

GENERIC · POWERTRAIN

P2205

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2205

NOx Sensor Heater Control Circuit/Open (Bank 1 Sensor 1)

P2205 indicates that the powertrain control module (PCM) has detected an open circuit or excessive resistance in the heater circuit of the upstream nitrogen oxide (NOx) sensor on bank 1. The PCM commands a heater duty cycle to bring the sensor to operating temperature, but the feedback voltage or current does not match the expected value, so the heater is considered faulty or disconnected.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering (injector circuits)

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms.
- Reduced fuel economy because the engine may enter a default fueling strategy.
- Possible rough running or hesitation if the fault affects closed-loop operation.
- In some vehicles, a message indicating emissions system service required.
- Intermittent warning light if the open circuit is temperature or vibration sensitive.

Common causes, most likely first

- 1 Open or damaged wire in the NOx sensor heater circuit, often due to chafing or corrosion.
- 2 Failed NOx sensor heater element, which can burn out internally.
- 3 Blown fuse or faulty relay that supplies power to the heater circuit.
- 4 Poor electrical connection at the sensor or PCM connector, including loose pins or water intrusion.
- 5 PCM internal driver failure, though this is less common.
- 6 Aftermarket sensor with incorrect resistance causing the PCM to set the code.



How to diagnose and fix it

- 1 Inspect the NOx sensor heater fuse and replace if blown, then recheck for the code.
- 2 Visually inspect the sensor wiring and connector for damage, corrosion, or loose pins, and repair as needed.
- 3 Measure the resistance of the heater element across the sensor terminals and compare to the manufacturer's specification.
- 4 Check for power and ground at the heater connector with the key on and the PCM commanding the heater on.
- 5 Perform a voltage drop test on the heater circuit to identify excessive resistance in the wiring.
- 6 If the circuit tests good, replace the NOx sensor with a quality OEM or equivalent part.
- 7 Clear the code and verify the repair by running the appropriate monitor or test drive.

Before you replace the NOx sensor

- A blown fuse for the NOx heater is often caused by a shorted sensor heater, so replacing only the fuse will lead to a repeat failure.
- The heater circuit is live only when the PCM commands it on, so a simple key-on voltage check may not reveal an open circuit; use a scan tool to command the heater on.
- Corrosion inside the connector pins can create enough resistance to set P2205 without any visible wire damage, so always inspect the terminals closely.
- Some vehicles use a smart NOx sensor with an integrated control module, and a heater circuit fault may be stored in that module rather than the PCM, requiring a different diagnostic approach.
- P2205 can be set by a low battery or charging system issue that causes the PCM to see implausible heater feedback, so check system voltage first.

Can I keep driving with P2205?

You can usually continue driving with P2205, but the vehicle may fail an emissions inspection and fuel economy may suffer. Avoid long periods of idling or heavy load until the fault is repaired, and address it promptly to prevent damage to the NOx sensor or catalytic converter.

Tools that help

- OBD-II scan tool with live data and bidirectional control
- Digital multimeter
- Wiring diagram for the specific vehicle
- Fuse puller and test light
- Socket set and trim removal tools



Reading P2205

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

Often seen with

P2200 NOx Sensor Circuit (Bank 1 Sensor 1) · **P2201** NOx Sensor Circuit Range/Performance (Bank 1 Sensor 1) · **P2202** NOx Sensor Circuit Low Input (Bank 1 Sensor 1) · **P2203** NOx Sensor Circuit High Input (Bank 1 Sensor 1) · **P2204** NOx Sensor Circuit Intermittent Input (Bank 1 Sensor 1)

See it working

Watch the animated explainer [Four-Stroke Engine Notebook: The Otto Cycle Explained](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2205/>

