

VOLKSWAGEN · POWERTRAIN

P1421

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1421 · Volkswagen

Secondary Air Injection Valve Circuit Short To Ground

P1421 on a Volkswagen means the engine control module has detected a short to ground on the electrical circuit that controls the secondary air injection valve, which is the valve that routes fresh air into the exhaust during cold starts. The computer monitors the valve's control wire and sees voltage pulled low when it should be high, indicating a wiring fault rather than a mechanical failure of the air pump itself.

SYSTEM

Powertrain

CODE TYPE

Volkswagen specific

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
- A brief rough idle or stumble during the first minute after a cold start
- Slightly elevated emissions during warm-up, which may not be obvious to the driver
- In some cases, a faint hissing or ticking noise from the secondary air injection valve area when the engine is cold
- Rarely, a stored pending code that reappears after clearing without any driveability change

Common causes, most likely first

- 1 Chafed or broken insulation on the secondary air injection valve control wire, allowing it to contact the chassis or engine block
- 2 Corroded or water-intruded connector at the secondary air injection valve, creating a low-resistance path to ground
- 3 Internal short to ground inside the secondary air injection valve solenoid winding
- 4 Pinched wiring harness between the valve and the engine control module, often near the intake manifold or exhaust heat shield
- 5 Faulty engine control module driver for the secondary air injection valve circuit, though this is less common
- 6 Aftermarket alarm or remote start wiring tapped into the circuit and shorting to ground



How to diagnose and fix it

- 1 Clear the code and road-test to confirm it returns, then check for any related pending codes that might point to a different circuit fault
- 2 Visually inspect the secondary air injection valve connector and the wiring harness for chafing, corrosion, or signs of rodent damage
- 3 Disconnect the valve connector and measure resistance from the control wire to a known good ground; a reading near zero ohms confirms a short to ground
- 4 Isolate the circuit by disconnecting the engine control module connector and rechecking for continuity to ground on the valve control wire to rule out the module
- 5 If the wiring checks good, test the secondary air injection valve solenoid for internal short to ground by measuring resistance from its control terminal to its mounting bracket
- 6 Repair or replace the damaged section of wiring, then clear codes and verify the circuit holds correct voltage with the key on and engine off
- 7 Replace the secondary air injection valve if it is internally shorted, then perform a cold-start readiness test to confirm the code does not reset

What the short-to-ground code really means

- A short to ground on this circuit does not mean the secondary air pump has failed; the pump is a separate component and is often perfectly functional when P1421 is stored.
- Volkswagen's secondary air injection system only runs for the first 30 to 90 seconds after a cold start, so a shorted valve may not affect normal driving at all and the driver may never feel a symptom.
- Water ingress into the valve connector is a frequent cause on models where the valve sits low near the front bumper or behind the headlight, and the corrosion can mimic a failed valve.
- A technician who replaces the valve without checking the control wire for continuity to ground will often see the code return immediately because the short is in the harness, not the component.
- The engine control module may set P1421 as a rationality check when it sees the valve control circuit voltage drop unexpectedly, even if the short is intermittent and only occurs over bumps.

Can I keep driving with P1421?

You can generally continue driving with P1421 because the secondary air injection system only operates during cold starts and does not affect engine power or safety. Avoid long periods of idling from cold and have the circuit inspected soon, since a persistent short can eventually damage the engine control module driver or cause the valve to stay open and dilute the exhaust mixture.



Tools that help

- Digital multimeter with resistance and continuity functions
- OBD-II scan tool capable of reading Volkswagen-specific codes and live data
- Wiring diagram for the specific Volkswagen model and engine
- Trim removal tools and a socket set for accessing the valve and harness
- Electrical contact cleaner and dielectric grease for connector repair

Reading P1421

- P** Powertrain: engine, transmission and emissions.
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- 1** Manufacturer-specific code (Volkswagen): its meaning depends on the make.
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- 4** Auxiliary emission controls.
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- 21** The exact fault within that area.

Often seen with

P1420 Secondary Air Injection Control Module Electrical Malfunction · **P1422** Secondary Air Injection Valve Circuit Short To B+ · **P1420** Fuel Tank Pressure Control Solenoid High Input · **P1422** EVAP Purge Control Solenoid Valve Circuit High Input · **P1420** Intake Air Low Pressure Switch Circuit Low Voltage · **P1420** Intake Air Low Pressure Switch Circuit Low Voltage · **P1420** Secondary Air Valve Control Circuit Electrical · **P1422** Secondary Air System Bank 2 · **P0411** Secondary Air Injection System Incorrect Flow · **P0413** Secondary Air Injection System Switching Valve 'A' Circuit Open · **P0414** Secondary Air Injection System Switching Valve 'A' Circuit Short

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/volkswagen-p1421/>

