

# **SUBJECT: BMS DTC P0A95-00 Pack Main Fuse is Broken**

## **Vehicle Model: ZS EV**

### **Description of Situation**

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The vehicle can't start/go into READY mode, or the high voltage system of the vehicle automatically shut off while driving, and a warning with "Vehicle Control System Fault" is active.

Active MIL:



Fault symptoms:

- Vehicle can't go into READY mode
- The high voltage system of the vehicle automatically shut off while driving
- Fault codes P0A95-00, P0AFA-00, P1E94-00 are confirmed in the BMS
- Fault code P1B07-00 is confirmed in the VCU

### **Related Vehicle**

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MG ZS EV

### **Cause**

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Internal short circuit in the PEB unit.

### **Operation**

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1. Erase all DTC's and try to start the vehicle again;
2. Confirm that the vehicle still fails to start;
3. Confirm that DTC P0A95-00, P0AFA-00, P1E94-00 is still active in the BMS;
4. Confirm that DTC P1B07-00 is still active in the VCU;
5. Put the vehicle in safe state. Measure the insulation resistance of high voltage system according to the following instructions:

## 5-1. Preparations before measurements:

- 1) Please turn off the ignition switch and wait for 5 minutes.
- 2) Wear insulating protective equipment and use an insulating mat



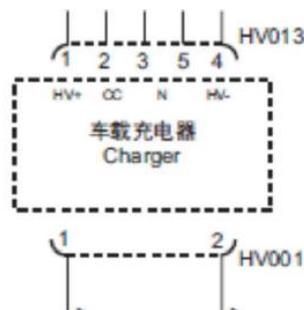
- 3) Disconnect the negative pole of the battery and wait for 10 minutes
- 4) Disconnect Manual Maintenance Switch (MSD) and wait for 10 minutes



- 5) Make sure that you have an insulation meter and you using the 1000V test function
- 6) **Only EV qualified persons can perform the following measurements!**

## 5-2. OBC Insulation Resistance Measurement

- 1) Disconnect ESS connectors on OBC
- 2) Short the OBC terminals
- 3) Connect the red probe with the shorted wire and the black probe with the shell
- 4) Measure with 1000V gear and wait 10 seconds. The resistance should be around 11GΩ



## 5-3. ESS Insulation Resistance Measurement

- 1) Remove the cover of the PDU and disconnect the main positive and negative terminals of ESS
- 2) Connect the red probe with the main positive and negative connectors, and the black probe with the shell
- 3) Always check first if there is no voltage on the terminals of the EDM!
- 3) Measure with 500V gear and wait 10 seconds. The resistance should be about >500 MΩ



## 5-4. PEB (Including DCDC) Insulation Resistance Measurement

- 1) Disconnect U, V, W three-phase connectors of EDU
- 2) Short U, V and W three-phase terminals with short wiring
- 3) Connect the red probe with U, V, W three-phase terminal short connection, black probe with the shell
- 4) Measure with 1000V gear and wait 10 seconds. The resistance is about 5.5M $\Omega$



- 5) Disconnect PEB T+ and T- connectors
- 6) Short T+ and T- terminal with short connection
- 7) Red probe T+ and T-terminal short connection, black probe shell
- 8) Measure with 1000V gear and wait 10 seconds. The resistance is about 5.5M $\Omega$



## 5-5. TM motor Insulation Resistance Measurement

- 1) Disconnect U, V, W three-phase connectors of EDU
- 2) The red probe takes one of the phases of U/V/W and connect the black probe on the shell.
- 3) The resistance value should be equal to  $11\text{G}\Omega$  after waiting 10 seconds for  $1000\text{V}$  measurement.



The resistance between any two phases is  $0.03\Omega$ .

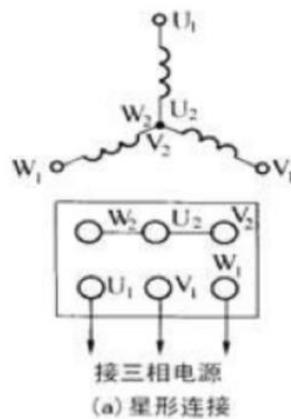
The measured data are as follows:

Resistance between U and V phases:  $0.03\Omega$

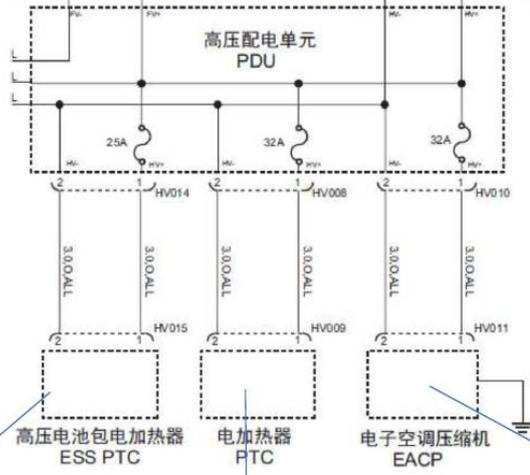
Resistance between V and W phases:  $0.03\Omega$

Resistance between W and U phases:  $0.03\Omega$

When the motor rotates, the measured waveform between any two phases is  $420\text{V}$  square wave signal.



## 5-6. EACP/PTC and ESS PTC Insulation Resistance Measurement



6. The inconsistency between measured values and the values in the following table indicates failures of the high voltage system, such as short circuit, open circuit.

Object	Red Probe	Black Probe	Value
TM	One of the phases of U/V/W	Shell	11GΩ
PEB	U/V/W Short Connection	Shell	5.5MΩ
PEB	T+/T- Short Connection	Shell	5.5MΩ
ESS	+ pole of the EDM	Tray of HV battery	>500MΩ
EACP	Positive/Negative Connection	Short Shell	384MΩ
ESS PTC	Positive/Negative Connection	Short Shell	11GΩ
PTC	Positive/Negative Connection	Short Shell	11GΩ
OBC	High Voltage Terminal Connection	Short Shell	11GΩ
High Voltage wiring harness	High Voltage Wire Harness End	Shell	11GΩ

7. Report the results of the HV insulation resistance measurement in SNW system with diagnose reports generated by VDS before and after the clearance of DTC's.