



BorgWarner's Twin Scroll Turbocharger Delivers Power and Response for Premium Manufacturers

- *Leading edge alloys allow higher combustion temperatures and cleaner exhaust gases*
- *Helps power 3.0-liter six-cylinder gasoline engine capable of up to 550 Nm of torque*
- *Drivers of premium cars enjoy top performance and faster response*

Auburn Hills, Michigan, February 18, 2020 – BorgWarner's twin scroll turbochargers featuring enhanced high temperature performance thanks to the use of sophisticated steel alloys, are being delivered to the BMW Group for its new 3.0-liter inline six-cylinder gasoline engine. Used across a wide range of BMW passenger cars, the engine has two performance options – medium and high – and delivers 250 to 280 kW of power and 500 to 550 Nm of torque.

"Twin scroll technology produces results similar to twin turbo applications but in a smaller package with reduced weight and cost," said Joe Fadool, President and General Manager, BorgWarner Emissions, Thermal and Turbo Systems. "We are delighted to have worked with BMW to develop and deliver these latest designs, which use advanced high-temperature alloys and casting technologies that allow our customer to develop a low-emissions engine that combines comfortable driving with excellent performance and an agile response at low engine speeds. With this project successfully completed a large number of BMW passenger cars are expected to be equipped with BorgWarner turbochargers into the future."

When using a BorgWarner twin scroll turbocharger for a six-cylinder engine, the ducts serve three cylinders at a time and are separated in both the exhaust manifold and turbocharger. This strategy prevents pulsating exhaust gases from interfering with each other as they are directed through two separate spiral chambers, or scrolls, in the turbocharger. Individual nozzles – one smaller and sharper for better low-end response and the other larger and less angled for high output requirements – are directed at the turbine. Compared with a single scroll

turbocharger, a twin scroll design recovers more energy from the exhaust gases, minimizes parasitic back losses and improves responsiveness at low engine speeds.

BorgWarner's major innovations for the turbocharger center on the use of sophisticated high-temperature-resistant materials that enable elevated combustion temperatures to be used. This results in a superior fuel-air combustion conversion and cleaner exhaust gases that support BMW's high-efficiency emission control system.

While using top-quality materials such as high-alloyed steel and castings, BorgWarner was able to provide an extremely economical solution for the customer by developing manufacturing processes that led to weight reduction.

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 67 locations in 19 countries, the company employs approximately 29,000 worldwide. For more information, please visit borgwarner.com.



BorgWarner's twin scroll turbocharger allows manufacturers to develop a low-emissions engine with excellent performance.

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