

Pedestrians should in the future come out better in traffic accidents

by Ingo Reuss

AUTOMOBILE: *The safety of pedestrians is being taken ever more seriously by the automobile manufacturers. Diverse component manufacturers are working on solutions that will in the future better protect the weaker participants in traffic circulation. The leader in this is a manufacturer from Sweden—Volvo with its special external airbag.*

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The automobile industry has worked for decades on the active and passive safety of their cars. For some time now, however, criticism has increased over the fact that a vehicle's passengers are well protected, yet little has been done to protect other participants in traffic circulation. Particularly pedestrians and two-wheeled vehicle drivers are protected to little. In 2011 15% of traffic fatalities in Germany were pedestrians.



Protection for the head: *In Volvo's crash-test center in Gothenburg the results of a auto/ped crash is clear. The head of the pedestrian is protected with an external airbag that is fired by sensors on the front of the vehicle. Severe injuries then are limited to the legs. (Photo: Volvo)*

The danger that pedestrians will suffer significant or fatal injuries in crash with a car is very high. It's particularly dangerous for pedestrians when legs, internal organs, and the chest area are hit—worse is when there is a blow to the head.

Statistics bear out this discrepancy in the protection of all traffic participants. Peter Lake, a member of the board of directors of TRW (Michigan, USA) confirms it. While the number of vehicle passenger accidents with fatal results has decreased in industrial countries, the share of pedestrians fatally injured has risen among the number of all traffic fatalities.

A promising approach that could stop this development comes from the insurance industry. A typical auto/ped crash happens at 40 kph (25 mph), which often leads to the danger of grave injuries. "The degree of injuries could be substantially reduced, if the impact speed could be lowered by just 10 kph (6 mph)," according to a study by the Insurance Research Institute (IRI).

Slowing to 20 kph (12.5 mph) brings with it significantly fewer head injuries among adults and children. Emergency braking systems that recognize pedestrians should be installed in vehicles of all classes as quickly as possible, says IRI spokesman Siegfried Brockmann.

TRW has just developed its second-generation pedestrian protection system. It uses a combination of improved accelerometers and pressure sensors and should be ready for series autos in 2016. With this system, the back part of the hood is pyrotechnically raised up. This creates a larger deformation zone with the result that the energy that develops between a pedestrian and the automobile hood will be more lightly dissipated. Since pedestrian protection comprises 20% of the rating of the entire vehicle in the European NCAP rating system, manufacturers like Porsche and Chrysler have used this since 2009 in their first-generation pedestrian protection systems to achieve a five-star rating.

The Swedish manufacturer Volvo has gone yet another step further with its new V40. In a defined crash with a human leg special sensors on the front of the car deploy the pedestrian airbag. The back end of the hood of the car is raised a hand's width. At the same time the big 120-liter airbag deploys itself along the bottom edge of the windshield and at the A columns. This all happens in fractions of a second as the pyrotechnic charge is triggered and ignited. Jan Ivarsson, the head safety manager at Volvo, talks of a new safety standard.

The series-ready system in the new Volvo V40 works up to 50 kph (30 mph). That's adequate, given that most auto/ped crashes occur at speeds less than 50 kph. The few that occur above 50 kph are usually fatal. Additionally the emergency braking system with pedestrian recognition contributes to a lowering of the collision speed. It works up to 80 kph (50 mph). Experts rate highly the improved safety of the city-brake system. Even the small Up car from VW, with a simple city-brake system, is already available.

Reduced speed improves the airbag strategy

The necessity of automatically braking the crash vehicle before a crash was confirmed also in a crash test with a pedestrian airbag at the Volvo Safety Center in Gothenburg. At just 40 kph (25 mph) the legs of the pedestrian were severely injured in a crash—bones and joints were shattered. Other parts of the

body were also injured, even when the head impact with the airbag was relatively soft. So the pedestrian airbag system seems to be just an intermediate solution. Another solution already needs to be found for crashes between vehicles and bicycles.

The work of the Swedes up to now has already been worth it: Just recently the NCAP Institute in Brussels awarded the Volvo V40 the best result with the highest number of points ever given. The compact model, which has been on the market since the middle of September, is thus “one of the safest cars in the world,” says Volvo safety head Thomas Broberg.

He sees the manufacturer on a good track. Volvo in the development of new models has set for itself the goal, that from 2020 onward no one will be injured or killed in one of their cars in an accident. An ambitious goal. But even more ambitious is the goal that by 2030 no other participant in traffic circulation will seriously injured or killed by a Volvo. The pedestrian airbag is just a first step.

Traffic accident victims

In 2011 the number of traffic fatalities on German roads grew almost 10%.

- According to the Federal Statistics Office 614 pedestrians died—29% more than in 2010
- The auto manufacturers are focusing on pedestrian protection. The safety ratings given by the European NCAP have increased 20%.