

The Volvo C70 convertible – the first open car with four belt tensioners

The Volvo C70 Convertible sets a new safety standard for open cars.

Among other things, Volvo is the first on the market to have automatic belt tensioners on all four seats in a convertible.

For understandable reasons, roll-over accidents present the greatest challenge to the safety design of an open car. One or more technical solutions must be found to replace the protective function of the supporting roof.

In the Volvo C70 Convertible, this is accomplished by reinforcing the A-pillars and windscreen frame with special steel and fitting automatic roll-over protection bars at the rear to make sure that the occupants have adequate survival space if the car does turn over. The system is known as ROPS – which stands for Roll Over Protection System.

The roll-over bars are recessed behind the head restraints and are activated by a special sensor if the car turns over, shooting up higher than the heads of the occupants.

Four belt tensioners

The ROPS system also includes the four belt tensioners, which are activated by the same sensor that releases the front airbags. This electronic sensor is placed in the centre console between the front seats. When it discovers an accident situation it activates the airbags and/or the tensioners in a fraction of a second.

In a frontal collision, all the systems are activated, i.e. airbags, tensioners and ROPS. In most roll-over situations, only the tensioners and ROPS are activated.

The side airbags, which are fitted in the front-seat backrests, are inflated by separate sensors if the car is hit from the side.

Tensioner in the belt reel

All belt tensioners are pyrotechnically activated by a charge that tightens a wire, which in turn tightens the belt on its reel. The tensioner device is placed alongside the belt reel.

By tightening the belt almost instantaneously in an accident, the tensioners eliminate any slack. In a roll-over situation, this naturally plays a very important part in keeping the occupant in the seat and reducing the risk of contact with the ground.

ROPS is a part of the overall protective system in the Volvo C70 Convertible – a system that also includes a robust basic structure, on or two front airbags and the SIPS side-impact protection system with side airbags.