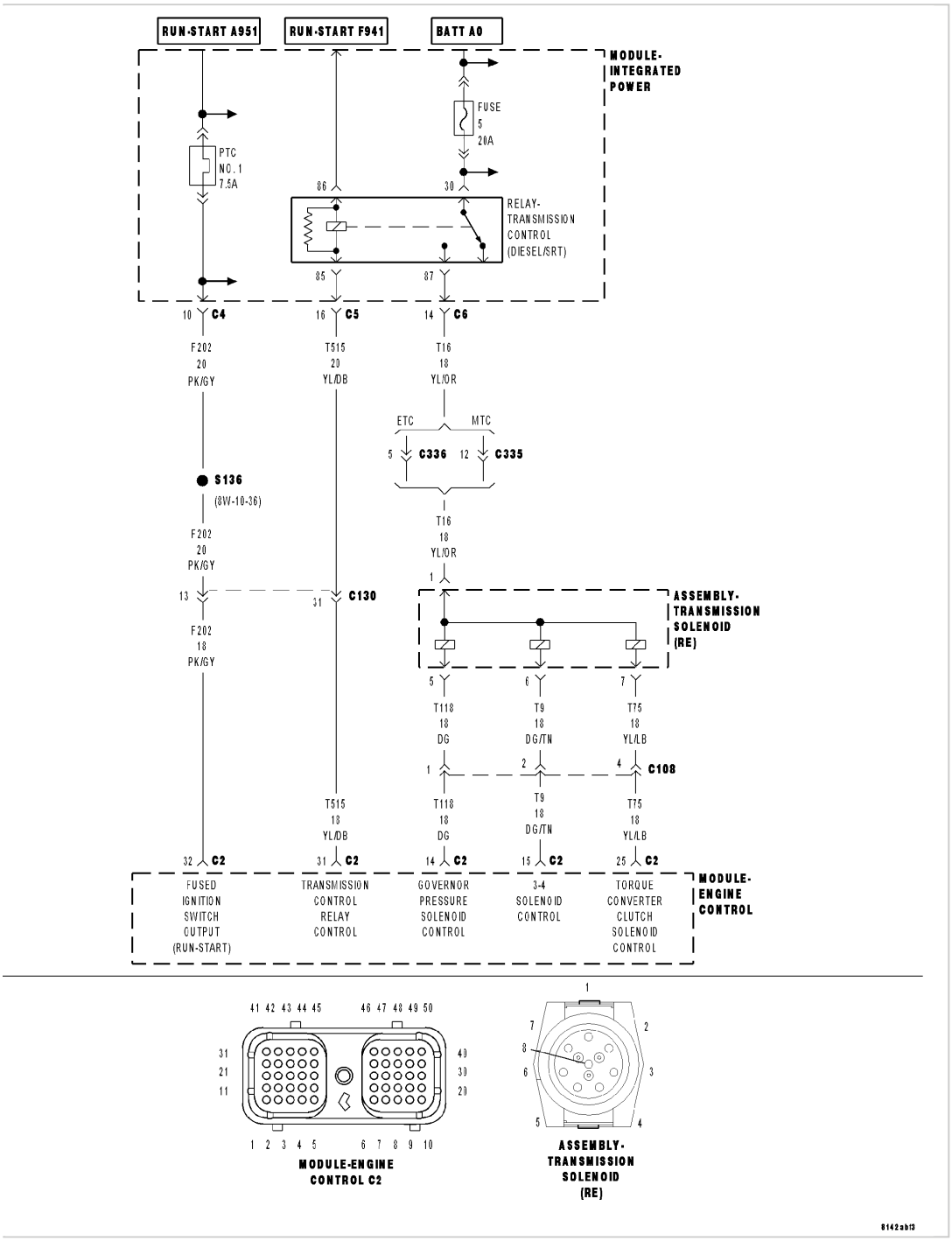
2005 Dodge or Ram Truck RAM 3500 Truck 4WD L6-5.9L DSL Turbo VIN C
Vehicle > ALL Diagnostic Trouble Codes (DTC) > Testing and Inspection > P Code Charts > P0973

TRANSMISSION CODE

P0973-TRANSMISSION OVERDRIVE CIRCUIT VOLTAGE TOO LOW (DIESEL)



For the Transmission circuit diagram Refer to Transmission Control Systems/Diagram.
For a complete wiring diagram refer to diagrams.

Theory of Operation

The 3-4 Solenoid is used the engage the gear change form 3rd gear to 4th gear.

The solenoids used in transmission applications are attached to valves which can be classified as normally open or normally closed. The normally open solenoid valve is defined as a valve which allows hydraulic flow when no current or voltage is applied to the solenoid. The normally closed solenoid valve is defined as a valve which does not allow hydraulic flow when no current or voltage is applied to the solenoid. These valves perform hydraulic control functions for the transmission and must therefore be durable and tolerant of dirt particles. For these reasons, the valves have hardened steel poppets and ball valves. The solenoids operate the valves directly, which means that the solenoids must have very high outputs to close the valves against the sizable flow areas and line pressures found in current transmissions. Fast response time is also necessary to ensure accurate control.

- When Monitored:
  Continuously with ignition on.
- Set Condition:
  This code will set if the voltage detected on the 3-4 Shift Solenoid Control circuit at the ECM is different then the expected voltage. Note: To clear this DTC it is necessary to drive the vehicle at a sustained speed which would allow the TCC and/or Overdrive Clutch to operate

Possible Causes

- TRANSMISSION CONTROL RELAY DTC PRESENT
- (T9) 3-4 SOLENOID CONTROL CIRCUIT OPEN
- FUSED B+ CIRCUIT OPEN
- (T16) TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT OPEN
- (T9) 3-4 SOLENOID CONTROL CIRCUIT SHORT TO GROUND
- (T16) TRANSMISSION RELAY OUTPUT CIRCUIT SHORT TO GROUND
- (T9) 3-4 SOLENOID CIRCUIT SHORT TO OTHER CIRCUITS
- TRANSMISSION CONTROL RELAY - POOR CONTACTS
- 3-4 SHIFT SOLENOID
- ENGINE CONTROL MODULE

Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding.

Diagnostic Test

1. CHECK FOR TRANSMISSION CONTROL RELAY DTCS
   Ignition on, engine not running.
   With the scan tool, read Engine DTCs.

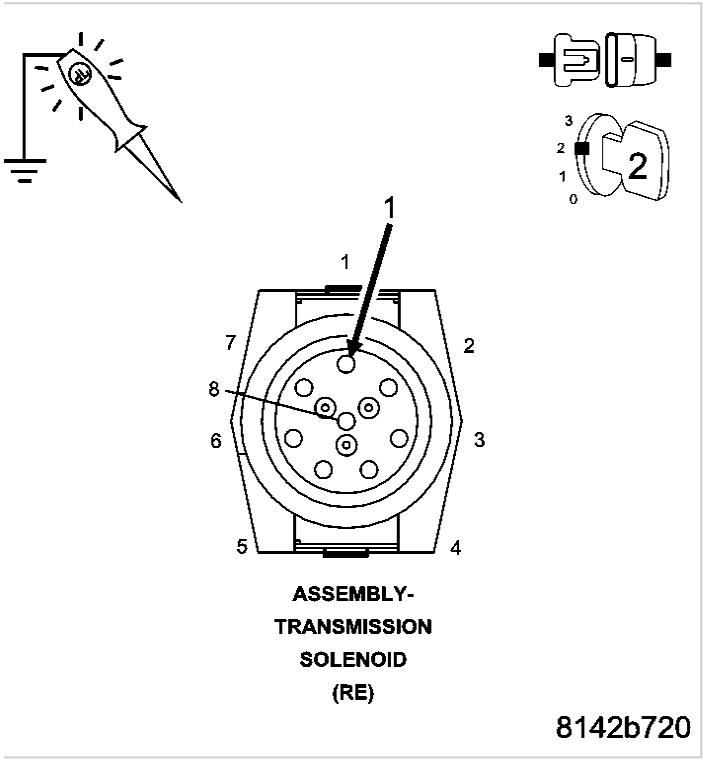
   Are there any Transmission Control Relay DTCs present?
   Yes >>Refer to the Transmission category, and perform the appropriate symptom(s).
   No >>Go To 2

2. CHECK IF THE DTC IS CURRENT
   Ignition on, engine not running.
   With the scan tool, read Engine DTCs.
   Record the Freeze Frame data for the reported DTC.
   With the scan tool, erase DTCs.
   Turn the ignition off to the lock position.
   Using the Freeze Frame data recorded earlier, try to duplicate the conditions in which the DTC originally set.

NOTE: It may be necessary to road test the vehicle to duplicate the original set conditions. With the scan tool, reac Engine DTCs.

Did the DTC reset?
Yes >>Go To 3
No >>Go To 12

3. CHECK THE (T16) TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT



Turn the ignition off to the lock position.
Disconnect the Transmission Solenoid Assembly harness connector.

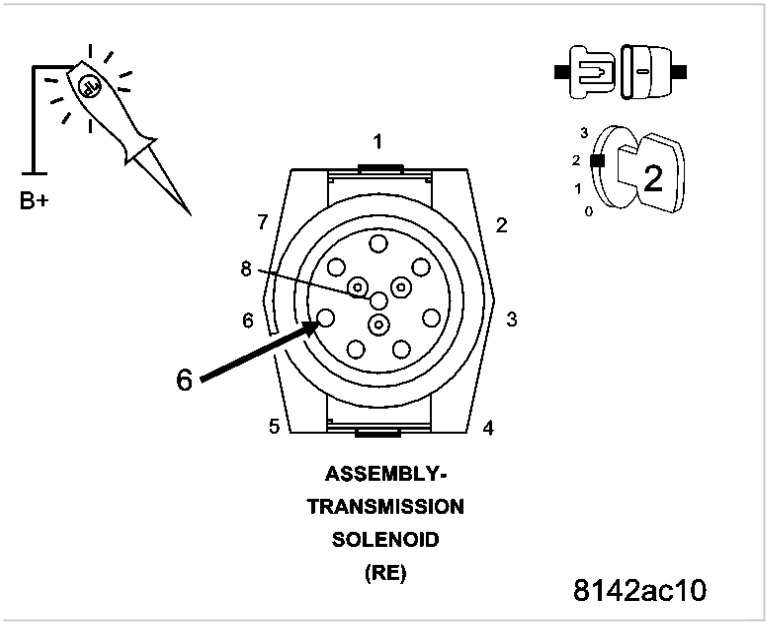
NOTE: Check connectors - Clean/repair as necessary.

Ignition on, engine not running.
With the scan tool, actuate the Transmission Control Relay.
Using a 12-volt test light connected to ground, check the (T16) Transmission Control Relay Output circuit in the Transmission Solenoid 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 cycle on and off and illuminate brightly?
Yes >>Go To 4
No >>Go To 9

4. CHECK THE 3-4 SHIFT SOLENOID



With the scan tool, actuate the Overdrive (3-4) Solenoid.

Using a 12-volt test light connected to 12-volts, check the (T9) 3-4 Shift Solenoid Control circuit in the Transmission Solenoid Assembly harness connector.

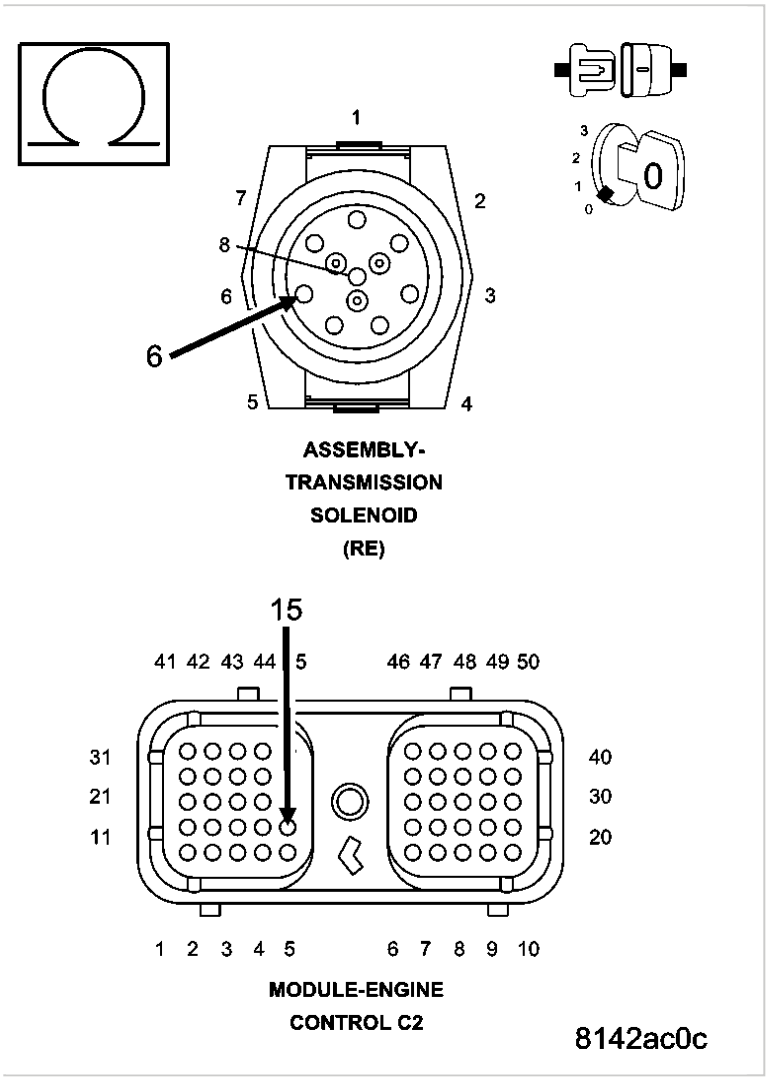
Does the test light cycle on and off and illuminate brightly?

Yes >>Check all internal wiring pertaining to the 3-4 Shift Solenoid for an open, short, and bent or broken terminals. If no internal wiring problems are found, replace the Transmission Solenoid Assembly per the Service Information.

Perform RE TRANSMISSION VERIFICATION TEST VER -1 (DIESEL). See: A L L Diagnostic Trouble Codes (DTC) > Verification Tests

No >>Go To 5

5. CHECK THE (T9) 3-4 SOLENOID CONTROL CIRCUIT FOR AN OPEN



Turn the ignition off to the lock position.

Disconnect the ECM C2 and C2 harness connectors.

Measure the resistance of the (T9) 3-4 Solenoid Control circuit between the Transmission Solenoid Assembly harness connector and the ECM C2 harness connector.

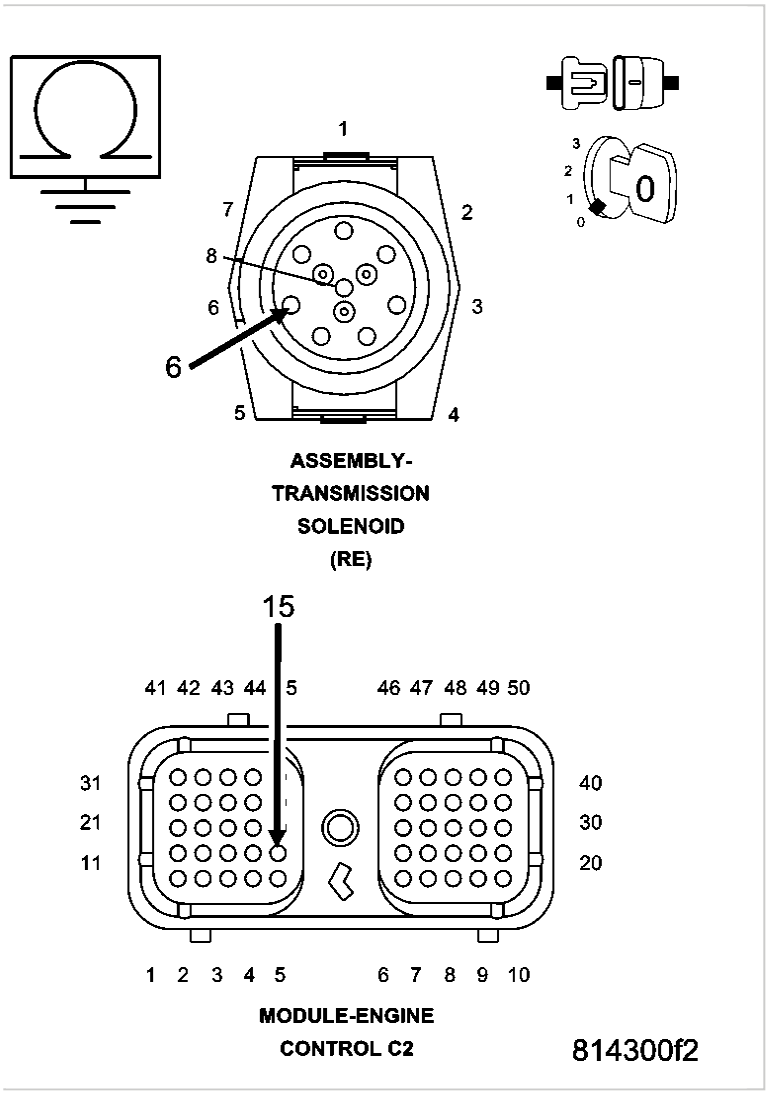
Is the resistance below 5.0 ohms?

Yes >>Go To 6

No >>Repair the (T9) 3-4 Solenoid Control circuit for an open.

Perform RE TRANSMISSION VERIFICATION TEST VER - 1 (DIESEL). See: A L L Diagnostic Trouble Codes (DTC) > Verification Tests

6. CHECK THE (T9) 3-4 SOLENOID CONTROL CIRCUIT FOR A SHORT TO GROUND



Measure the resistance between ground and the (T9) 3-4 Solenoid Control circuit.

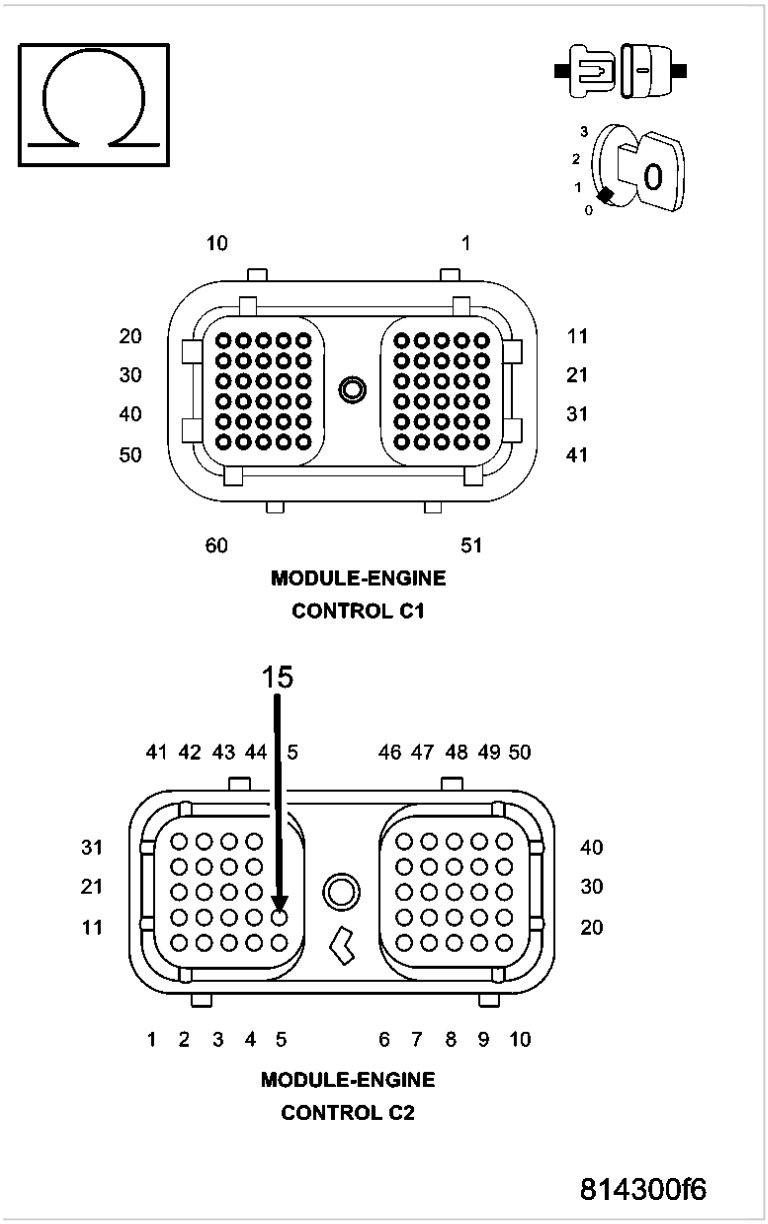
Is the resistance above 100k ohms?

Yes >>Go To 7

No >>Repair the (T9) 3-4 Solenoid Control circuit for a short to ground.

Perform RE TRANSMISSION VERIFICATION TEST VER - 1 (DIESEL). See: A L L Diagnostic Trouble Codes (DTC) > Verification Tests

7. CHECK THE (T9) 3-4 SHIFT SOLENOID CONTROL CIRCUIT FOR A SHORT TO ANOTHER CIRCUIT



Measure the resistance between the (T9) 3-4 Solenoid Control circuit and all other circuits in the ECM C1 and C2 harness connectors.

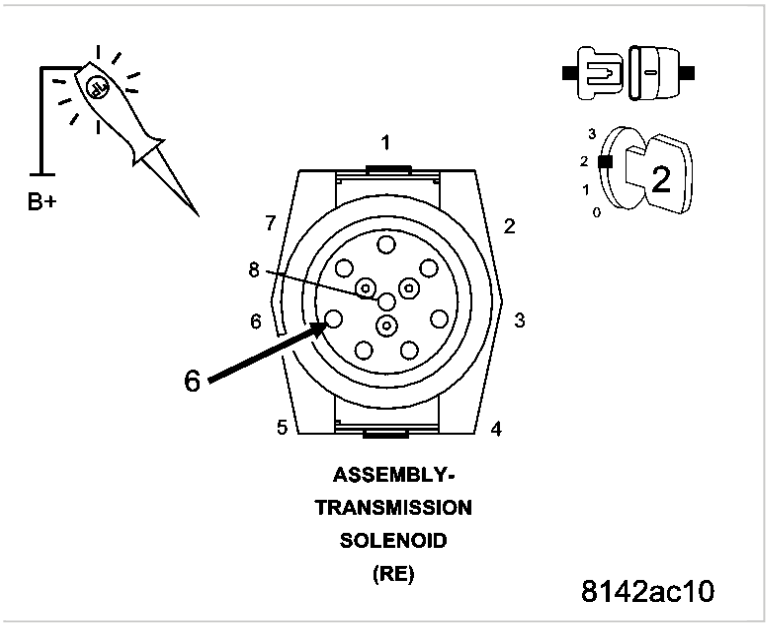
Is the resistance above 100k ohms between the (T9) 3-4 Solenoid Control circuit and any other circuit(s) in the ECM C1 or C2 harness connectors?

Yes >>Go To 8

No >>Repair the (T9) 3-4 Shift Solenoid Control circuit for a short to another circuit(s).

Perform RE TRANSMISSION VERIFICATION TEST VER - 1 (DIESEL). See: A L L Diagnostic Trouble Codes (DTC) > Verification Tests

8. CHECK THE ENGINE CONTROL MODULE



Reconnect the ECM harness connectors. Turn the ignition on, engine not running. With the scan tool, actuate the 3-4 (Overdrive) Solenoid. Using a 12-volt test light connected to 12-volts, check the (T9) 3-4 Solenoid Control circuit in the Transmission Solenoid Assembly harness connector.

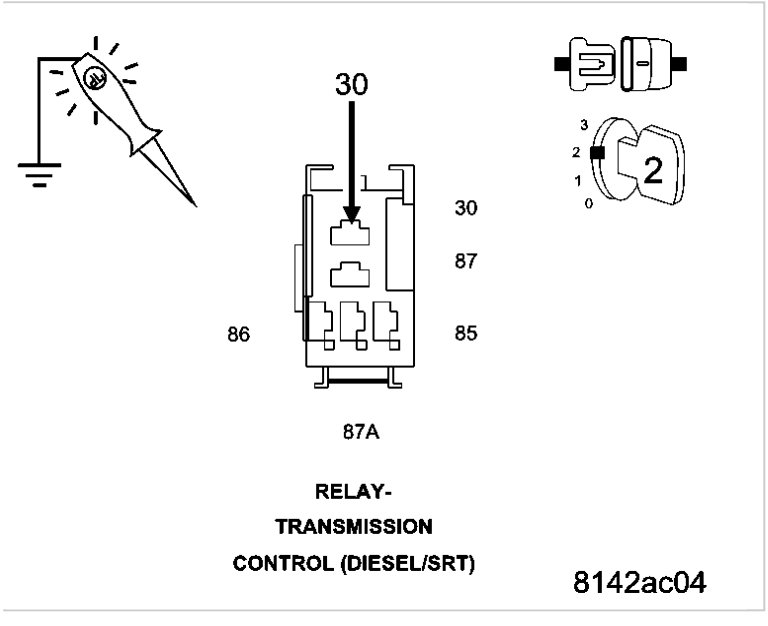
Does the test Light cycle on and off and illuminate brightly?

Yes >>Go To 12

No >>Using the schematics as a guide, check the Engine Control Module **(ECM)** pins, terminals, and connectors for corrosion, damage, or terminal push out. Pay particular attention to all Dower and around circuits. If no problems are found, replace and program the ECM per the Service Information.

Perform RE TRANSMISSION VERIFICATION TEST VER - 1 (DIESEL). See: A L L Diagnostic Trouble Codes (DTC) > Verification Tests

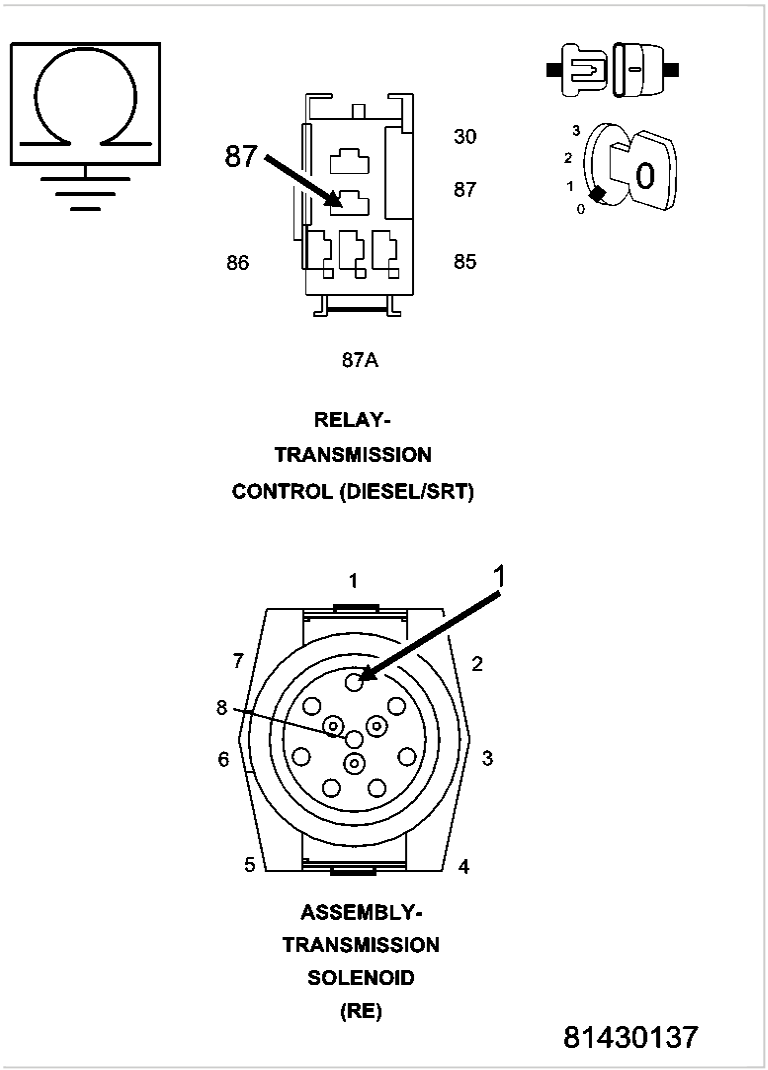
9. CHECK THE FUSED B(+) CIRCUIT



Turn the ignition off to the lock position.
Remove the Transmission Control Relay.
Ignition on, engine not running.
Using a 12-volt test light connected to ground, check the Fused B(+) circuit in the Transmission Control Relay connector.

Does the test light illuminate brightly?
Yes >>Go To 10
No >>Repair the Fused B(+) circuit for an open. Note: if the fuse is open, check for a short to ground.
Perform RE TRANSMISSION VERIFICATION TEST VER - 1 (DIESEL). See: A L L Diagnostic Trouble Codes (DTC) > Verification Tests

10. CHECK THE (T16) TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT FOR A SHORT TO GROUND



Turn ignition off to the lock position.
Measure the resistance between ground and the (T16) Transmission Control Relay Output circuit.

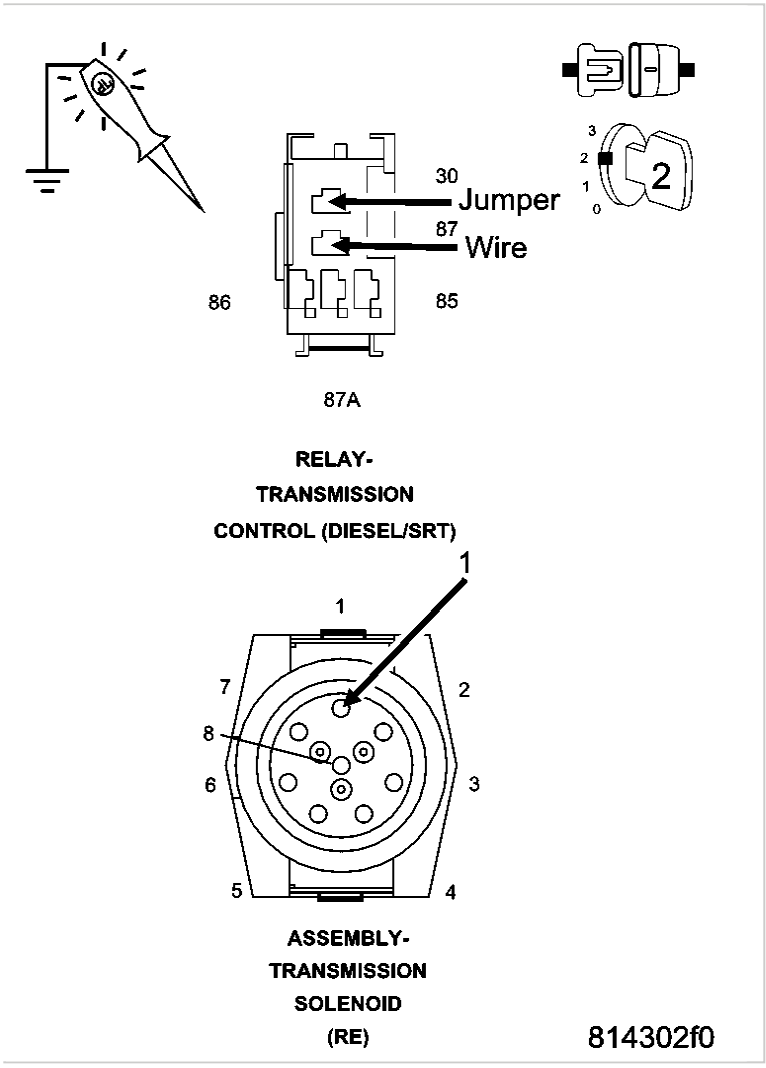
Is the resistance below 5.0 ohms?

Yes >>Repair the Fused Transmission Control Relay Output circuit for a short to ground.

Perform RE TRANSMISSION VERIFICATION TEST VER - 1 (DIESEL). See: A L L Diagnostic Trouble Codes (DTC) > Verification Tests

No >>Go To 11

11. CHECK THE (T16) TRANSMISSION CONTROL RELAY OUTPUT CIRCUIT FOR AN OPEN



Ignition on, engine not running.

Connect a jumper wire between the Fused B(+) circuit and the (T16) Transmission Relay Output circuit in the Transmission Relay connector.

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

Does the test light illuminate brightly?

Yes >>Replace the Transmission Control Relay.

Perform RE TRANSMISSION VERIFICATION TEST VER 1 (DIESEL). See: A L L Diagnostic Trouble Codes (DTC) > Verification Tests

No >>Repair the (T16) Transmission Control Relay Output circuit for an open.

Perform RE TRANSMISSION VERIFICATION TEST VER - 1 (DIESEL). See: A L L Diagnostic Trouble Codes (DTC) >

Verification Tests

12. INTERMITTENT WIRING AND CONNECTORS

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

Use the Freeze Frame Data to help duplicate the conditions in which the DTC originally set. Pay particular attention to the DTC set conditions, such as, VSS, MAP, ECT, and Load

Using the schematics as a guide, visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires.

Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

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

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

Were there any problems found?

Yes >>Repair as necessary.

Perform RE TRANSMISSION VERIFICATION TEST VER - 1 (DIESEL). See: A L L Diagnostic Trouble Codes (DTC) > Verification Tests

No >>Test Complete