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Item 7 (c) of the provisional agenda

Tyres: UN Regulation No. 108 (Retreaded tyres for passenger cars and their trailers)**Proposal for amendments to UN Regulation No. 108****Submitted by the experts from the Bureau International Permanent des Associations de Vendeurs et Rechapeurs de Pneumatiques (BIPAVÉR), France and the Netherlands***

The text reproduced below has been prepared by the experts from BIPAVÉR, France and the Netherlands in order to align the provisions for retreaded tyres with the proposals of France for UN Regulation No. 30, of the European Tyre and Rim Technical Organization (ETRTO) for UN Regulation No. 117 and to cover all the tread materials. The document takes into account ECE/TRANS/WP.29/GRBP/2021/2 and informal document GRBP-73-21. The modifications to the existing text of the Regulation are marked in bold for new or strikethrough for deleted characters. For better readability paragraphs with physical/mathematical terms or formulas are deleted and replaced completely.

* In accordance with the programme of work of the Inland Transport Committee for 2021 as outlined in proposed programme budget for 2021 (A/75/6 (Sect.20), para 20.51), 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

Paragraph 2.2.3., amend to read:

"2.2.3. "Radial" or "**radial-ply**" describes a ~~pneumatic~~-tyre structure in which the ply cords extend to the beads and are laid substantially at 90° to the centreline of the tread, the carcass being stabilized by an essentially inextensible circumferential belt. ~~in a zone outside the bead and the inextensible circumferential belt that stabilizes the carcass;~~"

Paragraph 2.3.1., amend to read:

"2.3.1. "Normal tyre" **means** is a tyre intended for normal **on-road** use ~~only~~."

Insert a new paragraph 2.3.3., to read:

"2.3.3. "**Special use tyre**" **means a tyre intended for mixed use both on- and off-road or for other special duty. These tyres are primarily designed to initiate and maintain the vehicle in motion in off-road conditions.**"

Insert a new paragraph 2.3.3.1., to read:

"2.3.3.1. "**Professional off-road tyre**" **is a special use tyre primarily used for service in severe off-road conditions.**"

Paragraphs 2.3.3. and 2.3.4. (former), renumber as paragraphs 2.3.4. and 2.3.5.

Insert a new paragraph 2.3.6., to read:

"2.3.6. "**Reinforced**" or "**Extra Load**" **means a pneumatic-tyre structure designed to carry more load at a higher inflation pressure than the load carried by the corresponding standard version tyre at the standard inflation pressure as specified in ISO 4000-1:2010;**"

Paragraph 2.49., amend to read:

"2.49. "~~Standard Reference Test Tyre (SRTT)~~" or "**SRTT**" means a tyre that is produced, controlled and stored in accordance with the ~~American Society for Testing and Materials (ASTM)~~ standards **of ASTM International:**

- (a) E1136 – 17 for the size P195/75R14 and referred to as "SRTT14",
- (b) ~~F2872 – 16 for the size 225/75R16C and referred to as "SRTT16C";~~
- (b) **F2493-19 for the size P225/60R16 and referred to as "SRTT16";"**

Paragraph 2.51., amend to read:

"2.51. "**Snow grip index ("SG")**" means the ~~ratio between the snow grip performance of the a candidate tyre relative to and the performance of the standard reference test tyre applicable~~ **SRTT.**"

Insert a new paragraph 2.54. to read:

"2.54. "**Void to fill ratio**" **means the ratio between the area of voids in a reference surface and the area of this reference surface calculated from the mould drawing.**"

Insert a new paragraph 3.2.6.2., to read:

"3.2.6.1. **The inscription "ET" and/or "POR" if the tyre is classified in the category of use "Special use. In addition, they may also bear the inscription M+S or M.S or M&S.**

ET means Extra Tread and POR means Professional Off Road."

Paragraph 3.5., amend to read:

"3.5. The markings referred to in paragraph 3.2. and the approval mark prescribed in paragraphs 3.4. and 5.8. shall be clearly legible and **indelible. They shall be raised above or sunk below the tyre surface** ~~shall be moulded on to or into the tyre~~ or shall be permanently marked on to the tyre."

Insert a new paragraph 3.5.1. to read:

"**3.5.1. The markings shall be situated in the lower area of the tyre on at least one of its sidewalls, except for the inscriptions mentioned in paragraph 3.2.1.**"

Insert a new paragraph 3.5.2. to read:

"**3.5.2. In the case that the date of manufacture is not moulded, it shall be applied not later than 24 hours after the tyre is removed from the mould.**"

Paragraph 4.1.4.3., amend to read:

"4.1.4.3. The category of use (normal tyre or snow tyre, **or special use tyre, or for temporary use**);"

Paragraph 4.1.4.3.1.1., first sentence, amend to read:

"4.1.4.3.1.1. For tyres retreaded by using **either pre-cured or mould cure** tread material with a tread pattern covered by paragraph 6.6.3.1. the list shall clearly identify the tyres in order to make the relevant link with the list(s) quoted in paragraph 6.6.3.1. b). ..."

Insert a new paragraph 4.1.4.3.1.3., to read:

"**4.1.4.3.1.3. For tyres retreaded by using mould cure tread material covered by paragraph 6.6.3.3. the list shall clearly identify the tyres in order to make the relevant link with the list(s) quoted in paragraph 6.6.3.3. b).**"

Insert a new paragraph 4.2.2., to read:

"**4.2.2. In the case of applications relating to special use tyres, a copy of the mould drawing of the tread pattern shall be supplied in order to allow verification of the void-to-fill ratio.**"

Paragraph 5.4., amend to read:

"5.4. Before granting approval the authority must be satisfied that retreaded tyres conform to this Regulation and that the tests have been successfully carried out:

- (a) On at least five and not necessarily more than 20 samples of retreaded tyres representative of the range of tyres produced by the retreading production unit when prescribed according to paragraphs 6.7. and 6.8. and;
- (b) On at least one sample of retreaded tyres, of each pattern ~~not~~ covered by paragraphs ~~6.6.3.1. and 6.6.3.2.3.~~, representative of the range of tyres produced by the retreading production unit when prescribed according to paragraph 6.8.2.* In case of paragraphs **6.6.3.1. and 6.6.3.2.**, the Type Approval Authority might request a test of compliance for the retreaded tyre. Testing of sampled sizes may be confined to a worst-case selection*, at the discretion of the Type Approval Authority or designated Technical Service."

Paragraph 6.6.3.1., amend to read:

"6.6.3.1. For tyres retreaded by using pre-cured tread material(s) **or an identical tread pattern design in a mould cure product** with a tread pattern not covered by paragraph 6.6.3.2. having to fulfil the requirements of paragraph 7.2.* the retreader shall ensure that the material manufacturer(s) or the material supplier(s) of the pre-cured tread material provides ~~(a) T~~ to the Type Approval Authority and the Technical Service issuing the approval according to this regulation and optionally to the retreader:

- (i)(a) A copy of the test report(s) as in Annex 9, Appendix 2 of the representative tyre size(s) (see definitions in paragraph 2.) demonstrating compliance of the precured tread(s) to the requirements of paragraph 7.2.;
- ~~(b) — To the retreader:~~
- (i)(b) The list(s) of tyre sizes to which it can be applied for the retreading process and validated by the same designated Technical Service and Type Approval Authority which issued the test report **requested** in paragraph 6.6.3.1.(a) The list(s) shall include at least the tyres defined in paragraph 4.1.4.3.1.1.
- (ii)(c) A copy of the measures taken to ensure the conformity of production. These measures shall include test results demonstrating that the minimum levels of the snow performances required in paragraph 7.2.1. will be maintained and demonstration periodically the compliance with the requirement defined in paragraph 9.2.3 or 9.4.3.
- (d) **In case of mould cure product, the material manufacturer(s) or the material supplier(s) shall provide, in addition: the drawing(s) of the tread pattern(s) and the compound specification to demonstrate that the compound and pattern design of the tread are technically identical to the pre-cured version;"**

Paragraph 6.6.3.2., amend to read:

- 6.6.3.2. For tyres retreaded by using either mould cure or pre-cured tread material(s) with the same major features including tread pattern(s) as a new tyre type approved according to UN Regulation No. 117 having fulfilled the requirements about minimum snow performance in severe snow conditions, the retreader shall ensure that the manufacturer of the new tyre type provides:
- ~~(a) — To the Type Approval Authority and Technical Service issuing the approval according to this regulation and optionally to the retreader:~~
 - (a) **A a** copy of the UN Regulation No. 117 certificate(s) and a copy of the appropriate test report(s) issued by a designated Technical Service** demonstrating compliance of the new tyre to the minimum snow performance in severe snow conditions.
 - ~~(b) — To the retreader:~~
 - (i)(b) The list(s) of tyre sizes to which it can be applied for the retreading process and validated by the same designated Technical Service** and/or Type Approval Authority that issued the UN Regulation No. 117 certificate(s). The list(s) shall include at least the tyres defined in paragraph 4.1.4.3.1.2.
 - (ii)(c) The drawing(s) of the tread pattern(s) covered by the UN Regulation No. 117 certificate(s) **and the compound specification;**
 - (iii)(d) A copy of the last report of the conformity of production as required in UN Regulation No. 117 and demonstration periodically the compliance with the requirement defined in paragraph 9.2.4. or paragraph 9.4.4.

Insert a new paragraph 6.6.3.3., to read:

- 6.6.3.3. For tyres retreaded by using mould cure tread material(s) and design(s) not covered by paragraphs 6.6.3.1. or 6.6.3.2. in case of mould cure and pre-cured, having to fulfil the requirements of paragraph 7.2.*, the retreader shall provide to the Type Approval Authority (TAA) and the Technical Service issuing the approval according to this Regulation:**
- (a) **A copy of the test report(s) as in Annex 10, Appendix 2 and/or 3 of the representative tyre size(s) (see definition in paragraph 2.)**

demonstrating compliance of the mould cure tread(s) to the requirements of paragraph 7.2.;

- (b) The list(s) of tyre sizes to which it can be applied for the retreading process and validated by the same designated Technical Service and TAA which issued the test report(s) requested in paragraph 6.6.3.3. (a). The list(s) shall include at least the tyres defined in paragraph 4.1.4.3.1.3.;
- (c) A copy of the measures taken to ensure the conformity of production. These measures shall include test results demonstrating that the minimum levels of the snow performances required in paragraph 7.2.1. will be maintained and demonstrating periodically the compliance with the requirement defined in paragraph 9.2.2. or 9.4.2.;
- (d) The drawing(s) of the tread pattern(s) and the compound specification. "

Insert a new paragraph 6.9., to read:

"6.9. Tread pattern of a tyre

6.9.1. In order to be classified as a "special use tyre" a tyre shall have a block tread pattern in which the blocks are larger and more widely spaced than for normal tyres and have the following characteristics:

- (a) A tread depth ≥ 11 mm;
- (b) A void-to-fill ratio ≥ 35 per cent.

6.9.2. In order to be classified as a "professional off-road tyre", a tyre shall have all of the following characteristics:

- (a) A tread depth ≥ 11 mm;
- (b) A void-to-fill ratio ≥ 35 per cent;
- (c) A maximum speed rating of $\leq Q$."

Paragraph 7.2., amend to read:

"7.2. In order to be classified as a "snow tyre for use in severe snow conditions", the retreaded tyre to comply with this Regulation shall meet the performance requirements of paragraph 7.2.1. The retreaded tyre size shall meet these requirements based on a test method of Annex 9 by which:

- (a) The mean fully developed deceleration ("mfdd") in a braking test;
- (b) Or alternatively an average traction force in a traction test;
- (c) Or alternatively the average acceleration in an acceleration test of the candidate tyre is compared to that of a Standard Reference Test Tyre (SRTT).

The relative performance shall be indicated by a snow grip index."

Paragraph 7.2.1., amend to read:

"7.2.1. For Class C1 tyres, the minimum snow grip index value, as calculated in the procedure described in Annex 9 and compared with the ~~respective Standard Reference Test Tyre SRTT14~~ shall be as follows: SRTT shall be as follows:

Class of tyre	Snow grip index (brake on snow method) ^(a)		Snow grip index (spin traction method) ^(b)
	Refs = C1 – SRTT 14, SRTT16	Refs = C2 – SRTT 16C	Refs = C1 – SRTT 14, SRTT16
C1	1.07	Ne	1.10

(a) See paragraph 3 of Annex 9 to this Regulation

(b) See paragraph 2 of Annex 9 to this Regulation"

Paragraph 9.2.2., amend to read:

"9.2.2. At least 1 tyre once every two years in order to verify conformity of the performance of the snow tyres for use in severe snow conditions fulfilling paragraph 6.8.2. and ~~not~~ covered by paragraphs ~~6.4.4.1. or 6.4.4.2.~~ **6.6.3.3.**"

Paragraph 9.4., amend to read:

"9.4. The authority which has approved the retreading production unit may at any time verify the conformity control methods applied in each production facility including among others the prescriptions defined in the paragraph 6.6.3.1.(c), ~~and 6.6.3.2.e. (d) and 6.6.3.3.(c)~~ For each production facility, the type Approval Authority shall take samples at random and at least the following number of tyres, representative of the range being produced, shall be checked and tested as prescribed in this Regulation:"

Paragraph 9.4.2., amend to read:

"9.4.2. At least 1 tyre once every two years in order to verify conformity of the performance of the snow tyres for use in severe snow conditions fulfilling paragraph 6.6.2. and ~~not~~ covered by paragraphs ~~6.4.4.1. or 6.4.4.2.~~ **6.6.3.3.**"

Insert a new paragraph 12.4., to read:

"12.4. Until 1 September 2024, Contracting Parties applying this Regulation may continue to grant type approvals according to the 02 series of amendments to this Regulation, based on snow performance test described in Annex 9 to this Regulation using SRTT14 as reference tyre.^(a)

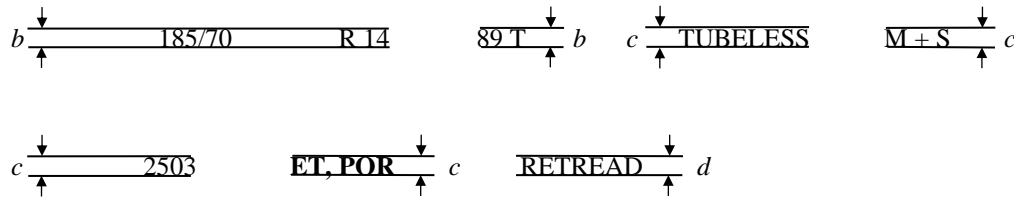
Add a new footnote (a) to read:

" (a) **SRTT14 will be available from the supplier until the end of October 2021.**"

Annex 3,

Paragraph 1., amend to read:

- “1. Example of the markings to be borne by retreaded tyres placed on the market after the entry into force of this Regulation



- b : 6 mm (min.)
 c : 4 mm (min.)
 d : 3 mm (min.)
 and from 1998, 4 mm (min.)

These markings define a retreaded tyre:

having a nominal section width of 185;

having a nominal aspect ratio of 70;

of radial-ply structure (R);

having a nominal rim diameter of code 14;

having a service description "89T" indicating a load capacity of 580 kg corresponding to a load index of "89" and a maximum speed capability of 190 km/h corresponding to a speed symbol "T";

for fitting without an inner tube ("TUBELESS");

of snow type (M+S);

retreaded in the weeks 25, 26, 27 or 28 of the year 2003;

of special-use professional off-road (POR) or extra tread (ET) type. “

Paragraph 3. c., amend to read:

- " (c) The symbols "TUBELESS", "REINFORCED", ~~and~~ "M + S" and "ET" and "POR" may be at a distance from the size-designation."

Annex 9,

Paragraph 1.3. amend to read:

- "1.3. **"Traction test" means a series of a specified number of spin-traction test runs according to ASTM standard:**
- (a) **F1805-06 in case SRTT14 is used as reference tyre or**
 - (b) **F1805-20 in case SRTT16 is used as reference tyre**
- of the same tyre repeated within a short time frame."**

Paragraphs 2., amend to read:

- "2. Spin traction method for Class C1 tyres

The test procedure of ASTM standard F1805-06 shall be used to assess snow performance through **the traction performance index (TPI)** ~~spin-traction values~~ on medium **pack** ~~packed~~ snow (The snow compaction index measured with a CTI penetrometer¹ shall be between 70 and 80)."

- 2.1. The test course surface shall be composed of a medium **pack** snow surface, as characterized in table A2.1 of ASTM standard F1805-06 **or ASTM F1805-20, as applicable.**"

2.2. The tyre load for testing shall be as per option 2 in paragraph 11.9.2. of ASTM standard F1805-06 or ASTM F1805-20, as applicable. When the SRTT16 is used as reference tyre, it shall be tested with a load of 531 kg at an inflation pressure of 240 kPa (cold)."

Insert a new paragraph 2.3. to read:

"2.3. The snow grip index (SG) of a candidate tyre Tn shall be computed as follows:

$$SG(Tn) = f \cdot \frac{TPI}{100}$$

where

- (a) $f = 1.000$ when using SRTT14 as reference tyre per ASTM F1805-06, and
- (b) $f = 0.987$ when using SRTT16 as reference tyre per ASTM F1805-20,

and TPI denotes the traction performance index as defined in ASTM F1805-06 or ASTM F1805-20, as applicable."

Insert a new paragraph 3.1.6. to read:

"3.1.6. In order to run this test, the Standard Reference Test Tyres (SRTT) as shown in the following table shall be used:

Class C1 tyres
SRTT14 or SRTT16

"

Paragraph 3.4.1.3., amend to read:

"3.4.1.3. The snow grip index (SG) of a candidate tyre Tn shall be computed as the quotient of from the arithmetic mean $\overline{a_{Tn}}$ of the mfd of the tyre Tn and the applicable weighted average wa_{SRTT} of the SRTT as shown in the table:

$$SG(Tn) = \frac{\overline{a_{Tn}}}{wa_{SRTT}}$$

$$SG(Tn) = f \cdot \frac{\overline{a_{Tn}}}{wa_{SRTT}}$$

where f is given in the following table

Tyre class	Reference tyre	Factor
C1	SRTT14	$f = 1.000$
	SRTT16	$f = 0.980$

"

Paragraph 3.4.3.1., amend to read:

"3.4.3.1. The snow grip index of the control tyre C relative to the SRTT (SG1) is given by

$$SG1 = SG(C) = f \cdot \frac{\overline{a_C}}{wa_{SRTT}}$$

where f is given in paragraph 3.4.1.3., and snow grip index of the candidate tyre Tn relative to the control tyre (SG2) is given by

$$SG2 = \frac{\overline{a_{Tn}}}{wa_C}$$

where wa_c is the applicable weighted average of the control tyre, shall be established using the procedure in paragraphs 3.1. to 3.4.2. above.

The snow grip index of the candidate tyre relative to the SRTT $SG(Tn)$ shall be the product of the two resulting snow grip indices that is given by

$$SG(Tn) = SG1 \cdot SG2."$$

Annex 9 - Appendix 2, Part 1, Report, amend to read:

"...

5. Tyre class:
6. Category of use:
7. Snow grip index SG relative to SRTT according to paragraph 7.2.1.""

Annex 9,

Appendix 2, Table 5, amend to read:

5. Test results: mean fully developed decelerations ($m \cdot s^{-2}$) / traction coefficient⁽³⁾

Run number	Specification	SRTT (1st test)	Candidate 1	Candidate 2	SRTT (2nd test)
1					
2					
3					
4					
5					
6					
Mean					
Standard deviation					
Coefficient of variation	$CV_a \leq 6 \%$				
Coefficient of Validation	$CVal_a(SRTT) \leq 5 \%$				
SRTT weighted average					
Factor f					
Snow grip index		1.00			

"

II. Justification

1. This amendment to UN Regulation No. 108 is required in order to ensure that the test procedures for retreaded tyres are aligned with the amendment proposals in ECE/TRANS/WP.29/GRBP/2020/21 and ECE/TRANS/WP.29/GRBP/2020/12 for UN Regulation No. 30 and in ECE/TRANS/WP.29/GRBP/2020/17 and ECE/TRANS/WP.29/GRBP/2020/16 for UN Regulation No. 117.

III. Justification submitted by ETRTO on 18 January 2021

Paragraph 2.2.3.

2. It is premature to introduce in this paragraph the definition of “radial tyre structure” which was proposed in ECE/TRANS/WP.29/GRBP/2020/21 for amending UN Regulation No. 30, because the proposed definition has not been adopted yet.

3. Instead the word "radial-ply" has to be added and the word “pneumatic” has to be deleted in order to align the definition of “radial tyre structure” in UN Regulation No. 108 with the definition in UN Regulation No. 30.

Paragraphs 3.4., 3.4.1 and 3.4.2.

4. It is not appropriate to amend paragraph 3.4., because it refers only to the approval marking (i.e. the markings referred to in paragraph 5.8. and as shown in Annex 2 to this Regulation) and therefore does not ensure that the marking requirements for retreaded tyres are aligned with the amendment proposed in ECE/TRANS/WP.29/GRBP/2020/12 for UN Regulation No. 30. Consequently, paragraphs 3.4.1. and 3.4.2. do not have to be added.

5. Additionally, the possibility of permanently marking retreaded tyres which are neither raised above nor sunk below the tyre surface has to be kept, because this is a practice largely adopted for retreaded tyres.

Paragraphs 3.5., 3.5.1 and 3.5.2.

6. Paragraph 3.5. has to be amended and paragraphs 3.5.1. and 3.5.2 have to be added to ensure that the marking requirements for retreaded tyres are aligned with the amendment proposed in ECE/TRANS/WP.29/GRBP/2020/12 for UN Regulation No. 30.

IV. Justification linked to informal document GRBP-73-21

7. Paragraph 6.6.3.1. concerns pre-cured tread material(s) not approved according to UN Regulation No. 117 and provided by a supplier. The aim of the proposal is to clarify the documents to be provided to the Type Approval Authority (TAA) by the retreader. In such case the retreader shall ensure that the tread material(s) supplier provides evidence (test report and conformity of production (CoP)).

8. Paragraph 6.6.3.2. concerns mould-cure or pre-cured tread material(s) approved according to UN Regulation No. 117. It is rephrasing/renumbering of the paragraph for clarification.

9. Paragraph 6.6.3.3. concerns mould-cure or pre-cured tread material(s) not approved according to UN Regulation No. 117 and provided or endorsed by the retreader. This is a new paragraph in order to address such case, then the retreader shall provide evidence (test report + CoP).

10. As a consequence:

- Paragraph 4.1.4.3.1.3. is added (list of tyres of the application for approval).
- Paragraph 5.4. is modified: a test is requested on the tyres covered by paragraph 6.6.3.3. (and paragraphs 6.6.3.1. and 6.6.3.2., at the request of TAA).
- Paragraphs 9.2.2. and 9.4.2. are updated according to the new provisions in paragraph 6.6.3.3.
- Paragraph 9.4. is updated according to the renumbering of paragraph 6.6.3.2. and the introduction of paragraph 6.6.3.3.

11. In addition, modifications are included to allow retreaded C1 tyres to use the “professional off-road” (POR) and “extra tread” (ET), as well as “reinforced” or “extra load” definitions and markings in line with UN Regulation No. 30:

- In paragraphs 2.3.1., 2.3.3., 2.3.6. and 2.54. the required definitions are included.

- Paragraph 3.2.6.1. is added to define the relevant markings.
 - Paragraph 4.1.4.3. is modified to add the “special use” tyre category.
 - Paragraph 4.2.2. is added to allow the verification of the “special use” tread parameters.
 - Paragraph 6.9. is added to define the tread parameters for “special use” and “POR”.
 - Annex 3, paragraphs 1 and 3.c are updated to specify the relevant marking parameters.
-