

GENERIC · POWERTRAIN

P2BF3

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2BF3

Fuel Control System B Too Rich Bank 2

P2BF3 indicates that the powertrain control module has detected an excessively rich air-fuel mixture on bank 2 of the engine, meaning the exhaust contains more unburned fuel than the feedback system can correct for. The computer monitors the bank 2 oxygen sensor or wideband air-fuel ratio sensor and sees a signal that stays richer than the commanded target despite the fuel trim already being pulled to its lean limit.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Professional

AREA

Hybrid propulsion

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms
- A strong raw fuel smell from the exhaust, especially at idle
- Noticeably worse fuel economy than normal
- Black sooty smoke from the tailpipe under acceleration
- Rough idle, misfire, or engine stumble when the mixture becomes too rich
- Failed emissions test with high hydrocarbon or carbon monoxide readings

Common causes, most likely first

- 1 A leaking or stuck-open fuel injector on bank 2 delivering excess fuel
- 2 Excessive fuel pressure from a failed fuel pressure regulator or restricted return line
- 3 A faulty bank 2 oxygen or air-fuel ratio sensor sending a false rich signal
- 4 A vacuum leak that the mass airflow sensor does not account for, causing the system to overfuel
- 5 A contaminated or failing mass airflow sensor reporting less air than actually enters the engine
- 6 A leaking evaporative emissions purge valve that allows fuel vapor to enter the intake continuously
- 7 Mechanical faults such as low compression or a stretched timing chain on bank 2



How to diagnose and fix it

- 1 Scan all stored codes and freeze-frame data, then verify the rich condition with live fuel trim and bank 2 oxygen sensor readings
- 2 Inspect the air intake tract and vacuum lines for leaks or disconnected hoses that could skew the mixture
- 3 Check fuel pressure with a gauge and compare it to the manufacturer's specification
- 4 Test the bank 2 fuel injectors for leakage, balance, and correct operation, including a cylinder balance test
- 5 Measure the bank 2 oxygen or air-fuel ratio sensor response and compare it with bank 1 to confirm sensor accuracy
- 6 Inspect the evaporative emissions purge valve for sticking open and allowing fuel vapor into the intake
- 7 Perform a compression or cylinder leak-down test on bank 2 if fuel and sensor checks are normal

Rich bank 2 faults that fool technicians

- A vacuum leak usually causes a lean condition, but on some speed-density systems an unmetered air leak can confuse the computer into overfueling bank 2, so do not rule out intake leaks just because the code says rich.
- A lazy or contaminated bank 2 oxygen sensor can report a rich mixture even when the actual air-fuel ratio is correct, so always cross-check the sensor signal against fuel trim and exhaust gas readings before replacing fuel system parts.
- Fuel pressure that is only slightly above specification may not trigger a lean or rich code on bank 1, but bank 2 can be the first to show the fault because of its position in the fuel rail.
- A sticking evaporative emissions purge valve is a commonly missed cause of rich codes because the extra fuel vapor enters the intake continuously and is not always obvious during a quick visual inspection.
- Never replace the catalytic converter for this code until the rich condition is repaired, because excess fuel will quickly destroy a new converter and the code will return.

Can I keep driving with P2BF3?

You can usually drive the vehicle short distances to a repair shop, but avoid heavy acceleration and long trips because the rich mixture can overheat and damage the catalytic converter. If the engine runs rough, misfires, or produces heavy black smoke, stop driving and have it towed.

Tools that help

- OBD-II scan tool with live data and fuel trim capability
- Fuel pressure gauge
- Vacuum gauge
- Digital multimeter
- Cylinder balance tester or compression gauge
- Infrared thermometer or exhaust gas analyzer



Reading P2BF3

- P** Powertrain: engine, transmission and emissions.
- 2** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- B** Hybrid propulsion.
- F3** The exact fault within that area.

Often seen with

P0172 System Too Rich (Bank 1) · **P0175** System Too Rich (Bank 2) · **P2196** O2 Sensor Signal Stuck Rich (Bank 1 Sensor 1) · **P2198** O2 Sensor Signal Stuck Rich (Bank 2 Sensor 1) · **P2BF2** Fuel Control System B Too Lean Bank 2

See it working

Watch the animated explainer [Disc Brake Trainer: How Car Brakes Stop a Wheel](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2bf3/>

