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

(Braking)

Note: The text reproduced below was adopted by the Administrative Committee (AC.1) of the amended 1958 Agreement at its twenty-third session, following the recommendation by WP.29 at its one-hundred-and-twenty-ninth session. It is based on document TRANS/WP.29/2003/2, as corrected (TRANS/WP.29/909, para. 114). The corrections are marked in **bold text**.

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Annex 12,

Paragraphs 2.2.19.1. and 2.2.19.2., correct 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., correct 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., correct 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., correct to read:

"2.2.26. M_r: Maximum braking torque **resulting from the maximum permissible travel s_r or the** maximum permissible fluid volume V_r when the trailer moves rearward (including rolling resistance $= 0.01 \cdot g \cdot G_{Bo}$);

2.2.27. s_r: Maximum permissible travel at **the** brake control lever when the trailer moves rearward;"

Paragraph 2.2.28., correct to read:

"2.2.28. V_r: Maximum permissible fluid volume **absorbed by** one braking wheel when the trailer moves rearward;"

Paragraphs 2.3.5. and 2.3.6., correct 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_o: 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., correct 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., correct to read:

"2.3.9. ρ: characteristic of **the** brake when the trailer moves forward as defined **from**:

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

2.3.9.1. ρ_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., correct 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., correct 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., correct to read:

"2.4.9. ρ': characteristic of **the** brake when the trailer moves forward as defined **from**:

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

2.4.9.1. ρ'_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., correct 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., correct 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., correct 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., correct 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., correct 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:"

$P_T = 1.8 \, P^*$ or $p_T = 1.8 \, p^*$ and $M_T = 1.8 \, M^*$ **as appropriate**."

Paragraphs 6.2.2.2. and 6.2.2.3., correct 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:

$P_{Top} = 1.1$ **to** $1.2 \, P^*$ or $p_{Top} = 1.1$ **to** $1.2 \, p^*$ and
$M_{Top} = 1.1$ **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., correct to read:

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

Paragraphs 7.3.2. and 7.3.3., correct 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., correct 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., correct 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., correct 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., correct to read:

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

Paragraphs 7.5. to 7.5.2., correct 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., correct 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., correct to read:

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

Items 9.8.1.2. and 9.8.1.3., correct to read:

"9.8.1.2.   Where the overload protector is mechanical [1]
max. force which the inertia control device can develop
$P'_{max}/i_{Ho} = P_{op\_max}$ = ... N

9.8.1.3.   Where the overload protector is hydraulic [1]
the pressure which the inertia control device can develop
$p'_{max}/i_h = P_{op\_max}$ = ... N/cm^2"

Item 9.8.2.1., correct to read:

"9.8.2.1.   Threshold force on the overload protector
where the overload protector is mechanical [1]
$D_{op}.i_{Ho}$ = ...N
where the overload protector is hydraulic [1]
$D_{op}.i_h$ = ...N"

Items 9.8.2.2. and 9.8.2.3., correct to read:

"9.8.2.2.   Where the overload protector is mechanical [1]/
                max force which the inertia control device can develop
                $P'_{max} = \mathbf{P_{op_max}} = $ .... N

9.8.2.3.   Where the overload protector is hydraulic [1]/
                the pressure which the inertia control device can develop
                $p'_{max} = \mathbf{P_{op_max}} = $ .... N/cm^2"

Annex 12, appendix 3,

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

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

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

Items 9.10., 9.10.1. and 9.10.1A., correct 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 = $ .... Nm

9.10.1.A.   Maximum **Fig 7** braking torque $M_r = $ .... Nm"

Item 9.10.2.A., correct to read:

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

Item 9.11., correct 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., correct 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., correct to read:

"9.12.2. Brake test Type I
     Test speed = ... km/h

     Sustained braking ratio = ... %

     Braking time = ... **minutes**

     Hot performance = ... %
     (**expressed** as a % of the above Type-0 test result in item 9.12.1.)

     Control force = ... N"

Annex 12, appendix 4,

Item 5.6., correct to read:

"5.6.   **Braking** torque of the brakes
     $n \cdot M^* /(B \cdot R)=$ ....
     (must be equal or greater than **1.0**)"

Items 5.6.1.1. to 5.6.1.4., correct to read:

"5.6.1.1. where the overload protector is mechanical on the inertia control device [1]/
     $n \cdot P^* /(i_{H1} \cdot \eta_{H1} \cdot P'_{max})=$ ....
     (must be equal or greater than **1.2**)

5.6.1.2. where the overload protector is hydraulic on the inertia control device [1]/
     $P^* / P'_{max} =$ ....
     (must be equal or greater than **1.2**)

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

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

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