

GENERIC · POWERTRAIN

P231D

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P231D

Cylinder 10 Air-Fuel Ratio Imbalance Adjustment At Limit During Balance

P231D indicates that the powertrain control module (PCM) has reached the limit of its ability to balance the air-fuel ratio on cylinder 10 during a diagnostic balance test. The PCM monitors crankshaft speed variations to detect an imbalance and adjusts fuel delivery to that cylinder; when the adjustment can no longer compensate, it sets this code.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Professional	Ignition system and misfire

Symptoms you may notice

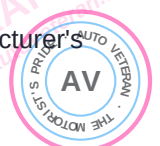
- Illumination of the check engine light, often with no other noticeable symptoms
- Rough idle or a noticeable vibration, especially when the engine is cold
- Misfire-like shudder or hesitation during acceleration
- Reduced fuel economy due to the engine running rich or lean on one cylinder
- In some cases, a slight loss of power or sluggish response

Common causes, most likely first

- 1 Faulty fuel injector for cylinder 10 (clogged, leaking, or electrically failed)
- 2 Ignition system problem on cylinder 10, such as a worn spark plug, coil, or plug wire
- 3 Vacuum leak affecting the intake runner for cylinder 10
- 4 Mechanical issue like low compression, worn rings, or a faulty valve in cylinder 10
- 5 Exhaust leak before the oxygen sensor that skews the balance test
- 6 Contaminated fuel or fuel pressure issue affecting that cylinder

How to diagnose and fix it

- 1 Perform a visual inspection of the engine bay for vacuum leaks, damaged wiring, and loose connectors
- 2 Swap the ignition coil and spark plug from cylinder 10 with a known-good cylinder to see if the misfire moves
- 3 Use a scan tool to check for pending or stored misfire codes and freeze-frame data to confirm the affected cylinder
- 4 Run a compression test and cylinder leak-down test to rule out mechanical problems
- 5 Test the fuel injector for cylinder 10 with a noid light and measure its resistance; compare to specifications
- 6 Check fuel pressure and inspect for contaminated fuel if other cylinders are also affected
- 7 If all else fails, perform a crank sensor variation learn procedure or reflash the PCM as per manufacturer's instructions



Cylinder 10 balance faults often misdiagnosed

- A clogged or failing fuel injector is the most common cause, but many technicians replace the ignition coil first without testing the injector.
- The code can be set by a vacuum leak at the intake manifold gasket that affects only one cylinder, which is easy to overlook during a visual inspection.
- Low compression from a worn camshaft lobe or a sticking valve can cause this code without triggering a traditional misfire code.
- An exhaust leak upstream of the oxygen sensor can skew the air-fuel ratio readings and cause the PCM to set this balance code even when the engine is mechanically sound.
- Always check for technical service bulletins (TSBs) for the specific vehicle, as some manufacturers have updated software or revised injector part numbers to address this issue.

Can I keep driving with P231D?

You can usually drive the vehicle short distances to a repair shop, but avoid heavy acceleration or towing. Prolonged driving with this code can damage the catalytic converter and worsen fuel economy.

Tools that help

- OBD-II scan tool with live data and misfire counters
- Compression tester
- Fuel pressure gauge
- Noid light or injector tester
- Vacuum gauge
- Digital multimeter

Reading P231D

P	Powertrain: engine, transmission and emissions.
2	Generic (SAE) code: it means the same thing on every OBD-II vehicle.
3	Ignition system and misfire.
1D	The exact fault within that area.

Often seen with

P0171 System Too Lean (Bank 1) · **P0172** System Too Rich (Bank 1) · **P0300** Random/Multiple Cylinder Misfire Detected · **P0301** Cylinder 1 Misfire Detected · **P219A** Bank 1 Air-Fuel Ratio Imbalance



See it working

Watch the animated explainer [How a Padlock Works: Pin Tumbler Lock in X-Ray](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p231d/>

