XVI.d ECM & Software for Fuel Cell Systems

Overview:

Classroom and lab instruction on interfacing with ECM(s) responsible for the fuel cell system, high voltage safety layer and hydrogen safety layer

- Review of application standards and OEM service procedures
- OEM electronic control module interfaces and programming
- Overview of ECM inputs, outputs and internal calculations
- Primary versus secondary controllers
- LAN,CAN and serial communication
- Communication with the controller, performing data acquisition and testing functions through the vehicle interface
- Feedback loops
- Location of ECM removal and replacement
- Troubleshooting harness issues

Description:

The fuel cell stack electronic control module (ECM) either as a standalone unit or as a sub-program within another vehicle controller controls both normal operation of the fuel cell system and in some cases the hydrogen safety layer and high voltage safety layer functions. Proper understanding of how the discrete, analog and digital signals interact between components and controllers is important to solving vehicle electrical faults.

Outcome (Goal):

Student will be able to explain ECM operation and interaction with other modules in its communication loop. They will setup communication with the fuel cell system ECM. The students will be capable of servicing OEM ECM and harness using OEM service instructions.

Objectives:

Student shall be able to:

1. Determine location of ECM using OEM service instruction
2. Identify signal and power pinouts in connectors
3. Safely service ECM and harness
4. Program an ECM

Tasks:

Student will:

1. Using either a test bench equivalent or vehicle program an ECM with OEM software using OEM service procedures
2. Use vehicle diagnostics to determine any fuel cell system faults
3. Find a wiring fault created by the instructor using a DVOM
4. Remove and replace an OEM ECM using OEM service instructions

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

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