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PRESSRELEASE

MAHLE Flexible ECU—the flexible development control unit

Frankfurt, September 2013 – The development, design, and control of engines and powertrains is becoming increasingly complex, as more and more parameters must be considered and factored into control calculations. In conventional gasoline and diesel engines, this is primarily driven by the increased level of technology, and in the case of hybrid vehicles by the interaction of two powertrains. The MAHLE Flexible ECU (MFE) is a development control unit, including software, that allows extremely rapid and flexible functional integration and comprehensive implementation of processes from the first prototype to series production.

Applications for the flexible development control unit range from initial commissioning of prototype engines—steady-state or transient—to hybrid-electric demonstrator vehicles. On the basis of commercially available hardware, MAHLE Powertrain provides the necessary software development and application to create an effective system.

MAHLE already has extensive experience with this system approach. For example, the 1.2-liter three-cylinder downsizing gasoline engine, developed in house, was integrated in a drivable demonstrator vehicle using the MFE. Model-based software development enabled an extremely short development time and above all the continuing flexible integration of new functionalities, such as supplementary exhaust gas recirculation.

Two MFEs are used for controlling the complex powertrain of the MAHLE range extender vehicle. One controls the range extender engine, and the second the overall vehicle. The vehicle control unit includes all functions for coordinating the

drive components, such as the hybrid powertrain output control, battery management monitoring, traction motor and transmission control, safety and monitoring functions, as well as the integrated collection of measurement data.

For engine and vehicle manufacturers, the MFE saves time and adds flexibility when integrated at an early phase of development (parallel to the development of a series production control unit). Thanks to its model-based software structure, the MFE is a consistently valuable tool, even well into the development process for the series control unit. In addition, it is possible to develop and integrate customer-specific proprietary functionalities on the basis of the flexible software and hardware architecture.

About MAHLE

The MAHLE Group is one of the 30 largest companies in the automotive supply industry worldwide. With its two business units Engine Systems and Components as well as Filtration and Engine Peripherals, MAHLE ranks among the top three systems suppliers worldwide for piston systems, cylinder components, as well as valve train, air management, and liquid management systems. The Industry business unit bundles the MAHLE Group's industrial activities. These include the areas of large engines, industrial filtration, as well as cooling and air conditioning systems. The Aftermarket business unit serves the independent spare parts market with MAHLE products in OE quality.

In 2012, the MAHLE Group achieved sales of nearly EUR 6.2 billion (USD 7.9 billion); approximately 48,000 employees work at over 100 production plants and 7 research and development centers.

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