



P02BD

Cylinder 9 - Injector Leaking

P02BD indicates that the engine control module has detected an excessively rich fuel condition on cylinder 9, which it attributes to a leaking fuel injector. The computer monitors crankshaft speed fluctuations and oxygen sensor feedback to identify a cylinder that is receiving more fuel than commanded, and it sets this code when the imbalance exceeds a calibrated threshold.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Professional	Fuel and air metering (injector circuits)

Symptoms you may notice

- A rough idle or misfire that is often more noticeable when the engine is cold
- Black smoke from the exhaust and a strong raw fuel smell
- Poor fuel economy and a rich-running condition
- Often no symptoms besides the warning light, especially if the leak is small
- Engine hesitation or stumbling under acceleration
- Illumination of the malfunction indicator lamp, sometimes accompanied by a flashing light if the misfire is severe

Common causes, most likely first

- 1 A fuel injector that is stuck partially open or has a damaged internal seal, allowing fuel to drip into the cylinder
- 2 A shorted or chafed injector control wire that holds the injector energized longer than commanded
- 3 A faulty engine control module driver circuit that keeps the injector ground engaged
- 4 Contaminated fuel or debris that prevents the injector needle from seating fully
- 5 A restricted fuel return line or high fuel pressure that overcomes a weak injector spring
- 6 Wear or corrosion on the injector electrical connector causing intermittent operation



How to diagnose and fix it

- 1 Perform a cylinder balance test or injector cutout test to confirm which cylinder is affected and verify that the misfire follows the injector when swapped to another cylinder
- 2 Check the injector electrical connector and wiring for corrosion, chafing, or a short to ground that could hold the injector on
- 3 Measure fuel pressure and compare it to the manufacturer's specification to rule out a system-wide overpressure condition
- 4 Use a noid light or oscilloscope to verify the injector pulse width and confirm that the control signal is not staying on longer than commanded
- 5 Remove the suspect injector and inspect it for external damage, then send it for professional cleaning and flow testing or replace it with a known-good unit
- 6 After repair, clear the adaptive fuel trims and the code, then road-test the vehicle to confirm the rich condition is resolved and the code does not return
- 7 If the injector and wiring test good, diagnose the engine control module driver circuit for a fault that could hold the injector energized

Why a leaking injector is often misdiagnosed

- A leaking injector can set a rich code on one cylinder without ever producing a misfire code, so technicians who only look for misfire counters may overlook the true cause.
- Fuel pressure that is too high from a failed fuel pressure regulator can mimic a leaking injector on multiple cylinders, so always verify system pressure before condemning an injector.
- A shorted injector driver inside the engine control module can hold an injector open continuously, and this will often damage the injector and the catalytic converter if not caught quickly.
- Some scan tools report injector balance values that are calculated rather than measured, so confirm any suspected leaking injector with a physical flow test or by swapping the injector to another cylinder.
- A leaking injector on cylinder 9 is often accompanied by fuel trim readings that are negative on that bank, and comparing bank-to-bank fuel trims can help isolate the fault before disassembly.

Can I keep driving with P02BD?

You can drive the vehicle a short distance to a repair shop, but avoid heavy acceleration and long trips because raw fuel can overheat and damage the catalytic converter. If the check engine light is flashing or you smell strong fuel, stop driving and have the vehicle towed.



Tools that help

- OBD-II scan tool with live data and injector balance test capability
- Fuel pressure gauge
- Noid light or oscilloscope for injector pulse testing
- Digital multimeter for wiring and resistance checks
- Mechanic's stethoscope or listening device to compare injector operation
- Injector removal tools and a flow-test bench or sending service

Reading P02BD

P	Powertrain: engine, transmission and emissions.
0	Generic (SAE) code: it means the same thing on every OBD-II vehicle.
2	Fuel and air metering (injector circuits).
BD	The exact fault within that area.

Often seen with

P0172 System Too Rich (Bank 1) · **P0175** System Too Rich (Bank 2) · **P02BC** Cylinder 9 - Injector Restricted · **P02BE** Cylinder 10 - Fuel Trim at Max Limit · **P0309** Cylinder 9 Misfire Detected

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/p02bd/>

