

## **Better brakes on heavy vehicles** (Proposal from the Danish delegation)

### **1. Heavy vehicles – traffic safety**

Heavy vehicles (buses, heavy goods vehicles and combinations) are dangerous in the traffic. In Denmark they account for 1/20 of the kilometres driven on the road but the heavy vehicles are involved in 1/6 of the fatal accidents. This should give an incentive to try to make the safety for heavy vehicles better by fitting ESP, lane-keeping-systems, collision-avoiding systems but most important not neglecting basic functions such as the brakes.

### **2. Investigation of brakes of heavy vehicles**

The investigation was initiated by the transport company's organisation in Denmark. They claimed that the users had difficulties in maintaining the specified minimum brake performance, especially for trailers, during the life of the vehicles, even if the vehicles were serviced as prescribed.

To investigate this a co-operation project between the Danish Motor Vehicle Inspection (now Applus+) and the Road Safety and Transport Agency was set up.

The brake performance was measured for 50 known combinations ( $N_3 + O_4$ ) over a 1-year period in order to clarify the development in brake performance.

The brake performance was also measured for 120 randomly selected combinations ( $N_3 + O_4$ ) at technical roadside inspection in order to clarify the brake performance for vehicles in ordinary operation.

In both series of test the performance was measured as a deceleration from 60 km/h.

The investigation shows that

- in general the heavy goods motor vehicles ( $N_3$ ) perform well
- there are serious problems with the brake performance of the trailers ( $O_4$ ) since 38% of the trailers ( $O_4$ ) on the road do not fulfill the statutory requirements

The reason for this is that

- trailers ( $O_4$ ) are from the start dimensioned with a brake performance that is too poor to maintain legal brake performance with the existing brake designs under normal use without more frequent maintenance

The report recommends that

- maintenance should include control measurements of brake performance at each service check
- technical roadside inspection should be focused on brakes of heavy vehicles
- new trailers ( $O_4$ ) should have a larger surplus of brake performance
- the Directive/Regulation relating to braking devices should be made more stringent
- the Directive/1997-Agreement relating to periodic roadworthiness inspection should be made more stringent

The report can be found (in English) on our website [www.fstyr.dk](http://www.fstyr.dk) (press the CTRL button and click [here](#) to go directly to the report).

### **3. Proposal to improve the brake performance**

The existing rules consist of type-approval rules (Directive 98/12/EC and ECE-Regulation 13) and periodic roadworthiness inspection rules (Directive 96/96/EC and ECE 1997-Agreement, proposed Rule no. 2).

The aim of proposal for improvements of the rules is that every single vehicle and every combination shall be capable of delivering a real world brake performance of at least  $5,0 \text{ m/s}^2$ . For a combination of a tractor and a semi trailer that could be achieved by a brake performance of  $5,5 \text{ m/s}^2$  for the tractor and 45% for the semi trailer.

- In the rules regarding periodic roadworthiness inspection (Directive 96/96/EC and ECE 1997-Agreement, proposed Rule no. 2) the limit values shall be raised to 45-55% braking rate dependent of the vehicle type. In addition it should be emphasised that the prescribed braking rate refers to real world braking on the road.
- In the rules regarding type-approval (Directive 98/12/EC and ECE-Regulation 13) the limit values shall be 10% higher than the values at periodic roadworthiness inspection, that is  $5,5 \text{ m/s}^2$  for lorries ( $6,0 \text{ m/s}^2$  for tractors), vans and buses, and 55% for trailers (50% for semi trailers). There will be no stability problems, because the vehicles already have anti-lock braking systems (ABS).
- In the rules regarding type-approval additionally a rule shall be incorporated concerning an on board diagnostic system (OBD), which is monitoring the brake performance of the motor vehicle and of the trailer. The OBD-system shall warn the driver if the brake performance falls below the limit.

The new rules should be applicable for vehicles registered after a certain date to be decided.

Denmark will make specific proposals for amendments to the relevant paragraphs in the Directive/Regulation.

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