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## Economic Commission for Europe

### Inland Transport Committee

### World Forum for Harmonization of Vehicle Regulations

#### 193rd session

Geneva, 25–28 June 2024

Item 4.9.8 of the provisional agenda

#### 1958 Agreement:

Consideration of draft amendments to existing

UN Regulations submitted by GRBP

## **Proposal for Supplement 10 to the 03 series of amendments to UN Regulation No. 51 (Noise of M and N categories of vehicles)**

### **Submitted by the Working Party on Noise and Tyres\***

The text reproduced below was adopted by the Working Party on Noise and Tyres (GRBP) at its seventy-ninth session (ECE/TRANS/WP.29/GRBP/77, para. 7). It is based on informal document GRBP-79-33-Rev.1. It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Administrative Committee (AC.1) for consideration at their June 2024 sessions.

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\* In accordance with the programme of work of the Inland Transport Committee for 2024 as outlined in proposed programme budget for 2024 (A/78/6 (Sect. 20), table 20.5), 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.

Paragraph 2.8., amend to read:

- “2.8. “Maximum net power, P<sub>n</sub>” means the declared engine power available for propulsion expressed in kW and measured dependent on the drive train concepts pursuant to UN Regulation No. 85 or UN GTR No. 21.
- Applicable power sources are those, which provide drive power for forward motion to the vehicle.”

Paragraph 11.6., amend to read:

- “11.6. “Until 30 June 2028, vehicles with a serial hybrid drive train which have a combustion engine with no mechanical coupling to the power train are excluded from the requirements of paragraph 6.2.3. above.”

Add a new paragraph 11.16., to read:

- “11.16. Supplement 9 does not apply to existing type approvals and their extensions, granted prior to the date of entry into force of Supplement 9.”

Annex 1, Appendix 2,

Item 3.3. and its subitems, amend to read:

- “3.3. Electric motor (describe each type of electric motor separately)
- 3.3.1. Make: .....
- 3.3.2. Type: .....
- 3.3.3. Rated maximum net power: .... kW
- 3.3.4. Operating voltage: .... V”

Annex 3,

Paragraph 2.2.3.4.2., amend to read:

- “2.2.3.4.2. Tyre conditioning
- Tyres with special fitment requirements, such as asymmetric or directional design, shall also be mounted in accordance with these requirements.
- Before testing, tyres shall be conditioned (broken-in). Tyre break-in shall be representative to about 100 km of normal on-road operation. Tyres with special fitment requirements shall be broken-in in accordance with these requirements. The tyres fitted to the test vehicle shall rotate in the same direction as when they were broken-in.
- Test tyres shall be warmed-up immediately prior to testing for at least 10min in the range of the test speed, with moderate lateral & longitudinal acceleration. The lateral acceleration shall be selected in a way to avoid excessive tire tread wear effects. If test tyres have operational temperature limits that do not cover the full temperature range of this regulation, the tyres shall be conditioned to their operational temperature regarding the provisions described in paragraph 2.2.3.1.”

Paragraph 3.1.3.4.1.2., amend to read:

- “3.1.3.4.1.2. ...
- The final result is calculated by combining L<sub>acc rep</sub> and L<sub>crs rep</sub>. The equation is:
- $$L_{urban} = L_{wot rep} - k_p * (L_{wot rep} - L_{crs rep})$$
- The partial power factor k<sub>p</sub> is given for urban driving. In cases other than a single gear test, k<sub>p</sub> is calculated by:
- $$k_p = 1 - (a_{urban} / a_{wot ref})$$
- If only one gear was specified for the test, k<sub>p</sub> is given by:
- $$k_p = 1 - (a_{urban} / a_{wot test})$$

In cases where  $a_{\text{wot test}}$  is less than  $a_{\text{urban}}$ :

$$k_p = 0 \dots$$

*Annex 3, Appendix 2,*

*Paragraph 3.2.4., amend to read:*

“3.2.4. For each gear, run and vehicle side under constant speed extract the power train component  $L_{\text{PT,crs},j}$  from the test result  $L_{\text{crs},j}$ , by calculation.

$$L_{\text{PT,crs},j} = 10 \times \lg(10^{0.1 \times L_{\text{crs},j}} - 10^{0.1 \times L_{\text{TR,crs},j,\theta_{\text{crs}}}})$$

In case that  $L_{\text{TR,crs},j,\theta_{\text{crs}}}$  is greater than  $L_{\text{crs},j}$  the power train component  $L_{\text{PT,crs},j}$  is determined by

$$L_{\text{PT,crs},j} = 10 \times \lg(0.01 \times 10^{0.1 \times L_{\text{crs},j}})$$

with  $L_{\text{TR,crs},j,\theta_{\text{crs}}}$  redefined as

$$L_{\text{TR,crs},j,\theta_{\text{crs}}} = 10 \times \lg(0.99 \times 10^{0.1 \times L_{\text{crs},j}})$$

The redefined  $L_{\text{TR,crs},j,\theta_{\text{crs}}}$  shall then be subjected to temperature correction in 3.2.3 to obtain the corresponding  $L_{\text{TR,crs},j,\theta_{\text{ref}}}$ .”

*Paragraph 3.3.4., amend to read:*

“3.3.4. For each gear, run and vehicle side extract the power train component  $L_{\text{PT,wot},j}$  from the reported acceleration test  $L_{\text{wot},j}$ , by calculation.

$$L_{\text{PT,wot},j} = 10 \times \lg(10^{0.1 \times L_{\text{wot},j}} - 10^{0.1 \times L_{\text{TR,wot},j,\theta_{\text{wot}}}})$$

In case that  ~~$L_{\text{TR,wot},j,\theta_{\text{wot}}}$  is greater than  $L_{\text{wot},j}$~~

$$10^{0.1 \times L_{\text{TR,wot},j,\theta_{\text{wot}}}} \geq 0.99 \times 10^{0.1 \times L_{\text{wot},j}}$$

the power train component  $L_{\text{PT,wot},j}$  is determined by

$$L_{\text{PT,wot},j} = 10 \times \lg(0.01 \times 10^{0.1 \times L_{\text{wot},j}})$$

with  $L_{\text{TR,wot},j,\theta_{\text{wot}}}$  redefined as

$$L_{\text{TR,wot},j,\theta_{\text{wot}}} = 10 \times \lg(0.99 \times 10^{0.1 \times L_{\text{wot},j}})$$

The redefined  $L_{\text{TR,wot},j,\theta_{\text{wot}}}$  shall then be subjected to temperature correction in 3.2.3 to obtain the corresponding  $L_{\text{TR,wot},j,\theta_{\text{ref}}}$ .”

*Annex 7,*

*Paragraph 5.2., amend to read:*

“5.2. The determination of gear  $\alpha$  is as follows:

- $\alpha = 3$  for manual transmission and for automatic transmission tested in locked position with up to 5 gears;
- $\alpha = 4$  for manual transmission and for automatic transmission tested in locked position with 6 or more gears. If the acceleration calculated from AA to BB + vehicle length in gear 4 exceeds  $1.9 \text{ m/s}^2$ , the first higher gear  $\alpha > 4$  with an acceleration lower than or equal to  $1.9 \text{ m/s}^2$  shall be chosen. If there is no gear with an acceleration less than or equal to  $1.9 \text{ m/s}^2$  available, the highest available gear shall be chosen.

For vehicles tested under locked condition, the gear ratio for further calculation shall be determined from the acceleration test result in Annex 3.

For vehicles tested under non-locked condition, the gear ratio for further calculation shall be determined from the acceleration test result in Annex 3 using the reported engine speed and vehicle speed at line BB'.”