



P2B09

Cold Start Cylinder 2 Injection Pulse Performance

P2B09 is a manufacturer-specific powertrain code indicating that the engine control module has detected an abnormal fuel injection pulse width or timing for cylinder 2 during a cold start. The computer compares the commanded injection pulse against expected values for the cold-start enrichment phase and flags a performance fault when the actual pulse deviates beyond a calibrated threshold.

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

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Rough idle or misfire immediately after a cold start that may fade as the engine warms
- Slight hesitation or stumble during the first few seconds of acceleration from a cold start
- Increased fuel consumption during warm-up
- Occasional black smoke or fuel odor from the exhaust at cold start
- In rare cases, a stored pending code without any driveability complaint

Common causes, most likely first

- 1 Faulty or contaminated fuel injector for cylinder 2, causing restricted or erratic flow
- 2 Wiring harness damage or poor electrical connection at the cylinder 2 injector
- 3 Carbon buildup on the intake valve or injector tip affecting cold-start fuel delivery
- 4 Low fuel pressure or a weak fuel pump that disproportionately affects cold-start enrichment
- 5 Engine control module software calibration issue or internal driver fault for the injector circuit
- 6 Intake air or coolant temperature sensor bias causing incorrect cold-start fuel calculation
- 7 Mechanical issue such as low compression or valve lash on cylinder 2 that alters combustion efficiency



How to diagnose and fix it

- 1 Connect a scan tool and record freeze-frame data to confirm the code set during a cold start and check for related pending codes
- 2 Perform a visual inspection of the cylinder 2 injector connector and harness for corrosion, chafing, or loose pins
- 3 Measure injector resistance and compare it to the manufacturer's specification to rule out an open or shorted coil
- 4 Run a fuel pressure test and check for adequate pressure and flow during the cold-start period
- 5 Use a noid light or oscilloscope to verify the injector pulse signal from the engine control module
- 6 Remove and flow-test the cylinder 2 injector, or perform an injector balance test, to check for clogging or uneven delivery
- 7 If electrical and fuel delivery checks pass, inspect for carbon buildup or mechanical faults on cylinder 2 and reflash the engine control module if a calibration update is available

Cold-start injector faults often misdiagnosed

- A P2B09 can be set by a perfectly functional injector if the engine coolant temperature sensor reports a skewed value during cold start, causing the engine control module to command the wrong pulse width.
- Many technicians replace the cylinder 2 injector only to find the real problem is a chafed wire in the harness near the intake manifold that shorts only when the engine is cold and vibrating.
- The code does not always mean the injector is failing; a weak fuel pump or a restricted fuel filter can cause a lean cold-start condition that the engine control module interprets as an injection pulse performance fault.
- Carbon buildup on intake valves is a common cause on direct-injection engines, and a simple induction cleaning service may resolve the code without any parts replacement.
- Always check for technical service bulletins and software updates for the engine control module before condemning hardware, as some cold-start injection pulse faults are addressed by a calibration reflash.

Can I keep driving with P2B09?

You can usually drive the vehicle short distances, but avoid heavy acceleration and prolonged idling until the fault is diagnosed. If the check engine light begins flashing or the engine runs very rough, stop driving and have the vehicle inspected promptly to prevent catalytic converter damage.

Tools that help

- OBD-II scan tool with live data and freeze-frame capability
- Digital multimeter for resistance and voltage checks
- Fuel pressure gauge
- Noid light or oscilloscope for injector pulse testing
- Hand tools for injector removal and harness inspection



Reading P2B09

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

Often seen with

P0171 System Too Lean (Bank 1) · **P0202** Injector Circuit Malfunction - Cylinder 2 · **P0302** Cylinder 2 Misfire Detected · **P2B08** Cold Start Cylinder 1 Injection Pulse Performance · **P2B0A** Cold Start Cylinder 3 Injection Pulse Performance

See it working

Watch the animated explainer [How a MAP Sensor Works: Engine Vacuum and Load](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2b09/>

