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## Economic Commission for Europe

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World Forum for Harmonization of Vehicle Regulations

Working Party on Brakes and Running Gear

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Item 3(b) of the provisional agenda

**Regulations Nos. 13 and 13-H (Braking) - Trailer braking**

### **Proposal for draft amendments to Regulation No. 13 (Heavy vehicle braking)**

**Submitted by the expert from the European Association of Automotive Suppliers \***

The text reproduced below was prepared by the expert from the European Association of Automotive Suppliers (CLEPA) to extend the use of the anti-lock braking test report produced according to Annex 19 to trailers with more than three axles. It is based on ECE/TRANS/WP.29/GRRF/2010/11 and modifications to the latter are marked in bold for new and strikethrough characters for deleted.

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\* In accordance with the programme of work of the Inland Transport Committee for 2006–2010 (ECE/TRANS/166/Add.1, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

## I. Proposal

Annex 20, insert new paragraphs 7.4 to 7.4.8.5., to read:

- “7.4. Trailers with more than 3 axles may utilize the Annex 19 ABS test report provided the following conditions are fulfilled:
- 7.4.1. ~~The minimum number of directly controlled wheels installed on the trailer, irrespective of type, shall be four;~~  
**Irrespective of trailer type at least one third of the axles in an axle group shall have all wheels directly controlled, with the wheels on the remaining axles being indirectly controlled.**<sup>1</sup>
- 7.4.2. Utilization of Adhesion: The minimum utilization of adhesion specified within paragraph 6.2. of Annex 13 **to this Regulation** is deemed to be achieved when following conditions are fulfilled:
- 7.4.2.1. The relationship of the number of wheels directly or indirectly controlled by one or more pressure modulators and the location of the directly controlled wheels within the ~~bogie~~ axle group shall correspond to those defined within paragraph 2.2. of the Information Document **referred to in paragraph 5.2. of Annex 19 to this Regulation;**
- 7.4.2.2. The utilization of adhesion of the ~~above installation~~ **installed configurations has been verified and referenced** is shown in the Test Report **as meeting the requirements of paragraph 6.2. of Annex 13 to this Regulation.**
- 7.4.3. Energy Consumption: ~~The number of equivalent static brake applications is not dependent on the number of axles controlled but a function of the trailer and brake type. Therefore,~~ The number of equivalent static brake applications defined within paragraph 2.5. of the Test Report may be used in conjunction with the verification procedure of paragraph 7.3. of Annex 20 **to this Regulation No. 13.** Alternatively the test procedure specified within paragraph 6.1. of Annex 13 **to this Regulation** may be used;
- 7.4.4. Low speed performance: ~~This is a function of the anti lock braking system and is not dependent on the number of axles on the trailer (see paragraph 3.3.4. of the Test Report) and therefore does not require further verification;~~ Additional verification is not required;
- 7.4.5. High speed performance: ~~This is a function of the anti lock braking system and is not dependent on the number of axles on the trailer (see paragraph 3.3.5. of the Test Report) and therefore does not require further verification;~~ Additional verification is not required;
- 7.4.6. Category A Performance: The **differential split** friction requirements specified within paragraph 6.3.2. of Annex 13 **to this Regulation** are deemed to be fulfilled when the number of wheels which are subject to independent

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<sup>1</sup> When the number of axle(s) in an axle group is divided by 3 and the resulting number is less than 1, at least one axle shall be directly controlled. When the number of axles in the axle group is divided by 3 and the resulting number is not a whole number, a further axle shall be directly controlled in addition to the number of axles indicated by the whole number value.

- left/right control is equal to or greater than the number of wheels controlled using "select low" axle control;
- 7.4.7. Surface transition performance: ~~This is a function of the anti-lock braking system and is not dependent on the number of axles on the trailer (see paragraphs 3.3.6.1. and 3.3.6.2. of the Test Report) and therefore does not require further verification;~~ Additional verification not required;
- 7.4.8. Installation limitations: in all cases the following limitations shall apply:
- 7.4.8.1. Any installation limitations defined within paragraphs 2.1. to 2.7. of the ~~system~~ Information Document **referred to in paragraph 5.2. of Annex 19 to this Regulation** shall apply;
- 7.4.8.2. Only products identified and referenced in the Information Document and Test Report may be installed;
- 7.4.8.3. The maximum delivery volume controlled by each pressure modulator shall not exceed the volume specified within paragraph 3.3. of the Information Document;
- 7.4.8.4. ~~All other installation limitations specified within paragraph 4. of the Test Report shall apply.~~
- An axle with directly controlled wheels may only be lifted when any axle which is indirectly controlled from this direct controlled axle is lifted in parallel;**
- 7.4.8.5. **All other installation limitations specified within paragraph 4. of the Test Report shall apply."**

## II. Justification

1. The current scope of the Annex 19 and 20 procedures with respect to anti-lock braking is limited to trailers with a maximum of three axles. As a result, trailers with more than three axles cannot utilize this procedure and therefore must be approved by practical test. This increases the approval costs significantly due to the relatively low volume of these trailers, which are often special.
2. As a matter of principle, trailers with more than three axles tend to be more stable due to the number of axles on the ground. Therefore, the extension of the scope of Annex 20 to such trailers will not decrease vehicle safety as the number of directly controlled wheels on the trailer, irrespective of **trailer type**, will be **at least four for trailers with four or five axles and multiples thereof for trailers with a greater number of axles.**
3. **The location of the pressure modulators and wheel speed sensors for the various anti-lock system configurations associated to trailer type and number of axles determine the utilisation of adhesion.**
4. **Low speed, high speed and surface transition performance is a function of the anti-lock braking system and is not dependent on the number of axles on the trailer and therefore does not require further verification.**
5. **In determining energy consumption the number of equivalent static brake applications is not dependent on the number of axles controlled, but is a function of the trailer and brake type. Therefore, the number of equivalent static brake applications defined within paragraph 2.5. of the Test Report may be used in**

conjunction with the verification procedure of paragraph 7.3. of Annex 20 to this Regulation.

6. The lifting of an axle with directly controlled wheels and not lifting an axle which is indirectly controlled by it would result, when the directly controlled axle is lifted, in the indirectly controlled wheels being no longer under ABS control, and, as such, would contravene the requirements of paragraph 3.2 of Annex 13 to Regulation No. 13 where all wheels must be either directly or indirectly controlled.

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