

P R E S S R E L E A S E

Pedestrian protection

At the international vehicle safety conference ESV (Enhanced Safety of Vehicles) in Amsterdam on June 4-7, automotive safety specialist Autoliv presented a new system to protect pedestrians when struck by cars. The new system could significantly reduce the risk for serious and fatal head injuries.

In Europe alone, over 7,000 pedestrians are killed when struck by cars every year. The EU Commission therefore considers to mandate pedestrian protection for all new vehicles. Head injuries account for the vast majority of the fatalities.

In Autoliv's new pedestrian protection system, sensors in the front bumper of the car send signals to two actuators which lift the rear part of the bonnet (hood). This will give the bonnet a sufficient deformation range to ease the impact of the pedestrian's head and reduce the risk of contact with hard engine and car structure parts close underneath.

While pedestrians are injured by cars in many ways, Autoliv has concentrated its efforts on the most life-threatening injuries: those to the head.

- Most pedestrian fatalities in car collisions are sustained when the head violently hits the bonnet or the lower part of the windshield. Our current technology allows us to develop an active system such as lifting the bonnet, says Yngve Håland, Autoliv's Research Director and Professor at the Chalmers University of Technology in Gothenburg.

He and his colleagues Rikard Fredriksson at Autoliv and Dr. Jikuang Yang at Chalmers have evaluated the system in a paper that was presented at the ESV conference on Wednesday, June 6.

- Collision protection systems for pedestrians have been studied for over fifteen years. However, few proposed solutions are both effective and economical. Our solution has the advantage, not to require any changes of the car design that could for instance increase fuel consumption, says Yngve Håland.

The idea of lifting the bonnet is common knowledge, but to do this in time before the head hits the bonnet has proved to be difficult. Developing a sensor that can distinguish between a human leg and, for instance, a light pole has been even more difficult.

- The sensors we have developed have shown to be able to do this in laboratory tests. These results must now be confirmed in full vehicle testing, explains Professor Håland.

Autoliv

What is all new is Autoliv's patented solution: compressed steel bellows, empty until a pedestrian is struck, then inflated by gas generators, derived from Autoliv's proven seat belt and airbag technology. Two bellows – one on each side of the bonnet – are inflated to lift the bonnet about 10 cm.

This is done in 60-70 milliseconds after the bumper has hit the pedestrian's leg. A typical head-to-bonnet impact at 40 km/h occurs at about 150 milliseconds after the leg is first hit. By then, Autoliv's device has already raised the bonnet to its injury reducing position.

In laboratory tests, the system has significantly reduced the critical injury value HIC (Head Injury Criterion) to levels consistently below the proposed EU standard.

Of all car-pedestrian accidents 95 per cent occur at under 60 km/h impact speed. The average impact speed is about 40 km/h. The proposed EU directives are based on this impact speed.

Autoliv Inc is a US company, headquartered in Stockholm, Sweden, and listed on the New York and Stockholm stock exchanges. With 30,000 employees (2,500 in R & D alone) in 30 car-producing countries, Autoliv is the world's automotive safety market leader with technical centers in eight countries. The group invoiced over USD 4.1 Billion in 2000.

Autoliv produces seat belts since 1956, pioneered the airbag technology in the early 1980:es and introduced the world's first side airbags in the 1990:es. Major products are:

- front and side airbags, steering wheels with integrated airbags
- seat belts with pretensioners, load limiters, height adjusters and belt grabbers
- seat sub systems including anti-whiplash systems
- rollover protection.

Autoliv's customers are all major car makers and most brands around the world. Often Autoliv is an integrated development partner.

More information

Research Director Yngve Håland, +46-322 626 307 or mobile +46-706-690 881,
Communications Managers Mats Ödman, +46-8-587 206 00 or +46-708-320 933, or
Patrick Jarboe, +1 248 475 0407

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www.autoliv.com/news