

GENERIC · POWERTRAIN

P01E4

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P01E4

Engine Coolant Temperature Sensor 3 Circuit Range/Performance

P01E4 indicates that the powertrain control module (PCM) has detected an out-of-range or erratic signal from the engine coolant temperature (ECT) sensor 3 circuit, which is often a second or auxiliary temperature sensor used for specific monitoring strategies. The PCM compares this signal against expected values and other temperature inputs, and it flags the code when the voltage or resistance stays outside the normal operating window for a calibrated period.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Low

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Inaccurate or erratic coolant temperature gauge readings on the dashboard
- Poor fuel economy or rough running during warm-up if the PCM substitutes a default temperature
- Cooling fan running constantly or not engaging at the proper temperature
- Intermittent stalling or hesitation when the engine is cold
- A P01E4 code stored with no drivability complaints in many cases

Common causes, most likely first

- 1 Faulty engine coolant temperature sensor 3, including internal drift or an open circuit
- 2 Damaged or corroded wiring and connectors in the sensor 3 circuit
- 3 High resistance or an open in the sensor ground circuit shared with other sensors
- 4 Signal circuit shorted to voltage or to ground, often from chafed insulation
- 5 PCM internal fault or corrupted calibration affecting the sensor 3 input
- 6 Coolant level low or air pockets causing the sensor to read incorrectly
- 7 Aftermarket or incorrect sensor installed that does not match the PCM's expected resistance curve



How to diagnose and fix it

- 1 Verify the coolant level is correct and the system is free of air pockets before any electrical testing
- 2 Scan all modules for stored codes and freeze-frame data to confirm P01E4 is active and not history
- 3 Visually inspect the sensor 3 connector, pins, and harness for corrosion, looseness, or chafing
- 4 Measure the sensor's resistance with a multimeter and compare it to the manufacturer's temperature-resistance chart
- 5 Backprobe the signal and ground circuits at the PCM to check for voltage drops or shorts while wiggling the harness
- 6 If the circuit and sensor test good, substitute a known-good sensor or use a signal generator to verify PCM response
- 7 Repair or replace the faulty sensor, wiring, or connector, then clear codes and verify the repair with a road test

What the ECT sensor 3 code hides

- Many vehicles use multiple coolant temperature sensors for different control strategies, and sensor 3 is often a secondary sensor that does not directly drive the dashboard gauge, so the driver may notice nothing at all.
- A common misdiagnosis is replacing the primary ECT sensor when the fault actually lies in the sensor 3 circuit or its shared ground, which can be confirmed by comparing live data from all temperature sensors.
- Corrosion inside a connector can create enough resistance to set a range/performance code without causing a hard failure, so wiggle tests and voltage-drop measurements are more reliable than a simple resistance check.
- The PCM may use a default coolant temperature when sensor 3 is out of range, which can affect fuel trim, fan operation, and transmission shift scheduling without turning on other warning lights.
- A weak battery or charging system fault can cause erratic sensor readings that mimic a failing sensor 3, so always check system voltage before condemning the sensor.

Can I keep driving with P01E4?

The vehicle is generally safe to drive with P01E4 because the PCM substitutes a default temperature and the fault rarely causes immediate damage, but avoid heavy loads or long trips until the circuit is repaired. If the engine overheats or the cooling fan stops working, stop driving and address the fault immediately.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter with backprobe pins
- Manufacturer's temperature-resistance chart or service information
- Socket set and basic hand tools for sensor access
- Wire repair kit with crimp connectors and heat shrink



Reading P01E4

- P** Powertrain: engine, transmission and emissions.
- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 1** Fuel and air metering.
- E4** The exact fault within that area.

Often seen with

P0115 Engine Coolant Temperature Circuit Malfunction · **P0116** Engine Coolant Temperature Circuit Range/Performance · **P0117** Engine Coolant Temperature Circuit Low Input · **P0118** Engine Coolant Temperature Circuit High Input · **P0119** Engine Coolant Temperature Circuit Intermittent

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/p01e4/>

