

GENERIC · POWERTRAIN

P2E20

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P2E20

Drive Motor A Phase Y Current Sensor Circuit Range/Performance

P2E20 indicates that the powertrain control module has detected an out-of-range or erratic signal from the current sensor monitoring phase Y of drive motor A, which is one of the three electrical phases feeding the traction motor. The computer compares this sensor's output against expected values during key-on and while the motor is operating, and it sets the code when the signal falls outside the acceptable range or fails a performance rationality check.

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

Symptoms you may notice

- Illumination of the check engine light or service vehicle soon message, often with no other symptoms
- Reduced power or limp mode, where the vehicle limits motor output to protect the inverter and motor
- Hesitation or shudder during acceleration as the motor controller struggles to balance phase currents
- Intermittent loss of propulsion or a sudden drop in power while driving
- A warning message on the instrument cluster indicating a hybrid or electric drivetrain fault

Common causes, most likely first

- 1 Faulty phase Y current sensor inside the motor or inverter assembly
- 2 Damaged or corroded wiring and connector pins in the sensor circuit
- 3 Poor electrical connection at the motor or inverter harness, often due to vibration or moisture intrusion
- 4 Internal failure in the motor control module or inverter that processes the sensor signal
- 5 Mechanical damage or debris interfering with the sensor's magnetic pickup
- 6 Software calibration issue in the motor controller that misinterprets a valid sensor signal



How to diagnose and fix it

- 1 Perform a visual inspection of the motor and inverter harnesses for chafed wires, loose connectors, or corrosion, and repair as needed
- 2 Use a scan tool to check for related codes and freeze-frame data, then clear the code and test-drive to see if it returns
- 3 Back-probe the phase Y current sensor connector and measure the signal voltage with a multimeter, comparing it to the manufacturer's specification
- 4 Check the sensor's reference voltage and ground circuits for continuity and shorts, and verify the sensor's output changes smoothly when the motor is rotated by hand
- 5 If the signal is erratic or out of range, replace the current sensor or the sensor-integrated motor component as required
- 6 After repair, clear codes and perform a road test to confirm the code does not reset and that motor performance is normal
- 7 If the code persists after sensor replacement, diagnose the motor control module or inverter for internal faults

What a phase Y current sensor code really means

- A phase Y current sensor fault often does not prevent the vehicle from moving because the motor controller can estimate current from other phases, so drivers may ignore it until a hard failure occurs.
- Many technicians replace the expensive motor assembly when the actual problem is a chafed wire in the harness near the inverter, so always perform a thorough circuit test before condemning parts.
- This code can be set by a weak 12-volt battery or poor grounds that cause the motor controller to reboot intermittently, so check the low-voltage system first.
- The sensor is typically a Hall-effect or magnetoresistive type, and its signal can be distorted by nearby high-current cables if the shielding is damaged, leading to false range/performance codes.
- A phase Y current sensor code may appear alongside codes for other phases or the inverter, indicating a shared power or ground fault rather than three separate sensor failures.

Can I keep driving with P2E20?

Do not continue driving with this code if the vehicle enters limp mode or shows a loss of power, because the motor controller may shut down the drive system unexpectedly. Have the vehicle towed to a qualified hybrid or electric vehicle technician for diagnosis.

Tools that help

- OBD-II scan tool with hybrid/EV capability
- Digital multimeter with back-probe pins
- Oscilloscope for signal waveform analysis
- Manufacturer service information for circuit specifications
- Insulation resistance tester for high-voltage cables



Reading P2E20

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

Often seen with

P0A3F Drive Motor A Position Sensor Circuit · **P0A94** DC/DC Converter A Performance · **P2E1F** Drive Motor A Phase Y Current Sensor Circuit · **P2E21** Drive Motor A Phase Y Current Sensor Circuit Low

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/p2e20/>

