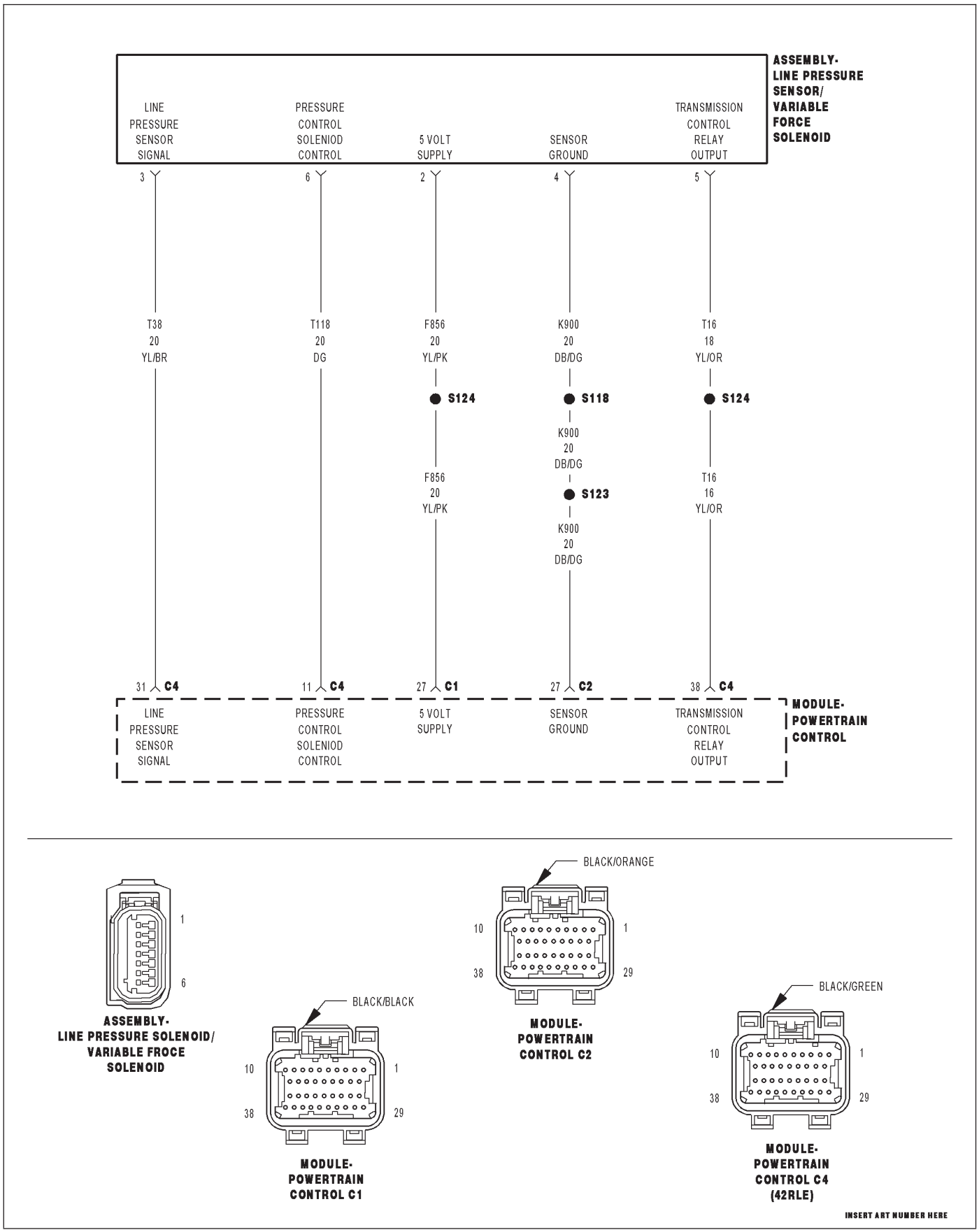
With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

**Where there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0935-LINE PRESSURE SENSOR CIRCUIT HIGH




For a complete wiring diagram **Refer to Section 8W**

- **When Monitored:**
  Continuously with ignition on and engine running.
- **Set Condition:**
  This DTC will set if the monitored Line Pressure Sensor voltage is greater than or equal to 4.75 volts for the period of 0.18 seconds

| Possible Causes |
|---|
| (T38) LINE PRESSURE SENSOR SIGNAL CIRCUIT OPEN |
| (K900) SENSOR GROUND CIRCUIT OPEN |
| (T38) LINE PRESSURE SENSOR SIGNAL CIRCUIT SHORT TO VOLTAGE |
| LINE PRESSURE SENSOR |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

Line pressure is electronically controlled by the Transmission Control System and is measured by the Line Pressure Sensor (LPS). The desired line pressure is continuously being compared to the actual line pressure and is regulated by electronically changing the duty cycle of the Pressure Control Solenoid (PCS). (5% duty cycle = solenoid off = max line pressure, 62% duty cycle = solenoid on = min line pressure).

The Transmission Control System calculates the desired line pressure based on inputs from the transmission and engine. A calculated torque input to the transmission is used as the primary input of the desired line pressure calculation and is called Torque Based Line Pressure. In addition, the line pressure is set to a preset level 827 to 931 kPa (120 to 135 PSI) during shifts and in Park and Neutral to ensure consistent shift quality.

The monitored Line Pressure Sensor voltage should always be between 0.35 and 4.75 volts. Any monitored voltages outside these parameters indicate an Line Pressure Sensor or wiring problem and will cause either DTC P0934 or P0935 to set.

## Diagnostic Test

### 1. CHECK TO SEE IF DTC IS CURRENT

With the scan tool, Check the STARTS SINCE SET counter for P0935.

**NOTE: This counter only applies to the last DTC set.**

**Is the STARTS SINCE SET counter 2 or less?**

**Yes** >> Go To 2

**No** >> Go To 6

### 2. CHECK THE PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Starter Relay.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the scan tool, monitor the Line Pressure.

Using the Transmission Simulator, set the rotary switch to each of the 3 line pressure positions.

**NOTE: All three scan tool Line Pressure readings should be steady and ± 14 kPa or 2.0 psi of the reading specified on the Transmission Simulator.**

**Did the Line Pressure read within ± 14 kPa or 2.0 psi in all three positions?**

**Yes** >> Replace the Line Pressure Sensor per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 3

## 3. CHECK THE (K900) SENSOR GROUND CIRCUIT FOR AN OPEN

Turn the ignition off to the lock position.

Disconnect the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Disconnect the PCM C2 harness connector and connect Miller tool #8815.

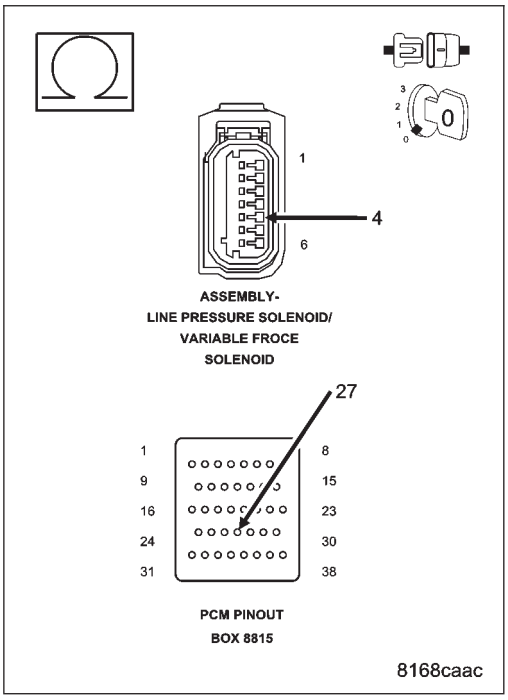
**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Measure the resistance of the (K900) Sensor Ground circuit from the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector to the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (K900) Sensor Ground circuit for an open.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 4



## 4. CHECK THE (T38) LINE PRESSURE SENSOR SIGNAL CIRCUIT FOR AN OPEN

Disconnect the PCM C4 harness connector and connect Miller tool #8815.

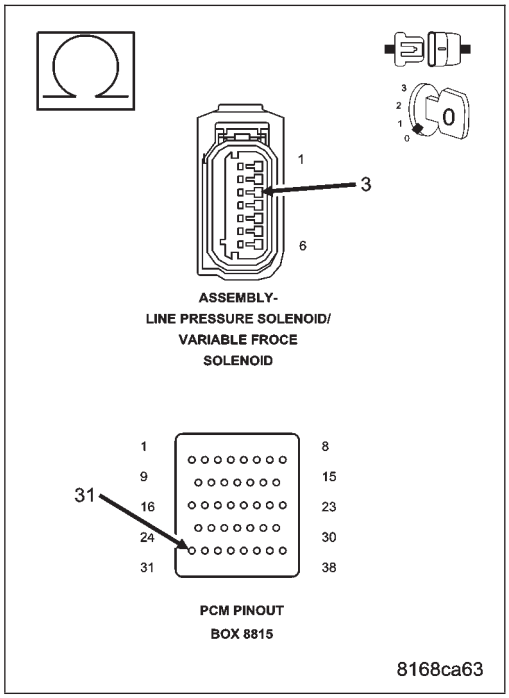
Measure the resistance of the (T38) Line Pressure Sensor Signal circuit from the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector to the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T38) Line Pressure Sensor Signal circuit for an open.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 5




## 5. CHECK THE (T38) LINE PRESSURE SENSOR SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T38) Line Pressure Sensor Signal circuit.

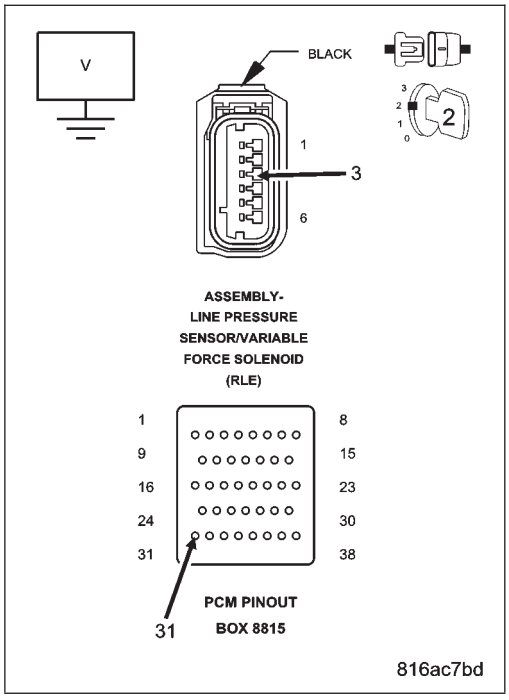
**Is the voltage above 5.5 volts?**

**Yes** >> Repair the (T38) Line Pressure Sensor Signal circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)



## 6. CHECK WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

**Where there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P0944-LOSS OF HYDRAULIC PUMP PRIME

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Every 350 msec
- **Set Condition:**
  If the transmission begins to slip in any forward gear, and the pressure switch or switches that should be closed for a given gear are open, a loss of prime test begins. All available elements (in 1st gear LR, 2/4 and OD, in 2nd, 3rd, and 4th gear 2/4 and OD) are turned on by the PCM to see if pump prime exists. The code is set if none of the pressure switches respond. The PCM will continue to run the loss of prime test until pump pressure returns. The vehicle will not move or the transmission will slip. Normal operation will continue if pump prime returns.

| Possible Causes |
|---|
| LOW TRANSMISSION FLUID LEVEL |
| SHIFT LEVER POSITION |
| PLUGGED TRANSMISSION FILTER |
| TRANSMISSION OIL PUMP |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The Loss of Prime Test is used to prevent transmission defaults and erroneous fault codes during temporary loss of pump prime that may occur with low transmission fluid under severe braking conditions, start-up, etc. and to point towards more subtle problems such as a plugged or ruptured oil filter. The Loss of Prime fault is set by a loss of hydraulic pressure in the transmission system. This condition, if sustained, will result in the vehicle being unable to move.

## Diagnostic Test

### 1. CHECK TO SEE IF DTC P0944 IS CURRENT

Place the gear selector in park.

Start the engine.

**NOTE: The Transmission Temperature must be at least 43° C (110° F) before performing the following steps.** The Transmission must be at operating temperature prior to checking pressure. Cold transmission fluid will result in higher pressure readings.

Place the Transmission in Reverse.

With the scan tool, observe the Transmission Pressure Switch states.

**Are any of the Pressure Switches closed?**

**Yes** >> Go To 2

**No** >> Go To 4

## 2. INTERMITTENT OPERATION

The conditions necessary to set this DTC are not present at this time.
Test drive the vehicle. Allow the Transmission to shift through all gears and ranges.

**Was a delayed engagement and/or a no drive condition present during the test drive?**

**Yes** >> Go To 4

**No** >> Go To 3

## 3. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.
Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.
Wiggle the wiring while checking for shorted and open circuits.
With the scan tool, check the EVENT DATA to help identify the conditions in which the DTC was set.

**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## 4. SHIFT LEVER POSITION TEST

With the scan tool, perform a Shift Lever Position test. Follow the instructions on the screen.

**Did the Shift Lever Position Test pass?**

**Yes** >> Go To 5

**No** >> Perform the diagnostic procedure for P0706-CHECK SHIFTER SIGNAL.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 5. CHECK FOR PLUGGED TRANSMISSION FILTER

Remove the Transmission Pan and inspect the Transmission Fluid and Transmission Filter per the Service Information.

**Does the Transmission Oil Pan contain excessive debris and/or is the Oil Filter plugged?**

**Yes** >> Repair the cause of the plugged Transmission Filter. Refer to the Service Information for the proper repair procedure.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Replace the Transmission Oil Pump per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## P0992-2/4/OD HYDRAULIC PRESSURE TEST

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  In any forward gear with engine speed above 1000 RPM, shortly after a shift and every minute thereafter.
- **Set Condition:**
  After a shift into a forward gear, with engine speed greater than 1000 RPM, the PCM momentarily turns on element pressure to the clutch circuits that do not have pressure to identify that the correct pressure switch closes. If the pressure switch does not close 2 times the DTC sets.

| Possible Causes |
|---|
| CONDITION P0992 PRESENT |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - DIAGNOSIS AND TESTING).**

## Theory of Operation

Pressure switches are normally off or open (no pressure applied) and read high (+12 volts). When an element is applied, the corresponding pressure switch closes to ground (0 volts) or turns on. The controller tests the OD and 2/4 pressure switches when they are off (when the corresponding friction element is not applied) by briefly applying the OD and 2/4 elements which will cause the corresponding pressure switch to close. The test verifies that the switches are operational and that the switch will close when the corresponding element is applied. If a switch fails to respond, it is re-tested. The MIL illuminates and the transmission system defaults to Limp-in mode.

### 1. CHECK TO SEE IF DTC P0992 IS CURRENT

**NOTE: The vehicle must be driven to set this DTC. The transmission must at operating temperature with the Engine RPM above 1000 RPM.**

This DTC is an indication of both the 2/4 and the O/D Hydraulic Pressure Switch DTCs present.

Perform the diagnostic procedures for both P0845 and P0870.

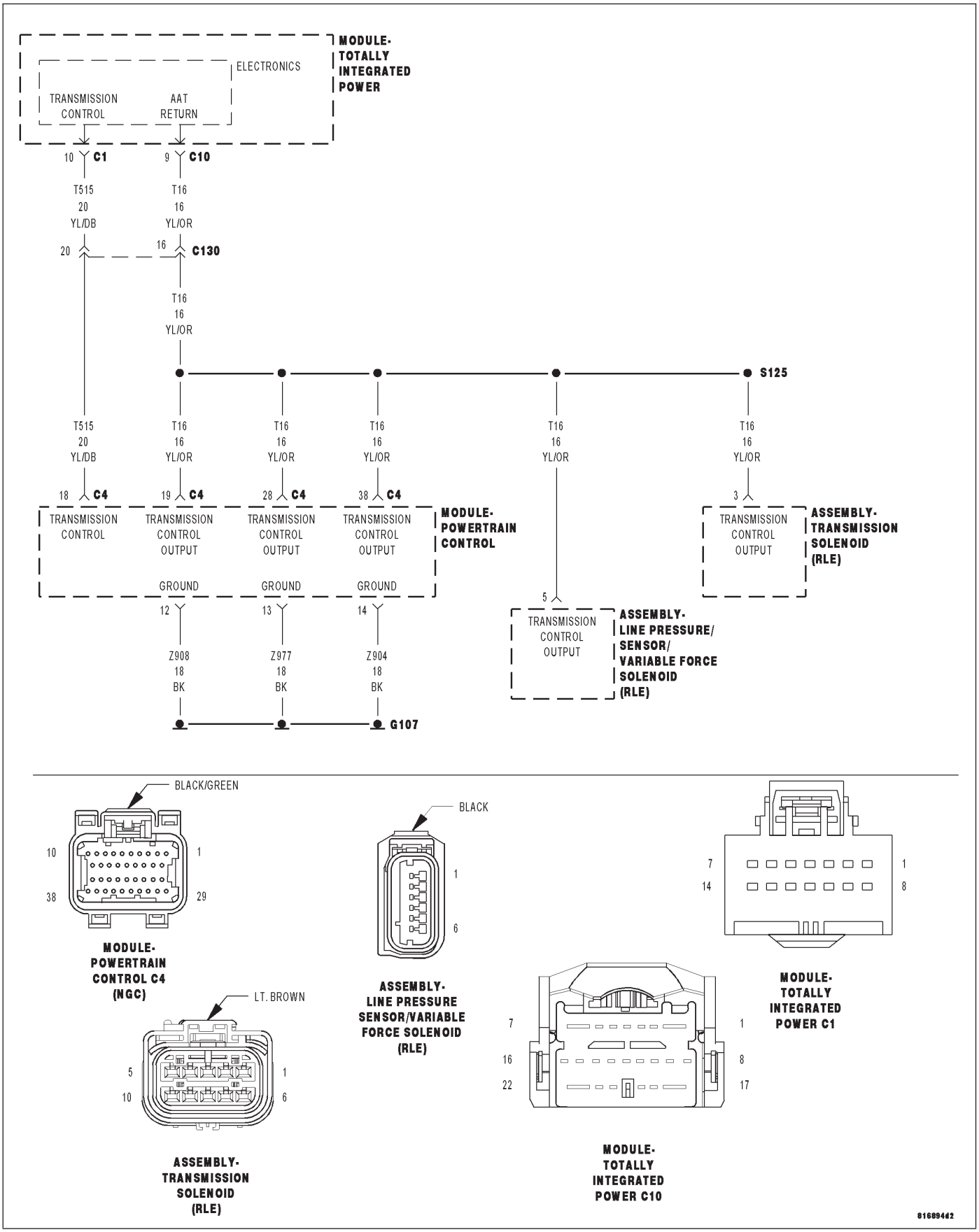
With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

**If there are no possible causes remaining, view repair.**

**Repair**

Refer to the Transmission category and perform the diagnostic procedures for P0845 and P0870.

## P128B-TCM POWER CONTROL CIRCUIT 2 LOW - TIPM




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  With the ignition on. Battery voltage greater than 10 volts.
- **Set Condition:**
  A shorted condition is detected in the Transmission Control Output circuit.

| Possible Causes |
|---|
| (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT SHORT TO GROUND |
| (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT FOR AN OPEN |
| TOTALLY INTEGRATED POWER MODULE (TIPM) |

## Diagnostic Test

### 1. CHECK IF THE DTC IS ACTIVE

Ignition on, engine not running.
With the scan tool, check TIPM DTCs.

**Is the status Active for this DTC?**

**Yes** >> Go to 2

**No** >> Go to 5

### 2. CHECK THE (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT SHORT TO GROUND

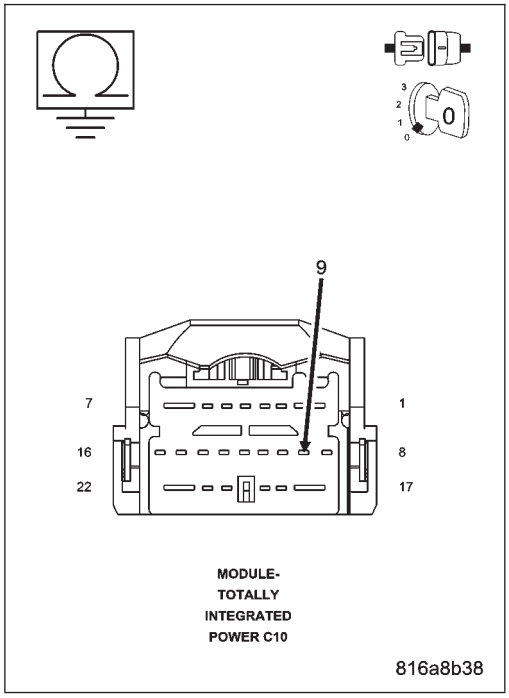
Turn the ignition off
Disconnect the TIPM C10 harness connector.
Disconnect the PCM C4 harness connector and install Miller tool #8815.

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**
Measure the resistance between ground and the (T16) Transmission Control Output circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (T16) Transmission Control Output circuit for a short to ground.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go to 3



## 3. CHECK THE (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT FOR AN OPEN

Turn the ignition off to the lock position.

Connect the TIPM C10 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch harness connector.

Disconnect the Line Pressure Sensor/Variable Force Solenoid harness connector (if equipped).

Ignition on, engine not running.

Using the scan tool under the TIPM Actuators, actuate the Transmission.

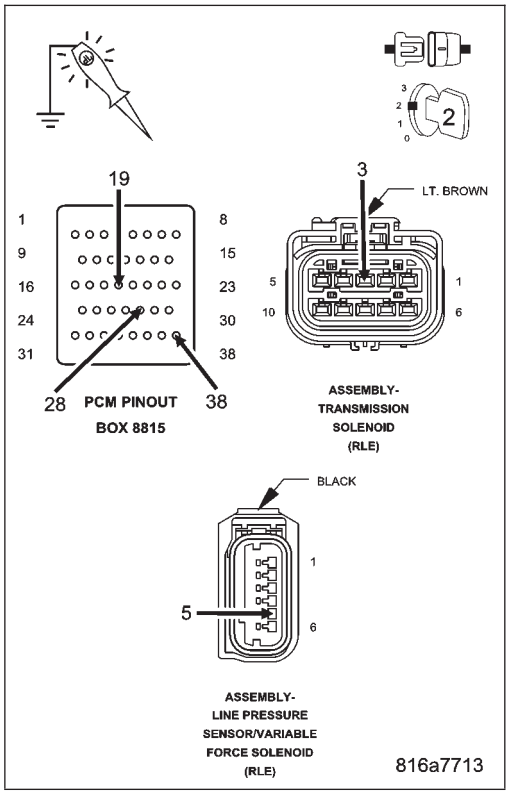
Using a 12-volt test light connected to ground, check the (T16) Transmission Control Output circuits.

**NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.**

**Does the test light illuminate brightly at all the (T16) Transmission Control Output circuits?**

**Yes** >> Go To 4

**No** >> Repair the (T16) Transmission Control Output circuit for an open.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)




## 4. TOTALLY INTEGRATED POWER MODULE

Using the schematics as a guide, inspect the wire harness and connectors.

Check the TIPM harness connector terminals for corrosion, damage, or terminal push out.

Pay particular attention to all power and ground circuits.

**Were any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Replace the Totally Integrated Power Module per Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

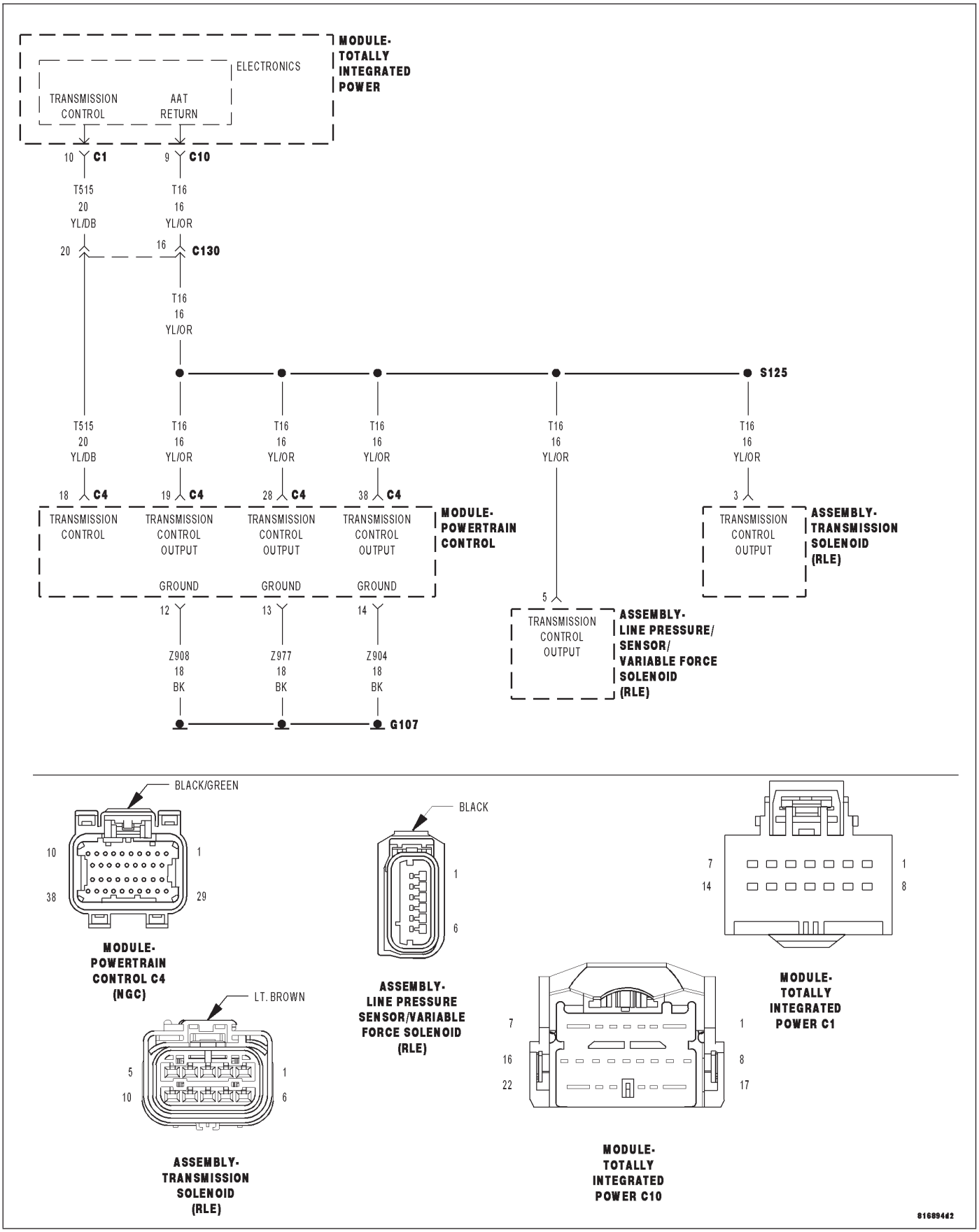
Look for the data to change or for the DTC to reset during the wiggle test.

**Were any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test complete.

## P128C-TCM POWER CONTROL CIRCUIT 2 HIGH - TIPM




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  With the ignition on. Battery voltage greater than 10 volts.
- **Set Condition:**
  A shorted condition is detected in the TIPM TCM Power control circuit.

| Possible Causes |
|---|
| (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT SHORT TO VOLTAGE |
| TOTALLY INTEGRATED POWER MODULE (TIPM) |

## Diagnostic Test

### 1. CHECK IF THE DTC IS ACTIVE

Ignition on, engine not running.
With the scan tool, read TIPM DTCs.

**Is the status Active for this DTC?**

**Yes** >> Go to 2

**No** >> Go to 4

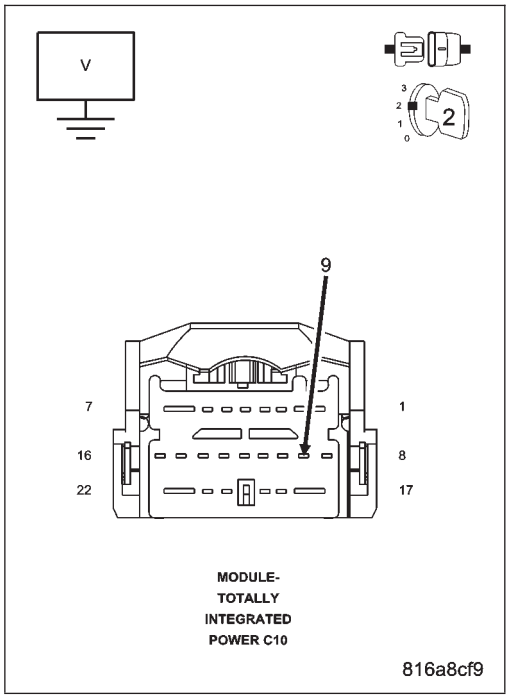
### 2. (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT SHORT TO VOLTAGE

Turn the ignition off
Disconnect the TIPM C10 harness connector.
Disconnect the PCM C4 harness connector.
Measure the voltage of the (T16) Transmission Control Output circuit.

**Is the voltage above 10.0 v?**

**Yes** >> Repair the (T16) Transmission Control Output circuit for a short to voltage.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go to 3



## 3. TOTALLY INTEGRATED POWER MODULE

Using the schematics as a guide, inspect the wire harness and connectors.
Check the TIPM harness connector terminals for corrosion, damage, or terminal push out
Pay particular attention to all power and ground circuits.

**Were any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Replace the Totally Integrated Power Module per Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 4. INTERMITTENT WIRING AND CONNECTORS

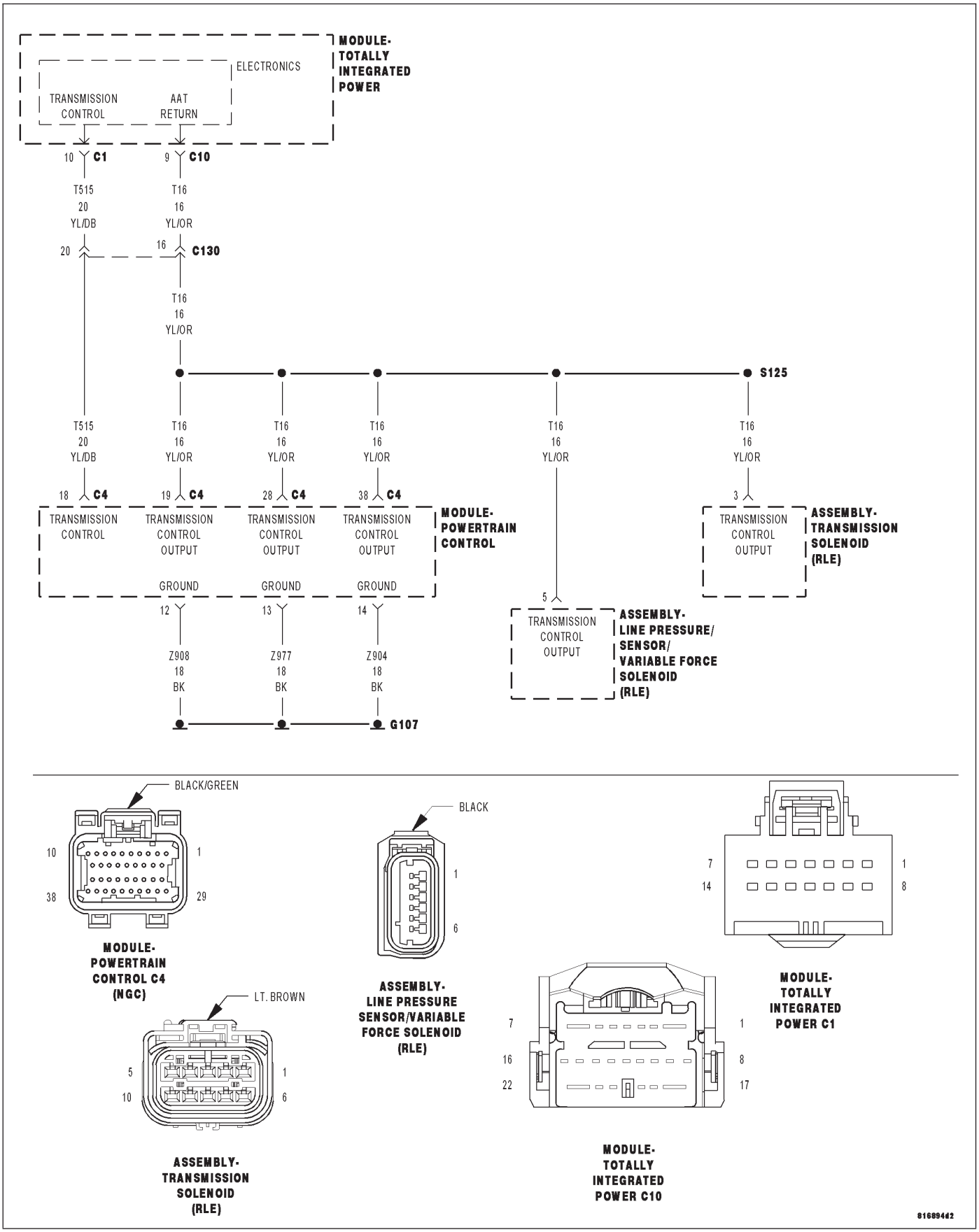
The conditions necessary to set this DTC are not present at this time.
Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.
While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.
Look for the data to change or for the DTC to reset during the wiggle test.

**Were any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test complete.

## P128D-TCM POWER CONTROL CIRCUIT 2 OPEN - TIPM




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  With the ignition on. Battery voltage greater than 10 volts.
- **Set Condition:**
  An open condition of the Transmission Control Output circuit is detected by the Totally Integrated Power Module (TIPM).

| Possible Causes |
|---|
| (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT OPEN |
| TOTALLY INTEGRATED POWER MODULE (TIPM) |

## Diagnostic Test

### 1. CHECK IF THE DTC IS ACTIVE

Ignition on, engine not running.

With the scan tool, select View DTCs.

**Is the status Active for this DTC?**

**Yes** >> Go to 2

**No** >> Go to 4

### 2. CHECK THE (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT FOR AN OPEN

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector and install Miller tool #8815.

Disconnect the Transmission Solenoid harness connector.

Disconnect the Line Pressure Sensor/Variable Force Solenoid harness connector (if equipped).

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Ignition on, engine not running.

Using the scan tool under the TIPM Actuators, actuate the Transmission.

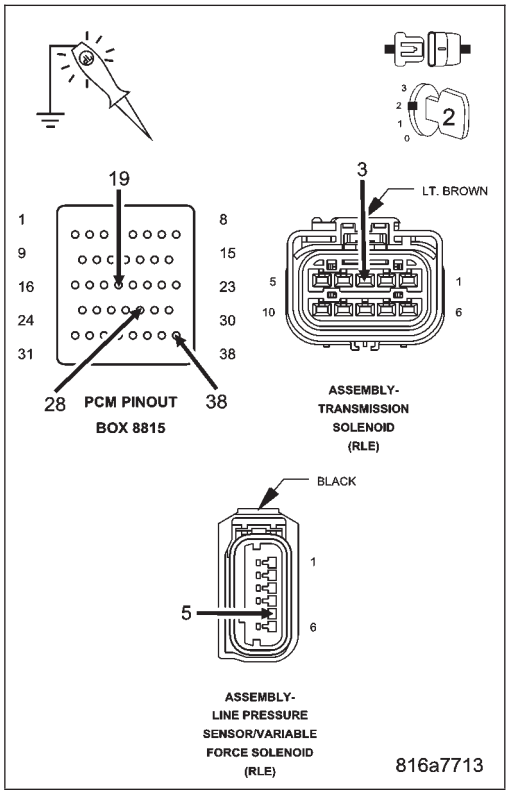
Using a 12-volt test light connected to ground, check the (T16) Transmission Control Output circuits.

**NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.**

**Does the test light illuminate brightly?**

**Yes** >> Go To 3

**No** >> Repair the (T16) Transmission Control Output circuit for an open.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)



## 3. TOTALLY INTEGRATED POWER MODULE

Using the schematics as a guide, inspect the wire harness and connectors.
Check the TIPM harness connector terminals for corrosion, damage, or terminal push out.
Pay particular attention to all power and ground circuits.

**Were any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Replace the Totally Integrated Power Module per Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 4. INTERMITTENT WIRING AND CONNECTORS

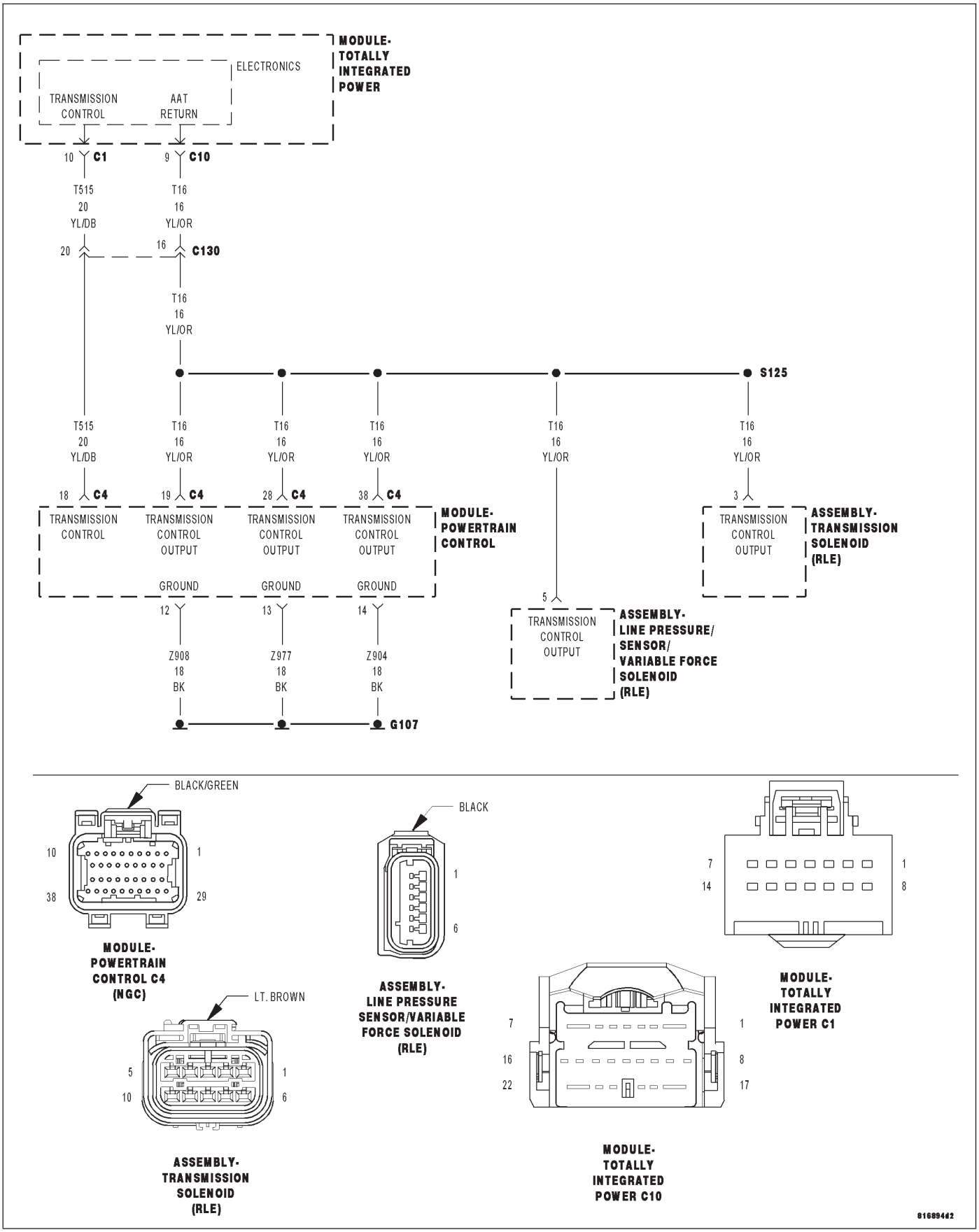
The conditions necessary to set this DTC are not present at this time.
Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.
While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.
Look for the data to change or for the DTC to reset during the wiggle test.

**Were any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test complete.

## P128E-TCM POWER CONTROL CIRCUIT 2 OVERCURRENT - TIPM




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  With the ignition on. Battery voltage greater than 10 volts.
- **Set Condition:**
  An overcurrent condition is detected in the TCM Power Control circuit. One Trip Fault. Three good trips to turn off the MIL.

| Possible Causes |
|---|
| LINE PRESSURE SENSOR VARIABLE FORCE SOLENOID |
| SOLENOID/PRESSURE SWITCH ASSEMBLY |
| POWERTRAIN CONTROL MODULE (PCM) |
| TOTALLY INTEGRATED POWER MODULE (TIPM) |

## Diagnostic Test

### 1. CHECK IF THE DTC IS ACTIVE

Ignition on, engine not running.
With a scan tool, read TIPM DTCs.

**Is the DTC active at this time?**

**Yes** >> Go To 2

**No** >> Go To 5

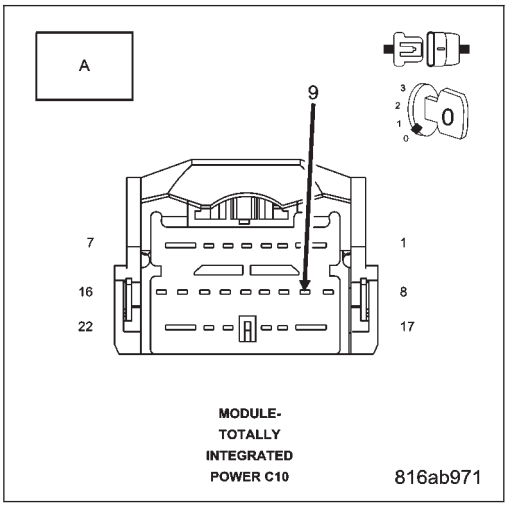
### 2. CHECK THE (T16) TRANSMISSION CONTROL OUTPUT

Turn the ignition off.
Disconnect the TIPM C10 harness connector.
Connect the positive probe of an ammeter to battery positive and connect the negative probe to the (T16) Transmission Control Output circuit in the TIPM C10 harness connector.
Read the amperage on the ammeter.

**Does the amperage read below 2.0 amps?**

**Yes** >> Go To 4

**No** >> Go To 3



## 3. CHECK THE PCM

Disconnect the amp meter from the TIPM C10 harness connector and battery positive.

Disconnect the PCM C4 harness connector.

Reconnect the positive probe of an ammeter to battery positive and connect the negative probe to the (T16) Transmission Control Output circuit in the TIPM C10 harness connector.

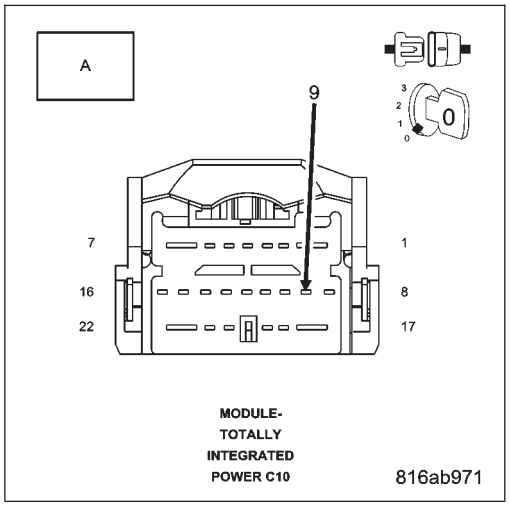
Read the amperage on the ammeter.

**Does the amperage read below 2.0 amps?**

**Yes** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 4




## 4. CHECK THE TRANSMISSION SOLENOIDS

Disconnect the amp meter from the TIPM C10 harness connector.

Disconnect the PCM C4 harness connector and install Miller tool #8815.

Connect the positive probe of an ammeter to battery positive and connect the negative probe to the (T16) Transmission Control Output circuit in the TIPM C10 harness connector.

While monitoring the amperage reading of the ammeter and using a jumper wire, jump each solenoid control circuit to ground one at a time in the appropriate terminals of Miller tool #8815.

**NOTE: The amperage draw should be approximately .02 milliampere on each solenoid circuit with the PCM C4 harness connector disconnected.**

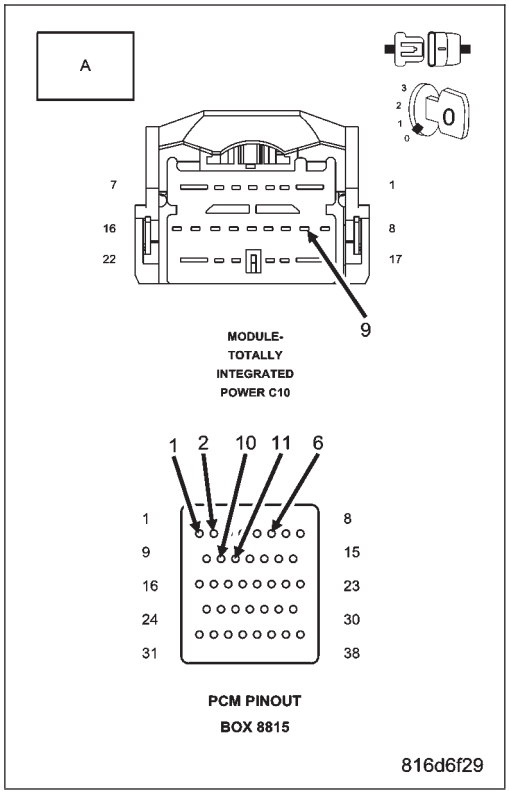
**Does the amperage read between .05 and .015 milliampere ± .005 milliampere on each solenoid tested?**

**Yes** >> Replace the Totally Integrated Control Module per the Service Information.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Depending on the identified circuit in the test, replace either Transmission Solenoid/Pressure Switch Assembly or the Line Pressure Solenoid (if equipped) per the Service Information.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)



## 5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

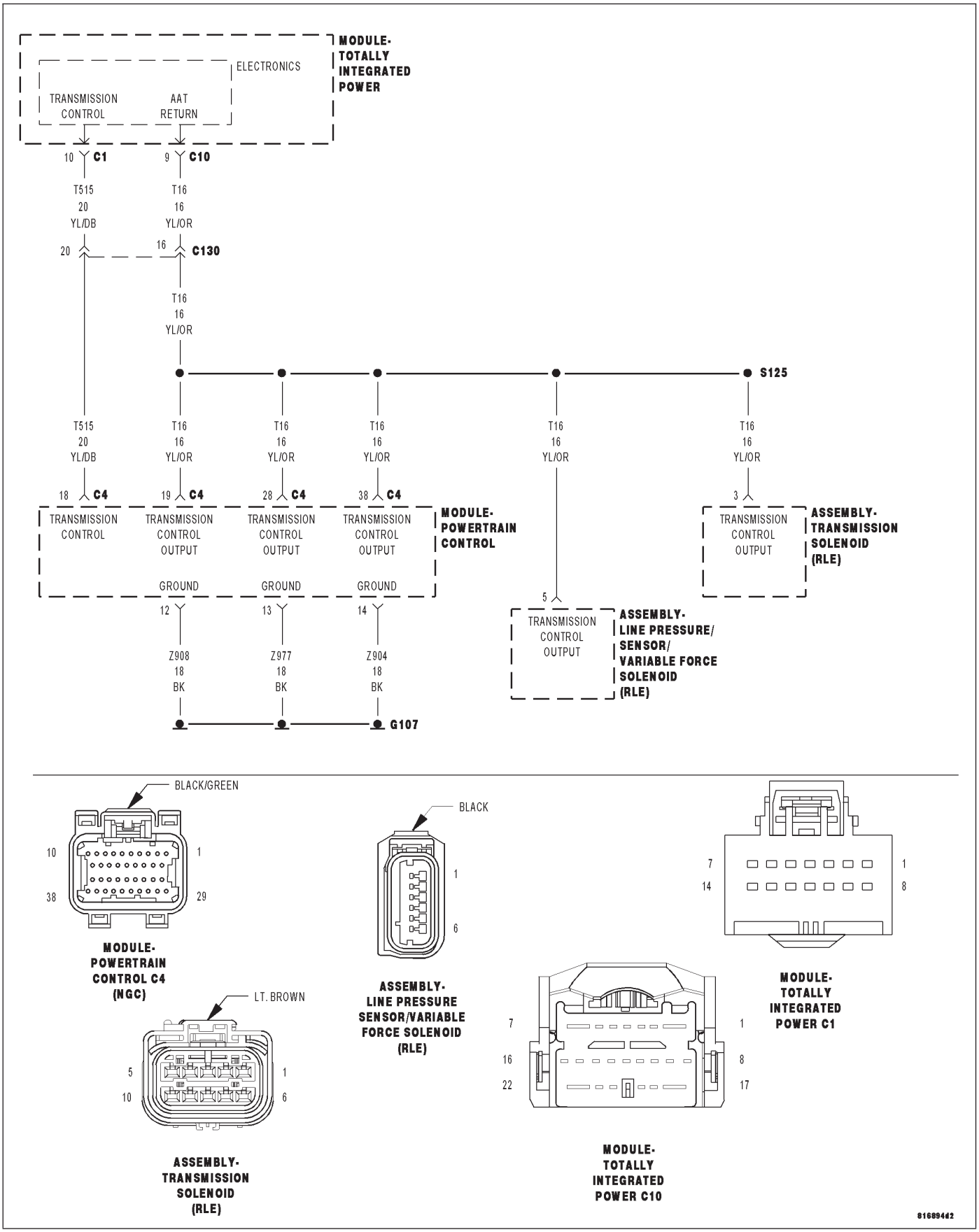
With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P1684-BATTERY WAS DISCONNECTED




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  After a reset (ignition key turned to the RUN position).
- **Set Condition:**
  The checksum of the battery backed RAM does not match the stored checksum. Set Time: Less than 7 msec.

| Possible Causes |
|---|
| BATTERY WAS DISCONNECTED |
| PCM WAS REPLACED OR DISCONNECTED |
| QUICK LEARN WAS PERFORMED |
| (A919) FUSED B+ CIRCUIT TO PCM OPEN |
| (Z908 and Z977) GROUND CIRCUIT OPEN |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

Note: This is not a fault code. It exists to provide reference information only. A battery backed RAM is used to maintain some learned values. When the battery is disconnected, this memory is lost. When the battery is reconnected, the loss of learned values will be detected by the controller. The code will be set and the learned values will be initialized to known constants and the learning process will continue. Setting the code has no effect except for re-initialization of learned values.

## Diagnostic Test

### 1. BATTERY WAS DISCONNECTED

**Has the battery been disconnected, lost it's charge, or been replaced recently?**

**Yes** >> Disconnecting or replacing the battery will set this DTC. Erase the DTC.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 2

### 2. WAS QUICK LEARN PERFORMED

**Has a Quick Learn procedure been performed?**

**Yes** >> Performing Quick Learn will set this DTC. Erase the DTC.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 3

### 3. PCM REPLACED OR DISCONNECTED

**Has the PCM been replaced or disconnected?**

**Yes** >> Replacing or disconnecting the PCM will set this DTC. Erase the DTC.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 4

## 4. (A919) FUSED B(+) CIRCUIT

Turn the ignition off to the lock position.

Disconnect the PCM C1 harness connector.

**NOTE: Check connectors - Clean/repair as necessary.**

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.**

Using a 12-volt test light connected to ground, check the (A919) Fused B(+) circuit.

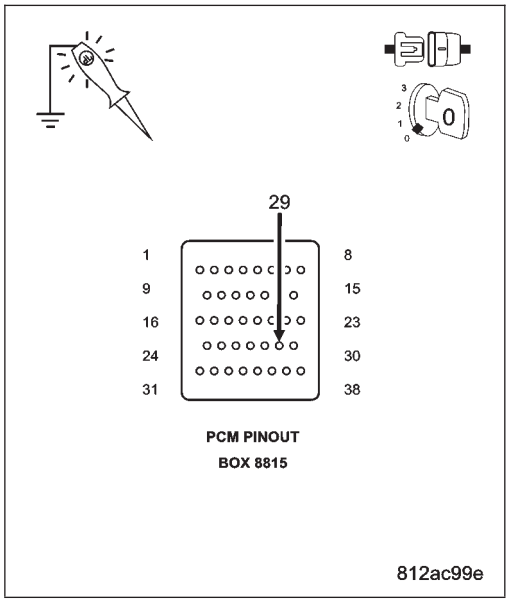
**NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.**

**Does the test light illuminate brightly?**

**Yes** >> Go To 5

**No** >> Repair the Fused B+ circuit for an open. If the fuse is open make sure to check for a short to ground.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)




## 5. (Z908) AND (Z977) GROUND CIRCUITS

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

**NOTE: Check connectors - Clean/repair as necessary.**

Using a 12-volt test light connected to 12-volts, check the (Z908) and (Z977) Ground circuits in the appropriate terminal of Miller tool #8815.

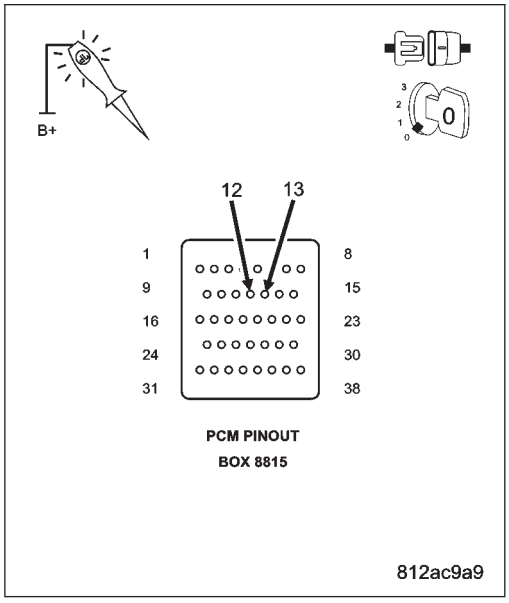
**NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.**

**Does the test light illuminate brightly for all of the ground circuits?**

**Yes** >> Go To 6

**No** >> Repair the Ground circuits for an open.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)




## 6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

**Were there any problems found?**

**Yes** >> Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P1713-RESTRICTED MANUAL VALVE IN T2 RANGE

For a complete wiring diagram**Refer to Section 8W**

- **When Monitored:**
  Ignition on, engine running with the gear shift selector in a valid forward gear.
- **Set Condition:**
  This DTC sets whenever Transmission control system detects the manual valve is in the T2 range when it should be in OD. This is mainly an informational DTC.

| Possible Causes |
|---|
| RELATED TRANSMISSION DTC'S PRESENT |
| CUSTOMER DRIVING HABITS |
| MIS-ADJUSTED SHIFTER CABLE |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Diagnostic Test

### 1. DETERMINING IF RELATED DTC'S ARE PRESENT

With the scan tool, check for other transmission DTC's

**Are there any speed sensor or gear ratio DTCs present?**

**Yes** >> Refer to the Transmission category and perform the appropriate symptom.

**No** >> Go To 2

### 2. CHECK THE GEAR SHIFT CABLE FOR PROPER ADJUSTMENT

Check the Gear shift cable adjustment per the Service Information.

Also check the cable for possible binding or improperly routed.

**Is the Gear shift cable properly adjusted and not binding or improperly routed?**

**Yes** >> Go To 3

**No** >> Adjust the Shifter Assembly per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

### 3. CHECK CUSTOMER DRIVING HABIT

This DTC can be set if the customer does not move the shift lever completely into the OD position (in between gears) causing the manual valve to be in the T2 position.

When this occurs, the feed port to the clutch is restricted, the transmission will declare neutral, and this DTC will set.

This DTC can also be set by simply bumping the shift lever toward neutral while accelerating.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

**If there are no possible causes remaining, view repair.**

**Repair**

This DTC can be set by the shift lever in the wrong position or not completely in the OD position. Make sure the customer is properly informed.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## P1745-TRANSMISSION LINE PRESSURE TOO HIGH FOR TOO LONG

For a complete wiring diagram **Refer to Section 8W**

- **When Monitored:**
  Continuously with ignition on.
- **Set Condition:**
  If the transmission has been operating in an open-loop line pressure control for 2000 miles or 1000 2-3 upshifts.

| Possible Causes |
| --- |
| LINE PRESSURE DTCS PRESENT |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

This DTC is an informational DTC to inform the technician that transmission has been operating in an open-loop line pressure control for 2000 miles or 1000 2-3 upshifts resulting from a Line Pressure DTC. The 42RLE Transmission is not designed to operate in open-loop line pressure control for an extended period time. This DTC is intended to protect the transmission. If the DTC sets, the transmission controller will place the transmission into limp-in mode.

## Diagnostic Test

### 1. CHECK FOR RELATED DTC'S

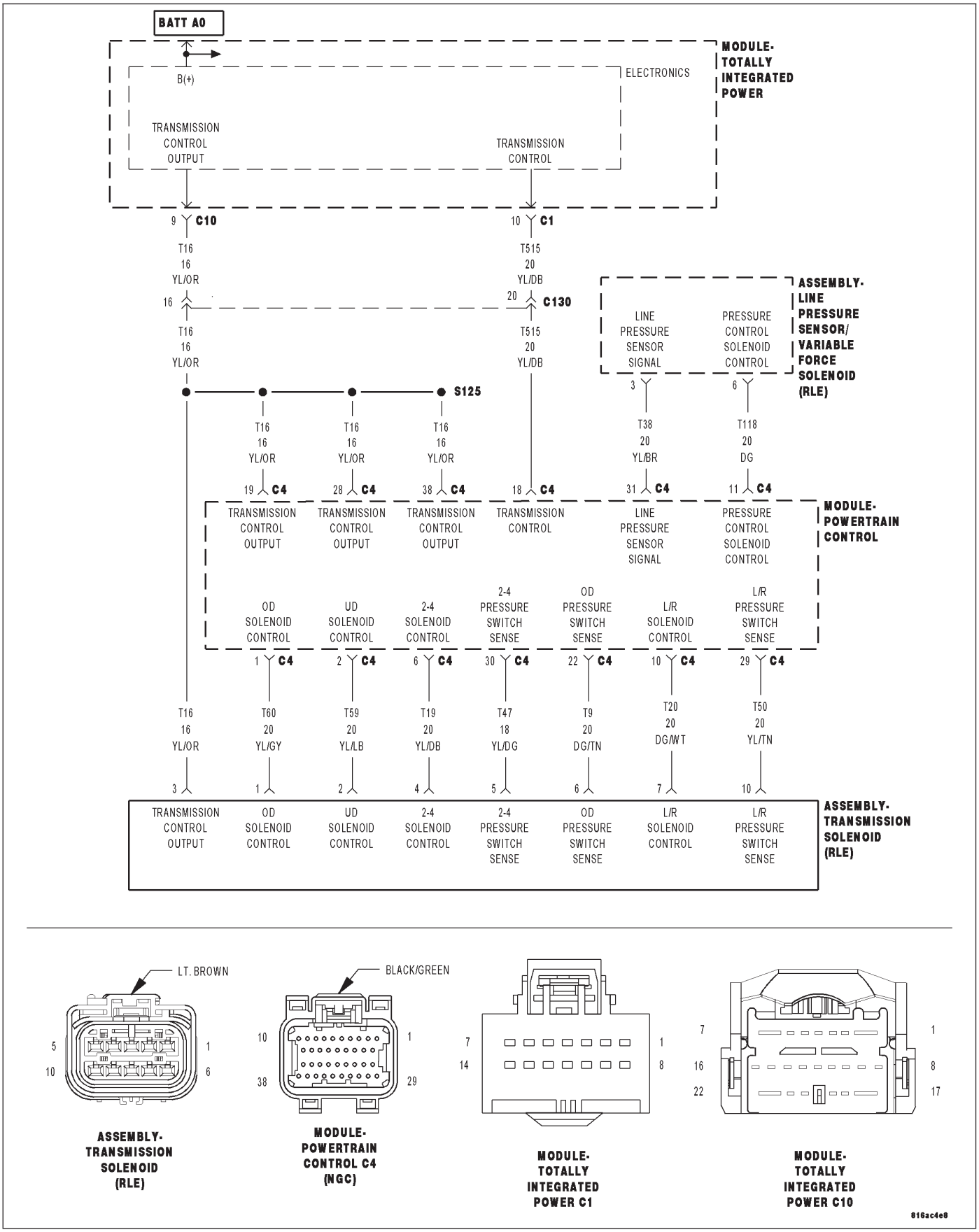
With the scan tool, check for Transmission Line Pressure DTCs.

**View repair**

**Repair**

Refer to the Transmission category and perform the appropriate symptom. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - DIAGNOSIS AND TESTING)

## P1775-SOLENOID SWITCH VALVE LATCHED IN TCC POSITION




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Prior to a shift into 1st gear.
- **Set Condition:**
  Transmission temperature must be hot. DTC is set after six unsuccessful attempts to shift into 1st gear.

| Possible Causes |
|---|
| RELATED DTC P0841 PRESENT |
| (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT OPEN |
| (T50) L/R PRESSURE SWITCH SENSE CIRCUIT OPEN |
| (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND |
| (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE |
| INTERNAL TRANSMISSION |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The Solenoid Switch Valve, an internal, hydraulically operated valve, controls the direction of the transmission fluid when the LR solenoid is energized. When the solenoid switch valve is in the downshifted position and the LR solenoid is energized, fluid is directed to the LR element for 1st gear. When the solenoid switch valve is In the upshifted position (2nd, 3rd, and 4th gear) and the LR solenoid is energized, fluid is directed into the Lockup Switch Valve which controls the Torque Converter Clutch. When shifting into 1st gear, a special sequence is followed to insure solenoid switch valve movement into the downshifted position. The LR pressure switch is monitored to confirm switch valve movement. If the solenoid switch valve movement is not confirmed (i.e. no LR pressure when the LR solenoid is energized), 2nd gear is substituted for 1st. No 1st gear (2nd gear is substituted). The transmission Torque converter FEMCC operation is inhibited. MIL on after 5 min. of substituted operation.

## Diagnostic Test

### 1. DETERMINING IF RELATED DTCS ARE PRESENT

With the scan tool, check for other Transmission DTCs

**Is the DTC P0841 present also?**

**Yes** >> Refer to the Transmission category and perform the appropriate symptom.

**No** >> Go To 2

### 2. CHECK TO SEE IF DTC P1775 IS CURRENT

With the scan tool, view DTCs.

**Is the status Active for this DTC or is the STARTS SINCE SET counter 2 or less?**

**Yes** >> Go To 3

**No** >> Go To 8

## 3. PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Pressure Switch selector switch to L/R.

With the scan tool, monitor the L/R Pressure Switch State while pressing the Pressure Switch Test button.

**Did the Pressure Switch state change from open to closed when the test button was pressed?**

**Yes** >> Repair internal transmission as necessary per the Service Information. Inspect the Solenoid Switch Valve per the Service Information and repair or replace as necessary. If no problems are found, replace the Transmission Solenoid/Pressure Switch Assembly.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 4

## 4. (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT OPEN

Turn the ignition off to the lock position.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

Disconnect the PCM C4 harness connector.

With the scan tool under TIPM, actuate the Transmission.

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Using a 12-volt test light connected to ground, check all (T16) Transmission Control Relay Output circuits in the appropriate terminals of Miller tool #8815.

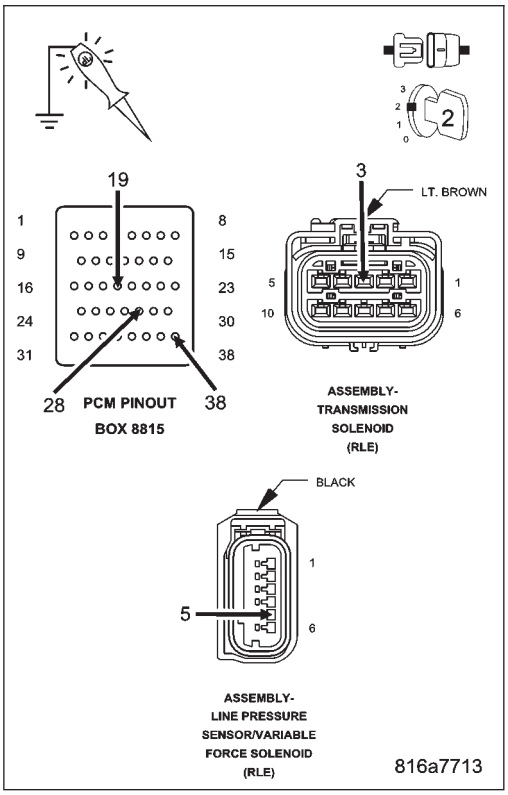
**NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.**

**Does the test light illuminate brightly on all (T16) Transmission Control Output circuits?**

**Yes** >> Go To 5

**No** >> Repair the (T16) Transmission Control Relay Output circuit for an open.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)



## 5. (T50) L/R PRESSURE SWITCH SENSE CIRCUIT OPEN

With the scan tool under TIPM, stop the Transmission actuation.

Turn the ignition off to the lock position.

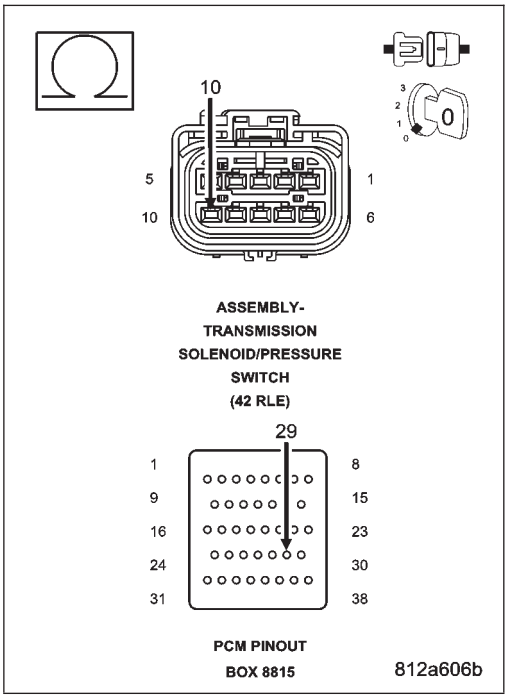
Measure the resistance of the (T50) L/R Pressure Switch Sense circuit between the Transmission Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T50) L/R Pressure Switch Sense circuit for an open.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 6




## 6. (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND

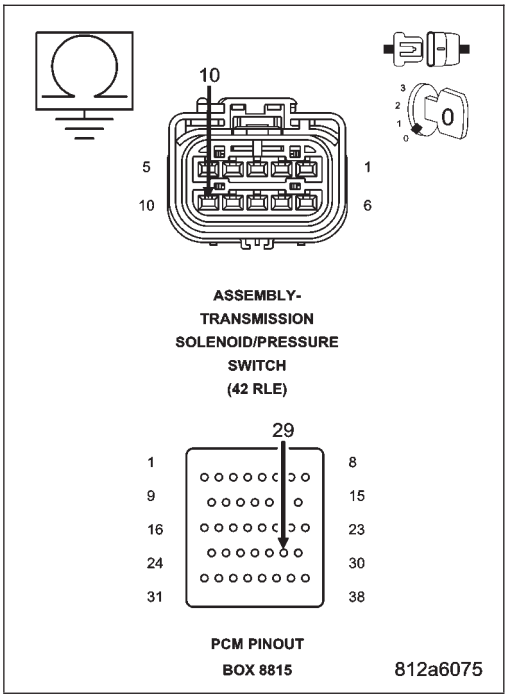
Measure the resistance between ground and the (T50) L/R Pressure Switch Sense circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (T50) L/R Pressure Switch Sense circuit for a short to ground.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 7



## 7. (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T50) L/R Pressure Switch Sense circuit.

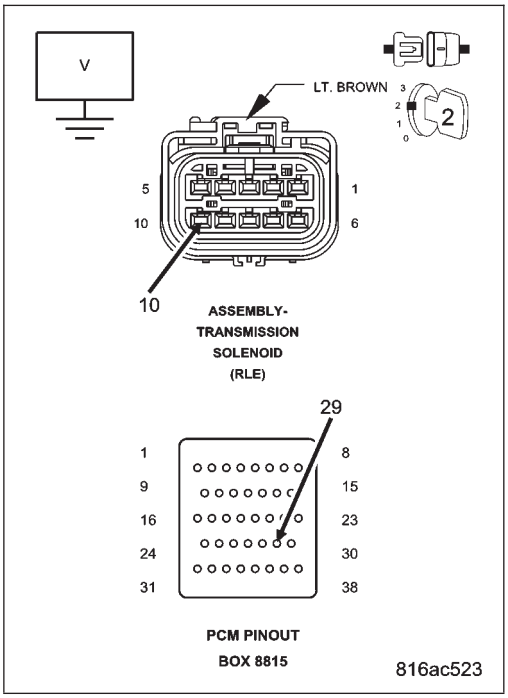
**Is the voltage above 0.5 volts?**

**Yes** >> Repair the (T50) L/R Pressure Switch Sense circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1.

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)




## 8. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Test drive and verify if the transmission is launching in 2nd gear and/or no TCC engagement.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

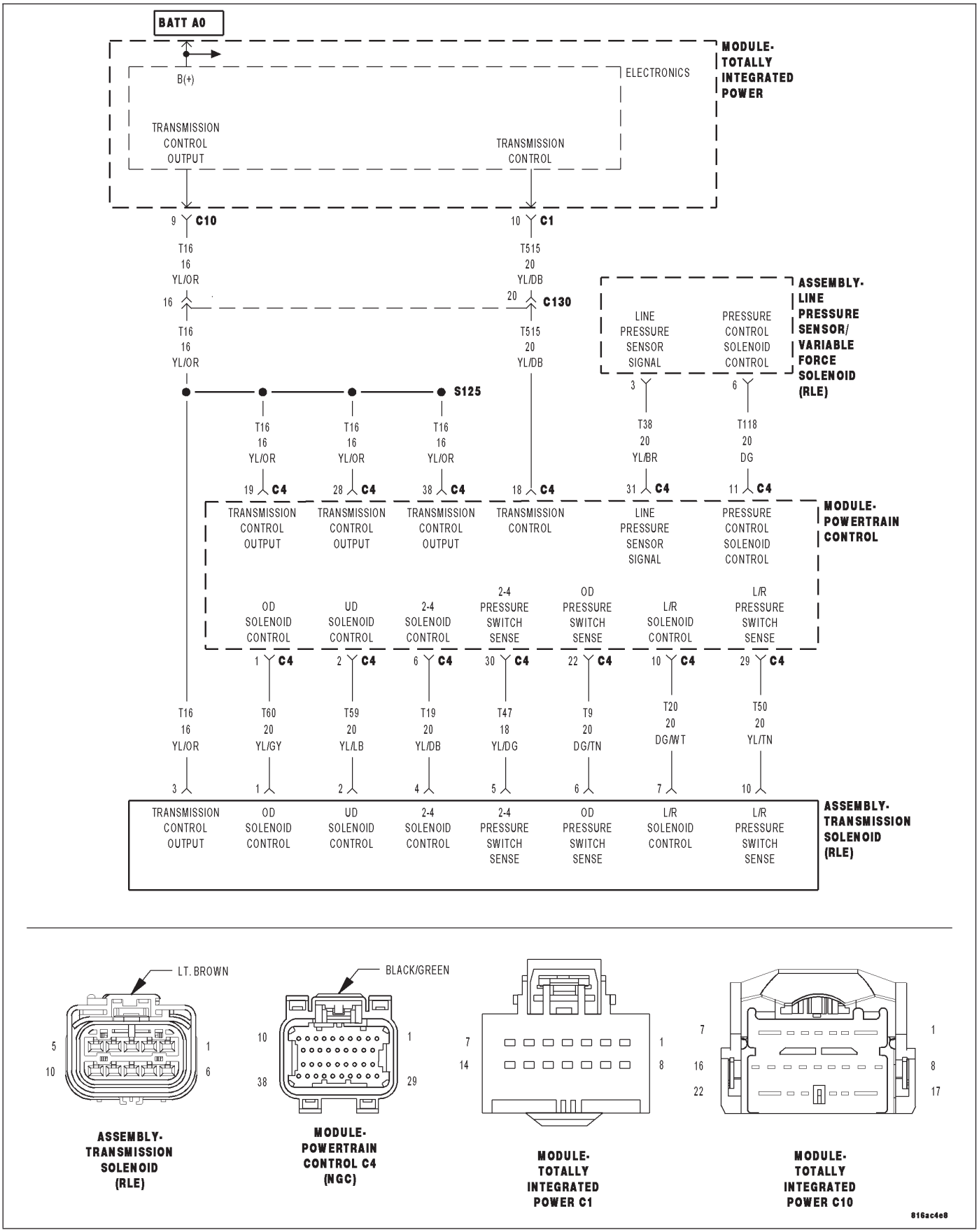
**Are there 2nd gear launches and/or no TCC engagement?**

**Yes** >> Disassemble and inspect the Valve Body per the Service Information and repair or replace as necessary. If no problems are found in the Valve Body, replace the Transmission Solenoid Pressure Switch Assembly.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P1776-SOLENOID SWITCH VALVE LATCHED IN LR POSITION




For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Every 7 ms when doing PEMCC or FEMCC.
- **Set Condition:**
  Must be in partial or full EMCC. The DTC is set if L/R pressure is detected high for the fourth time.

| Possible Causes |
|---|
| RELATED DTC P0841 PRESENT |
| DTC EVENT DATA SHOWS TRS CODE TR2 - SHIFT LEVER OR MANUAL CONTROL VALVE IN A INVALID POSITION |
| SHIFTER CABLE OUT OF ADJUSTMENT |
| SOLENOID SWITCH VALVE STICKING IN ITS BORE |
| (T50) L/R PRESSURE SWITCH SENSE CIRCUIT OPEN |
| (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND |
| (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE |
| VALVE BODY |
| POWERTRAIN CONTROL MODULE |

**Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The Solenoid Switch Valve, an internal, hydraulically operated valve, controls the direction of the transmission fluid when the L/R solenoid is energized. When the solenoid switch valve is in the downshifted position and the L/R solenoid is energized, fluid is directed to the L/R element for 1st gear. When the solenoid switch valve is In the up-shifted position (2nd, 3rd, and 4th gear) and the L/R solenoid is energized, fluid is directed into the Lockup Switch Valve which controls the Torque Converter Clutch. When doing PEMCC or FEMCC, the L/R pressure switch should indicate no pressure if the solenoid switch valve is in the L/R position. If the L/R pressure switch indicates pressure for some time while in partial or full EMCC, the EMCC operation is aborted and momentarily inhibited to avoid accidental application of the L/R clutch. EMCC is attempted again when there is no L/R pressure. The fourth detection of L/R pressure while in PEMCC or FEMCC will result in setting the DTC. Torque converter EMCC operation inhibited. MIL on after 5 min. of substituted operation.

## Diagnostic Test

### 1. DETERMINING IF RELATED DTC'S ARE PRESENT

With the scan tool, check for other Transmission DTC's

**Is the DTC P0841 present also?**

**Yes** >> Refer to the Transmission category and perform the appropriate symptom.

**No** >> Go To 2

### 2. CHECK THE DTC EVENT DATA FOR TRS CODE TR2

With the scan tool, check the DTC EVENT DATA for P1776.

**Does the DTC EVENT DATA show a TRS Code of TR2?**

**Yes** >> This indicates the shift lever and the manual control valve were in an invalid position between Neutral and OD. Check the shifter cable for: proper adjustment, binding, friction, improper routing, or the shifter was moved in transit. Repair as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 3

## 3. CHECK TO SEE IF DTC P1776 IS CURRENT

With the scan tool, check the STARTS SINCE SET counter for P1776.

**NOTE: This counter only applies to the last DTC set.**

**Is the status Active or is the STARTS SINCE SET counter 2 or less for this DTC?**

**Yes** >> Go To 4

**No** >> Go To 9

## 4. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Pressure Switch selector switch to L/R.

With the scan tool, monitor the L/R Pressure Switch State while pressing the Pressure Switch Test button.

**Did the Pressure Switch state change from open to closed when the test button was pressed?**

**Yes** >> Go To 5

**No** >> Go To 6

## 5. CHECK THE SOLENOID SWITCH VALVE FOR STICKING

Remove the transmission oil pan and Valve body and inspect the Solenoid Switch Valve for sticking in its bore, repair or replace as necessary.

**NOTE: This DTC may be caused by debris lodged in the Transmission Solenoid Switch Valve bore. If debris is found, clean the valve body and reassemble the transmission per the Service Information.**

With the scan tool, record the DTC EVENT DATA for P1776 and erase DTCs.

Reassemble the transmission and test drive the vehicle. Try to duplicate the original set conditions using the DTC EVENT DATA recorded earlier.

With the scan tool, check Transmission DTCs.

**Did the DTC P1776 reset?**

**Yes** >> Replace the Transmission Solenoid Assembly per the Service Information.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/ TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 6. CHECK THE (T50) L/R PRESSURE SWITCH SENSE CIRCUIT FOR AN OPEN

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

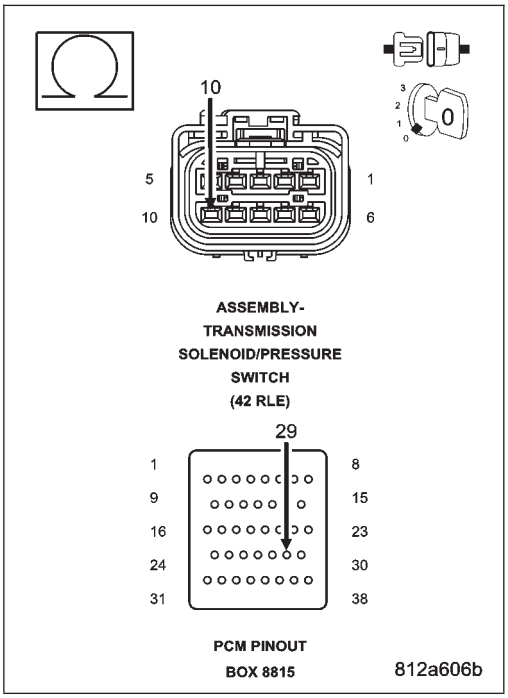
Measure the resistance of the (T50) L/R Pressure Switch Sense circuit between the Transmission Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

**Is the resistance above 5.0 ohms?**

**Yes** >> Repair the (T50) L/R Pressure Switch Sense circuit for an open.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 7




## 7. CHECK THE (T50) L/R PRESSURE SWITCH SENSE CIRCUIT FOR A SHORT TO GROUND

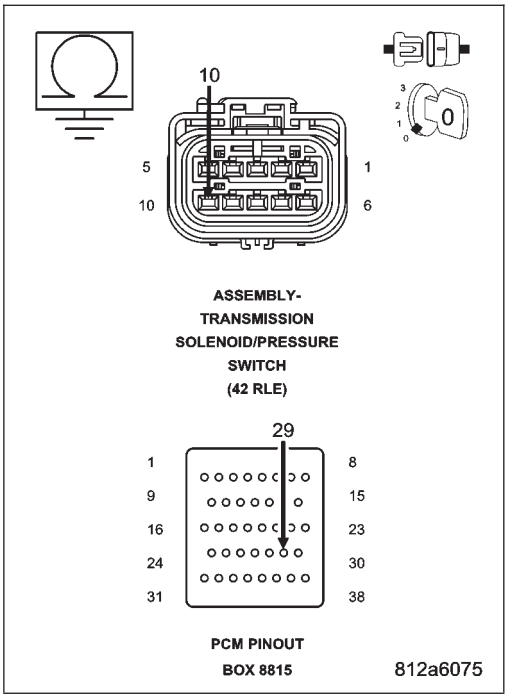
Measure the resistance between ground and the (T50) L/R Pressure Switch Sense circuit.

**Is the resistance below 5.0 ohms?**

**Yes** >> Repair the (T50) L/R Pressure Switch Sense circuit for a short to ground.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Go To 8



## 8. CHECK THE (T50) L/R PRESSURE SWITCH SENSE CIRCUIT FOR A SHORT TO VOLTAGE

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T50) L/R Pressure Switch Sense circuit.

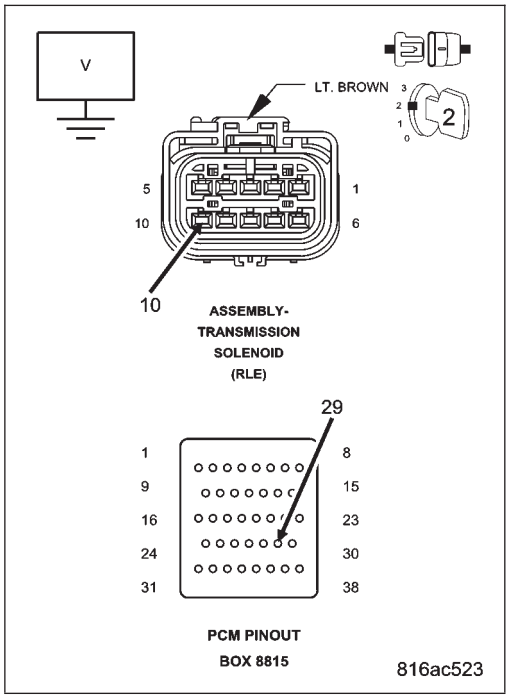
**Is the voltage above 0.5 volts?**

**Yes** >> Repair the (T50) L/R Pressure Switch Sense circuit for a short to voltage.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)




## 9. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Test Drive the vehicle and verify if the transmission is launching in 2nd gear and/or there is no TCC engagement.

With the scan tool, check the EVENT DATA to help identify the conditions in which the DTC was set.

Check for any Service Information Tune-ups or Service Bulletins for possible causes that may apply.

**Are there 2nd gear launches and/or no TCC engagement?**

**Yes** >> Disassemble and inspect the Valve Body per the Service Information Inspect the Solenoid Switch Valve for sticking in its bore and repair or replace as necessary.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P1790-FAULT IMMEDIATELY AFTER SHIFT

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  After a Gear Ratio Error code is stored.
- **Set Condition:**
  After a Gear Ratio Error DTC has already been set. The DTC is set if the fault happened within 1.3 seconds of a shift. The DTC set time will vary from 1.214 seconds to 15 seconds.

| Possible Causes |
|---|
| FAULT AFTER SHIFT |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

This DTC is not stored alone. It is stored if a Gear Ratio DTC is detected immediately after shift. The existence of DTC P1790 indicates a mechanical or hydraulic (not electrical) related problems. It should be noted, however, that all mechanical problems don't necessarily result in DTC P1790. When this DTC exists, diagnosing the system should be based on the associated DTC and only mechanical causes should be considered.

## Diagnostic Test

### 1. FAULT AFTER SHIFT

This DTC is set along with a Gear Ratio DTC. Perform the appropriate test for the Gear Ratio DTC stored.

**NOTE: Check Pending DTCs or 1 trip failures if there are no Active or Stored Gear Ratio DTCs.**

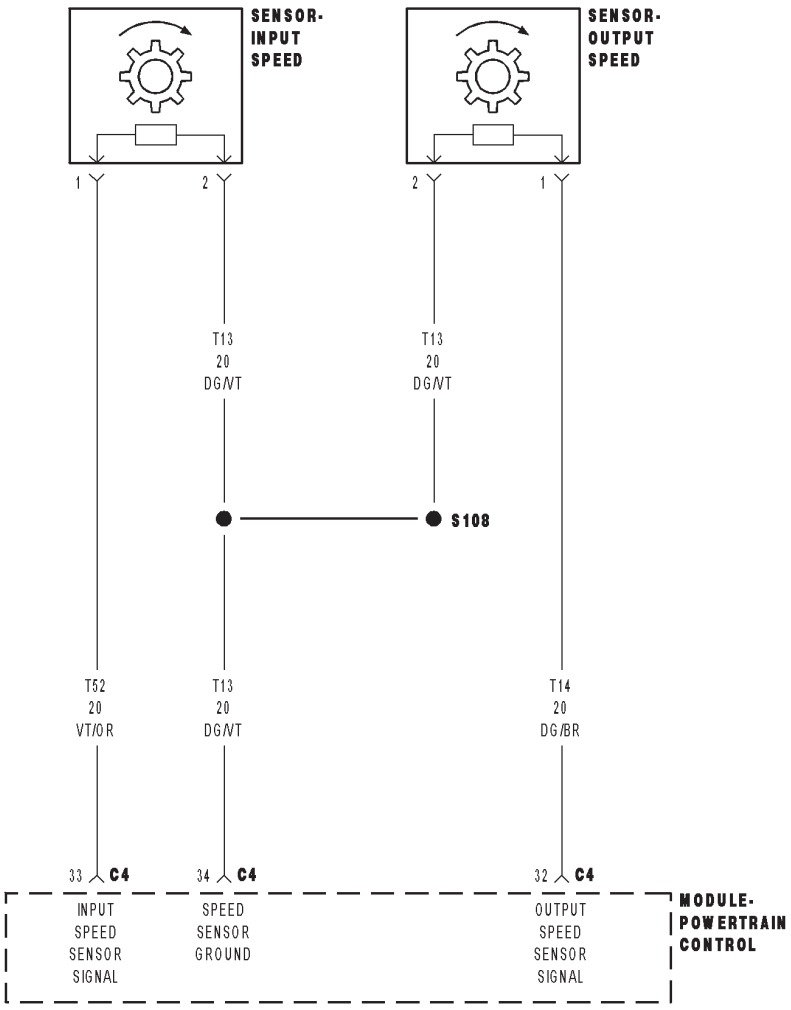
**If there are no possible causes remaining, view repair.**

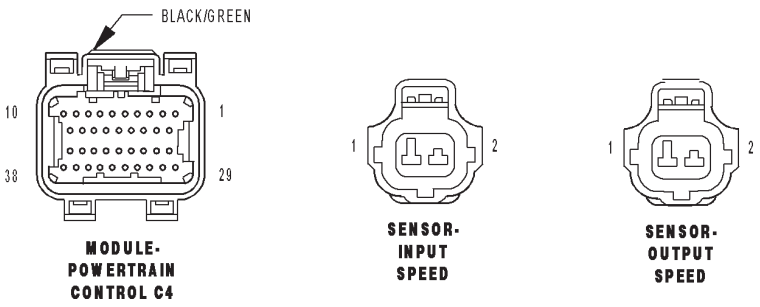
**Repair**

Refer to the Transmission category and perform the appropriate symptom.

Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## P1794-SPEED SENSOR GROUND ERROR




814AE832

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Every 7msec after a controller reset with transmission in neutral.
- **Set Condition:**
  After a PCM reset in neutral and Input and Output sensor ratio equals 2.50 to 1.0 ± 50.0 RPM.

| Possible Causes |
| --- |
| SPEED SENSOR GROUND CIRCUIT OPEN |
| POWERTRAIN CONTROL MODULE |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The input and output speed sensors use a common ground circuit. The loss of this common ground results in the input signal being sensed for both. After a reset in neutral, and after observing a specific ratio, the Speed Check Fault Counter will increment. Because the speed sensors and the thermistor share the same ground circuit, this DTC may indicate a loss of the common speed sensor ground. In some cases this fault will cause a Gear Ratio Error DTC to be set.

## Diagnostic Test

### 1. PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Ignition Switch Feed fuse from the TIPM.

**CAUTION: Removal of the Ignition Switch Feed fuse from the TIPM will prevent the vehicle from being started in gear.**

**WARNING: The Ignition Switch Feed fuse must be removed from the TIPM. Failure to do so can result in personal injury or death.**

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A.

Ignition on, engine not running.

With the Transmission Simulator, set the ″Input/Output Speed″ switch to ″ON″ and the rotary switch to the ″3000/1250″ position.

With the scan tool, monitor the Input and Output Speed Sensor readings.

**Does the Input Speed read 3000 RPM and the Output Speed read 1250 RPM, ± 50 RPM?**

**Yes** >> Go To 2

**No** >> Go To 3

## 2. (T13) SPEED SENSOR GROUND CIRCUIT OPEN

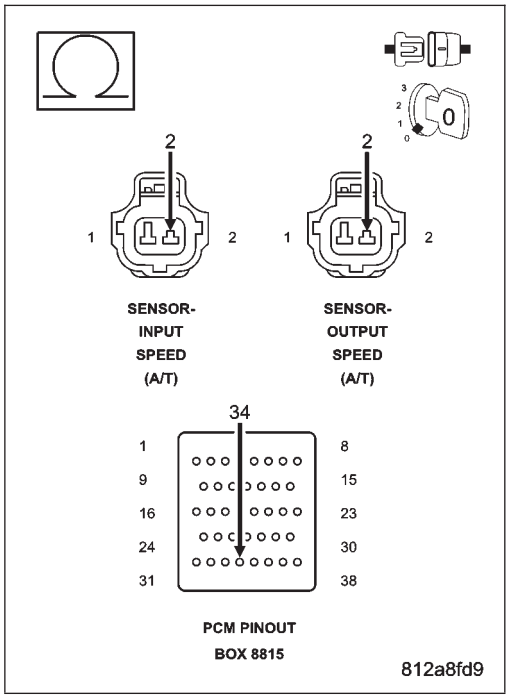
Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Input and Output Speed Sensor harness connectors.

**CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.**

Measure the resistance of both of the (T13) Speed Sensor Ground circuits from the appropriate terminal of special tool #8815 to the Input and Output Speed Sensor harness connectors.




**Is the resistance above 5.0 ohms on either circuit?**

**Yes** >> Repair the (T13) Speed Sensor Ground circuit for an open.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## 3. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

**Were there any problems found?**

**Yes** >> Repair as necessary.
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Test Complete.

## P1797-MANUAL SHIFT OVERHEAT

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Continuously with engine running.
- **Set Condition:**
  If the Engine Temperature exceeds 123° C (255° F) or the Transmission Temperature exceeds 135° C (275° F) while in AutoStick® mode. Note: Aggressive driving or driving in low for extended periods of time will set this DTC.

| Possible Causes |
|---|
| MANUAL SHIFT OVERHEAT |

**Always perform the 42RLE Pre-Diagnostic Troubleshooting procedure before proceeding. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)**

## Theory of Operation

The major cause of heat build up in the transmission is torque converter slip. With the transmission in the AutoStick® mode, the torque converter can slip during aggressive driving or heavy loading conditions such as trailer towing or driving up steep grades. In the non AutoStick® mode, internal controller logic prevents the transmission from overheating by managing the shift and EMCC schedule. In the AutoStick® mode, when the transmission or engine temperature approaches an overheat condition, the manual shift overheat DTC sets and the AutoStick® mode is temporarily suspended until the temperature returns to normal.

## Diagnostic Test

### 1. MANUAL SHIFT OVERHEAT

This is an informational DTC only.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Check the engine and transmission cooling system for proper operation.

Check the Radiator Cooling Fan operation.

Check the Transmission Cooling operation.

Check the Transmission Fluid Level per the Service Information to verify that it is not overfilled.

**NOTE: Aggressive driving or driving in low for extended periods of time will set this DTC.**

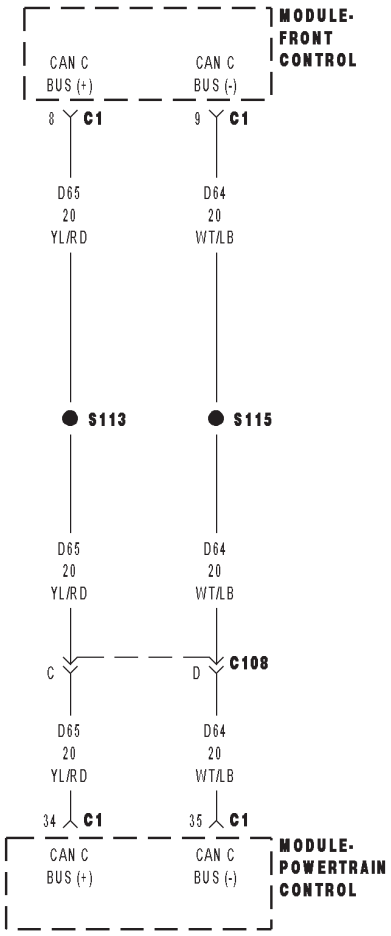
**If there are no possible causes remaining, view repair.**

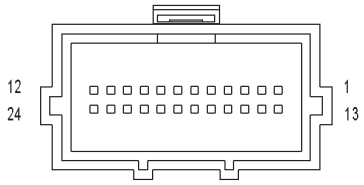
**Repair**

If the Transmission Fluid is low, repair any Transmission Fluid leak as necessary and adjust the Transmission Fluid Level per the Service Information. Refer to Service Information for the related symptoms and repair as necessary.

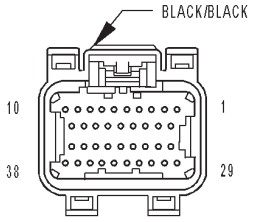
Perform 42RLE TRANSMISSION VERIFICATION TEST - VER 1. (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

## U0100 LOST COMMUNICATION WITH ECM/PCM




MODULE-
FRONT
CONTROL C1




MODULE-
POWERTRAIN
CONTROL C1

814AE844

For a complete wiring diagram **Refer to Section 8W**.

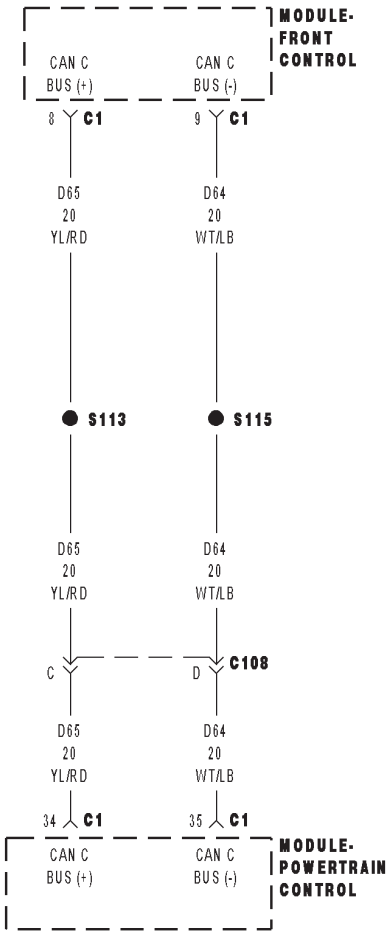
- **When Monitored:**
  Every 7 msec with:
  1) Engine speed greater than 500 RPM.
  2) Battery voltage between 10 and 16 volts.
- **Set Condition:**
  CAN C BUS messages are not received for 10 seconds.

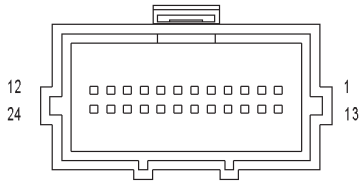
## Theory of Operation

The NGC controller communicates over the CAN C BUS. The transmission controller continuously monitors BUS activity. The CAN C BUS is also used to communicate transmission MIL status to the Engine Controller. If the Engine Controller is unable to communicate with the Transmission Controller, a DTC will set and the Engine Controller will illuminate the MIL.

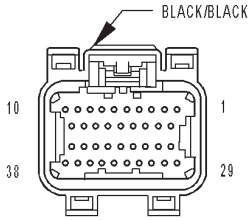
**Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES - DIAGNOSIS AND TESTING for diagnostic procedures and for further possible causes.**

## U0002 CAN C BUS OFF PERFORMANCE




MODULE-
FRONT
CONTROL C1




MODULE-
POWERTRAIN
CONTROL C1

814AE844

For a complete wiring diagram **Refer to Section 8W**.

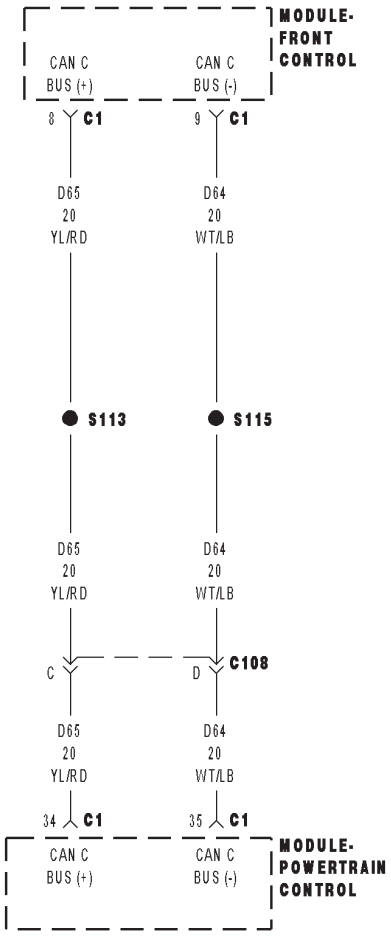
- **When Monitored:**
  Every 7 msec with:
  1) Engine speed greater than 500 RPM.
  2) Battery voltage between 10 and 16 volts.
- **Set Condition:**
  CAN C BUS messages are not received for 10 seconds.

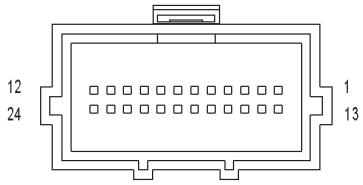
## Theory of Operation

The NGC controller communicates over the CAN C BUS. The transmission controller continuously monitors BUS activity. The CAN C BUS is also used to communicate transmission MIL status to the Engine Controller. If the Engine Controller is unable to communicate with the Transmission Controller, a DTC will set and the Engine Controller will illuminate the MIL.

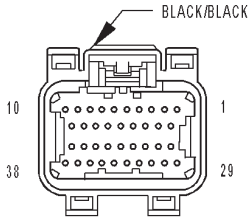
**Diagnose the U0002 CAN C BUS OFF PERFORMANCE as the U0001 CAN C BUS CIRCUIT test in 8-ELECTRICAL/ELECTRONIC CONTROL MODULES - DIAGNOSIS AND TESTING for diagnostic procedures and for further possible causes.**

## U0121 LOST COMMUNICATION WITH ABS




MODULE-
FRONT
CONTROL C1




MODULE-
POWERTRAIN
CONTROL C1

814AE844

For a complete wiring diagram **Refer to Section 8W**.

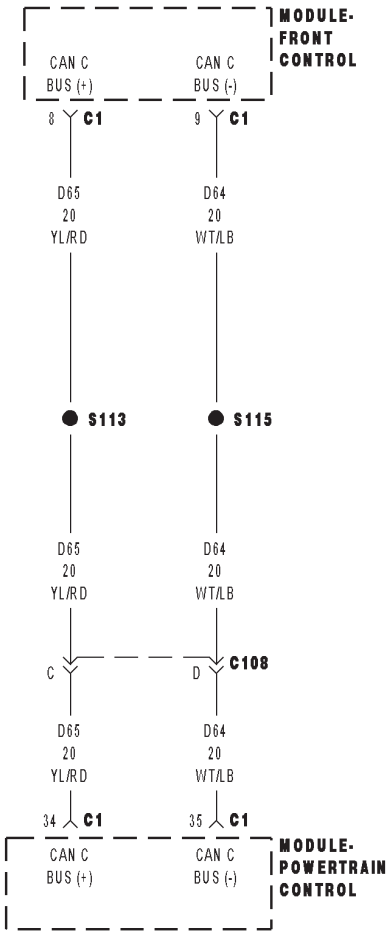
- **When Monitored:**
  Every 7 msec with:
  1) Engine speed greater than 500 RPM.
  2) Battery voltage between 10 and 16 volts.
- **Set Condition:**
  CAN C BUS messages are not received for 10 seconds.

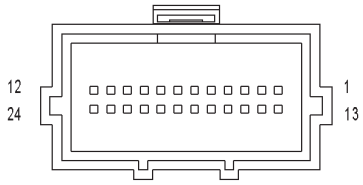
## Theory of Operation

The NGC controller communicates over the CAN C BUS. The transmission controller continuously monitors BUS activity. The CAN C BUS is also used to communicate transmission MIL status to the Engine Controller. If the Engine Controller is unable to communicate with the Transmission Controller, a DTC will set and the Engine Controller will illuminate the MIL.

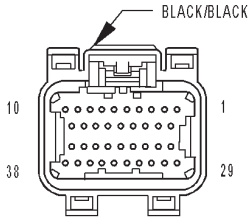
**Refer to 8-ELECTRICAL/ELECTRONIC CONTROL MODULES - DIAGNOSIS AND TESTING for diagnostic procedures and for further possible causes.**

## U0141 LOST COMMUNICATION WITH FCM




MODULE-
FRONT
CONTROL C1




MODULE-
POWERTRAIN
CONTROL C1

814AE844

For a complete wiring diagram **Refer to Section 8W**.

- **When Monitored:**
  Every 7 msec with:
  1) Engine speed greater than 500 RPM.
  2) Battery voltage between 10 and 16 volts.
- **Set Condition:**
  CAN C BUS messages are not received for 10 seconds.

## Theory of Operation

The NGC controller communicates over the CAN C BUS. The transmission controller continuously monitors BUS activity. The CAN C BUS is also used to communicate transmission MIL status to the Engine Controller. If the Engine Controller is unable to communicate with the Transmission Controller, a DTC will set and the Engine Controller will illuminate the MIL.

**Refer to 8-ELECTRICAL/ELECTRONIC CONTROL MODULES - DIAGNOSIS AND TESTING for diagnostic procedures and for further possible causes.**

# STANDARD PROCEDURE

## PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE - 42RLE

For a complete wiring diagram **Refer to Section 8W**.

1.

**Perform the following steps prior to any diagnostic procedure:**

- Many transmission symptoms can be caused by a low fluid level. If the fluid level is low, locate and repair any leaks and fill the transmission to the proper fluid level. Refer to the Service Information for the proper repair and fluid fill procedures.
- Testing should only be performed with the battery fully charged to avoid false diagnosis.
- With the scan tool, read Engine (PCM) DTCs. If Engine DTCs are present, refer to the Driveability Category and perform to the appropriate diagnostic procedure(s) before proceeding.
- With the scan tool, read Transmission (TCM) DTCs. Record all Stored, Active, and Pending DTC information. Diagnose any Pending DTC as a matured DTC.
- With the scan tool, read DTC EVENT DATA. Use this data to identify the conditions in which the DTC was set.
- **Note: Performing a Battery Disconnect will clear all DTC EVENT DATA and reset all learned Transmission values to the controllers default values, which may temporarily result in erratic shift schedules.**
- With the scan tool, perform the Shift Lever Position Test. If the test does not pass, refer to the diagnostic procedure for P0706-Check Shifter Signal.
- For Gear Ratio Error DTCs, use the scan tool to read and record the Clutch Volume Index (CVI) information.
- Use the wiring diagram as a guide, inspect the wiring and connectors related to this circuit and repair as necessary.
- Refer to the When Monitored and Set Conditions for this DTC. DTCs can set at ignition on, at start up, driving under specific conditions, and after controller diagnostic monitors have run.
- Refer to applicable Technical Service Bulletins (TSBs) for controller software update information. Some conditions can be corrected by upgrading the Engine (PCM) or Transmission (TCM) controller software.
- Check for any Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

**Were there any repairs made that fixed the vehicle?**

**Yes** >> Testing complete.
Perform 42RLE VERIFICATION TEST - VER 1 (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - STANDARD PROCEDURE)

**No** >> Refer to the Transmission category and perform the appropriate diagnostic procedure(s). (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - DIAGNOSIS AND TESTING)

## 42RLE TRANSMISSION VERIFICATION TEST - VER 1

# 1.

Perform the following after completion of a diagnostic repair:

- **Note: After completion of the Transmission Verification Test, the Powertrain Verification Test must be performed. Refer to the Engine Category.**
- Reconnect any disconnected components.
- With the scan tool, erase all Transmission and Engine DTCs.
- Erase DTC P0700 under engine to turn off the MIL off after completion of transmission repairs.
- Perform *PRNDL FAULT CLEARING PROCEDURE after completion of repairs for P0706-TRANSMISSION RANGE SENSOR RATIONALITY.
- If the Powertrain Control Module or the Transmission has been repaired or replaced, it is necessary to perform the scan tool Quick Learn Procedure.
- If the Torque converter has been replaced, with the scan tool perform TCC BREAK-IN.
- If the Powertrain Control Module or Front Control Module has been replaced you must reset the Pinion Factor in the Front Control Module.
- With the scan tool, display Transmission Temperature. Start and run the engine until the Transmission Temperature is HOT, above 43° C or 110° F.
- Check the transmission fluid and adjust if necessary. Refer to the Service Information for the Fluid Fill procedure.
- Road test the vehicle. With the scan tool, monitor the engine RPM. Make 15 to 20 1-2, 2-3, 3-4 upshifts. Perform these shifts from a standing start to 45 mph with a constant throttle opening of 20 to 25 degrees.
- With speeds below 25 MPH, make 5 to 8 wide open throttle kickdowns to 1st gear. Allow at least 5 seconds each in 2nd and 3rd gear between each kickdown.
- For a specific DTC, drive the vehicle to the Symptom's When Monitored/When Set conditions to verify the DTC is repaired.
- If equipped with AutoStick®, upshift and downshift several times using the AutoStick® feature during the road test.
- **Note: Use the OBDII task manager to run a Good Trip in each gear, this will confirm the repair and to ensure that the DTC has not re-matured.**
- Check for any Diagnostic Trouble Codes (DTCs) during and after the road test.

**Did any Diagnostic Trouble Codes set during the road test?**

**Yes** >> Repair is not complete. Refer to the Transmission category and perform the appropriate symptom(s). (Refer to 21 - TRANSMISSION/TRANSAXLE/AUTOMATIC - 42RLE - DIAGNOSIS AND TESTING)

**No** >> Repair is complete.