

P0701: TRANSMISSION CONTROL SYSTEM RANGE/PERFORMANCE

OVERVIEW

Severity	:	High
DIY Difficulty Level	:	Advanced
Repair Cost	:	\$300-\$1400
Can I Still Drive?	:	Yes (Short-term only)

What Does The P0701 Code Mean?

If your vehicle instrument panel has presented an illuminated malfunction indicator lamp (MIL), accompanied by a stored code P0701, it simply means that the powertrain control module (PCM) has detected a malfunction in the transmission control system. This code pertains exclusively to vehicles equipped with an automatic transmission.

While most transmission controllers (for OBD-II equipped vehicles) are integrated into the PCM, there are still some manufacturers that choose to use a stand-alone transmission control module (TCM). Transmission related codes are stored as P-codes regardless of which type of system a particular vehicle is equipped (there are no T-codes). If the P0701 code is stored, it is very likely that there are other transmission control codes stored as well.

Automatic transmissions in OBD-II equipped vehicles are controlled electronically. This involves a control module, a controller area network (CAN), numerous sensors and solenoids, a powerful hydraulic pump, and a hydraulic valve body.

The transmission controller receives input voltage signals from engine and transmission sensors. Engine sensor inputs include (but are not limited to) throttle angle, engine RPM, load percentage, and coolant temperature. Transmission sensor inputs help to monitor pump pressure, transmission input speed (RPM), transmission output speed (RPM), shifter position, vehicle speed, torque converter lock-up percentage, and transmission temperature, just to name a few. The

transmission controller uses these input signals to map shift strategy and electronic pump pressure parameters.

The electronic pressure control valve is used to regulate pump pressure and keep the transmission shifting smoothly. If maximum pump pressure were to be applied directly to the valve body, shifting would instantly become extremely harsh and driveline components could be damaged.

Electronically controlled solenoids operate spring-loaded ball valves to restrict and release high pressure fluid through hydraulic circuits, causing up and down shifts as desired. Yet another solenoid controls the percentage of torque converter lock-up, increasing fuel efficiency and power to the pavement.

The CAN is a complex system of wiring and connectors that is utilized to transmit data from the TCM (where applicable) and the PCM. Data (including stored codes) may also be shared with other controllers via the CAN. Transmission input and output speed (RPM), vehicle speed, and transmission temperature are all shared between various controllers. This data is used for comparison in anti lock braking systems, electronic traction control systems, and electronic stability control systems (among others).

This code is unique in that it is usually only stored if other transmission related codes are present. These may be codes related to mechanical issues or electrical issues.

What Are The Symptoms Of The P0701 Code?

Symptoms of a P0701 code may include:

- Erratic transmission shift patterns
- Failure of the transmission to shift
- Diminished fuel efficiency
- Transmission slippage
- Delayed transmission engagement
- Other transmission related codes

What Are The Potential Causes Of The P0701 Code?

Potential causes for this code to set are:

- Low transmission fluid level
- Substandard transmission fluid
- Transmission sensor failure
- Open or shorted circuits in the transmission control system
- Mechanical (internal) transmission failure
- Torque converter defects
- Defective transmission controller or PCM programming error

How Can You Fix The P0701 Code?

Step 1

A good starting point is always to check for technical service bulletins (TSB) for your particular vehicle. Your issue may be a known issue with a known fix put out by the manufacturer and can save you time and money during diagnosis.

A scanner, a digital volt/ohmmeter, a transmission pressure gauge, and a vehicle service manual (or the equivalent) may be required to diagnose a P0701.

Step 2

Begin with a visual inspection of transmission control wiring and connectors. Also, test the battery, check battery cables, and battery terminal ends at this time.

Connect the scanner to the vehicle diagnostic connector and retrieve all stored codes and freeze frame data. Write this information down and save it for later.

Step 3

Since the leading cause of transmission failure is due to fluid level and/or condition, the fluid should be checked now. Follow manufacturer's specifications for checking the transmission fluid level.

If the fluid has a pungent burnt smell, suspect catastrophic mechanical failure that will require a complete transmission rebuild and a new torque converter. If the fluid level is more than one quart low, refill the transmission with the recommended transmission fluid and start the engine. Inspect the transmission, transmission cooler, and cooler hoses/lines for leakage. Repair leaks as necessary.

After the leaks are repaired and the fluid level is corrected, test drive the vehicle to see if the code/s reset. If they do not, then the code was related to the low fluid condition and it has been rectified.

Step 4

If the code/s immediately reset, return to your recorded freeze frame data. Begin by diagnosing the code that was stored first and diagnose/repair all other stored transmission control codes before attempting to diagnose the P0701.

Additional diagnostic notes:

- Diagnose and repair all other transmission related codes before attempting to diagnose this code
- Low transmission fluid is a common cause of transmission failure

- Servicing the transmission at recommended intervals can prolong longevity

Severity Description

If this code is stored, you may have noticed that your transmission shifts much more harshly than normal. This is due to the transmission control system being placed in limp-in mode. In this mode, transmission pump pressure is dramatically increased. This mode is not meant for long-term use. If your vehicle has exhibited a code P0701, it should be diagnosed immediately.

Reference Sources

[P0701 Transmission Control System Range/Performance](#), OBD-Codes.