

# **Volvo S60 Performance Concept Car: Thor's Lightning Bolt Strikes Again**

**With one of the world's most advanced dynamically controlled chassis, an electronically managed four-wheel drive and 300 bhp, Volvo's Performance Concept Car is a future study in high-performance engineering.**

**Rockleigh, NJ** -- Thor's Lightning Bolt first struck Volvo in 1995 with the introduction of their screaming yellow 850 T-5 R. With the unveiling of PCC, looks like lightning can strike twice. The all new Volvo S60 is the sportiest, most dynamic Volvo sedan ever. Developed in parallel with this exciting production model is the S60 Performance Concept Car...an engineering and design study to identify and test technical solutions plus design structures that will support a high-performance European touring sedan.

"From the design viewpoint, we wanted to provide a hint of what a future high-performance car with a Volvo badge could look like," says Peter Horbury, vice president and chief designer at Volvo Cars. "The Volvo Performance Concept Car has a subtle racing-car appearance that conveys refined sporty appeal."

## **Laser Blue and Silver**

The Laser Blue is an exclusive color that enables "flop effect" light displacement, creating a color that shimmers and changes with ambient light conditions – somewhat like a lightning bolt.

In a head-on view, the Volvo Performance Concept Car displays a new front spoiler with two additional air intakes whose pronounced grilles direct airflow towards the radiator and front brakes respectively. The grilles have a satin-silver finish.

The rear bumper has a satin-silver center panel that separates the dual inset rectangular exhaust tailpipes, further emphasizing the car's sporty appearance.

On each side, the front spoiler features a stability-enhancing aerofoil on the lower lip, running from the front towards the leading edge of the front wheel housing. The stabilizer then follows the line of the bottom rail between the front and rear wheel housings, continuing in an elongated teardrop-shaped lip aerofoil that integrates into the rear spoiler. These airflow stabilizers are also finished in satin-silver, contrasting elegantly with the Laser Blue color.

Under the car there is a smooth undertray front to channel air optimally and thus minimize lift force at speed.

The wheels come straight from the racing-track. They are the 19" BBS magnesium wheels used on the British Touring Car Championship's Volvo S40, and they are fitted with 245/35-19 tires.

The interior exudes an aura of sportiness and refinement. The deeply contoured seats are upholstered in soft leather with a metallic effect as well as inlay panels in Nubuck suede. The foot pedals are made of ribbed aluminium and the instrument panel gauges are an exclusive shade of blue. The IP is surrounded by Nubuck suede trim.

Under the hood is a potent version of Volvo's proven 5-cylinder all alloy engine, producing 300 bhp and no less than 295 lb.ft. of torque from 2.4 liters of displacement. Power is channeled to all wheels through a 6-speed compact four-shaft manual gearbox developed by Volvo Engineering.

#### **FOUR-C – a unique chassis**

The concept study's most interesting feature is the unique continuously controlled chassis. Volvo's Continuously Controlled Chassis Concept (Four-C) is the direct result of the company's close relationship with Ohlins Racing AB, one of the world's foremost manufacturers and developers of advanced high-technology damper systems. The result is unsurpassed potential for optimizing the dampers to suit the driver's bias for either a comfortable ride or enthusiastic driving.

500 times per second, the system's microprocessor monitors the precise position of each wheel, assessing its degree of grip and so on, and alters the suspension damping characteristics of each individual wheel accordingly. The system's ability to collect large amounts of information about the way in which the car moves, and to respond instantly by adjusting the damper characteristics to suit conditions enables optimal performance or ride comfort.

### **A large amount of information**

The main body of information supplied to the dampers comes from the height sensors and body-mounted accelerometers that measure the position and movements of each wheel and the car's body.

The car's on-board computer system, Volvo's Multiplex processor system, also supplies vital information to the damper's computer, helping the system to anticipate events before they actually occur. For example, if the driver brakes firmly, this information reaches the dampers a few milliseconds before the brake pads actually grab the discs. During this interval, the FOUR-C microprocessor will calculate just how much the car may pitch once the brake pads are actually activated. Using this information, the system will instantly reset and prepare the dampers to maximize control and road holding before the body alters its pitch.

If harsh braking activates the ABS system, the dampers automatically set to maximize tire grip on the road surface. A corresponding effect resulting from harsh acceleration and quick steering wheel movements is equally managed by the FOUR-C system.

### **Three chassis modes**

FOUR-C offers three chassis modes that can be selected by the driver via a button set into the instrument panel: Comfort, Sport, and Advanced Sport. However, these chassis modes are not fixed settings. They are a way for the driver to indicate to the system which driving style he or she prefers for the moment. Is it time to pack the car with family and luggage for the annual summer holiday – or for finding a twisty bit of pavement?

The Sport mode, is optimal for normal driving, with a well-balanced mix of comfort and driving pleasure. Or, the driver can select either of the other modes.

“The Comfort mode optimizes the body isolation from road irregularities in the road,” explains Marcus Rothoff, development engineer at Volvo Cars and the person responsible for the development of FOUR-C. “It is as though the car has simulated or virtual dampers,” he adds. The Advanced Sport mode totally alters the character of the car. According to Rothoff, “The system gives top priority to maximum driving pleasure and road holding, permitting a firmer ride so that the driver has more direct contact with the road surface.”

The Volvo Performance Concept Car is also equipped with DSTC (Dynamic Stability and Traction Control). It serves as a “helping hand”, stepping in to help the driver avoid a skid. In the Volvo Performance Concept Car, the choice of chassis mode influences just how early or late in a skid the DSTC system steps in to recover the car’s poise. The Stability Traction System, STC, automatically disengages when operating in the Advanced Sport chassis mode.

FOUR-C significantly enhances the sum total of active driving pleasure, stability and comfort. The three manually controlled modes make it possible to discover and appreciate the thrilling properties of a high-performance car. The system offers enthusiastic sporty driving on demand – in a car that is equally at home driving to the supermarket to do the weekly shopping.

### **Electronically managed four-wheel drive**

The Volvo Performance Concept Car is also fitted with electronically managed all-wheel drive (AWD), developed with one of the foremost experts in this field, Haldex of Sweden.

The AWD system is linked to the car’s Multiplex electrical system. This means it communicates continuously with the car’s other functions to optimize four-wheel drive operation to suit current conditions. The unique interaction between AWD, DSTC and FOUR-C gives the car exactly the intended ride and road holding characteristics – anywhere between comfort and advanced sportiness. The electronically controlled AWD system is characterized by extremely rapid engagement and disengagement. Since the AWD system responds so swiftly, it is possible to balance and control oversteering and understeering tendencies with immense precision and stability.

“In this application, we’re not using AWD for enhanced off-road ability, but optimizing it for superb road holding and dependable stability,” says Hans Nilsson, overall project manager of the Volvo Performance Concept Car. “The work we have done with the Performance Concept Car helps us to choose the right path for a feasible high-performance model in the future.”

Contact: Daniel Johnston  
Volvo Cars of North America  
800-970-0888

V2001-14