

GENERIC · POWERTRAIN

P20C7

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P20C7

Reductant Heater D Control Circuit Low

P20C7 indicates that the powertrain control module has detected a low-voltage condition on the control circuit for the reductant heater designated as 'D', which is part of the diesel exhaust fluid system. The computer commands the heater on and monitors the circuit, and it sets this code when the voltage on the control side falls below the expected threshold, 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 pending code may be stored without turning on the warning light if the fault is intermittent
- Possible reduction in engine power or limp mode if the fault persists and the system cannot maintain proper DEF temperature
- Longer DEF thaw times in cold weather, which may delay the start of selective catalytic reduction operation
- In some vehicles, a message on the driver information center indicating a problem with the emissions system or DEF system

Common causes, most likely first

- 1 Damaged or corroded wiring harness between the reductant heater control module and the heater element
- 2 Failed reductant heater element with an internal short to ground
- 3 Poor electrical connection at the heater connector, such as loose pins or water intrusion
- 4 Faulty reductant heater control module or relay that fails to provide the correct voltage
- 5 Open circuit in the control wire due to a broken wire or failed splice
- 6 Corrosion or damage at the powertrain control module connector affecting the control circuit



How to diagnose and fix it

- 1 Inspect the reductant heater connector and wiring for signs of corrosion, chafing, or loose pins, and repair as needed
- 2 Measure the resistance of the reductant heater element with a multimeter and compare to the manufacturer's specification to check for an open or shorted element
- 3 Check for voltage on the control circuit at the heater connector when the heater is commanded on; if voltage is low, trace the circuit back to the control module
- 4 Perform a voltage drop test on both the power and ground sides of the heater circuit to identify excessive resistance
- 5 Test the reductant heater control module or relay for proper operation and replace if faulty
- 6 If the control circuit is intact and the heater is good, inspect the powertrain control module connector and wiring for damage
- 7 Clear the code and verify the repair by running the heater command with a scan tool and confirming the code does not return

Reductant heater circuit low-voltage traps

- A low-voltage code on the control circuit often results from a short to ground in the heater element itself, which can be missed if only the control wire is checked.
- Intermittent faults may only appear in cold ambient temperatures when the heater is commanded on, so a warm-weather inspection might not reproduce the condition.
- The reductant heater is often part of the DEF tank assembly, and replacing the entire tank is sometimes recommended by the manufacturer rather than just the heater element.
- Corrosion at the heater connector is a common cause that can mimic a failed heater or control module, so always inspect the connector pins before replacing parts.
- This code can be set by a weak battery or charging system issue that causes low system voltage during heater operation, so verify battery and charging system health first.

Can I keep driving with P20C7?

You can generally continue driving with this code, but avoid long trips or cold weather operation until repaired, as the DEF system may not function properly and could lead to reduced engine power or increased emissions. If the check engine light starts flashing or you experience significant power loss, stop driving and seek service immediately.

Tools that help

- OBD-II scan tool with bidirectional control capability
- Digital multimeter
- Wiring diagram for the specific vehicle
- Basic hand tools for connector and component access



Reading P20C7

- 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.
- C7** The exact fault within that area.

Often seen with

P20B9 Reductant Heater A Control Circuit/Open · **P20BD** Reductant Heater B Control Circuit/Open · **P20BE** Reductant Heater B Control Circuit Performance · **P20C6** Reductant Heater D Control Circuit Performance · **P20C8** Reductant Heater D Control Circuit High

See it working

Watch the animated explainer [How a Jet Engine Works: Two-Spool Turbofan](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p20c7/>

