

BMW · POWERTRAIN

P1160

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1160 · BMW

Fuel Trim Adaptation Additive Bank 2 Low

P1160 on BMW vehicles indicates that the engine control module has detected an excessively low additive fuel trim adaptation value on bank 2, meaning the engine is running too lean at idle and low-load conditions and the computer has reached the limit of its ability to add fuel. The additive adaptation specifically corrects mixture deviations at idle and low throttle, so this code points to a vacuum leak or unmetered air affecting the bank 2 cylinder group rather than a general fuel delivery issue.

SYSTEM

Powertrain

CODE TYPE

BMW 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 or unstable idle, sometimes with a slight shake felt through the steering wheel
- Occasional lean misfire at idle that may clear as soon as the throttle is opened
- Slightly elevated idle speed as the DME tries to compensate for the lean condition
- Poor fuel economy during city driving and stop-and-go traffic
- A faint fuel or exhaust smell from the tailpipe when the engine is cold

Common causes, most likely first

- 1 Vacuum leak on the bank 2 intake tract, such as a cracked intake boot, deteriorated vacuum hose, or leaking intake manifold gasket
- 2 Faulty or contaminated mass air flow sensor reporting less air than actually enters the engine
- 3 Leaking crankcase ventilation valve or breather hose on the bank 2 side of the engine
- 4 Sticking or clogged fuel injector on one or more bank 2 cylinders, reducing fuel delivery at idle
- 5 Low fuel pressure from a weak fuel pump or restricted fuel filter, affecting bank 2 more than bank 1
- 6 Intake valve carbon buildup on bank 2 cylinders, common on direct-injection BMW engines, restricting airflow at low lift
- 7 Exhaust leak upstream of the bank 2 oxygen sensor allowing outside air to skew the sensor reading



How to diagnose and fix it

- 1 Connect a scan tool and read live data for additive and multiplicative fuel trims on both banks to confirm the lean condition is isolated to bank 2 at idle
- 2 Perform a visual inspection of all bank 2 intake hoses, vacuum lines, and the crankcase ventilation system for cracks, loose clamps, or oil residue
- 3 Spray a small amount of carburetor cleaner or propane around the bank 2 intake manifold gasket and vacuum connections while watching fuel trim to pinpoint a vacuum leak
- 4 Check fuel pressure and volume at the rail against BMW specifications, and inspect the bank 2 fuel injectors for clogging or incorrect spray pattern
- 5 Clean or replace the mass air flow sensor if live data shows an implausible reading, and verify the intake air temperature sensor is reading correctly
- 6 Perform a smoke test on the intake system to reveal hidden leaks that visual inspection misses, especially around the intake manifold and valve cover
- 7 After repairs, clear the adaptations with the scan tool and drive the vehicle through a complete idle and low-load adaptation cycle to confirm the code does not return

Why bank 2 leans out at idle only

- Additive fuel trim only operates at idle and very low load, so a P1160 that appears only when the engine is idling almost always points to a vacuum leak rather than a failing fuel pump or mass air flow sensor.
- BMW inline-six and V8 engines often develop leaks at the valve cover gasket or the oil filler cap, which act as unmetered air sources that affect one bank more than the other and set this code without any obvious hissing noise.
- A dirty mass air flow sensor can cause lean additive trims on both banks, but if only bank 2 is flagged, technicians should focus on bank-specific intake leaks before condemning the sensor.
- Carbon buildup on intake valves is a common cause on BMW direct-injection engines, and it can produce a bank-specific lean idle trim that does not respond to normal vacuum leak testing.
- Replacing the bank 2 oxygen sensor because of this code is a common misdiagnosis; the sensor is usually reporting the lean condition accurately, and the real fault lies upstream in the intake or fuel system.

Can I keep driving with P1160?

You can usually drive the vehicle short distances to a repair shop, but avoid prolonged idling and heavy load until the lean condition is corrected, because a persistent lean mixture can overheat the catalytic converter and cause misfires. If the check engine light begins flashing or the engine runs rough, stop driving and have the vehicle towed.



Tools that help

- OBD-II scan tool with live fuel trim and mass air flow data capability
- Smoke machine for intake leak detection
- Carburetor cleaner or propane enrichment tool for vacuum leak testing
- Fuel pressure gauge
- Basic hand tools including screwdrivers, socket set, and hose clamp pliers

Reading P1160

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

Often seen with

P1161 Manifold Temperature Sensor Circuit Open/Short To B+ · **P1161** HO2S Heater Power Stage Circuit Bank 2 Sensor 2 · **P1161** HO2S Heater Power Stage Circuit Bank 2 Sensor 2 · **P1161** Fuel Trim Adaptation Additive Bank 2 High · **P0171** System Too Lean (Bank 1) · **P0174** System Too Lean (Bank 2) · **P0300** Random/Multiple Cylinder Misfire Detected · **P0302** Cylinder 2 Misfire Detected

See it working

Watch the animated explainer [How Coil-on-Plug Ignition Works: Coil and Spark Plug](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/bmw-p1160/>

