

## Communiqués

Sep 18, 2003 | ID: 560

# Chassis and powertrain: performance and roadholding at premium level

For immediate release

## **Chassis and powertrain: performance and roadholding at a premium level**

- Ride comfort and road holding on a par with premium passenger cars
- Emergency Brake Assistance
- Electronically controlled all wheel drive
- Turbocharged engines from 208 bhp to 268 bhp
- Geartronic standard with all engines

The Volvo XC90 is a vehicle designed for all types of roads. Even though it is not intended for extreme off-road driving, the combination of electronically controlled all wheel drive and 8.6" of ground clearance creates the right preconditions for continued progress when road surfaces get rough.

The feeling of safety that the high seating position gives the driver is supplemented with the knowledge that he or she can control the car with the help of instant, well-weighted response from the chassis, engine and brakes. Progress is thus more relaxed and comfortable.

The chassis in the Volvo XC90 is designed to give the vehicle the same ride and road holding as a premium passenger car. It is based on the chassis of the Volvo S80, S60 and V70, cars that are renowned for their excellent road manners.

In the Volvo XC90, however, the suspension has been upgraded and dimensioned to handle heavier loads and higher ground clearance.

### **Well-insulated rear suspension for quieter progress**

The independent multi-link rear suspension is completely insulated, with the dampers and springs attached directly to the sub frame. This results in a quieter ride, since road and transmission noise are largely filtered out before it reaches the bodywork.

The independent MacPherson front suspension together with the new ZF steering gear, promotes increased precision and sharp response.

The Volvo XC90 has an extremely wide track 64.3" front, 63.9" rear and a long wheelbase 112.6". This makes for exceptional stability, with the vehicle behaving very consistently and dependably even on curving, twisting and uneven roads. The Volvo XC90 can be specified with a range of wheels with a diameter of up to 18 inches.

The braking system in the Volvo XC90 is dimensioned to help stop the vehicle safely, even when it is fully loaded with seven people and their luggage. This is achieved with a large brakesystem and Emergency Brake Assistance, (EBA). This system monitors how quickly the brake pedal is pressed, and can thus determine if the driver is panic braking. In such a situation, the brake pressure is boosted to maximum in the shortest possible time, thus reducing the stopping distance.

## **Electronically controlled AWD**

One important ingredient in the recipe for safe driving pleasure in the Volvo XC90 is its electronic AWD system, developed in close cooperation with one of the foremost experts in this area - Haldex of Sweden.

The all wheel drive system in the XC90, like the one in the S60AWD sedan, automatically distributes power between the front and the rear wheels for enhanced traction on all surfaces. The electronically controlled AWD monitors the vehicle's contact with the underlying road surface and assesses the signals that the driver receives through the steering wheel, brake pedal and accelerator. This information then helps determine whether, and if so how, the system should respond.

In normal driving on dry roads, almost all power, 95%, is delivered to the front wheels.

If the road surface causes the front wheels to slip, power is proportionately diverted to the rear wheels. With electronically activated all wheel drive, engagement takes place extremely quickly, after just one-seventh of a wheel turn, which limits wheel spin and helps ensure reliable road grip.

As a result, the AWD system in the Volvo XC90 has all the benefits of a permanent all wheel drive system, without the accompanying disadvantages such as higher fuel consumption and heavier weight.

The electronic AWD system interacts in the Volvo XC90 with the active chassis systems DSTC - Dynamic Stability and Traction Control. This is an anti-skid system that automatically counteracts tendencies towards a skid before the driver even has time to notice. The system continuously compares the vehicle's direction of progress with the driver's steering wheel movements. If the vehicle shows any tendency to start skidding, the brakes are instantly applied to one or more wheels to stabilize the vehicle.

DSTC also includes an anti-spin system that automatically brakes the wheel that spins, so that drive is diverted to the wheel with the best grip. It also controls the engine torque.

## **Engines for every need**

The Volvo XC90 is available with a choice of two engines, all made entirely of aluminium:

- An in-line 6-cylinder engine with a displacement of 2.9 litres, equipped with twin turbochargers. It produces 268 bhp and has 280 ft.lbs of torque from just 1800 revs/min.
- An in-line 5-cylinder 2.5 litre engine with a light-pressure turbocharger. It has a power output of 208 bhp and 236 ft.lbs of torque from 1500 revs/min.

Both engines come from Volvo's passenger car range, but they have been re-profiled to suit XC90. In particular they produce far more torque from lower engine speed.

The 6-cylinder engine is the same unit that powers Volvo's largest sedan, the S80 T6. It has a parallel turbo system - two small and highly efficient turbochargers that are installed alongside each other. They are driven by and feed three cylinders each.

In the Volvo XC90, the T6 engine's displacement has been enlarged from 2.8 to 2.9 litres and it is equipped with continuously variable valve timing or CVVT on both the inlet and exhaust sides. CVVT adjusts valve timing to suit the engine's current revs and load, and it thus exploits the engine more effectively, reducing fuel consumption and emissions.

One of the most important results is that maximum torque is available from just 1800 revs/minute, compared with the 2000 revs/minute of the 2.8-litre version.

The 5-cylinder light-pressure turbo engine now reaches its maximum torque 236 ft.lbs from just 1500 revs/minute, giving the XC90 excellent starting and towing characteristics. This has been achieved with a longer piston stroke by increasing engine displacement from 2.4 to 2.5 litres. This change is matched by a somewhat smaller turbo charger, which steps into operation a bit earlier. In addition, power output has increased from 197 to 208 horsepower.

## **Best of two worlds: Geartronic**

Both the Volvo XC90 T6 and the 2.5T use automatic Geartronic transmissions as standard. The T6 uses a 4-speed transmission, while the 2.5T is equipped with a 5 speed. With Geartronic, the driver gets the best of both worlds: on the one hand, the transmission can be left to take care of gear changing entirely automatically, or the driver can over-ride the system to change gears manually without a clutch pedal.

The automatic transmission is adaptive, which means that it monitors the driver's driving style and adjusts the gear changing pattern accordingly. It also features a "W" setting for winter driving on slippery surfaces. Here, the car starts off in a higher gear to avoid wheel spin and loss of control.

## Mots clés:

XC90 (2002-2014), Press Releases, 2003

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