

GENERIC · POWERTRAIN

P2B1A

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2B1A

Cylinder 6 Injection Pulse Offset Not Learned

P2B1A indicates that the powertrain control module has not successfully learned the injection pulse offset for cylinder 6, which is a calibration value used to fine-tune fuel delivery for that specific cylinder. The computer detects this when the learning routine fails to complete or the offset remains outside the acceptable range after a drive cycle.

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

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms
- Rough idle or slight misfire that may be intermittent
- Reduced fuel economy or a rich/lean condition on one bank
- Hesitation or stumble during acceleration
- Possible pending misfire code for cylinder 6

Common causes, most likely first

- 1 Faulty fuel injector on cylinder 6 (clogged, leaking, or electrically degraded)
- 2 Wiring or connector issue at the cylinder 6 injector
- 3 Mechanical fault such as low compression or valve problem on cylinder 6
- 4 PCM software calibration issue or failed learning procedure
- 5 Contaminated fuel or fuel pressure problem affecting injector performance
- 6 Failed PCM driver circuit for the injector

How to diagnose and fix it

- 1 Verify battery voltage and clear the code to see if the learning routine completes on a test drive
- 2 Inspect the cylinder 6 injector connector and wiring for corrosion, chafing, or loose pins
- 3 Measure injector resistance and compare to specifications
- 4 Perform a compression test and cylinder leak-down test on cylinder 6
- 5 Check fuel pressure and quality, and test for injector balance or flow
- 6 Reprogram or update the PCM if a known calibration issue exists
- 7 Replace the cylinder 6 injector if electrically or mechanically faulty, then relearn the offset



What the learning routine really needs

- The injection pulse offset learning often requires a specific drive cycle with steady throttle and closed-loop fuel control, so short trips may never complete it.
- A marginal injector that flows slightly off can set this code without ever causing a noticeable misfire, so don't dismiss it as a phantom fault.
- Low compression on cylinder 6 from a worn cam lobe or valve seat can prevent the offset from learning even when the injector is perfect.
- After replacing the injector, the PCM must be commanded to relearn the offset; simply clearing the code is not enough on many vehicles.
- Corroded pins at the injector connector often cause intermittent learning failures that disappear when the harness is wiggled.

Can I keep driving with P2B1A?

You can usually drive the vehicle short distances, but avoid heavy acceleration or towing until the fault is repaired because the cylinder 6 fuel mixture may be incorrect. If the check engine light flashes or the engine runs rough, stop driving and seek service.

Tools that help

- OBD-II scan tool with bidirectional control and relearn capability
- Digital multimeter
- Compression tester
- Fuel pressure gauge
- Noid light or injector pulse tester

Reading P2B1A

P	Powertrain: engine, transmission and emissions.
2	Generic (SAE) code: it means the same thing on every OBD-II vehicle.
B	Hybrid propulsion.
1A	The exact fault within that area.

Often seen with

P0206 Injector Circuit/Open - Cylinder 6 · **P0263** Cylinder 1 Contribution/Balance · **P0306** Cylinder 6 Misfire Detected · **P2B19** Cylinder 5 Injection Pulse Offset Exceeded Learning Limit · **P2B1B** Cylinder 6 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/p2b1a/>

