

GENERIC · POWERTRAIN

P20B4

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P20B4

Reductant Heater Coolant Control Valve Circuit High

P20B4 indicates that the powertrain control module (PCM) has detected an abnormally high voltage on the control circuit for the reductant heater coolant control valve. This valve manages coolant flow to warm the diesel exhaust fluid (DEF) heater, and a high-voltage condition typically means the circuit is open, shorted to power, or the valve's internal coil has failed.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering and auxiliary emission controls

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Reduced engine power or limp mode in some vehicles
- DEF system-related warnings on the dashboard, such as low DEF or service exhaust fluid system
- Possible rough running or poor fuel economy if the valve affects overall reductant temperature management
- In cold weather, the DEF may not heat properly, leading to crystallization or system shutdown

Common causes, most likely first

- 1 Open circuit in the valve control wiring, such as a broken wire or disconnected connector
- 2 Short to voltage on the control circuit, often due to chafed wiring or moisture intrusion
- 3 Failed reductant heater coolant control valve (open internal coil)
- 4 Corroded or damaged electrical connector at the valve or PCM
- 5 PCM internal fault causing incorrect voltage regulation (rare)
- 6 Blown fuse or relay supplying power to the valve circuit



How to diagnose and fix it

- 1 Use a scan tool to verify the code and check for related freeze-frame data; clear the code and test-drive to see if it returns.
- 2 Visually inspect the valve connector and wiring for damage, corrosion, or loose pins; repair as needed.
- 3 Measure resistance across the valve solenoid terminals and compare to manufacturer specifications to check for an open coil.
- 4 Check for short to voltage on the control circuit by backprobing the PCM connector with a multimeter while the circuit is active.
- 5 Test the valve by applying power and ground directly to confirm it actuates; replace if it fails to operate.
- 6 Inspect the fuse and relay for the valve circuit and replace if faulty.
- 7 If all external circuits and components test good, suspect the PCM and perform further diagnostics before replacement.

Common Missteps with P20B4 Diagnosis

- A high-voltage code often results from an open circuit rather than a shorted valve, so technicians who replace the valve without checking wiring may not fix the problem.
- The reductant heater coolant control valve is sometimes confused with the DEF heater itself; P20B4 specifically points to the coolant control valve circuit, not the heater element.
- Intermittent faults can be caused by wiring chafing near hot exhaust components, which may only appear when the engine is at operating temperature.
- Some vehicles use a pulse-width modulated signal to control the valve; a standard multimeter may not capture the average voltage accurately, so an oscilloscope is recommended.
- A failed valve can cause the DEF to overheat or freeze, leading to additional codes like P20B3 or P20B5, so always check for related codes before replacing parts.

Can I keep driving with P20B4?

You can usually continue driving with this code, but avoid long trips or cold weather operation until repaired, as the DEF system may not function correctly and could lead to reduced engine power or increased emissions.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Wiring diagram for the specific vehicle
- Basic hand tools (socket set, screwdrivers)
- Oscilloscope (optional but helpful for PWM signals)



Reading P20B4

- P** Powertrain: engine, transmission and emissions.
- 2** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 0** Fuel and air metering and auxiliary emission controls.
- B4** The exact fault within that area.

Often seen with

P20B3 Reductant Heater Coolant Control Valve Circuit Low · **P20B5** Reductant Metering Unit Heater Control Circuit/Open · **P20B6** Reductant Metering Unit Heater Control Circuit Performance · **P20B7** Reductant Metering Unit Heater Control Circuit Low · **P20B8** Reductant Metering Unit Heater Control Circuit High

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/p20b4/>

