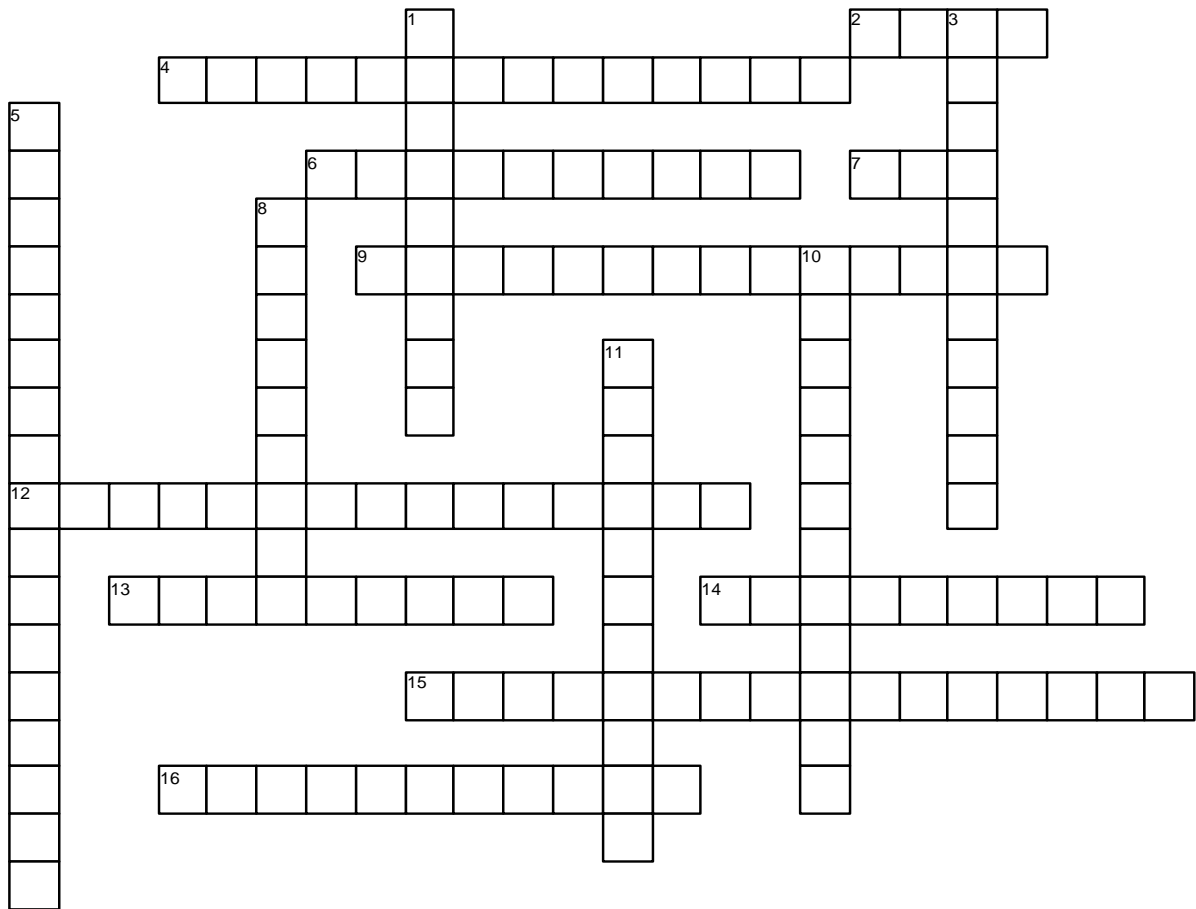


# High-Voltage Batteries

## Chapter 10



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### ACROSS

- 2 To help consumers compare the energy consumption of electric vehicles with those that run on fossil fuel, the EPA created a miles-per-gallon measurement, called \_\_\_\_\_.
- 4 \_\_\_\_\_ refers to the amount of energy in kilowatt-hours (kWh) that a battery can store per kilogram of mass (kWh per kilograms) or volume (kWh per liter) of volume.
- 6 \_\_\_\_\_ Relays (SMRs) are heavy duty relays that control the high-voltage circuit between the battery and the other components of the high-voltage system.
- 7 Abbreviation for Electrical Distribution System.
- 9 The \_\_\_\_\_ module (BCM) is responsible for controlling the operation of the high-voltage battery based on the requests from the hybrid control module.
- 12 \_\_\_\_\_ is achieved when energy is drawn from the most charged cell and transferred to the least charged cells, usually through DC-DC converters.
- 13 In the United States the EPA estimates electric vehicle range, while in Europe electric vehicle range uses the \_\_\_\_\_ harmonized Light vehicles Test Procedure (WLTP).
- 14 Another cathode design for automotive applications includes lithium iron \_\_\_\_\_ (LiFePO<sub>4</sub>), which is stable at higher temperatures and does not contain cobalt, which is in limited supply worldwide.

- 15 \_\_\_\_\_ is achieved by having energy drawn from the most charged cell and dissipated as heat, usually through resistors.
- 16 \_\_\_\_\_-\_\_\_\_\_ hydride Most current production HEVs use nickel-metal hydride (NiMH) battery technology for the high-voltage battery.

### DOWN

- 1 A NiMH battery may have a \_\_\_\_\_ type design that is a rectangular or boxlike design with the active materials formed into flat plates, much like a conventional lead-acid battery.
- 3 The dash display that shows the miles per kWh is often called a \_\_\_\_\_-\_\_\_\_\_ (GOM) because it is often not accurate.
- 5 The \_\_\_\_\_ system (BMS) is an electronic system that manages cells in a battery pack.
- 8 Pouch design HV battery uses laminated architecture in a bag referred to as \_\_\_\_\_.
- 10 Tesla uses \_\_\_\_\_, \_\_\_\_\_ and aluminum (NCA) cathode material, which results in a long battery life and faster charging capability.
- 11 A NiMH battery may have a \_\_\_\_\_ type design that has the active materials made in long ribbons and arranged in a spiral fashion inside a steel cylinder (case).