
Vehicle Electrification System Standards

III. High Voltage Vehicle Safety Systems

III.e High Voltage Isolation Fault Detection Systems

OEM Acronyms:

Iso Fault

Description:

The high voltage isolation fault system continually monitors the vehicle chassis while the high voltage system is in operation to measure how much high voltage energy is leaking to the chassis. The monitoring system can use a DC electronic method to measure high voltage DC resistance to the chassis while the vehicle is in operation or an AC electronic method to measure the high voltage system impedance to the chassis after the vehicle has been powered OFF.

Outcome (Goal):

Students will verify that the isolation fault circuit detection system is operational.

Objective:

When provided with a hybrid, plug-in, or electric vehicle, students will verify the isolation fault detection circuits are operating correctly.



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Task:

Students will disable the high voltage system, disassemble the component that provides access to a high voltage connection, and connect a special resistor jumper wire to the high voltage connection and the vehicle chassis. Students will observe a serial data tool and vehicle instrumentation messages to determine if the vehicle has detected an isolation fault condition.

Required Special Tools and/or Equipment to Complete Task:

OEM service information; serial data tool; PPE; DVOM; special 20kΩ/5W jumper wire; hand tools.

Instructor Demonstrations (System Operation, Testing, Servicing, Repair):

The instructor shall utilize a training vehicle to demonstrate how the isolation fault detection circuits monitor the vehicle chassis. The instructor shall use a special jumper wire calibrated for causing an isolation fault and connect it to any high voltage component electrical connection. The isolation fault will be detected by a DTC fault being logged and displayed on a serial data tool. Instrument panel messages will also be displayed to alert the technician of the fault.

Information Resources to support Tasks, Demonstrations, Repairs, etc.:

OEM service information

Suggested Vehicle for Tasks and Demonstrations:

Available vehicles.

Governing Standards (Safety, Testing, Diagnostics or Repair):

FMVSS 305; J1766



Industry Resource Organization:

- √ Society of Automotive Engineers (SAE)
- Institute of Electrical & Electronic Engineers (IEEE)
- International Electrotechnical Commission (IEC)
- American Society for Testing and Materials (ASTM)
- Occupational Safety & Health Administration (OSHA)
- National Fire Protection Association (NFPA)
- Underwriters Laboratories (UL)
- √ Federal Motor Vehicle Safety Standard (FMVSS)

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