

Distr.  
GENERAL

TRANS/WP.29/GRRF/2002/26  
5 July 2002

Original: ENGLISH

ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

World Forum for Harmonization of Vehicle Regulations (WP.29)

Working Party on Brakes and Running Gear (GRRF)  
(Fifty-second session, 16-18 September 2002,  
agenda item 1.1.)

PROPOSAL FOR DRAFT CORRIGENDUM 2 TO SUPPLEMENT 6  
TO THE 09 SERIES OF AMENDMENTS TO REGULATION No. 13

(Braking)

Transmitted by the Expert from the European Association  
of Automobile Suppliers (CLEPA)

Note: The text reproduced below was prepared by the expert from CLEPA in order to correct the text of the Regulation. It supersedes document TRANS/WP.29/GRRF/2002/4. The corrections to the current text are underlined.

---

Note: This document is distributed to the Experts on Brakes and Running Gear only.

Annex 12,

Paragraphs 2.2.19.1. and 2.2.19.2., amend to read:

- "2.2.19.1.  $s_{Hz}$ : stroke of the master cylinder in millimetres according to figure 8 of appendix 1 to this annex;
- 2.2.19.2.  $s''_{Hz}$ : spare travel of the master cylinder in millimetres at piston rod, according to figure 8;"

Paragraph 2.2.22., amend to read:

- "2.2.22.  $2s_B^*$  minimum brake shoe centre lift .....
- .....

where:  $V_{60}$  = fluid volume absorbed by one wheel brake at a pressure .....

Paragraphs 2.2.23. and 2.2.23.1., amend to read:

- "2.2.23.  $M^*$ : Braking torque as specified by the manufacturer in paragraph 5. of appendix 3. This braking torque shall produce at least, the prescribed braking force  $B^*$ ;
- 2.2.23.1.  $M_T$ : Test braking torque in the case when no overload protector is fitted (according to paragraph 6.2.1. below);"

Paragraphs 2.2.26. and 2.2.27., amend to read:

- "2.2.26.  $M_x$ : Maximum braking torque resulting from the maximum permissible travel  $s_x$  or the maximum permissible fluid volume  $V_x$  when the trailer moves rearward (including rolling resistance =  $0.01 \cdot g \cdot G_{Bo}$ );
- 2.2.27.  $s_x$ : Maximum permissible travel at the brake control lever when the trailer moves rearward;"

Paragraph 2.2.28., amend to read:

- "2.2.28.  $V_x$ : Maximum permissible fluid volume absorbed by one braking wheel when the trailer moves rearward;"

Paragraphs 2.3.5. and 2.3.6., amend to read:

- "2.3.5.  $P$ : force applied to the brake control lever; (see Figure 4 of appendix 1 to this annex);
- 2.3.6.  $P_0$ : Brake-retraction force when the trailer moves forward; i.e., in the graph of  $M = f(P)$ , the value of the force  $P$  at the point of intersection of the extrapolation of this function with the abscissa (see Figure 6 of appendix 1 to this annex);"

Paragraph 2.3.7., amend to read:

- "2.3.7.  $P^*$ : Force applied to the brake control lever to produce the braking force  $B^*$ ;"

Paragraphs 2.3.9. and 2.3.9.1., amend to read:

2.3.9.  $\rho$ : characteristic of the brake when the trailer moves forward as defined from:

$$M = \rho (P - P_o)$$

2.3.9.1.  $\rho_r$ : characteristic of the brake when the trailer moves rearward as defined from:

$$M_r = \rho_r (P_r - P_{or})"$$

Paragraph 2.4.6., amend to read:

"2.4.6.  $p_o$ : retraction pressure in the brake cylinder when the trailer moves forward; i.e., in graph of  $M = f(p)$ , the value of the pressure  $p$  at the point of intersection of the extrapolation of this function with the abscissa (see Figure 7 of appendix 1 to this annex);"

Paragraph 2.4.7., amend to read:

"2.4.7.  $p^*$ : Hydraulic pressure in the brake cylinder to produce the braking force  $B^*$ ;"

Paragraphs 2.4.9. and 2.4.9.1., amend to read:

"2.4.9.  $\rho'$ : characteristic of the brake when the trailer moves forward as defined from:

$$M = \rho' (p - p_o)$$

2.4.9.1.  $\rho'_r$ : characteristic of the brake when the trailer moves rearward as defined from:

$$M_r = \rho'_r (p_r - p_{or})"$$

Paragraphs 2.5.1., amend to read:

"2.5.1.  $D_{op}$ : Application force at the input side of the control device, at which the overload protector is activated"

Paragraph 3.6., amend to read:

"3.6. Inertia braking systems may incorporate overload protectors. They must not be activated at a force of less than  $D_{op} = 1.2 \cdot D^*$  (when fitted at the control device) or at a force of less than  $P_{op} = 1.2 \cdot P^*$  or at a pressure of less than  $p_{op} = 1.2 \cdot p^*$  (when fitted at the wheel brake) where the force  $P^*$  or the pressure  $p^*$  corresponds to a braking force of  $B^* = 0,5 \cdot g \cdot G_{Bo}$ ."

Paragraphs 5.4.4. to 5.4.6., amend to read:

"5.4.4. surface area  $F_{HZ}$  of the piston in the master cylinder.

5.4.5. stroke  $s_{Hz}$  of the master cylinder (in millimetres).

5.4.6. spare travel  $s''_{Hz}$  of the master cylinder (in millimetres)."

Paragraph 6.1, amend to read:

"6.1. In addition to the brakes to be checked, the manufacturer shall submit to the Technical Service conducting the tests, drawings of the brakes showing the type, dimensions and material of the essential components and the make and type of the linings. In the case of hydraulic brakes, these drawings shall show the surface area  $F_{RZ}$  of the brake cylinders. The manufacturer shall also specify the braking torque  $M^*$  and the mass  $G_{Bo}$  defined in paragraph 2.2.4. of this annex."

Paragraph 6.2.1., amend to read:

"6.2.1. In the case when an overload protector is neither fitted nor intended to be fitted within the inertia (overrun) braking system, the wheel brake shall be tested with the following test forces or pressures:"

$$P_T = 1.8 P^* \text{ or } p_T = 1.8 p^* \text{ and } M_T = 1.8 M^* \text{ as appropriate.}$$

Paragraphs 6.2.2.2. and 6.2.2.3., amend to read:

"6.2.2.2. The ranges of minimum test force  $P_{Top}$  or minimum test pressure  $p_{Top}$  and the minimum test torque  $M_{Top}$  are:

$$P_{Top} = 1.1 \text{ to } 1.2 P^* \text{ or } p_{Top} = 1.1 \text{ to } 1.2 p^* \\ \text{and } M_{Top} = 1.1 \text{ to } 1.2 M^*$$

6.2.2.3. The maximum values ( $P_{op\_max}$  or  $p_{op\_max}$ ) for the overload protector shall be specified by the manufacturer and shall not be more than  $P_T$  or  $p_T$  respectively."

Paragraph 7.3., amend to read:

"7.3. In the case of mechanical brakes, the following shall be determined:"

Paragraphs 7.3.2. and 7.3.3., amend to read:

"7.3.2. Force  $P^*$  for braking torque  $M^*$

7.3.3. Torque  $M^*$  as a function of the force  $P^*$  applied to the control lever in mechanical-transmission systems. The rotational speed of the braking surfaces shall correspond to an initial vehicle speed of 60 km/h when the trailer moves forward and 6 km/h when the trailer moves rearward. The following shall be derived from the curve obtained from these measurements (see Figure 6 of appendix 1 to this annex):"

Paragraph 7.3.3.4., amend to read:

"7.3.3.4. Maximum permissible travel at the brake control lever when the trailer moves rearward (see Figure 6 of appendix 1 to this annex)"

Paragraphs 7.4.2. and 7.4.3., amend to read:

"7.4.2. Pressure  $p^*$  for braking torque  $M^*$

7.4.3. Torque  $M^*$  as a function of the pressure  $p^*$  applied to the brake cylinder in hydraulic transmission systems.  
The rotational speed of the braking surfaces shall correspond to an initial vehicle speed of 60 km/h when the trailer moves forward and 6 km/h when the trailer moves rearward. The following shall be derived from the curve obtained from these measurements (see Figure 7 of appendix 1 to this annex):"

Paragraph 7.4.3.4., amend to read:

"7.4.3.4. Maximum permissible fluid volume  $V_r$  absorbed by one braking wheel when the trailer moves rearward (see figure 7 of appendix 1)."

Paragraph 7.4.4., amend to read:

"7.4.4. Surface area  $F_{RZ}$  of the piston in the brake cylinder."

Paragraph 7.5. to 7.5.2., amend to read:

"7.5. Alternative Procedure for the Type-I test

7.5.1. The Type-I test according to annex 4, paragraph 1.5. does not have to be carried out on a vehicle submitted for type approval, if the braking system components are tested on an inertia test bench to meet the prescriptions of annex 4, paragraphs 1.5.2. and 1.5.3.

7.5.2. The alternative procedure for the Type-I test shall be carried out in accordance with the provisions laid down in annex 11, appendix 2, paragraph 3.5.2. (in analogy also applicable for disc brakes)."

Annex 12, appendix 2,

Item 8.2., amend to read:

"8.2. with hydraulic transmission device 1/

$i_h$  = from ..... to ..... 2/

$F_{HZ}$  = .....  $cm^2$

travel of master cylinder  $s_{HZ}$ ..... mm

spare travel of master cylinder  $s''_{HZ}$  ..... mm"

Item 9.8.1.1., amend to read:

"9.8.1.1. Threshold force of the overload protector  
 $D_{op}$  = .....N"

Item 9.8.2.1., amend to read:

"9.8.2.1. Threshold force on the overload protector  
where the overload protector is mechanical <sup>1/</sup>  
 $D_{op\_ih0} = \dots\dots\dots N$   
where the overload protector is hydraulic <sup>1/</sup>  
 $D_{op\_ih} = \dots\dots\dots N$ "

Annex 12, appendix 3,

Items 9.6.1. and 9.6.1.A., amend to read:

"9.6.1. Braking torque activating the overload protector  
 $M_{op\_} = \dots\dots\dots Nm$   
9.6.1.A. Braking torque activating the overload protector  
 $M_{op\_} = \dots\dots\dots Nm$ "

Items 9.10., 9.10.1. and 9.10.1A., amend to read:

"9.10. Service brake performance when the trailer moves rearwards (see  
figures 6 and 7 of appendix 1 to this annex)  
9.10.1. Maximum Fig 6 braking torque  $M_r = \dots\dots\dots Nm$   
9.10.1.A. Maximum Fig 7 braking torque  $M_r = \dots\dots\dots Nm$ "

Item 9.10.2.A., amend to read:

"9.10.2.A. Maximum permissible fluid volume absorbed  $V_r = \dots\dots\dots cm^3$ "

Item 9.11., amend to read:

"9.11. Further brake characteristics when the trailer moves rearwards (see  
figures 6 and 7 of appendix 1 to this annex)"

Item 9.12., amend to read:

"9.12. Tests according to paragraph 7.5. of this annex (if  
applicable)(corrected to take account of the rolling resistance  
corresponding to  $0.01 \cdot g \cdot G_{Bo}$ )"

Item 9.12.2., amend to read:

"9.12.2. Brake test Type I  
Test speed =  $\dots\dots\dots km/h$   
  
Sustained braking ratio =  $\dots\dots\dots \%$   
  
Braking time =  $\dots\dots\dots$  minutes  
  
Hot performance =  $\dots\dots\dots \%$   
(expressed as a % of the above Type 0 test result in 9.12.1)  
  
Control force =  $\dots\dots\dots N$ "

Annex 12, appendix 4,

Item 5.6.1.3., amend to read:

"5.6.1.3. if the overload protector is on the inertia control device:  
threshold force  $\frac{D_{op}}{D^*} = \dots\dots\dots$   
(must be equal or greater than 1.2)"

Item 5.6.1.4., amend to read:

"5.6.1.4. if the overload protector is fitted on the brake:  
threshold torque  $\frac{n.M_{op}}{(B.R)} \dots\dots\dots$   
(must be equal or greater than 1.2)"

---