

Press Release

May 23, 2012 | ID: 43844

Volvo Car Corporation's pedestrian airbag: here's how it works

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Seven sensors, advanced technology and an airbag that deploys at lightning speed in the windscreen area. These are some of the main elements of Pedestrian Airbag Technology - the system that makes Volvo Car Corporation with its all-new V40 the first manufacturer with a pedestrian airbag.

In China 25 percent of traffic fatalities are pedestrians. In Europe the figure is 14 percent and in the USA 12 percent. Far larger numbers of pedestrians are injured. The most serious head injuries involving pedestrians and cars are caused by the hard structure under the bonnet panel, the windscreen's lower edge and the A-pillars.

These were some of the considerations when Volvo Car Corporation started development of its Pedestrian Airbag Technology. The system was a world breakthrough when the all-new Volvo V40 was launched in Geneva earlier this year.

"We are proud to be able to offer a car with an airbag for pedestrians. The purpose of the airbag is to help protect pedestrians in certain situations when they impact the bonnet and the area around the windscreen wiper recess and A-pillar, where there may be a risk of serious head injuries," says Thomas Broberg, Senior Technical Advisor Safety, Volvo Car Corporation.

Seven sensors embedded in the front of the car transmit signals to a control unit. When the car comes into contact with an object, the signals change. The control unit evaluates the signals and if it registers what it interprets as a human leg the pedestrian airbag is deployed.

Raises the bonnet by ten centimetres

The bonnet hinges are each equipped with pyrotechnical release mechanisms which, when the system is activated, pull out a pin and release the rear of the bonnet panel. At the same time, the airbag is activated and starts filling with gas. During the inflation sequence the airbag raises the bonnet. It is lifted ten centimetres and stays in the raised position.

The added gap between the bonnet and the hard components in the engine compartment gives space for the bonnet to deform, creating a dampening effect when it is hit by a pedestrian.

"The airbag has two functions. Firstly, it raises the bonnet to create distance, and secondly it cushions the impact around the hard parts of the area near the windscreen," explains Thomas Broberg.

In its inflated position, the airbag covers the entire windscreen wiper recess, about one-third of the windscreen and the lower part of the A-pillars. The entire sequence from activation of the system to full inflation takes a few hundredths of a second.

Tests with human-like dummy legs

The system is active at speeds between 20 and 50 km/h. 75 percent of all accidents involving pedestrians take place at up to 40 km/h.

"We developed the technology using computer simulations and human-like leg and head forms.

The tests were carried out in a wide variety of configurations," relates Thomas Broberg.

The airbag itself consists of a sack and a gas hybrid generator. Upon activation, the sack is filled with gas within a few milliseconds.

Two years ago, 2010, Volvo Car Corporation launched Pedestrian Detection with full auto brake. The system can avoid a collision with a pedestrian at speeds of up to 35 km/h if the driver does not respond in time. At higher speeds the focus is on reducing the car's speed as much as possible before the collision.

Keywords:

V40, Press Releases, 2013, Product News

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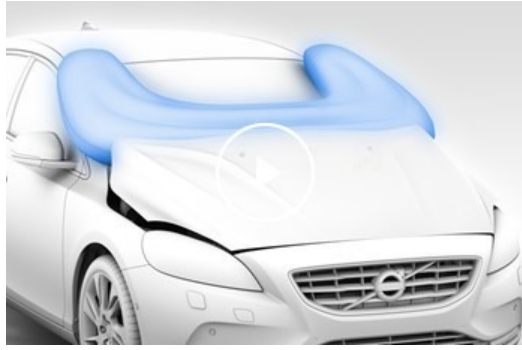
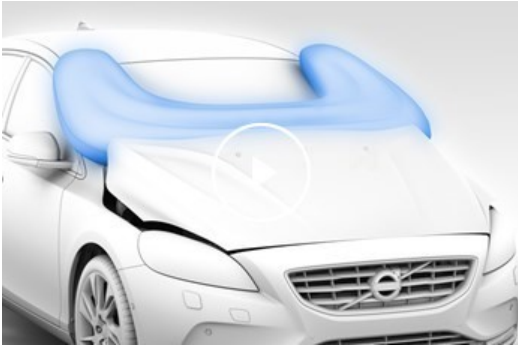
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