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Continental Automotive Systems expects major boost for DDS, TPMS and ABS from new US road safety legislation

### Tire Pressure Monitoring Systems to become Obligatory in the USA

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From November 1, 2003, in line with a new statute drawn up by the US National Highway Traffic Safety Administration (NHTSA), all new passenger cars, light commercial vehicles, SUVs, and vans in the USA must be equipped with a tire pressure monitoring system. In the period up to October 2006, automakers can fit systems that use either direct or indirect measuring methods. In a subsequent phase, the US legislature will then prescribe one or the other. With the Deflation Detection System (DDS), which features indirect measurement, and the direct-measuring Tire Pressure Monitoring System (TPMS), Continental Automotive Systems is technology leader for both types of systems. Consequently, the company is in an optimal position to serve this high-growth market, where some 17 million new vehicles are registered each year. The company is also expecting to see a steep rise in demand for electronic braking systems in the US, since indirect-measurement systems such as DDS are based on the companies ABS anti-lock brake technology.

In the wake of a series of dramatic accidents, the majority of which were found to be due to defective tires, the NHTSA drew up a study on the effects of various tire pressure monitoring systems.

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The study revealed that both direct and indirect measurement systems lead to a decisive improvement in road safety, since excessively low tire pressures have a disastrous impact on the dynamic handling of a vehicle. According to NHTSA findings in the United States, tire pressures are too low in 27 percent of all passenger cars and no less than 33 percent of SUVs, vans and pick-ups.

Indirect measurement systems such as the Deflation Detection System (DDS) from Continental Automotive Systems use the infrastructure provided by the vehicle's ABS system to identify tire deflation as soon as the pressure drops by approximately 30 percent. They do so by purely mathematical means, by comparing the speeds of all four wheels. DDS relies on the fact that, as tire pressure drops, the wheel diameter becomes smaller and the affected wheel will therefore rotate faster. Following its comparative tests of indirect measurement systems, the NHTSA ranked DDS as the best system of its kind.

Far more precise – if also more complex – are the direct measurement systems. With its pressure and temperature sensors, the Tire Pressure Monitoring System (TPMS) from Continental Automotive Systems can spot deflation from as little as 0.1 bar deviation. TPMS transmits its findings straight to the electronic control unit of the ABS anti-lock brake system. In the latest generation, the receivers are dipolar antennas, integrated into the wheel speed sensor cables – a solution which makes the assembly process much less complex for vehicle manufacturers compared to competitive direct measurement systems.

Together, TPMS and DDS offer a unique level of safety which competitive systems have yet to match. The Deflation Detection System acts as a permanent back-up for the perilous event that a defective TPMS wheel module should fail to trigger a warning when the actual pressure drops below the set value.

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DDS also enables a lower-cost configuration of TPMS with a central antenna receiving the signals from all four wheels. In this case, TPMS determines the precise tire pressure, while DDS identifies which tire is affected.

Since 2000, DDS has been fitted to the BMW M3 as standard and is now also featured in the Mini and available as an option for the BMW 3-Series. Two other major automakers are planning to include DDS in their standard specifications. TPMS is due to debut in production models from a leading German automaker in the first quarter of 2004. The next step on the development front will be to utilize the TPMS data for extended ESP control and rollover prevention.

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