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World Forum for Harmonization of Vehicle Regulations**Working Party on Automated/Autonomous and Connected Vehicles*****Fifth session**

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Item 8 (c) of the provisional agenda

UN Regulations Nos. 13, 13-H, 139 and 140:**Clarifications****Proposal for a Supplement to the 11 series of amendments
to UN Regulation No. 13 (Heavy Vehicle Braking)****Submitted by the expert from the Russian Federation****

This proposal aims at clarification of the test method for the evaluation of performance of energy sources and energy storage devices reproduced in Annex 7 to the UN Regulation No. 13. It is based on the working document ECE/TRANS/WP.29/GRVA/2019/18. The modifications of the existing Regulation are marked in bold for new or strikethrough for deleted characters.

* Formerly: **Working Party on Brakes and Running Gear (GRRF)**.

** In accordance with the programme of work of the Inland Transport Committee for 2020 as outlined in proposed programme budget for 2020 (A/74/6 (part V sect. 20) para 20.37), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.



I. Proposal

Annex 7 (Provisions relating to energy sources and energy storage devices (energy accumulators), Part A (Compressed-Air braking systems):

...

"1.2.1. The energy storage devices (energy reservoirs) of power-driven vehicles shall be such that after eight full-stroke actuations of the service braking system control the pressure remaining in the energy storage device(s) shall be not less than the pressure required to obtain the specified secondary braking performance.

... "

Paragraph 1.2.2.3., amend to read:

"1.2.2.3. In the case of power-driven vehicle to which the coupling of a trailer is authorized and with a pneumatic control line, the supply line shall be stopped and a compressed-air reservoir of 0.5 litre capacity shall be connected directly to the coupling head of the pneumatic control line. Before each braking operation, the pressure in this compressed-air reservoir shall be completely eliminated. After the test referred to in paragraph 1.2.1. above, **at the additional (ninth) actuation of the service braking system control**, the energy level supplied to the pneumatic control line shall not fall below a level equivalent to one-half the figure obtained at the first brake application. "

Paragraph 1.3.1., amend to read:

"1.3.1. The energy storage devices (energy reservoirs) with which trailers are equipped shall be such that, after eight full-stroke actuations of the towing vehicle's service braking system, the energy level supplied to the operating members using the energy **obtained at the additional (ninth) actuation of the towing vehicle's service braking system**, does not fall below a level equivalent to one-half of the figure obtained at the first brake application and without actuating either the automatic or the parking braking system of the trailer."

Annex 7, Part B (Vacuum braking systems):

"...

1.2.1. The energy storage devices (energy reservoirs) of power-driven vehicles shall be such that it is still possible to achieve the performance prescribed for the secondary braking system:

1.2.1.1. After eight full-stroke actuations of the service braking system control where the energy source is a vacuum pump; and

1.2.1.2. After four full-stroke actuations of the service brake control where the energy source is the engine.

... "

Paragraph 1.2.2.3., amend to read:

"1.2.2.3. In the case of a power-driven vehicle authorized to tow a trailer, the supply line shall be stopped and an energy storage device of 0.5 litre capacity shall be connected to the control line. After the test referred to in paragraph 1.2.1. above, **at the additional actuation of the service braking system control**, the vacuum level provided at the control line shall not have fallen below a level equivalent to one-half of the figure obtained at the first brake application. "

Paragraph 1.3.1., amend to read:

“1.3.1. The energy storage devices (energy reservoirs) with which trailers are equipped shall be such that **after a test comprising four full-stroke actuations of the trailer's service braking system, at its additional (fifth) actuation** the vacuum level provided at the user points shall not have fallen below a level equivalent to one-half of the value obtained at the first brake application ~~after a test comprising four full-stroke actuations of the trailer's service braking system.~~”

II. Justification

1. The background for the development of this proposal was a disagreement between a technical service and one of their customers on the interpretation of the test methods according to the UN Regulation No. 13, Annex 7.

2. When checking the supply of compressed air in the energy storage devices (energy reservoirs) of power-driven vehicles authorized to tow a trailer, the evaluation of the energy level supplied to the control line in accordance with paragraph 1.2.2.3. of Annex 7, Sections A and B, the level of energy remaining after the test prescribed in paragraph 1.2.1. of the respective sections shall not fall below half of the value achieved during the first activation of the brakes. However, the text of the Regulation does not clearly indicate when the pressure in the control line shall be measured – at the last (eighth) pressing the control of the service braking system or at the additional (ninth) actuation of the service braking system control.

3. The review of the available test reports of the different technical services shown that they have different interpretation of the afore-said provisions of the Regulation: some check the residual pressure in the control line at the eighth actuation of the service braking system control, but others do that at the ninth actuation.

4. However, ISO 7635:2006, governing the test methods of vehicles in accordance with the UN Regulation No. 13, describes in details the procedure for verification of the compressed air in the energy storage devices (energy reservoirs). According to that procedure (paragraph 15.7 of ISO 7635:2006), the evaluated pressure in the pneumatic control line is measured at the ninth actuation of the service braking system control.

5. For elimination of discrepancies, it is proposed to clarify in UN Regulation No. 13, Annex 7, Sections A and B, paragraph 1.2.2.3. that the level of residual energy in the control line shall be measured at the additional actuation of the service braking system control.

6. Following the results of the discussion of this proposal at the second GRVA session (GRVA-02-10), for the sake of consistency, the proposed wording was aligned for the both paragraphs 1.2.2.3. in Parts A and B of Annex 7 to UN Regulation No. 13.

7. At the discussion of this proposal at the fourth GRVA session (document ECE/TRANS/WP.29/GRVA/2019/18) it was pointed out that there was a similar uncertainty with regard to the number of actuations of the service braking system in trailer tests, so the corresponding modifications were also proposed for the both paragraphs 1.3.1. in Parts A and B of Annex 7 to UN Regulation No. 13.