

GENERIC · POWERTRAIN

P0BAE

 OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P0BAE

Hybrid/EV Battery Voltage Sense X Circuit

P0BAE indicates that the hybrid or electric vehicle battery pack monitoring system has detected an abnormal voltage reading on one of its sense circuits, specifically the channel designated as 'X'. The battery energy control module compares this sense line against expected values and other cell groups, and when the signal falls outside the allowable range or behaves erratically, it stores this code and may disable hybrid operation or limit power.

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

Symptoms you may notice

- Illumination of the hybrid system warning light or service vehicle soon message
- Reduced electric-only range or the vehicle refusing to enter EV mode
- Loss of power or limp-home mode with limited engine or motor output
- Inconsistent state-of-charge readings or sudden jumps in the battery gauge
- Often no symptoms besides the warning light, especially if the fault is intermittent
- Possible failure to start or charge if the battery management system enters a protective shutdown

Common causes, most likely first

- 1 Faulty voltage sense wire or connector at the battery pack, including chafed insulation or corroded terminals
- 2 Open or high-resistance sense circuit within the battery module harness
- 3 Failed cell voltage sensor or battery monitoring module internal fault
- 4 Loose or improperly seated high-voltage interlock or service disconnect plug affecting sense lines
- 5 Battery energy control module software glitch or internal hardware failure
- 6 Water intrusion or contamination in the battery pack connector area causing intermittent shorts
- 7 Damaged battery pack assembly from impact or vibration leading to sense line damage



How to diagnose and fix it

- 1 Retrieve all stored codes and freeze-frame data with a scan tool capable of hybrid battery diagnostics, then record the exact sense channel and voltage values
- 2 Visually inspect the battery pack connectors, sense wiring, and service disconnect for corrosion, looseness, or damage
- 3 Perform a voltage drop test on the suspect sense circuit while wiggling the harness to catch intermittent faults
- 4 Check the battery energy control module for software updates or known service bulletins related to voltage sense accuracy
- 5 Measure the actual cell group voltage with a calibrated meter and compare it to the scan tool reading to isolate a sensor versus wiring problem
- 6 If wiring and connectors are good, substitute a known-good sensor or monitoring module and recheck the code
- 7 Clear codes and perform a battery pack relearn or calibration drive cycle as required by the manufacturer

Sense line faults often mimic cell failure

- A voltage sense code frequently appears when the actual battery cells are healthy, so replacing the pack before testing the sense wiring is an expensive misdiagnosis.
- Intermittent sense codes often set only during temperature swings or after the vehicle sits, which means a simple key-on check may not reveal the fault.
- The 'X' in the definition is a placeholder for a specific sense channel, and the same physical wiring can serve multiple channels, so a single code does not always mean a unique wire is bad.
- High-voltage battery service disconnects and interlock circuits can interrupt sense lines without setting a dedicated interlock code, leading technicians to overlook them.
- After any repair, the battery management system may require a relearn or adaptation reset before the code will stay cleared, even when the hardware fault is fixed.

Can I keep driving with P0BAE?

You can usually drive the vehicle short distances to a service location, but avoid aggressive acceleration, high-speed driving, and deep discharging the battery because the management system may not accurately protect the pack. If the vehicle enters limp mode or shows a high-voltage warning, stop driving and arrange a tow to prevent further damage.

Tools that help

- Hybrid/EV-capable scan tool with battery pack data streaming
- Digital multimeter with high-voltage safety rating and low-voltage scale
- Insulation tester or megohmmeter for high-voltage circuit checks
- Manufacturer service information for sense circuit pinouts and relearn procedures
- High-voltage safety gloves and insulated tools



Reading P0BAE

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

Often seen with

P0A7F Hybrid/EV Battery Pack Deterioration · **P0AFA** Hybrid/EV Battery System Voltage Low · **P0B00** Electric/Auxiliary Transmission Fluid Pump Motor Phase U Cur · **P0BAD** Hybrid/EV Battery Voltage Sense W Circuit Intermittent/Errat · **P0BAF** Hybrid/EV Battery Voltage Sense X Circuit Range/Performance

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/p0bae/>

