

GARRETT MOTION TO SHOWCASE ELECTRIC TURBOCHARGER FOR FIRST TIME AT IAA 2019

- *On display for the first time will be Garrett's "E-Turbo" for mass market passenger vehicles, expected to launch in 2021*
- *Garrett will display additional turbo technologies for gasoline, diesel, electric and hybrid, as well as software applications for connected vehicles*

FRANKFURT, Germany – September 6, 2019 – Garrett Motion Inc. (**NYSE: GTX**), a leading differentiated technology provider into the automotive industry, will showcase its latest products and technology applications at the 68th International Motor Show (IAA) in Frankfurt, including for the first time an electrified turbocharger (E-Turbo) for mass market passenger vehicles.

"We continue to advance our electrification capabilities at Garrett to support the interests of our global customer base. As such, we are excited for the public unveiling of our first-generation E-Turbo, designed to dramatically improve the performance and fuel economy of mild-hybrid and plug-in hybrid powertrains in conjunction with both gasoline and diesel engines," said Olivier Rabiller, president and chief executive officer for Garrett. "Electrified engine technology will be key in meeting industry challenges for increased energy efficiency and new global regulatory emission targets while still meeting consumer demands for better vehicle performance and affordability."

Garrett's E-Turbo delivers superior performance, fuel economy and emissions by integrating ultra-high-speed electric motors and power electronics into the turbocharger, while also providing energy recuperation to the vehicle's electrical system. The E-Turbo uses a small electric motor on the shaft to spool up the turbo and provide immediate boost from idle, eliminating felt acceleration lag time, and generating electricity and recharging the hybrid battery. E-Turbo's in gasoline engines can result in up to a 15 percent reduction in CO₂.

In concert with the E-Turbo hardware, Garrett's new turbocharger boost control software also significantly enhances turbo performance and health as well and helps unlock optimized energy management in hybrid vehicles. Connected software controls support the performance and fuel efficiency potential of E-Turbo systems by integrating boost control algorithms in existing electronic control units (ECUs). Garrett's software additions contribute to optimized turbo boost, torque,

efficiency, and emissions performance. In addition, it also employs prognostic and smart diagnostic functionality to monitor the health status of the entire air loop within the vehicle as OEMs focus on all aspects of powertrain design to meet increasingly more stringent environmental standards, including the upcoming Euro 7 emission targets.

Additional technologies to be on display in Frankfurt will show the full breadth of Garrett's product portfolio in turbochargers, electrification and connected vehicle software, including:

- **Gasoline Variable Nozzle Turbine (VNT) Turbocharger**, an enabler for offering diesel-like fuel economy with gasoline performance while helping meet stringent emissions regulations. Variable geometry turbos use inlet vanes on the turbine to optimize the flow and efficiency characteristic of the turbine to deliver best fuel economy and transient performance. Our variable geometry turbo for gasoline are particularly suited for Miller-cycle engines that have higher boost requirements and deliver 5-10% better fuel economy with low emissions.
- **TwoStage Electric Compressor for Hydrogen Fuel Cells**, this two-stage electrical compressor is used by Honda Motor Company for its hydrogen-powered Clarity Fuel Cell vehicle. Garrett's TwoStage Electric Compressor eliminates previous powertrain sizing issues with a compact design, and an industry-first continuous maximum power density rating of 20kW. The technology features another industry first with oil-less foil air bearings which are cooled by the machine's own compressed air eliminating the potential for poisoning the fuel cell with any oils or greases and helping ensure zero emissions.
- **Third Generation Twin Scroll Turbo**, developed in the context of Worldwide Harmonized Light Vehicle Test Procedure (WLTP) and Real Driving Emissions (RDE) regulations features optimized aerodynamics and bearing system to compensate for the ban of engine scavenging and for the introduction of Gasoline Particulate Filter (GPF) technology.
- **Turbocharging with a Sheet Metal Turbine Housing**, this two-stage architecture provides enhanced thermal management technology offering augmented performance and contributions to NOx emissions reduction.
- **Ball Bearing VNT Turbo Diesel** offers new aerodynamics and an up-graded bearing system for better low-end torque, transient response, as well as higher exhaust gas recirculation (EGR) capability and reliability.



- Connected vehicle software for **Integrated Vehicle Health Maintenance (IVHM)**, which anticipates and directs the fixing of faults before they occur, provides smart diagnostics for faster and more effective maintenance activities, and enhances vehicle or fleet reliability through prognosis-based maintenance.

Visit Garrett Motion in **Hall 4.1, Booth D10** at IAA in Frankfurt, Sept. 10–13, 2019.

About Garrett

Garrett (www.garrettmotion.com) is a differentiated technology leader, serving customers worldwide for more than 65 years with passenger vehicle, commercial vehicle, aftermarket replacement and performance enhancement solutions. Garrett's cutting-edge technology enables vehicles to become safer, and more connected, efficient and environmentally friendly. Our portfolio of turbocharging, electric boosting and automotive software solutions empowers the transportation industry to redefine and further advance motion. For more news and information on Garrett, please visit www.garrettmotion.com/news.

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