

GENERIC · POWERTRAIN

P0BA1

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P0BA1

Hybrid/EV Battery Voltage Sense U Circuit Low

P0BA1 indicates that the hybrid or electric vehicle battery pack monitoring system has detected a low voltage signal on the dedicated voltage sense circuit labeled 'U'. The battery energy control module expects a specific voltage range on this sense line and sets the code when the signal falls below the calibrated threshold, which can be caused by a wiring fault, a poor connection, or an internal issue within the battery pack.

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
- Often no symptoms besides the warning light, with the vehicle continuing to drive normally
- Reduced electric-only range or the engine starting more frequently than usual
- A sudden drop in state of charge or unexpected battery depletion
- Entry into a reduced power or limp-home mode in some vehicles
- Inability to charge the high-voltage battery or charging interrupted prematurely

Common causes, most likely first

- 1 Damaged, chafed, or corroded wiring in the voltage sense circuit U between the battery module and the control unit
- 2 Loose or contaminated connector pins at the battery pack interface or the control module harness
- 3 Faulty voltage sense harness internal to the battery pack, such as a broken wire at a module terminal
- 4 High-resistance connection at a battery module terminal or interconnector bus bar
- 5 Failed battery energy control module or voltage sensing circuit inside the module
- 6 Internal fault in the battery pack assembly, such as a failing sense board or module electronics
- 7 Water intrusion or debris in the battery pack connector causing signal degradation



How to diagnose and fix it

- 1 Retrieve all stored codes and freeze-frame data, then clear codes and verify whether P0BA1 returns immediately or after a drive cycle
- 2 Visually inspect the voltage sense circuit U wiring and connectors for damage, corrosion, or loose pins, focusing on areas near the battery pack
- 3 Measure resistance and voltage drop on the sense circuit U from the battery module to the control module, comparing to manufacturer specifications
- 4 Perform a wiggle test on the harness and connectors while monitoring the sense circuit voltage on a scan tool to reveal intermittent faults
- 5 Check the battery module terminal torque and condition, and verify the sense line connection at the module
- 6 If wiring and connections are good, substitute a known-good control module or perform guided diagnostics for internal battery pack faults
- 7 Repair or replace the faulty harness, connector, or battery pack component as indicated by test results, then clear codes and verify the repair

Sense circuit faults often mimic battery failure

- A low voltage sense signal is frequently caused by a poor connection at the battery pack connector rather than an actual failing battery module, so technicians should always perform a voltage drop test before condemning the pack.
- The code can set intermittently due to vibration or temperature changes, and a simple wiggle test of the harness while watching live data often reveals the fault when static resistance measurements look normal.
- Some vehicles set P0BA1 as a companion code to other battery cell voltage codes, and diagnosing only the U circuit without checking for related codes can lead to an incomplete repair.
- Replacing the battery energy control module without first verifying the sense circuit integrity can result in the same code returning because the root cause is in the wiring or connector.
- High-voltage safety procedures must be followed when inspecting battery pack connectors, and a lack of proper personal protective equipment can create a serious shock hazard during diagnosis.

Can I keep driving with P0BA1?

The vehicle may remain drivable with only a warning light, but continued operation with a low voltage sense signal can lead to inaccurate battery management and reduced hybrid system performance. Avoid long trips or heavy electrical loads until the fault is diagnosed, and if the vehicle enters a limp mode or shows charging problems, stop driving and seek professional service.



Tools that help

- OBD-II scan tool with hybrid/EV battery data capability
- Digital multimeter with low-resistance and voltage-drop functions
- Manufacturer service information and wiring diagrams
- Insulated hand tools and high-voltage personal protective equipment
- Back-probe kit for connector testing without damage
- Battery terminal torque wrench

Reading P0BA1

P	Powertrain: engine, transmission and emissions.
0	Generic (SAE) code: it means the same thing on every OBD-II vehicle.
B	Hybrid propulsion.
A1	The exact fault within that area.

Often seen with

P0A09 DC/DC Converter Status Circuit Low Input · **P0AFA** Hybrid/EV Battery System Voltage Low · **P0BA0** Hybrid/EV Battery Voltage Sense U Circuit Range/Performance · **P0BA2** Hybrid/EV Battery Voltage Sense U Circuit High · **P0BA3** Hybrid/EV Battery Voltage Sense U Circuit Intermittent/Errat

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/p0ba1/>

