

GENERIC · POWERTRAIN

P2E29

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2E29

Drive Motor A Excitation Current Sensor Circuit Low Voltage

P2E29 indicates that the powertrain control module has detected an abnormally low voltage signal from the excitation current sensor circuit of drive motor A, which is the sensor that monitors the field or excitation current supplied to the motor's rotor or field winding. The computer expects the sensor's output voltage to stay within a calibrated range, and a sustained low reading tells the module that the circuit is shorted to ground, the sensor has failed, or the motor's excitation current is genuinely too low.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Professional

AREA

Hybrid propulsion

Symptoms you may notice

- Illumination of the check engine light or service vehicle soon message, often with no other noticeable symptoms
- Reduced power or a limp-home mode that limits motor output to protect the drive system
- Intermittent hesitation or a sudden loss of propulsion assist during acceleration
- A stored code accompanied by a freeze-frame showing low sensor voltage at the time of the fault
- In rare cases, a burning smell or visible damage at the sensor connector if the short is internal to the harness
- No driver-perceptible change in vehicle behavior besides the warning light in many cases

Common causes, most likely first

- 1 A failed excitation current sensor that internally shorts its signal line to ground
- 2 A chafed or pinched signal wire in the sensor harness rubbing against a grounded metal surface
- 3 Corrosion or water intrusion at the sensor connector causing a low-resistance path to ground
- 4 A poor ground connection for the sensor or the motor assembly that skews the voltage reference
- 5 An internal fault in the drive motor A assembly, such as a shorted field winding or damaged exciter circuit
- 6 A faulty powertrain control module with a damaged internal pull-up resistor or analog input circuit



How to diagnose and fix it

- 1 Connect a scan tool and record the freeze-frame data for P2E29, then clear the code and verify whether it returns immediately or only under specific load conditions
- 2 Visually inspect the excitation current sensor connector and the full length of its harness for chafing, corrosion, moisture, or loose pins
- 3 Measure the sensor's reference voltage and ground at the connector with a digital multimeter and compare against the manufacturer's specification
- 4 Back-probe the signal wire and check for a short to ground with the sensor disconnected, then wiggle the harness to reveal intermittent faults
- 5 Test the excitation current sensor with a known-good substitute or perform a resistance and voltage output check per the service information
- 6 If the circuit and sensor test good, inspect the drive motor A field winding and exciter circuit for an internal short or low resistance
- 7 As a final step, verify the powertrain control module's analog input by checking for a shorted internal circuit or replacing the module only after all other causes are ruled out

When the sensor is not the real culprit

- A low voltage reading on this circuit is frequently caused by a shorted signal wire where the harness passes near a sharp bracket or a heat source, not by a failed sensor, so a thorough wiggle test with a multimeter connected is essential before replacing parts.
- Water intrusion into the sensor connector is a common missed cause on vehicles that have been driven through deep puddles or have a clogged underbody drain, and the corrosion often hides inside the terminal cavity.
- Technicians sometimes replace the excitation current sensor only to find the code returns because the motor's field winding has an internal short that pulls the excitation current down, which the sensor faithfully reports as a low voltage.
- A poor chassis ground for the motor or the sensor can elevate the ground reference and make a normal sensor signal appear low to the control module, so ground voltage drop testing should always accompany sensor testing.
- This code can set intermittently from a momentary harness rub that only occurs during certain suspension movements, so a single clear-and-drive test may not reproduce the fault and a road test over rough surfaces may be needed.

Can I keep driving with P2E29?

The vehicle may enter a reduced-power mode, which can make merging or climbing hills difficult, so limit driving to low-speed routes until the fault is repaired. Avoid heavy acceleration or sustained high-load operation, and if the warning light begins flashing or the vehicle loses propulsion entirely, stop driving and arrange a tow.



Tools that help

- OBD-II scan tool with live data and freeze-frame capability
- Digital multimeter with back-probe pins and a min/max recording function
- Wiring diagram and service information for the specific vehicle
- Hand tools for connector and harness access
- Insulation piercing probes or a breakout box for circuit testing

Reading P2E29

- P** Powertrain: engine, transmission and emissions.
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- 2** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
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- E** Hybrid propulsion.
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- 29** The exact fault within that area.

Often seen with

P0A3F Drive Motor A Position Sensor Circuit · **P2E28** Drive Motor A Excitation Current Sensor Performance · **P2E2A** Drive Motor A Excitation Current Sensor Circuit High Voltage · **P2E2B** Drive Motor A Excitation Current Too High

See it working

Watch the animated explainer [How Regenerative Braking Works in Electric Cars](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p2e29/>

