

# eBooster® and the Motor Generator Unit Combining Synergies for Future Mobility

- System solution for further engine downsizing and downspeeding
- Cost-effective technologies solve dual challenges of increasing efficiency and reducing emissions
- Supporting 48-volt electrification trend and optional integration into existing propulsion systems

Auburn Hills, Michigan, October 25, 2018 – The current trend toward 48-volt electrified vehicles is growing as the automotive industry faces two important challenges. Vehicles need to be more efficient to meet stringent emissions regulations and even a 48-volt architecture has limited electrical energy storage. Also, more electrical power is needed to support added vehicle features. In response to these challenges, BorgWarner presented a smart combination of the company's eBooster® electrically driven compressor and its belted motor generator unit (MGU) on a demonstrator vehicle. Easily integrated into existing propulsion systems, the cost-effective combination provides an ideal solution for 48-volt electrification. Benefits such as improved low speed engine torque in combination with engine downsizing, downspeeding and brake energy recuperation allow for significant fuel efficiency enhancements. On a demonstration vehicle, a heavy pickup truck, the synergy between the components enables energy efficient means to collect regenerated energy and provide added torque, faster engine response, and extended engine off operation among a list of added features.

"At BorgWarner, we are constantly working on improving our system technology solutions. The combination of our eBooster technology with the MGU presents an ideal 48-volt capable solution for our customers and strengthens our position as a supplier of choice," said Robin Kendrick, President and General Manager, BorgWarner Turbo Systems.

## **eBooster Electrically Driven Compressor – Further Downsizing Enabled**

BorgWarner's compact eBooster electrically driven compressor is independent of the exhaust gas flow, as it uses an electric motor to drive the compressor wheel. It provides

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outstanding low-end torque and can be installed in different locations of the air path with an actively controlled bypass valve next to it. High system efficiency as well as extraordinary power density and improved acceleration time virtually eliminate turbo lag. The technology reduces pumping losses, and – due to higher low end torque – allows for the possibility of further downsizing and downspeeding.

## **Powerful and Flexible MGU Replaces Conventional Generator**

BorgWarner's advanced MGU is usually located within the powertrain architecture to facilitate hybrid functions. Replacing the conventional generator, the more powerful MGU is connected to the engine via a front-end accessory drive. Its position can be varied, depending on the architecture and integration needs. Different available configurations also allow for varying performance characteristics. Capable of adding as well as subtracting torque, the technology captures sufficient regenerative electrical energy to supply the vehicle's electrical loads with additional electrical energy to save fuel. The 48-volt MGU, which has a capability of 25 kW input and output, also provides quick and smooth engine starts. In addition, BorgWarner provides a motor generator with integrated electronics (MGI) which offers multiple electromagnetic variants to meet varying performance requirements.

#### **About BorgWarner**

BorgWarner Inc. (NYSE: BWA) is a global product leader in clean and efficient technology solutions for combustion, hybrid and electric vehicles. With manufacturing and technical facilities in 66 locations in 18 countries, the company employs approximately 29,000 worldwide. For more information, please visit <a href="mailto:borgwarner.com">borgwarner.com</a>.

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The combination of BorgWarner's eBooster® electrically driven compressor and the belted motor generator unit (MGU) results in a cost-effective system which provides an ideal solution for 48-volt electrification.

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