

## Press Release

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# Five-cylinder high-performance diesel in the Volvo S40 and Volvo V50

- Compact car with large diesel engine – a competitive combination
  - Higher performance, improved driveability and lower emissions
  - Electronically controlled turbocharger – without any turbo kick
  - Advanced injection system gives efficient combustion
  - Particle filter incinerates more than 95 percent of soot particles
- Volvo's new in-house manufactured five-cylinder D5 diesel engine is now also being fitted in the company's medium-segment models, the Volvo S40 and V50. Volvo Cars can thus offer a unique combination of large diesel engine in a compact body. High power and massive torque result in a first-class driving experience at all speeds – with very low exhaust emissions. The engine will initially be mated to a five-speed automatic transmission that gives smooth and comfortable progress.

The D5 engine is of the new generation of five-cylinder diesel units that Volvo Cars launched earlier in 2005 in its larger models – the Volvo S60, V70, XC70 and XC90. Compared with the first generation, the new engine has undergone comprehensive redevelopment, resulting in higher performance and improved driveability. What is more, emissions have dropped markedly.

“In order to fit the five-cylinder D5 engine into the smaller engine compartment of the Volvo S40 and V50, we have altered the entire engine installation and most of the ancillaries,” says Peter Ewerstrand, project manager of the Volvo S40 and V50. “For instance, we've integrated the manifold and turbocharger into one single unit.”

The transversely installed D5 engine, which has a displacement of 2.4 litres, will be the exclusive top offering of the diesel range for the Volvo S40 and V50. Two four-cylinder engines of 1.6 and 2.0 litres have already previously been available.

The D5 engine's maximum power output is 180 hp (132 kW) and it offers excellent high-speed capability. Torque is a massive 350 Nm, which means serious pulling power and alert response at both low and high revs. The Volvo S40 D5 accelerates from 0 to 100 km/h in 8.5 seconds (V50 D5 8.6 seconds). These figures are preliminary.

Fuel consumption is modest for a car with the sort of high performance offered by the D5. In mixed driving conditions, fuel consumption is 7.0 litres/100 km (preliminary figures).

### In the upper segment

“With the Volvo S40 D5 and V50 D5, we have a pair of truly competitive cars in the upper segment for compact diesel cars,” says Peter Ewerstrand. “The engine's high performance combined with the body's torsional rigidity and the widely acclaimed chassis of these models results in a wonderful driving experience with the emphasis on power, control and comfort.”

The chassis, with MacPherson struts at the front and a Multilink rear axle, is set for comfort. The five-speed automatic transmission contributes further to the comfortable progress.

### Electronically controlled turbocharger

The D5 engine has the latest generation turbocharger featuring electronic control for swift and precise regulation of boost pressure. A large impeller gives high torque and high power output. The variable ducts are angled for efficient gas flow and high efficiency. All this contributes to fast acceleration and good high-speed resources.

The turbo housing is water-cooled, which is unusual in diesel engines. It provides continued cooling of the turbocharger when the engine has been switched off, which is particularly important during short stops after driving at high speeds, for instance when refuelling on the German autobahn.

The electronically controlled turbo boosts the power without any noticeable turbo kick, further contributing to good driving comfort.

#### **Injection with variable swirl**

The air is rotated inside the cylinders' combustion chamber. With the help of a throttle, this swirling motion is controlled steplessly and the combustion is adjusted with immense precision to suit the current driving conditions and the engine's current load. Large combustion chambers give low compression and thus contribute to high performance allied to low emissions.

The injection system features injectors with seven nozzles. This system provides a finely atomised fuel spray and promotes efficient combustion. Injection takes place in three stages: pre-injection, main injection and post-injection. The last stage helps burn off soot in the exhaust gases.

An electronically controlled quick glow system results in short glow times and makes it easy to start the engine in cold weather.

#### **Engine management system with high capacity**

The D5 engine has the latest generation of management systems, with high capacity and a large number of sensors ensuring extremely precise regulation of the engine's functions. Among other things, the throttle and the EGR (Exhaust Gas Recirculation) valve are controlled electronically to ensure exact control of air supply and recirculation of the exhaust gases. An EGR cooler lowers the combustion temperature very effectively and cuts emissions.

The catalytic converter is installed very close to the engine for fast warm-up and fast start-up of the filtration process. It has been supplemented with a Lambda probe that regulates both fuel blend and emissions with immense precision.

#### **Particle filter fitted as standard**

The D5 engine has a particle filter as standard. It cleans soot particles from the exhaust gases very effectively, filtering out more than 95 percent. The filter is of the CDPF or Coated Diesel Particulate Filter type. A special coating helps incinerate the particles. For this reason, no additive is needed in the fuel, and no service is needed either. Soot incineration, which lasts about 20 minutes, takes place automatically every 500 to 1000 kilometres, depending on driving conditions. "We feel we have produced a particularly successful combination of a compact and agile car with a powerful and responsive high-performance diesel engine," says Peter Ewerstrand. "The Volvo S40 D5 and V50 D5 will be an excellent complement to our already broad model range."

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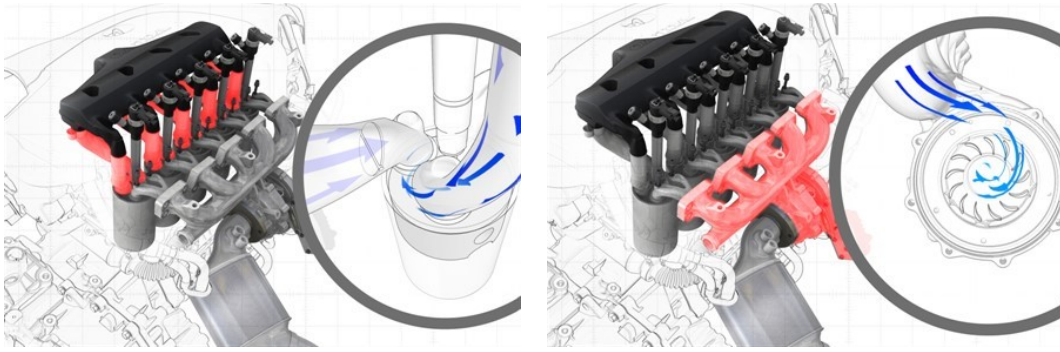
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