

GENERIC · POWERTRAIN

P20EA

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P20EA

Reductant Pump Control Circuit Open

P20EA indicates that the powertrain control module (PCM) has detected an open circuit in the reductant pump control circuit, which is part of the diesel exhaust fluid (DEF) injection system used for selective catalytic reduction (SCR). The PCM commands the pump on and monitors the circuit for expected voltage or current feedback; when the feedback is missing or out of range, it sets this code.

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 or service engine soon light
- Often no symptoms besides the warning light
- Reduced engine power or limp mode in some vehicles
- A message on the driver information center indicating DEF system fault or service required
- Possible rough running or hesitation if the system enters a derate strategy
- In some cases, the vehicle may refuse to restart after the engine is shut off once the DEF countdown expires

Common causes, most likely first

- 1 Open or damaged wiring in the reductant pump control circuit (broken wire, corroded connector, or chafed harness)
- 2 Failed reductant pump (open internal winding or seized motor)
- 3 Blown fuse or faulty relay supplying power to the reductant pump
- 4 Poor electrical connection at the pump or PCM connector (loose pins, water intrusion, or corrosion)
- 5 Faulty PCM driver for the reductant pump control circuit (rare but possible)
- 6 Aftermarket accessories or poor previous repairs tapping into the circuit



How to diagnose and fix it

- 1 Perform a visual inspection of the reductant pump harness and connectors for damage, corrosion, or loose pins
- 2 Check the fuse and relay that supply power to the reductant pump control circuit
- 3 Use a scan tool to command the reductant pump on and off while monitoring circuit voltage and current to confirm the open circuit
- 4 Disconnect the pump and measure resistance across the pump motor terminals to check for an open winding
- 5 Check for continuity and voltage drop on the control circuit wiring between the PCM and the pump, repairing any open or high-resistance faults
- 6 If the wiring and pump test good, verify the PCM control signal with an oscilloscope or bidirectional scan tool; replace the PCM only if the driver is confirmed faulty
- 7 Clear the code and perform a road test or a forced DEF system test to verify the repair

Open circuit faults are not always the pump

- A common misdiagnosis is replacing the reductant pump when the actual fault is a corroded connector or a broken wire in the harness, especially near the pump where it is exposed to road debris and moisture.
- The PCM may set P20EA if the pump control circuit is open only intermittently, so a wiggle test of the harness while monitoring live data can reveal a fault that a simple resistance check misses.
- Some vehicles use a separate reductant pump control module; an open circuit in the communication or power supply to that module can also trigger P20EA, so check for related codes before condemning the pump.
- A failed DEF heater can sometimes cause the pump control circuit to log an open code if the heater and pump share a ground or power circuit, so inspect the entire DEF system rather than just the pump.
- After any repair, the DEF system may need a scan-tool reset or a short drive cycle to clear the code and restore full engine power, as some vehicles latch a derate until the monitor runs and passes.

Can I keep driving with P20EA?

You can usually drive the vehicle with P20EA set, but the DEF system may be disabled, which can lead to reduced engine power or a no-restart condition after the engine is shut off once the DEF countdown expires. Avoid long trips or heavy loads until the fault is repaired, and do not ignore the warning if a countdown message appears.

Tools that help

- OBD-II scan tool with bidirectional control and live data
- Digital multimeter
- Test light
- Wiring diagram for the reductant pump circuit
- Oscilloscope (optional for signal verification)



Reading P20EA

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

Often seen with

P20B9 Reductant Heater A Control Circuit/Open · **P20E8** Reductant Pressure Too Low · **P20E9** Reductant Pressure Too High · **P20EB** Reductant Reservoir Heater "A" Control Circuit · **P20EE** NOx Catalyst Efficiency Below Threshold (Bank 1)

See it working

Watch the animated explainer [How a Knock Sensor Works: Spark Timing and Octane](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p20ea/>

