

GENERIC · POWERTRAIN

P2185

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2185

Engine Coolant Temperature Sensor 2 Circuit High

P2185 means the powertrain control module (PCM) has detected an abnormally high voltage on the signal circuit of engine coolant temperature sensor 2, which is typically the radiator outlet sensor on vehicles that use two coolant sensors. A high voltage reading on this circuit tells the PCM that the sensor is reporting an unrealistically cold temperature or that the circuit is open.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms
- Cooling fan may run continuously or not at all because the PCM cannot trust the outlet temperature reading
- Temperature gauge or coolant temperature display may behave erratically or read colder than normal
- Poor fuel economy or slightly rough running if the PCM substitutes a default coolant temperature
- Possible reduced engine power or cooling system warning message on some vehicles
- Overheating risk if the fan control strategy is affected and the driver ignores the warning

Common causes, most likely first

- 1 Open or damaged signal wire between sensor 2 and the PCM, often from corrosion or a broken conductor
- 2 Failed engine coolant temperature sensor 2, typically an open thermistor element
- 3 Poor electrical connection at the sensor 2 harness connector, including backed-out or corroded terminals
- 4 High resistance in the sensor ground circuit shared with other sensors
- 5 PCM internal fault on the sensor 2 input circuit, which is rare but possible
- 6 Aftermarket sensor installed with incorrect resistance characteristics for the application



How to diagnose and fix it

- 1 Scan all modules and record freeze-frame data for P2185 to confirm the fault occurred under specific coolant temperatures
- 2 Inspect the sensor 2 connector and harness for corrosion, chafing, or a loose terminal, and repair as needed
- 3 Measure sensor 2 resistance with a multimeter and compare it to the manufacturer's temperature-resistance chart
- 4 Backprobe the sensor 2 signal circuit at the PCM and check voltage with the key on, engine off, looking for a value near 5 volts that does not change when the sensor is unplugged
- 5 Check the sensor ground circuit for excessive resistance using a voltage drop test under load
- 6 If the wiring and ground test good, substitute a known-good sensor and clear the code to see if it returns
- 7 If the code persists with a known-good sensor and verified wiring, diagnose the PCM input circuit or replace the PCM as a last resort

Sensor 2 is not always the gauge sensor

- Many vehicles use sensor 2 as the radiator outlet temperature sensor, so a P2185 can set even when the dashboard temperature gauge reads normally from sensor 1.
- A common misdiagnosis is replacing sensor 1 because the code mentions coolant temperature, but P2185 specifically refers to the second sensor circuit.
- The PCM may command the cooling fan on high as a fail-safe when sensor 2 voltage is high, which can drain the battery on vehicles that keep the fan running after shutdown.
- Corrosion inside the sensor 2 connector is a frequent cause on vehicles driven in road-salt regions, and the terminals can look clean until the connector is opened.
- A high voltage reading can also be caused by a poor ground shared with other sensors, so testing the ground circuit is as important as testing the signal wire.

Can I keep driving with P2185?

The vehicle is usually safe to drive short distances to a repair shop, but avoid heavy loads, long trips, or stop-and-go traffic where cooling fan operation is critical. If the temperature gauge climbs above normal or a cooling system warning appears, stop driving and let the engine cool.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter with backprobe pins
- Temperature-resistance chart for the specific sensor
- Socket or wrench set for sensor removal
- Wire repair kit with heat-shrink connectors
- Contact cleaner and dielectric grease



Reading P2185

- P** Powertrain: engine, transmission and emissions.
- 2** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 1** Fuel and air metering.
- 85** The exact fault within that area.

Often seen with

P0115 Engine Coolant Temperature Circuit Malfunction · **P0117** Engine Coolant Temperature Circuit Low Input · **P0118** Engine Coolant Temperature Circuit High Input · **P2183** Engine Coolant Temperature Sensor 2 Circuit Range/Performanc · **P2184** Engine Coolant Temperature Sensor 2 Circuit Low

See it working

Watch the animated explainer [Engine Cooling System Trainer: How Engines Stay Cool](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2185/>

