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### Delphi Energy Storage Technology Leads Company Into Decade Of High Voltage Advancements

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TOKYO - With an eye on the future of vehicle power and new market opportunities, Delphi Automotive Systems (NYSE: DPH) continues to advance its battery technology and product lines. At the same time, the company, a long-time global leader in energy storage technology, reaffirmed its commitment to protecting the world's environment by encouraging the recycling of used automotive and motorcycle batteries.

"Delphi's advancements in this industry have helped eliminate many of the conditions responsible for battery wear-out," said Pankaj Dhingra, interim business line executive, energy management systems, Delphi Energy & Chassis Systems. "We supply batteries to most major original equipment manufacturers (OEMs) in every region of the world. Each Delphi Freedom? battery is manufactured to meet regional specifications and customer requirements."

Delphi engineers continue to incorporate design improvements and develop new technologies to provide longer lasting, more durable batteries that meet the needs of increasingly sophisticated automotive electrical systems, and non-automotive needs. Delphi technological advancements include:

- **Delphi Freedom? Battery** - The Delphi Freedom Battery is a maintenance-free lead-calcium design available in top post, side terminal and dual terminal configurations. The wrought lead-calcium grid design provides excellent current conductivity and resists damage from overcharging, heat, thermal runaway and vibration. The Delphi Freedom Battery performs four key functions to meet various electrical system requirements: it supplies electrical energy for the accessories when the engine is not running and it supplies energy to the cranking motor and ignition system or glow plugs as the engine is started. The battery also intermittently supplies current for accessories when energy demand is greater than generator output and it acts as a voltage stabilizer in the electrical system. Many different versions of the Delphi Freedom Battery are available to both OE and aftermarket customers.
- **Delphi Heavy-Duty Freedom? Batteries** - Delphi Freedom Heavy-Duty Batteries are designed to withstand the punishment of commercial vehicle applications. Also a lead-calcium design, the battery resists corrosion, overcharging, gassing, water usage, self-discharge and thermal runaway. With center cast-on plate straps and anchored plates they offer excellent resistance to vibration damage.
- **AGM Battery** - The absorbent glass mat (AGM) battery is gas-recombinant, meaning the gasses produced when the battery is charging recombine in a sealed setting to create water (H<sub>2</sub>O). Absorbent glass mat separators trap the gasses where the recombination occurs. Delphi's AGM battery is maintenance-free and spill-proof, providing packaging flexibility to mount the battery in any orientation. This provides new opportunities for vehicle designers to position the battery in various locations in the vehicle. This battery is currently in production for both OE and aftermarket applications.
- **14/42-Volt Systems** - Increased power demands on vehicle electrical systems, in addition to the industry's need to improve fuel economy and emissions, are making current 12/14-volt electrical systems inadequate. Delphi has developed a 14/42-volt system that can enable new technologies that previously would have been impractical or impossible to use in a vehicle. Higher voltages will enable the use of by-wire technologies, ride control systems, electromagnetic valve trains, integrated starter/generators, thinner and lighter wiring and cables and smaller semiconductors. Already developed, many OEMs have seen Delphi's 14/42-volt system demonstrated on a test-vehicle.
- **Lithium Polymer Battery** - Delphi has developed a new lithium polymer battery. This battery offers outstanding performance for power and energy density. It utilizes an environmentally friendly combination of polymer materials, lithium alloys and organic solvents to produce a highly efficient battery system. Delphi's Lithium Battery System has achieved specific power greater than 1400 watts/kg and specific energy greater than 47 watt-hours/kg. This battery technology delivers high power over a wide range of battery states of charge and temperatures. Operating temperature is from -40 degrees to 70 degrees Celsius. Delphi's Lithium Battery System will enable practical hybrid vehicle solutions by providing space-effective battery systems, able to be packaged in conventional vehicle layouts. The superior charge and discharge efficiency will enable high rates of regenerative brake energy recovery without large power conversion losses.

"Eventually, we will be at a point in which the traditional lead-acid battery won't be enough to power the vehicles of the world," said David Kessler, chief engineer, batteries, Delphi Energy & Chassis Systems. "When that happens, Delphi will be ready with systems like our 14/42-Volt and Lithium Polymer Batteries. We have intense interest in these advancements from OEMs around the globe."

Delphi sells batteries in 62 countries. With 11 manufacturing sites and four engineering and product development centers worldwide, Delphi produces batteries for various industries, including the OE and aftermarket automotive, heavy-duty, farm and commercial vehicle, marine, motorcycle and recreational vehicles.

For more information about Delphi Automotive Systems, visit Delphi's virtual press room at [www.delphiauto.com/vpr](http://www.delphiauto.com/vpr).

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