

GENERIC · POWERTRAIN

P3451

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P3451

Cylinder 7 Deactivation/Intake Valve Control Circuit Low

P3451 indicates that the powertrain control module has detected an abnormally low voltage on the control circuit for the cylinder 7 deactivation or intake valve control solenoid. This circuit is responsible for commanding the valve to switch between active and deactivated states, and a low voltage condition means the PCM cannot reliably actuate the valve. The code is generic and applies to any OBD-II vehicle equipped with cylinder deactivation or variable valve timing hardware.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Intermediate	Auxiliary emission controls

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms
- Rough idle or misfire-like shuddering, especially when the engine transitions between active and deactivated modes
- Reduced engine power or a stumble during light-throttle cruising
- Poor fuel economy if the cylinder remains stuck in the active state
- Audible ticking or clicking from the valve cover area on the affected bank
- In rare cases, a no-start condition if the control circuit shorts to ground and affects shared power feeds

Common causes, most likely first

- 1 Damaged or chafed wiring harness between the PCM and the cylinder 7 valve control solenoid
- 2 Failed cylinder 7 deactivation solenoid or intake valve control actuator
- 3 Corroded or loose electrical connector at the solenoid or PCM
- 4 Short to ground in the control circuit, often from oil intrusion or heat damage
- 5 Internal PCM driver failure for that specific circuit
- 6 Low oil pressure or sludge blocking the solenoid's hydraulic passage, indirectly causing a low-voltage feedback



How to diagnose and fix it

- 1 Connect a scan tool and verify P3451 is active, then check for any related circuit codes before clearing anything
- 2 Visually inspect the cylinder 7 solenoid connector and wiring for corrosion, chafing, or oil contamination
- 3 Measure resistance across the solenoid and compare to the manufacturer's specification to rule out an open or shorted coil
- 4 Backprobe the control circuit at the PCM and check for a short to ground with the key on and engine off
- 5 Perform a voltage drop test on the power and ground sides of the circuit while commanding the solenoid on with a bidirectional scan tool
- 6 If the circuit tests good, remove and inspect the solenoid for debris or sludge, and verify oil pressure to the deactivation gallery
- 7 Replace the faulty solenoid or repair the wiring, clear the code, and road-test to confirm the repair

What a low circuit code really means

- A low-voltage code does not automatically mean the solenoid has failed; a shorted wire or a poor ground can pull the circuit low and mimic a bad actuator.
- Oil sludge and low oil pressure are commonly overlooked causes because they prevent the solenoid from fully actuating, which the PCM interprets as a circuit fault.
- Technicians often replace the solenoid only to have the code return because the connector pins were spread or corroded, so always load-test the circuit under command.
- On engines with cylinder deactivation, a failed solenoid on one cylinder can cause the PCM to disable the entire deactivation system, leading to broader drivability complaints.
- A short to ground in this circuit can sometimes be intermittent and only set the code after a cold start or during a specific driving condition, so a wiggle test of the harness is essential.

Can I keep driving with P3451?

You can usually drive the vehicle short distances to a repair shop, but avoid heavy acceleration or sustained highway speeds because a stuck deactivation valve can cause misfires and potential catalyst damage. If the engine runs rough or loses power, stop driving and have it towed.

Tools that help

- OBD-II scan tool with bidirectional control capability
- Digital multimeter with backprobe pins
- Wiring diagram for the specific vehicle
- Socket set and Torx bits for valve cover removal
- Oil pressure gauge



Reading P3451

- P** Powertrain: engine, transmission and emissions.
- 3** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 4** Auxiliary emission controls.
- 51** The exact fault within that area.

Often seen with

P3401 Cylinder 1 Deactivation/Intake Valve Control Circuit/Open · **P3450** Cylinder 7 Deactivation/Intake Valve Control Performance · **P3452** Cylinder 7 Deactivation/Intake Valve Control Circuit High · **P3453** Cylinder 7 Exhaust Valve Control Circuit/Open · **P3497** Cylinder Deactivation System (Bank 2)

See it working

Watch the animated explainer [Four-Stroke Engine Cutaway: Intake to Exhaust](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p3451/>

