
Vehicle Electrification System Standards

VIII. DC – DC Converters Systems

VIII.c DC-DC Converter Components

Overview:

DC-DC Converter Components

- Input Filtering System (LC)
- Transformer Driver Systems (Totem Pole or equivalent)
- Center-Tapped Transformer
- Full Wave Rectifier Bridge
- Output Filtering System (LC)

Description:

The DC-DC Converter module is comprised of various power electronic and passive electrical components. Each component within the DC-DC Converter has a unique application and operational task. The components within the module provide the low voltage (12V system) with the proper voltage and current levels as the demands increase or decrease. Understanding the operation of the DC-DC Converter is critical when acquiring an understanding of the electrified vehicle accessory power electrical system.

Outcome (Goal):

Students will be able to:

1. Visually identify components within the DC-DC Converter
2. Disassemble and reassemble the DC-DC Converter



3. Statically test specified power electronics and electrical components within the DC-DC Converter.
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Objective:

Students shall be able to:

1. Visually identify the primary DC-DC Converter components when provided physical components or a worksheet with graphics/pictures of the components.
 2. Indicate and trace (by connecting the dots) the DC-DC Converter circuit from the High Voltage Input to the Low Voltage Output when provided an electrical schematic and block diagram
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Task:

1. When provided with a worksheet, Students will be able to define and describe the function for each of the primary hardware components that comprise a DC-DC Converter
 2. Students will disassemble and reassemble a DC-DC Converter assembly
 3. Students will test the transistor input, diode output, and transformer stages to determine if the stages are functioning correctly, and complete a lab worksheet with the findings.
 4. While assembling the Power Inverter Module, students will demonstrate the correct application of thermal grease to power components that require it
 5. Students will use OEM vehicle service information, component supplier information, and vehicle electrification websites to complete the tasks
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