

GENERIC · POWERTRAIN

P2E27

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2E27

Drive Motor A Phase X-Y-Z Current Sensor Correlation

P2E27 indicates that the inverter controller for drive motor A has detected a correlation error between the phase X, Y, and Z current sensors, meaning the three readings do not agree with each other or with the commanded current. The computer compares the sensor signals during operation and sets this code when the expected mathematical relationship between the phases is violated beyond a calibrated threshold.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	High	Professional	Hybrid propulsion

Symptoms you may notice

- Illumination of the hybrid or electric vehicle warning light, often with a message to service the drive system
- Reduced power output or a limp-home mode that limits vehicle speed
- The vehicle may refuse to start or shift into drive if the fault is active at key-on
- Intermittent hesitation or shudder during acceleration under load
- Often no symptoms besides the warning light, especially if the correlation error is marginal

Common causes, most likely first

- 1 A failing current sensor on one of the three motor phases, most commonly due to internal drift or thermal damage
- 2 Damaged or chafed wiring in the motor phase current sensor harness, including poor terminal tension at the sensor or inverter connector
- 3 Water intrusion or corrosion in the inverter assembly or motor connector, affecting sensor reference voltage or signal integrity
- 4 A faulty inverter controller or gate driver board that misinterprets the sensor signals
- 5 Loose or corroded high-voltage ground connections that create offset errors in the current sensing circuit
- 6 Software calibration drift in the inverter control module that requires a reflash or relearn procedure



How to diagnose and fix it

- 1 Connect a scan tool capable of reading hybrid/EV-specific data and record the freeze-frame and live current sensor values for all three phases to confirm the correlation error.
- 2 Visually inspect the motor phase cables, sensor connectors, and inverter harness for chafing, corrosion, water intrusion, or loose pins, and repair any obvious damage.
- 3 Measure the sensor reference voltage and signal return at the inverter connector with a multimeter and compare against the manufacturer's specification to rule out wiring faults.
- 4 Perform a resistance and insulation test on the phase cables and motor windings to eliminate a short or ground fault that could skew current readings.
- 5 If wiring and sensors check out, follow the manufacturer's diagnostic flow for the inverter controller, which may include a software update or replacement of the current sensor board.
- 6 After any repair, clear the codes and perform a road test under load to verify the correlation error does not return, then complete any required relearn or calibration procedure.

Why phase current correlation codes mislead

- A marginal 12-volt battery or a weak DC-DC converter can cause the inverter's internal reference voltage to sag, producing a false correlation error that disappears after charging or replacing the auxiliary battery.
- Technicians often replace the inverter assembly when the real fault is a single current sensor connector that has been partially unseated by vibration or a previous repair.
- This code can set intermittently during regenerative braking or hard acceleration because the current sensors are stressed at high di/dt, so a static key-on test may show no fault.
- A failed motor resolver or position sensor can indirectly cause current correlation errors because the controller's phase current expectations depend on accurate rotor position.
- Some manufacturers require a current sensor offset learn procedure after replacement, and skipping it will immediately reset P2E27 even with new hardware.

Can I keep driving with P2E27?

Do not continue driving with this code active because the inverter may miscontrol motor current, leading to sudden loss of power or damage to the drive motor and inverter. Have the vehicle towed to a qualified hybrid/EV service facility for diagnosis.

Tools that help

- Hybrid/EV-capable scan tool with live data and freeze-frame recording
- Digital multimeter with min/max and duty-cycle functions
- Insulation resistance tester (megohmmeter) rated for high-voltage systems
- Oscilloscope for capturing phase current sensor waveforms
- Manufacturer service information for connector pinouts and sensor specifications



Reading P2E27

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

Often seen with

P0A3F Drive Motor A Position Sensor Circuit · **P0A45** Drive Motor B Position Sensor Circuit · **P2E20** Drive Motor A Phase Y Current Sensor Circuit Range/Performan · **P2E21** Drive Motor A Phase Y Current Sensor Circuit Low · **P2E22** Drive Motor A Phase Y Current Sensor Circuit 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/p2e27/>

