

Press Release

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The Car That Catches The Eye

We rely on our eyes to see what's around us and our mind to interpret our environment. When combined with advanced safety thinking future drivers will have a better chance of avoiding dangerous situations that could turn deadly. The Volvo Safety Concept Car (SCC) has been equipped with a range of future-generation systems designed to give the driver increased control and better preconditions for making the right decisions in difficult traffic situations.

The interior of the SCC automatically adapts to the location of the driver's eyes and his or her body size, while advanced technology provides improved vision in every direction, both in day and night time driving.

Seeing the world differently:

- Eliminate blink spots
- Adjust floor, seat, steering wheel, pedals and center console automatically
- Adaptable headlights
- Enhanced night vision
- Lane change warning
- Vehicle passing warning

Roughly 90 per cent of all vital driver information comes to us visual through the windshield and windows. Improving the quality of this visual information improves the driver's chances of avoiding a collision. With the SCC, the Volvo Car Corporation and Ford Motor Company are demonstrating the viability of the latest vision-enhancing safety technologies in cars of the future.

Fixed eye position

Sitting properly is very much a matter of safety. Proper seating not only enhances one's ability to see, it helps reduce driver fatigue. The concept car has a range of advanced systems to help ensure a proper seating position.

The Volvo SCC automatically sets the appropriate seating position on the basis of the location of the eyes, irrespective of individual build. Sensors scan the precise position of the driver's eyes and then adjust the driver's seat to offer optimum vision. After this, the steering wheel, floor, pedals and center console are all adjusted accordingly, thereby promoting the best possible ergonomics and comfort. The adjustment parameter program accounts for about 80% of driver's height, the driver can fine-tune the various adjustments to suit individual tastes.

The entire system is based on a Volvo idea that has been further developed and implemented in a concept car, bringing together the expertise of researchers, engineers and designers from Volvo Cars and the Ford Motor Company. The system has also had considerable input from external suppliers such as Johnson Controls, Inc. (the control module that controls the position of the seat, floor/pedals, center console and steering wheel), Sarnoff Corp. (eye sensor based on IR camera technology), BGM Technologies (capacitive eye position sensor that pinpoints the driver's head and calculates the position of the eyes on the basis of this data) and Presta (steering column).

Since the system also encompasses adjustments to the steering wheel, pedals and center console, all the controls are better positioned than a car without this feature. With SCC

technology, the driver has better control and is in the best possible position for responding to emergencies. A relaxed driving position also improves comfort and reduces fatigue, so the driver can be more alert behind the wheel.

New design for the A-pillar and B-pillar

The Volvo SCC also offers a better field of vision as a result of the redesigned A- and B-pillars.

In the SCC, these pillars have a new design. The driver can see through the A-pillars at the sides of the windscreen, as they have been rendered partly transparent by using a steel box construction combined with see-through Plexiglas.

The B-pillars, between the front and rear doors, curve inwards at the top to give the driver an unobstructed field of vision to the offset rear. In terms of passive safety, these B-pillars are at least as safe as conventional B-pillars in a rollover or side-impact scenario as they are integrated with the front seat frames.

Active rear-view mirrors and rearward-facing cameras

Embedded in the door mirrors are sensors that alert the driver to approaching traffic in the "blind spot" to the offset rear.

The driver are first alerted via visual signals in the door mirrors then a combination of visual and acoustic signals as the situation becomes more dangerous.

There are also rearward-facing cameras to supplement the door mirrors. When necessary, the driver can view information from the cameras located in the door mirrors on both sides of the car and this information is relayed via video to a display monitor on the instrument panel.

A camera in the roof at the rear shows the area to the rear and also provides good visibility to the rear when the interior luggage compartment is loaded all the way up to the roof. Another camera points downwards to help the driver see if a small child is concealed just behind the car when reversing, for example. When the driver engages reverse gear, the display monitor automatically shows the area immediately behind the car.

Adaptive lights

The headlamp monitoring system tracks road speed, steering wheel movements of the car, and adjusts the lighting position and intensity for optimum forward visibility.

- When driving at high speed the light beam is intensified and lengthened.
- When driving at low speeds, for example in the city or when approaching a crossroads, the light beam can be made shorter and broader to light up a larger area close to the car.
- When steering into a curve, the beam can be directed along the track of the curve to light up the entire road as the car changes direction.

Traditional bulbs have been replaced with fiber-optic technology. The light itself is generated by a single light generator is located elsewhere in the car and is led to the headlamps via fiber-optic cables. This makes it possible to alter light intensity and beam patterns at lightning speed in response to changing conditions.

The new headlamps have been produced in close collaboration with the Ford Motor Company and lighting experts Hella.

Enhanced night vision

Improved night visibility is being tested in this car with an infrared (IR) light enhancer. IR technology gives the driver both a longer and a broader field of vision in the dark. The system, which further boosts night-vision capability, has been developed by Swedish safety experts Autoliv.

When driving at night, a black-and-white image is projected onto a glass display located at the top of the instrument panel. This image shows what is concealed in the area that is not lit up by the headlights; for example, if there is a wild animal in the ditch alongside the road. It is also possible to see what is hidden in the blacked-out area between the SCC's own headlights and the usually

dazzling lights of an oncoming vehicle, such as a pedestrian.

When driving in daylight, the glass display is retracted so it does not distract the driver.

Collision warning sensor

The SCC also features a collision warning device that senses if the distance to the car in front is too short or the gap is closing too quickly. In this case, the driver is alerted by a red warning signal and there is also the option of an acoustic signal, developed together with Delphi and Fujitsu Ten.

Remain in lane... or change lanes

A forward-facing camera monitors the position of the car in relation to the center-marker and side-marker road lines about 60 feet ahead of the car. If the car displays signs of veering to either side without activating the turn indicators, the driver is alerted by an acoustic signal.

The rearward-facing cameras give the driver a view of what is going on behind the car. At a specific distance, or, if traffic approaching from the rear is in the blind spot, the driver is alerted via yellow LEDs that glow in the outer rear-view mirror. If the driver activates the turn indicator in preparation for changing lanes, an additional warning is given in the form of an acoustic signal and red LEDs in the rear-view mirror and a picture showing the approaching vehicle on the monitor in front of the driver.

Run-flat tires

The Volvo SCC is also equipped with a tire system, which offers improved safety over today's standard tires. This so-called "run-flat tire", supplied by Michelin, allows the driver to maintain control of the vehicle in the case of a sudden loss of pressure.

With its directional and asymmetrical tread design, the tire offers both excellent water evacuation and exceptional handling on dry surfaces.

The opportunity to drive on the tire even after a puncture also has a personal security aspect. Instead of stopping in a vulnerable position, the driver can drive to a safe location before having to change tires.

Contact:

Daniel Johnston
Volvo Cars of North America
1 800 970 0888

Maria Sheler-Edwards
Ford Motor Company
1 313 248 4979

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