

GENERIC · POWERTRAIN

P02D5

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P02D5

Cylinder 5 Fuel Injector A Offset Learning At Max Limit

P02D5 indicates that the engine control module has learned a fuel injector offset correction for cylinder 5 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 detects this by monitoring the fuel injector's electrical characteristics and the resulting fuel trim corrections during closed-loop operation.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering (injector circuits)

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms
- Rough idle or misfire sensation, especially when the engine is cold
- Slight loss of power or hesitation during acceleration
- Decreased fuel economy due to over-fueling or under-fueling on cylinder 5
- Occasional engine stumble at steady cruise speeds

Common causes, most likely first

- 1 Faulty or clogged fuel injector on cylinder 5
- 2 Carbon buildup or deposit on the injector nozzle restricting flow
- 3 Wiring harness damage or poor electrical connection at the cylinder 5 injector
- 4 Internal ECM driver circuit fault for the cylinder 5 injector
- 5 Low fuel pressure or restricted fuel supply affecting injector performance
- 6 Mechanical engine issue such as low compression on cylinder 5 altering injector learning

How to diagnose and fix it

- 1 Perform a visual inspection of the cylinder 5 injector connector and wiring for damage or corrosion
- 2 Check fuel pressure and volume to rule out a supply problem before condemning the injector
- 3 Use a scan tool to monitor cylinder 5 injector offset and fuel trim values under different operating conditions
- 4 Swap the cylinder 5 injector with a known-good injector from another cylinder and see if the code follows
- 5 Clean or replace the cylinder 5 fuel injector if testing confirms it is out of specification
- 6 Inspect the ECM connector and perform a resistance check on the injector driver circuit
- 7 Clear the code and perform a relearn or adaptation reset if required, then verify the repair with a road test



What the offset learning limit really means

- The offset learning value is not a fuel trim; it is a correction for the injector's electrical and flow characteristics, so a maxed-out value points directly to the injector or its circuit rather than a vacuum leak.
- A dirty injector can cause this code without setting a misfire code, so technicians who only look for misfires may overlook the root cause.
- Swapping the injector to another cylinder is the fastest way to confirm whether the fault is the injector itself or the wiring/ECM driver for that cylinder.
- After replacing an injector, some vehicles require a specific injector coding or adaptation reset; failing to do so can leave the code stored or cause poor running.
- Low fuel pressure can mimic a failing injector by forcing the offset learning to its limit, so always verify fuel supply before replacing parts.

Can I keep driving with P02D5?

You can usually drive the vehicle short distances to a repair shop, but avoid heavy acceleration or towing until the fault is repaired. Prolonged driving with a maxed-out injector offset can lead to catalytic converter damage or engine misfire.

Tools that help

- OBD-II scan tool with live data and injector offset monitoring capability
- Fuel pressure gauge
- Digital multimeter for circuit testing
- Noid light or injector pulse tester
- Basic hand tools for injector removal and replacement

Reading P02D5

P	Powertrain: engine, transmission and emissions.
0	Generic (SAE) code: it means the same thing on every OBD-II vehicle.
2	Fuel and air metering (injector circuits).
D5	The exact fault within that area.

Often seen with

P0172 System Too Rich (Bank 1) · **P0205** Injector Circuit/Open - Cylinder 5 · **P02D4** Cylinder 5 Fuel Injector A Offset Learning At Min Limit · **P02D6** Cylinder 6 Fuel Injector A Offset Learning At Min Limit · **P0305** Cylinder 5 Misfire Detected



See it working

Watch the animated explainer [How a MAF Sensor Works: Hot-Wire Airflow Explained](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p02d5/>

