
Vehicle Electrification System Standards

X. Vehicle Cabin HVAC Systems

X.d Vehicle Cabin HVAC Systems Diagnostics and Service

Overview:

Vehicle Cabin HVAC Systems Diagnostic and Service

- Scan Tool PIDs
- Scan Tool Special Function (Bidirectional) Tests
- Testing Load Current (Low, Medium, High Power)
- Digital Volt-Ohmmeter
- A/C R&R Machine (Low & High Side Pressure Test)
- Thermal Imager (Test Dynamic Coolant Temp)
- Vac-N-Fill Tool

Description:

Service of electrified vehicles requires a wide array of specialized and traditional measuring instruments. Utilizing these tools will permit an accurate assessment of the HVAC system and its components. Students will utilize these tools and document results to demonstrate their skills in assessing HVAC systems and component operation.

Outcome (Goal):

Students will utilizing a test vehicles, diagrams, OEM service information, Scan Tools, electronic test equipment, and worksheets to test and check the functionality



of cabin and High Voltage battery pack HVAC system and its associated components.

Objective:

The Students will be able to:

1. Use Scan Tool PIDs and Special Functions tests to determine the functionality and operating conditions of the cabin and battery pack HVAC system
 2. Utilize test equipment to acquire live electrical currents and voltages on High Voltage HVAC components
 3. Monitor HVAC system high and low side pressures
 4. Acquire dynamic temperatures of determine functionality of High Voltage HVAC components
 5. Utilize the vehicle HVAC Controller to command changes in HVAC system operation
 6. Test the 12V coolant pump systems for cabin and High Voltage battery pack systems.
-

Task:

The Students will complete the following tasks:

1. Connect a scan tool to a live vehicle and list the PIDs and Special Functions tests associated with the cabin and High Voltage battery pack HVAC system
2. Connect a DC current clamp and DVOM to each High Voltage HVAC load, and Use the Scan Tool or HVAC Controller to turn each of the loads ON to acquire the actual electrical current consumed by each load
3. Connect HVAC pressure gauges to the A/C high and low side and document the pressures as the electric A/C compressor speed is set to Low, Medium, and High rpm levels
4. Document the temperatures of the cabin and High Voltage battery pack heater systems, when temperatures are commanded Low, Medium, and



- High levels by sampling the temperatures of the electric compressor high and low side tubes/hoses with a Thermal Imaging Camera
5. Document the temperatures of the cabin and High Voltage battery pack cooling systems by sampling the temperatures with a Thermal Imaging Camera
 6. Use a scan tool to control the speed of the 12V coolant pumps for the cabin and High Voltage battery pack and check the coolant temperature with a Thermal Imaging camera.
-

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

Ken Mays

NEVTEX

541-383-7753

kmays@cocc.edu

