

Press Release

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The 2007 Volvo S80 Engines

Powerful V8, sophisticated new in-line 6 power the flagship Volvo sedan

Manufacturers that hope to succeed in the hyper-competitive premium segments of the market must provide their customers an ever-expanding array of features, but none is more crucial to success than the selection of powertrains. For the 2007 Volvo S80, Volvo Car Corporation has provided one of its most comprehensive engine line-ups with the company's two newest gasoline engines headlining the car's introduction in North America.

The new S80 will be available with either a powerful V8 or a sophisticated new in-line 6-cylinder engine beneath the graceful hood of the Volvo flagship sedan.

The first V8 Volvo sedan

The new Volvo S80 is the first Volvo sedan to be powered by the compact, transverse-mounted V8 engine first introduced in the 2006 Volvo XC90. A unique design with a slim 60-degree angle between the cylinder banks makes the Volvo V8 an extremely streamlined engine. By reversing the traditional offset of the cylinders and placing the left row ahead of the right, the engine has the optimum shape to fit the car's body structure. A counter-rotating balance shaft reduces noise, vibration, and harshness.

Despite its relatively small size (4.4 litres), the V8 produces exemplary horsepower (311 bhp) and torque (325 lb.-ft.), with exceptional drivability (273 lb.-ft. of torque is available from 2000 rpm). Extensive use of aluminum has resulted in very low weight for the new engine, a contributor to ride, handling and fuel economy.

Despite its high output, the first V8 offered in a Volvo sedan is also among the cleanest V8s in the world. Four catalytic converters – two of which are positioned close to the engine – and a highly advanced engine management system contribute to quick start-up of the filtration process, reducing exhaust emissions to a minimum (which satisfies ULEV II and Euro 4 requirements). Variable camshaft timing and a variable intake system also contribute to efficient emission control and good drivability.

Compact, powerful I6

A new, sophisticated and compact in-line Volvo 6-cylinder engine will also make its world debut in the 2007 Volvo S80. The new engine features an advanced induction system that contributes to both good performance and impressive fuel economy. Through innovative engineering, the compact engine can also be installed transversely in the 2007 Volvo S80's engine bay.

Despite its compact dimensions, the new engine has a larger displacement than its predecessor – 3.2 litres compared to 2.9 litres. The output of the new engine has also been improved, with 235-horsepower and 236 lb.-ft. of torque, representing an increase of 44-horsepower and 45 lb.-ft.

“The engine has been designed to be mated to the new Volvo 6-speed automatic transmission,” says Derek Crabb, Vice President Powertrain at Volvo Cars. “And the entire driveline has been developed in concert with the rest of the car to create a harmonious, refined driving experience in every respect.”

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delivery. Through an advanced valve train and a variable intake system, the engine can be exploited efficiently throughout the rev range, improving throttle response. The engine features a range of technologies designed to improve fuel efficiency and power delivery. Through an advanced valve train and a variable intake system, the engine can be exploited efficiently throughout the rev range, improving throttle response.

The valve train features Variable Cam Timing (VCT) and Cam Profile Switching (CPS) to control valve lift and duration on the inlet side – two key elements in providing the engine with excellent flexibility. CPS determines valve lift; the VCT system controls duration over a wide range of operation.

With CPS, the camshaft lifts the inlet valves to two different heights, depending on engine speed and load. In normal driving with modest throttle openings and low engine revs, fuel consumption is moderate yet torque is sufficient to provide good drivability.

Two engines in one

For more enthusiastic driving, involving full throttle and high engine revs, the engine response is near instantaneous, providing a thrust of power at both low and high engine speeds.

“In principle, Cam Profile Switching creates two engines in one,” explains Crabb. “We can unite widely differing demands on the engine and easily meet the requirements of customers with entirely different wishes. For instance, we can satisfy customers who prioritize performance as well as those who are more interested in driving comfort and fuel economy with equal ease.”

A Variable Intake System (VIS) has been equipped with two throttle flap valves which adjust the intake manifold volume to suit the current driving situation. This results in a uniformly high and broad torque curve.

Like the V8 engine, the 6-cylinder engine is mated to a 6-speed automatic transmission with Geartronic sequential shifting, allowing the driver to change gears manually. Regardless of whether the customer selects the V8 or the new six, Canadian S80s come with the Volvo All-Wheel-Drive feature as standard equipment.

Narrower is safer

The engine's compact dimensions have been achieved by locating the ancillaries, such as the power steering pump and air conditioning compressor, behind the engine in the space above the gearbox. Consequently, there is no front-end drive of the ancillaries. Instead they are driven via gears by the rear end of the crankshaft. This engineering solution is known as READ – Rear End Ancillary Drive. The alternator is direct-driven and installed on the engine block. The entire engine and transmission package takes up minimum space, particularly in the car's longitudinal direction.

By designing the drive system in the form of a small gearbox with an intermediate shaft inside the driveshaft – known as a Shaft in Shaft design – it was possible to ensure a very short package. The two shafts are driven by different gears that give them different speeds (one speed for camshaft drive and one for the ancillaries). The new engine is just 625 millimetres long – about the same length as the Volvo in-line 5-cylinder engine.

“It's a particularly compact solution that is the result of highly advanced development work,” says Crabb.

The compact nature of both engines, and their transverse mounting architecture, contributes to the safety of the new S80. The smaller overall engine size has left engineers more room to design controlled deformation space in the case of a collision. “The fact that the engine's design also helps enhance safety isn't something the customer usually thinks about, but it is naturally a key element in a Volvo product concept,” Crabb adds.

In markets outside of North America, the 2007 S80 can be specified with three other engines. Depending on the market, the Volvo in-line 5-cylinder gasoline engine with low pressure turbocharging and two versions of the company's 5-cylinder diesel engines are also available.

Volvo Cars of Canada Corp. is part of the Volvo Car Corporation of Göteborg, Sweden. The company provides marketing, sales, parts, service, technology and training support to the 43 Volvo automobile retailers across the country. The company's product range includes the flagship S80 luxury sedan, the versatile V70 wagon, the S60 sports sedan, the compact and sporty S40 and V50, and an XC-line of vehicles that includes the rugged XC70 and the award-winning XC90 sport

utility vehicle. For 2006, the company is proud to introduce the second-generation C70 convertible with a new retractable three piece hardtop.

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