



P20BB

Reductant Heater A Control Circuit Low

P20BB means the powertrain control module (PCM) has detected a low-voltage condition on the control circuit for the reductant heater, which is the heating element used to keep diesel exhaust fluid (DEF) from freezing in cold weather. The PCM commands the heater on and monitors the circuit, and it sets this code when the voltage on the control side is lower than expected, indicating a short to ground or an open circuit.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	Medium	Intermediate	Fuel and air metering and auxiliary emission controls

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms.
- A driver information message warning that the DEF system is unavailable or that the vehicle will be speed-limited after a countdown.
- In cold weather, the DEF may not thaw, leading to a no-start condition or reduced engine power if the system cannot inject reductant.
- Possible rough running or poor fuel economy if the heater failure prevents proper DEF dosing and the engine enters limp mode.
- A stored freeze-frame showing the fault occurred during a cold start or heater activation request.

Common causes, most likely first

- 1 A short to ground in the reductant heater control wire between the PCM and the heater element.
- 2 An open circuit in the control wire, often due to a broken wire or corroded connector terminal.
- 3 A failed reductant heater element with an internal short that pulls the control circuit low.
- 4 A faulty PCM driver for the heater control circuit, though this is less common.
- 5 Water intrusion or corrosion in the heater connector causing a low-resistance path to ground.
- 6 Aftermarket wiring or accessories tapped into the heater circuit that create an unintended ground.



How to diagnose and fix it

- 1 Inspect the reductant heater connector and wiring for corrosion, chafing, or loose pins, and repair as needed.
- 2 Disconnect the heater and measure resistance across the heater element to compare with the manufacturer's specification; replace the heater if out of range.
- 3 With the heater disconnected, check the control wire from the PCM for continuity to ground; if continuity exists, locate and repair the short.
- 4 Check for voltage on the control circuit with the key on and the heater commanded off; if voltage is present when it should not be, diagnose the PCM or wiring.
- 5 Use a scan tool to command the reductant heater on and off while monitoring the control circuit voltage and current to confirm the repair.
- 6 Clear the diagnostic trouble codes and perform a road test or heater activation test to verify the code does not return.

Reductant heater circuit low-voltage traps

- A low-voltage code on the control circuit does not always mean the heater element is bad; a shorted control wire or corroded connector is just as likely and much cheaper to fix.
- Many technicians replace the heater first, but the PCM driver can be damaged by a shorted heater, so always check the control circuit for a short before installing a new heater.
- The reductant heater is only active below a certain temperature, so the code may not set during warm weather, leading to a false sense of security after a repair.
- Aftermarket remote starters or alarm systems tapped into the wrong wire can backfeed the heater control circuit and set this code intermittently.
- A weak battery or charging system can cause the PCM to misreport circuit voltages, so verify battery and ground integrity before condemning the heater or PCM.

Can I keep driving with P20BB?

You can usually drive with this code, but the DEF system may become disabled, and in cold weather the vehicle may enter a speed-limited limp mode after a countdown. Avoid long trips in freezing conditions until the fault is repaired, and do not ignore a driver information message warning of impending speed limitation.

Tools that help

- OBD-II scan tool with bidirectional control capability
- Digital multimeter
- Wiring diagram for the reductant heater circuit
- Terminal pick and electrical contact cleaner
- Heat gun or hair dryer for cold-weather testing



Reading P20BB

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

Often seen with

P20BA Reductant Heater A Control Performance · **P20BC** Reductant Heater A Control Circuit High · **P20BD** Reductant Heater B Control Circuit/Open · **P20BE** Reductant Heater B Control Circuit Performance · **P20BF** Reductant Heater B Control Circuit Low

See it working

Watch the animated explainer [How ABS Works: Anti-Lock Brakes in X-Ray](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p20bb/>

