

GENERIC · POWERTRAIN

P0309

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P0309

Cylinder 9 Misfire Detected

P0309 means the engine computer has detected a misfire on cylinder 9, typically by monitoring crankshaft speed fluctuations that occur when that cylinder fails to contribute power. The powertrain control module (PCM) sets this code when the misfire count for cylinder 9 exceeds a calibrated threshold, which can be caused by ignition, fuel, compression, or mechanical faults.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	High	Intermediate	Ignition system and misfire

Symptoms you may notice

- The check engine light may be the only sign, especially if the misfire is intermittent or occurs only under light load.
A noticeable engine shake or vibration at idle, particularly on V8 engines where cylinder 9 is one of eight firing cylinders.
- Loss of power or sluggish acceleration when the misfire occurs under load.
- A flashing check engine light if the misfire is severe enough to damage the catalytic converter.
- Rough running or a stumble that worsens when the engine is cold or under heavy throttle.
- A distinct exhaust note or popping sound from unburned fuel entering the exhaust.

Common causes, most likely first

- Worn or fouled spark plug on cylinder 9, often due to oil or coolant intrusion or normal wear.
- Failed ignition coil or spark plug wire dedicated to cylinder 9, causing a weak or no-spark condition.
- Faulty fuel injector for cylinder 9, including clogging, electrical failure, or a stuck-open or stuck-closed condition.
- Low compression on cylinder 9 from worn rings, a burned valve, or a leaking head gasket.
- Vacuum leak or intake manifold gasket failure near cylinder 9 that leans out that specific cylinder.
- Mechanical valvetrain issue such as a collapsed lifter, worn cam lobe, or broken valve spring affecting cylinder 9.
- Wiring or connector damage to the coil or injector circuit for cylinder 9, causing an intermittent electrical fault.



How to diagnose and fix it

- 1 Scan all stored and pending codes, then check freeze-frame data to see the conditions when the misfire was set.
- 2 Perform a cylinder balance test or use a misfire counter to confirm cylinder 9 is the problem and not a false code.
- 3 Inspect the spark plug, coil, and wiring for cylinder 9; swap the coil and plug with a known-good cylinder to see if the misfire moves.
- 4 Check fuel injector operation with a noid light or injector balance test, and verify the injector connector is clean and tight.
- 5 Run a compression test and, if low, a cylinder leak-down test on cylinder 9 to rule out mechanical faults.
- 6 Smoke-test the intake system for vacuum leaks that could affect cylinder 9 specifically.
- 7 Repair the confirmed fault, clear the codes, and road-test the vehicle to verify the misfire is gone and does not return.

Cylinder 9 misfire traps to avoid

- Cylinder numbering is not universal; on some V8 engines cylinder 9 does not exist, so confirm the engine configuration before chasing a ghost cylinder.
- A misfire code for one cylinder often appears alongside codes for the same bank, such as P0300 or P0308, which can point to a shared coil or injector driver rather than a single cylinder fault.
- A flashing check engine light means the misfire is actively dumping raw fuel into the catalytic converter, and continuing to drive can destroy the converter in minutes.
- Swapping components between cylinders is the fastest way to isolate a bad coil or plug, but always clear the codes and recheck after the swap to see if the misfire follows the part.
- Low fuel pressure or a weak fuel pump can cause a single-cylinder misfire that mimics an injector fault, so check fuel pressure before replacing the injector.

Can I keep driving with P0309?

Do not continue driving if the check engine light is flashing, because raw fuel can overheat and destroy the catalytic converter. If the light is steady and the engine runs smoothly, you can drive cautiously to a repair shop, but avoid heavy acceleration and towing until the misfire is fixed.

Tools that help

- OBD-II scan tool with live misfire data and freeze-frame capability
- Spark tester or inline ignition tester
- Compression gauge and cylinder leak-down tester
- Noid light or injector balance tester
- Vacuum gauge or smoke machine for intake leak detection
- Basic hand tools including a spark plug socket and torque wrench



Reading P0309

- P** Powertrain: engine, transmission and emissions.
- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 3** Ignition system and misfire.
- 09** The exact fault within that area.

Often seen with

P0171 System Too Lean (Bank 1) · **P0300** Random/Multiple Cylinder Misfire Detected · **P0301** Cylinder 1 Misfire Detected · **P0308** Cylinder 8 Misfire Detected · **P0420** Catalyst System Efficiency Below Threshold (Bank 1)

See it working

Watch the animated explainer [Four-Stroke Engine Cutaway: Intake to Exhaust](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p0309/>

