

GENERIC · POWERTRAIN

P0666

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P0666

PCM/ECM/TCM Internal Temperature Sensor Circuit

P0666 indicates that the powertrain control module (PCM), engine control module (ECM), or transmission control module (TCM) has detected an abnormal signal from its own internal temperature sensor circuit. This sensor monitors the module's internal temperature to protect electronics from overheating, and the code sets when the signal falls outside the expected range or is intermittent.

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 symptoms.
- Intermittent drivability issues such as rough idle or hesitation when the module is hot.
- Transmission may shift erratically or enter limp mode if the TCM is affected.
- Engine may stall or fail to start in extreme cases due to module overheating protection.
- Erratic operation of multiple systems controlled by the affected module, such as fuel delivery or shift scheduling.

Common causes, most likely first

- 1 Faulty internal temperature sensor inside the PCM, ECM, or TCM.
- 2 Damaged or corroded wiring or connectors between the sensor and the module's internal circuitry.
- 3 Poor electrical ground or power supply to the module causing voltage irregularities.
- 4 Overheating of the module due to a blocked cooling path or high ambient temperatures.
- 5 Internal circuit board fault or solder joint failure within the module.
- 6 Software glitch or corrupted calibration in the module requiring reflash or replacement.



How to diagnose and fix it

- 1 Verify the code with a scan tool and check for any related codes in other modules.
- 2 Inspect the module's connectors and wiring for corrosion, loose pins, or damage.
- 3 Check the module's power and ground circuits for voltage drops and proper grounding.
- 4 Monitor the internal temperature sensor data (if available) with a scan tool to see if it correlates with the fault.
- 5 Perform a wiggle test on the wiring harness while watching live data to identify intermittent connections.
- 6 If the sensor circuit is internal to the module and all external checks pass, replace or reflash the module as per manufacturer procedures.
- 7 After repair, clear codes and verify the fault does not return during a test drive.

Internal sensor faults often misdiagnosed

- Many technicians replace the PCM, ECM, or TCM prematurely when the real issue is a poor ground or voltage supply to the module.
- The internal temperature sensor is not a separate serviceable part on most vehicles, so diagnosis must rule out external factors first.
- A failing module cooling fan or blocked ventilation can cause the internal temperature to rise, triggering the code without an actual sensor failure.
- This code can be set by a low battery or charging system issue that causes voltage spikes affecting the module's internal reference signal.
- Always check for technical service bulletins (TSBs) for the specific vehicle, as some manufacturers have known issues with module temperature sensor calibration.

Can I keep driving with P0666?

If the only symptom is the warning light and the vehicle runs normally, you can drive cautiously to a repair shop, but avoid long trips or heavy loads that could raise module temperature. If drivability issues or transmission problems occur, stop driving and seek professional diagnosis to prevent further damage.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Wiring diagram for the specific vehicle
- Basic hand tools for connector inspection
- Thermal camera or infrared thermometer (optional for checking module temperature)



Reading P0666

- 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.
- 66** The exact fault within that area.

Often seen with

P0562 System Voltage Low · **P0601** Internal Control Module Memory Checksum Error · **P0602** Control Module Programming Error · **P0606** PCM Processor Fault · **P0607** Control Module Performance

See it working

Watch the animated explainer [Four-Stroke Engine Notebook: The Otto Cycle Explained](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p0666/>

