



P2C5D

Cylinder 6 Fuel Injector B Offset Learning At Max Limit

P2C5D indicates that the engine control module has learned a fuel injector offset correction for cylinder 6 that has reached its maximum allowed limit, meaning the injector is flowing outside the expected range and the computer can no longer compensate. The ECM monitors injector performance during closed-loop operation and stores this code when the adaptive learning value for that injector saturates at the upper threshold.

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

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms
- Rough idle or misfire that may be intermittent, especially when the engine is cold
- Slight loss of power or hesitation during acceleration
- Decreased fuel economy due to improper fuel delivery
- Possible fuel odor or black smoke from the exhaust if the injector is over-fueling

Common causes, most likely first

- 1 Clogged or partially restricted fuel injector on cylinder 6
- 2 Internal injector wear or electrical solenoid failure causing incorrect flow
- 3 Wiring harness damage or poor connection at the cylinder 6 injector
- 4 Fuel contamination or low fuel pressure affecting injector performance
- 5 Faulty engine control module adaptive learning memory or software
- 6 Mechanical engine issue such as low compression on cylinder 6 altering combustion

How to diagnose and fix it

- 1 Connect a scan tool and verify P2C5D is current, then check for any related misfire or fuel trim codes
- 2 Inspect the cylinder 6 injector connector and wiring for corrosion, chafing, or loose pins
- 3 Measure fuel pressure and compare to specification to rule out a supply problem
- 4 Perform an injector balance test or cylinder contribution test to confirm the injector is the faulty component
- 5 Remove and flow-test the cylinder 6 injector, or swap it with a known-good injector to see if the code follows
- 6 Replace the faulty fuel injector and clear adaptive learning values with the scan tool
- 7 Road-test the vehicle to allow the ECM to relearn injector offsets and confirm the code does not return



When the injector is not the real culprit

- A saturated offset learning value can be caused by a vacuum leak or exhaust leak near cylinder 6 that skews the oxygen sensor reading and forces the ECM to max out injector correction.
- Technicians often replace the injector only to find the code returns because the fuel injector driver circuit inside the ECM has degraded, especially on higher-mileage vehicles.
- Low compression or a worn camshaft lobe on cylinder 6 can mimic an injector fault by changing the engine's breathing, so a compression test should precede injector replacement.
- The code may set intermittently and clear itself after a few drive cycles if the injector is only marginally restricted, leading owners to ignore a developing problem.
- After replacing the injector, failing to reset the adaptive learning values will leave the ECM using the old maxed-out offset, and the code will reappear immediately.

Can I keep driving with P2C5D?

You can usually continue driving short distances, but avoid heavy acceleration or towing until the fault is repaired because prolonged driving with a maxed-out injector offset can lead to catalytic converter damage or engine misfire. Have the vehicle diagnosed promptly to prevent secondary damage.

Tools that help

- OBD-II scan tool with bidirectional control and live data
- Fuel pressure gauge
- Digital multimeter
- Injector balance tester or cylinder contribution tester
- Compression gauge
- Basic hand tools and safety equipment

Reading P2C5D

P	Powertrain: engine, transmission and emissions.
2	Generic (SAE) code: it means the same thing on every OBD-II vehicle.
C	Hybrid propulsion.
5D	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 · **P2146** Fuel Injector Group 'A' Supply Voltage Circuit/Open · **P2C5C** Cylinder 6 Fuel Injector B Offset Learning At Min Limit



See it working

Watch the animated explainer [How a Six-Speed Manual Gearbox Works](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2c5d/>

