



DTC P0A95 - High Voltage Interlock Signal Fault

Product Family	Fault Supported	Earliest Firmware Supported
Orion BMS [Original] (24 - 180 Cell)	NO	N/A
Orion BMS 2 (24 - 180 Cell)	YES	v3.6.2
Orion JR [Original] (16 Cell)	YES	v3.6.2
Orion JR 2 (16 Cell)	YES	v3.6.2

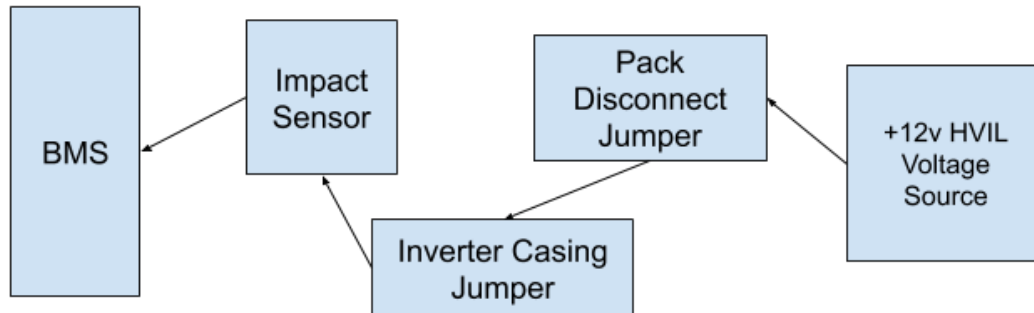
FAULT DESCRIPTION

The Orion BMS supports a common safety feature called High Voltage Interlock, which allows for a voltage to be transmitted throughout an application with “stages” along the way to ensure that critical features are operational or present. For example, the signal might pass through a connector on a service disconnect plug or pack fuse to ensure that it is properly inserted, or through a hood release sensor to ensure that the hood is closed for safe operation, or through an impact sensor to inhibit the signal in the event of a collision or physical impact. If any one of these stages or junctions were to open or be removed, the circuit would be broken and the fault is set.

This function can be assigned to one of the multi-purpose inputs on supported Orion BMS products. By default, this fault will inhibit primary outputs within 400ms of the HVIL signal being interrupted, and it can optionally be latched across multiple power cycles. It is necessary that the HVIL signal be energized within 300ms of the BMS powering up to ensure it does not trip falsely.

IMPORTANT SAFETY NOTE: This function is not intended to be used as the sole method to de-energize an application in the event of an accident or collision.

Example HVIL Circuit Diagram



A simplified example demonstrating possible junctions along the HVIL circuit

Fault Code	Fault Description	Possible Trouble Area
P0A95: Subcode 0 / 2	High Voltage Interlock signal is low	<ul style="list-style-type: none"> High Voltage Interlock circuit
P0A95: Subcode 1	High Voltage Interlock signal has been interrupted (signal was previously high before interruption)	<ul style="list-style-type: none"> High Voltage Interlock circuit

FAULT BEHAVIOR

This fault is **Inhibits All Primary Outputs** immediately when set. It can optionally be configured to latch in memory across multiple power cycles, but default operation would be for this to clear upon power cycle.

FAULT THRESHOLDS

Fault will trigger when **ONE** of the following conditions are satisfied

(a)

<p>(a) Input voltage for the High Voltage Interlock circuit input signal is low while Is-Ready or Is-Charging power input sources are energized</p>	<p>The input voltage for the High Voltage Interlock signal input is measured too low (interrupted) continuously for more than 300ms. Either the Is-Ready or Is-Charging power input source must be energized.</p>
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DIAGNOSTIC STEPS

<p>1.</p>	<p>Inspect High Voltage Interlock signal circuit.</p> <p>The exact specifics of how the High Voltage Interlock circuit is implemented may vary depending on the application and industry it is being used in, however the BMS is expecting the High Voltage Interlock input to be energized at all times when the BMS is powered up (Charge Power or Ready Power energized). This signal passes through multiple different “stages” in the circuit, such that if any stage is removed, damaged or non-functional that the signal is disrupted (ie: a ring topology).</p> <p>Inspect each element or stage of the high voltage interlock circuit to determine where the break is using a multimeter.</p>
<p>2.</p>	<p>Download the freeze frame for the fault code using the BMS Utility.</p> <p>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. <u>Additionally this freeze frame data may be requested by Technical Support if further assistance is required.</u></p> <p>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.</p> <p>Steps to download the Freeze Frame:</p> <ol style="list-style-type: none"> 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.
3.	Contact technical support. Please contact the company or reseller that the BMS was originally purchased from for additional questions, warranty claims, repair requests and technical support.