

Press Release

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Volvo Safety Concept Car - 4-point safety belt

For Immediate Release

Two types of 4-point safety belt and better protection for pedestrians

ROCKLEIGH, NJ -- January 8, 2001 -- Providing all the passengers with the best possible protection in an accident is one of the cornerstones of the Volvo Cars and Ford Motor Company safety philosophy. In this context, the Volvo Safety Concept Car (SCC) has several new features that may find their way into forthcoming car models, for instance improved roll-over protection, better side-impact protection, two prototypes of 4-point safety belts and a protection system for vulnerable road-users such as pedestrians and cyclists.

The front seat backrests are reinforced with new structures integrated with the B-posts and roof, so as to enhance protection in a roll-over accident or side-impact collision.

The new structures also make it possible to utilise new types of safety belt and they promote even better safety belt geometry.

Two types of 4-point safety belt

In order to hold the car's occupants in place even more securely in the event of a roll-over accident or other multi-sequential crash scenario, different types of innovative safety belt design are being tested. Since the 3-point safety belt is already today the single most important safety-enhancing feature in a car, it is important to assess whether other types of restraining device, such as the 4-point harness, would provide an even higher safety level.

The Volvo SCC is therefore fitted with two different prototype 4-point safety harnesses that engineers at Volvo Cars, the Ford Research Laboratory and TRW are currently evaluating and developing jointly: a crossover harness (CrissCross - X4) and a brace-type system (Centre Buckle - V4).

- The X4 CrissCross harness is a conventional 3-point safety belt that is supplemented with a retractable diagonal chest-belt that goes from the shoulder to the hip. The regular 3-point safety belt is put on first, followed by the additional chest-belt. Since the system forms a cross-brace across the chest, the shoulders are located securely so that the occupant is kept more firmly in place if the car rolls over or is hit from the side. The cross-brace across the seat occupant's chest also helps distribute incoming crash forces across the breast-cage more uniformly.
- The Centre Buckle V4 belt is similar to the harness used in competition cars and for child seats. The belt retracts into the seat's frame when not in use. The upper attachment points are located near the seat occupant's shoulders and the lower anchorages are on the left and right of the hips. The belt, which is V-shaped, is worn over the shoulders like backpack straps once the occupant is in the seat, and is fastened conveniently with a buckle across the pelvis and hips. The belt secures the shoulders to effectively hold the body in position in a roll-over accident.

The locks in both belt types are equipped with sensors that indicate if the belts are not properly locked in place.

Vertically adjustable rear seat

Child comfort in the rear seat is a matter of vital safety. One precondition dictating whether child safety equipment is actually used is that it must be comfortable and convenient - for children and

parents alike. That is why the child-safety equipment in the Volvo SCC focuses as much on comfort and ease of use as it does on providing crash safety.

Today's generation of rear seats is designed for adults and modified to suit children. In the Volvo SCC, Volvo Cars approaches the matter from the opposite direction and presents a rear seat that is designed first and foremost for children, while functioning perfectly well for adults too.

Both the seats in the rear of the SCC have electrically adjustable seat cushions that can be varied vertically. This is done so that the rear seat can be altered to suit all those children who have outgrown rearward-facing child seats. The seat cushion height is adjusted steplessly to exactly match the child's height, and with due attention to belt geometry, comfort and forward visibility. In order to provide comfortable legroom for smaller children too, the forward section of the cushion can be conveniently folded out of the way.

Protection system for vulnerable road-users

A car's design has crucial significance for the severity of injuries that a pedestrian or cyclist might suffer in a collision.

The front of the Volvo SCC has a rounded design without any sharp edges. This is done so as to reduce the accident victim's rotation in a collision, thus reducing the force of impact. The bonnet itself has a crumple zone featuring a large empty space between engine and bonnet panel - so that the pedestrian does not hit any solid components concealed just beneath the panel.

An external airbag at the joint between the bonnet and windscreen prevents the victim's head from striking the windscreen glass and the A-post. The airbag is activated by a sensor at the front of the bonnet and it remains inflated for a few seconds to extend the protective effect. The inflated airbag covers only the lower part of the windscreen. This is sufficient to provide the required protective effect without obstructing the driver's field of vision.

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