Technical Service Bulletin

SUBJECT:	No:	TSB-19-54-008
UPDATED DIAGNOSTICS FOR ETACS-ECU DTC U0141, B16A0, & B16A7 - SERVICE MANUAL REVISION	DATE:	March 2019
	MODEL:	See below

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

PURPOSE

This TSB updates the Chassis Electrical section of the affected Service Manuals to update diagnostics for ETACS-ECU CAN timeout diagnostics with DTC U0141.

The change detailed on pages 2 and 3 for DTC U0141 may also apply to the following groups of the affected Service Manuals listed below, all groups containing diagnostics for DTC U0141.

- Group 13-Fuel (Multiport Fuel Injection [MFI])
- Group 17-Engine and Emission Control
- Group 23-Automatic Transmission
- Group 27-Rear Axle
- Group 35-Service Brakes
- Group 36-Parking Brake
- Group 37-Steering
- Group 42-Body (42B-Keyless Operation System [KOS] and 42C-Wireless Control Module [WCM])
- Group 52B-Supplemental Restraint System (SRS)
- Group 55-Heater, Air Conditioning and Ventilation

AFFECTED VEHICLES

- 2008 - 2017 Lancer
- 2008 - 2015 Lancer Evolution
- 2009 - 2017 Lancer Sportback
- 2007 - 2019 Outlander
- 2018 - 2019 Outlander PHEV
- 2011 - 2019 Outlander Sport

AFFECTED SERVICE MANUALS

- 2008 - 2017 Lancer Service Manual, Group 54-Chassis Electrical
- 2008 - 2015 Lancer Evolution Service Manual, Group 54-Chassis Electrical
- 2009 - 2017 Lancer Sportback Service Manual, Group 54-Chassis Electrical
- 2007 - 2019 Outlander Service Manual, Group 54-Chassis Electrical
- 2018 - 2019 Outlander PHEV Service Manual, Group 54-Chassis Electrical
- 2011 - 2019 Outlander Sport Service Manual, Group 54-Chassis Electrical

Continued

Please make the indicated changes below to Group 54-Chassis Electrical -> 54A -> Combination Meter -> Diagnostic Trouble Code Procedures -> DTC U0141: ETACS CAN timeout, in the following Service Manuals:

- 2008 - 2017 Lancer
- 2008 - 2015 Lancer Evolution
- 2009 - 2017 Lancer Sportback
- 2007 - 2019 Outlander
- 2011 - 2019 Outlander Sport

DTC U0141: ETACS CAN timeout

⚠ CAUTION

- **If the DTC No. U0141 stored, be sure to diagnose the CAN bus line.**
- **Before replacing the ECU or combination meter, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.**
- **When the ETACS-ECU of vehicles without KOS is replaced, the encrypted code of the ignition key needs to be registered to the ETACS-ECU. (If the encrypted code is not registered, the engine cannot be started. Register the encrypted code as described in Immobilizer System – How to Register Key ID .)**

DIAGNOSTIC FUNCTION

If the signal from ETACS-ECU cannot be received, the combination meter sets DTC No. U0141.

JUDGMENT CRITERIA

With the ignition switch is at ON position, DTC No. U1190 is not stored and DTC No. U1195 is not stored, if the communication with ETACS-ECU cannot be established for 2500 ms or more, the combination meter determines that a problem has occurred.

TROUBLESHOOTING HINTS

- The CAN bus line may be defective.
- The combination meter may be defective.
- The ETACS-ECU may be defective.

DIAGNOSIS

STEP 1. Using scan tool (M.U.T.-III), diagnose the CAN bus line

⚠ CAUTION

To prevent damage to scan tool (M.U.T.-III), always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool (M.U.T.-III).

(1) Connect scan tool (M.U.T.-III). Refer to "How to connect the Scan Tool (M.U.T.-III) ."
(2) Turn the ignition switch to the "ON" position.
(3) Diagnose the CAN bus line.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the CAN bus line found to be normal?
YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis).

STEP 2. Using scan tool (M.U.T.-III), read the ETACS diagnostic trouble code

Check if DTC is stored in the ETACS-ECU.

Q: Is the DTC stored?
YES : Diagnose the ETACS-ECU (Refer to).
NO : Go to Step 3

STEP 3. Using scan tool (M.U.T.-III), read the KOS diagnostic trouble code.

~~Check if the DTC No. U0141 stored in KOS-ECU.~~ <Incorrect>

Q: Is the DTC stored?
YES : Go to Step 4.
NO : Go to Step 5.

<Correct>
Check whether an ETACS "time-out" related DTC is set in other ECUs (Refer to GROUP 54C – CAN-Related DTC Table).

Please make the indicated changes below to the 2018 - 2019 Outlander PHEV Service Manual, Group 54-Chassis Electrical -> 54A, in the following areas:

- Combination Meter -> Diagnostic Trouble Code Procedures -> DTC U0141: ETACS CAN timeout.
- Multi Around Monitor -> Diagnostic Trouble Code Procedures -> DTC U0141: ETACS CAN timeout.
- Smartphone Link Display Audio -> Diagnostic Trouble Code Procedures -> DTC U0141: ETACS CAN timeout.
- Mitsubishi Remote Control -> Diagnostic Trouble Code Procedures -> DTC U0141: ETACS CAN timeout.
- Blind Spot Warning (BSW)/Rear Cross Traffic Alert (RCTA) -> Diagnostic Trouble Code Procedures -> DTC U0141: ETACS CAN timeout.

DTC U0141: ETACS CAN timeout

⚠ CAUTION

- **If DTC No. U0141 is set, be sure to diagnose the CAN bus line.**
- **Before replacing the ECU or combination meter, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.**

DIAGNOSTIC FUNCTION

If the signal from ETACS-ECU cannot be received, the combination meter sets DTC No. U0141.

DTC SET CONDITIONS

With the electric motor switch is at ON position, DTC No. U1190 is not set and DTC No. U1195 is not set, if the communication with ETACS-ECU cannot be established for 2500 ms or more, the combination meter determines that a problem has occurred.

TROUBLESHOOTING HINTS

- The CAN bus line may be defective
- The combination meter may be defective
- The the ETACS-ECU may be defective

DIAGNOSIS

STEP 1. Using scan tool (M.U.T.-IIISE), diagnose the CAN bus line.

⚠ CAUTION

To prevent damage to scan tool (M.U.T.-IIISE), always turn off the power supply mode of the electric motor switch before connecting or disconnecting scan tool (M.U.T.-IIISE).

(1) Connect scan tool (M.U.T.-IIISE). Refer to "How to connect the Scan Tool (M.U.T.-IIISE) P.54A-6."
(2) Press the electric motor switch to turn on the power supply mode.
(3) Diagnose the CAN bus line.
(4) Press the electric motor switch to turn off the power supply mode.

Q: Is the CAN bus line found to be normal?
YES : Go to Step 2.
NO : Repair the CAN bus line (Refer to GROUP 54C, Diagnosis P.54C-12).

STEP 2. Using scan tool (M.U.T.-IIISE), read the other system DTC.

Check if DTC is set in the ETACS-ECU.

Q: Is the DTC set?
YES : Diagnose the ETACS-ECU (Refer to P.54A-433).
NO : Go to Step 3

STEP 3. Using scan tool (M.U.T.-IIISE), read the other system DTC.

<Incorrect>
~~Check if a DTC, which relates to CAN communication-linked systems below, is set.~~
~~Engine control module~~
~~• DTC No.U0141: ETACS CAN timeout~~

Q: Is the DTC set?
YES : Go to Step 4.
NO : Go to Step 5.

<Correct>
Check whether an ETACS "time-out" related DTC is set in other ECUs (Refer to GROUP 54C - CAN-Related DTC Table).

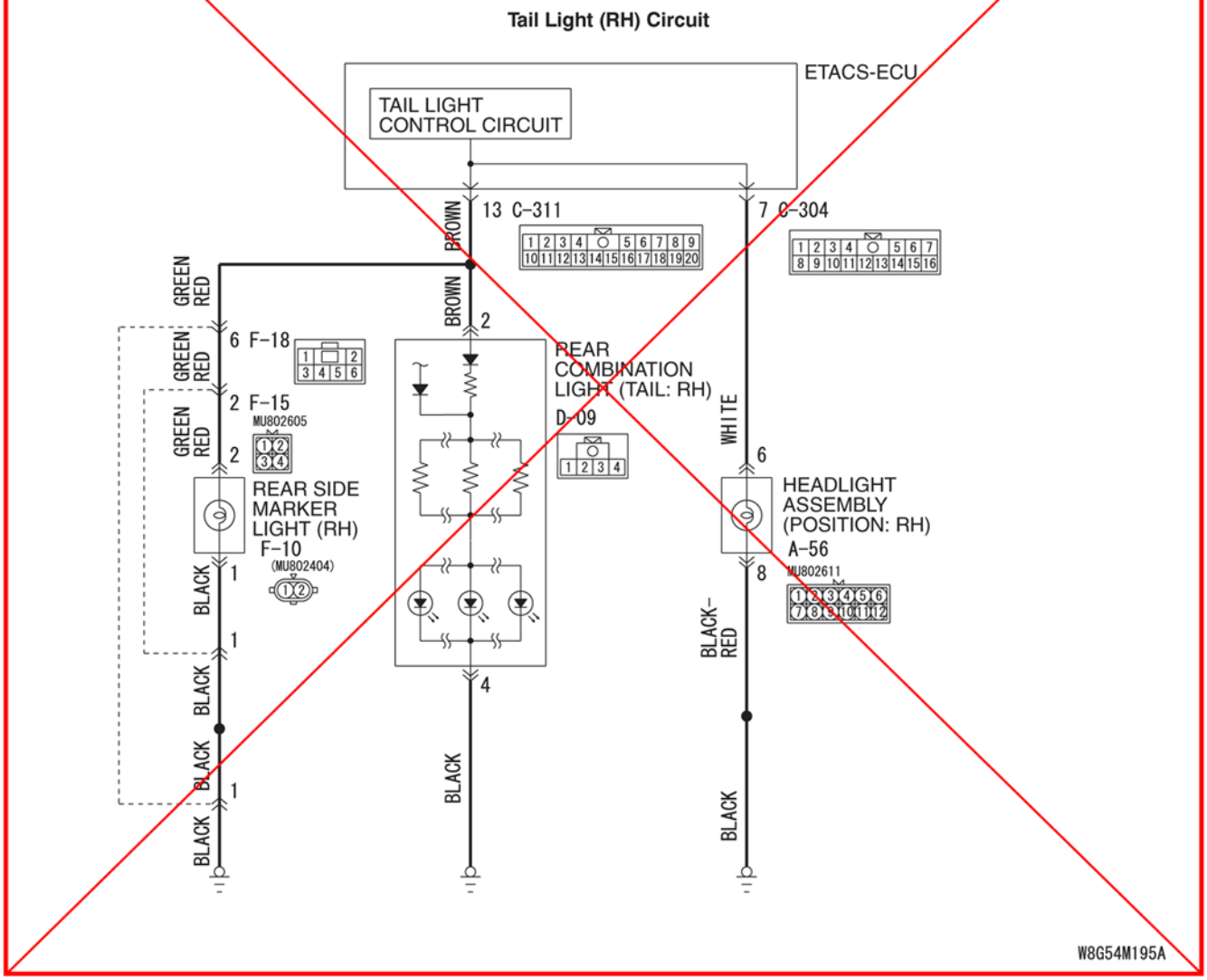
Please **replace** the "Incorrect" pages below with the "Correct" pages that follow, in Group 54-Chassis Electrical -> 54A -> Rear Combination Light -> Diagnostic Trouble Code Procedures -> DTC B16A0 and DTC B16A7, in the following Service Manuals:

- 2007 - 2013 Outlander
- 2011 - 2019 Outlander Sport

NOTE: Due to a design change, DTC B16A0 does not appear in 2012 MY and newer Outlander Sport Service Manuals.

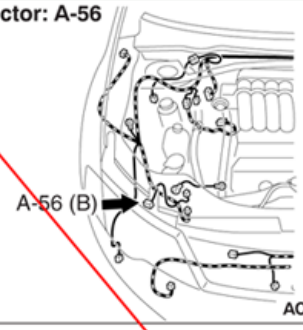
<Incorrect>

DTC B16A0: Taillight (RH) circuit open <Open circuit in the position light (RH) circuit, rear side marker light (RH) circuit and the taillight (RH) circuit>
DTC B16A7: Taillight (RH) circuit short <Short circuit in the position light (RH) circuit, rear side marker light (RH) circuit or the taillight (RH) circuit>



<Incorrect>

Connector: A-56



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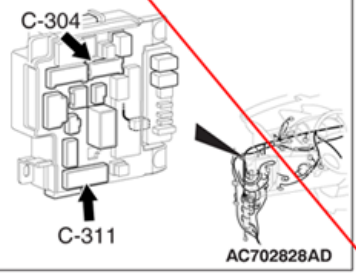
Connectors: C-304, C-311



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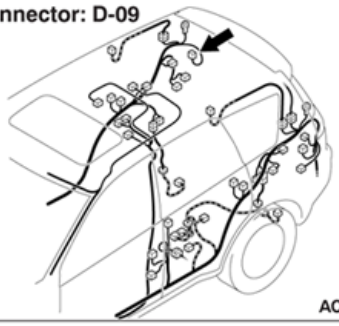
Connector: D-09



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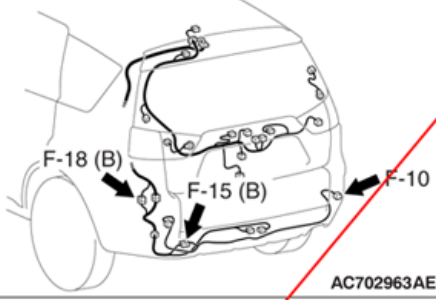
Connectors: F-10, F-15, F-18



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TROUBLE JUDGMENT

When an open circuit is detected in the taillight circuit, the ETACS-ECU sets DTC B16A0. If a short circuit is detected, DTC B16A7 is set.

TECHNICAL DESCRIPTION (COMMENT)

The problem detection of taillight is made based on the digital feed back signal (input signal to ETACS-ECU) which operates the taillight. When the ignition switch is "ON", the ETACS-ECU determines the taillight circuit state from the load placed on the line. After 100 ms has elapsed since the start of the check, the ETACS-ECU performs a sampling with each 10 ms. If an abnormality is detected, it increases the counter by 2, and when no abnormality is detected, it decreases the counter by 1. Once the counter reaches "10", the ETACS-ECU sets the DTC B16A0 if the load is detected on the line, and sets the DTC B16A7 if no load is detected.

TROUBLESHOOTING HINTS

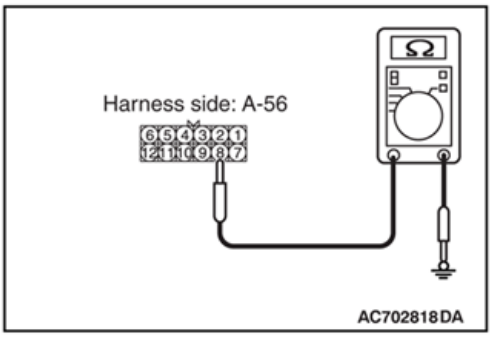
- Malfunction of bulbs
- Malfunction of rear combination light unit (RH)
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- Malfunction of the ETACS-ECU

DIAGNOSIS

Required Special Tools:

- MB992006: Extra fine probe
- MB991223: Harness set
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A (Vehicles with CAN communication system)

<Incorrect>



STEP 1. Bulb check.
Check the bulb of the light that does not illuminate.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Replace the bulb of the light that does not illuminate.

STEP 2. Check headlight assembly (RH) connector A-56 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is headlight assembly (RH) connector A-56 in good condition?

YES : Go to Step 3.
NO : Repair the damaged parts.

STEP 3. Resistance measurement at headlight assembly (RH) connector A-56.
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between headlight assembly (RH) connector A-56 (terminal No. 8) and the body ground.

The measured value should be continuity exists (2 Ω or less).

Q: Does the measured resistance value correspond with this range?

YES : Go to Step 5.
NO : Go to Step 4.

STEP 4. Check the wiring harness between headlight assembly (RH) connector A-56 (terminal No. 8) and ground.
Check the ground line for open circuit.

Q: Is the wiring harness between headlight assembly (RH) connector A-56 (terminal No. 8) and ground in good condition?

YES : Go to Step 17.
NO : Repair the wiring harness.

STEP 5. Check ETACS-ECU connectors C-304 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is ETACS-ECU connectors C-304 in good condition?

YES : Go to Step 6.
NO : Repair the damaged parts.

<Incorrect>

STEP 6. Check the wiring harness between headlight assembly (RH) A-56 connector (terminal No. 6) and ETACS-ECU connector C-304 (terminal No. 7).
Check the communication line for open or short circuit.

Q: Is the wiring harness between headlight assembly (RH) A-56 connector (terminal No. 6) and ETACS-ECU connector C-304 (terminal No. 7) in good condition?

YES : Go to Step 7.
NO : Repair the wiring harness.

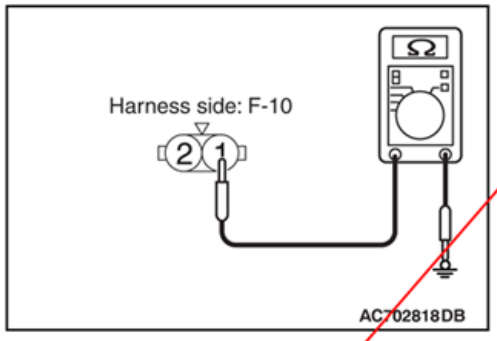
STEP 7. Check rear side marker light (RH) connector F-10 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is rear side marker light (RH) connector F-10 in good condition?

YES : Go to Step 8.
NO : Repair the damaged parts.

STEP 8. Resistance measurement at rear side marker light (RH) connector F-10.
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between rear side marker light (RH) connector F-10 (terminal No. 1) and the body ground.

The measured value should be continuity exists (2 Ω or less).



Q: Does the measured resistance value correspond with this range?

YES : Go to Step 10.
NO : Go to Step 9.

STEP 9. Check the wiring harness between rear side marker light (RH) connector F-10 (terminal No. 1) and ground.
Check the ground line for open circuit.

NOTE: Before the wiring harness check, check the F-15, F-18 and repair that if necessary.

Q: Is the wiring harness between rear side marker light (RH) connector F-10 (terminal No. 1) and ground in good condition?

YES : Go to Step 17.
NO : Repair the wiring harness.

<Incorrect>

STEP 10. Check ETACS-ECU connectors C-311 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is ETACS-ECU connectors C-311 in good condition?

YES : Go to Step 11.
NO : Repair the damaged parts.

STEP 11. Check the wiring harness between rear side marker light (RH) F-10 connector (terminal No. 2) and ETACS-ECU connector C-311 (terminal No. 13).

Check the communication line for open or short circuit.

NOTE: Before the wiring harness check, check the F-15, F-18 and repair that if necessary.

Q: Is the wiring harness between rear side marker light (RH) F-10 connector (terminal No. 2) and ETACS-ECU connector C-311 (terminal No. 13) in good condition?

YES : Go to Step 12.
NO : Repair the wiring harness.

STEP 12. Check rear combination light (RH) connector D-09 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is combination light (RH) connector D-09 in good condition?

YES : Go to Step 13.
NO : Repair the damaged parts.

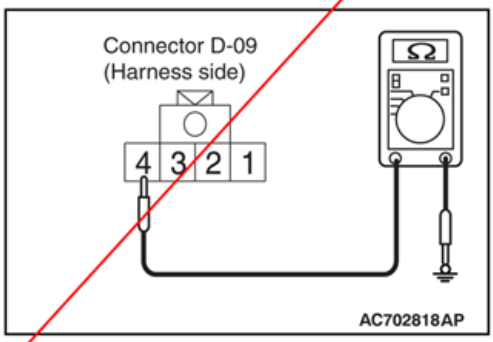
STEP 13. Resistance measurement at rear combination light (RH) connector D-09.

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between rear combination light (RH) connector D-09 (terminal No. 4) and the body ground.

The measured value should be continuity exists (2 Ω or less).

Q: Does the measured resistance value correspond with this range?

YES : Go to Step 15.
NO : Go to Step 14.



<Incorrect>

STEP 14. Check the wiring harness between rear combination light (RH) connector D-09 (terminal No. 4) and ground.
Check the ground line for open circuit.

Q: Is the wiring harness between rear combination light (RH) connector D-09 (terminal No. 4) and ground in good condition?

YES : Go to Step 17.
NO : Repair the wiring harness.

STEP 15. Check ETACS-ECU connectors C-311 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Is ETACS-ECU connectors C-311 in good condition?

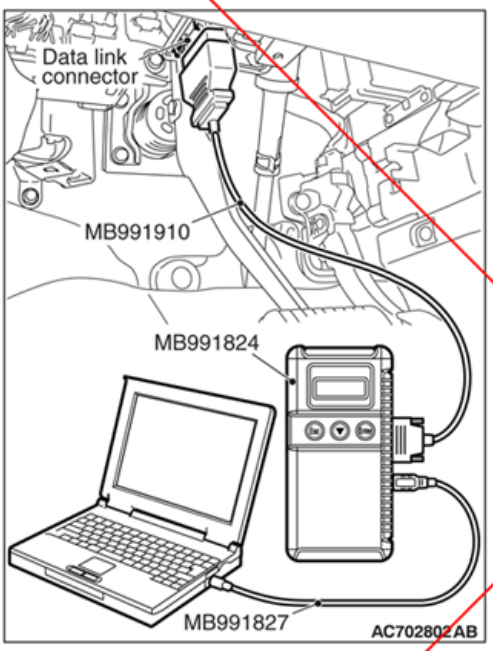
YES : Go to Step 16.
NO : Repair the damaged parts.

STEP 16. Check the wiring harness between rear combination light (RH) D-09 connector (terminal No. 2) and ETACS-ECU connector C-311 (terminal No. 13).
Check the communication line for open or short circuit.

Q: Is the wiring harness between rear combination light (RH) D-09 connector (terminal No. 2) and ETACS-ECU connector C-311 (terminal No. 13) in good condition?

YES : Go to Step 17.
NO : Repair the wiring harness.

<Incorrect>



STEP 17. Using scan tool MB991958, Check whether the diagnostic trouble code is reset.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958. Refer to "How to connect scan tool ."
(2) Turn the ignition switch to the "ON" position.
(3) Erase the DTC.
(4) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(5) Check if DTC is set.

Q: Is the DTC set?

YES : Go to Step 18.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/ inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 18. Substitute a known good rear combination light unit (RH), and Using scan tool MB991958, Check whether the diagnostic trouble code is reset.

(1) Turn the ignition switch to the "ON" position.
(2) Erase the DTC.
(3) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(4) Check if DTC is set.

Q: Is the DTC set?

YES : Replace the ETACS-ECU.
NO : Replace the rear combination light unit (RH).

<Correct>

DTC B16A0: Taillight (RH) circuit open <Open circuit in the taillight control circuit>
DTC B16A7: Taillight (RH) circuit short <Short circuit in the taillight control circuit>

⚠ CAUTION
Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

TROUBLE JUDGMENT
When an open circuit is detected in the following circuit, the ETACS-ECU sets DTC B16A0. If a short circuit is detected, DTC B16A7 is set.
- Taillight
- Side marker light
- Position light
- Glove box light
- Heated seat (illumination circuit in the heated seat switch) <Up to 2016 model year, and vehicles with heated seat>

TECHNICAL DESCRIPTION (COMMENT)
The problem detection of the each light is made based on the digital feed back signal (input signal to ETACS-ECU) which operates the each light. When the ignition switch is "ON", the ETACS-ECU determines the each light circuit state from the load placed on the line. After 100 ms has elapsed since the start of the check, the ETACS-ECU performs a sampling with each 10 ms. If an abnormality is detected, it increases the counter by 2, and when no abnormality is detected, it decreases the counter by 1. Once the counter reaches "10", the ETACS-ECU sets the DTC B16A0 if the load is detected on the line, and sets the DTC B16A7 if no load is detected.

TROUBLESHOOTING HINTS
- The rear combination light unit (RH) may be defective
- The rear side marker light bulb (RH) may be defective <OUTLANDER>
- The rear side marker light unit (RH) may be defective <OUTLANDER>
- The position light bulb (RH) may be defective
- The headlight body may be defective
- The glove box light bulb may be defective
- The heated seat (RH, LH) may be defective <Up to 2016 model year, and vehicles with heated seat>
- The heated seat switch (RH, LH) may be defective <Up to 2016 model year, and vehicles with heated seat>
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The ETACS-ECU may be defective

DIAGNOSIS

Required Special Tools:
- MB992006: Extra fine probe
- MB991223: Harness set

STEP 1. Resistance measurement at the rear combination light (RH) connector (ground terminals).
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the rear combination light (RH) connector (ground terminal) and ground.

OK: The resistance should be 2 ohms or less

Q: Is the check result normal?

YES : Go to Step 3.
NO : Go to Step 2.

STEP 2. Check of open circuit in ground lines between the rear combination light (RH) connector and ground.

Q: Is the check result normal?

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

<Correct>

STEP 3. Check of short to power supply and open circuit in power supply lines between the rear combination light (RH) connector and ETACS-ECU connector.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the connector(s) or wiring harness. Then go to Step 4.

STEP 4. Using scan tool (M.U.T.-III), Check whether the diagnostic trouble code is stored again.

⚠ CAUTION
To prevent damage to scan tool (M.U.T.-III), always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool (M.U.T.-III).

(1) Connect scan tool (M.U.T.-III). Refer to "How to connect Scan Tool (M.U.T.-III)."
(2) Erase the DTC.
(3) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(4) Check if DTC is stored.

Q: Is the DTC stored?

YES : Go to Step 5.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/ inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 5. Substitute a known good rear combination light unit (RH), and check whether the DTC is stored again.

(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is stored.

Q: Is the DTC stored?

YES <OUTLANDER> : Go to Step 6.
YES <ASX/OUTLANDER SPORT> : Go to Step 12.
NO : Replace the rear combination light unit (RH).

STEP 6. Check the rear side marker light bulb (RH).

Check the continuity at the rear side marker light bulb (RH) to confirm whether it is normal.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Replace the rear side marker light bulb (RH). Then go to Step 7.

<Correct>

STEP 7. Resistance measurement at the rear side marker light (RH) connector (ground terminals).

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the rear side marker light (RH) connector (ground terminal) and ground.

OK: The resistance should be 2 ohms or less

Q: Is the check result normal?

YES : Go to Step 9.
NO : Go to Step 8.

STEP 8. Check of open circuit in ground lines between the rear side marker light (RH) connector and ground.

Q: Is the check result normal?

YES : Go to Step 9.
NO : Repair the connector(s) or wiring harness. Then go to Step 9.

STEP 9. Check of short to power supply and open circuit in power supply lines between the rear side marker light (RH) connector and ETACS-ECU connector.

Q: Is the check result normal?

YES : Go to Step 10.
NO : Repair the connector(s) or wiring harness. Then go to Step 10.

STEP 10. Using scan tool (M.U.T.-III), Check whether the diagnostic trouble code is stored again.

⚠ CAUTION
To prevent damage to scan tool (M.U.T.-III), always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool (M.U.T.-III).

(1) Connect scan tool (M.U.T.-III). Refer to "How to connect Scan Tool (M.U.T.-III)."
(2) Erase the DTC.
(3) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(4) Check if DTC is stored.

Q: Is the DTC stored?

YES : Go to Step 11.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/ inspection Service Points – How to Cope with Intermittent Malfunction).

<Correct>

STEP 11. Substitute a known good rear side marker light unit (RH), and check whether the DTC is stored again.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is stored.

Q: Is the DTC stored?

YES : Go to Step 12.
NO : Replace the rear side marker light unit (RH).

STEP 12. Check the position light bulb (RH).
Check the continuity at the position light bulb (RH) to confirm whether it is normal.

Q: Is the check result normal?

YES : Go to Step 13.
NO : Replace the position light bulb (RH). Then go to Step 13.

STEP 13. Resistance measurement at the headlight assembly (position: RH) connector (ground terminals).
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the headlight assembly (position: RH) connector (ground terminal) and ground.

OK: The resistance should be 2 ohms or less

Q: Is the check result normal?

YES : Go to Step 15.
NO : Go to Step 14.

STEP 14. Check of open circuit in ground lines between the headlight assembly (position: RH) connector and ground.

Q: Is the check result normal?

YES : Go to Step 15.
NO : Repair the connector(s) or wiring harness. Then go to Step 15.

STEP 15. Check of short to power supply and open circuit in power supply lines between the headlight assembly (position: RH) connector and ETACS-ECU connector.

Q: Is the check result normal?

YES : Go to Step 16.
NO : Repair the connector(s) or wiring harness. Then go to Step 16.

<Correct>

STEP 16. Using scan tool (M.U.T.-III), Check whether the DTC is stored again.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is stored.

Q: Is the DTC stored?

YES <Up to 2016 model year, and vehicles with heated seat> : Go to Step 17.
YES <From 2017 model year or vehicles without heated seat> : Go to Step 29.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/ inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 17. Check the continuity of the heated seat (RH) connector.
Check the continuity at the heated seat (RH).

Terminal number	Standard value
1 – 2	Continuity exists (2 ohms or less)

Q: Is the check result normal?

YES : Go to Step 19.
NO : Go to Step 18.

STEP 18. Check the continuity of the heated seat switch (RH) connector.
Refer to GROUP 52A – Front seat assembly – Inspection, continuity test of heated seat switch.

Q: Is the check result normal?

YES : Replace the heated seat (RH). Then go to Step 19.
NO : Replace the heated seat switch (RH). Then go to Step 19.

STEP 19. Resistance measurement at the heated seat (RH) connector (ground terminals).
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the heated seat (RH) connector (ground terminal) and ground.

OK: The resistance should be 2 ohms or less

Q: Is the check result normal?

YES : Go to Step 21.
NO : Go to Step 20.

<Correct>

STEP 20. Check of open circuit in ground lines between the heated seat (RH) connector and ground.

Q: Is the check result normal?

YES : Go to Step 21.
NO : Repair the connector(s) or wiring harness. Then go to Step 21.

STEP 21. Check of short to power supply and open circuit in power supply lines between the heated seat (RH) connector and ETACS-ECU connector.

Q: Is the check result normal?

YES : Go to Step 22.
NO : Repair the connector(s) or wiring harness. Then go to Step 22.

STEP 22. Using scan tool (M.U.T.-III), Check whether the DTC is stored again.

(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is stored.

Q: Is the DTC stored?

YES : Go to Step 23.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/ inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 23. Check the continuity of the heated seat (LH) connector.

Check the continuity at the heated seat (LH).

Terminal number	Standard value
1 – 2	Continuity exists (2 ohms or less)

Q: Is the check result normal?

YES : Go to Step 25.
NO : Go to Step 24.

STEP 24. Check the continuity of the heated seat switch (LH) connector.

Refer to GROUP 52A – Front seat assembly – Inspection, continuity test of heated seat switch.

Q: Is the check result normal?

YES : Replace the heated seat (LH). Then go to Step 25.
NO : Replace the heated seat switch (LH). Then go to Step 25.

<Correct>

STEP 25. Resistance measurement at the heated seat (LH) connector (ground terminals).
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the heated seat (LH) connector (ground terminal) and ground.

OK: The resistance should be 2 ohms or less

Q: Is the check result normal?

YES : Go to Step 27.
NO : Go to Step 26.

STEP 26. Check of open circuit in ground lines between the heated seat (LH) connector and ground.

Q: Is the check result normal?

YES : Go to Step 27.
NO : Repair the connector(s) or wiring harness. Then go to Step 27.

STEP 27. Check of short to power supply and open circuit in power supply lines between the heated seat (LH) connector and ETACS-ECU connector.

Q: Is the check result normal?

YES : Go to Step 28.
NO : Repair the connector(s) or wiring harness. Then go to Step 28.

STEP 28. Using scan tool (M.U.T.-III), Check whether the DTC is stored again.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is stored.

Q: Is the DTC stored?

YES : Go to Step 29.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/ inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 29. Check the glove box light bulb.
Check the continuity at the glove box light bulb to confirm whether it is normal.

Q: Is the check result normal?

YES : Go to Step 30.
NO : Replace the glove box light bulb. Then go to Step 30.

<Correct>

STEP 30. Check of short to power supply and open circuit in power supply lines between the glove box light connector and ETACS-ECU connector.

Q: Is the check result normal?

YES : Go to Step 31.
NO : Repair the connector(s) or wiring harness. Then go to Step 31.

STEP 31. Check of open circuit in ground lines between the glove box light connector and ground.

Q: Is the check result normal?

YES : Go to Step 32.
NO : Repair the connector(s) or wiring harness. Then go to Step 32.

STEP 32. Using scan tool (M.U.T.-III), Check whether the DTC is stored again.

(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is stored.

Q: Is the DTC stored?

YES : Replace the ETACS-ECU.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/ inspection Service Points – How to Cope with Intermittent Malfunction).

Please **replace** the "Incorrect" pages below with the "Correct" pages that follow, in Group 54-Chassis Electrical -> 54A -> Rear Combination Light -> Diagnostic Trouble Code Procedures -> DTC B16A7, in the following Service Manuals:

- 2014 - 2019 Outlander

<Incorrect>

DTC B16A7: Taillight(RH) circuit short <Short circuit in the position light (RH) circuit or the taillight (RH) circuit>

⚠ CAUTION
- **Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.**
- **When the ETACS-ECU of vehicles without KOS is replaced, the encrypted code of the ignition key needs to be registered to the ETACS-ECU. (If the encrypted code is not registered, the engine cannot be started. Register the encrypted code as described in Immobilizer System – How to Register Key ID .)**

DIAGNOSTIC FUNCTION
When a short circuit is detected in the position light circuit or the taillight circuit, the ETACS-ECU stores the DTC No. B16A7.

TROUBLE JUDGMENT
The problem detection of taillight is made based on the digital feed back signal (input signal to ETACS-ECU) which operates the taillight. When the ignition switch is ON, the ETACS-ECU determines the taillight circuit state from the load placed on the line. After 100 ms has elapsed since the start of the check, the ETACS-ECU performs a sampling with each 10 ms. If an abnormality is detected, it increases the counter by 2, and when no abnormality is detected, it decreases the counter by 1. Once the counter reaches "10," the ETACS-ECU stores the DTC No. B16A7 if no load is detected.

TROUBLESHOOTING HINTS
- The bulbs may be defective
- The ETACS-ECU may be defective
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

DIAGNOSIS

Required Special Tools:
- MB992006: Extra fine probe
- MB991223: Harness set

STEP 1. Bulb check
Check the bulb(s) of the light that does not illuminate.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Replace the bulb(s) of the light that does not illuminate.

STEP 2. Resistance measurement at the headlight assembly (position/side maker: RH) connector, rear combination light (tail/side maker: RH) connector (ground terminals).
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the connector terminal of light which does not illuminate and ground.
- Measure the resistance between the headlight assembly (position/side maker: RH) connector (ground terminal) and ground.
- Measure the resistance between the rear combination light (tail/side maker: RH) connector (ground terminal) and ground.

OK: The resistance should be 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 4.
NO : Go to Step 3.

STEP 3. Check of open circuit in ground lines between the headlight assembly (position/side maker: RH) connector , rear combination light (tail/side maker: RH) connector and ground.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the connector(s) or wiring harness.

<Incorrect>

STEP 4. Check of short to power supply, short to ground, and open circuit in (TAR1, TAR2) lines between the headlight assembly (position/side maker: RH) connector , rear combination light (tail/side maker: RH) connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the connector(s) or wiring harness.

STEP 5. Using scan tool (M.U.T.-III), Check whether the diagnostic trouble code is stored again.

⚠ CAUTION
To prevent damage to scan tool (M.U.T.-III), always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool (M.U.T.-III).
(1) Connect scan tool (M.U.T.-III). Refer to "How to connect Scan Tool (M.U.T.-III) ."
(2) Erase the DTC.
(3) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(4) Check if DTC is stored.

Q: Is the DTC stored?
YES : Replace the ETACS-ECU.
NO : The diagnosis is complete.

<Correct>

DTC B16A7: Taillight(RH) circuit short <Short circuit in the taillight control circuit>

⚠ CAUTION
- **Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.**
- **When the ETACS-ECU of vehicles without KOS is replaced, the encrypted code of the ignition key needs to be registered to the ETACS-ECU. (If the encrypted code is not registered, the engine cannot be started. Register the encrypted code as described in Immobilizer System – How to Register Key ID.)**

DIAGNOSTIC FUNCTION
When a short circuit is detected in the following circuit, the ETACS-ECU stores the DTC No. B16A7.
- Taillight
- Side marker light
- Position light
- Glove box light
- Floor console box light <From 2017 model year>

TROUBLE JUDGMENT
The problem detection of each light is made based on the digital feed back signal (input signal to ETACS-ECU) which operates the each light. When the ignition switch is ON, the ETACS-ECU determines the each light circuit state from the load placed on the line. After 100 ms has elapsed since the start of the check, the ETACS-ECU performs a sampling with each 10 ms. If an abnormality is detected, it increases the counter by 2, and when no abnormality is detected, it decreases the counter by 1. Once the counter reaches "10," the ETACS-ECU stores the DTC No. B16A7 if no load is detected.

TROUBLESHOOTING HINTS
- The rear combination light bulb (RH) may be defective <Bulb type>
- The rear combination light unit (RH) may be defective
- The position light bulb (RH) may be defective <Bulb type>
- The side marker light bulb (front RH) may be defective
- The headlight body may be defective
- The taillight assembly (RH) may be defective <From 2016 model year>
- The glove box light bulb may be defective
- The floor console box light may be defective <From 2017 model year>
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The ETACS-ECU may be defective

DIAGNOSIS

Required Special Tools:
- MB992006: Extra fine probe
- MB991223: Harness set

STEP 1. Check the rear combination light bulb (RH). <Bulb type>
Check the continuity at the rear combination light bulb (RH) to confirm whether it is normal.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Replace the rear combination light bulb (RH). Then go to Step 2.

STEP 2. Resistance measurement at the rear combination light (tail/side maker: RH) connector (ground terminals).
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the rear combination light (tail/side maker: RH) connector (ground terminal) and ground.
OK: The resistance should be 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 4.
NO : Go to Step 3.

STEP 3. Check of open circuit in ground lines between the rear combination light (tail/side maker: RH) connector and ground.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the connector(s) or wiring harness. Then go to Step 4.

<Correct>

STEP 4. Check of short to power supply and open circuit in (TAR2) lines between the rear combination light (tail/side maker: RH) connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the connector(s) or wiring harness. Then go to Step 5.

STEP 5. Using scan tool (M.U.T.-III), Check whether the diagnostic trouble code is stored again.

⚠ CAUTION
To prevent damage to scan tool (M.U.T.-III), always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool (M.U.T.-III).
(1) Connect scan tool (M.U.T.-III). Refer to "How to connect Scan Tool (M.U.T.-III)."
(2) Erase the DTC.
(3) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(4) Check if DTC is stored.

Q: Is the DTC stored?
YES : Go to Step 6.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 6. Substitute a known good rear combination light unit (RH), and check whether the DTC is stored again.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is stored.

Q: Is the DTC stored?
YES : Go to Step 7.
NO : Replace the rear combination light unit (RH).

STEP 7. Check the position/side marker light bulb (RH).
Check the continuity at the position light bulb (RH) <Bulb type> or side marker light bulb (RH) to confirm whether it is normal.

Q: Is the check result normal?
YES : Go to Step 8.
NO : Replace the position light bulb (RH) <Bulb type> or side marker light bulb (RH). Then go to Step 8.

STEP 8. Resistance measurement at the headlight assembly (position/side maker: RH) connector (ground terminals).
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the headlight assembly (position/side maker: RH) connector (ground terminal) and ground.
OK: The resistance should be 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 10.
NO : Go to Step 9.

STEP 9. Check of open circuit in ground lines between the headlight assembly (position/side maker: RH) connector and ground.

Q: Is the check result normal?
YES : Go to Step 10.
NO : Repair the connector(s) or wiring harness. Then go to Step 10.

STEP 10. Check of short to power supply and open circuit in (TAR1) lines between the headlight assembly (position/side maker: RH) connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 11.
NO : Repair the connector(s) or wiring harness. Then go to Step 11.

<Correct>

STEP 11. Using scan tool (M.U.T.-III), Check whether the DTC is stored again.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is stored.

Q: Is the DTC stored?
YES : Go to Step 12.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 12. Substitute a known good headlight body (RH), and check whether the DTC is stored again.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is stored.

Q: Is the DTC stored?
YES <From 2016 model year> : Go to Step 13.
YES <Up to 2015 model year> : Go to Step 18.
NO : Replace the headlight body (RH).

STEP 13. Resistance measurement at the taillight (RH) connector (ground terminals).
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the taillight (RH) connector (ground terminal) and ground.

OK: The resistance should be 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 15.
NO : Go to Step 14.

STEP 14. Check of open circuit in ground lines between the taillight (RH) connector and ground.

Q: Is the check result normal?
YES : Go to Step 15.
NO : Repair the connector(s) or wiring harness. Then go to Step 15.

STEP 15. Check of short to power supply and open circuit in (TAR2) lines between the taillight (RH) connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 16.
NO : Repair the connector(s) or wiring harness. Then go to Step 16.

STEP 16. Using scan tool (M.U.T.-III), Check whether the DTC is stored again.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is stored.

Q: Is the DTC stored?
YES : Go to Step 17.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 17. Substitute a known good taillight assembly (RH), and check whether the DTC is stored again.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is stored.

Q: Is the DTC stored?
YES : Go to Step 18.
NO : Replace the taillight assembly (RH).

STEP 18. Check the glove box light bulb.
Check the continuity at the glove box light bulb to confirm whether it is normal.

Q: Is the check result normal?
YES : Go to Step 19.
NO : Replace the glove box light bulb. Then go to Step 19.

STEP 19. Check of short to power supply and open circuit in (TAR3) lines between the glove box light connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 20.
NO : Repair the connector(s) or wiring harness. Then go to Step 20.

<Correct>

STEP 20. Check of open circuit in ground lines between the glove box light connector and ground.

Q: Is the check result normal?
YES : Go to Step 21.
NO : Repair the connector(s) or wiring harness. Then go to Step 21.

STEP 21. Using scan tool (M.U.T.-III), Check whether the DTC is stored again.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is stored.

Q: Is the DTC stored?
YES <From 2017 model year> : Go to Step 22.
YES <Up to 2016 model year> : Go to Step 26.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 22. Check the continuity of the floor console box light.
Refer to floor console box light inspection.

Q: Is the check result normal?
YES : Go to Step 23.
NO : Replace the floor console box light. Then go to Step 23.

STEP 23. Resistance measurement at the floor console box light connector (ground terminals).
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the floor console box light connector (ground terminal) and ground.

OK: The resistance should be 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 25.
NO : Go to Step 24.

STEP 24. Check of open circuit in ground lines between the floor console box light connector and ground.

Q: Is the check result normal?
YES : Go to Step 25.
NO : Repair the connector(s) or wiring harness. Then go to Step 25.

STEP 25. Check of short to power supply and open circuit in (TAR3) lines between the floor console box light connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 26.
NO : Repair the connector(s) or wiring harness. Then go to Step 26.

STEP 26. Using scan tool (M.U.T.-III), Check whether the DTC is stored again.
(1) Erase the DTC.
(2) Turn the ignition switch from "LOCK" (OFF) position to "ON" position.
(3) Check if DTC is stored.

Q: Is the DTC stored?
YES : Replace the ETACS-ECU.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).

Please **replace** the "Incorrect" pages below with the "Correct" pages that follow, in the 2018 - 2019 Outlander PHEV Service Manual, Group 54-Chassis Electrical -> 54A -> Rear Combination Light -> Diagnostic Trouble Code Procedures -> DTC B16A7.

DIAGNOSIS

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

M1541402500133

Refer to GROUP 00, How to use Troubleshooting/inspection Service Points, Troubleshooting Contents P.00-8.

DIAGNOSTIC TROUBLE CODE CHART

M1541400200471

⚠ CAUTION

On troubleshooting, if the electric motor switch is turned ON while disconnecting connector(s), DTC(s) associated with other system may be set. On completion, confirm all systems for DTC(s). If DTC(s) are set, erase them all.

DTC No.	Diagnostic item	Reference page
B16A7	Taillight(RH) circuit short <Short circuit in the position light (RH) circuit or the taillight (RH) circuit>	P.54A-143
B16A8	Taillight(LH) circuit short <Short circuit in the position light (LH) circuit, taillight (LH) circuit or the license plate light circuit>	P.54A-146
B1E17	Taillight(RH) deactivated (FET failure)	P.54A-149
B1E18	Taillight(LH) deactivated (FET failure)	P.54A-150
B1E1C	Stoplight Overload or Short Circuit	P.54A-150

DIAGNOSTIC TROUBLE CODE PROCEDURES

<Incorrect>

DTC B16A7: Taillight (RH) circuit short
<Short circuit in the position light (RH) circuit or the taillight (RH) circuit>

⚠ CAUTION

Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

DIAGNOSTIC FUNCTION

When a short circuit is detected in the position light circuit or the taillight circuit, the ETACS-ECU sets DTC No. B16A7.

DTC SET CONDITION

The problem detection of taillight is made based on the digital feedback signal (input signal to ETACS-ECU) which operates the taillight. When the electric motor switch is ON, the ETACS-ECU determines the taillight circuit state from the load placed on the line. After 100 ms has elapsed since the start of the check, the ETACS-ECU performs a sampling with each 10 ms. If an abnormality is detected, it increases the counter by 2, and when no abnormality is detected, it decreases the counter by 1. Once the counter reaches "10," the ETACS-ECU sets DTC No. B16A7 if no load is detected.

TROUBLESHOOTING HINTS

- The headlight assembly (RH) may be defective
- The rear combination light assembly (RH) may be defective
- The taillight assembly (RH) may be defective
- The ETACS-ECU may be defective
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector

DIAGNOSIS

Required Special Tools:

- MB992006: Extra fine probe
- MB991223: Harness set

<Incorrect>

STEP 1. Determine a trouble spot.

Q: Which of light does not work?
Headlight : Go to Step 2.
Rear combination light : Go to Step 7.
Taillight : Go to Step 13.

STEP 2. Resistance measurement at the headlight assembly (position light/side marker light: RH) connector (ground terminal).
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the headlight assembly (position light/side marker light: RH) connector (ground terminal) and ground.

OK: The resistance should be 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 4.
NO : Go to Step 3.

STEP 3. Check of open circuit in ground line between the headlight assembly (position light/side marker light: RH) connector and ground.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the connector(s) or wiring harness.

STEP 4. Check of short to power supply, short to ground, and open circuit in TAR1 line between the headlight assembly (position light/side marker light: RH) connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the connector(s) or wiring harness.

STEP 5. Check whether the DTC is set again.

⚠ CAUTION
To prevent damage to scan tool (M.U.T.-IIISE), always turn off the power supply mode of the electric motor switch before connecting or disconnecting scan tool (M.U.T.-IIISE).
(1) Connect scan tool (M.U.T.-IIISE). Refer to "How to connect Scan Tool (M.U.T.-IIISE) P.54A-6."
(2) Erase the DTC.
(3) Press the electric motor switch to turn the power supply mode from "OFF" to "ON."
(4) Check if DTC is set.

Q: Is the DTC set?
YES : Go to Step 6.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction P.00-17).

STEP 6. Substitute a known good headlight assembly (RH), and check the DTC.
(1) Erase the DTC.
(2) Press the electric motor switch to turn the power supply mode from "OFF" to "ON."
(3) Check if DTC is set.

Q: Is the DTC set?
YES : Replace the ETACS-ECU.
NO : Replace the headlight assembly (RH).

STEP 7. Check the rear combination light socket.
Check the continuity at the rear combination light socket to confirm whether it is normal.

Q: Is the check result normal?
YES : Go to Step 8.
NO : Replace the rear combination light socket (RH).

STEP 8. Resistance measurement at the rear combination light (taillight/side marker light: RH) connector (ground terminal).
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the rear combination light (taillight/side marker light: RH) connector (ground terminal) and ground.

OK: The resistance should be 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 10.
NO : Go to Step 9.

<Incorrect>

STEP 9. Check of open circuit in ground line between the rear combination light (taillight/side marker light: RH) connector and ground

Q: Is the check result normal?
YES : Go to Step 11.
NO : Repair the connector(s) or wiring harness.

STEP 10. Check of short to power supply, short to ground, and open circuit in TAR2 line between the rear combination light (taillight/side marker light: RH) connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 11.
NO : Repair the connector(s) or wiring harness.

STEP 11. Check whether the DTC is set again.

⚠ CAUTION
To prevent damage to scan tool (M.U.T.-IIISE), always turn off the power supply mode of the electric motor switch before connecting or disconnecting scan tool (M.U.T.-IIISE).

(1) Connect scan tool (M.U.T.-IIISE). Refer to "How to connect Scan Tool (M.U.T.-IIISE) P.54A-6."
(2) Erase the DTC.
(3) Press the electric motor switch to turn the power supply mode from "OFF" to "ON."
(4) Check if DTC is set.

Q: Is the DTC set?
YES : Go to Step 12.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction P.00-17)

STEP 12. Substitute a known good rear combination light assembly (RH), and check the DTC.

(1) Erase the DTC.
(2) Press the electric motor switch to turn the power supply mode from "OFF" to "ON."
(3) Check if DTC is set.

Q: Is the DTC set?
YES : Replace the ETACS-ECU.
NO : Replace the rear combination light assembly (RH).

STEP 13. Resistance measurement at the taillight (RH) connector (ground terminal).

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the taillight (RH) connector (ground terminal) and the ground.

OK: The resistance should be 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 15.
NO : Go to Step 14.

STEP 14. Check of open circuit in ground lines between the taillight (RH) connector and ground.

Q: Is the check result normal?
YES : Go to Step 16.
NO : Repair the connector(s) or wiring harness.

STEP 15. Check of short to power supply, short to ground, and open circuit in TAR2 line between the taillight (RH) connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 16.
NO : Repair the connector(s) or wiring harness.

STEP 16. Check whether the DTC is set again.

⚠ CAUTION
To prevent damage to scan tool (M.U.T.-IIISE), always turn off the power supply mode of the electric motor switch before connecting or disconnecting scan tool (M.U.T.-IIISE).

(1) Connect scan tool (M.U.T.-IIISE). Refer to "How to connect Scan Tool (M.U.T.-IIISE) P.54A-6."
(2) Erase the DTC.
(3) Press the electric motor switch to turn the power supply mode from "OFF" to "ON."
(4) Check if DTC is set.

Q: Is the DTC set?
YES : Go to Step 17.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction P.00-17).

<Incorrect>

STEP 17. Substitute a known good taillight assembly (RH), and check the DTC.
(1) Erase the DTC.
(2) Press the electric motor switch to turn the power supply mode from "OFF" to "ON."
(3) Check if DTC is set.

Q: Is the DTC set?
YES : Replace the ETACS-ECU.
NO : Replace the taillight assembly (RH).

<Correct>

DTC B16A7: Taillight(RH) circuit short <Short circuit in the taillight control circuit>

⚠ CAUTION

Before replacing the ECU, ensure that the power supply circuit, the ground circuit and the communication circuit are normal.

DIAGNOSTIC FUNCTION

When a short circuit is detected in the following circuit, the ETACS-ECU stores the DTC No. B16A7.

- Taillight
- Side marker light
- Position light
- Glove box light
- Floor console box light <Vehicles with floor console box light>

TROUBLE JUDGMENT

The problem detection of each light is made based on the digital feed back signal (input signal to ETACS-ECU) which operates the each light. When the ignition switch is ON, the ETACS-ECU determines the each light circuit state from the load placed on the line. After 100 ms has elapsed since the start of the check, the ETACS-ECU performs a sampling with each 10 ms. If an abnormality is detected, it increases the counter by 2, and when no abnormality is detected, it decreases the counter by 1. Once the counter reaches "10," the ETACS-ECU stores the DTC No. B16A7 if no load is detected.

TROUBLESHOOTING HINTS

- The rear combination light unit (RH) may be defective
- The side marker light bulb (front RH) may be defective
- The headlight body may be defective
- The taillight assembly (RH) may be defective
- The glove box light bulb may be defective
- The floor console box light may be defective <Vehicles with floor console box light>
- The wiring harness or connectors may have loose, corroded, or damaged terminals, or terminals pushed back in the connector
- The ETACS-ECU may be defective

DIAGNOSIS

Required Special Tools:

- MB992006: Extra fine probe
- MB991223: Harness set

STEP 1. Resistance measurement at the rear combination light (tail/side maker: RH) connector (ground terminals).

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the rear combination light (tail/side maker: RH) connector (ground terminal) and ground.

OK: The resistance should be 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 3.
NO : Go to Step 2.

STEP 2. Check of open circuit in ground lines between the rear combination light (tail/side maker: RH) connector and ground.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the connector(s) or wiring harness. Then go to Step 3.

STEP 3. Check of short to power supply and open circuit in power supply lines between the rear combination light (tail/side maker: RH) connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the connector(s) or wiring harness. Then go to Step 4.

<Correct>

STEP 4. Check whether the DTC is set again.

⚠ CAUTION
To prevent damage to scan tool (M.U.T.-IIISE), always turn off the power supply mode of the electric motor switch before connecting or disconnecting scan tool (M.U.T.-IIISE).

(1) Connect scan tool (M.U.T.-IIISE). Refer to "How to connect Scan Tool (M.U.T.-IIISE)."
(2) Erase the DTC.
(3) Press the electric motor switch to turn the power supply mode from "OFF" to "ON."
(4) Check if DTC is set.

Q: Is the DTC set?
YES : Go to Step 5.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 5. Substitute a known good rear combination light unit (RH), and check the DTC.

(1) Erase the DTC.
(2) Press the electric motor switch to turn the power supply mode from "OFF" to "ON."
(3) Check if DTC is set.

Q: Is the DTC set?
YES : Go to Step 6.
NO : Replace the rear combination light unit (RH).

STEP 6. Check the side marker light bulb (RH).
Check the continuity at the side marker light bulb (RH) to confirm whether it is normal.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Replace the side marker light bulb (RH). Then go to Step 7.

STEP 7. Resistance measurement at the headlight assembly (position/side maker: RH) connector (ground terminals).

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the headlight assembly (position/side maker: RH) connector (ground terminal) and ground.

OK: The resistance should be 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 9.
NO : Go to Step 8.

STEP 8 Check of open circuit in ground lines between the headlight assembly (position/ side maker: RH) connector and ground.

Q: Is the check result normal?
YES : Go to Step 9.
NO : Repair the connector(s) or wiring harness. Then go to Step 9.

STEP 9. Check of short to power supply and open circuit in power supply lines between the headlight assembly (position/side maker: RH) connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 10.
NO : Repair the connector(s) or wiring harness. Then go to Step 10.

STEP 10. Check whether the DTC is set again.

(1) Erase the DTC.
(2) Press the electric motor switch to turn the power supply mode from "OFF" to "ON."
(3) Check if DTC is set.

Q: Is the DTC set?
YES : Go to Step 11.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 11. Substitute a known good headlight body (RH), and check the DTC.

(1) Erase the DTC.
(2) Press the electric motor switch to turn the power supply mode from "OFF" to "ON."
(3) Check if DTC is set.

Q: Is the DTC set?
YES : Go to Step 12.
NO : Replace the headlight body (RH).

<Correct>

STEP 12. Resistance measurement at the taillight (RH) connector (ground terminals).
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the taillight (RH) connector (ground terminal) and ground.

OK: The resistance should be 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 14.
NO : Go to Step 13.

STEP 13. Check of open circuit in ground lines between the taillight (RH) connector and ground.

Q: Is the check result normal?
YES : Go to Step 14.
NO : Repair the connector(s) or wiring harness. Then go to Step 14.

STEP 14. Check of short to power supply and open circuit in power supply lines between the taillight (RH) connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 15.
NO : Repair the connector(s) or wiring harness. Then go to Step 15.

STEP 15. Check whether the DTC is set again.
(1) Erase the DTC.
(2) Press the electric motor switch to turn the power supply mode from "OFF" to "ON."
(3) Check if DTC is set.

Q: Is the DTC set?
YES : Go to Step 16.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).

STEP 16. Substitute a known good taillight assembly (RH), and check the DTC.
(1) Erase the DTC.
(2) Press the electric motor switch to turn the power supply mode from "OFF" to "ON."
(3) Check if DTC is set.

Q: Is the DTC set?
YES : Go to Step 17.
NO : Replace the taillight assembly (RH).

STEP 17. Check the glove box light bulb.
Check the continuity at the glove box light bulb to confirm whether it is normal.

Q: Is the check result normal?
YES : Go to Step 18.
NO : Replace the glove box light bulb. Then go to Step 18.

STEP 18. Check of short to power supply and open circuit in power supply lines between the glove box light connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 19.
NO : Repair the connector(s) or wiring harness. Then go to Step 19.

STEP 19. Check of open circuit in ground lines between the glove box light connector and ground.

Q: Is the check result normal?
YES : Go to Step 20.
NO : Repair the connector(s) or wiring harness. Then go to Step 20.

STEP 20. Check whether the DTC is set again.
(1) Erase the DTC.
(2) Press the electric motor switch to turn the power supply mode from "OFF" to "ON."
(3) Check if DTC is set.

Q: Is the DTC set?
YES <Vehicles with floor console box light> : Go to Step 21.
YES <Vehicles without floor console box light> : Go to Step 25.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).

<Correct>

STEP 21. Check the continuity of the floor console box light.
Refer to floor console box light inspection.

Q: Is the check result normal?
YES : Go to Step 22.
NO : Replace the floor console box light. Then go to Step 22.

STEP 22. Resistance measurement at the floor console box light connector (ground terminals).

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the floor console box light connector (ground terminal) and ground.

OK: The resistance should be 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 24.
NO : Go to Step 23.

STEP 23. Check of open circuit in ground lines between the floor console box light connector and ground.

Q: Is the check result normal?
YES : Go to Step 24.
NO : Repair the connector(s) or wiring harness. Then go to Step 24.

STEP 24. Check of short to power supply and open circuit in (TAR3) lines between the floor console box light connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 25.
NO : Repair the connector(s) or wiring harness. Then go to Step 25.

STEP 25. Check whether the DTC is set again.
(1) Erase the DTC.
(2) Press the electric motor switch to turn the power supply mode from "OFF" to "ON."
(3) Check if DTC is set.

Q: Is the DTC set?
YES : Replace the ETACS-ECU.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to use Troubleshooting/inspection Service Points – How to Cope with Intermittent Malfunction).