

VOLKSWAGEN · POWERTRAIN

P1147

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1147 · Volkswagen

Oxygen Sensor Control Bank 2 System Too Lean

P1147 on Volkswagen vehicles indicates that the engine control module has detected a lean condition on bank 2, meaning the exhaust from the cylinders on that side contains too much oxygen relative to fuel. The oxygen sensor on bank 2 is reporting a voltage that stays lower than expected, and the fuel trim adjustments have reached a point where the computer can no longer compensate, triggering the code.

SYSTEM

Powertrain

CODE TYPE

Volkswagen specific

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Rough idle or misfire, particularly when the engine is cold
- Hesitation or stumble during acceleration
- Reduced fuel economy
- Occasional surging or uneven power delivery
- A faint fuel odor from the exhaust in severe cases

Common causes, most likely first

- 1 Vacuum leak on the bank 2 intake side, such as a cracked intake manifold gasket or a split vacuum hose
- 2 Faulty bank 2 oxygen sensor that is biased lean or has a contaminated sensing element
- 3 Leaking fuel injector seals or a clogged injector on bank 2 causing uneven fuel delivery
- 4 Exhaust leak upstream of the bank 2 oxygen sensor, allowing outside air to be drawn into the exhaust stream
- 5 Low fuel pressure from a weak fuel pump or a restricted fuel filter, affecting both banks but more noticeable on bank 2
- 6 Mass airflow sensor contamination or faulty reading that skews the air-fuel mixture
- 7 Positive crankcase ventilation (PCV) system leak or a faulty PCV valve introducing unmetered air



How to diagnose and fix it

- 1 Connect a scan tool and record freeze-frame data and fuel trim values for both banks to confirm the lean condition is isolated to bank 2
- 2 Perform a visual inspection of all intake and vacuum lines on bank 2, including the intake manifold gasket and PCV hoses, using a smoke machine to locate leaks
- 3 Check for exhaust leaks upstream of the bank 2 oxygen sensor by listening for ticking noises and inspecting for soot trails
- 4 Test the bank 2 oxygen sensor response with a scan tool or oscilloscope to verify it switches rapidly between rich and lean; replace if sluggish or stuck lean
- 5 Measure fuel pressure and compare with specifications; replace the fuel filter or fuel pump if pressure is below spec
- 6 Clean or replace the mass airflow sensor if contamination is suspected, and verify its reading against known good values
- 7 Inspect and test the bank 2 fuel injectors for clogging or leaking seals, and perform a fuel injector balance test if equipment allows

Before you replace the bank 2 oxygen sensor

- A lean code on only one bank often points to a vacuum leak specific to that cylinder head, such as a failed intake manifold gasket, rather than a global fuel delivery issue.
- Volkswagen engines are known for crankcase breather valve failures that can cause unmetered air to enter the intake, setting a lean code on one or both banks.
- The bank 2 oxygen sensor may be reporting accurately while the actual problem is a leaking injector seal or a cracked exhaust manifold drawing air, so replacing the sensor first is a common misdiagnosis.
- Fuel trim values can reveal whether the lean condition is present at idle only (vacuum leak) or across the entire operating range (fuel delivery or sensor issue).
- After repairs, clear the codes and perform a drive cycle that includes idle, cruise, and acceleration to verify the fuel trims return to normal before returning the vehicle to the customer.

Can I keep driving with P1147?

You can drive the vehicle short distances to a repair shop, but avoid heavy acceleration or towing because a persistent lean condition can raise combustion temperatures and damage the catalytic converter or exhaust valves over time. If the check engine light begins flashing, stop driving immediately and have the vehicle towed.



Tools that help

- OBD-II scan tool with live data and fuel trim display
- Smoke machine for intake leak detection
- Vacuum gauge
- Fuel pressure test kit
- Digital multimeter or oscilloscope for oxygen sensor testing
- Basic hand tools and socket set

Reading P1147

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

Often seen with

P1157 Manifold Absolute Pressure Sensor Circuit Power Supply Malfunction · **P1137** Long Term Fuel Trim Add Fuel Bank 1 System Too Rich · **P1137** Front Oxygen AF Sensor Circuit Range Performance Problem · **P1137** HO2S Bank 1 Sensor 2 Not Switching Fuel Control Limit Reached · **P1137** Lack Of HO2S12 Switches Sensor Indicates Lean · **P1157** Lack Of HO2S22 Switches Sensor Indicates Lean · **P1137** O2 Sensor Low Voltage During Power Enrichment (Bank 1 Sensor) · **P1157** HO2S Bank 2 Sensor 2 Lean System Or Low Voltage · **P1137** Lack of Downstream Heated Oxygen Sensor Switch Sensor Indicates · **P1157** Lack of Downstream Heated Oxygen Sensor Switch Sensor Indicates · **P1137** HO2S Bank 1 Sensor 2 Lean Or Low Voltage · **P1157** HO2S Bank 2 Sensor 2 Lean System Or Low Voltage · **P1137** O2 Sensor Heater Circuit Signal Intermittent Bank 1 Sensor 2 · **P1157** O2 Sensor Heater Circuit High Voltage Bank 2 Sensor 2 · **P0171** System Too Lean (Bank 1) · **P0300** Random/Multiple Cylinder Misfire Detected · **P0174** System Too Lean (Bank 2)

See it working

Watch the animated explainer [Car Relay Test Bench: Test 4-Pin and 5-Pin Relays](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/volkswagen-p1147/>

