

## Communiqués

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# Most advanced active-performance chassis can change character of new Volvo R cars

## Volvo S60 R and V70 R:

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The new Volvo S60 R and V70 R are equipped with Volvo's exclusive Four-C Technology (Continuously Controlled Chassis Concept), probably the world's most advanced active-performance chassis.

With Four-C, Volvo's R cars combine the uncompromising road contact of the extreme sports cars with the comfort essential in a family car.

Three buttons in the middle of the instrument panel - Comfort, Sport and Advanced Sport - give the driver unprecedented control over the ride and handling characteristics of the R car.

In the Sport setting (which is also the default setting), the chassis provides a well-balanced mix of driving enjoyment, body roll control and ride comfort. This setting is ideal for handling winding roads at brisk speeds.

Pressing the Comfort button increases the softness of the chassis and insulates the body from irregularities in the road. This is the ideal setting for urban traffic and the family holiday. It's also a smart choice for driving on slippery surfaces, where a "softer" car is easier to drive and more compliant.

In both Sport and Comfort settings, the R chassis uses a technology which seems to make the body float over irregularities in the road.

"It's almost as if the body of the car is suspended from above on virtual shock absorbers," explains Marcus Rothoff, head of Four-C Technology development at Volvo Car Corporation.

When the driver presses the Advanced Sport setting, the chassis is optimized for maximum roadholding in all situations, including the racetrack.

Four-C differs from other chassis concepts in its ability to process enormous amounts of information from seven sensors throughout the chassis. Sensors measure the longitudinal, lateral and vertical acceleration of the car relative to the road.

There are also sensors to measure:

- Rotation speed and vertical movement of each wheel
- Steering wheel deflection and velocity
- Cornering (yaw rate)
- Engine torque (calculated)
- Braking interventions by ABS (Anti-lock Braking System) and DSTC (Dynamic Stability and Traction Control)

The sensors send signals to the microprocessor in Four-C, which computes the motions of the car and adjusts the stiffness of the shock absorbers so that the car maintains a parallel attitude to the road surface.

The shock absorbers are updated with new information 500 times a second. In practice, this means the shock absorbers in the Four-C chassis are constantly being adjusted.

This is made possible by a totally new technology developed jointly with Öhlins Racing AB, one of the world's leading developers of high-tech shock absorber systems, and shock absorber manufacturer Monroe.

The computerized electrical system of the Volvo S60 R and V70 R, known as Multiplex, also sends information to the Four-C system. On severe braking, for instance, the Four-C system receives the braking information a few milliseconds before the brake pads touch the brake disc. By then, the Four-C microprocessor has computed how much the braking will cause the front end of the car to dip, and uses this information to set the shock absorbers to maximize control and tire grip.

When the car is accelerating, Four-C receives the corresponding information from the longitudinal acceleration sensor. Similarly, the system passes on information about a sharp deflection of the steering wheel a few milliseconds before the car actually changes direction.

The R cars' electronically controlled all-wheel-drive (AWD) system also works in concert with the Four-C suspension to optimize road holding and stability. With its extremely short engagement and disengagement time -- less than 100 milliseconds -- the AWD system can react immediately to the throttle position and the torque of the engine.

The AWD system is also connected to the Multiplex system of the car. This means that the AWD system can interact with DSTC, which in turn means that the car can deliver precisely the driving characteristics the driver wants.

When parking, the AWD system is controlled to prevent the front and rear axles working against each other in tight turns, making the Volvo S60 R and V70 R easy to manoeuvre.

On braking, the system is deactivated so that the brake system in ABS mode can operate without interference, to ensure high stability and a short braking distance. In the same way, the AWD system is deactivated by the DSTC (Dynamic Stability and Traction Control) system when the DSTC applies the brakes to prevent a skid.

Volvo S60 R and V70 R are fitted with power-assisted steering which is controlled by the speed of the car. It is programmed to give maximum servo assistance during parking manoeuvres and then gradually increase the forces in the steering when the speed increases. At top speed, the least servo assistance is provided.

The brakes on the R cars employ four-piston aluminum Brembo brake callipers on 330-mm (13-inch) discs, stopping the car from 100 km/h in a distance of 36 metres.

The passive safety in the Volvo S60 R and V70 R is on the same high level as in other Volvo cars, which includes:

- Crash testing in the most advanced laboratory in the world
- Extremely strong safety cage around the passengers
- WHIPS, Whiplash Protection System, in the front seats
- Inflatable Curtain (IC) for side impact protection
- Belt tensioners at all seats
- Side impact airbags for the front seats

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## Mots clés:

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