

Press Release

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New Volvo S60 AWD: Electronically controlled all-wheel-drive for all-season safety, control

For immediate release

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for all-season safety, control

Volvo Car Corporation has expanded the appeal of the sporty S60 sedan for 2002 with a new all-wheel-drive system designed to enhance traction in all conditions.

The new Volvo S60 AWD made its public debut at the international Frankfurt Motor Show in Germany in September, showcasing an electronically controlled Active On-Demand (AOD) system which provides nearly instantaneous power distribution between the front and rear wheels.

Like previous Volvo all-wheel-drive systems, the new AWD operates completely automatically, independent of the driver. The advantage of the new system is the speed and sophistication with which it operates.

In normal driving situations, the S60 AWD primarily powers the front wheels. It is only when the system detects that the front wheels have lost traction and have begun to spin that it delivers power to the rear wheels.

The system, created by Haldex of Sweden, uses a mechanical pump, control valve and 'wet' multi-plate clutch to distribute the power to the rear wheels. When front and rear wheels are rotating at the same speed, no power is transferred to the rear wheels. The instant that the front wheels begin to lose traction and spin, the system introduces power to the rear. The difference in rotational speed between the slipping front wheels and the rear wheels causes the pump (located at the rear differential) to force highly pressurized oil to the wet clutch plates in the rear differential, pushing the plates together to transfer power to the rear wheels. A small electrical pump is used to "pre-pressurize" the system so that power transfer can occur almost instantly.

The system is electronically controlled by a module mounted on the rear differential. The module controls the electric pump and an oil control valve. The differential module communicates with the engine control module (ECM) and brake control module via the car's Multiplex network to determine when the front (driven) wheels begin to lose traction and to anticipate different driving situations.

The module opens and closes the valve, which controls oil flow between the pump and the wet clutch pack. The valve opens when the module detects a loss of traction. The amount of wheelspin (and resultant difference in rotational speed between front and rear wheels) determines the how far the valve opens and the amount of oil pressure applied to the wet clutch by the pump, which in turn dictates how much power is transferred to the rear wheels.

By measuring front wheel spin, throttle position and other data, the system can determine how quickly to distribute power, and how much power to distribute. When accelerating on a difficult surface like snow, for example, the rear wheels can be engaged quickly with maximum power transfer. During a low speed cornering or parking maneuver the system knows that the difference

in speed between the wheels does not require the rear wheels to be engaged. As a result, the inertia other systems experience in similar circumstances is avoided.

The system is so finely tuned it can react to as little as a quarter turn difference between the input shaft and the output shaft of the differential.

Because it is part of the car's Multiplex computer system, the AWD control system can communicate with other systems (such as the TRACS traction control system) in the car to optimize the all-wheel-drive to match almost any driving situation. The Dynamic Stability and Traction Control (DSTC) feature, first introduced on the Volvo S80 luxury sedan, has also been integrated into the system and is offered as an option on the S60 AWD.

The extremely fast speed of engagement and disengagement, and the variable power transfer to suit the driving conditions, is a factor in the safety and security the system provides in the S60 AWD, and contributes to its exceptional handling in all conditions.

Because of its sophisticated electronic control, the AWD system does not pose any special consideration for owners when towing or changing a tire.

Smooth, seamless power for the S60 AWD comes from the proven 2.4-litre, 5-cylinder aluminum engine with variable valve timing and light-pressure turbocharger. Output is 197 hp at 5,100 rpm and maximum torque is 210 lb./ft. at a low 1,800 rpm. A member of the new generation RN family of engines, extensively modified for improved emissions and fuel economy, it is the same power plant used in the S60 2.4T.

Enhanced engine management software helps the engine deliver impressive power and highly responsive performance - important characteristics that contribute to the S60 AWD's dynamic character.

Production of the Volvo S60 AWD will be limited. Suggested list price for the Volvo S60 AWD is \$43,995 and includes an extensive list of standard equipment.

Volvo automobiles are sold and serviced through 43 retailers across Canada. Volvo Cars of Canada Ltd. is headquartered in Toronto. The 2002 Volvo automobile line includes the flagship S80 luxury sedan, versatile V70 wagon and rugged Cross Country, C70 coupe and convertible, the sporty, new S60 sedan and compact S40 and V40 models.

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