

GENERIC · POWERTRAIN

P2219

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2219

NOx Sensor Heater Control Circuit Low (Bank 2 Sensor 1)

P2219 means the engine computer has detected that the heater circuit inside the nitrogen oxide (NOx) sensor for bank 2, sensor 1 is drawing less current than expected, indicating an open or high-resistance circuit. The NOx sensor heater is a small heating element that brings the sensor up to operating temperature quickly so it can measure nitrogen oxides in the exhaust, and a low-current condition prevents that from happening.

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 engine power or limp mode in some vehicles as the computer limits torque to protect emissions components
- Slightly rough running or hesitation during cold starts while the sensor is not yet at temperature
- Poor fuel economy if the engine management strategy enriches the mixture to compensate for an inactive NOx sensor
- A stored pending code or freeze-frame data showing the fault occurred during a cold-start heater test
- In rare cases, a message on the dash about emissions system service or a related diesel exhaust fluid (DEF) warning

Common causes, most likely first

- 1 Open or broken wire in the NOx sensor heater circuit, often at the connector or where the harness flexes near the exhaust
- 2 Failed NOx sensor heater element itself, which can burn out internally and present an open circuit
- 3 Corroded, loose, or water-intruded electrical connector at the sensor or at the control module
- 4 Blown fuse or faulty relay that supplies power to the NOx sensor heater circuit
- 5 High resistance in the ground circuit for the heater, causing the computer to see low current draw
- 6 Faulty NOx sensor control module or engine control module (ECM) driver, though this is less common than wiring or sensor failure
- 7 Aftermarket or incorrect sensor installed previously that does not meet the heater current specification



How to diagnose and fix it

- 1 Scan all modules and record freeze-frame data to confirm the fault is active and not a history code from a previous repair
- 2 Inspect the NOx sensor connector and harness for corrosion, chafing, or loose pins, and check the heater circuit fuse and relay
- 3 Measure the resistance of the NOx sensor heater element with a multimeter and compare it to the manufacturer's specification
- 4 Check for battery voltage and ground at the heater connector with the key on, using a load test to confirm the circuit can carry current
- 5 Perform a voltage drop test on both the power and ground sides of the heater circuit to find high-resistance connections
- 6 If the circuit tests good, substitute a known-good NOx sensor or use a scan tool bidirectional control to command the heater on and verify current draw
- 7 Clear the code and complete a drive cycle that includes a cold start and enough run time for the heater monitor to run, then recheck for return of the fault

What a low-current NOx heater code really means

- A low-current heater code is almost always an open circuit rather than a shorted sensor, so a visual inspection of the wiring often finds the problem before any parts are replaced.
- The heater circuit is powered through a fuse that may also supply other emissions components, so a blown fuse can set P2219 along with other codes and lead you to the wrong sensor.
- Some vehicles run a heater test only after a cold soak, so the code may not reset immediately after repair until the vehicle sits overnight and is restarted.
- A NOx sensor that is mechanically damaged or contaminated can still have a good heater circuit, so do not assume the sensor is faulty just because the code points to its heater.
- The bank 2 sensor 1 designation refers to the exhaust bank that does not contain cylinder number one, and on inline engines or single-bank exhaust systems the code may not apply or may be reported differently.

Can I keep driving with P2219?

You can usually drive the vehicle with this code because the engine will run, but the NOx sensor heater being inactive means the emissions system is not working correctly and the vehicle may fail an emissions inspection. Avoid long periods of idling and heavy load until the fault is repaired, and do not ignore the code if your area requires emissions testing.



Tools that help

- OBD-II scan tool with live data and bidirectional control capability
- Digital multimeter with resistance and voltage drop functions
- Wiring diagram for the NOx sensor heater circuit
- Socket set and trim removal tools for accessing the sensor and harness
- Test light or load tester for circuit verification

Reading P2219

- P** Powertrain: engine, transmission and emissions.
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- 2** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
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- 2** Fuel and air metering (injector circuits).
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- 19** 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) · **P2218** NOx Sensor Heater Control Circuit/Open (Bank 2 Sensor 1) · **P2220** NOx Sensor Heater Control Circuit High (Bank 2 Sensor 1) · **P229E** NOx Sensor Circuit (Bank 1 Sensor 2)

See it working

Watch the animated explainer [How a Manual Transmission Works: Four-Speed Cutaway](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2219/>

