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## Vehicle Electrification System Standards

### VII. 3-Phase Power Inverter Systems and Controls

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#### VII.b Overview of Power Inverter Systems

##### Overview:

###### The Role of the 3-Phase Power Inverter

- Use in Vehicle Propulsion
  - Use in Vehicle Regenerative Braking and during Generator AC Electrical Power Modes
  - Use in Vehicle Coasting
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##### Description:

Power Inverter Modules (change) one type of signal to another. In the case of electric traction systems, the power inverter will change dc from the high voltage battery pack to ac for the propulsion to utilize to propel the vehicle forward invert ac from the drive motor to dc to recharge the high voltage battery pack during regenerative braking. The power inverter can also control the drive motor to neither provide propulsion or regenerative braking (zero torque). Within the power inverter module is a microprocessor, programmed with software that, is used to control the power electronics connected to the electric machine(s).

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##### Outcome (Goal):

1. Students will be able to describe verbally and in written communications how vehicle power inverter module is used in propulsion, regenerative braking, and coasting modes
  2. Student will utilize the correct acronyms and definitions when describing power inverter module operation
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Objective:

Students shall be able to:

1. Describe the operation of the power inverter module in propulsion mode
  2. Describe the operation of the power inverter module in regenerative braking mode
  3. Describe the operation of the power inverter module during coasting mode
  4. Utilize proper acronyms and definitions related to the power inverter module.
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Task:

Students will be able to describe the operation of power inverter module in propulsion, regenerative braking, and coasting modes; utilize associated acronyms and definitions when describing each of the aforementioned modes. Students will use OEM vehicle service information, component supplier information, and vehicle electrification websites.

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