

GENERIC · POWERTRAIN

P2D51

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2D51

Air Assisted Injector Control Circuit

P2D51 indicates that the powertrain control module has detected a fault in the electrical circuit that controls the air-assisted fuel injector, which uses compressed air to improve fuel atomization. The computer monitors the circuit for expected voltage or current and sets this code when the signal falls outside the manufacturer's specified range.

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

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Rough idle or misfire, especially when the engine is cold
- Hesitation or stumble during acceleration
- Increased fuel consumption due to poor fuel delivery
- Difficulty starting or extended cranking time
- Possible rich or lean fuel trim readings on a scan tool

Common causes, most likely first

- 1 Faulty air-assisted injector solenoid or internal short
- 2 Damaged or corroded wiring harness or connector at the injector
- 3 Open or shorted circuit in the injector control wiring
- 4 Failed powertrain control module driver for the injector circuit
- 5 Poor ground connection for the injector circuit
- 6 Contaminated or clogged air passages in the injector assembly



How to diagnose and fix it

- 1 Connect a scan tool and record all stored codes and freeze-frame data to confirm P2D51 is the primary fault.
- 2 Visually inspect the injector connector and wiring for chafing, corrosion, or loose pins, and repair as needed.
- 3 Measure the resistance of the air-assisted injector solenoid with a multimeter and compare to the manufacturer's specification.
- 4 Check for battery voltage at the injector connector with the key on and engine off, and verify the ground circuit integrity.
- 5 Perform a wiggle test on the harness while monitoring injector data to identify intermittent faults.
- 6 If the circuit tests good, substitute a known-good injector or use a noid light to verify the control signal from the PCM.
- 7 If the PCM driver is suspected, follow the manufacturer's diagnostic flow to test the output circuit before replacing the PCM.

What the air-assisted injector code hides

- A clogged air passage in the injector can set this code even when the electrical circuit tests perfectly, because the PCM may infer a fault from abnormal feedback.
- The air-assisted injector system relies on a separate air pump or compressed air supply, and a weak air supply can cause the PCM to flag the injector circuit as faulty.
- Intermittent connector fretting at the injector is a common cause that only shows up during a wiggle test, so a static resistance check can pass while the code still returns.
- This code is often misdiagnosed as a simple injector failure when the real problem is a chafed wire in the harness near a hot exhaust component.
- Some vehicles use the air-assisted injector only during cold starts, so the code may not set until the engine is started from a completely cold condition.

Can I keep driving with P2D51?

You can usually drive the vehicle short distances to a repair shop, but avoid heavy acceleration or towing because the faulty injector can cause misfires that may damage the catalytic converter. If the engine runs very rough or stalls, stop driving and arrange a tow.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Noid light or injector pulse tester
- Wiring diagram for the specific vehicle
- Hand tools for connector and harness access



Reading P2D51

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

Often seen with

P0201 Injector Circuit Malfunction - Cylinder 1 · **P0202** Injector Circuit Malfunction - Cylinder 2 · **P0203** Injector Circuit Malfunction - Cylinder 3 · **P0204** Injector Circuit Malfunction - Cylinder 4 · **P0300** Random/Multiple Cylinder Misfire Detected

See it working

Watch the animated explainer [How a Knock Sensor Works: Spark Timing and Octane](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2d51/>

