

P2770: TORQUE CONVERTER CLUTCH CIRCUIT HIGH

OVERVIEW

Severity	:	High
DIY Difficulty Level	:	Advanced
Repair Cost	:	\$100-\$400
Can I Still Drive?	:	No

What Does The P2770 Code Mean?

Modern vehicles equipped with automatic transmissions / transaxles use a torque converter between the engine and transmission to increase the engine torque output and drive the rear wheels.

The engine and transmission are actually connected by a fluid coupling mechanism inside of the torque converter which is what multiplies the torque until the speeds equalize and create a "stall" speed where the difference in actual engine RPM and transmission input RPM is around 90% efficient. Torque converter clutch (TCC) solenoids commanded by the Powertrain control module/Engine control module (PCM/ECM) or the Transmission control module (TCM) to direct hydraulic fluid and engage the torque converter clutch to create a solid coupling and increase efficiency.

The transmission control module has detected a fault with the circuit that operates the torque converter clutch solenoid. We will consider the TCM the controller for the sake of this article although it may be controlled through the PCM/ECM, consult factory wiring diagrams to determine which system is being used.

Note: This code is similar to codes [P0740](#), [P0741](#), [P0742](#), [P0743](#), [P0744](#), and [P2769](#).

A P2770 code means that the PCM has detected that the TCC electrical circuit is experiencing a high condition. There may be other diagnostic trouble codes associated with the transmission control

module that can only be accessed by using an advanced scan tool. If any additional transmission related DTC's appear in addition to the P2770, an electrical failure is likely.

What Are The Symptoms Of The P2770 Code?

Symptoms of a P2770 trouble code may include:

- Malfunction Indicator Lamp (MIL) illuminated (a.k.a. Check Engine Light)
- Minimal decrease in fuel economy, this will not affect engine performance

What Are The Potential Causes Of The P2770 Code?

Causes of this DTC may include:

- Wiring harness to transmission damaged, loose connection, open or shorted circuit
- Torque converter clutch (TCC) solenoid
- Transmission control module (TCM)

How Can You Fix The P2770 Code?

Wiring harness

Check transmission wiring harness for damage or loose connections. Use a factory wiring diagram to locate the appropriate power source and all connection points between circuits. The transmission may be powered by a fuse or relay, and triggered by the TCM.

Disconnect the transmission harness at the transmission connector, power source and TCM. Check for continuity inside the transmission internal wiring harness by locating the appropriate + and - pins for the torque converter clutch solenoid.

Using a digital volt ohm meter (DVOM), set to ohms scale, check for resistance in the circuit with the positive and negative leads on the appropriate pins. If resistance is extremely high or over limit (OL), suspect a fault with the internal harness or the TCC solenoid – removing the transmission oil pan may be necessary to further diagnose the TCC solenoid.

Test the wiring between the TCM and the wiring harness connector at the transmission case using the DVOM set to ohms. Check for a possible short to ground by moving the negative lead on the DVOM to a known good ground, resistance should be very high or over limit (OL).

Torque converter clutch (TCC) solenoid

Check the resistance in the TCC solenoid and internal transmission wiring at the transmission case after removing the transmission harness plug (if applicable, some makes/models use a TCM bolted directly to the transmission case). Some makes/models use a transmission wire harness with the

TCC solenoid and internal harness as a single unit.

The DVOM should be set to ohms scale with the positive lead and negative lead on the pins for the TCC power and control circuit. Resistance should be within manufacturers specifications, if it is very high or over limit (OL), remove the transmission oil pan to inspect the solenoid inside the transmission if possible. Check for voltage on the power side circuit of the TCC solenoid or at the wire harness connector at the TCM with the DVOM set to volts scale, positive lead at the wire being tested and the negative to a known good ground with the vehicles key on/engine off, battery voltage should be present.

Transmission control module (TCM)

Since the torque converter clutch is only activated during certain driving conditions, it will be necessary to monitor the TCM with an advanced scan tool to determine if the TCM is commanding the TCC solenoid and what the actual feedback reading is at the TCM. The TCC solenoid is normally controlled by a duty cycle to engage a more comfortable torque converter clutch engagement.

To test if the TCM is actually sending the signal, a graphing multimeter set to duty cycle or a digital storage oscilloscope will be required as well. The positive lead is probed into the wiring harness plugged into the TCM and the negative lead to a known good ground. The duty cycle should be the same as being commanded by the TCM in the advanced scan tool reading. If the cycle stays at 0% or 100% or is intermittent, re-check connections and if all wiring / solenoid is OK, the TCM may be at fault.

Reference Sources

[P2770 Torque Converter Clutch Circuit High](#), OBD-Codes.