

GENERIC · POWERTRAIN

P0147

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P0147

O2 Sensor Heater Circuit (Bank 1 Sensor 3)

P0147 means the engine computer has detected a problem with the electrical heater circuit inside the downstream oxygen sensor on Bank 1, which is the side of the engine containing cylinder number one. The computer monitors how much current the heater draws when it commands the heater on, and it sets this code when the current is outside the expected range or the circuit does not respond as commanded.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Low	Intermediate	Fuel and air metering

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Slightly higher fuel consumption because the downstream sensor takes longer to reach operating temperature
- A pending or stored P0147 code with no drivability complaint in many cases
- Occasional rough running or hesitation during cold starts if the sensor stays cold too long
- Failed emissions inspection due to the check engine light being on

Common causes, most likely first

- 1 Failed heater element inside the Bank 1 Sensor 3 oxygen sensor
- 2 Open or shorted wiring in the sensor heater circuit, often at the connector or where the harness flexes
- 3 Corroded, loose, or water-intruded electrical connector at the sensor or at the computer
- 4 Blown fuse that supplies power to the oxygen sensor heater circuit
- 5 Faulty oxygen sensor heater relay in vehicles that use a dedicated relay
- 6 Damaged or corroded ground connection for the heater circuit
- 7 Internal driver failure in the engine control module, which is rare but possible



How to diagnose and fix it

- 1 Scan all stored and pending codes and record freeze-frame data to confirm the fault is present and not intermittent
- 2 Inspect the oxygen sensor connector and harness for corrosion, chafing, or water intrusion, and repair as needed
- 3 Check the fuse and relay that supply power to the oxygen sensor heater circuit, replacing any failed component
- 4 Measure the resistance of the heater element at the sensor connector and compare it with the manufacturer's specification
- 5 Command the heater on with a scan tool and measure voltage and current at the sensor connector to verify the circuit operates
- 6 If the circuit tests good but the code returns, replace the Bank 1 Sensor 3 oxygen sensor with a quality direct-fit part
- 7 Clear the codes and complete a drive cycle to confirm the repair, then recheck for any returning codes

What the heater circuit test really checks

- The engine computer often tests the heater circuit only during a cold start, so a heater that fails only when hot can set this code intermittently and be missed by a simple resistance check at room temperature.
- A P0147 can be set by a heater circuit that draws too much current, not just an open circuit, so a shorted sensor heater or pinched harness can be the cause even though the sensor still reads correctly.
- Technicians sometimes replace the downstream sensor when the real fault is a corroded connector or a chafed wire near the exhaust, so always inspect the harness before condemning the sensor.
- On vehicles with a dedicated oxygen sensor heater relay, a failing relay can cause this code without any fault in the sensor itself, and the relay is often overlooked.
- This code does not mean the downstream sensor is reading the exhaust gas incorrectly; the sensor may still produce a valid signal while only its heater circuit is faulty.

Can I keep driving with P0147?

You can usually keep driving with P0147 because the fault mainly affects how quickly the downstream sensor warms up, but have it repaired soon to avoid higher emissions and a failed inspection. Avoid ignoring it for months, since a persistent heater circuit fault can mask other oxygen sensor problems.

Tools that help

- OBD-II scan tool with live data and bidirectional control
- Digital multimeter
- Test light
- Wiring diagram for the oxygen sensor heater circuit
- Basic hand tools for connector and sensor access



Reading P0147

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

Often seen with

P0053 HO2S Heater Resistance (Bank 1 Sensor 1) · **P0135** O2 Sensor Heater Circuit Malfunction (Bank 1 Sensor 1) · **P0136** O2 Sensor Circuit Malfunction (Bank 1 Sensor 2) · **P0140** O2 Sensor Circuit No Activity (Bank 1 Sensor 2) · **P0141** O2 Sensor Heater Circuit Malfunction (Bank 1 Sensor 2)

See it working

Watch the animated explainer [How a Supercharger Works: Roots Blower in X-Ray](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p0147/>

