
Vehicle Electrification System Standards

IV. High Voltage Battery Pack System

IV.a Acronyms and Definitions

Description:

Vehicle Electrification acronyms that are typically found in OEM, online, or special technical documents that can be accessed by technicians and instructors. Industry and OEM terminology and acronyms for hybrid, plug-in, and electric vehicles

Outcome (Goal):

Students shall be able to use industry terminology and acronym standards when documenting and communicating with others with respect to high voltage systems and components.

Objective:

When documenting vehicle high voltage safety systems information students shall be able to use proper vehicle electrification terminology and acronyms.

Task:

Utilize proper terminology and acronyms when documenting information on high voltage system components or systems.



| Name | Acronym | Definition |
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| Air Flow Sensor | AFS | Sensor that measures the flow of air entering or within a component |
| Air Temperature Sensor | ATS | Sensor that measures the temperature of incoming or ambient air of a component |
| Amp-Hour | A-h | The amperage that can be delivered by energy storage device (i.e. battery) for a period of 1 hour |
| Apparent Capacity Loss | ACL | A failure mode of NiMH battery technology that places portions of the battery cell in a dormant state and causes capacity loss. ACL is reversible by cycling the cell. |
| Battery Control Module | BCM | The electronic controller that controls the operation of a high voltage battery pack |
| Battery Electric Vehicle | BEV | A battery electric vehicle (BEV) is an electric vehicle that utilizes chemical energy that is stored in a rechargeable battery pack. Electric vehicles use electric motors instead of an engine system to propel the vehicle. |
| Battery Management System | BMS | A control system software/firmware within the BCM that manages the control and balancing of a battery pack |
| Capacity Rate | "C" Rate | The rate that an energy storage device is charged or discharged within a one-hour period |
| Coulomb | C | SI unit of electric charge, equal to the quantity of electricity transferred in one second by a current of one ampere. |
| Electromagnetic Compatibility | EMC | A method of ensuring that electronic components that produce electrical (magnetic) noise are operationally compatible when the components are within a close or moderate proximity |



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| Electromagnetic Interference | EMI | Electrical signal noise generated from components that produce magnetic fields that can interfere with the operation of other electronic components that are in an immediate area |
| Energy Density (Watt-Hours/Liter) | Wh/L | The watt-hours of energy stored within a specified volume area. |
| Energy Storage System | ESS | A system that stores energy and is non-rechargeable (i.e., an onboard hydrogen storage tank for an FCEV) |
| Fuel Cell Electric Vehicle | FCEV | A vehicle containing a fuel cell using stored hydrogen gas and oxygen pumped into the fuel cell to create electricity that is transferred to an electric propulsion system for propelling a vehicle |
| Heating-Ventilation-Air Conditioning | HVAC | A vehicle system that provides heating or cooling to the cabin or high voltage battery pack |
| High Voltage | HV | Per the SAE, high voltage is defined as a DC voltage that is $\geq 60V$ or 30VACRMS |
| Hybrid Electric Vehicle | HEV | A vehicle that uses a combination of an engine and electric propulsion system to propel a vehicle |
| Joule | J | One joule is the equivalent of one watt of power radiated or dissipated for one second |
| Kilowatt-Hour | kW-h | A measure of electrical energy equivalent to a power consumption of 1,000 watts for 1 hour. |
| Kilowatts/Kilogram | kW/kg | A unit of specific energy commonly used to measure the density of energy in batteries and capacitors (i.e., the mass of battery and the number of watts that it can deliver) |
| Lithium Cobalt Oxide | LCO | A type of Lithium battery containing Cobalt Oxide as its main reactive chemical components |
| Lithium Iron Phosphate (LiFePO ₄) | LiFePO | A type of Lithium battery containing an Iron Phosphate as its main reactive chemical components |



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| Lithium Manganese Oxide | LMO | A type of Lithium battery containing Manganese Oxide as its main reactive chemical components |
| Lithium Nickel Cobalt Aluminum Oxide | NCA | A type of Lithium battery containing a Nickel, Cobalt, & Aluminum as its main reactive chemical components |
| Lithium Nickel Manganese Cobalt Oxide | NMC | A type of Lithium battery containing Nickel, Manganese, & Cobalt as its main reactive chemical components |
| Lithium Titanate | LTO | A type of Lithium battery containing Titanate as its main reactive chemical component |
| Nickel Metal Hydride | NiMH | A battery chemistry that utilizes a Nickel Metal Hydride as its primary storage material |
| Plug-In Hybrid Electric Vehicle | PHEV | A PHEV is defined as a vehicle with an engine combined with an electric propulsion system that utilizes stored energy from a battery with a capacity of at least four kilowatt-hours, is capable of being charged from an external source |
| Power Density (Watts/Liter) | W/L | Watts of electric power that can be stored in the volume (area) of 1 liter |
| Rechargeable Energy Storage System | RESS | An alternative name for a Battery Pack |
| Specific Energy (Watt-Hours/Kilogram) | Wh/kg | Stored Watts of power, with a given mass, that can be delivered for a period of 1 hour |
| Specific Power | W/kg | Watts of electric power with a specific mass that can deliver electric power to a load |
| State-of-Charge | SOC | The state of charge is a measurement of the amount of energy available in a battery at a specific point in time expressed as a percentage (100% energy full or 0% energy empty. The SOC provides the user with information of how much longer the battery can perform before it needs to be charged or replaced or need to be recharged. |



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| State-of-Health | SOH | The State of Health is a "measurement" that reflects the general condition of a battery and its ability to deliver the specified performance compared with a new battery. It takes into account such factors as charge acceptance, internal resistance, voltage and self-discharge. It is a measure of the long-term capability of the battery and gives an "indication" not an absolute measurement, of how much of the available "lifetime energy throughput" of the battery has been consumed, and how much remains. |
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To comment or offer suggestions on this standard, contact Ken Mays:

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| Ken Mays | NEVTEX |
| 541-383-7753 | kmays@cocc.edu |

