

GENERIC · POWERTRAIN

P2B15

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2B15

Cylinder 3 Injection Pulse Offset Exceeded Learning Limit

P2B15 indicates that the engine control module (ECM) has detected that the fuel injection pulse offset for cylinder 3 has exceeded its learned correction limit. The computer can no longer compensate for the difference between the commanded and actual fuel delivery for that cylinder, meaning something is causing an imbalance it cannot correct.

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 a noticeable vibration that may be worse when cold
- Slight hesitation or stumble during acceleration
- Reduced fuel economy as the engine struggles to balance cylinders
- In rare cases, a misfire code may accompany this code if the imbalance becomes severe

Common causes, most likely first

- 1 Faulty or clogged fuel injector on cylinder 3
- 2 Carbon buildup on the intake valve or port for cylinder 3, restricting airflow
- 3 Vacuum leak near the intake runner for cylinder 3
- 4 Worn or fouled spark plug on cylinder 3 causing incomplete combustion
- 5 Mechanical issue such as low compression or a sticking valve on cylinder 3
- 6 Faulty engine coolant temperature sensor or mass airflow sensor skewing fuel calculations
- 7 Software calibration issue in the ECM requiring an update



How to diagnose and fix it

- 1 Connect a scan tool and verify the code is current, then check freeze-frame data for engine load, coolant temperature, and short-term fuel trims
- 2 Perform a visual inspection of the cylinder 3 ignition coil, spark plug, and injector connector for damage or corrosion
- 3 Swap the cylinder 3 ignition coil and spark plug with another cylinder to see if the misfire or offset changes cylinders
- 4 Run a compression test and cylinder leak-down test on cylinder 3 to rule out mechanical faults
- 5 Use a noid light or injector pulse tester to confirm the injector is receiving a command signal
- 6 Clean or replace the cylinder 3 fuel injector if flow testing shows an imbalance
- 7 Check for vacuum leaks at the intake manifold gasket and cylinder 3 runner, and perform a carbon cleaning if intake valve deposits are suspected

Why cylinder 3 offset learning fails

- A dirty mass airflow sensor or a small vacuum leak can skew fuel trims across all cylinders, but the ECM may learn out the offset on cylinder 3 first because it is the weakest cylinder mechanically.
- This code does not always mean the injector is bad; a worn spark plug or a failing ignition coil can cause incomplete combustion that the ECM interprets as a fuel offset error.
- Carbon buildup on direct-injection engines is a common cause that many technicians miss because it does not set a traditional misfire code until the offset limit is exceeded.
- After repairing the root cause, the ECM must relearn the injection pulse offset; clearing the code alone without a drive cycle may cause the code to return immediately.
- A failing engine coolant temperature sensor can make the ECM think the engine is colder than it is, adding fuel that throws off the cylinder 3 offset learning without setting a temperature sensor code.

Can I keep driving with P2B15?

You can usually drive the vehicle short distances to a repair shop, but avoid heavy acceleration or towing because the imbalance may worsen and lead to misfire or catalytic converter damage. If the check engine light starts flashing, stop driving and have the vehicle towed.

Tools that help

- OBD-II scan tool with live data and freeze-frame capability
- Compression tester
- Noid light or injector pulse tester
- Vacuum gauge
- Spark plug socket and wrench
- Digital multimeter



Reading P2B15

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

Often seen with

P0171 System Too Lean (Bank 1) · **P0172** System Too Rich (Bank 1) · **P0203** Injector Circuit Malfunction - Cylinder 3 · **P0303** Cylinder 3 Misfire Detected · **P2B14** Cylinder 3 Injection Pulse Offset Not Learned

See it working

Watch the animated explainer [How Push-Button Start Works: Keyless Ignition](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2b15/>

