

**ATTENTION:**

GENERAL MANAGER ☐

PARTS MANAGER ☐

CLAIMS PERSONNEL ☐

SERVICE MANAGER ☐

IMPORTANT - All Service Personnel Should Read and Initial in the boxes provided, right.

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**SUBARU.**

**QUALITY DRIVEN® SERVICE**

## SERVICE BULLETIN

**APPLICABILITY:** 2019-23MY Crosstrek PHEV

**NUMBER:** 07-220-23

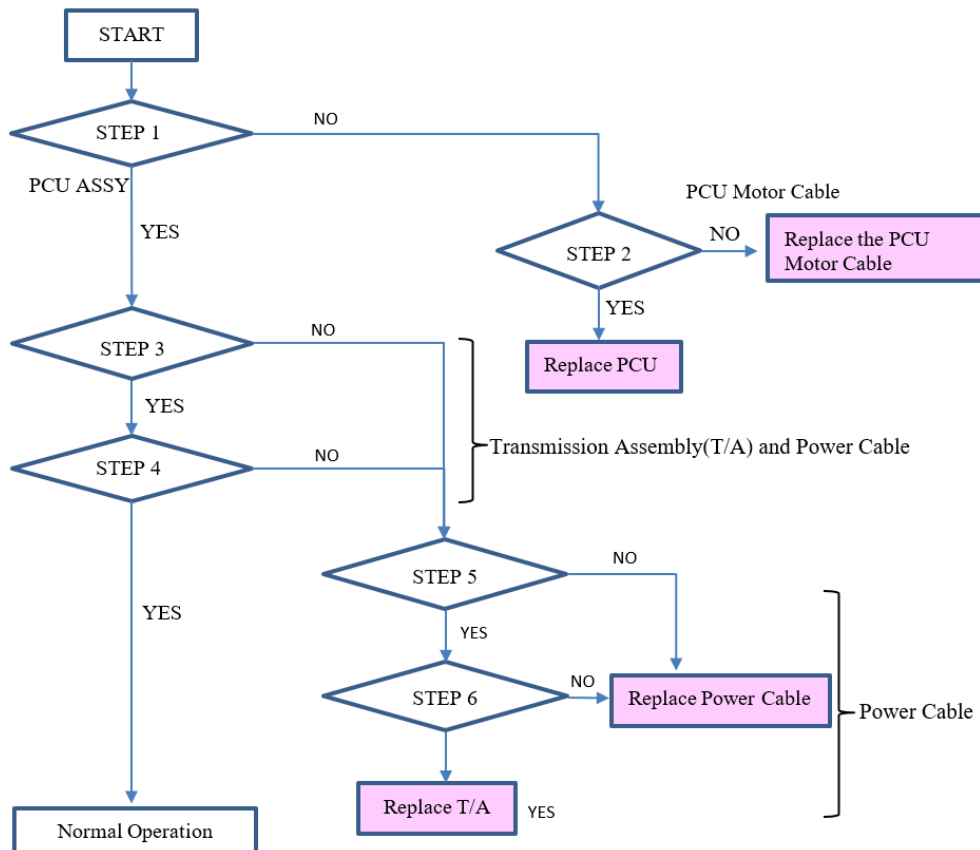
**SUBJECT:** Diagnostic Procedures / DTCs P0AA649 & P1C7E49

**DATE:** 05/16/23

### INTRODUCTION:

This service information bulletin announces the diagnostic procedures to be used when DTCs P0AA649 (Hybrid/EV Battery Voltage System Isolation Internal Electronic Failure) & P1C7E49 (Hybrid/EV Battery Voltage System Isolation (Transaxle Area) Internal Electronic Failure) are detected by the Powertrain Control Unit (PCU). Follow the procedures outlined in this bulletin if the described DTCs are encountered.

### DIAGNOSTIC PROCEDURE / INFORMATION:



**CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.**

Subaru Service Bulletins are intended for use by professional technicians ONLY. They are written to inform those technicians of conditions that may occur in some vehicles, or to provide information that could assist in the proper servicing of the vehicle. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do the job correctly and safely. If a condition is described, DO NOT assume that this Service Bulletin applies to your vehicle, or that your vehicle will have that condition.

**Subaru of America, Inc. is ISO 14001 Compliant**

ISO 14001 is the international standard for excellence in Environmental Management Systems. Please recycle or dispose of automotive products in a manner that is friendly to our environment and in accordance with all local, state and federal laws and regulations.

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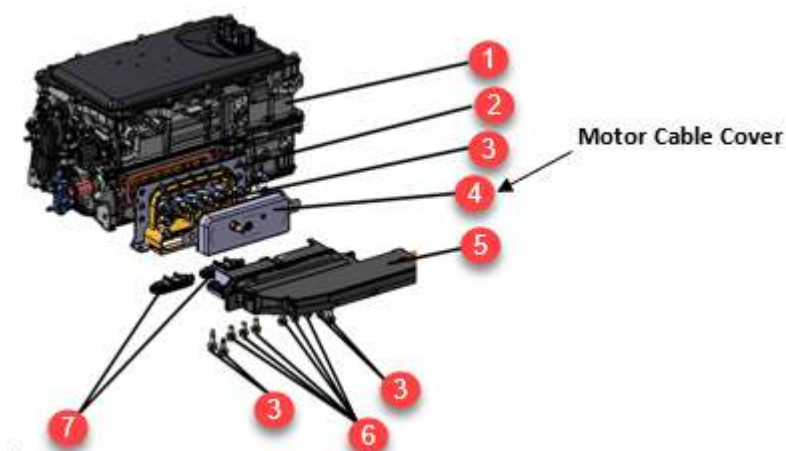
| STEP 1: Check Inverter with converter assembly |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Procedure                                      | <ol style="list-style-type: none"> <li>1. Confirm the service plug is disconnected.</li> <li>2. Visually inspect the wiring for any physical damage.</li> <li>3. Disconnect the inverter/converter assembly from Power Cable. (*1)</li> <li>4. Using a megohmmeter (500 V range), measure the resistance between connector (HV99) terminal and chassis ground.</li> </ol> <p>(*1) Replace the inverter/converter, inverter/converter motor cable, and Power Cable ONLY if water intrusion or rust caused by water intrusion are found on the inverter/converter assembly side.</p> |
| Check List                                     | <p>■For Motor<br/>(HV99) U2-chassis ground<br/>(HV99) V2-chassis ground<br/>(HV99) W2-chassis ground</p> <p>Are the resistances 1.8 MΩ or more?</p> <p>■For Generator<br/>(HV99) U1-chassis ground<br/>(HV99) V1-chassis ground<br/>(HV99) W1-chassis ground</p> <p>Are the resistances 1.8 MΩ or more?</p>                                                                                                                                                                                                                                                                        |
| YES                                            | Go to STEP 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| NO                                             | Go to STEP 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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## STEP 2: Check the motor cable of Inverter with converter

### Procedure

1. Confirm the service plug is disconnected.
2. Visually inspect the wiring for any physical damage.
3. Remove the inverter/converter assembly from the vehicle. Refer to STIS: Body & Electrical/WIRING SYSTEM > HYBRID ELECTRIC VEHICLE > Inverter and Converter Assembly > Removal
4. Remove the Inverter/converter assembly motor cable cover. (\*2)
5. Remove the motor cable from Inverter with converter. (\*2)
6. Using a megohmmeter (500 V range), measure the resistance between connector (HV99) terminal of motor cable of inverter/converter and motor cable case (metal part).



### Check List

(\*2) Replace the inverter/converter, and inverter/converter motor cable ONLY if water intrusion is found inside the cover or motor cable.

#### ■For Motor

- (HV99) U2-motor cable case (metal part)
- (HV99) V2-motor cable case (metal part)
- (HV99) W2-motor cable case (metal part)

**Are the resistances 100 MΩ or more?**

#### ■For Generator

- (HV99) U1-motor cable case (metal part)
- (HV99) V1-motor cable case (metal part)
- (HV99) W1-motor cable case (metal part)

Are the resistances 100 MΩ or more?

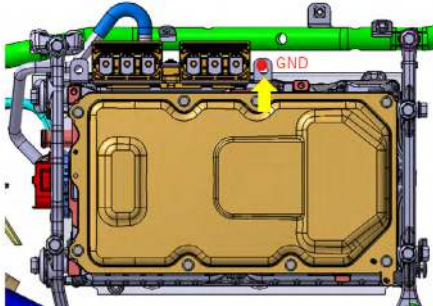
**YES**

Replace inverter with converter

**NO**

Replace inverter with converter motor cable.

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| STEP 3: Check the Power Cable (for Motor) with transmission connected |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Procedure                                                             | <ol style="list-style-type: none"> <li>1. Confirm the service plug is disconnected.<br/><b>CAUTION:</b> Never turn to READY ON with Service plug removed to prevent faults.</li> <li>2. Visually inspect the wiring for any physical damage.</li> <li>3. Turn to READY OFF (Turn the ignition on).<br/><br/><b>NOTE:</b> Since other DTCs are memorized when turning the ignition on with the service plug removed, clear the memory of DTCs after inspection.</li> <li>4. Check that ATF oil temperature is less than 50 Celsius (122 Fahrenheit) by using Subaru Select Monitor: <u>Subaru Select Monitor &gt; [P-HEV hybrid powertrain control] &gt; Data Monitor.</u></li> <li>5. Using a megohmmeter (500 V range), measure the resistance between connector (HV99) terminal of Power Cable (For Motor) (on inverter/converter assembly side) and chassis ground and shield line ground.</li> </ol> |
| Check List                                                            | <p>(HV99) U2-chassis ground and shield line ground<br/>(HV99) V2-chassis ground and shield line ground<br/>(HV99) W2-chassis ground and shield line ground</p> <p><b>Are the resistances 44 MΩ or more? (CONFIRM the ATF oil temperature less than 50 Celsius (122 Fahrenheit)).</b></p> <p><b>Reference EXAMPLE for chassis ground:</b></p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p><b>Reference EXAMPLE for shield line ground:</b></p>                                                                                                                                                 |
| YES                                                                   | Go to STEP 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| NO                                                                    | Go to STEP 5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

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| <b>STEP 4: Check the Power Cable (for Generator) with transmission connected</b> |                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Procedure</b>                                                                 | <ol style="list-style-type: none"> <li>1. Confirm the service plug is disconnected.</li> <li>2. Visually inspect the wiring for any physical damage.</li> <li>3. Using a megohmmeter (500 V range), measure the resistance between connector (HV99) terminal of Power Cable (for Generator) (on inverter/converter assembly side) and chassis ground and shield line ground.</li> </ol> |
| <b>Check List</b>                                                                | (HV99) U1- chassis ground and shield line ground<br>(HV99) V1- chassis ground and shield line ground<br>(HV99) W1- chassis ground and shield line ground<br><br><b>Are the resistances 100 MΩ or more?</b>                                                                                                                                                                              |
| <b>YES</b>                                                                       | Normal operation at this time.                                                                                                                                                                                                                                                                                                                                                          |
| <b>NO</b>                                                                        | Go to STEP 5.                                                                                                                                                                                                                                                                                                                                                                           |

| <b>STEP 5: Check the Power Cable (for Motor) without Transmission connected</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Procedure</b>                                                                | <ol style="list-style-type: none"> <li>1. Confirm the service plug is disconnected.</li> <li>2. Visually inspect the wiring for any physical damage.</li> <li>3. Disconnect the Power Cable from Transmission Assy.</li> <li>4. Using a megohmmeter (500 V range), measure the resistance between connector (HV99) terminal of Power Cable (for Motor) (on inverter/converter assembly side) and chassis ground and shield line ground.</li> </ol> |
| <b>Check List</b>                                                               | (HV99) U2- chassis ground and shield line ground<br>(HV99) V2- chassis ground and shield line ground<br>(HV99) W2- chassis ground and shield line ground<br><br><b>Are the resistances 100 MΩ or more?</b>                                                                                                                                                                                                                                         |
| <b>YES</b>                                                                      | Go to STEP 6.                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>NO</b>                                                                       | Replace the Power Cable.                                                                                                                                                                                                                                                                                                                                                                                                                           |

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| <b>STEP 6: Check the Power Cable (for Generator)</b> |                                                                                                                                                                                                                                                                                                                                                                                         |
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| <b>Procedure</b>                                     | <ol style="list-style-type: none"> <li>1. Confirm the service plug is disconnected.</li> <li>2. Visually inspect the wiring for any physical damage.</li> <li>3. Using a megohmmeter (500 V range), measure the resistance between connector (HV99) terminal of Power Cable (for Generator) (on inverter/converter assembly side) and chassis ground and shield line ground.</li> </ol> |
| <b>Check List</b>                                    | (HV99) U1- chassis ground and shield line ground<br>(HV99) V1- chassis ground and shield line ground<br>(HV99) W1- chassis ground and shield line ground<br><br><b>Are the resistances 100 MΩ or more?</b>                                                                                                                                                                              |
| <b>YES</b>                                           | Replace the Transmission Assembly.                                                                                                                                                                                                                                                                                                                                                      |
| <b>NO</b>                                            | Replace the Power Cable.                                                                                                                                                                                                                                                                                                                                                                |

### **SERVICE PROCEDURE INFORMATION:**

There have been no changes made to the work procedures. Always refer to the applicable Service Manual and review the full requirements of the repair being performed. The Service Manual procedures contain information critical to performing an effective repair the first time, every time. This includes but is not limited to important SAFETY precautions, proper inspection criteria, necessary special tools, required processes and related one-time-use parts needed for a complete and lasting repair.

### **IMPORTANT REMINDERS:**

- SOA strongly discourages the printing and/or local storage of service information as previously released information and electronic publications may be updated at any time.
- Always check for any open recalls or campaigns anytime a vehicle is in for servicing.
- Always refer to STIS for the latest service information before performing any repairs.