

VOLKSWAGEN · POWERTRAIN

P1148

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1148 · Volkswagen

Oxygen Sensor Control Bank 2 System Too Rich

P1148 on a Volkswagen indicates that the engine control module has detected a rich fuel mixture on Bank 2, meaning the exhaust contains too much unburned fuel and not enough oxygen. The oxygen sensor monitoring Bank 2 has reported a signal that stays richer than the computer's target, and the fuel control system has reached or exceeded its correction limit while trying to lean the mixture out.

SYSTEM

Powertrain

CODE TYPE

**Volkswagen
specific**

SEVERITY

Medium

FIX DIFFICULTY

Professional

AREA

**Fuel and air
metering**

Symptoms you may notice

- Often no symptoms besides the warning light, especially in the early stages of the fault.
- A noticeable drop in fuel economy as the engine burns more fuel than necessary.
- Black, sooty exhaust smoke or a strong fuel smell from the tailpipe.
- Rough idle, misfiring, or engine stumbling due to excessive fuel fouling the spark plugs.
- Sluggish acceleration or reduced power under load.
- The check engine light may flash if the rich condition is severe enough to risk catalytic converter damage.

Common causes, most likely first

- 1 A leaking or stuck-open fuel injector on Bank 2, delivering too much fuel into the cylinder.
- 2 Excessive fuel pressure caused by a faulty fuel pressure regulator or a restricted fuel return line.
- 3 A faulty mass air flow sensor that over-reports airflow, causing the computer to inject more fuel than needed.
- 4 A contaminated or failed oxygen sensor on Bank 2 that sends a false rich signal to the engine control module.
- 5 A vacuum leak or unmetered air entering after the mass air flow sensor, which the computer misinterprets as a lean condition and overcorrects with fuel.
- 6 A leaking intake manifold gasket or faulty positive crankcase ventilation valve allowing fuel vapors to enter the intake.
- 7 A stuck-open purge valve in the evaporative emissions system, allowing fuel vapor to flood the intake manifold.



How to diagnose and fix it

- 1 Scan all stored codes and freeze-frame data to confirm P1148 is the primary fault and not a secondary code triggered by another issue.
- 2 Inspect the Bank 2 oxygen sensor signal and fuel trim values with a scan tool to verify the rich condition and identify whether the sensor is reporting accurately.
- 3 Check fuel pressure with a gauge and compare it to the manufacturer's specification to rule out a failing pressure regulator or restricted return line.
- 4 Perform a smoke test on the intake system to find vacuum leaks or unmetered air entry that could confuse the fuel control system.
- 5 Test the mass air flow sensor by comparing its reported airflow to expected values or by swapping it with a known-good unit.
- 6 Remove and flow-test the Bank 2 fuel injectors, or use a scan tool injector balance test, to identify a leaking or stuck-open injector.
- 7 Inspect the evaporative emissions purge valve for proper operation and replace it if it is stuck open, allowing fuel vapor to enter the intake.

When the oxygen sensor lies about a rich mixture

- A contaminated oxygen sensor on Bank 2 can report a rich condition even when the actual mixture is correct, leading to unnecessary replacement of fuel system components.
- Volkswagen engines with direct injection are prone to carbon buildup on intake valves, which can disrupt airflow and cause the computer to misjudge the mixture, setting a rich code without any faulty fuel component.
- A failing coolant temperature sensor can make the engine control module think the engine is cold and command a richer mixture, triggering P1148 without any obvious driveability complaint.
- The evaporative emissions purge valve is a commonly overlooked cause; when it sticks open, fuel vapor from the charcoal canister floods the intake and creates a rich condition that the oxygen sensor detects.
- After any repair, the engine control module must relearn fuel trims, so clearing the code and performing a road test with several drive cycles is essential to confirm the fix.

Can I keep driving with P1148?

You can drive the vehicle short distances to a repair shop, but avoid heavy acceleration or sustained high-speed driving because a rich mixture can overheat and damage the catalytic converter. If the check engine light is flashing, stop driving and have the vehicle towed to prevent costly emissions system damage.



Tools that help

- OBD-II scan tool with live data and fuel trim capability
- Fuel pressure gauge
- Smoke machine for intake leak detection
- Digital multimeter for testing sensors and wiring
- Injector balance tester or flow bench
- Vacuum gauge

Reading P1148

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

Often seen with

P1136 Long Term Fuel Trim Add Fuel Bank 1 System Too Lean · **P1150** Oxygen Sensor Control Bank 2 Out Of Range · **P1150** Air/Fuel Sensor Circuit Range Performance Bank 1 Sensor 2 · **P1150** Front Oxygen Sensor Heater Circuit High Input · **P1136** HO2S Bank 1 Sensor 1 Heater Circuit High Input · **P1150** HO2S Bank 2 Sensor 1 Not Switching Fuel Control Limit Reached · **P1136** Control Box Fan Circuit · **P1136** HO2S Rich Average Bank 1 Sensor 1 · **P1150** Lack of Upstream Heated Oxygen Sensor Switch Adaptive Fuel L · **P1136** HO2S Rich Average Bank 1 Sensor 1 · **P1136** O2 Sensor Heater Circuit High Voltage Bank 1 Sensor 1 · **P0172** System Too Rich (Bank 1) · **P0175** System Too Rich (Bank 2) · **P2188** System Too Rich at Idle (Bank 1)

See it working

Watch the animated explainer [How Airbags Work: A 50 km/h Crash in Slow Motion](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/volkswagen-p1148/>

