

BorgWarner's 48-volt Technologies Electrify Vehicles for Better Efficiency

- 48-volt systems expected to capture more than 60 percent of the global HEV market by 2027
- BorgWarner is focusing its deep systems-level expertise to develop one of the broadest 48-volt portfolios in the industry
- 48-volt technologies provide more power, efficiency and increased functionality through innovative use of energy that is typically wasted

Auburn Hills, Michigan, September 12, 2017 – BorgWarner, a global leader in clean and efficient technology solutions for combustion, hybrid and electric vehicles, foresees a global shift in propulsion demands. In addition to systems for full hybrid and battery electric vehicles (BEVs), BorgWarner considers 48-volt mild hybrid technologies as a crucial step on the road to delivering the fuel efficiency, features and performance consumers demand. Bolstered by its 2015 acquisition of Remy International and its agreement to acquire Sevcon later this year, the company has been developing one of the broadest ranges of readily available technologies for 48-volt mild hybrids in the industry.

"We are excited about the demand and opportunity for electrified vehicle technologies – it is a turning point for the industry. We believe 48-volt systems offer the high-volume economics that will get us to the ultimate destination of a cleaner, more energy-efficient world," said James R. Verrier, Chief Executive Officer, BorgWarner. "With our widening breadth of products and deep systems knowledge, BorgWarner can help automakers reach their goals quickly."

BorgWarner expects 48-volt systems to capture over 60 percent of the global hybrid vehicle market, with an annualized production rate of roughly 25 million units by 2027. BorgWarner's 48-volt system solutions, which, for example, include eBooster® electrically driven compressors and integrated belt alternator starters (iBAS), capture and use waste energy in the most efficient way, providing more power, efficiency and functionality. Mass production of

BorgWarner's eBooster solution is currently ramping up with the innovative system launching first with three global automakers, including Daimler's latest 3.0-liter gasoline engine.

"Operating in multiple 48-volt product areas allows BorgWarner to perfect how the individual technologies function as a system," explains Christopher P. Thomas, Chief Technology Officer, BorgWarner. "For example, our engineers have evaluated a 48-volt system that incorporates an eBooster electrically driven compressor and an iBAS to determine the optimal control strategy to most effectively convert the charge in the battery to the needs of the propulsion system. This results in efficiency gains that enable engine right-sizing and more optimal matching of the turbocharger and driveline components, creating game-changing opportunities for automakers in packaging space, architecture, design and efficiency. Depending on the baseline and application, fuel economy improvements could be as much as 20%."

BorgWarner will showcase its broad range of combustion, hybrid and electric technologies—including eBooster electrically driven compressors, iBAS, on- and off-axis P2 modules, eAWD electric drive modules, one-way clutches, electric rear drive modules (eRDMs), electric motors, power electronics and efficient transmissions—at the upcoming International Motor Show (IAA) Cars in Frankfurt, Germany, and Electric & Hybrid Vehicle Technology Expo in Michigan.

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 62 locations in 17 countries, the company employs approximately 27,000 worldwide. For more information, please visit <u>borgwarner.com</u>.



A global leader in clean and efficient technology solutions for combustion, hybrid and electric vehicles, BorgWarner has developed one of the broadest ranges of readily available technologies for 48-volt mild hybrids in the industry.

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