

GENERIC · POWERTRAIN

P2E21

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2E21

Drive Motor A Phase Y Current Sensor Circuit Low

P2E21 indicates that the powertrain control module has detected an abnormally low voltage signal from the current sensor that monitors phase Y of drive motor A, which is the main traction motor in a hybrid or electric vehicle. The sensor's output has fallen below the expected range for the measured current, so the module cannot reliably determine the phase current and may disable or limit motor operation to protect the inverter and motor.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

High

FIX DIFFICULTY

Professional

AREA

Hybrid propulsion

Symptoms you may notice

- Illumination of the hybrid or electric vehicle warning light, often accompanied by a reduced power message
- The vehicle may enter a fail-safe mode that limits motor torque or prevents the use of electric drive
- Intermittent loss of propulsion or a sudden reduction in power while accelerating
- A stored diagnostic trouble code in the motor control module with no noticeable driveability change in some cases
- The engine may start and run more frequently in a plug-in hybrid as the vehicle relies less on electric power
- No symptoms besides the warning light when the fault is a momentary low signal during a key cycle

Common causes, most likely first

- 1 A faulty current sensor on the phase Y conductor of drive motor A, often due to internal sensor degradation
- 2 Damaged or chafed wiring between the current sensor and the motor control module, causing a short to ground or an open circuit
- 3 Corroded or loose connector pins at the current sensor or at the motor control module harness
- 4 A low-voltage power supply or ground issue affecting the sensor reference voltage
- 5 A failed motor control module or inverter assembly that is unable to process the sensor signal correctly
- 6 Moisture intrusion into the sensor connector or into the motor housing, leading to signal corruption
- 7 Aftermarket modifications or improper repair work that disturbed the phase Y sensor circuit



How to diagnose and fix it

- 1 Connect a scan tool and record all stored and pending codes in every module, then clear codes and test-drive to see if P2E21 returns
- 2 Inspect the current sensor connector and the motor control module connector for corrosion, loose pins, or pushed-out terminals
- 3 Check the sensor reference voltage and ground at the current sensor connector with a multimeter, comparing to the manufacturer's specification
- 4 Measure the resistance of the signal circuit between the sensor and the control module to rule out an open or high-resistance fault
- 5 Perform a wiggle test on the harness while monitoring the sensor signal on a scan tool to catch intermittent wiring faults
- 6 If the wiring and connectors are good, substitute a known-good current sensor and recheck the code
- 7 If the code persists after sensor replacement, follow the manufacturer's diagnostic flow for the motor control module or inverter assembly

What the phase Y sensor code really tells you

- A low signal from a current sensor often results from a poor ground connection at the sensor or at the motor control module rather than a failed sensor itself, so voltage drop testing is essential before parts replacement.
- The phase Y current sensor is sometimes integrated into the motor housing or the inverter assembly, meaning a sensor fault may require replacing a larger assembly rather than a standalone sensor.
- This code can set intermittently due to a momentary low signal during a high-current event, and it may not return on a short test drive, so a thorough road test with live data monitoring is necessary.
- A weak 12-volt battery or a failing DC-DC converter can cause the sensor's reference voltage to sag, triggering a low signal code that mimics a sensor failure.
- Technicians sometimes replace the motor control module when the actual fault is a chafed wire in the harness near a sharp bracket or a heat source, so always inspect the entire circuit before condemning the module.

Can I keep driving with P2E21?

Do not continue driving with this code if the vehicle has entered a reduced power mode or if the warning light is accompanied by a loss of propulsion, because the motor may shut down unexpectedly. If the vehicle still drives normally, limit driving to a short distance to a repair facility and avoid heavy acceleration or high-speed operation.



Tools that help

- OBD-II scan tool with live data and the ability to read motor control module codes
- Digital multimeter with min/max recording and a low-voltage probe
- Manufacturer-specific wiring diagram and connector pinout
- Breakout box or back-probe kit for testing connectors without damage
- Insulated hand tools and a torque wrench for high-voltage component access

Reading P2E21

P Powertrain: engine, transmission and emissions.

2 Generic (SAE) code: it means the same thing on every OBD-II vehicle.

E Hybrid propulsion.

21 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 · **P2E22** Drive Motor A Phase Y Current Sensor Circuit High · **P2E23** Drive Motor A Phase Z Current Sensor Circuit

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/p2e21/>

