

## Press Release

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# Volvo S60 AWD

For immediate release

At its introduction, the S60 was described as the Swedish manufacturers' sportiest and most dynamic sedan...ever. The next stage in the company's commitment to enhanced driving pleasure is now available - the Volvo S60 AWD - the first Volvo with electronically controlled all-wheel-drive.

### Electronically-Controlled All-Wheel Drive

The S60 AWD features electronically controlled AWD. The Active-On-Demand (AOD) system has been developed in collaboration with one of the pioneers in this field - the Swedish company Haldex. In this new system, the power is distributed between the front and rear wheels via a wet multi-plate clutch.

The function of this unique design is divided into three parts: hydraulic, mechanical, and electronic systems.

The unit can be regarded as a hydraulic pump that when a speed difference between front and rear wheels occurs, a hydraulic pump generates oil pressure that forces two sets of wet clutch plates to close. When both axles are rotating at the same speed, pressure is reduced bringing the drive wheels into equilibrium.

As it is a mechanical piston pump, the response is virtually instantaneous - about 15<sup>th</sup> of wheel rotation, without any delay occurring as a result of slow pumping.

The system is electronically controlled through a module mounted on the rear differential. It forms part of a unit with the stepper motor and the control valve. The differential electronic module communicated with the Engine Control Module (ECM) and brake control module via the Control Area Network (CAN). The differential electronic module uses sensor signals to control oil pressure on the wet clutch plates by adjusting a control valve.

The oil pressure on the wet clutch plates determines the torque that can be transferred to the rear wheels where the housing and the ring-shaped piston are connected to one axle while the piston control unit is connected to the other axle. When both axles are rotating at the same speed, no pumping takes place. As soon as a difference in speed arises, the pumping and flow of oil starts.

Oil is supplied to a clutch piston which compresses the wet clutch pack consequently reduces the speed difference. The oil returns to the reservoir via an adjustable throttle valve, which controls the oil pressure, and therefore the pressure on the wet clutches.

The electronic control means that the clutch functionality can be adapted to different driving situations.

### Intelligent System

The AWD system is electronically intelligent. It senses what road condition (through road wheel slippage) and what the driver wants. This information provides the basis for whether and how the system is to act.

When accelerating on a difficult surface, for example loose gravel, fast powerful and instantaneous engagement takes place. During a low speed cornering or parking maneuver, the system knows that the difference in speed between the wheels does not require engagement - and as a result, the inertia experienced with other systems in similar situations is avoided.

The AWD system is connected to the vehicle Multiplex electrical system. As a result, it communicates with the other systems in the car in order to optimize all-wheel drive to match almost any driving situation. This digital communication involves the Traction Control System (TRACS), for example.

Beginning January 2002, it will also be possible to equip the Volvo S60 AWD with DSTC (Dynamic Stability and Traction Control) for better skid control during adverse weather conditions.

### **Lightning-Fast Engagement And Disengagement**

The electronically controlled AWD system is characterized first and foremost by its extremely fast engagement and disengagement times, a further illustration of Volvo Cars' commitment to driving safety.

"The speed of the system gives what was already a well-balanced car exceptionally good road handling. After all, the owner of a sedan does not use all-wheel drive primarily for accessibility but for optimal roadholding and stability," says Hans Gustavsson, Senior Vice President Research, Development & Purchase at Volvo Car Corporation.

### **Five-Cylinder Turbocharged Intercooled Engine Developing 197hp**

The Volvo S60 AWD is equipped with a five-cylinder, 2.4-litre engine with a light-pressure turbocharger. Output is 197 hp at 5,100 rpm and maximum torque is 210 lb./ft. at a low 1,800 rpm.

This engine is also used in the Volvo S60 2.4T. It is a member of the new generation of RN engines, which have undergone extensive modifications to make them cleaner and more fuel-efficient.

Quick responding turbocharged engine management software means that the engine has a lightning response and impressive power at low engine speeds - two very important features when it comes to the Volvo S60 AWD's dynamic characteristics.

Volvo Cars of North America, LLC (VCNA), is an affiliate of Ford Motor Company's Premier Automotive Group based in Irvine, CA. And, is a subsidiary of the Volvo Car Corporation of Goteborg, Sweden, which will be celebrating its 75th anniversary in 2002. VCNA provides marketing, sales, parts, service, technology and training support to Volvo automobile retailers in the U.S., Canada, Mexico and Puerto Rico.

In addition to the sporty S60 and the new S60 AWD, the 2002 Volvo automobile line includes the flagship S80 luxury sedan, the versatile V70 wagon and rugged Cross Country, C70 Coupe and Convertible, and the compact S40 and V40 models.

#### **For More Information, Contact:**

Roger Ormisher  
800.970.8888

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