

GENERIC · POWERTRAIN

P011E

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P011E

Engine Coolant Temperature 1 / Ambient Air Temperature Correlation

P011E indicates that the powertrain control module (PCM) has detected an implausible relationship between the engine coolant temperature (ECT) sensor and the ambient air temperature (AAT) sensor after a cold soak. The PCM expects these two temperatures to be within a calibrated threshold of each other when the engine has not run for several hours, and it sets this code when the correlation falls outside that window.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering

Symptoms you may notice

- Illuminated check engine light, often with no other noticeable symptoms
- Rough idle or poor driveability if the coolant sensor is skewed enough to affect fuel enrichment
- Incorrect temperature gauge reading on the dashboard
- Reduced fuel economy or increased emissions due to faulty cold-start fuel strategy
- Hard starting or extended cranking in cold weather
- Cooling fan running continuously or not at all due to corrupted temperature data

Common causes, most likely first

- 1 Faulty engine coolant temperature (ECT) sensor reading out of specification
- 2 Faulty ambient air temperature (AAT) sensor or its wiring
- 3 Corroded, chafed, or open wiring in the ECT or AAT sensor circuits
- 4 Poor electrical connection at the ECT or AAT sensor connector
- 5 Failed thermostat stuck open or closed, preventing proper warm-up and cold-soak correlation
- 6 PCM software calibration issue or internal fault in the temperature input circuitry
- 7 Low coolant level or air pockets causing the ECT sensor to read incorrectly



How to diagnose and fix it

- 1 Verify the coolant level is correct and the engine has fully cooled overnight before testing
- 2 Use a scan tool to compare ECT and AAT readings after a true cold soak; they should be within a few degrees of each other
- 3 Inspect the ECT and AAT sensor connectors and wiring for corrosion, damage, or loose pins
- 4 Measure the resistance of the ECT and AAT sensors with a multimeter and compare to the manufacturer's temperature-resistance chart
- 5 Check the thermostat operation by monitoring coolant temperature rise during warm-up
- 6 Repair or replace any faulty sensor, wiring, or connector found during testing
- 7 Clear the diagnostic trouble codes and perform a cold-soak drive cycle to confirm the repair

Cold-soak correlation traps that fool technicians

- The PCM only runs this correlation test after a genuine cold soak, so a vehicle that has been started recently will not set the code even if a sensor is faulty.
A thermostat that is stuck open can keep the engine from reaching normal operating temperature, causing the ECT signal to stay too close to ambient and triggering P011E without any sensor failure.
- Ambient air temperature sensors on many vehicles are integrated into the mass airflow sensor or a mirror assembly, so a fault in those components can set P011E indirectly.
- Technicians often replace the ECT sensor first, but the AAT sensor circuit is just as likely to be the culprit and should be tested with equal rigor.
After a repair, the code may not clear immediately because the PCM requires a new cold-soak cycle to re-run the correlation test and turn off the light.

Can I keep driving with P011E?

The vehicle is generally safe to drive with P011E because the fault mainly affects cold-start fuel strategy and emissions, but avoid extended idling or heavy load until the issue is diagnosed. If you notice overheating, rough running, or the temperature gauge behaving erratically, stop driving and have the vehicle inspected promptly.

Tools that help

- OBD-II scan tool with live data capability
- Digital multimeter
- Infrared thermometer
- Manufacturer-specific service information for temperature-resistance charts
- Basic hand tools for sensor and connector access



Reading P011E

- P** Powertrain: engine, transmission and emissions.
- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 1** Fuel and air metering.
- 1E** The exact fault within that area.

Often seen with

P0071 Ambient Air Temperature Sensor Range/Performance · **P0115** Engine Coolant Temperature Circuit Malfunction · **P0116** Engine Coolant Temperature Circuit Range/Performance · **P0117** Engine Coolant Temperature Circuit Low Input · **P0118** Engine Coolant Temperature Circuit High Input

See it working

Watch the animated explainer [Engine Cooling System Trainer: How Engines Stay Cool](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p011e/>

