

**Innovative actuators for use in the engine compartment**

Stuttgart, Germany, October 2007 — At this year's International Motor Show in Frankfurt, MAHLE, the automotive supplier headquartered in Stuttgart, Germany, will present innovative actuators for use in the engine compartment. One example is a plastic actuator with planetary gearing that has been optimized in terms of installation space.

These components serve the shifting of charge movement flaps, resonance flaps on intake modules, as well as the adjustment of the resonance tubes on variable-length switching intake manifolds. Additional applications include the adjustment of flaps and turbines on turbochargers. The plastic housing is partially replaced by a metal housing in order to withstand the high mechanical and thermal requirements.

By integrating a spring in the actuator, which at the same time serves as a clearance compensation spring, a fail-safe function is put in place. That is to say, the actuator automatically switches to this defined position in dead state.

The MAHLE actuator can be connected directly to the flap axes via a gear wheel interface. This eliminates the lever connection commonly used today, thus increasing the accuracy of the overall system and reducing the number of interfaces. Such a gear wheel connection also enables a flexible installation position of 360 degrees about the flap axis.

These actuators can be operated both with direct drive and via integrated electronics with diagnostic features. As a result, they are infinitely variable and can assume any intermediate position. In addition, a contactless position sensor can be integrated in the new MAHLE actuators, thus enabling wear-free sensing of the drive shaft. To further reduce the number of interfaces, and

thereby optimize the adjusting precision of the overall system, a direct connection of actuators to an adjusting unit or an integration of actuators on the intake system is possible as well.

In applications that do not require a fail-safe function, MAHLE offers torque- and efficiency-optimized actuators with worm gearing.

The MAHLE Group is one of the 30 largest automotive suppliers worldwide. As the leading manufacturer of components and systems for the internal combustion engine and its peripherals, MAHLE is among the top 3 systems suppliers for piston systems, cylinder components, valve train systems, air management systems, and liquid management systems. With more than 40,000 employees in 110 production plants and seven research and development centers, MAHLE generated sales in excess of EUR 4.3 billion (USD 5.8 billion) in 2006.

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