

GENERIC · POWERTRAIN

P2245

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2245

O2 Sensor Reference Voltage Circuit Low (Bank 1 Sensor 1)

P2245 means the engine computer has detected that the reference voltage circuit for the upstream oxygen sensor on bank 1 is lower than expected, which can prevent the sensor from producing a valid signal. The computer monitors this circuit and sets the code when the voltage on the reference line falls below a calibrated threshold for a set time.

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

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Rough idle or hesitation during acceleration if the sensor signal is affected
- Poor fuel economy due to incorrect air-fuel ratio feedback
- Increased emissions or a failed emissions test
- In rare cases, a stumble or surge while driving at steady speed

Common causes, most likely first

- 1 A short to ground or chafed wire in the sensor reference voltage circuit
- 2 Corroded or loose electrical connector at the oxygen sensor or engine computer
- 3 Failed oxygen sensor with an internal short in the reference circuit
- 4 Open or high-resistance ground connection for the sensor heater or signal return
- 5 Faulty engine computer driver for the reference voltage circuit, though uncommon
- 6 Contamination or damage to the sensor wiring from heat or debris



How to diagnose and fix it

- 1 Inspect the oxygen sensor connector and wiring for corrosion, chafing, or loose pins, and repair as needed
- 2 Check the reference voltage circuit for a short to ground using a digital multimeter and wiring diagram
- 3 Test the oxygen sensor heater and signal circuits for resistance and continuity against manufacturer specifications
- 4 Verify the sensor ground circuit is clean and tight, and clean or repair ground connections
- 5 If the circuit tests good, replace the bank 1 sensor 1 oxygen sensor with a quality direct-fit unit
- 6 Clear the code and perform a road test to confirm the repair, monitoring live data for proper sensor switching
- 7 If the code returns after sensor replacement, diagnose the engine computer reference voltage output and repair or replace as required

Reference voltage faults that fool sensor replacement

- A chafed wire harness near the exhaust manifold often shorts the reference voltage to ground, and replacing the sensor will not fix the code until the harness is repaired.
The reference voltage circuit is shared internally in some engine computers, so a fault on one sensor circuit can affect others and set additional codes that point away from the real problem.
- A poor engine ground can cause the reference voltage to read low at the computer even though the sensor and wiring test fine, so always verify ground integrity before condemning parts.
- Some scan tools show a default or substitute value for the oxygen sensor when the reference circuit fails, which can mislead a technician into thinking the sensor is working normally.
After repairs, the code may not clear immediately because the computer runs a specific monitor that requires a complete drive cycle with steady cruise and idle periods.

Can I keep driving with P2245?

You can usually drive the vehicle with this code, but avoid aggressive acceleration and long trips until it is repaired because the engine may run rich or lean and damage the catalytic converter over time. If the check engine light begins flashing or you notice severe drivability problems, stop driving and have the vehicle towed.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Wiring diagram for the specific vehicle
- Socket set and oxygen sensor socket
- Wire repair kit with crimp connectors and heat shrink



Reading P2245

- 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).
- 45** The exact fault within that area.

Often seen with

P0130 O2 Sensor Circuit Malfunction (Bank 1 Sensor 1) · **P0131** O2 Sensor Circuit Low Voltage (Bank 1 Sensor 1) · **P0132** O2 Sensor Circuit High Voltage (Bank 1 Sensor 1) · **P2243** O2 Sensor Reference Voltage Circuit/Open (Bank 1 Sensor 1) · **P2244** O2 Sensor Reference Voltage Performance (Bank 1 Sensor 1)

See it working

Watch the animated explainer [How a CVT Works: Belt and Pulley Transmission](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2245/>

