DTC P0A0F - Cell Voltage ASIC Fault

Product Family	Fault Supported
Orion BMS [Original] (24 - 180 Cell)	**NO**
Orion BMS 2 (24 - 180 Cell)	**YES**
Orion JR [Original] (16 Cell)	**YES***
Orion JR 2 (16 Cell)	**YES**

*On the original Orion JR this fault was implemented with limited capabilities and voltage failsafe behavior would not be triggered.

FAULT DESCRIPTION

This fault code indicates that the BMS encountered an internal fault with the cell voltage measurement circuitry. While some of these fault conditions can be caused by external wiring issues, the vast majority of these fault conditions represent a potential legitimate failure inside the unit itself. Please consult the troubleshooting section below for details on the specific fault encountered.

Fault Code	Fault Description	Possible Trouble Area
P0A0F: Subcode 100-11F	Internal ASIC power supply #1 is receiving insufficiently low voltage. **This can be caused by having too few cells loaded on a populated cell group on the standard Orion BMS / Orion BMS 2.**	• High Voltage Battery Assembly • Cell Wiring Assembly • Internal BMS Fault
P0A0F: Subcode 200-21F	Internal ASIC power supply #2 is receiving insufficiently low voltage. **This can be caused by having too few cells loaded on a populated cell group on the standard Orion BMS / Orion BMS 2.**	• High Voltage Battery Assembly • Cell Wiring Assembly • Internal BMS Fault

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P0A0F: Subcode 300-31F	Internal ASIC voltage reference is out of range.	• Internal BMS Fault
P0A0F: Subcode 400-41F	Internal ASIC multiplexer failure.	• Internal BMS Fault
P0A0F: Subcode 500-51F	Internal ASIC redundant voltage comparison check failure. **This can be caused by having too few cells loaded on a populated cell group on the standard Orion BMS / Orion BMS 2.**	• High Voltage Battery Assembly • Cell Wiring Assembly • Internal BMS Fault
P0A0F: Subcode 600-61F	Internal ASIC analog measurement failure.	• Internal BMS Fault
P0A0F: Subcode 700-71F	Internal ASIC circuitry thermistor failure.	• Internal BMS Fault
P0A0F: Subcode 800-81F	Internal ASIC power supply #3 failure.	• Internal BMS Fault

FAULT BEHAVIOR

This fault will trigger **Voltage Failsafe Mode** which will inhibit the BMS from allowing charging or discharging of the battery pack.

DIAGNOSTIC STEPS

1.	**Determine if fault could potentially be caused by external means.** Consult the Fault Description table found up above in this document to determine if the possible cause may be due to external wiring or battery cell layout. **For the standard Orion BMS / Orion BMS 2 ONLY (not the JR products):** For faults that may be caused by having an insufficient number of cells on a group, please verify that each (used) cell group connector on the Orion BMS has a minimum normal working voltage of 12 volts total to meet operating requirements. Typically this is at least 4 cells in series though more may be

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	needed if the chemistry has an abnormally low operating voltage (such as lithium titanate). Please see the Orion BMS wiring manual for details on this requirement.
2.	**Verify proper cell voltage wiring and check for wiring related faults.** Certain subcodes can be caused by incorrectly wired cell voltage inputs (if the BMS is not receiving the proper voltages it can prevent the internal circuitry from operating properly). Typically an incorrectly wired (or damaged) cell input would show up as a secondary fault code (such as **P0A04** or **P0AFA**). If any of these fault codes are actively set, they should be investigated first as they may help indicate the root cause for this fault being set.
3.	**Download the freeze frame for the fault code using the BMS Utility.** The BMS will normally produce a freeze frame on the "Diagnostic Trouble Codes" screen in the BMS Utility when this fault code occurs that contains a comprehensive list of BMS data parameters at the time the fault occurred. **It is strongly recommended that the freeze frame be downloaded from the BMS and saved to disk before the fault is cleared again** as this data may assist in the future if further diagnostics are required. Additionally this freeze frame data may be requested by Technical Support if further assistance is required. **NOTE:** Only Fault Codes with a (F) next to them have freeze frame data available for download. If there is no (F) next to the fault, there is no stored freeze frame available and this step can be skipped. Steps to download the Freeze Frame: 1) Connect to the BMS using the Orion BMS utility. 2) Click the "Diagnostic Trouble Codes" tab at the top. 3) Select the correct fault code by clicking on the ID on the left side of the screen to initiate the Freeze Frame retrieval. 4) Once the retrieval process is complete, click the "Export (CSV)" button to save the freeze frame data to the computer disk.
4.	**If the problem persists, contact technical support.** If all above steps fail to determine the cause of the fault then additional support is needed. **Please contact the company or reseller that the BMS was originally purchased from for additional questions, warranty claims, repair requests and technical support.**

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