

GENERIC · POWERTRAIN

P20B3

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P20B3

Reductant Heater Coolant Control Valve Circuit Low

P20B3 indicates that the powertrain control module (PCM) has detected a low-voltage condition on the electrical circuit that controls the reductant heater coolant control valve. This valve manages coolant flow to warm the diesel exhaust fluid (DEF) heater, and the PCM expects a certain voltage on the control circuit; a reading below the expected threshold triggers this code.

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 (malfunction indicator lamp).
- Often no other symptoms besides the warning light.
- Possible reduced DEF heating efficiency in cold weather, leading to a pending derate or limited vehicle speed.
- In some cases, a message on the driver information center indicating DEF system fault or service required.
- Rough running or poor fuel economy if the valve failure affects overall reductant system performance.
- In rare instances, the vehicle may enter limp mode if the fault is severe enough to disable DEF heating.

Common causes, most likely first

- 1 Faulty reductant heater coolant control valve (solenoid or motor) with an open or shorted internal coil.
- 2 Damaged or corroded wiring harness or connector at the valve, causing high resistance or an open circuit.
- 3 Poor electrical connection at the PCM or intermediate connectors, leading to low voltage on the control circuit.
- 4 Failed PCM driver for the coolant control valve circuit (less common).
- 5 Aftermarket accessories or improper previous repairs that tapped into the circuit and caused a voltage drop.
- 6 Corrosion or water intrusion in the connector causing intermittent low voltage.



How to diagnose and fix it

- 1 Verify the code with a scan tool and check for any related pending or stored codes in the reductant system.
- 2 Inspect the coolant control valve connector and wiring for damage, corrosion, or loose pins; repair as needed.
- 3 Measure resistance across the valve solenoid and compare to manufacturer specifications; replace the valve if out of range.
- 4 Check the control circuit voltage at the valve connector with the key on and engine off; a low voltage indicates a wiring or PCM issue.
- 5 Perform a voltage drop test on the ground and power sides of the circuit to identify excessive resistance.
- 6 If wiring and valve are good, test the PCM output with a bidirectional scan tool or oscilloscope; replace the PCM if the driver is faulty.
- 7 Clear the code and perform a road test to verify the repair, ensuring the valve operates correctly during a commanded activation test.

Low Voltage Doesn't Always Mean a Bad Valve

- A low voltage code often results from a poor ground connection or a chafed wire rather than a failed valve, so always perform a thorough visual and electrical inspection before replacing parts.
- The coolant control valve is part of the DEF heating system, and a fault here may not immediately affect drivability but can lead to a derate if not addressed, especially in cold climates.
- Some technicians mistakenly replace the DEF heater itself when the actual problem is the control valve or its circuit, so follow the diagnostic flow to isolate the correct component.
- Intermittent low voltage can be caused by water intrusion into the connector, which may not be obvious until the harness is flexed or the connector is disassembled.
- Aftermarket electrical accessories or improper jump-starting can back-feed the circuit and damage the PCM driver, so check for non-factory wiring before condemning the module.

Can I keep driving with P20B3?

You can generally continue driving with this code, but avoid long trips in freezing temperatures because the DEF heater may not function, which could lead to a derate and reduced vehicle speed. Have the fault diagnosed soon to prevent more severe reductant system issues.

Tools that help

- OBD-II scan tool with bidirectional control capability
- Digital multimeter (DMM)
- Wiring diagram for the specific vehicle
- Test light or logic probe
- Socket set and trim removal tools



Reading P20B3

- 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.
- B3** The exact fault within that area.

Often seen with

P20B2 Reductant Heater Coolant Control Valve Performance/Stuck Ope · **P20B4** Reductant Heater Coolant Control Valve Circuit High · **P20B5** Reductant Metering Unit Heater Control Circuit/Open · **P20B6** Reductant Metering Unit Heater Control Circuit Performance · **P20B7** Reductant Metering Unit Heater Control Circuit Low

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/p20b3/>

