

GENERIC · POWERTRAIN

P3421

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P3421

Cylinder 3 Exhaust Valve Control Circuit/Open

P3421 indicates that the powertrain control module (PCM) has detected an open circuit or excessive resistance in the electrical path controlling cylinder 3's exhaust valve, which is typically managed by a variable valve timing or cylinder deactivation solenoid. The PCM monitors the control circuit for expected current flow and sets this code when the circuit does not respond as commanded, meaning the valve may not be actuating properly.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Auxiliary emission controls

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Rough idle or misfire-like shudder, especially when the engine is cold or under light load
- Reduced engine power or sluggish acceleration due to improper exhaust valve timing
- Increased fuel consumption as the engine compensates for inefficient breathing
- Audible ticking or tapping from the valve cover area if the solenoid is not engaging
- Intermittent driveability issues that worsen when the engine is at operating temperature

Common causes, most likely first

- 1 Open or damaged wiring harness between the PCM and the exhaust valve control solenoid
- 2 Failed exhaust valve control solenoid (open coil or stuck armature)
- 3 Corroded or loose electrical connector at the solenoid or PCM
- 4 Blown fuse or relay supplying power to the solenoid circuit
- 5 Internal PCM driver failure, though this is less common
- 6 Mechanical binding of the exhaust valve or rocker arm preventing solenoid actuation
- 7 Oil sludge or debris clogging the solenoid screen, causing intermittent open circuit



How to diagnose and fix it

- 1 Perform a visual inspection of the solenoid connector and wiring for chafing, corrosion, or loose pins
- 2 Check the fuse and relay that supply power to the exhaust valve control circuit
- 3 Measure resistance of the solenoid coil with a multimeter and compare to manufacturer specification
- 4 Back-probe the control circuit at the PCM and command the solenoid on with a scan tool to verify voltage and ground
- 5 Test for continuity and voltage drop across the harness while wiggling connectors to expose intermittent opens
- 6 Replace the exhaust valve control solenoid if electrical tests confirm an open coil or no actuation
- 7 If the circuit tests good but the code persists, diagnose the PCM driver or mechanical valve train binding

What a P3421 open circuit really means

- An open circuit code does not always mean the solenoid has failed; a poor ground or a broken wire inside the insulation can set the same code.
- Some vehicles use the exhaust valve control solenoid for cylinder deactivation, so a failure may cause the engine to stay in full-cylinder mode and trigger misfire codes.
- Intermittent opens often appear only when the engine is hot, so a cold-engine resistance test can pass while the fault is still present.
- A scan tool bidirectional test that commands the solenoid on and off is the quickest way to confirm whether the PCM can actually control the circuit.
- Replacing the solenoid without checking the harness connector for pushed-out pins or water intrusion is a common misdiagnosis that leads to a repeat failure.

Can I keep driving with P3421?

You can generally drive the vehicle short distances to a repair shop, but avoid heavy acceleration or towing because the inactive exhaust valve can cause misfires and overheating. If the check engine light begins flashing, stop driving and have the vehicle towed to prevent catalytic converter damage.

Tools that help

- OBD-II scan tool with bidirectional control capability
- Digital multimeter with back-probe pins
- Wire piercing probes or breakout box
- Service manual with wiring diagrams for the specific vehicle
- Socket set and torx bits for solenoid removal



Reading P3421

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

Often seen with

P0011 'A' Camshaft Position - Timing Over-Advanced or System Perfo · **P0303** Cylinder 3 Misfire Detected · **P3400** Cylinder Deactivation System (Bank 1) · **P3420** Cylinder 3 Deactivation/Intake Valve Control Circuit High · **P3422** Cylinder 3 Exhaust Valve Control Performance

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/p3421/>

