
Fuel Cell Standards

XIX Fuel Cell Cooling System

XIX.c Coolant Bypass and Control Valves

Overview:

Classroom and lab topics

- Primary functions of the various types of coolant valves
- Valve mechanization
- Valve control methodology and response time
- Schematic representations versus actual components
- Diagnostic Trouble Codes associated with the coolant control valves

Description:

The coolant control and bypass valves allow faster startup and better stack temperature control when transitioning from low power to high power and back again vice-versa during a normal drive cycle. Due to low delta T and high waste heat removal the coolant valves have higher and more variable flow rates when compared to ICE engines of comparable power

Outcome (Goal):

Student will be able to identify major features of the coolant control valves and failure modes.

Objectives:

Students shall be able to:



1. When provided with a vehicle, identify the coolant control/bypass valve(s) and associated harnesses
 2. Identify leaks and repair
 3. Remove and replace the valve(s)
 4. Utilize OEM service information to perform service and maintenance of the coolant control/bypass valve.
 5. Utilize a serial data (scan) tool to observe data to determine the functionality of the coolant control/bypass valve.
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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 valve and associated harness
 2. Identify and troubleshoot the coolant valve(s) on a live vehicle using on-board diagnostics and a serial data tool.
 3. Remove and replace coolant valve(s) using OEM service instructions
 4. Determine any preventative maintenance or service interval of the coolant valve, using OEM serviced information
 5. Perform leak repairs on the coolant/bypass valve using OEM service information.
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