

GENERIC · POWERTRAIN

P2231

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2231

O2 Sensor Signal Circuit Shorted to Heater Circuit (Bank 1 Sensor 1)

P2231 indicates that the engine control module has detected an electrical short between the signal circuit and the heater circuit of the upstream oxygen sensor on bank 1. This means the voltage on the sensor's signal wire is being influenced by the heater voltage, corrupting the air-fuel ratio feedback the computer relies on.

SYSTEM Powertrain	CODE TYPE Generic (all makes)	SEVERITY Medium	FIX DIFFICULTY Intermediate	AREA Fuel and air metering (injector circuits)
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Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Rough idle or stumbling, especially when the engine is cold
- Poor fuel economy due to incorrect air-fuel mixture control
- Hesitation or lack of power during acceleration
- Failed emissions test or increased exhaust emissions
- In rare cases, the engine may enter limp mode or stall

Common causes, most likely first

- 1 Chafed or melted wiring harness where the oxygen sensor signal and heater wires run close together
- 2 Internal short inside the oxygen sensor between the signal and heater elements
- 3 Contaminated or damaged oxygen sensor connector allowing voltage to bleed between pins
- 4 Faulty engine control module driver for the heater circuit, though this is less common
- 5 Aftermarket accessories or repairs that routed wiring incorrectly and caused a short



How to diagnose and fix it

- 1 Inspect the oxygen sensor wiring harness for visible damage, chafing, or melted insulation near the sensor and along the exhaust system
- 2 Disconnect the sensor and check for corrosion or moisture in the connector; clean or replace the connector if needed
- 3 Measure resistance between the signal and heater terminals on the sensor itself to check for an internal short
- 4 With the sensor disconnected, check for continuity between the signal wire and heater wire at the harness side to rule out a short in the wiring
- 5 If the sensor shows an internal short, replace the upstream oxygen sensor with a quality direct-fit unit
- 6 If wiring is damaged, repair the harness with proper solder and heat-shrink, then clear the code and verify with a scan tool
- 7 As a last resort, test the engine control module's heater driver circuit for internal shorts if all other checks pass

Don't overlook the wiring harness

- A common cause of P2231 that technicians miss is a wiring harness that has rubbed through on a heat shield or bracket, creating a short only when the engine moves under load.
- The code does not always mean the oxygen sensor itself is faulty; the short can be entirely in the vehicle's wiring, so replacing the sensor without testing the harness often leads to a repeat failure.
- On some vehicles, a failing heater circuit inside the sensor can bleed voltage into the signal wire without setting a heater code, so resistance checks on the sensor are essential.
- Aftermarket sensors with poor internal insulation are a frequent culprit, and using an OEM-quality sensor reduces the risk of recurrence.
- A shorted signal circuit can cause the engine computer to command an excessively rich or lean mixture, which may eventually damage the catalytic converter if left unrepaired.

Can I keep driving with P2231?

You can usually drive the vehicle short distances to a repair shop, but avoid prolonged driving because the incorrect air-fuel mixture can damage the catalytic converter and cause poor performance. If the engine runs very rough or stalls, stop driving and have it towed.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Wiring diagram for the specific vehicle
- Soldering iron and heat-shrink tubing for wiring repairs
- Oxygen sensor socket



Reading P2231

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

Often seen with

P0131 O2 Sensor Circuit Low Voltage (Bank 1 Sensor 1) · **P0132** O2 Sensor Circuit High Voltage (Bank 1 Sensor 1) · **P0133** O2 Sensor Circuit Slow Response (Bank 1 Sensor 1) · **P0135** O2 Sensor Heater Circuit Malfunction (Bank 1 Sensor 1) · **P2232** O2 Sensor Signal Circuit Shorted to Heater Circuit (Bank 1 S

See it working

Watch the animated explainer [How the EVAP System Works: Fuel Vapour and Leak Test](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2231/>

