

GENERIC · POWERTRAIN

P01E7

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P01E7

Engine Coolant Temperature Sensor 3 Circuit Intermittent/Erratic

P01E7 indicates that the powertrain control module (PCM) has detected an intermittent or erratic signal from the engine coolant temperature sensor 3 circuit, which is used on some vehicles to monitor a second coolant temperature point. The PCM sets this code when the voltage signal from that sensor jumps, drops out, or behaves unpredictably rather than following a smooth, plausible curve as the engine warms up.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Erratic or inaccurate coolant temperature gauge readings on the dashboard
- Poor fuel economy or rough running during warm-up if the faulty signal affects fuel enrichment
- Intermittent cooling fan operation, either running constantly or not engaging when needed
- Occasional hard starting or stalling when the engine is cold, depending on how the PCM uses sensor 3
- A stored freeze-frame showing a coolant temperature that does not match ambient or actual engine temperature

Common causes, most likely first

- 1 A failing engine coolant temperature sensor 3 itself, with internal intermittent open or short circuits
- 2 Corroded, loose, or backed-out terminals in the sensor 3 connector or at the PCM harness
- 3 Chafed or broken wires in the sensor 3 circuit that make contact only intermittently, often due to vibration or heat
- 4 A poor ground connection shared by the sensor circuit, causing voltage reference fluctuations
- 5 Coolant contamination or low coolant level that exposes the sensor element and causes erratic readings
- 6 A faulty PCM driver or internal circuit for sensor 3, though this is less common than wiring issues
- 7 Aftermarket accessories or repairs that tapped into the sensor 3 wiring and introduced noise or resistance



How to diagnose and fix it

- 1 Scan all modules and record freeze-frame data for P01E7, then clear the code and test-drive while monitoring sensor 3 voltage and temperature on a live data stream
- 2 Visually inspect the sensor 3 connector and harness for corrosion, loose pins, chafing, or heat damage, and repair any obvious wiring faults
- 3 Measure resistance across the sensor 3 terminals at known temperatures and compare with the manufacturer's resistance chart to check for an erratic element
- 4 Back-probe the sensor 3 signal and ground wires at the PCM while wiggling the harness to catch intermittent opens or shorts
- 5 Check coolant level and condition, and verify the sensor is fully immersed and free of sludge or debris
- 6 If wiring and sensor tests pass, substitute a known-good sensor 3 and recheck live data to confirm the fault follows the sensor
- 7 As a last step, test the PCM circuit for sensor 3 with a lab scope or breakout box, and replace or reprogram the PCM only if all other causes are ruled out

Intermittent sensor faults that fool good technicians

- Many P01E7 cases are caused by a harness rub-through near the engine mount or exhaust shield that only shorts when the engine moves under load, so a stationary wiggle test can miss it.
- A sensor that tests perfectly at room temperature can still be erratic when hot, so resistance checks must be repeated after warming the engine or using a heat gun on the sensor body.
- Some vehicles use coolant temperature sensor 3 for a secondary function such as radiator outlet temperature or cylinder head temperature, and a fault there may not affect the dashboard gauge at all.
- Aftermarket coolant or sealant products can coat the sensor tip and create an intermittent signal without setting a hard fault, so a visual inspection of the sensor element is worthwhile.
- A weak battery or charging system can cause reference voltage fluctuations that mimic an erratic sensor 3 signal, so always verify system voltage before condemning the sensor.

Can I keep driving with P01E7?

You can usually continue driving with P01E7 because the fault is intermittent and the engine will default to a safe coolant temperature estimate, but avoid heavy loads or long trips until it is diagnosed. If the temperature gauge behaves erratically or the engine overheats, stop driving and have the circuit inspected promptly.



Tools that help

- OBD-II scan tool with live data and freeze-frame capability
- Digital multimeter with resistance and voltage measurement
- Back-probe kit or breakout leads
- Wiring diagram for the specific vehicle
- Heat gun for testing the sensor at operating temperature
- Lab scope for observing intermittent signal glitches

Reading P01E7

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.
E7	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 · **P01E6** Engine Coolant Temperature Sensor 3 Circuit High

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/p01e7/>

