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## Fuel Cell Standards

### XIX Fuel Cell Cooling System

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# XIX.e Coolant, Coolant Reservoir, Ion Exchange (IEX) and Coolant Filters

## Overview:

Classroom and lab topics

- Coolant properties and unique handling requirements
- Possible hydrogen in the coolant
- Functions of the coolant reservoir
- Functions of the ion exchange component
- Functions of the particulate filter
- High voltage isolation and conductivity measurement techniques
- Purging trapped air from the coolant loops
- Consequences of out of specification and cross contaminated coolant
- Trouble codes associated with the coolant conductivity

## Description:

FCEV coolant is similar in its requirements to that used in BEVs but usual tighter requirements in conductivity limits and maximum particle size allowed. This requires filtering and ion exchange media to reduce the coolant conductivity. Potential hydrogen in the coolant also requires mitigation in the coolant reservoir.

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## Outcome (Goal):

Student will be able to identify major and unique features of the coolant, ion exchange device, coolant reservoir and coolant particulate filter and troubleshoot issues

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**Objectives:**

Students shall be able to:

1. When provided with a vehicle student will be able to identify the proper coolant type and the locations of coolant reservoir(s), ion exchange media and coolant filter if present.
  2. Identify leaks and repair/replace coolant reservoir, IEX cartridge and particulate filter
  3. Measure coolant conductivity and take correct actions
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**Tasks:**

Students will

1. Use a schematic, OEM service instructions and an OEM vehicle or complete fuel cell system to identify the proper coolant type and the locations of coolant reservoir(s), ion exchange media and coolant filter
  2. When provided with a vehicle and on board diagnostics identify and troubleshoot the coolant conductivity issues
  3. Test high voltage isolation and coolant conductivity
  4. Remove and replace the coolant reservoir(s), ion exchange media and coolant filter using OEM service instructions
  5. Drain and replace the vehicle coolant using OEM service instructions for procedures, capacities and proper coolant
  6. Verify proper operation of coolant level sensor
  7. Purge air from the coolant following OEM service instructions
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