

GM · POWERTRAIN

P1790

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1790 · GM

Transmission Control Module Checksum

P1790 on a GM vehicle means the Transmission Control Module (TCM) has detected a checksum error in its own internal memory or in the calibration data it relies on to control shifting. The TCM runs a mathematical check on stored data every time the ignition is turned on, and when the calculated value does not match the expected value, it flags this code and typically commands a default or limp-home shift strategy.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	GM specific	Medium	Professional	Transmission

Symptoms you may notice

- The Service Engine Soon or Transmission warning light illuminates on the instrument cluster.
- Often no symptoms besides the warning light, especially if the checksum fault is intermittent.
- Harsh or delayed shifts as the TCM falls back to a default pressure and shift schedule.
- The transmission may stay in a single gear or refuse to downshift when coming to a stop.
- In some cases the vehicle enters limp mode with reduced engine power or limited road speed.
- A no-start condition can occur if the TCM is part of the vehicle's anti-theft or communication network and the checksum failure prevents proper handshaking.

Common causes, most likely first

- Corrupted or failed TCM internal flash memory, which is the most common root cause on high-mileage GM units.
- Low or unstable battery voltage during cranking or while the TCM is writing adaptive data, which can corrupt the checksum.
- Poor ground connections at the TCM or at the transmission case, causing voltage spikes that damage stored data.
- Water intrusion into the TCM connector or case, leading to corrosion and intermittent memory faults.
- A failed or failing ignition switch that drops power to the TCM mid-write cycle.
- Aftermarket tuning or a botched reflash that left the calibration checksum incorrect.
- Rarely, a wiring harness chafe that shorts the TCM power or ground circuit and disrupts memory integrity.



How to diagnose and fix it

- 1 Connect a scan tool and record all TCM codes plus freeze-frame data before clearing anything, because the checksum code may be a one-time event or may return immediately.
- 2 Check battery voltage and load-test the battery; a weak battery that drops below 9.5 volts during cranking is a frequent trigger for memory corruption.
- 3 Inspect and clean the TCM ground points at the transmission and chassis, and verify less than 0.1 volt drop on the ground circuit under load.
- 4 Disconnect the TCM connector and inspect for water intrusion, corrosion, or pushed-back pins; dry and repair as needed.
- 5 Clear the code and perform a relearn or adaptive reset with the scan tool, then drive the vehicle through a full shift cycle to see if the code returns.
- 6 If the code returns immediately, reflash the TCM with the latest GM calibration using a J2534 pass-through device or a factory scan tool.
- 7 If reflashing does not resolve it, replace the TCM and perform the required programming and anti-theft relearn for the vehicle.

What a checksum code really tells you

- A checksum error does not always mean the TCM is dead; a single low-voltage event during cranking can set P1790 once and never return after clearing.
- Many technicians replace the TCM only to find the real culprit is a corroded ground strap on the transmission, so always verify ground integrity before condemning the module.
- Aftermarket handheld tuners and improper reflashes are a common cause on GM trucks and SUVs, and the fix is often a correct factory calibration rather than new hardware.
- P1790 can be stored alongside communication codes like U0100 or U0101 when the TCM drops offline, which can mislead you into chasing a CAN bus fault instead of the memory fault.
- On some GM platforms the TCM is inside the valve body and shares fluid with the transmission, so overheating or contaminated fluid can precede internal electronics failure.

Can I keep driving with P1790?

You can usually drive the vehicle to a shop if it is shifting normally, but avoid heavy throttle and highway speeds because the TCM may suddenly default to a limp-home gear. If the transmission is already harsh-shifting or stuck in one gear, limit driving to a short distance to a repair facility.



Tools that help

- GM-capable scan tool with TCM bidirectional controls and relearn functions
- J2534 pass-through device for TCM reflashing
- Digital multimeter for voltage drop and ground testing
- Battery load tester
- Basic hand tools for connector and ground access

Reading P1790

P Powertrain: engine, transmission and emissions.

1 Manufacturer-specific code (GM): its meaning depends on the make.

7 Transmission.

90 The exact fault within that area.

Often seen with

P0601 Internal Control Module Memory Checksum Error · **P0606** PCM Processor Fault · **P0700** Transmission Control System Malfunction · **U0100** Lost Communication With ECM/PCM A · **U0101** Lost Communication with TCM

See it working

Watch the animated explainer [How an Automatic Transmission Works, Gear by Gear](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/gm-p1790/>

