



# SERVICE BULLETIN

|                 |            |                   |
|-----------------|------------|-------------------|
| Classification: | Reference: | Date:             |
| EL14-050        | NTB14-102  | November 11, 2014 |

## 2011-2012 LEAF; MIL ON WITH DTC P3141 SET

**APPLIED VEHICLES:** 2011 – 2012 LEAF (ZE0)

### SERVICE INFORMATION

The diagnostic and repair procedures from the Electronic Service Manual (ESM) for DTC P3141 (On-Board Charger) have been amended.

When diagnosing or repairing P3141, please use only the SERVICE PROCEDURE (page 2) from this bulletin unless otherwise directed by this bulletin.

- Refer to the Warranty Flat Rate manual for any Op codes or flat rate times that may apply.

**This procedure is to be performed ONLY by a Master Technician with current LEAF certification.**

**Follow all Warning, Caution, and Danger instructions in the ESM.**

### **DANGER:**

- Touching high voltage components without using the appropriate personal protective equipment will cause electrocution.
- Electric vehicles contain a high voltage battery. There is the risk of electric shock, electric leakage, or similar accidents if the high voltage components and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing this procedure.

### **WARNING:**

- Be sure to remove the service plug in order to disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- The removed service plug must always be carried in a pocket of the responsible worker or placed in the tool box during the procedure to prevent the plug from being connected by mistake.
- Be sure to wear insulating protective equipment consisting of gloves, shoes, a face shield and glasses before beginning work on the high voltage system.
- Never allow workers other than the responsible person to touch the vehicle containing high voltage parts. To keep others from touching the high voltage parts, these parts must be covered with an insulating sheet except when using them.
- Erect the safety barriers around the vehicle to prevent un-authorized personnel from entering high voltage work area.

### **CAUTION:**

- Never turn the vehicle ignition to the READY status with the service plug removed unless otherwise instructed in the ESM. A malfunction may occur if this is not observed.

## SERVICE PROCEDURE

### P3141 ON-BOARD CHARGER

#### Description

If the situation is not improved under the operation of the Charge Insulation Resistance Loss Protection Control, VCM stops charging and detects DTC P3141. For details of the protection control, refer to section [EVC – EC Control System, NORMAL OPERATING CONDITION](#).

#### DTC Logic

##### DTC DETECTION LOGIC

**NOTE:**

If DTC P3141 is displayed with other DTC, first perform the trouble diagnosis for other DTC.

| DTC   | Trouble diagnosis name | DTC detecting condition                                                                                                                                     | Possible cause                                                                                                                                                                                                                                                               |
|-------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| P3141 | ON-BOARD CHARGER       | The Charge Insulation Resistance Loss Protection Control is repeated more than the specified number of times or active for 255 consecutive seconds or more. | <ul style="list-style-type: none"><li>• High voltage harness or connectors</li><li>• Electric compressor</li><li>• PTC elements heater</li><li>• Traction motor</li><li>• On-board charger</li><li>• Li-ion battery</li><li>• DC/DC J/B</li><li>• On-board charger</li></ul> |

##### DTC CONFIRMATION PROCEDURE

#### 1.PERFORM DTC CONFIRMATION PROCEDURE

**NOTE:**

Since this DTC is difficult to be confirmed, check component function to judge the normality.

>> Proceed to "Component Function Check".

#### Component Function Check

#### 1.CHECK OPERATIONAL HISTORY OF CHARGE INSULATION RESISTANCE LOSS PROTECTION CONTROL

**With CONSULT**

1. Turn power switch OFF and wait at least 20 seconds.
2. Turn power switch ON.
3. On the CONSULT screen, select "EV/HEV" >> "DATA MONITOR" >> "PRTCTN CNT OPERAT HIST 1".
4. Check that "0" is indicated.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to "Diagnosis Procedure".

#### Diagnosis Procedure

**WARNING:**

- Because hybrid vehicles and electric vehicles contain a high voltage battery, there is the risk of electric shock, electric leakage, or similar accidents if the high voltage component and vehicle are handled incorrectly. Be sure to follow the correct work procedures when performing inspection and maintenance.
- Be sure to remove the service plug in order to disconnect the high voltage circuits before performing inspection or maintenance of high voltage system harnesses and parts.
- To prevent the removed service plug from being connected by mistake during the procedure, always carry it in your pocket or put it in the tool box.
- Be sure to wear insulating protective equipment consisting of glove, shoes, face shield and glasses before beginning work on the high voltage system.

- Clearly identify the persons responsible for high voltage work and ensure that other persons do not touch the vehicle. When not working, cover high voltage parts with an insulating cover sheet or similar item to prevent other persons from contacting them.
- Refer to [EVC – EC Control System, High Voltage Precautions](#).

**CAUTION:**

- There is the possibility of a malfunction occurring if the vehicle is changed to READY status while the service plug is removed. Therefore do not change the vehicle to READY status unless instructed to do so in the Service Manual.
- Erase DTC after the work is completed.

**NOTE:**

If DTC P3141 is displayed with other DTC, first perform the trouble diagnosis for other DTC.

## 1.IDENTIFY ON BOARD CHARGER DIAGNOSIS OCCURRENCE MODE-I

1. Turn power switch OFF and wait at least 20 seconds.
2. Turn power switch ON.
3. On the CONSULT screen, select “EV/HEV” >> “DATA MONITOR” >> “IR SENSOR SIGNAL P-P”.

Is the indicated value 3,550 mV or less?

YES >> Perform Li-ion battery insulation resistance loss check. Refer to [EVB – EV Battery System, Component Inspection](#).

NO >> GO TO 2.

## 2.IDENTIFY ON BOARD CHARGER DIAGNOSIS OCCURRENCE MODE-II

1. Turn power switch OFF and wait at least 20 seconds.
2. Perform normal charging (charge status indicator is ON) at least 5 minutes.

**CAUTION:**

- Never perform normal charge for 6 minutes or more continuously.
- Never turn ON the power switch or air conditioner while performing normal charge.

3. Turn power switch ON.
4. Check self-diagnostic result in “EV/HEV”.

Is DTC “P3141” detected?

YES >> GO TO 4.

NO >> GO TO 3.

## 3.REPLACE ON-BOARD CHARGER

1. Replace on-board charger. Refer to [VC – Charging System, REMOVAL AND INSTALLATION](#).
2. Turn power switch ON.
3. Erase self-diagnostic result.
4. Turn power switch OFF.
5. Perform normal charge at least 5 minutes.

**CAUTION:**

**Never turn ON the power switch or air conditioner while performing normal charge.**

6. Check that normal charge operates normally.
7. Stop normal charge.
8. Check self-diagnostic result of VCM and On-board charger.

Are any DTC detected?

YES >> Check the DTC. Refer to [EVC – EC Control System, DTC Index](#) (VCM), [VC – Charging System, DTC Index](#) (on-board charger).

NO >> INSPECTION END

## 4.PRECONDITIONING

**WARNING:**

**Disconnect high voltage. Refer to [GI – General Information, How to Disconnect High Voltage](#).**

Check voltage in high voltage circuit. (Check that condenser are discharged.)

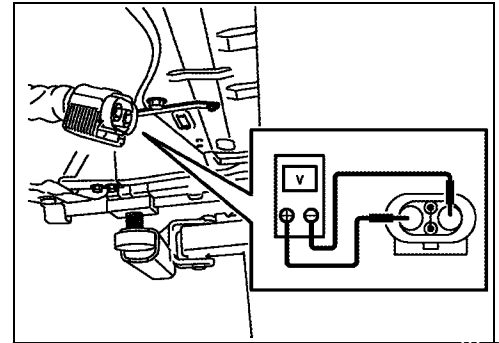
1. Lift up the vehicle and remove the Li-ion battery under covers. Refer to [EVB – EV Battery System, REMOVAL AND INSTALLATION](#).
2. Disconnect high voltage harness connector from front side of Li-ion battery. Refer to [EVB – EV Battery System, REMOVAL AND INSTALLATION](#).

3. Measure voltage between high voltage harness connector terminals.

**DANGER:**



Touching high voltage components without using the appropriate protective equipment will cause electrocution.



Standard

: 5 V or less

**CAUTION:**

For voltage measurements, use a tester which can measure to 500 V or higher.

>> GO TO 5.

## 5.CHECK INSULATION RESISTANCE OF ON-BOARD CHARGER-I

Check insulation resistance of on-board charger. Refer to [VC – Charging System, Component Insulation Resistance Check](#).

**CAUTION:**

- Since testers are polarized, check the polarity of the tester and connect it in the forward direction to the circuit.
- If the inspection results show no continuity, check the parts for proper installation.

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 6.

## 6.CHECK INSULATION RESISTANCE OF ON-BOARD CHARGER-II

1. Disconnect on-board charger high voltage harness connector (H6).
2. Check insulation resistance of on-board charger. Refer to [VC – Charging System, Component Insulation Resistance Check](#).

**CAUTION:**

- Since testers are polarized, check the polarity of the tester and connect it in the forward direction to the circuit.
- If the inspection results show no continuity, check the parts for proper installation.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace on-board charger. Refer to [VC – Charging System, REMOVAL AND INSTALLATION](#).

## 7.CHECK INSULATION RESISTANCE OF HIGH VOLTAGE HARNESS-I

1. Disconnect normal charge port high voltage harness connector (H8).
2. Check the insulation resistance of high voltage harness with an insulation resistance tester (Multi tester), between normal charge port and on-board charger.

**WARNING:**



Unlike the ordinary tester, the insulation resistance tester applies 500 V when measuring. If used incorrectly, there is the danger of electric shock. If used in the vehicle 12V system, there is the danger of damage to electronic devices. Read the insulation resistance tester instruction manual carefully and be sure to work safely.

**CAUTION:**

- Use 500V range of insulation resistance tester to measure insulation resistance.
- Wait for 30 seconds until the value becomes stable.
- If the inspection results show no continuity, check the parts for proper installation.

| +                |          | -      | Resistance      |
|------------------|----------|--------|-----------------|
| On-board charger |          |        |                 |
| Connector        | Terminal |        |                 |
| H6               | 34       | Ground | $\infty \Omega$ |
|                  | 35       |        |                 |
|                  | 36       |        |                 |

Is the inspection result normal?

- YES >> Replace normal charge port. Refer to [VC – Charging System, REMOVAL AND INSTALLATION](#).  
 NO >> Replace high voltage harness.

## 8. CHECK INSULATION RESISTANCE OF HIGH VOLTAGE HARNESS-II

1. Disconnect DC/DC junction box high voltage harness connector (H7).
2. Check the insulation resistance of high voltage harness with an insulation resistance tester (Multi tester), between DC/DC junction box and on-board charger.

### WARNING:



Unlike the ordinary tester, the insulation resistance tester applies 500 V when measuring. If used incorrectly, there is the danger of electric shock. If used in the vehicle 12V system, there is the danger of damage to electronic devices. Read the insulation resistance tester instruction manual carefully and be sure to work safely.

### CAUTION:

- Use 500V range of insulation resistance tester to measure insulation resistance.
- Wait for 30 seconds until the value becomes stable.
- If the inspection results show no continuity, check the parts for proper installation.

| +                |          | -      | Resistance      |
|------------------|----------|--------|-----------------|
| On-board charger |          |        |                 |
| Connector        | Terminal |        |                 |
| H7               | 27       | Ground | $\infty \Omega$ |
|                  | 28       |        |                 |

Is the inspection result normal?

- YES >> GO TO 9.  
 NO >> Replace high voltage harness.

## 9. PRECONDITIONING

### WARNING:

**Disconnect high voltage. Refer to [GI – General Information, How to Disconnect High Voltage](#).**  
 Check voltage in high voltage circuit. (Check that condenser are discharged.)

1. Lift up the vehicle and remove the Li-ion battery under covers. Refer to [EVB – EV Battery System, REMOVAL AND INSTALLATION](#).
2. Disconnect high voltage harness connector from front side of Li-ion battery. Refer to [EVB – EV Battery System, REMOVAL AND INSTALLATION](#).

3. Measure voltage between high voltage harness connector terminals.

**DANGER:**



Touching high voltage components without using the appropriate protective equipment will cause electrocution.

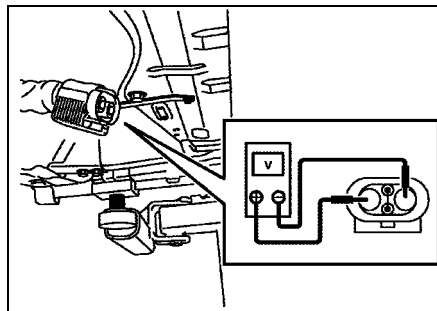


Standard

: 5 V or less

**CAUTION:**

For voltage measurements, use a tester which can measure to 500 V or higher.



>> GO TO 10.

## 10. CHECK INSULATION RESISTANCE OF ELECTRIC COMPRESSOR

Check insulation resistance of electric compressor. Refer to [HAC – Heating & Air Conditioning Control System, Component Inspection](#).

**CAUTION:**

- Since testers are polarized, check the polarity of the tester and connect it in the forward direction to the circuit.
- If the inspection results show no continuity, check the parts for proper installation.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace electric compressor. Refer to [HA – Heating & Air Conditioning System, REMOVAL AND INSTALLATION](#).

## 11. CHECK INSULATION RESISTANCE OF PTC ELEMENTS HEATER

Check insulation resistance of PTC elements heater. Refer to [HAC – Heating & Air Conditioning Control System, Component Inspection](#).

**CAUTION:**

- Since testers are polarized, check the polarity of the tester and connect it in the forward direction to the circuit.
- If the inspection results show no continuity, check the parts for proper installation.

Is the inspection result normal?

YES >> GO TO 12.

NO >> Replace PTC elements heater. Refer to [HA – Heating & Air Conditioning System, REMOVAL AND INSTALLATION](#).

## 12. CHECK INSULATION RESISTANCE OF TRACTION MOTOR INVERTER

Check insulation resistance of traction motor inverter. Refer to [TMS – Traction Motor System, Component Inspection](#).

**CAUTION:**

- Since testers are polarized, check the polarity of the tester and connect it in the forward direction to the circuit.
- If the inspection results show no continuity, check the parts for proper installation.

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace traction motor inverter. Refer to [TMS – Traction Motor System, REMOVAL AND INSTALLATION](#).

## 13. CHECK INSULATION RESISTANCE OF HIGH VOLTAGE HARNESS-III

1. Remove traction motor inverter. Refer to [TMS – Traction Motor System, REMOVAL AND INSTALLATION](#).
2. Remove DC/DC junction box.
3. Check the insulation resistance of high voltage harness with an insulation resistance tester (Multi tester).

**WARNING:**

Unlike the ordinary tester, the insulation resistance tester applies 500 V when measuring. If used incorrectly, there is the danger of electric shock. If used in the vehicle 12V system, there is the danger of damage to electronic devices. Read the insulation resistance tester instruction manual carefully and be sure to work safely.

**CAUTION:**

- Use 500V range of insulation resistance tester to measure insulation resistance.
- Wait for 30 seconds until the value becomes stable.
- If the inspection results show no continuity, check the parts for proper installation.

| Connected to:       | +         |          | -      | Resistance      |
|---------------------|-----------|----------|--------|-----------------|
|                     | Connector | Terminal |        |                 |
| Li-ion battery      | H4        | 24       | Ground | $\infty \Omega$ |
|                     |           | 25       |        |                 |
| Electric compressor | H2        | 18       |        |                 |
|                     |           | 19       |        |                 |
| PTC elements heater | H9        | 30       |        |                 |
|                     |           | 31       |        |                 |

Is the inspection result normal?

YES >> Replace DC/DC junction box. Refer to [EVC – EC Control System, REMOVAL AND INSTALLATION](#).

NO >> Replace high voltage harness.

## 14. REPLACE LITHIUM BATTERY CONTROLLER

1. If inspection results 1-13 do not resolve this DTC, then replace the Lithium Battery Controller. Refer to [EVB – EV Battery System, UNIT DISASSEMBLY AND ASSEMBLY](#).

