

VDI Nachrichten, 28 September, Hannover

## Driver-assistants climb into the truck cab

by Chr. Hammerschmidt

IAA Utility and Transport Vehicles (this is a German trade show on transport and delivery vehicles)

*Without them there is hardly an automobile on the street: The electronic passenger, who supports the driver in emergency situations and helps make driving more relaxed. Assistance systems in every imaginable form populate in droves the options lists. Ever more often manufacturers of semis and delivery vehicles entice buyers with electronic helpers—from emergency braking systems to emergency swerving systems. Up through yesterday manufacturers and component manufacturers exhibited at the largest worldwide trade show in Hannover what they have to offer for mobility, transport, and logistics at the IAA show for heavy vehicles.*

It's not just in well-equipped automobiles that ever more often the electronics grabs the driver under the shoulders. Also in the cabs of big trucks and delivery vehicles one finds ever more often such assistants. But the motivation to put this technology in trucks and delivery vans is different from that for chic private cars.

A common motivation for the acceptance of driver-assistance systems is safety: All want to arrive safely at their destination, the private driver as much as the captain of the land ship.

Also, driver assistance that implements a fuel-saving driving style is desired in both driving regimes. But with semis and smaller delivery trucks and vans, there is a good deal more pressure to drive economically. "There are above all three motives for adding driver-assistance systems to big trucks," says an expert in truck transport. "They are efficiency, efficiency, and once again efficiency."

Another reason for outfitting a truck with a driver-assistance system is a legal one. After 1 November 2013 all new vehicles with a total weight of 3.5 tons must have a lane-holding system. From this same date forward, all trucks and vans manufactured in the EU with a weight exceeding 8 tons must be equipped with an emergency braking system. From 2015, this requirement will be imposed on all trucks weighing more than 3.5 tons.

Particularly notable was the array of big-truck driver-assistance systems at the biannual IAA for big trucks and vans, which took place 20-27 September in Hannover. The big manufacturers of trucks and busses as well as their component manufacturers vied with each other to present new assistance functions for transport vehicles. Safety improvements were top priority, followed by automation and algorithms for improved economy.

The electronic passenger in 18-wheelers functions in a fashion very similar to their counterparts in passenger cars. They also use pretty much the same situational sensors—for instance, radar, infra-red sensors, or cameras—whose photos are evaluated. "All systems that are available for cars are also available for large transport vehicles," says a spokesperson for the component manufacturer

Continental. The drivers of the innovation are, however, from the passenger vehicle industry—because of their much higher sales numbers.

To the most important representative in the safety realm belongs the emergency braking system. It helps to prevent or at least mollify the greatly-feared collision that occurs at the end of a traffic jam on a freeway. The severity of these crashes has evidently not left big truck manufacturers at ease.

Thus Daimler exhibited its third generation “Active Brake Assist” (ABA3) for its Actros line and also for its new, heavy distribution truck Antos. Compared to earlier models, the system recognizes also now stationary obstacles and brakes—after it has already warned the driver with light and acoustic alarms to intervene—in an emergency by a graduated full reaction down to no reaction. This system is built on a distance cruise control that, by radar, maintains a constant distance from the vehicle in front, and in normal driving (i.e. without cruise control) still maintains this constant distance. The radar sensor measures the distance in front of the vehicle up to 200 meters.

In contrast to an automatic emergency braking system, the lane-holding assistant works with a camera sensor, built into the driver’s cab, that watches the road. It compares the actual position of the vehicle in the lane with the lane-edge markings and gives an optical, acoustic, or haptic alarm. In some systems a steering impulse is given that brings the vehicle once again into the lane.

This principle is not new; it’s been available in passenger cars since 2007. For use in transport vehicles the engineers have altered the parameters—the height of the systems in heavy trucks is greater than it is in standard cars. Also steering behavior and steering correction suggestions have been altered for heavy vehicles.

Daimler offers also a fatigue assistant that watches over the driving behavior of the trucker. If it notices unsafe or erratic driving behavior, it recommends not just a coffee stop but also turns up the lane-holding assistant, even if the driver has turned it off.

Also new from MAN is a swerving assistant. With two ultrasound sensors it watches over the dead angle next to the truck. The assistant is intended to reduce the possibility of one of the most dangerous accident scenarios—that between a heavy truck and a bicycle. Often a truck driver overlooks the presence of a cyclist standing next to the truck as he/she turns right. The system should recognize reliably the presence of a cyclist or motorcyclist next to the truck and warn the driver. Continental exhibited a similar system that functions with short-range radar.

Besides these safety systems are many driver-assistance systems optimized to save fuel. Above all cruise controls connected with automatic transmissions should save fuel in heavy diesel trucks.

For example, there is the Eco-Module that Scania showed at the IAA. The module ties together the functions of the cruise control and the GPS navigation system. The knowledge of the terrain allows the cruise control to act in advance. Thus the cruise control lowers the speed prior to a descent and raises the speed prior to an ascent. This takes advantage of the optimal engine torque and the use of momentum. This control algorithm mimics the behavior of experienced drivers and saves fuel. The

savings amount somewhere between an insignificant 0.7% and a very significant 3.8% and is higher when the weight of the vehicle is more.

It is mostly inexperienced truckers who benefit from the system: The very captains of the freeways who know well the stretches and the vehicle already drive instinctively like the automatic system would.