
Fuel Cell Standards

XVIII. Anode Subsystem

XVIII.a Anode Subsystem Mechanization

Overview:

Classroom and lab instruction on the operation of the anode subsystem and its components

- Primary functions of the anode subsystem in an OEM system
- Schematic representations versus actual components
- Methodology to use hydrogen to quickly warm a stack in freezing conditions
- Methodology to generate water vapor without generating power
- Trouble codes associated with anode subsystem errors
- Faults caused by insufficient hydrogen in the anode subsystem
- Faults caused by excessive hydrogen in the anode subsystem
- Faults caused by out of specification hydrogen fuel

Description:

The anode subsystem or anode loop supplies hydrogen from the hydrogen storage system to the fuel cell membrane by controlling hydrogen metering, flow and pressure. It allows the purging of excess nitrogen and liquid water from the system. It also recirculates unused hydrogen back into the fuel cell stack. The subsystem also allows the quick pressure release of hydrogen to de-energize the stack on shut down or during a safety layer event.

Outcome (Goal):

Student will be able to explain the functions of the anode subsystem and major components as well as conditions requiring rapid pressure reduction



Objectives:

Students shall be able to:

1. When provided a schematic or vehicle identify the anode system's major components
 2. Identify hydrogen leaks and repair
 3. Inspect anode subsystem per OEM service instructions
 4. Understand anode valves, their operations and normal position under various operating conditions
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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 major anode subsystem components
 2. When provided with a vehicle student will be able to identify the flow of hydrogen through the vehicle
 3. Identify major failure modes in the anode subsystem
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