



P2BEF

Fuel Control System A Too Rich Bank 2

P2BEF indicates that the powertrain control module has detected an excessively rich air-fuel mixture on bank 2 of the fuel control system, meaning the engine is receiving more fuel or less air than the computer commanded. The module monitors short-term and long-term fuel trim values and sets this code when the bank 2 fuel trim correction exceeds a calibrated threshold for a sustained period.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Professional	Hybrid propulsion

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms
- Noticeable decrease in fuel economy compared to normal driving
- Rough idle or engine stumbling, especially when the engine is cold
- Black, sooty exhaust smoke or a strong fuel odor from the tailpipe
- Hesitation or sluggish acceleration under load
- Elevated carbon monoxide levels that may cause an emissions test failure

Common causes, most likely first

- 1 Leaking or stuck-open fuel injector on bank 2
- 2 Faulty or contaminated mass airflow sensor reporting lower airflow than actual
- 3 Vacuum leak or unmetered air entering downstream of the mass airflow sensor on bank 2
- 4 Exhaust leak before the upstream oxygen sensor on bank 2 causing a false lean reading
- 5 Failed upstream oxygen sensor on bank 2 sending an incorrect signal
- 6 High fuel pressure from a faulty fuel pressure regulator or restricted return line
- 7 Evaporative emissions purge valve stuck open allowing fuel vapor into the intake



How to diagnose and fix it

- 1 Connect a scan tool and record freeze-frame data plus bank 1 and bank 2 fuel trim values at idle and at 2500 rpm to confirm the rich condition is isolated to bank 2
- 2 Inspect the intake tract and vacuum lines on bank 2 for cracks, loose clamps, or disconnected hoses that admit unmetered air
- 3 Check fuel pressure with a gauge and compare it to the manufacturer's specification, looking for a regulator that is stuck closed or a restricted return line
- 4 Perform a cylinder balance test or injector flow test to identify a leaking or stuck-open injector on bank 2
- 5 Inspect the exhaust system upstream of the bank 2 oxygen sensor for leaks that could skew the sensor reading
- 6 Swap the bank 2 upstream oxygen sensor with a known-good unit or compare its live reading against bank 1 to verify sensor accuracy
- 7 Command the evaporative emissions purge valve closed with the scan tool and recheck fuel trims to rule out a stuck-open purge valve

Bank 2 rich codes that fool good technicians

- A vacuum leak usually causes a lean condition, but on some engines a leak that bypasses the mass airflow sensor can disturb the airflow signal enough to create a rich command on one bank, so do not dismiss intake leaks just because the code says rich.
- An exhaust leak before the upstream oxygen sensor draws outside air into the exhaust stream, making the sensor report lean and driving the computer to add fuel until bank 2 goes rich, which is a common misdiagnosis trap.
- Fuel trim values must be evaluated at both idle and higher rpm because a leaking injector shows up as rich across the range while a vacuum leak often shows lean at idle and normalizes off idle.
- A failing mass airflow sensor can bias the entire fuel control system, but bank 2 may cross the threshold first due to cylinder bank differences, so always compare bank 1 and bank 2 trims before condemning a bank-specific part.
- The evaporative emissions purge valve can stick open and feed fuel vapor into the intake, and this often sets a rich code on one bank without any evaporative emissions code being stored.

Can I keep driving with P2BEF?

You can drive the vehicle short distances to a repair shop, but avoid sustained high-speed driving, heavy throttle, or towing because a rich mixture can overheat and damage the catalytic converter. If the check engine light begins flashing or the engine runs very rough, stop driving and arrange a tow.



Tools that help

- OBD-II scan tool with live data and fuel trim display
- Fuel pressure gauge
- Vacuum gauge
- Infrared thermometer or cylinder balance tester
- Smoke machine for intake and exhaust leak detection
- Digital multimeter

Reading P2BEF

P	Powertrain: engine, transmission and emissions.
2	Generic (SAE) code: it means the same thing on every OBD-II vehicle.
B	Hybrid propulsion.
EF	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) · **P2BEE** Fuel Control System A Too Lean Bank 2

See it working

Watch the animated explainer **V6 Engine Explained: 60° Bank and Firing Order** on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2bef/>

