

## **Compatibility bands – ECE R13**

### **(Proposal from the Danish delegation)**

#### **1. Proposal**

Brake compatibility between truck/tractor and trailer is enhanced by narrowing the limits for control line pressure versus brake rate in the area below 200kPa where most common brake events occur. The aim is to reduce the occurrence of too frequent exchange and disposal of not worn down brake pads due to sleeping and glazed brake linings thereby ensuring the presence of adequate brake performance throughout brake lining life.

To ensure compatibility not only in the full laden condition the compatibility bands should cover all load conditions in the area below 200kPa control line pressure.

For verification purposes – including PTI – it is required to be able to check the control line pressure. Accordingly an easily accessible test connection for pm is required.

This paper is coordinated by the Nordic Road Association, Vehicles and Transport Committee (NVF), and the International Road Transport Union, International Commission of Technical Affairs (IRU CIT).

#### **2. Justification**

Various studies and results from annual periodical technical inspections as well as experiences reported from IRU (International Road Transport Union) call for focus on reduced maintenance costs for heavy goods vehicle combinations and enhanced and more consistent brake performance of trailers in particular.

The European Truck Accident Causation Study [1] found technical failures in 5.3% of all main causes for traffic accident with trucks, and that queue accidents accounted for 20.6% of all accidents. Brakes can play a role in these accidents.

A Danish study [2] of brake performance of heavy goods vehicle combinations found that most heavy trucks performed well as only 4% were under-performing. However major problems were identified regarding brake performance of trailers as 38% did not meet legal requirements.

The EU General Safety Regulation 661/2009 requires AEBS (Automatic Emergency Brake System) for trucks type approved from 01.11.2013. Well functioning wheel brakes are a prerequisite for obtaining the safety benefit.

The ISO 20918 International Standard “Road vehicles - Braking threshold pressures for heavy commercial vehicle combinations with fully pneumatic braking systems - Test with roller brake tester” describes a method to evaluate the braking threshold of heavy commercial vehicle combinations with pneumatic braking systems by means of a roller brake tester. This International Standard describes procedures for workshops and garages and

provides a recommended pressure range of the system threshold pressure for motor vehicles and trailers, and a recommended practice for determining the system threshold pressure. The standard says that optimization and low adhesion utilization requires good braking balance between axles in the pressure range up to 200kPa. This improvement in balance is achieved by minimizing the variation in pressure when all brakes start to develop a braking force and recommends an interval of 50-80kPa.

Likewise inspiration has been found in the former Swedish voluntary XTB (Extra Tested Brakes) maintenance prescription. The XTB maintenance prescription recommended a brake activation pressure of 50 to 80kPa for each individual wheel brake. A similar demand were planned to be introduced in Swedish national demands at PTI, but it was not implemented due to the less stringent EU/ECE demands: The ECE R13 allows for a brake activation pressure spread between 20 and 100kPa for each vehicle in the combination, which is a too wide tolerance by today's standards.

References:

- [1] International Road Transport Union and European Commission Directorate General TREN, 2007: European Truck Accident Causation Study.
- [2] Danish Road Safety and Transport Authority and Applus, 2005: Investigation of brakes of heavy vehicles.

## PROPOSAL

Insert a new paragraph 5.1.4.2.4:

**"5.1.4.2.4: In the control line between the coupling head and the trailer relay emergency valve."**

Existing paragraph 5.1.4.2.4 and 5.1.4.2.5 to be renumbered to 5.1.4.2.5 and 5.1.4.2.6.

Annex 10, diagrams 2, 3 and 4A, amend to read:

DIAGRAM 2

**Revised**

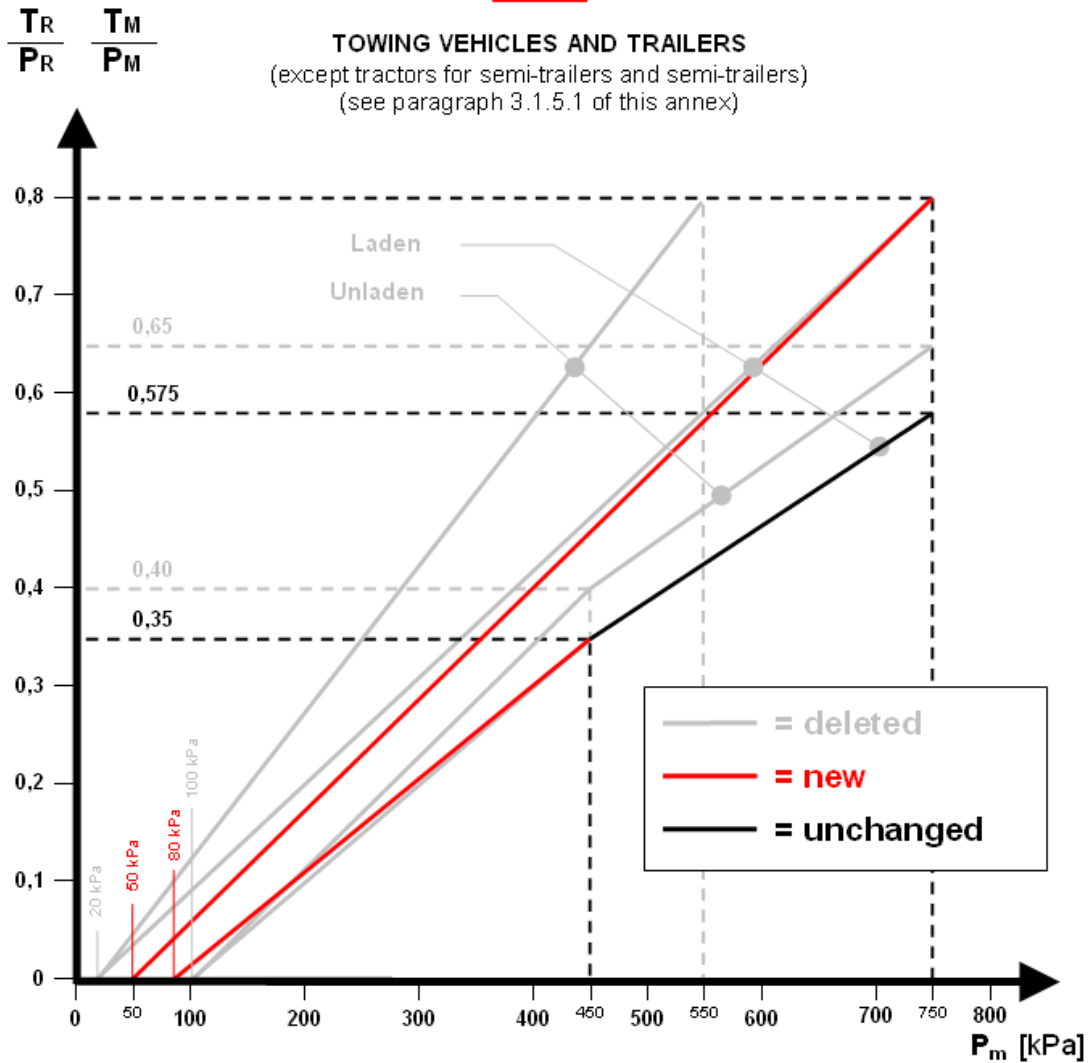


DIAGRAM 3

Revised

TRACTORS FOR SEMI-TRAILERS  
(see paragraph 3.1.6.3 of this annex)

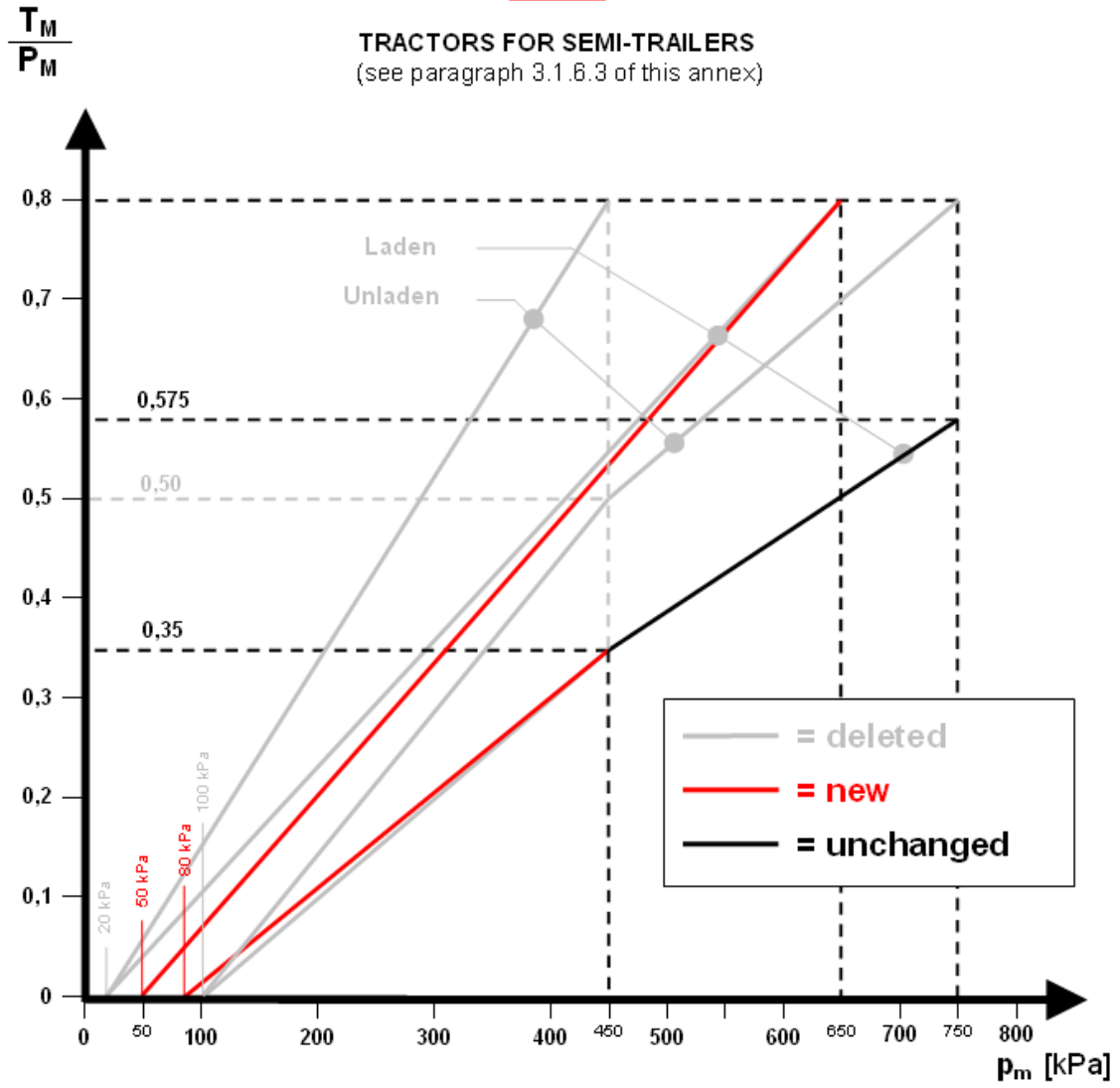
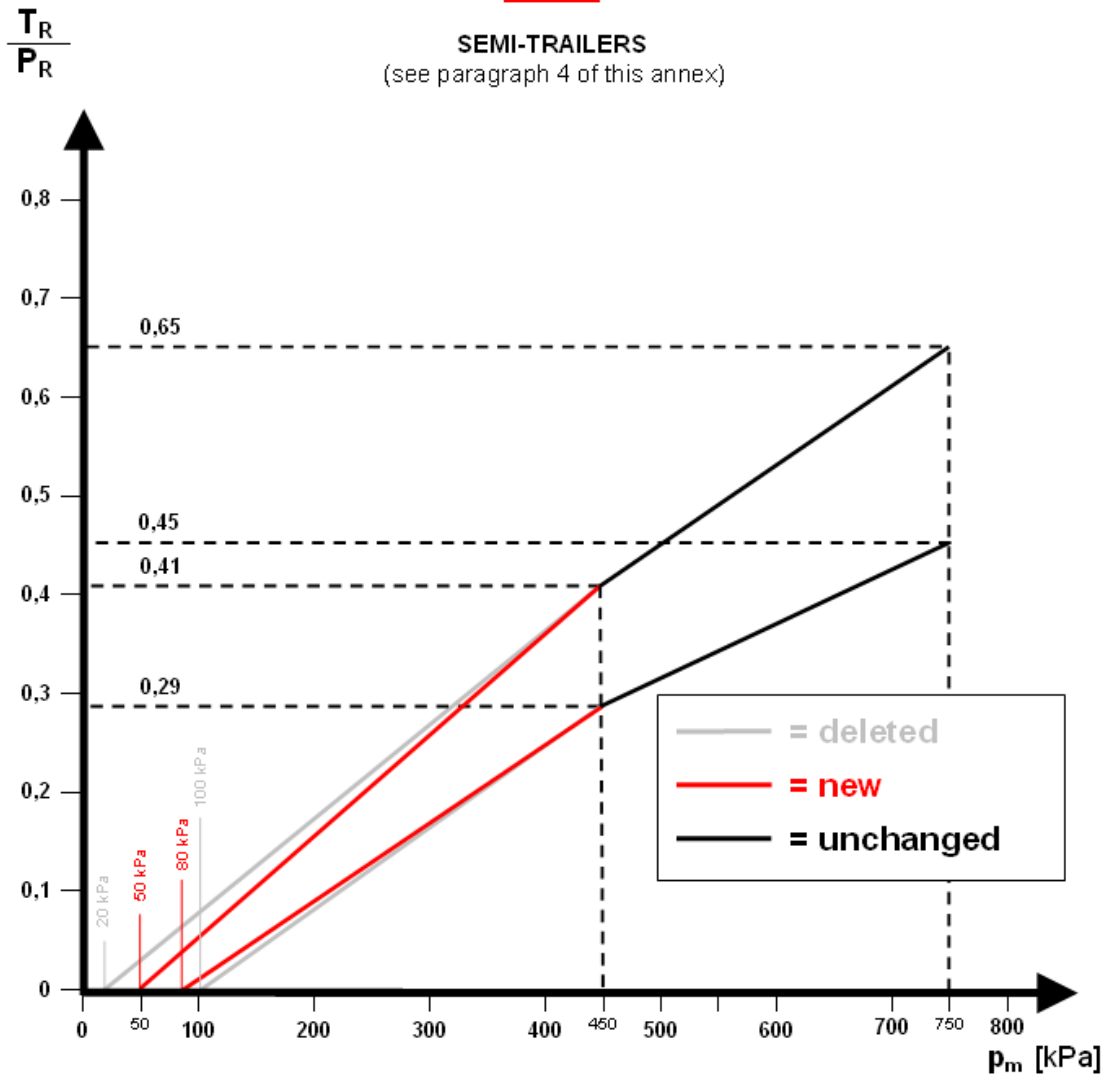


DIAGRAM 4

Revised

SEMI-TRAILERS

(see paragraph 4 of this annex)



Annex 13.

Paragraph 1.1., amend to read:

- 1.1 This annex defines the required braking performance for road vehicles fitted with antilock systems. In addition, power-driven vehicles which are authorized to tow a trailer, and trailers equipped with compressed-air braking systems, shall, when the vehicles are laden, meet the requirements for compatibility set out in Annex 10 to this Regulation. However, for all load conditions, **the requirements for compatibility set out in Annex 10 to this Regulation shall be fulfilled for a pressure (p<sub>m</sub>) below 200kPa or the equivalent digital demand value at the coupling head of the control line(s).**