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Working Party on Brakes and Running Gear (GRRF)
(Fifty-eighth session, 20-23 September 2005,
agenda item 1.1.)

PROPOSAL FOR DRAFT AMENDMENTS TO REGULATION No. 13

(Braking)

Transmitted by the expert from the European Association of Automotive Suppliers (CLEPA)

Note: The text reproduced below was prepared by the expert from CLEPA proposing an amendment to Regulation No. 13 in the light of experience in utilizing the current test requirements. The modifications to the existing text of the Regulation are marked in **bold** characters.

A. PROPOSAL

Insert a new paragraph 12.1.1.4., to read:

"12.1.1.4. Existing test reports according to Annex 11, Appendices 3 and 4 which confirm the fulfilment of the requirements of Regulation No. 13, 09 series of amendments, Supplement 7 and as subsequently amended up to and including 10 series of amendments, Supplement 1 shall remain in force subsequent to the modifications to Annex 11, Appendix 2, paragraph 3.5.1. and Annex 19, paragraphs 4.4.2.7.1., 4.4.2.8. and diagram 1, and new paragraph 4.4.2.9., as amended by 10 series of amendments, Supplement 2."

Annex 11,

Appendix 2, paragraph 3.5.1., amend to read:

"3.5.1. Supplementary cold performance test

The preparation of the brake shall be in accordance with paragraph 4.4.2. of Annex 19 of this Regulation.

However, it is permissible to carry out the cold performance tests after the verification for the brake factor B_F in accordance with paragraph 4. of Annex 19 of this Regulation.

In the case, that the verification of the brake factor B_F and brake threshold torque has been carried out according to paragraph 4. of Annex 19 of this Regulation, the bedding in procedure for supplementary cold performance test must be identical with the procedure used for the verification for the brake factor B_F .

It is also permissible to carry out the two fading tests Type I and Type III one after the other.

Some brake applications according to Annex 19, paragraph 4.4.2.6. may be done between each of the fade tests, and between the verification and the cold performance tests. The quantity of applications is to be declared by the brake manufacturer."

Annex 19,

Paragraph 4.4.2.7.1., amend to read:

"4.4.2.7.1. **Calculate** the input torque to produce ..."

Paragraph 4.4.2.8., amend to read:

"4.4.2.8. Repeat the procedures defined in paragraphs 4.4.2.6. and 4.4.2.7.3. above, **where paragraph 4.4.2.6. is optional**, until the performance of five consecutive non monotonic measurements at **the 0.5 TR/Test Mass constant input value has stabilized within a tolerance of –10 per cent of the maximum value.**"

Insert a new paragraph 4.4.2.9., to read:

"4.4.2.9. **If the manufacturer can demonstrate by field test results, that this bedding in state does not reflect the normal conditions during driving on the road, further conditioning is permissible.**

This field test shall be an endurance run with a reference brake on the road. The results of at least 3 tests conducted under the conditions of the type 0 test during the field test shall be the basis for determining whether further conditioning is permissible.

The details of any additional conditioning shall be recorded and appended to the brake factor B_F in paragraph 2.3.1. of Annex 11, Appendix 3, by specifying for instance the following test parameters:

- **Brake actuator pressure or the brake torque of the brake application**
- **Speed at the beginning and the end of the brake application**
- **Time in the case of a constant speed**
- **Temperature at the beginning and the end of the brake application or the duration of the brake cycle."**

Paragraph 4.4.2.9. (former), renumber as paragraph 4.4.2.10.

The drafting that resulted in Annex 19 being adopted at the fifty-first GRRF session was carried-out in an ad-hoc working group in 1998/1999. At this time, the large-scale series production of disc brakes for trailers was in its infancy and the bedding-in process was based primarily on drum brake experience. Since then pad and lining development - to meet not only legislative braking performance criteria, but also health and safety, servicing, noise, durability, low/high deceleration with new linings/pads, etc., requirements – has resulted in materials for which the existing Annex 19 bedding-in process may not be appropriate.

Therefore, it is proposed that additional conditioning is allowed, with the existing bedding-in process being retained to maintain a minimum standard. The details of any additional conditioning are required to be appended to the test report so that they are available for future reference. Without the flexibility of additional conditioning being allowed, the development of new linings/pads is restricted and existing materials which are proven via vehicle homologation and in-service experience would require further extensive testing and possibility re-engineering to take advantage of Annex 20, which was initiated to simplify the type approval procedure.

In the light of the above, the amendment to Annex 19, paragraph 4.4.2.8. and the additional new paragraph 4.4.2.9. to Annex 19 are proposed. In paragraph 4.4.2.8., the cleaning requirement of paragraph 4.4.2.6. is made optional. In paragraph 4.4.2.9., the results of at least 3 type O tests conducted during an endurance field test are allowed to justify further conditioning. This field test is conducted with a reference brake which is identical to that described in the related test report. The conditions of the field test shall be as agreed with the technical service.

The proposed amendments to Annex 11, Appendix 2, paragraph 3.5.1. are to provide clarification on how Annex 19 and Annex 11 interface, thereby enabling the total amount of testing to be reduced. Paragraphs 3.5.1.1. and 3.5.1.2. are unchanged.

The brake factor characteristic is typically curved. Therefore, it is proposed to modify the upper boundary line in diagram 1 of Annex 19 to take into account this fact. The two-slope line is replaced by a single slope.

Furthermore, the relative tolerance of this section is increased from 10 per cent to 20 per cent at 0.55 braking rate relative to the brake input, and from 20 per cent to 40 per cent at 0.15 braking rate relative to the brake input.

The lower boundary line is unchanged, thereby maintaining the same minimum standard, but the method of dimensioning is changed from braking rate to brake input. This change in dimensioning is to have the same dimensioning method throughout the diagram.

The new paragraph 12.1.1.4. is to ensure that existing test reports according to Supplement 7 remain in force after the proposed amendments come into force.

In Annex 19, paragraph 4.4.2.7.1. the word "Determine..." should be changed to "Calculate..." for clarification of what is meant.
