Presseinformation

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InCar highlights for the powertrain and chassis: Reduced fuel consumption, lower costs

With their innovations for the engine, the InCar engineers are increasing the efficiency of the combustion process and reducing friction losses in the powertrain. In the chassis area it's all about lightweight construction, comfort and part integration. The new powertrain solutions ease the burden on the climate, while the new concepts for axles, steering systems and dampers offer cost, function and weight advantages.

Valve control system for maximum performance and minimum fuel consumption
The multi-step valve lift system Presta Shiftable Valve Control (PSVC) reduces fuel consumption by two to five percent compared with the already fuel-efficient direct-injection 1.4-liter four cylinder engine used as a reference. At low engine loads, additional fuel savings of eight to 20 percent and further reductions in CO_2 emissions can be achieved by cylinder deactivation. The environmental statistics: Emissions of CO_2 equivalent decrease by more than 2,000 kilograms per vehicle over the full lifecycle.

With the PSVC system the intake or exhaust valves can be adjusted in at least three steps between full valve opening and cylinder deactivation. The system tailors the volume, composition and utilization of the air/fuel mixture precisely to the engine speed and load.

Innovative camshaft bearing reduces weight and cost
The PICA camshaft module saves up to ten euros in cylinder head machining, reduces weight by more than a kilogram and lowers valve train friction by up to ten percent. The reference is an aluminum four-cylinder DOHC cylinder head (DOHC stands for Double Overhead Camshaft). The current state of the art is a solution in which the camshafts rotate in split plain bearings. For this, a bearing bore has to be milled into the cylinder head.

In the new InCar solution the bearings are mounted directly on the camshafts. The bearing block modules surround the shafts completely and thanks to their flat base can be fastened easily to the cylinder head cover. Among other things this eliminates costly bearing bore machining. The new system saves weight because the height of the cylinder head is reduced. In addition, one-piece antifriction bearings can be used in the bearing blocks. This reduces valve train friction by up to ten percent compared with the reference.

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LCK II: Lightweight high-strength steel chassis
LCK II, the InCar concept for rear axles, utilizes the potential of high-strength steels to achieve weight reduction in the chassis. Compared with the reference, an aluminum rear axle beam, the lightweight chassis concept II is 50 percent less expensive and delivers the same performance, yet it is only four percent heavier than the reference aluminum subassembly.

The LCK II uses the hot-rolled complex-phase steel CP-W® 800. With a yield strength of 680 megapascals (MPa) the material is much stronger than the steels currently used in chassis construction. As a result, parts can be made thinner and with less weight. The LCK II rear axle reduces emissions by around 120 kilograms of CO_2 equivalent per vehicle over the full lifecycle.

Integrated steering system: Reduced space, reduced weight, reduced cost
One and one is one: That's the sum when you add up steering know-how and chassis expertise at ThyssenKrupp. The integrated steering system shows how intelligent part integration can reduce weight by eleven percent and save space – while lowering costs by three percent compared with a conventional front axle beam with an electromechanical steering system. The new solution reduces CO_2 equivalent emissions by 85 kilograms per vehicle over the full lifecycle.

The integrated steering system combines steering housing and cross member in one part. In a conventional U-shaped front axle beam the cross member together with two longitudinal members form the base frame. In the new InCar solution the cross member is replaced by a steel housing that accommodates the steering gear and at the same time performs the structural functions of the cross member. This integration saves weight and cost because a separate steering housing is no longer needed. At the same time the new solution creates space that can be used for example for hybrid drive components.

DampTronic® select: Sport suspension at the flick of a switch
The two-stage damper system DampTronic® select shows how customers can benefit from the advantages of variable suspension at low cost. By means of a switch on the dashboard the damper can be switched between a normal and a stiff sport characteristic. DampTronic® select offers major customer benefits at an attractive cost and closes the gap between conventional dampers and complex electronic systems. The two-stage damper system costs 70 percent less than conventional continuously variable systems. The system can be adapted to the requirements of different vehicles.

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