

GENERIC · POWERTRAIN

P2B16

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2B16

Cylinder 4 Injection Pulse Offset Not Learned

P2B16 indicates that the powertrain control module (PCM) has not successfully completed the learn procedure for the fuel injector pulse offset on cylinder 4. The PCM expects to adapt the injector opening time to compensate for manufacturing tolerances and wear, but the learned value remains outside the acceptable range or the learning process was interrupted.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Hybrid propulsion

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms.
- Rough idle or misfire sensation, especially when the engine is cold.
- Slight hesitation or stumble during acceleration from a stop.
- Decreased fuel economy due to incorrect fuel delivery on cylinder 4.
- In rare cases, a faint fuel odor or black smoke from the exhaust if the injector is over-fueling.

Common causes, most likely first

- 1 Faulty fuel injector on cylinder 4 that cannot be trimmed into specification.
- 2 Carbon buildup or clogging on the cylinder 4 injector nozzle, restricting flow.
- 3 Wiring harness damage or poor electrical connection at the cylinder 4 injector.
- 4 PCM software calibration issue or corrupted adaptive memory preventing the learn routine from completing.
- 5 Low fuel pressure or a restricted fuel filter affecting all injectors but most noticeable on one cylinder.
- 6 Mechanical issue such as low compression or a faulty spark plug on cylinder 4 that skews the offset learning.

How to diagnose and fix it

- 1 Connect a scan tool and verify the code is current, then check for any related misfire or fuel trim codes.
- 2 Inspect the cylinder 4 injector connector and harness for corrosion, chafing, or loose pins.
- 3 Measure the resistance of the cylinder 4 injector and compare it to the manufacturer's specification.
- 4 Perform a fuel pressure test and check for a restricted fuel filter or weak pump.
- 5 Run a compression test and inspect the spark plug on cylinder 4 to rule out mechanical faults.
- 6 Use a scan tool to command the injector offset learn procedure and verify it completes successfully.
- 7 If the learn fails, replace the cylinder 4 injector with a quality part and repeat the learn procedure.



Why the injector offset learn fails

- A dirty or partially clogged injector often causes this code without setting a misfire code because the PCM can still adjust pulse width, but the offset exceeds the learn window.
- The learn procedure may be blocked by a low battery or unstable voltage, so always clear the code and retry after charging the battery and ensuring clean power.
- A faulty spark plug or coil on cylinder 4 can mimic an injector offset problem by causing incomplete combustion that the PCM misinterprets as a fueling error.
- Some vehicles require a specific driving cycle or idle period for the offset learn to complete, and short trips can prevent the monitor from running.
- Replacing the injector without checking fuel pressure can lead to a repeat failure if a weak pump is the root cause.

Can I keep driving with P2B16?

The vehicle is generally safe to drive short distances, but avoid heavy acceleration or towing until the fault is repaired. Prolonged driving with an uncorrected injector offset can lead to catalytic converter damage or worsening drivability.

Tools that help

- OBD-II scan tool with bidirectional controls and injector learn capability
- Digital multimeter for resistance and voltage checks
- Fuel pressure gauge
- Compression tester
- Basic hand tools for injector removal

Reading P2B16

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

Often seen with

P0172 System Too Rich (Bank 1) · **P0204** Injector Circuit Malfunction - Cylinder 4 · **P0304** Cylinder 4 Misfire Detected · **P2B15** Cylinder 3 Injection Pulse Offset Exceeded Learning Limit · **P2B17** Cylinder 4 Injection Pulse Offset Exceeded Learning Limit



See it working

Watch the animated explainer [Readiness Monitors and the OBD-II Drive Cycle](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2b16/>

