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## Fuel Cell Standards

### XIX Fuel Cell Cooling System

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## XIX.d Coolant Heater

### Overview:

Classroom and lab topics

- Primary functions of the coolant heater
- Coolant heater mechanization
- High voltage isolation
- Methodology and response time
- Electrical and mechanical schematic representations when compared to actual components
- Diagnostic Trouble Codes associated with the coolant heater

### Description:

The coolant heater allows faster fuel cell stack startup and production of cabin heat when operating in low ambient temperature environments.

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### Outcome (Goal):

Student will be able to define the functionality and major functional features of the coolant heater and troubleshoot operational concerns.

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### Objectives:

Students shall be able to:

1. Identify the coolant heater and associated harnesses when provided with a live vehicle



2. Identify leaks and repair/replace the heater
  3. Use a serial data tool to determine the functionality of the coolant heater.
  4. Test the coolant heater system isolation resistance
  5. Remove and replace the coolant heater.
  6. Utilize OEM service information to determine service repairs and maintenance intervals.
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Tasks:

Students will

1. Use a schematic, OEM service instructions and a live vehicle or complete fuel cell system to identify the heater and associated harnesses
  2. Use the on-board diagnostic system and a serial data tool to identify, analyze, and diagnose the coolant heater system a live vehicle
  3. Test the coolant heater system high voltage isolation
  4. Repair coolant heater system leaks.
  5. Remove and replace the coolant heater using OEM service instructions
  6. List the preventative maintenance or service intervals of the coolant heater system using OEM service information
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