Fuel Cell Standards

XIX Fuel Cell Cooling System

XIX.b Coolant Pump

Overview:

Classroom and lab topics

- Primary functions of the coolant pump
- Types of coolant pump mechanization
- Coolant pump control methodology and response time
- Coolant pump power requirements
- Schematic representations when compared to actual components
- Coolant pump mechanical noise mitigation
- Coolant Pump Diagnostic Trouble Codes

Description:

The coolant pump is a critical system component to ensure the fuel cell stack maintains a near isothermal (constant) temperature. Due to low delta T and high waste heat removal through the coolant, FCEV coolant pumps are higher powered, and have higher and more variable flow rates when compared to ICE engines plants of comparable power. Coolant pumps can operate with high voltage and lower amperage or low voltage and high amperage system designs.

Outcome (Goal):

Student will be able to list the major features and failure modes of a fuel cell coolant pump.

Objectives:

Students shall be able to:

1. When provided with a vehicle student will be able to identify the coolant pump and associated harnesses
2. Identify fuel cell pump coolant pump leaks
3. Repair fuel cell coolant pump leaks
4. Remove and replace the fuel cell coolant pump
5. Utilize OEM service information to determine service and maintenance intervals for the fuel cell coolant pump.
6. Utilize a serial data (scan tool) to observe data to determine the fuel cell coolant pump functionality.

Tasks:

Students will

1. Use a fuel cell cooling system schematic, OEM service instructions, OEM vehicle or complete fuel cell system, to identify the pump and associated harnesses
2. Evaluate the functionality of a fuel cell coolant pump on a vehicle by monitoring on-board diagnostic data using a serial data (scan) tool
3. Remove and replace a fuel cell coolant pump using OEM service information.
4. Examine OEM service information and list all fuel cell coolant pump
5. Identify and repair a fuel cell coolant leak

To comment or offer suggestions on this standard, contact Ken Mays:

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