Technical Service Bulletin

SUBJECT:	No:	TSB-23-54-004
DIAGNOSTIC PROCEDURE CORRECTION FOR BATTERY MANAGEMENT UNIT – SERVICE MANUAL REVISION	DATE:	**May 2023**
	MODEL:	**2018-21 Outlander PHEV**

CIRCULATE TO:	[ ] GENERAL MANAGER	[**X**] PARTS MANAGER	[**X**] TECHNICIAN
[**X**] SERVICE ADVISOR	[**X**] SERVICE MANAGER	[**X**] WARRANTY PROCESSOR	[ ] SALES MANAGER

PURPOSE

This TSB provides diagnostic procedure correction for the Battery Management Unit (BMU) in the applicable Service Manual section.

AFFECTED VEHICLES

2018-2021 Outlander PHEV

AFFECTED SERVICE MANUAL

- 2018-2021 Outlander PHEV Service Manual, Group 54

PROCEDURE

Please use the following chart as a guide to replace the indicated pages in the affected Service Manuals, Group 54, Battery Management Unit (BMU) and Main Drive Lithium-Ion Battery Diagnostic Trouble Code Procedures.

Applicable manual	Pub. No.	Applicable Title	Contents
2018 OUTLANDER PHEV Service Manual	MSCD-027B-2018	54Dc BATTERY MANAGEMENT UNIT (BMU) AND MAIN DRIVE LITHIUM-ION BATTERY └ DIAGNOSTIC TROUBLE CODE PROCEDURES<BMU (SUB)> └ DTC P0AA6: LEAK DETECTION, P0AA9: LEAK SNS. DETECTION CIRCUIT SHORT	Attached Sheet 2
2019 OUTLANDER PHEV Service Manual	MSCD-027B-2019	54Dc BATTERY MANAGEMENT UNIT (BMU) AND MAIN DRIVE LITHIUM-ION BATTERY └ DIAGNOSTIC TROUBLE CODE PROCEDURES<BMU (SUB)> └ DTC P0AA8: LEAK SENSOR DETECTION CIRCUIT OPEN	Attached Sheet 3
2020 OUTLANDER PHEV Service Manual	MSCD-027B-2020	54Dc BATTERY MANAGEMENT UNIT (BMU) AND MAIN DRIVE LITHIUM-ION BATTERY └ DIAGNOSTIC TROUBLE CODE PROCEDURES<BMU (SUB)> └ DTC P0AA6: LEAK DETECTION, P0AA9: LEAK SNS. DETECTION CIRCUIT SHORT	Attached Sheet 4
2021 OUTLANDER PHEV Service Manual	MSCD-027B-2021	54Dc BATTERY MANAGEMENT UNIT (BMU) AND MAIN DRIVE LITHIUM-ION BATTERY └ DIAGNOSTIC TROUBLE CODE PROCEDURES<BMU (SUB)> └ DTC P0AA8: LEAK SENSOR DETECTION CIRCUIT OPEN	Attached Sheet 5

FAIL-SAFE AND BACKUP FUNCTION <DTC P0AA6>

- Estimating computing for the current capacity of the battery is not performed.
- Automatic capacity measurement by the tester and smoothing of cell voltage are prohibited.

FAIL-SAFE AND BACKUP FUNCTION <DTC P0AA9>

- Not available

PROBABLE CAUSES

- Decrease of insulation resistance of high voltage system components
- The sub-battery management unit [BMU (SUB)] is failed.
- Malfunction of BMU (SUB) (malfunction of the leakage sensor function inside the ECU)

DIAGNOSIS

Required Special Tools

- MB991658: Test harness

⚠ ***DANGER***

When high voltage system components are serviced, be sure to pull service plugs to shut down high voltage.

⚠ ***DANGER***

When pulling service plugs, wear the specified protective equipment.

<Incorrect>

STEP 1. Using scan tool (M.U.T.-IIISE), check whether the DTC is set. <DTC P0AA9>
Check whether the DTC P0AA6 is set.

Q: Is the DTC set?

YES : Perform the troubleshooting.
NO : Go to Step 2.

<Correct>

STEP 1. Using scan tool (M.U.T.-IIISE), check whether the DTC is set.
Is only either one of DTC No. P0AA6 and No. P0AA9 set?
Q:Is the DTC set?
YES : Go to Step 1-1.
NO : Go to Step 2.

STEP 1-1. Using scan tool (M.U.T.-IIISE), check whether the DTC is set.
Check whether the DTC No. P0AA6 or No. P0AA9 is set.
・Wait 20 seconds after turning ON the power supply mode of electric motor switch.
・Ready indicator is illuminated.
Q:Is the DTC set?
YES : Go to Step 2.
NO : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions).

STEP 2. Using scan tool (M.U.T.-IIISE), read the DTC.
(1) Turn on the power supply mode of the electric motor switch.
(2) Wait 20 seconds.
(3) Selector lever position indicator: P

NOTE: If the DTC is set with the power supply mode of electric motor switch turned ON, an electric leak could occur inside the main drive lithium-ion battery.

Q: Is the DTC set?

YES : Go to Step 3.
NO : Go to Step 10.

Attached sheet 3

FAIL-SAFE AND BACKUP FUNCTION

- Not available

PROBABLE CAUSES

- Ground fault of high voltage system component.
- The main drive lithium-ion battery ground fault detector failed.
- Open circuits of main drive lithium-ion battery ground fault detector circuit, short circuits to ground, short circuits to power supply system or damage; poor contact of connector.
- The sub-battery management unit [BMU (SUB)] is failed.

DIAGNOSIS

Required Special Tools

- MB991658: Test harness

⚠ ***DANGER***

When pulling service plugs, wear the specified protective equipment.

STEP 1. Using scan tool (M.U.T.-IIISE), check whether the DTC is set.

Check whether the DTC P0AA6 is set.

Q: Is the DTC set?

YES : Perform the troubleshooting.

NO : Go to Step 2. <Incorrect> 1-1. <Correct>

STEP 2. Measure the resistance at main drive lithium-ion battery connector.

(1) Disconnect the connector No.D-34, and measure at the wiring harness side.

(2) Check the resistance between the main drive lithium-ion battery connector No.D-34 (terminal No.6) and body ground.

OK: Continuity (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the connector(s) or wiring harness. Then go to Step 6.

STEP 1-1. Using scan tool (M.U.T.-IIISE), check whether the DTC P0AA8 is set.

Check whether the DTC P0AA8 is set.

Q:Is the DTC set?

YES : Go to Step 2.

NO : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions).

<Added>

FAIL-SAFE AND BACKUP FUNCTION <DTC P0AA6>

- Estimating computing for the current capacity of the battery is not performed.
- Automatic capacity measurement by the tester and smoothing of cell voltage are prohibited.

FAIL-SAFE AND BACKUP FUNCTION <DTC P0AA9>

- Not available

PROBABLE CAUSES

- Decrease of insulation resistance of high voltage system components
- The sub-battery management unit [BMU (SUB)] is failed.
- Malfunction of BMU (SUB) (malfunction of the leakage sensor function inside the ECU)

DIAGNOSIS

Required Special Tools

- MB991223: Wiring harness set
- MB992006: Extra fine probe
- MB992355: Electric insulation tester

⚠ DANGER

When high voltage system components are serviced, be sure to pull service plugs to shut down high voltage.

⚠ DANGER

When pulling service plugs, wear the specified protective equipment.

<Incorrect>

<Correct> **STEP 1-2.**

STEP 1. Using scan tool (M.U.T.-IIISE), check whether the other DTC is set.

Q: Is the DTC related to PHEV-ECU system set?

YES : Check PHEV-ECU system (Refer to GROUP 54Da - Diagnostic Trouble Code Chart).

NO : Go to Step 2.

STEP 2. Using scan tool (M.U.T.-IIISE), check whether the other DTC is set.

Q: Is the DTC related to A/C compressor or electric heater-ECU system set?

YES : Check A/C-ECU system (Refer to GROUP 55 - Troubleshooting - Diagnostic Trouble Code Chart <A/C compressor>, <Electric heater-ECU>).

NO : Go to Step 3.

<Added>

STEP 1. Using scan tool (M.U.T.-IIISE), check whether the DTC is set.

Is only either one of DTC No. P0AA6 and No. P0AA9 set?

Q:Is the DTC set?

・Wait 20 seconds after turning ON the power supply mode of electric motor switch.

・Ready indicator is illuminated

YES : Go to Step 1-1.

NO : Go to Step 1-2.

STEP 1-1. Using scan tool (M.U.T.-IIISE), check whether the DTC is set.

Q:Check if the DTC is set in the PHEV-ECU.

YES : Go to Step 1-2.

NO : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions).

Attached sheet 5

Check Conditions
- BMU (SUB) power supply voltage is 8 volts to 16 volts.
- Time after above conditions satisfy is more than 3.5 seconds.
- Precheck signal status is on.

Judgment Criterion
- Isolation counter 1 is less than 2 times for 25.4 seconds.

OBD-II DRIVE CYCLE PATTERN
Refer to OBD-II Drive Cycle - Pattern 1.

FAIL-SAFE AND BACKUP FUNCTION
- Not available

PROBABLE CAUSES
- Ground fault of high voltage system component.
- The main drive lithium-ion battery ground fault detector failed.
- Open circuits of main drive lithium-ion battery ground fault detector circuit, short circuits to ground, short circuits to power supply system or damage; poor contact of connector.
- The sub-battery management unit [BMU (SUB)] is failed.

DIAGNOSIS

Required Special Tools
- MB991658: Test harness

⚠ ***DANGER***
When high voltage system components are serviced, be sure to pull service plugs to shut down high voltage before servicing.

⚠ ***DANGER***
When pulling service plugs, wear the specified protective equipment.

<Correct> **STEP 1-1.**

<Incorrect> ~~**STEP 1.**~~ **Measure the resistance at main drive lithium-ion battery connector.**

(1) Disconnect the D-34 main drive lithium-ion battery connector, and measure at the wiring harness side.
(2) Check the resistance between the D-34 main drive lithium-ion battery connector (terminal No.6) and body ground.

OK: Continuity exist (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the connector(s) or wiring harness. Then go to Step 3.

STEP 1. Using scan tool (M.U.T.-IIISE), check whether the DTC P0AA8 is set.
Check whether the DTC P0AA8 is set.
Q:Is the DTC set?
YES : Go to Step 1-1.
NO : Intermittent malfunction (Refer to GROUP 00 - How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunctions).

<Added>