
Fuel Cell Standards

XX Fuel Cell High Voltage Systems

XX.b Fuel Cell Vehicle Specific High Voltage Component Safety

Overview:

Classroom and lab topics

- Review topics from Vehicle Electrification System Standards and the major HEV and BEV high voltage components
- Potential of high voltage in a fuel cell that is not in operation
- Fuel cell stack high voltage does and don'ts
- Compressor high voltage inverter and motor
- High volume high voltage coolant pump if applicable
- High volume high voltage cooling fan if applicable
- Danger of spinning motor voltage generation
- How to install a dissipative high voltage resistor
- Hazards of stack and other component high voltage isolation testing

Description:

High voltage vehicle safety systems provide layers of safety to vehicle operators, technicians, and engineers by ensuring that high voltage energy is not permitted to be transferred onto the high voltage bus when the vehicle is powered off and/or disabled. Fuel cell vehicles have several high voltage components that are not found on other electric vehicles. Understanding how to disable these components and interact with the other vehicle systems is necessary to properly troubleshoot and repair them.



Outcome (Goal):

Student will be able to identify and locate unique FCEV high voltage components utilizing OEM schematic diagrams; demonstrate high voltage isolation testing of these component; identify high voltage cables, power flow and areas where high voltage energy can be stored in the subsystems.

Objectives:

Students shall be able to:

1. Identify unique FCEV high voltage components, service/electrical disconnects, bus bars and harnesses when provided a with a fuel cell electric vehicle or sub-system components.
 2. Compare and explain the differences between fuel cell High Voltage components when compared to BEV system components
 3. Articulate and demonstrate disabling of High Voltage from a fuel cell power High Voltage component
 4. Demonstrate high voltage isolation testing of fuel cell components using OEM service procedures.
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Tasks:

Students will:

1. Demonstrate proper inspection, testing, wearing and usage of all PPE
 2. Use OEM technical information to identify unique fuel cell system high voltage components.
 3. Contrast and compare the fuel cell power system to a BEV system.
 4. Articulate how the fuel cell power systems operate to convert hydrogen and oxygen to electrical power by using resources provided by the instructor.
 5. Safety disable the fuel cell power high voltage system on a live vehicle using OEM service information.
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