Press Release

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Demand-driven climate control
Bosch carbon-dioxide sensor saves fuel
New control strategy reduces energy requirement

- CO_2 sensor increases efficiency of air-conditioning system
- Constant monitoring of cabin climate

Cars that emit less CO2 and consume less fuel – these are the prime objectives of development work in the automotive industry. To achieve this objective, engineers are also exploring new paths: Bosch's new Climate Control Sensor, or CCS, measures the level of carbon dioxide (CO_2) in the passenger compartment. The result is an enhanced electronic control of the air-conditioning system, and a corresponding reduction in energy demand. While the air in the passenger compartment remains good, the system consumes far less fuel. On the basis of a series of trials under southern European summer conditions, engineers calculate that fuel economy can be as high as ten percent.

The Bosch Climate Control Sensor opens up new control strategies for the developers of modern air-conditioning systems. The sensor constantly measures the carbon-dioxide level of the air in the passenger compartment, while an enhanced version also measures air humidity and air temperature. These data are used to precisely control all the actuators of the air-conditioning system, and in this way provide for a balanced management of air recirculation.

As much fresh air as necessary is constantly fed into the passenger compartment. But as often as possible, the air-conditioning system automatically switches to recirculation mode, and thus works without any stream of fresh air from outside the vehicle. This saves energy, because the amount of power needed for cooling is reduced. Using less power for cooling means a lower load on the combustion engine that drives the air-conditioning compressor, and thus reduced fuel consumption in the vehicle.

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Bosch has carried out a series of dynamometer tests with the prototype of a mid-size vehicle equipped with an air-conditioning system based on the R744 coolant. This coolant already complies with future European Union requirements. When climate control was optimized by the addition of this sensor, the fuel saving was as high as nearly 20 percent, depending on climate zone and vehicle speed. If these figures are applied to an optimized air-conditioning system using the R134a coolant, Bosch engineers calculate a fuel saving of up to ten percent when the system is operating in maximum cooling mode.

The robust and compact Climate Control sensor uses infrared-based spectroscopy to measure CO_2 levels in the air. This can reliably measure even minute concentrations of less than 0.02 percent by volume. The properties of the Climate Control Sensor form the basis for new control strategies for air-conditioning systems. Samples of the sensor are already available.

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The Bosch Group is a leading global manufacturer of automotive and industrial technology, consumer goods, and building technology. In fiscal 2006, some 260,000 associates generated sales of 43.7 billion euros. Set up in Stuttgart in 1886 by Robert Bosch (1861-1942) as "Workshop for Precision Mechanics and Electrical Engineering," the Bosch Group today comprises a manufacturing, sales, and after-sales service network of some 300 subsidiaries and more than 13,000 Bosch Service Centers in over 140 countries.

The special ownership structure of the Bosch Group guarantees its financial independence and entrepreneurial freedom. It makes it possible for the company to undertake significant up-front investments in safeguarding its future, as well as to do justice to its social responsibility in a manner reflective of the spirit and will of its founder. A total of 92% of the share capital of Robert Bosch GmbH is held by the charitable foundation Robert Bosch Stiftung. The entrepreneurial ownership functions are carried out by Robert Bosch Industrietreuhand KG.

Additional information can be accessed at www.bosch.com.