

The Future of E-Mobility

Schaeffler Touts System Solutions and Electrification Advancements at Detroit Symposium

Matthew Jaster, Senior Editor

Mobility for Tomorrow was the theme of the Schaeffler Symposium in Detroit, Michigan that took place on September 6th. The event kicked off with discussions on innovations for tomorrow's mobility and the technologies and products driving Schaeffler toward the future.

The company presented technologies for future mobility, including components and system solutions for optimizing internal combustion engine powertrains, the electrification of hybrid vehicles and electric vehicles, and a new vehicle concept.

The Schaeffler Symposium has its roots in the decades-old tradition of sharing advancements and technology during symposiums held every four years in Germany, North America and Asia. This year's Detroit event built on the 11th Global Symposium, held in Baden-Baden, Germany last April, including new developments focused on the North American market.

Urban Vehicle Concept: The Schaeffler Mover

A new urban vehicle concept was featured at the event. The Schaeffler Mover offers a flexible and emission-free platform for a range of different vehicle concepts. All the drive and chassis components are integrated in one unit, called the "Schaeffler Intelligent Corner Module," to save space and enable vehicle maneuverability and passenger



The Schaeffler Mover was on display during the Detroit show.

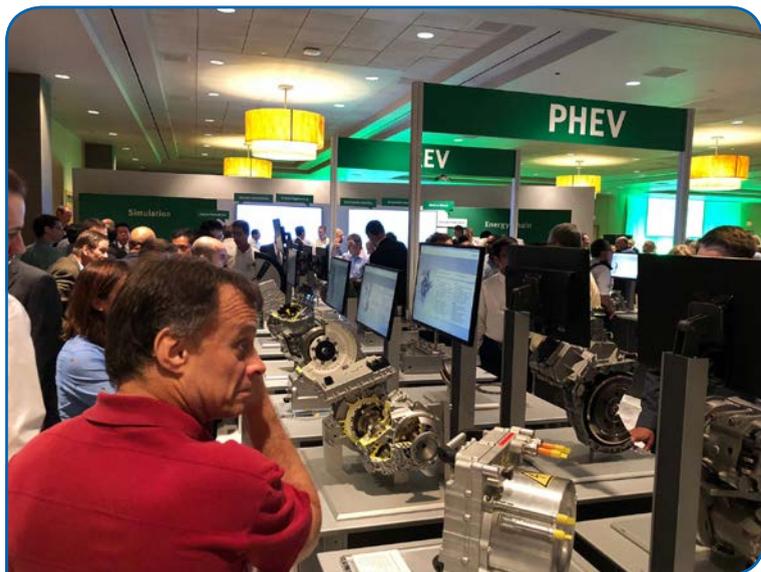
comfort. This concept is Schaeffler's answer to mobility requirements in growing metropolitan areas.

This Module is installed in all four wheels and includes the wheel hub motor, wheel suspension including the spring system, and the actuator for the electromechanical steering system. The steering system of the wheel module is designed as an electromechanical steer-by-wire system. The wheel suspension design selected enables a steering angle of up to 90 degrees. This allows the vehicle to be maneuvered in narrow alleys and be parked in short parking spaces in order to let the passengers enter and exit. Its turning radius of less than five meters makes the vehicle extremely maneuverable in city traffic and even turning on the spot is possible.

The traction motor of the wheel module has been designed as a permanently-excited synchronous motor and is a variant of the wheel hub motor already developed by Schaeffler in a 2013 project. In the current design for the Mover, each of the four electric motors supplies a continuous output of 13 kilowatts and a temporary peak output of 25 kilowatts. The nominal torque of 250 Newton meters per motor can be doubled for short periods.

The Evolution of Clutches, Gears & Bearings

One of the main themes of the event was letting transmission engineers know that there was no reason whatsoever to panic. Matt Frary, vice president, business unit transmission applications, reassured the audience that despite all the electrification going on



Electric and hybrid automotive technologies were on display at the Detroit Symposium.

in the automotive industry—transmission components would remain vital for years to come.

Frary said that the main components of the transmission—gears, clutches and bearings—will be necessary in the future, but their complexity and design characteristics will change with the industry.

There will be fewer gears in an automobile in the future, but the gears that remain will be a higher quality product with unique properties. Bearings will need to perform at high speeds, high currents and produce less noise. Engineers will need to utilize more bearing test rigs to examine loading conditions and failure issues. In the case of clutches, engineers will optimize and redesign the components to make them less complex—remove hydraulic systems and focus on electromechanical automation.

A Look at the Future

The exhibition hall featured several key areas where the organization continues to grow and expand including urban mobility, the energy chain, simulation, powertrain,



An inside look at the wheel hub unit of the Schaeffler Mover.

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Matt Frary discussed the evolution of bearings, gears and clutches.

surface technology, engine systems and a large emphasis on digitalization.

Product Digitalization

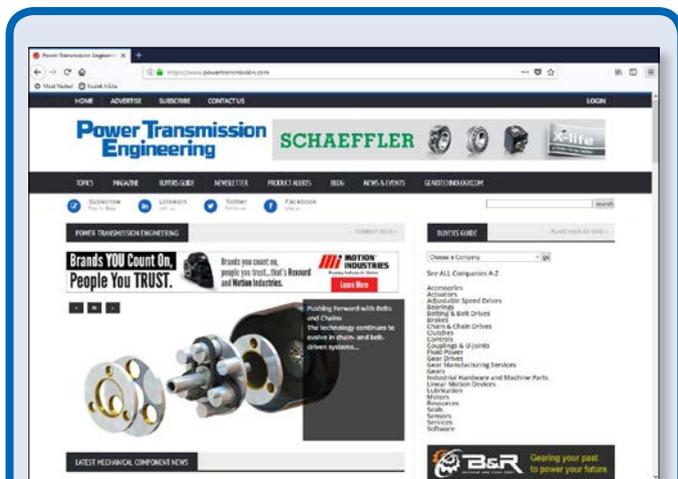
For vehicles, high-speed trains and wind turbines, Schaeffler's mechatronic products are fitted with sensors, electronics and actuators, bearings, and other drive components to provide the information required for big data analysis and business models based on networking.

The goal is to respond more quickly to current developments and to digitize the entire product life cycle. The company has already used its digital capabilities to reduce greenhouse gas emissions in road traffic, generate green electricity using water or wind power more cost-effectively, and to make particularly economical use of fertilizers.

Facing the Challenges Ahead

For the automotive industry, Schaeffler is prepared to be at the forefront of new technologies as vehicles become more efficient, compact and electric.

"Today's auto industry is transforming into a mobility industry," said Jeff Hemphill, CTO, Schaeffler Americas. "Tightening global regulations, new mobility business models and rapidly evolving technologies make designing a vehicle technology portfolio as exciting as it is challenging. (www.schaeffler.us) **PTE**



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