

GENERIC · POWERTRAIN

P02A9

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P02A9

Cylinder 4 - Injector Leaking

P02A9 is a generic powertrain code that indicates the engine control module (ECM) has detected a leaking condition in the fuel injector for cylinder 4. The ECM typically determines this by monitoring fuel trim corrections, cylinder balance, or injector pulse width and recognizing that cylinder 4 is receiving excess fuel beyond what the ECM commands.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	High	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 or a strong fuel odor around the vehicle
- A decrease in fuel economy that the driver may notice over time
- The check engine light may be the only symptom, with no noticeable driveability issues
- Engine hesitation or stumbling during acceleration
- Elevated hydrocarbon (HC) emissions that may cause an emissions test failure

Common causes, most likely first

- 1 A fuel injector that is mechanically stuck open or leaking at the nozzle due to internal wear or debris
- 2 A faulty injector O-ring or seal that allows fuel to seep past the injector body
- 3 A shorted injector driver circuit in the wiring harness that holds the injector open longer than commanded
- 4 A failed engine control module (ECM) driver that keeps the injector ground circuit energized
- 5 Contaminated fuel or debris that prevents the injector needle from seating properly
- 6 A cracked injector body or damaged pintle cap that allows fuel to leak externally or internally



How to diagnose and fix it

- 1 Perform a visual inspection of the cylinder 4 injector and its surrounding area for fuel stains, strong odor, or damaged seals
- 2 Use a scan tool to check fuel trim data and cylinder balance; compare cylinder 4 fuel trim to other cylinders to confirm excess fuel
- 3 Conduct an injector balance test or cylinder contribution test to isolate the leaking injector
- 4 Check the injector electrical circuit with a noid light or oscilloscope to rule out a shorted driver or wiring issue
- 5 Remove the cylinder 4 injector and inspect it for external leaks, damaged O-rings, or a stuck-open condition; replace if defective
- 6 If the injector is not faulty, test the ECM driver circuit for a short to ground that could hold the injector open
- 7 After repair, clear the diagnostic trouble codes (DTCs) and verify fuel trims and cylinder balance return to normal

Leaking injector versus rich condition traps

- A leaking injector can mimic a rich condition caused by a faulty oxygen sensor or mass airflow sensor, so technicians should compare fuel trim shifts across all cylinders before condemning the injector.
- Some vehicles set P02A9 only after multiple drive cycles with a specific fuel trim threshold, meaning the leak may be minor and not yet cause noticeable driveability symptoms.
- A stuck-open injector can hydrolock the cylinder and cause catastrophic engine damage if left unrepaired, so addressing the code promptly is critical even when symptoms are mild.
- Injector O-rings can leak externally and create a fire hazard, so a visual inspection for fuel seepage around the injector base is a mandatory safety check.
- After replacing a leaking injector, the ECM may need a fuel trim relearn or injector coding procedure on some vehicles to prevent false codes from returning.

Can I keep driving with P02A9?

Do not continue driving with a confirmed leaking injector, as excess fuel can wash cylinder walls, dilute engine oil, and damage the catalytic converter or cause a fire. If the only symptom is the warning light and no misfire or fuel odor is present, drive directly to a repair facility without delay.

Tools that help

- OBD-II scan tool with live data and fuel trim capabilities
- Fuel pressure gauge
- Noid light or oscilloscope for injector circuit testing
- Injector balance tester or cylinder contribution tester
- Basic hand tools for injector removal
- Fuel line disconnect tools



Reading P02A9

- 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).
- A9** The exact fault within that area.

Often seen with

P0172 System Too Rich (Bank 1) · **P0175** System Too Rich (Bank 2) · **P02A8** Cylinder 4 - Injector Restricted · **P02AA** Cylinder 5 - Fuel Trim at Max Limit · **P0304** Cylinder 4 Misfire Detected

See it working

Watch the animated explainer [How a Refrigerator Works: The Cooling Cycle](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p02a9/>

