



BorgWarner's R2S® Turbocharger Boosts Premium Class

- *German premium manufacturer's 4-cylinder diesel uses two-stage turbocharging*
- *BorgWarner's solutions reduce consumption and meet latest emission standards*
- *First to feature a steel-casted turbine housing for diesel applications*

Auburn Hills, Michigan, June 18, 2019 – The success story of BorgWarner's regulated two-stage (R2S®) turbocharging system now includes another milestone in the long-standing cooperation with the German premium manufacturer, Mercedes-Benz. The unique solution now boosts the most powerful version of Mercedes-Benz 4-cylinder diesel engine, the OM 654, with a power of 180 kW (241 HP). The design of BorgWarner's turbocharging system was especially adapted to comply with the stringent current emissions standard Euro 6d TEMP, while delivering outstanding engine performance. For this reason, the R2S utilizes an intelligent combination of a highly sophisticated variable turbine geometry (VTG) turbocharger for high-pressure stages and a wastegate turbocharger for low-pressure stages.

"With its innovative technologies, BorgWarner is supporting automakers in meeting tough emissions standards. Developing more environmentally friendly vehicles is part of our larger vision for a cleaner, more energy-efficient world," said Joe Fadool, President and General Manager, BorgWarner Turbo Systems. "At BorgWarner, we are proud to continue our successful long-term cooperation with Mercedes-Benz. Our highly efficient R2S turbocharging technology enables a much cleaner diesel engine to achieve the best possible performance."

BorgWarner's advanced R2S system enables optimized air supply over the whole engine map, which results in best possible fuel consumption and low emissions by supplying the required boost for optimum combustion. The new turbocharging system takes care that Mercedes-Benz OM 654, which offers a smaller displacement of just under 2 liters compared to its forerunner, still delivers 20 percent higher power output. BorgWarner's R2S system is the first on the market for diesel applications to feature a steel-casted turbine housing, thus ensuring a high thermal resistance. The advanced technology also features water-cooled e-actuator, bearing system and

compressor housing combined in an extremely compact package. The combination of a large and a small turbocharger allows a higher torque, especially in the lower and upper speed ranges, as well as excellent response times.

S-shaped guide vanes within the company's high-pressure VTG turbocharger regulate the turbine output by changing the inflow angle and speed at the turbine wheel inlet. The turbine cross-section constantly adapts to the engine's operating conditions to reduce fuel consumption and emissions. As the engine speed increases, a bypass gradually diverts the exhaust flow to the larger low-pressure wastegate turbocharger. In this way, BorgWarner's solution allows consistent power delivery and outstanding efficiency. In addition, the company's R2S system provides excellent response times and helps to reduce emissions significantly.

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 68 locations in 19 countries, the company employs approximately 30,000 worldwide. For more information, please visit borgwarner.com.



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