

GENERIC · POWERTRAIN

P2244

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2244

O2 Sensor Reference Voltage Performance (Bank 1 Sensor 1)

P2244 indicates that the powertrain control module (PCM) has detected a performance fault in the reference voltage circuit for the upstream oxygen sensor on bank 1, sensor 1. The PCM monitors the sensor's reference voltage and sets this code when the voltage falls outside the expected range or does not respond correctly during key-on or closed-loop operation.

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

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms
- Rough idle or hesitation during acceleration if the sensor feedback is skewed
- Decreased fuel economy due to incorrect air-fuel ratio control
- Failed emissions test because the oxygen sensor monitor is not ready or the sensor is not switching
- Intermittent misfire or surging at steady speeds in some cases

Common causes, most likely first

- 1 Faulty upstream oxygen sensor (bank 1 sensor 1) with an internal reference voltage circuit failure
- 2 Damaged or corroded wiring or connector at the oxygen sensor or PCM
- 3 Open or shorted reference voltage circuit between the sensor and PCM
- 4 PCM internal fault affecting the reference voltage supply
- 5 Exhaust leak before the sensor allowing outside air to affect the reading
- 6 Contaminated sensor from oil or coolant entering the exhaust stream



How to diagnose and fix it

- 1 Connect a scan tool and verify the code is current; check freeze-frame data for engine conditions when the fault set
- 2 Inspect the oxygen sensor wiring and connector for damage, corrosion, or loose pins; repair as needed
- 3 Measure reference voltage at the sensor connector with the key on; compare to manufacturer specification
- 4 Check for exhaust leaks upstream of the sensor using a smoke machine or visual inspection
- 5 Perform a resistance and continuity test on the sensor's heater circuit and reference circuit
- 6 If voltage is incorrect at the sensor but correct at the PCM, repair the wiring harness; if correct at the sensor, replace the sensor
- 7 Clear codes and perform a road test to confirm the repair and ensure the monitor runs to completion

Reference voltage faults often misdiagnosed

- A P2244 can be set by a poor ground connection at the sensor or engine block, which skews the reference voltage without any sensor failure.
Technicians sometimes replace the oxygen sensor only to find the connector pins are pushed back or corroded, so always perform a voltage drop test under load.
 - The code may appear intermittently due to vibration or heat affecting a marginal wire, so wiggle-test the harness while monitoring live data.
 - An exhaust leak before the sensor can cause the sensor to read lean and set a reference voltage code, so inspect the exhaust system before condemning the sensor.
- On some vehicles, a weak battery or charging system issue can cause low reference voltage and set this code, so check system voltage first.

Can I keep driving with P2244?

You can usually drive with this code, but avoid aggressive acceleration and long trips until it is diagnosed, as fuel economy and emissions may suffer. If the engine runs rough or misfires, have it checked promptly to prevent damage to the catalytic converter.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Wiring diagram for the vehicle
- Smoke machine for exhaust leak detection
- Basic hand tools for sensor removal



Reading P2244

- 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).
- 44** 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) · **P0133** O2 Sensor Circuit Slow Response (Bank 1 Sensor 1) · **P0134** O2 Sensor Circuit No Activity (Bank 1 Sensor 1)

See it working

Watch the animated explainer [How a Catalytic Converter Works: 3D Cutaway](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2244/>

