Volvo unveils innovative safety system - Pedestrian Detection with Full Auto Brake debuts on the all-new S60

VOLVO UNVEILS INNOVATIVE SAFETY TECHNOLOGY - PEDESTRAIN DETECTION WITH FULL AUTO BRAKE DEBUTS ON THE ALL-NEW VOLVO S60

"Cars are driven by people. Therefore the guiding principle behind everything we make at Volvo is - and must remain - safety." These words, stated more than 80 years ago by Volvo's founders Assar Gabrielsson and Gustaf Larson, still ring true with the introduction of the latest safety technologies on the all-new Volvo S60.

While Volvo's safety features have traditionally been designed to protect the occupants inside the car, the introduction of Pedestrian Detection with Full Auto Brake on the all-new S60 aims to increase safety for unprotected road users as well.

Pedestrian Detection is a groundbreaking technological solution that actively helps the driver avoid accidents. Volvo's radar- and camera-based system can detect pedestrians in front of the car, warn the driver if anyone walks out into its path - and then automatically activate the S60's full braking power if the driver fails to respond in time. This world-first technology can help the driver avoid a collision with a pedestrian.

Pedestrian accidents occur every day in our increasingly intensive traffic environments. In the U.S., 11 percent of all traffic fatalities are pedestrians. The corresponding figure for Europe is 14 percent and in China the proportion rises to a worrying 26 percent.

"We are truly proud of our success in making our technology so reliable that we can offer a complete system that can avoid a collision with a pedestrian, by detecting, alerting and full braking - a world first, to our knowledge," says Thomas Broberg, Senior Safety Advisor at Volvo Cars. "With this technology we increase the braking force in our system for automatic braking from fifty percent to full stopping power."

**Radar and camera focus on pedestrians**

Pedestrian Detection with Full Auto Brake consists of a newly developed radar unit integrated into the S60's grille, a camera fitted in front of the inside rearview mirror and a central control unit. The radar's task is to detect any object in front of the car and to determine the distance to it while the camera determines what type of object it is.

The function is also programmed to respond to vehicles in front that are at a standstill or are moving in the same direction as the car fitted with the system. Thanks to the newly developed dual-mode radar's much wider field of vision, pedestrians about to step into the roadway can also be detected early on. The camera has higher resolution than the previous-generation unit. This makes it possible to detect the pedestrian's pattern of movement.

"The auto-brake system requires that the object is confirmed by both the radar and the camera," says Broberg. "Detecting pedestrians with sufficiently high reliability has been a complex challenge. Our innovative technology is programmed to trace a pedestrian's pattern of movement and also to calculate whether he or she is likely to step into the road in front of the car. The system can detect pedestrians who are 32 inches tall and higher, including children."

**Can avoid a collision with a pedestrian at up to 22 mph**

Half of all pedestrian accidents occur at speeds below 16 mph. Pedestrian Detection with Full Auto Brake can avoid a collision with a pedestrian at speeds up to 22 mph if the driver does not react in time. At higher speeds, the focus is on reducing the car's speed as much as possible prior to the impact. The speed reduction is up to 22 mph.
Statistics reveal that the car's speed has considerable importance for the outcome of the accident. A lower speed of impact means that the risk of serious injury is significantly reduced. For instance, if speed is cut from 31 mph to 16 mph, Pedestrian Detection with Full Auto Brake is expected to reduce the fatality risk by as much as 20 percent and in some certain cases up to 85 percent.

"The proportion of pedestrian fatalities is high today and our technology will play a major role in reducing it," says Thomas Broberg.

**New technology permits full braking force**
In an emergency situation the driver first receives an audible warning combined with a flashing light in the windshield's head-up display. In order to generate an immediate, intuitive reaction this warning resembles a brake light. At the same time, the car's brakes are pre-charged. If the driver does not react to the warning and an accident is imminent, full braking power is automatically applied.

This technology has the same limitations as the human eye, and just like us it "sees" less well in the dark and in poor weather.

Volvo Cars has worked for five years on the development of Pedestrian Detection with Full Auto Brake. Test cars have been in operation all over the world to cover variations of traffic behavior, road condition and climate.

"We've driven more than 300,000 miles in real traffic to 'train' the system to recognize pedestrians' patterns of movement and their appearance in different countries and cultures," says Broberg. "We use the information obtained from these tests to conduct advanced computer simulations."

**Also brakes for other cars**
Studies have determined that up to 90 percent of all road accidents are caused by distraction. Half of all drivers hitting another vehicle from behind do not brake at all prior to the collision.

Pedestrian Detection is a further development of the Collision Warning with Auto Brake technology already introduced by Volvo. The all-new S60 will also detect, alert and automatically brake if the car risks hitting another vehicle from behind.

The aim of the initial warning is to alert the driver so that he or she can brake or avoid the danger. If the driver does not react to the warning, the car automatically brakes with full force, moments before the collision is unavoidable. With automatic braking, the collision can be avoided if the speed difference between the two vehicles is up to 22 mph.

**City Safety helps prevent low-speed impacts**
The all-new Volvo S60 also features City Safety as standard. This system can lessen or even entirely avoid low-speed rear-end impacts at speeds up to 19 mph.

Rear impacts are common in dense city traffic. About 75 percent of all these collisions occur at speeds below 19 mph. Investigations reveal that in 50 percent of cases, the driver has not braked at all prior to the collision.

With City Safety, the S60 automatically brakes if the driver fails to react in time when the vehicle in front slows down or stops - or if he or she is driving too fast towards a stationary object. If the relative speed difference between the two vehicles is below 9 mph, the collision can be avoided. If the speed difference is between 9 and 19 mph, the speed of impact is reduced to minimize the effects of the accident.

**Full spectrum of driver support features**
The all-new Volvo S60 can also be equipped with a range of additional features that help the driver to drive more safely, including:

- Driver Alert Control (DAC) is a unique technology that alerts tired and distracted drivers. This function monitors the car's progress between the lane markers and warns the driver if his or her driving pattern changes in a random or uncontrolled way.

- Blind Spot Information System (BLIS) helps detect vehicles in the offset rear blind spot on both sides of the car. A warning lamp adjacent to the outside mirror illuminates to alert the driver to the danger.

- Dual Xenon with Active Bending Lights (ABL) swivel to follow the curve of the road for the best possible illumination when driving in the dark on twisting roads.

- Lane Departure Warning (LDW) alerts the driver if the car runs across the lane markers without the turn indicator being used.

**Collision safety includes an improved Inflatable Curtain**
In a frontal collision situation, the well-balanced combination of high-strength steel of various grades dissipates the impact energy and helps prevent intrusion into the passenger compartment. The front body structure of the new S60 is divided into four zones, each of which has a different task during a collision. The transverse engine installation creates more space for deformation and helps reduce the risk of intrusion into the passenger compartment in frontal collision situations.
The standard Roll Over Protection System (ROPS) uses advanced sensor technology. The pretensioners will tighten the safety belts and the Inflatable Curtains (IC) will deploy in case the car is involved in a rollover. This, together with safety cage construction, will help to reduce the risk of injuries for belted occupants in such situations.

All seating positions are equipped with safety belt pre-tensioners. The Pre-Prepared Restraints (PRS) regulate the airbags and the safety belt load limiters to optimize protection depending on the force of the impact.

Other safety systems include an advanced Side Impact Protection System, seat-mounted side airbags, Inflatable Curtains and Whiplash Protection System - one of the market's most effective systems to help reduce the risk of neck injuries in rear impacts.

The Side Impact Protection System (SIPS) has been further improved in the all-new S60 to address a wider span of real life situations, such as side impacts on either side of the passenger compartment. This has been made possible by combining information from accelerometers in the vehicle and a unique gyro measuring yaw rate for controlling the activation of the IC, SIPS airbag and seatbelt pretensioners in such situations.

"No previous Volvo has ever had such advanced safety technology as the all-new S60," says Broberg. "Our aim is to build the world's safest cars. The new S60 marks another step towards our vision of a crash-free future and ambition of no fatalities or serious injuries in a new Volvo car by the year 2020."

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