Press release

Production milestone for diesel injection systems

10 million Bosch common-rail systems
for commercial vehicles

- Success of four generations of common-rail systems for commercial vehicles (CRSN)
- Injection pressure has increased from 1,400 to 2,500 bar since 1999
- Universal use: for commercial-vehicle, off-highway, and maritime applications

This year sees Bosch celebrating the production of the 10 millionth common-rail system for commercial vehicles (CRSN). The production figures over the past few years are testimony to the rapid development of this technology, which delivers enhanced efficiency and lower emissions: following the launch of the CRSN1 in 1999, one million systems had already been manufactured by the end of 2003. Now Bosch can celebrate another production milestone, with the 10-millionth CRSN rolling off the production line in January 2013.

Continuous development: universal CRSN model family

The first Bosch common-rail system for commercial vehicles (CRSN1) was unveiled in 1999 in the light-duty segment at Iveco (Turbo Daily). The first heavy-duty application followed shortly thereafter at Renault, and delivered an injection pressure of 1,400 bar. In 2001, the enhanced 1,600 bar system was rolled out in the U.S. pickup segment.

The CRSN3, which delivers 1,800 bar and was launched in 2005, ushered in a major advance. This system’s low-return injector delivers additional fuel savings. The design reduces the amount of fuel delivered by the high-pressure pump and, in turn, the associated drive power, increasing the efficiency both of the injection system and of the engine overall. From the CRSN3, the system evolved further with the CRSN3-20 and -22 systems in 2010. Today’s CRSN3-25 delivers 2,500 bar injection pressure. The CRSN3-
25 is also available with various injection pumps to generate pressure, making it universally suited to medium- and heavy-duty commercial vehicle engines featuring anything between 4 and 16 cylinders. The injector also demonstrates its qualities in the off-highway segment, such as in tractors and construction machinery, and in the maritime segment, in yachts, cruise liners, and container ships.

The CRSN4 for heavy-duty commercial vehicles, which was launched in 2007, rounds off the extensive lineup of Bosch injection systems. Bosch has adopted the all-new, two-stage pressure generation concept for the CRSN4. In this pressure-amplified system, the fuel in the high-pressure pump is initially compressed to up to 900 bar before the injector takes it up to the maximum injection pressure of 2,100 bar. In 2012, the CRSN4 was also made available with an injection pressure of 2,500 bar. Advantages include ultrafine fuel atomization and precise multiple injections for effective, clean combustion as well as quiet engine running.

**Common base: separation of pressure generation and injection**

Across the generations and development stages, all CRSN systems share compelling common features, including a pressure accumulator from where the fuel is injected at high pressure into the cylinders via the connected injectors. The separation of pressure generation and injection provides additional leeway as regards engine design. Solenoid valves precisely meter the fuel and support up to seven individual injections per power cycle on the current systems. Flexible multiple injections make the engines quieter as well as reducing emissions and fuel consumption.

**10 million common-rail systems for commercial vehicles and 74 million for passenger cars: paving the way to the future**

Apart from injection technology, Bosch is also working on other systems to reduce fuel consumption and emissions in diesel engines. These include the Denoxtronic and Departronic exhaust-gas treatment systems, which are designed to reduce emissions of nitrogen oxide and particulates respectively. Bosch is also working on the hybridization of the commercial-vehicle powertrain.

**Press photos:** 1-DS-18402, 1-DS-18403

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