

PRESS INFORMATION

The new Volvo V50

Sportswagon with turbo and AWD

- **Transverse, five-cylinder, in-line engines**
- **Compact car with top-class performance and wonderful driving pleasure**
- **New compact engine generation**
- **High torque and enjoyable engine performance**
- **Extensive engine programme and new diesel engine**
- **Particle filter with automatic regeneration function**
- **Sporty gearboxes**
- **Chassis for responsive, stable driving performance**

Volvo's new sportswagon, the V50, has transverse, in-line engines – with both four and five cylinders.

“Making room for a five-cylinder engine in a compact body is something of a work of art,” says Peter Ewerstrand, project leader for the V50 and the new S40. “We have succeeded by using new methods to reduce the exterior dimensions of the engine.”

The result is a compact car offering high performance and a generous helping of driving pleasure. The compact dimensions of the engine also contribute to the very high level of crash safety.

The chassis has been developed in parallel with the new engines to provide driving properties worthy of a sportswagon.

T5 turbo in combination with All Wheel Drive

The top-of-the-line model in the V50 programme is a four-wheel-drive, turbo-charged Volvo, the V50 T5 AWD. It has a five-cylinder, 2.5-litre petrol engine with a light-pressure turbocharger. Turbo technology produces exceptional torque from low to high revs. The high, flat torque curve ensures excellent acceleration.

The manifold and turbo unit in the T5 engine have been cast together in high-alloy cast steel which is particularly heat resistant (1,050°C)). It therefore requires less conventional cooling with petrol. As a result, the engine can be run on a leaner fuel mixture, resulting in lower fuel consumption and emissions, especially when driving at high speeds.

The T5 engine offers a maximum output of 220 bhp and 320 Nm of torque.

The Volvo V50 T5 AWD will have the same kind of four-wheel-drive system as Volvo's larger AWD models. The engine power will be automatically distributed between the front and rear wheels by an electrically-controlled hydraulic clutch, which reacts very swiftly (Haldex).

"The T5 engine and All Wheel Drive give the V50 model extremely enjoyable road manners," says Peter Ewerstrand. "Top-class performance is combined with responsive, stable driving characteristics."

New engine generation with extremely compact dimensions

The new petrol engines in the Volvo V50 (and the new S40) are a further development of the low-friction engines that power the large Volvo models. The new generation is known as RNC, where C stands for Compact. Most of the external engine components have been designed and packaged to enable the engine installation to take up exceptionally little space:

- The exhaust manifold outlets are angled down towards the engine block.
- The manifolds on the turbo engines are cast together with the turbo unit housing for added compactness.

The inlet manifold is compact-cast in fibreglass-reinforced plastic and is routed up over the engine. The fuel injectors are installed in an aluminium section for safety reasons.

- The alternator, water pump and air conditioning compressor have a compact design and are very efficiently packaged.
- The air conditioning compressor has been moved so that it is well protected in the event of a collision.

More space between engine and passenger compartment

The result is an engine that is 200 mm slimmer and 25 mm shorter than the one in the large Volvo models. This compact format makes the engine lighter. Combined with Volvo's transverse engine installation concept, it also contributes to a high level of crash safety, as there is added space for deformation in the engine compartment. In a collision, the engine can be shunted 150 mm to the rear before the crankshaft comes into contact with the cross-member near the bulkhead.

There is no less than 70 mm of free space above the engine between the cylinder head and bonnet. This allows the bonnet to crumple gently, thereby helping to reduce the risk of head injuries if a pedestrian or cyclist should collide with the car.

Powerful engines for silky-smooth operation

The new five-cylinder, in-line engines have a displacement of 2.4 and 2.5 litres respectively. The five cylinders and the large displacement produce high torque from low engine speeds – together with swift acceleration.

What is more, a five-cylinder engine with a long stroke has a more relaxed and pleasant character owing to its low vibration level and smooth operation.

The engines share the same technology as the units that power the large Volvo cars.

- Four valves per cylinder and dual overhead camshafts – for high power and alert response.
- Variable camshaft timing (CVVT) – for high power and high torque in combination with lower consumption and reduced emissions.
- Electronic engine management system with precise, adaptive control – for efficient combustion and good performance.

Extensive engine programme

When it is launched, the Volvo V50 will also be available with two five-cylinder, normally-aspirated engines, the 2.4i and 2.4 with outputs of 170 bhp and 140 bhp respectively. Both engines have a displacement of 2.4 litres.

In addition, there is an entirely new four-cylinder diesel engine. It is turbo-charged and has second-generation common rail technology featuring moving rails.

The injection system operates under immense pressure, ensuring extremely fine distribution of the fuel particles. This produces both good performance and low emission levels.

Using piezo-electrical injectors, the fuel can be divided between several small injectors during each combustion cycle, thereby helping to cut noise levels. With these piezo-electrical injectors, the engine is also prepared for forthcoming emission requirements.

It will also be possible to specify the diesel engine with a particle filter which significantly reduces unburned soot particles in the emissions, thereby reducing the negative environmental impact. The system is cleaned (regenerated) automatically, as the contents of the filter are burnt off at regular intervals. An additive in the fuel enables this process to take place at a moderate temperature (approximately 450°C compared with the normal 550°C or thereabouts). The entire process, including the supply of the fuel additive, takes place without the driver noticing anything. The regeneration interval is adjusted to match driving conditions and the driver's driving style.

The diesel engine is a result of the Ford Motor Company's and PSA's joint engine development programme.

The diesel engine has a displacement of 2.0 litres. In 2004, a smaller 1.6-litre diesel engine will also be launched.

The range of engines will be continuously extended.

Engine	Configuration	Output	Torque
2.4	5-cyl in-line	140 bhp	220 Nm
2.4i	5-cyl in-line	170 bhp	230 Nm
T5	5-cyl in-line	220 bhp	320 Nm
2.0 D (turbodiesel)	4-cyl in-line	136 bhp	340 Nm
1.8	4-cyl in-line	125 bhp	165 Nm
1.6	4-cyl in-line	100 bhp	145 Nm
1.6 D (turbodiesel)	4-cyl in-line	110 bhp	240 Nm

For performance and consumption figures, please see the separate specification document.

The plans also include a Bi-Fuel engine – an engine that can be run on both natural gas and petrol.

“We shall have a remarkably powerful range of engines and will be able to comply with most needs and wishes,” says Peter Ewerstrand.

Transmissions from the R models

The six-speed manual gearbox, which was originally developed for the Volvo S60 R and V70 R, is now making its entry in the Volvo V50 T5. The six gears are spread out to combine swift acceleration with high top speed. The gearbox has triple synchromesh and an extremely distinct gear-changing pattern.

The normally-aspirated engines are combined with a new generation of Volvo’s five-speed manual gearbox. It has been further developed with triple synchromesh for faster changes and distinct feel.

Adaptive automatic transmission

The automatic transmission for the Volvo V50 is the same as that used in the larger Volvo models. It is a five-speed unit with an adaptive gear-changing pattern; in other words, it adapts to the current driving style.

A great deal of effort has been invested in matching driveshafts and universal joints to the high engine power outputs and in ensuring smooth, snatch-free power transmission while accelerating.

Six gears for the diesel too

The turbodiesel comes as standard with a six-speed manual gearbox (not the same as in the T5 model). This contributes to swift acceleration, as a result of excellent pulling power in every ratio.

Chassis with the properties of a large car

The Volvo V50 has been developed in the same spirit as the Volvo S60 and Volvo S80. The experience acquired from the advanced Volvo S60 R and V70 R has also helped to form the basis for this new compact model.

“We wanted to produce a sportswagon with the right driving experience,” explains Peter Ewerstrand. “Driving pleasure with responsive, stable road performance as the starting point.”

The five-cylinder powertrain laid the foundations for large-car properties. Independent wheel suspension with a multilink system at the rear produces a superb combination of comfort and consistent driving characteristics. The wider track and longer wheelbase, compared with the current Volvo V40 model, also contribute to the stable behaviour the car exhibits on the road.

Front suspension geometry has been carefully balanced to provide quick, precise steering response, thereby enhancing the sporty appeal.

The steering is electro-hydraulic, with light, distinct and controlled steering feedback.

The Volvo V50 can be equipped with a sports chassis as an option (not the AWD model). Stiffer springs and reduced ground clearance help to produce greater directional stability in connection with sporty driving.

“People are entitled to expect a great deal from a modern sportswagon,” concludes Peter Ewerstrand. “We are convinced that the Volvo V50 is going to offer a particularly pleasant driving experience. This will be largely due to the new powertrain, the carefully-balanced chassis and the exceptional torsional rigidity of the body.”

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