

GENERIC · POWERTRAIN

P0668

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P0668

PCM/ECM/TCM Internal Temperature Sensor Circuit Low

P0668 indicates that the powertrain control module (PCM), engine control module (ECM), or transmission control module (TCM) has detected a voltage signal from its internal temperature sensor that is lower than the expected range. The computer uses this sensor to monitor its own operating temperature and adjust strategies to protect the electronics, so a low signal can trigger the code and may cause the module to enter a protective mode.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Professional

AREA

Computer and output circuits

Symptoms you may notice

- Illumination of the check engine light or service engine soon light, often with no other noticeable symptoms.
- Intermittent engine stalling or rough running, especially after the vehicle has been operating for a while.
- Transmission shifting may become harsh or erratic if the affected module is the TCM.
- Reduced engine performance or a limp-home mode may be activated by the PCM to protect the module.
- In some cases, the engine may fail to start or may crank but not run if the module's internal protection strategy is triggered.

Common causes, most likely first

- 1 A faulty internal temperature sensor inside the PCM, ECM, or TCM, which is the most common cause and usually requires module replacement.
- 2 Corroded, damaged, or loose wiring or connectors at the module harness, causing a low voltage signal.
- 3 A short to ground in the sensor circuit wiring between the module and the sensor, if the sensor is external.
- 4 Moisture or fluid intrusion into the module connector or housing, leading to signal corruption.
- 5 A failing module power or ground circuit that affects the reference voltage to the internal sensor.
- 6 Less commonly, a software or calibration issue within the module that misinterprets the sensor signal.



How to diagnose and fix it

- 1 Verify the code with a scan tool and check for any related codes in the PCM, ECM, or TCM to confirm the fault is isolated to the internal temperature sensor circuit.
- 2 Inspect the module connectors and harness for corrosion, loose pins, or damage, and clean or repair as necessary.
- 3 Perform a voltage drop test on the module power and ground circuits to ensure they are within specification.
- 4 If the sensor is external, test the sensor resistance and wiring for a short to ground; replace the sensor if faulty.
- 5 If the sensor is internal to the module, compare the sensor reading with a known-good module or use a manufacturer-specific diagnostic procedure to confirm the internal fault.
- 6 Reprogram or update the module software if a calibration bulletin applies to the vehicle.
- 7 Replace the PCM, ECM, or TCM if the internal sensor is confirmed faulty, and perform any required programming or relearn procedures.

When the module itself is the culprit

- Many technicians replace the PCM, ECM, or TCM prematurely when the real problem is a corroded connector or a chafed wire that is shorting the sensor signal to ground.
- A low signal from the internal temperature sensor can be caused by a failing module ground, which raises the reference voltage and skews the sensor reading without any sensor fault.
- On some vehicles, the internal temperature sensor is part of a circuit that also monitors other module functions, so a fault in a related component can set P0668 as a secondary code.
- The code can be set intermittently by heat soak after the engine is shut off, especially if the module's cooling is compromised, so a thorough road test and wiggle test are essential.
- Always check for technical service bulletins (TSBs) for the specific vehicle, as some manufacturers have extended warranties or reprogramming procedures for this issue.

Can I keep driving with P0668?

You can usually continue driving to a repair shop, but avoid heavy loads or long trips because the module may enter a protective mode that reduces performance or affects transmission shifting. If the engine stalls or runs poorly, pull over safely and seek immediate assistance.

Tools that help

- OBD-II scan tool with manufacturer-specific software for module diagnostics
- Digital multimeter for voltage and resistance checks
- Wiring diagram and connector pinout for the affected module
- Back probe kit and jumper wires for circuit testing
- Module programming tool if replacement is required



Reading P0668

- P** Powertrain: engine, transmission and emissions.
- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 6** Computer and output circuits.
- 68** The exact fault within that area.

Often seen with

P0600 Serial Communication Link Malfunction · **P0601** Internal Control Module Memory Checksum Error · **P0606** PCM Processor Fault · **P0667** PCM/ECM/TCM Internal Temperature Sensor Range/Performance · **P0669** PCM/ECM/TCM Internal Temperature Sensor Circuit High

See it working

Watch the animated explainer [How a Catalytic Converter Works: 3D Cutaway](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p0668/>

