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## Vehicle Electrification System Standards

### IX. On-Board High Voltage Battery Charging Systems

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#### IX.c On-Board High Voltage Battery Charging Systems Components

##### Overview:

##### On-Board High Voltage Battery Charging System Components

- On-Board Charging Module
  - High Voltage Cable Connections
  - Charge Port AC Input Connections
  - OBCM DC Output Connections to Battery Pack
  - CAN Communications Wiring Harness
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##### Description:

The On-Board Charging System is comprised of the charging module but, also several supporting system that are necessary to ensure that the high voltage battery pack is safely charged to the desired state-of-charge value based on charging rate and the Level of charger used for charging. It is critical that technicians understand not only system operation but, the components that comprise the OBCM system.

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##### Outcome (Goal):

The Students will be able to Identify all OBCM internal components, trace OBC wire/cable system routing of all electrical harnesses, and identify charging connection electrical terminals, and identify the OBCM.

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Objective:

Students shall be able to:

1. Identify all components that comprise the OBCM system, including all supporting systems
  2. Trace the routing of all electrical wire/cable, communications harness, and cooling system to determine all components that comprise the OBCM system
  3. Describe, by using a circuit diagram, the OBC input power filtering system operation
  4. Describe, by using a circuit diagram, the OBC Power Factor Correction stage and the Totem-Pole Transistor switching system
  5. Describe, by using a circuit diagram, the OBC Center Tapped Transformer operation
  6. Describe, by using a circuit diagram, the OBC output filter operation.
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Task:

1. Given a vehicle topology diagram or live vehicle, the Students will be able to identify all On-Board charging module internal components
  2. Given a vehicle diagram, Students will be able to trace the inputs and outputs of all high voltage and low voltage electrical circuits, and cooling system components
  3. Given a live vehicle, Students will be able to identify and components that comprise or support OBCM cooling, and trace the OBCM cooling system loop when provided with system diagram
  4. Students will be able to identify each of the charge connector and vehicle charge port electrical terminals and explain the function of each.
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