

## Press Release

Findings from the DEKRA Road Safety Report 2023

# Truck emergency brake assistants: Technical potential is still far from being fully exploited

- Legally prescribed oversteer capability can be problematic
- Standardization of system designs urgently needs to be discussed
- Deviations from the “standard” reduce the performance of the systems

**The truck emergency brake assistant has been mandatory in the EU since 2018. But despite mandatory equipment, serious accidents at the end of traffic jams still occur. What is the technical background to this? Can the driver's behavior unintentionally impair the effectiveness of the assistants? DEKRA investigated these questions for the Road Safety Report 2023 “Technology and People”. Driving tests with three trucks from different manufacturers were carried out on the premises of the DEKRA Technology Center at the Lausitzring in Brandenburg, Germany. “The results showed that the emergency brake assistants tested are compliant with the law, but that there is still considerable potential for optimization, particularly in system design”, sums up Uwe Burckhardt, Head of Test and Event at the DEKRA Lausitzring.**

When it comes to improving road safety, driver assistance systems play an essential role. One important accident scenario is hitting the end of a traffic jam. Severe injuries and fatalities occur here time and again, especially when heavy trucks are involved. Optimizations in terms of vehicle structure compatibility can help to a certain extent, but the physical limits are quickly reached as the speed difference increases. Given the large masses of heavy commercial vehicles, the potential of passive safety to reduce the consequences of accidents is limited.

Effective improvements can therefore be achieved primarily through active safety systems. Driver assistance systems such as truck emergency brake assist can prevent crashes or reduce their severity. However, not all emergency brake assistants do this as well as would be technically possible and desirable. This is the result of the driving tests at DEKRA Lausitzring with three tractor units from different manufacturers. The trucks, each equipped with measurement technology as well as steering and pedal

Date Stuttgart, 08.11.2023 / Nr. 102-A  
Contact Wolfgang Sigloch  
Phone +49.711.7861-2386  
Fax +49.711.7861-742386  
E-Mail wolfgang.sigloch@dekra.com

DEKRA e.V.  
Corporate Communications  
Handwerkstraße 15  
70565 Stuttgart, Germany  
[www.dekra.com/en/press-overview](http://www.dekra.com/en/press-overview)

actuators, drove in a straight line at a speed of 50 km/h (30 mph) toward a stationary passenger car dummy – with 100 percent overlap, i.e., centered on the target’s rear.

The experiments were first run as a test of the respective system without driver intervention. IN the second step, various driver interventions were simulated with different levels of brake pedal pressure and steering intervention. “For reproducibility, the driver interventions were triggered by a robotics system as soon as it detected in the collision warning phase that the brake assistant had already reduced the speed of the truck by 2 km/h”, DEKRA expert Uwe Burckhardt explains test setup.

### **Manual additional braking can improve effectiveness**

During the journeys without driver intervention, it became apparent that the three assistance systems are designed very differently in terms of warning and braking behavior. The trucks from manufacturers 1 and 3 came to a halt before the obstacle, but in the case of manufacturer 1 the distance to the dummy was only five centimeters (2 inches), while in the case of manufacturer 3 it was 2.6 meters (8.5 feet). The system installed in manufacturer 2's truck slowed the vehicle down but was unable to prevent a collision with the dummy. At least the collision speed was reduced to 27 km/h (17 mph).

In the other simulation cases, the truck from manufacturer 1 reliably warned and braked to a standstill and could not be “rattled” by driver intervention. In the case of the truck from manufacturer 2, driver intervention brought about at least a partial improvement: a strong braking intervention reduced the impact speed to 15 km/h (9 mph) and a strong steering intervention, in view of the speed reduction by the emergency brake assistant, at least led to driving past the dummy car. However, a moderate steering intervention would not have been sufficient for this. The system thus meets minimum legal standards but cannot reliably prevent rear-end collisions. The system of manufacturer 3 warned and braked reliably for the most part. However, even moderate braking intervention by the driver caused the emergency brake assistant to switch off, thus disabling its safety-relevant function. “This system behavior, which is unexpected for the driver, shows that the legally required oversteer capability can prevent successful accident avoidance, depending on the design”, Uwe Burckhardt cautions.

### **Legal requirements must be increased**

Conclusion: The various truck emergency brake assistants tested are undoubtedly compliant with EU law. However, the comparison of the system designs of different

manufacturers and the partial effectiveness of manual additional braking show that the technical potential is not fully exploited by the existing regulations. The systems also showed in part considerable safety-relevant interactions depending on driver behavior. It would therefore be desirable to discuss a standardization of the system designs. In addition, DEKRA's tests showed that the performance of the systems drops significantly in the event of deviations from the "standard". Manufacturers should therefore make their tests in development even more variable and test the systems in even more diverse scenarios.

"For the future, it is also important to increase the legal requirements so that the systems function even more reliably in real traffic situations", demands Jann Fehlauer, Managing Director of DEKRA Automobil GmbH. According to the minimum requirement in the current regulation, the systems would have to reduce the speed by 20 km/h (12 mph) in front of a stationary obstacle. "So, if the truck is traveling at 80 km/h (50 mph), it would still impact at 60 km/h (37 mph), which still means a crash with devastating consequences", says Jann Fehlauer.

New, stricter minimum requirements for the future have already been formulated and decided at UN level: The maximum collision speed may be 42 km/h (26 mph) – which means a stronger minimum braking intervention than previously prescribed. The ability to deactivate the brakes will be significantly restricted, and the systems must automatically reactivate themselves. In addition, the systems must also function in urban environments and recognize pedestrians. These regulations are to apply to newly developed vehicle types from September 2025 and to all newly registered trucks from September 2028. According to DEKRA's managing director, these regulations could be even more ambitious from a road safety perspective. "However, they are clearly a step in the right direction and must now be swiftly transposed into EU law."

Further background on the topic, as well as on the overall area of conflict between technology and people, can be found in the DEKRA Road Safety Report 2023, available at [www.dekra-roadsafety.com](http://www.dekra-roadsafety.com).

### **About DEKRA**

*DEKRA was originally founded in 1925 to ensure road safety through vehicle inspection. With a much wider scope today, DEKRA is the world's largest independent non-listed expert organization in the testing, inspection, and certification sector. As a global provider of comprehensive services and solutions, we help our customers improve their safety, security, and sustainability outcomes. In 2022, DEKRA generated sales totaling nearly EUR 3.8 billion. The company currently employs almost 49,000 people who offer qualified and independent expert services in approximately 60 countries on five continents. With a platinum rating from EcoVadis, DEKRA is now in the top one percent of sustainable businesses ranked.*