

VOLKSWAGEN · POWERTRAIN

P1120

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1120 · Volkswagen

Oxygen Sensor Heater Circuit Bank 2 Sensor 1 Open

P1120 on Volkswagen vehicles indicates that the engine control module has detected an open circuit in the heater element of the bank 2, sensor 1 oxygen sensor, which is the pre-catalyst sensor on the bank opposite cylinder one. The heater is responsible for bringing the sensor up to operating temperature quickly after a cold start, and an open circuit means the heater is not drawing current when commanded on.

SYSTEM

Powertrain

CODE TYPE

**Volkswagen
specific**

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

**Fuel and air
metering**

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms
- Slightly higher fuel consumption during the first few minutes after a cold start
- A brief delay in entering closed-loop fuel control, which may cause a faint rich smell from the exhaust when cold
- In rare cases, a rough idle or hesitation when the engine is cold
- No drivability complaints once the engine is at operating temperature

Common causes, most likely first

- 1 Failed oxygen sensor heater element (open circuit inside the sensor)
- 2 Damaged or corroded wiring harness between the oxygen sensor and the engine control module
- 3 Blown fuse or faulty relay supplying power to the oxygen sensor heater circuit
- 4 Loose, corroded, or water-intruded connector at the oxygen sensor or at the engine control module
- 5 Open circuit in the heater ground path, including a poor chassis ground connection
- 6 Engine control module internal driver failure for the heater circuit (rare)



How to diagnose and fix it

- 1 Check the fuse and relay that supply power to the bank 2 sensor 1 oxygen sensor heater circuit and replace any failed component.
- 2 Inspect the oxygen sensor connector and the engine control module connector for corrosion, water intrusion, or loose pins, and clean or repair as needed.
- 3 Measure the resistance of the oxygen sensor heater element with a multimeter and compare it to the manufacturer's specification; an open circuit confirms a failed sensor.
- 4 Perform a voltage drop test on the heater power and ground circuits while the heater is commanded on to identify excessive resistance in the wiring.
- 5 Repair any damaged wiring or connectors in the heater circuit, then clear the fault memory and verify the code does not return.
- 6 If the wiring and connectors are good and the heater circuit tests correctly, replace the bank 2 sensor 1 oxygen sensor with a quality part.
- 7 After replacement, clear the fault memory, perform a road test with a cold start, and confirm the heater circuit monitor passes.

Why the heater circuit fails before the sensor does

- The heater element inside the oxygen sensor is the most common failure point, but a corroded connector or chafed wire in the harness can mimic a failed sensor and lead to unnecessary replacement.
- A blown fuse for the oxygen sensor heater circuit often indicates a shorted sensor heater or a wiring fault, so replacing the fuse without finding the root cause will usually result in the fuse blowing again.
- On many Volkswagen models, the oxygen sensor heater circuit is powered through a relay that can fail intermittently, causing the code to set only under certain temperature or vibration conditions.
- The engine control module may set P1120 even if the sensor heater still works intermittently, so a resistance check when the sensor is cold is more reliable than testing after the engine has warmed up.
- This code does not always mean the sensor is completely dead; the sensor may still produce a signal, but the heater circuit open will prevent the system from entering closed-loop fuel control quickly, affecting emissions and fuel economy.

Can I keep driving with P1120?

You can usually continue driving with P1120, but the engine may run slightly richer during warm-up and fuel economy may suffer until the fault is repaired. Avoid extended idling from cold and have the circuit diagnosed soon to prevent increased emissions and potential catalytic converter damage over time.



Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Wiring diagram for the specific Volkswagen model
- Basic hand tools for connector and sensor access
- Fuse puller and test light

Reading P1120

- P** Powertrain: engine, transmission and emissions.
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- 1** Manufacturer-specific code (Volkswagen): its meaning depends on the make.
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- 1** Fuel and air metering.
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- 20** The exact fault within that area.

Often seen with

P1121 Oxygen Sensor Heater Circuit Bank 2 Sensor 2 Short To Ground · **P1119** Oxygen Sensor Heater Circuit Bank 2 Sensor 1 Short To Ground · **P1121** Accelerator Pedal Position Sensor Range Performance Problem · **P1121** Neutral Position Switch Circuit Low Input AT Vehicles · **P1121** Throttle Position Lower Than Expected · **P1121** Throttle Position Sensor Signal Not Consistent With Mass Air · **P1121** Pedal Position Sensor A Circuit Range Performance · **P1121** Throttle Position Lower Than Expected · **P1119** Engine Coolant Temperature Out of Range · **P1121** Throttle Position Sensor Out of Range · **P1121** Throttle Position Sensor Inconsistent with Mass Air Flow Sen · **P1119** Manifold Absolute Temperature Circuit High Input · **P1121** TP Sensor Circuit Intermittent High Voltage · **P1119** ECT Signal Out Of Rage With TFT Sensor · **P1121** Pedal Position Sensor 1 Range Performance Problem · **P0135** O2 Sensor Heater Circuit Malfunction (Bank 1 Sensor 1) · **P0155** O2 Sensor Heater Circuit Malfunction (Bank 2 Sensor 1) · **P0141** O2 Sensor Heater Circuit Malfunction (Bank 1 Sensor 2)

See it working

Watch the animated explainer [Excavator Simulator: Hydraulics You Can Operate](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/volkswagen-p1120/>

