

GENERIC · POWERTRAIN

P20BA

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P20BA

Reductant Heater A Control Performance

P20BA indicates that the powertrain control module (PCM) has detected a performance fault in the reductant heater circuit, which is the heater element that warms diesel exhaust fluid (DEF) so it can be injected into the exhaust for selective catalytic reduction (SCR). The PCM monitors the heater's electrical current and temperature response, and it sets this code when the heater fails to reach the expected temperature within a calibrated time or when the current draw is outside the expected range.

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 or stored P20BA code with possible reduced engine power or limp mode
- Longer DEF thaw times in cold weather, leading to delayed SCR system activation
- Possible poor fuel economy or increased DEF consumption if the system remains in a default strategy
- In some vehicles, a message indicating DEF system fault or service required
- Rough running or hesitation only if the fault triggers a broader SCR system derate

Common causes, most likely first

- Failed reductant heater element (open circuit or shorted winding)
- Damaged or corroded wiring harness or connector at the reductant heater
- Blown fuse or faulty relay supplying power to the reductant heater circuit
- PCM software calibration issue or internal driver fault in the heater control circuit
- Low or contaminated DEF causing the heater to overheat or fail prematurely
- Poor ground connection for the reductant heater circuit



How to diagnose and fix it

- 1 Verify battery voltage and inspect the reductant heater fuse and relay, replacing any blown fuse or faulty relay
- 2 Perform a visual inspection of the reductant heater wiring and connector for chafing, corrosion, or loose pins
- 3 Measure the resistance of the reductant heater element with a multimeter and compare to the manufacturer's specification
- 4 Check for power and ground at the heater connector with the key on and the heater commanded on using a scan tool
- 5 Use a scan tool to command the reductant heater on and monitor the heater current and temperature parameters for proper response
- 6 If the heater element is out of specification, replace the reductant heater assembly or the DEF tank heater as applicable
- 7 Clear the code and perform a road test or heater activation test to confirm the repair and ensure the code does not return

What the reductant heater code really means

- A P20BA can be set by a weak battery or charging system fault because the heater draws high current and low voltage can mimic a heater performance failure.
- The reductant heater is often integrated into the DEF tank or pump module, so a failed heater may require replacing the entire assembly rather than just the heater element.
- In some vehicles, the PCM uses a smart driver that can set this code even when the heater element is good, due to a failed driver inside the PCM.
- Contaminated or diluted DEF can cause the heater to overheat and fail, so always check DEF quality before replacing the heater.
- A P20BA may be accompanied by other SCR-related codes, and diagnosing only the heater without checking the entire DEF system can lead to a repeat repair.

Can I keep driving with P20BA?

You can generally continue driving with P20BA, but the vehicle may enter a reduced power or limp mode if the SCR system cannot operate properly, especially in cold weather. Avoid long trips in freezing conditions until the fault is repaired, as the DEF may not thaw and the vehicle could derate.

Tools that help

- OBD-II scan tool with bidirectional control and live data
- Digital multimeter
- Fuse puller and test light
- Socket and wrench set
- Manufacturer-specific diagnostic software (if available)



Reading P20BA

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

Often seen with

P20B9 Reductant Heater A Control Circuit/Open · **P20BB** Reductant Heater A Control Circuit Low · **P20BC** Reductant Heater A Control Circuit High · **P20BD** Reductant Heater B Control Circuit/Open · **P20BE** Reductant Heater B Control Circuit Performance

See it working

Watch the animated explainer [How the EVAP System Works: Fuel Vapour and Leak Test](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p20ba/>

