Submitted by the Chair of the EMB Special Interest Group
and by the experts from OICA and CLEPA.

Informal document **GRVA-19-23**
19th GRVA, 25 June 2024
(For review during the
Troy meeting 20-24 May 2024)
Provisional agenda item 8(b)

Proposal to amend document ECE/TRANS/WP.29/GRVA/2024/25:

"Proposal for amendments to UN Regulation No. 13 (Heavy vehicle braking)."

Red font is used to distinguish changes proposed by this informal document from those changes proposed in GRVA/2024/25.

I. Amendments

Amend new paragraph 2.44. to read:

2.44. "~~**Wheel**~~ **bB**rake demand value" means the demand value for the braking force of a single wheel, or an axle, ~~**brake**~~ being electrically actuated.

Amend new paragraph 2.53. to read:

2.5.3. "*Electrical Transmission Braking System*" (ETBS) means a braking system ~~of a power-driven vehicle~~ where the service braking force, and transmission, depend exclusively on the use, controlled by the driver, of energy provided from electrical storage devices.

Amend Paragraph 5.1.4.6.2.1. to read:

5.1.4.6.2.1. It shall be possible ~~on the vehicle~~ to evaluate the relationship between the brake demand value(s) ~~(e.g. as a percent value, voltage, brake pedal force or stroke)~~ and the measured braking force on a roller brake tester. **The brake demand value(s) shall be displayed on the vehicle and easily readable from the driver's seat during the roller brake test (e.g., using a menu system, automatic demand, etc.).** The vehicle manufacturer shall describe ~~the method by which this can be realized, and make this information available freely by e.g. handbook, electronic data record etc.~~ **how to display those values and make this information available according to paragraph 5.1.4.5.1. above.**

Amend Paragraph 5.2.1.13.1. to read:

5.2.1.13.1. Any vehicle fitted with a service brake actuated from an energy ~~**reservoir**~~ **reserve** shall, where the prescribed secondary braking performance cannot be obtained by means of this braking system without the use of the stored energy, be provided with a warning device, in addition to **an indication of the available energy (e.g.** a pressure gauge**)** where fitted, giving an optical or**,** **except for an electrical transmission braking system,** an acoustic signal **at the latest** when the stored energy **(or the state of an electrical storage device, as relevant)** in any part of the system, falls to a **level** ~~**value**~~ at which without re-charging of the ~~**reservoir**~~ **reserve** and irrespective of the load conditions of the vehicle:

(a) For braking systems other than an electrical transmission braking system, it is possible to apply the service brake control a fifth time after four full-stroke actuations and obtain the prescribed secondary braking performance;

(b) For electrical transmission braking systems, the prescribed service brake performance cannot be achieved, or it is still possible to apply the service brake control a fifth time after four full*/ actuations and obtain at least the secondary braking performance, whichever occurs first,

without faults in the service brake transmission and with the brakes adjusted as closely as possible.

This warning device shall be directly and permanently connected to the circuit. The red warning signal specified in paragraph 5.2.1.29.1.1. shall be used as the optical warning signal. When the engine is running, or during a run cycle (e.g., in case of a vehicle propelled by an electric motor),

under normal operating conditions and there are no faults in the braking system, as is the case in approval tests for this type, the warning device shall give no signal except during the time required for charging the energy reserve(s) after each new engine start/run cycle, as relevant.

Footnote: */ A full actuation means the actuation of the control in accordance with Annex 7, Part D, paragraph 1.2.3.3 for a duration of 8.0 seconds or for a time T as described in that paragraph.

Amend paragraph 5.2.1.13.1.2. to read:

5.2.1.13.1.2. In addition, for vehicles equipped with an electrical transmission braking system, there shall be an acoustic signal that is activated no later than 60 seconds after the activation of the red warning signal required by paragraph 5.2.1.13.1. (b) **or ~~following~~** on the first application of the service brake control after activation of that red warning signal, whichever occurs first.

Vehicles which rely for their propulsion on energy from an electrical storage device or devices, shall be deemed to comply with this requirement if the energy to the traction motor(s) is stopped before the energy in the electrical storage device(s) has fallen to a level at which the red warning signal is activated.

Amend new paragraph 5.2.1.35., to read:

5.2.1.35. Special additional requirements for power-driven vehicles equipped with electrical transmission braking systems.

Amend new paragraph 5.2.1.35.1. to read:

5.2.1.35.1. When the state of the electrical storage device(s) is insufficient to ensure ~~the residual~~ secondary braking performance ~~as laid down in paragraph 2.4. of Annex 4 to this Regulation~~ by the actuation of the service brake control the release of the parking braking system shall be prevented. However, in the case that secondary braking performance is achievable by a separate control, it shall be sufficient for the service braking system to provide residual braking performance as laid down in paragraph 2.4. of Annex 4.

Amend new paragraph 5.21.35.11. to read:

5.2.1.35.11. The red warning signal specified in paragraph 5.2.1.29.1.1. shall be activated when ~~the service braking performance~~ it is not anymore ensured that secondary braking performance can be achieved by at least two independent ~~service~~ braking circuits; at least one of those circuits shall be part of the service braking system. ~~from each achieving the prescribed secondary or residual braking performance~~.

Amend new paragraph 5.2.1.35.13. to read:

5.2.1.35.13. A failure within the electric transmission,*/ that affects the function and performance of systems addressed in this Regulation shall be indicated to the driver by the red or yellow warning signal specified in paragraphs 5.2.1.29.1.1. and 5.2.1.29.1.2., respectively, as appropriate.

When the prescribed service braking performance can no longer be achieved (red warning signal), failures resulting from a loss of electrical continuity (e.g. breakage, disconnection) shall be signalled to the driver as soon as they occur, and the prescribed ~~residual~~ secondary braking performance shall be fulfilled by operating the service braking control ~~in accordance with paragraph 2.4. of Annex 4 to this Regulation~~. ~~These requirements shall not be construed as a departure from the requirements concerning secondary braking.~~ However, in the case that the declared secondary braking system utilises a separate control, and that performance can be achieved, it shall be sufficient for the service braking system to provide residual braking performance as laid down in paragraph 2.4. of Annex 4.

Amend paragraph 5.2.1.35.17.2. to read;

5.2.1.35.17.2. In the event of a failure in the *energy* source or electrical supply, whilst the vehicle is stationary and the parking braking system applied, the energy in the electrical storage device(s) shall be sufficient to actuate the lights even when the brakes are applied.

Annex 13 - Appendix 2,
Amend new paragraph 1.1.3. to read:

Paragraph 1.1.3., amend to read:

1.1.3. A number of tests at increments of line pressure / ~~wheel~~ brake demand value shall be carried out to determine the maximum ...

II. Justifications

Paragraph 2.44.
This definition is principally of importance to the provisions for PTI where the interest may be associated with an individual wheel or an individual axle. To avoid interpretation difficulties, defining the meaning of "brake demand value" is more appropriate.

Paragraph 2.53.
The inclusion of a reference to "power-driven vehicle" in a definition implies that the definition imposes a requirement or constraint. This amendment suggests deleting the specific reference from the definition and, instead, introduce it as part of the specific requirements for electrical transmission braking systems.

Paragraph 5.1.4.6.2.1.
It is recognised that some Contracting Parties may use brake reference values as part of their roadworthiness inspection. The intention has been to provide for electrical transmission braking systems to be assessed in the same way as compressed air braking systems today. This revision to the proposal requires the brake demand values to be displayed on the vehicle when it is subject to a roller brake test so that the respective brake forces can be assessed. The display may be initiated automatically (e.g. recognition the vehicle is on a roller brake tester) or on the manual demand of the operator. The method by which the display is activated has to be described and be readily available.

Paragraph 5.2.1.13.1.
This paragraph allows the manufacturer a choice of using an optical or an audible signal to alert the driver to a fault within the braking system that compromises service brake performance. However, for electric transmission braking systems the use of the audible device has been prescribed for use in the "Low Energy Emergency Function" (para. 5.2.1.35.18). It is therefore necessary to require that, for electrical transmission braking systems, only an optical signal can be used for the purpose of 5.2.1.13.1. The choice remains for other types of braking system.

Paragraph 5.2.1.13.1.2.
By referring to "… or following the first application of the service brake control …" it was not clear whether this meant when the control is actuated or at some time after that actuation. Replacing the word "following", with "on", makes clear that the signal is required when the control is actuated.

Paragraph 5.2.1.35.
The new, additional, requirements for electrical transmission braking systems have been developed only for application with power-driven vehicles (Categories M and N). Further work would be necessary to permit the technology on vehicles of Category O. In Document GRVA/2024/25, it is proposed to include a reference to "power-driven vehicle" in the definition of ETBS) paragraph

2.53.), however, the use of a definition to dictate use is not ideal. This revised approach permits a new and additional section to be introduced for Category O vehicles, if and when appropriate.

Paragraph 5.2.1.35.1.
This amendment is intended to ensure that at any time that the parking brake of a vehicle with an electrical transmission braking system is released there is the capability to stop the vehicle with at least the performance required for secondary braking. It recognises that this performance may be achieved by use of the service brake control or by the use of a separate control (the designated secondary brake control). If a separate control is used, there shall, in addition, still be the capability to achieve residual brake performance using the service brake control.

Paragraph 5.21.35.11.
This revision clarifies that the red warning signal is required whenever there are less than two braking circuits capable of providing secondary brake performance. It recognises that, in some cases, one of those circuits may require the use of a separate control to that used for service braking.

Paragraph 5.2.1.35.13.
The intention of this paragraph was to ensure that under any single failure of the brake transmission secondary braking would still be available. However, it was necessary to understand that the statement "These requirements shall not be construed as a departure from the requirements concerning secondary braking" meant that the secondary performance may be provided from a separate secondary braking system. This revision is intended to provide additional clarity.

Paragraph 5.2.1.35.17.2
Typographical error – "whilst **he** vehicle" should read "whilst **the** vehicle".

Annex 13 - Appendix 2,
Paragraph 1.1.3.
The amendment to paragraph 2.4.4. of the Regulation has removed the reference to "Wheel brake demand value" from the definition in favour of "Brake demand value". This subsequent amendment aligns with the revised definition.