



Technical Service Bulletin

SB-10058387-6169

SUBJECT:		No: TSB-15-54-003	
UPDATE FOR DTC P1A15: HIGH VOLTAGE SYSTEM ERROR – SERVICE MANUAL REVISION		DATE: July, 2015	
		MODEL: 2012-13 i-MiEV	
CIRCULATE TO:	<input type="checkbox"/> GENERAL MANAGER	<input checked="" type="checkbox"/> PARTS MANAGER	<input checked="" type="checkbox"/> TECHNICIAN
<input checked="" type="checkbox"/> SERVICE ADVISOR	<input checked="" type="checkbox"/> SERVICE MANAGER	<input type="checkbox"/> WARRANTY PROCESSOR	<input type="checkbox"/> SALES MANAGER

PURPOSE

Information in this TSB replaces the diagnostic procedure for DTC P1A15 High-voltage system error (1). This TSB contains new information only. Old information is not shown.

AFFECTED VEHICLES

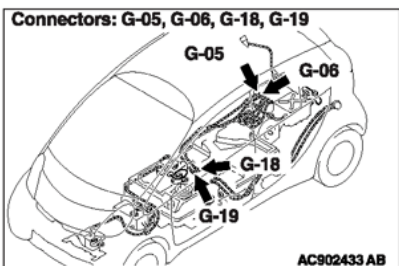
2012-2013 i-MiEV

AFFECTED SERVICE MANUAL

2012-13 i-MiEV Service Manual group 54D Electric Motor Unit and Main Drive Lithium-ion Battery → EV-ECU → Diagnostic Trouble Code Procedures → P1A15 – High-voltage system error (1)

Please replace the current diagnostic procedure in the 2012 i-MiEV Service Manual group 54D Electric Motor Unit and Main Drive Lithium-ion Battery → EV-ECU → Diagnostic Trouble Code Procedures → P1A15 – High-voltage system error (1) with the following information.

**ELECTRIC MOTOR UNIT AND MAIN DRIVE LITHIUM-ION BATTERY
 EV-ECU**



OPERATION

The high-voltage circuit activation and shutdown are controlled by the EV-ECU. The EV-ECU also monitors the voltage of the smooth condenser in the EMCU via the CAN communication.

DTC SET CONDITION

- If the charging time of the smooth condenser in the EMCU reaches the specified time or more when the high-voltage circuit activation, the DTC P1A15 will be stored.

PROBABLE CAUSES

- Damaged wiring harness or connector(s)
- Malfunction of the high-voltage fuse No.1 (Main, 280A) (traction battery assembly)
- Malfunction of the traction battery assembly
- Malfunction of the EMCU
- Malfunction of the EV water PTC heater
- Malfunction of the A/C control unit
- Malfunction of the onboard charger/DC-DC converter
- Malfunction of the A/C compressor

⚠ DANGER

- *When servicing the high voltage system parts, always shut off the high voltage by removing the service plug.*
- *When servicing the high voltage system parts, always wear the protective equipment or armor to measure the high voltage.*

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect DTC may be stored. Prior to this diagnosis, always diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).

DIAGNOSIS

STEP 1. Check diagnostic troubleshooting

Q: Is the troubleshooting of DTC P1A15 check for the first time?

- YES : Go to Step 2.
 NO : Go to Step 4.

STEP 2. Using scan tool MB991958, diagnose the CAN bus lines

Use the scan tool to diagnose the CAN bus lines.

Q: Is the check result normal?

- YES : Go to Step 4.
 NO : Repair the CAN bus line. (Refer to GROUP 54C – CAN Bus Diagnostics Table). Then go to Step 3.

STEP 3. DTC recheck after resetting CAN bus lines

Check again if the DTC P1A15 is stored in the EV-ECU.

- (1) Erase the DTC.
- (2) Set the electric motor switch from the "LOCK" (OFF) position to the "ON", and then to the "START" position temporarily.
- (3) Check if the DTC is stored.

Q: Is the DTC stored?

- YES : Go to Step 4.
 NO : This diagnosis is complete.

<New>

<Added>

When diagnosing the CAN Bus lines using the scan tool according to the EV-ECU troubleshooting procedure, certain DTCs will cause the onboard charger/DC/DC converter and J/C 2 to show up in red. This will mistakenly indicate that there is a problem in the lines between the ECUs even if the CAN Bus lines are normal. Therefore it is unnecessary to diagnose the CAN Bus lines a second time.

ELECTRIC MOTOR UNIT AND MAIN DRIVE LITHIUM-ION BATTERY
EV-ECU

<New>

STEP 4. Use scan tool MB991958 to confirm a diagnostic trouble code of other systems.

Check if the DTC except No. No. P0AA1, P1A17 or P1AF2 is stored in the EV-ECU.

Q: Is the DTC stored?

YES : Carry out troubleshooting for the DTC.

NO : Go to Step 5.

STEP 5. Use scan tool MB991958 to confirm a diagnostic trouble code of other systems.

Check if the DTC is stored in the A/C control unit.

Q: Is the DTC stored?

YES : Carry out troubleshooting for the DTC.

NO : Go to Step 6.

STEP 6. Using scan tool MB991958, check freeze frame (FFD) data

Check the freeze frame data.

Freeze frame data

- Item No. 15 : EMCU: Condenser voltage

OK: 220 V or more

Q: Is the check result normal?

YES : Go to Step 7.

NO : Go to Step 10.

STEP 7. Check whether the DTC is stored again.

⚠ DANGER

Carry out the check on the high-voltage circuit while reading carefully the precautions on handling a high-voltage vehicle.

⚠ DANGER

Wear the specified protection equipment during the check.

Check again if the DTC is stored in the EV-ECU.

(1) Remove the service plug.

⚠ DANGER

Isolate bare wires of the disconnected high-voltage circuit with a plastic tape.

(2) Disconnect the G-21 EV water PTC heater connector.

(3) Installation the service plug.

(4) Set the electric motor switch from the "LOCK" (OFF) position to the "ON", and then to the "START" position temporarily.

(5) Check if the DTC is stored.

Q: Is the DTC stored?

YES : Go to Step 8.

NO : Go to Step 17.

ELECTRIC MOTOR UNIT AND MAIN DRIVE LITHIUM-ION BATTERY
EV-ECU

<New>

STEP 8. Check whether the DTC is stored again.

⚠ DANGER

Carry out the check on the high-voltage circuit while reading carefully the precautions on handling a high-voltage vehicle.

⚠ DANGER

Wear the specified protection equipment during the check.

Check again if the DTC is stored in the EV-ECU.

(1) Remove the service plug.

⚠ DANGER

Isolate bare wires of the disconnected high-voltage circuit with a plastic tape.

(2) Disconnect the G-20 A/C compressor connector.

(3) Installation the service plug.

(4) Set the electric motor switch from the "LOCK" (OFF) position to the "ON", and then to the "START" position temporarily.

(5) Check if the DTC is stored.

Q: Is the DTC stored?

YES : Go to Step 9.

NO : Replace the A/C compressor (Refer to GROUP 55 - A/C Compressor).

STEP 9. Check whether the DTC is stored again.

⚠ DANGER

Carry out the check on the high-voltage circuit while reading carefully the precautions on handling a high-voltage vehicle.

⚠ DANGER

Wear the specified protection equipment during the check.

Check again if the DTC is stored in the EV-ECU.

(1) Remove the service plug.

⚠ DANGER

Isolate bare wires of the disconnected high-voltage circuit with a plastic tape.

(2) Disconnect the G-13 onboard charger/DC-DC converter connector.

(3) Installation the service plug.

(4) Set the electric motor switch from the "LOCK" (OFF) position to the "ON", and then to the "START" position temporarily.

(5) Check if the DTC is stored.

Q: Is the DTC stored?

YES : Replace the inverter. Then go to Step 23.

NO : Replace the onboard charger/DC-DC converter .

ELECTRIC MOTOR UNIT AND MAIN DRIVE LITHIUM-ION BATTERY
EV-ECU

<New>

<Added>

STEP 10. High-voltage fuse No.1 (Main,280A) (traction battery assembly) check
Check the high-voltage fuse No.1 (Main, 280A).

Q: Is the check result normal?
YES : Go to Step 12.
NO : Replace the high-voltage fuse No.1 (Main, 280A).
Then go to Step 11

STEP 11. Using scan tool other systems DTC.
Check if the DTC is stored in the EMCU.

Q: Is the DTC stored?
YES : Carry out troubleshooting for the DTC.
NO : Go to Step 23.

STEP 12. Connector check: G-18, G-19 traction battery connector, G-05, G-06 inverter connector

⚠ DANGER
Carry out the check on the high-voltage circuit while reading carefully the precautions on handling a high-voltage vehicle.

⚠ DANGER
Be sure to wear the specified protective equipment when removing the service plug.

- Check whether terminals are engaged correctly (deformation or discoloration).
- Check whether the terminals are tightened to the specified torque.
- Check whether foreign materials are pinched.

Q: Is the check result normal?
YES : Go to Step 13.
NO : Reconnect the terminals or replace the traction battery cable.

STEP 13. Check the wiring harness between G-05, G-06 inverter connector terminal and G-18, G-19 traction battery connector terminal.

⚠ DANGER
Carry out the check on the high-voltage circuit while reading carefully the precautions on handling a high-voltage vehicle.

⚠ DANGER
Be sure to wear the specified protective equipment when removing the service plug.

Check the high-voltage line for damage.

Q: Is the check result normal?
YES : Go to Step 14.
NO : Replace the traction battery cable.

ELECTRIC MOTOR UNIT AND MAIN DRIVE LITHIUM-ION BATTERY
EV-ECU

<New>

STEP 14. Connector check: C-22 traction battery connector, C-111 EV-ECU connector

Q: Is the check result normal?

YES : Go to Step 15.

NO : Repair the damaged connector

STEP 15. Check the wiring harness between C-111 EV-ECU connector terminal No. 105, 106, 107 and C-22 traction battery connector terminal No. 3, 6, 7.

Check the signal lines, ground line for open.

Q: Is the check result normal?

YES : Go to Step 16.

NO : Repair the wiring harness.

STEP 16. Check on main contactor (+), (-), charging contactor coil resistance of contactor.

Q: Is the check result normal? <Incorrect>

YES : Go to Step 17.

NO : Repair the traction battery assembly.

<Correct>

Replace the traction battery assembly.

STEP 17. Measure the resistance of the G-21 EV water PTC heater connector.

⚠ DANGER

Carry out the check on the high-voltage circuit while reading carefully the precautions on handling a high-voltage vehicle.

⚠ DANGER

Wear the specified protection equipment during the check.

- (1) Remove the service plug.
- (2) Disconnect the G-21 EV water PTC heater connector.
- (3) Measure it on the resistance at the EV water PTC heater side.
- (4) Measure the resistance between the G-21 EV water PTC heater connector terminal No.1 and No.2.

OK: 1 MΩ or more

Q: Is the check result normal?

YES : Go to Step 18.

NO : Check the high-voltage fuse No.3. Replace the EV water PTC heater (Refer to GROUP 55 - EV Water PTC Heater).

ELECTRIC MOTOR UNIT AND MAIN DRIVE LITHIUM-ION BATTERY
EV-ECU

<New>

STEP 18. Measure the resistance at A-113 EV water PTC heater connector.

- (1) Disconnect the A-113 EV water PTC heater connector and measure it on the resistance at the EV water PTC heater side.
- (2) Measure the resistance between the A-113 EV water PTC heater connector terminal No.3, 4, 5 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 19. Check whether the DTC is stored again.

NO : Replace the EV water PTC heater (Refer to GROUP 55 - EV Water PTC Heater).

STEP 19. Measure the resistance at A-113 EV water PTC heater connector.

- (1) Disconnect the A-113 EV water PTC heater connector and measure it on the resistance at the wiring harness side.
- (2) Measure the resistance between the A-113 EV water PTC heater connector terminal No.3, 4, 5 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 22.

NO : Go to Step 20.

STEP 20. Connector check: A-113 EV water PTC heater connector, B-01 joint connector, C-113 A/C control unit connector.

Q: Is the check result normal?

YES : Go to Step 21.

NO : Repair the damaged connector.

STEP 21. Check the wiring harness between A-113 EV water PTC heater connector terminal No. 3, 4, 5 and C-113 A/C control unit connector terminal No. 34, 35, 36.

Check the signal line for short circuit.

Q: Is the check result normal?

YES : Replace the A/C control unit.

NO : Repair the wiring harness.

ELECTRIC MOTOR UNIT AND MAIN DRIVE LITHIUM-ION BATTERY
EV-ECU

<New>

STEP 22. Check whether the DTC is stored again.

Check again if the DTC is stored in the EV-ECU.

- (1) Erase the stored DTC.
- (2) Set the electric motor switch from the "LOCK" (OFF) position to the "ON", and then to the "START" position temporarily.
- (3) Check if the DTC is stored.

Q: Is the DTC stored?

YES : Replace the traction battery assembly.
Then go to Step 23.

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

STEP 23. Check whether the DTC is stored again.

Check again if the DTC is stored in the EV-ECU.

- (1) Erase the stored DTC.
- (2) Set the electric motor switch from the "LOCK" (OFF) position to the "ON", and then to the "START" position temporarily.
- (3) Check if the DTC is stored.

Q: Is the DTC stored?

YES : Return to Step 1.

NO : The diagnosis is complete.

Please replace the current diagnostic procedure in the 2013 i-MiEV Service Manual group 54D Electric Motor Unit and Main Drive Lithium-ion Battery → EV-ECU → Diagnostic Trouble Code Procedures → P1A15 – High-voltage system error (1) with the following information.

**ELECTRIC MOTOR UNIT AND MAIN DRIVE LITHIUM-ION BATTERY
EV-ECU**

STEP 3. Use scan tool MB991958 to confirm a diagnostic trouble code of other systems.
Check if except DTC P0AA1, P1A17 or P1AF2 is stored in the EV-ECU.

Q: Is the DTC stored?

YES : Carry out troubleshooting for the DTC.
NO : Go to Step 4.

STEP 4. Use scan tool MB991958 to confirm a diagnostic trouble code of other systems.
Check if the DTC is stored in the A/C control unit.

Q: Is the DTC stored?

YES : Carry out troubleshooting for the DTC.
NO : Go to Step 5.

STEP 5. Using scan tool MB991958, check freeze frame (FFD) data
Check the freeze frame data.

Freeze frame data

- Item No. 15 : EMCU: Condenser voltage
OK: 220 V or more

Q: Is the check result normal?

YES : Go to Step 6.
NO : Go to Step 9.

<New>

STEP 6. Check whether the DTC is stored again.

⚠ DANGER

Carry out the check on the high-voltage circuit while reading carefully the precautions on handling a high-voltage vehicle.

⚠ DANGER

Wear the specified protection equipment during the check.

Check again if the DTC is stored in the EV-ECU.

(1) Remove the service plug.

⚠ DANGER

Isolate bare wires of the disconnected high-voltage circuit with a plastic tape.

- (2) Disconnect the G-21 EV water PTC heater connector.
- (3) Installation the service plug.
- (4) Set the electric motor switch from the "LOCK" (OFF) position to the "ON", and then to the "START" position temporarily.
- (5) Erase the DTC.
- (6) Check if the DTC is stored.

Q: Is the DTC stored?

YES : Go to Step 7.
NO : Go to Step 16.

ELECTRIC MOTOR UNIT AND MAIN DRIVE LITHIUM-ION BATTERY
EV-ECU

<New>

STEP 7. Check whether the DTC is stored again.

⚠ DANGER

Carry out the check on the high-voltage circuit while reading carefully the precautions on handling a high-voltage vehicle.

⚠ DANGER

Wear the specified protection equipment during the check.

Check again if the DTC is stored in the EV-ECU.

(1) Remove the service plug.

⚠ DANGER

Isolate bare wires of the disconnected high-voltage circuit with a plastic tape.

(2) Disconnect the G-20 A/C compressor connector.

(3) Installation the service plug.

(4) Set the electric motor switch from the "LOCK" (OFF) position to the "ON", and then to the "START" position temporarily.

(5) Erase the stored DTC.

(6) Check if the DTC is stored.

Q: Is the DTC stored?

YES : Go to Step 8.

NO : Replace the A/C compressor (Refer to GROUP 55 - A/C Compressor .).

ELECTRIC MOTOR UNIT AND MAIN DRIVE LITHIUM-ION BATTERY
EV-ECU

<New>

STEP 8. Check whether the DTC is stored again.

⚠ DANGER

Carry out the check on the high-voltage circuit while reading carefully the precautions on handling a high-voltage vehicle.

⚠ DANGER

Wear the specified protection equipment during the check.

Check again if the DTC is stored in the EV-ECU.

(1) Remove the service plug.

⚠ DANGER

Isolate bare wires of the disconnected high-voltage circuit with a plastic tape.

(2) Disconnect the G-24 inverter and on board charger/DC-DC converter combination (+ terminal) connector, G-25 inverter and on board charger/DC-DC converter combination (- terminal) connector.

(3) Installation the service plug.

(4) Set the electric motor switch from the "LOCK" (OFF) position to the "ON", and then to the "START" position temporarily.

(5) Erase the stored DTC.

(6) Check if the DTC is stored.

Q: Is the DTC stored?

YES : Replace the inverter. Then go to Step 22.

NO : Replace the onboard charger/DC-DC converter

STEP 9. High-voltage fuse No.1 (Main,280A) (Main Drive Lithium-ion Battery assembly) check

⚠ DANGER

Carry out the check on the high-voltage circuit while reading carefully the precautions on handling a high-voltage vehicle.

⚠ DANGER

Wear the specified protection equipment during the check.

Check the high-voltage fuse No.1 (Main, 280A).

Q: Is the check result normal?

YES : Go to Step 11.

NO : Replace the high-voltage fuse No.1 (Main, 280A).
Then go to Step 10.

STEP 10. Use scan tool MB991958 to confirm a DTC of other systems.

Check if the DTC is stored in the EMCU.

Q: Is the DTC stored?

YES : Carry out troubleshooting for the DTC.

NO : Go to Step 22.

ELECTRIC MOTOR UNIT AND MAIN DRIVE LITHIUM-ION BATTERY
EV-ECU

STEP 15. Check on main contactor (+), (-), charging contactor coil resistance of contactor.

Q: Is the check result normal?

YES : Go to Step 16.

<Correct> NO : ~~Repair~~ the Main Drive Lithium-ion Battery assembly
Replace <Incorrect>

STEP 16. Measure the resistance of the G-21 EV water PTC heater connector.

⚠ DANGER

Carry out the check on the high-voltage circuit while reading carefully the precautions on handling a high-voltage vehicle.

⚠ DANGER

Wear the specified protection equipment during the check.

- (1) Remove the service plug.
- (2) Disconnect the G-21 EV water PTC heater connector.
- (3) Measure it on the resistance at the EV water PTC heater side.
- (4) Measure the resistance between the G-21 EV water PTC heater connector terminal No.1 and No.2.

OK: 1 MΩ or more

Q: Is the check result normal?

YES : Go to Step 17.

NO : Check the high-voltage fuse No.3
. Replace the EV water PTC heater (Refer to GROUP 55 - EV Water PTC Heater).

STEP 17. Measure the resistance at A-113 EV water PTC heater connector.

- (1) Disconnect the A-113 EV water PTC heater connector and measure it on the resistance at the EV water PTC heater side.
- (2) Measure the resistance between the A-113 EV water PTC heater connector terminal No.3, 4, 5 and the body ground.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 18.

NO : Replace the EV water PTC heater (Refer to GROUP 55 - EV Water PTC Heater).