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**Economic Commission for Europe****Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on Brakes and Running Gear****Eighty-third session**

Geneva, 23-27 January 2017

Item 7(e) of the provisional agenda

**Tyres: Regulation No. 106****Proposal for amendments to Regulation No. 106 (Uniform provisions concerning the approval of pneumatic tyres for agricultural vehicles and their trailers)****Submitted by the experts from the European Tyre and Rim Technical Organisation\***

The text reproduced below was originally proposed by the expert from the European Tyre and Rim Technical Organisation (ETRTO) at the eighty-second session of the Working Party on Brakes and Running Gear (GRRF) in ECE/TRANS/WP29/GRRF/2016/38. The proposal received comments during the session. The text in red reflects the modifications discussed during that session. GRRF agreed to resume consideration of the amended proposal at its eighty-third session on the basis of a document distributed with an official symbol.

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\* In accordance with the programme of work of the Inland Transport Committee for 2016–2017 (ECE/TRANS/254, para. 159 and ECE/TRANS/2016/28/Add.1, cluster 3.1), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

## I. Proposal

*Paragraph 1.*, amend to read:

- "1. Scope  
This Regulation covers new pneumatic tyres \* designed primarily, .....

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**\* For the purpose of this Regulation "tyres" means "pneumatic tyres".**

*Paragraph 2.1.*, amend to read:

- 2.1. "Type of agricultural tyre" means ~~a category~~ of tyres which do not differ in such essential ~~respects~~ **characteristics** as:
- ~~2.1.1.~~ (a) The manufacturer's name;
  - ~~2.1.2.~~ (b) Tyre-size designation;
  - ~~2.1.3.~~ (c) Category of use:
    - ~~(a)~~ (i) Tractor - steering wheel;
    - ~~(b)~~ (ii) Tractor - drive wheel - standard tread;
    - ~~(c)~~ (iii) Tractor - drive wheel - special tread;
    - ~~(d)~~ (iv) Implement - traction;
    - ~~(e)~~ (v) Implement - trailer;
    - ~~(f)~~ (vi) Implement - mixed applications;
    - ~~(g)~~ (vii) Forestry machines – standard tread;
    - ~~(h)~~ (viii) Forestry machines – special tread;
    - ~~(i)~~ (ix) Construction applications (IND).
  - ~~2.1.4.~~ (d) Structure (diagonal or ~~(bias-ply)~~, bias-belted, radial-~~ply~~);
  - ~~2.1.5.~~ (e) Speed category symbol;
  - ~~2.1.6.~~ (f) Load capacity index;
  - ~~2.1.7.~~ (g) Tyre cross-section.

*Insert a new paragraph 2.2.* to read:

- "2.2. "Manufacturer" means the person or body who is responsible to the Type Approval Authority (TAA) for all aspects of the type-approval and for ensuring the conformity of production."**

*Insert a new paragraph 2.3.* to read:

- "2.3. "Brand name/trademark" means the identification of the brand or trademark as defined by the tyre manufacturer and marked on the sidewall(s) of the tyre. The brand name/trademark may be the same as that of the manufacturer."**

*Insert a new paragraph 2.4.* to read:

- "2.4. "Trade description/commercial name" means an identification of a range of tyres as given by the tyre manufacturer. It may coincide with the brand name/trademark."**

Renumber paragraphs 2.2. to 2.15.7.(former) as paragraphs 2.5. to 2.18.7.

Paragraph 2.15.8., amend to read:

"**2.18.8.** The letters "IF" before the nominal section width in case of "Improved Flexion Tyre". ~~The letters "VF" before the nominal section width in case of "Very High Flexion Tyre".~~"

Insert a new paragraph 2.18.9., to read:

"**2.18.9.** The letters "VF" before the nominal section width in case of "Very High Flexion Tyre".

Renumber paragraphs 2.15.9. to 2.42. as paragraphs 2.18.10. to 2.45. and in the new paragraph 2.23.1., replace "pneumatic tyre" by "**tyre**".

Paragraph 2.25. (former 2.22.), amend to read:

"**2.25.** "Implement tyre" means a tyre designed primarily for agricultural machines or ~~implements~~ **interchangeable towed equipments** (vehicles in category S) or for agricultural trailers (vehicles in category R); however it may also equip either front steering wheels and drive wheels of agricultural and forestry tractors (vehicles in category T), but it is not suitable for sustained high torque services; "

Paragraph 2.26. (former 2.23.), amend to read:

"**2.26.** "Traction tyre" means a tyre designed primarily for the equipment of driven axles ~~of implements or~~ agricultural machinery, excluding sustained high torque services. The tread pattern of the tyre generally consists of **blocks**, lugs or cleats. The type of application is identified with the symbol: "

Paragraph 2.27. (former 2.24.), amend to read:

"**2.27.** "Trailer tyre" means a tyre designed for the equipment of non-driven (trailed) axles of ~~implements~~ **interchangeable towed equipments**, agricultural machinery or trailers; "

Paragraph 2.28. (former 2.25.), amend to read:

"**2.28.** "Mixed applications tyre" means a tyre designed to be fitted to either driven and non-driven axles of ~~implements~~ **interchangeable towed equipments**, agricultural machinery or trailers; "

Paragraph 3.1., amend to read:

"**3.1.** Tyres ~~must~~ **submitted for approval shall bear on both sidewalls the following markings:**

3.1.1. The manufacturer's ~~trade name or mark~~ **the brand name/trademark;**"

Insert a new paragraph 3.1.2. to read:

"**3.1.2.** **The trade description/commercial name (see paragraph 2.4. of this Regulation). However, the trade description is not required when it coincides with the brand name/trademark.**"

Paragraph 3.1.2., amend to read:

"~~3.1.2.3.~~ The tyre-size designation ~~as defined in paragraph 2.15.;~~ "

Renumber paragraphs 3.1.3. to 3.1.3.3. as paragraphs 3.1.4. to 3.1.4.3.

Paragraph 3.1.4., amend to read:

"3.1.4.5. The "service description" ~~as defined in paragraph 2.26.~~ "

*Renumber paragraph 3.1.4.1. as paragraph 3.1.5.1.*

Paragraph 3.1.4.2., amend to read:

"3.1.4.5.2. In the case of implement tyre for mixed applications, two service descriptions one for "trailer" applications and the other for "traction" applications, each supplemented with the relevant symbol (see paragraphs ~~2.23.26.~~ and ~~2.24.27.~~ above) as follows:"

*Renumber paragraphs 3.1.5. and 3.1.6. as paragraphs 3.1.6. to 3.1.7.*

Paragraph 3.1.7., amend to read:

"3.1.7.8. The inscriptions "F-1" or "F-2" or "F-3" in the case of a tractor steering wheel tyre that is not already marked as per paragraph ~~2.45.18.6.~~ above; "

*Renumber paragraphs 3.1.8. to 3.1.8.2. as paragraphs 3.1.9. to 3.1.9.2.*

Paragraph 3.1.9., amend to read:

"3.1.9.10. The inscription "IMPLEMENT" in the case of an implement tyre that is not already marked as per paragraph ~~2.45.18.5.~~ above; "

*Delete paragraph 3.1.12.*

*Renumber paragraphs 3.1.10. to 3.1.11. as paragraphs 3.1.11. to 3.1.12.*

Paragraph 3.1.13., amend to read:

"3.1.13.14. The inscription "R-4" in the case of a construction application tyre, identified in Annex 5, Table 9, that is not already marked as per paragraph ~~2.45.18.12.~~ above. "

*Insert a new paragraph 3.1.13. to read:*

"3.1.13. **An indication, in kPa, of the inflation pressure to be adopted for measurements (as specified in Annex 6 point 1) and for the tyre resistance to bursting (as specified in Annex 8 point 2.1) and, if applicable, the load/speed test (as specified in Annex 9 point 2.3). This marking shall be preceded by the symbol "@" (e.g. @ 240 kPa) and be placed near the service description, either after or below. [However, this indication shall not be mandatory on any tyre submitted for type approval, until two years after the date of entry into force of this Supplement [xx] to this Regulation;]** "

*Delete paragraph 3.2.*

*Insert a new paragraph 3.2. to read:*

"3.2. **Tyres submitted for approval shall bear on one sidewall only the following markings:** "

Paragraph 3.3., amend to read:

"3.3.2.1. ~~The tyre must also be marked with the~~ **The** date of manufacture in the form of a group of four digits, the first two showing the week and the last two the year of manufacture. ~~However, this marking shall not be mandatory on any tyre submitted for approval until two a years after the date of entry into force of this Regulation.<sup>2/</sup>~~"

Paragraph 3.4., amend to read:

"3.4.2.2. The ~~tyre must also bear the~~ type approval mark, the model of which is given in Annex 2. "

Paragraphs 3.5. to 3.5.2., shall be deleted

Paragraph 3.5.3., amend to read:

"3.5.3. All markings ~~must~~ **shall** be clearly and legibly moulded and produced as part of the process during manufacture. The use of branding or other methods of marking after completion of the original manufacturing process is not permitted. "

Renumber paragraph 3.6. as paragraph 3.4.

Paragraphs 4.1. to 4.1.2.2., amend to read:

"4.1. The application for approval of a type of tyre for agricultural and forestry services **with regard to this Regulation** shall be submitted by ~~the holder of the trade name or mark~~ **the tyre manufacturer** or by his duly accredited representative. It shall specify:

4.1.1. The tyre-size designation ~~as defined in paragraph 2.15. of this Regulation~~ ;

4.1.2. ~~The trade name or mark~~; **The manufacturer's name;**

**4.1.2.1. The brand name(s)/trademark(s);**

**4.1.2.2. The trade description(s)/commercial name(s)."**

~~Footnote 2, to be deleted (following the modification to (former) paragraph 3.3. being now paragraph 3.2.1.)~~

Paragraph 4.1.12., amend to read:

"4.1.12. The inflation pressure (~~bar or~~ kPa) for measurements **as detailed in paragraph 3.1.13.;** "

Paragraph 4.1.15., amend to read:

"4.1.15. The test pressure, in kPa (~~or in bar~~) **as detailed in paragraph 3.1.13.** "

In paragraph 5.1. replace "pneumatic tyre" by "**tyre**".

Paragraph 5.2., amend to read:

"5.2. An approval number shall be assigned to each type approved; ~~its~~ **its** first two digits (at present 00 ~~for the Regulation in its original form~~) shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party ~~may~~ **shall** not assign the same number to another type of ~~pneumatic~~ **tyre covered by this Regulation.** "

In paragraphs 5.3. and 5.4., replace "pneumatic tyre" by "**tyre**".

Paragraph 6.1.1, amend to read:

"6.1.1. The section width shall be obtained by means of the following formula:

$$S = S1 + K (A - A1),$$

Where:

S is the "section width" **rounded to the nearest millimetre** ~~expressed in millimetres~~ related to the measuring rim;

S1 is "the nominal section width" in mm, as shown on the sidewall of the tyre in the tyre-size designation as prescribed;

A is the width (expressed in mm)<sup>4</sup> of the measuring rim, as shown by the manufacturer in the descriptive note;

A1 is the width (expressed in mm)<sup>6</sup> of the theoretical rim; it is taken to equal S1 multiplied by the factor X as specified by the tyre manufacturer; and K is taken to equal 0.4."

*Paragraph 6.2.1.*, amend to read:

"6.2.1. Except as provided by paragraph 6.2.2., the outer diameter of a tyre is calculated by the following formula:

$$D = d + 2 H$$

where:

D is the outer diameter expressed in mm;

d is the conventional number denoting the nominal rim diameter expressed in mm (see paragraph 2.16.);

H is the nominal section height **rounded to the nearest millimetre** ~~in mm~~ and is equal to:

$$H = 0.01 \times Ra \times S1 \text{ Where:}$$

Ra is the nominal aspect ratio;

S1 is the "nominal section width" in mm.

All as shown on the sidewall of the tyre in the tyre-size designation in conformity with the requirements of paragraph 2.15."

*Paragraph 6.3.2.*, amend to read:

"6.3.2. The overall width of a tyre may not exceed the section width determined pursuant to paragraph 6.1. by more than the following:

Radial construction: +5 per cent

Diagonal (bias) construction: +8 per cent

**Calculated value to be rounded to the nearest mm"**

*Paragraph 6.4.1.*, amend to read:

"6.4.1. The outer diameter of a tyre must not be outside the values D min and D max obtained from the following formulae:

$$D \text{ min} = d + 2 \times H \text{min} \text{ (H} \times \text{a)}$$

$$D \text{ max} = d + 2 \times H \text{max} \text{ (H} \times \text{b)}$$

Where

**Hmin = H x a , rounded to the nearest mm**

**Hmax = H x b , rounded to the nearest mm**

"H" and "d" are as defined in paragraph 6.2.1.

**Coefficients "a" and "b" are specified in paragraph 6.4.2."**

*In paragraphs 8.1., 9.1. and 10., replace "pneumatic tyre" by "tyre".*

Paragraphs 11.1. to 11.3., amend to read:

- "11.1. The Contracting Parties to the **1958** Agreement which apply this Regulation shall communicate to the United Nations Secretariat the names and addresses of the Technical Services responsible for conducting approval tests and, where applicable, of the approved test laboratories and of the Type Approval Authorities which grant approval and to which forms certifying approval, **or extension of approval**, or refusal **of approval** or withdrawal of approval **or production definitively discontinued**, issued in other countries, are to be sent.
- 11.2. The Contracting Parties to the **1958** Agreement which apply this Regulation ~~may use laboratories of tyre manufacturers and may designate, as approved, test laboratories~~ **may designate laboratories of tyre manufacturers as approved, test laboratories** ~~those among them which are situated on their territory or on the territory of another Party to the Agreement, subject to a preliminary agreement to this procedure by the competent Type Approval Authority of the latter.~~
- 11.3. Where a Contracting Party to the **1958** Agreement applies paragraph 11.2. above, it may, if it so desires, be repressed at the tests by one or more persons of its choice."

**[Insert new paragraph 12., to read:**

- "12. Transitional Provisions**
- 12.1. Contracting Parties applying this UN Regulation shall continue to accept type approvals of tyres approved before 1 September 2019 according to this UN Regulation and not meeting the requirements in paragraph 3.1.13.**
- 12.2. As from 1 September 2019, Contracting Parties applying this UN Regulation shall grant new UN type approvals only if the tyre type to be approved meets the requirements of paragraph 3.1.13."]**

*Annex 1*

"Communication

.....

of a type of pneumatic tyre for motor agricultural vehicles pursuant to Regulation No. 106"

*Item 1.* amend to read:

"1. Manufacturer's name ~~or trade mark of the tyre~~ **and address** :....."

*Item 2.* amend to read:

"2. Tyre type designation ~~by the manufacturer~~ <sup>3</sup>....."

**2.1. Brand-name(s)/trademark(s):** .....

**2.2. Trade description(s)/ Commercial name(s):**....."

*Delete item 3.*

*Re-number items 4. to 5.2. as items 3. to 4.2.*

*Items 5.3.,* amend to read:

"**5.4.3.** Structure: diagonal **or** (bias-ply)/bias belted/radial<sup>2</sup>"

Renumber paragraphs 5.4 to 14. as paragraphs 4.4. to 13.

Insert Footnote 3, to read:

"\_\_\_\_\_

<sup>3</sup> A list of brand name(s)/trademark(s) or Trade description(s)/ Commercial name(s) may be annexed to this communication. "

Annex 2, amend to read:

"...

The above approval mark affixed to a pneumatic tyre shows that the type of tyre concerned has been approved in the Netherlands (E 4) pursuant to Regulation No. 106 under approval number 002439.

..."

Annex 3

In all parts A to E amend the explanatory drawings adding the following example:

**c @ 240 kPa**

Annex 3 – Part A

Add note (k), to read:

<sup>(k)</sup> Requiring to be inflated to 240 kPa for measurements and tyre resistance to burst and, if applicable, load/speed test."

Add at the end of the part the following note:

"The inflation pressure to be used for measurement and tests is placed near the service description. It may either follow or be placed below it."

Annex 3 – Part B

Add note (i), to read:

<sup>(i)</sup> Requiring to be inflated to 240 kPa for measurements and tyre resistance to burst."

Add at the end of the part the following note:

"The inflation pressure to be used for measurement and tests is placed near the service description. It may either follow or be placed below it."

Annex 3 – Part C

Add note (k), to read:

<sup>(k)</sup> Requiring to be inflated to 240 kPa for measurements and tyre resistance to burst and, if applicable, load/speed test."

Add at the end of the part the following note:

"The inflation pressure to be used for measurement and tests is placed near the service description. It may either follow or be placed below it."

Annex 3 – Part D

Add note (j), to read:

<sup>(j)</sup> Requiring to be inflated to 240 kPa for measurements and tyre resistance to burst."



*Add at the end of the part the following note:*

**"The inflation pressure to be used for measurement and tests is placed near the service description. It may either follow or be placed below it."**

*Annex 3 – Part E*

*Add note (j), to read:*

**"(i) Requiring to be inflated to 240 kPa for measurements and tyre resistance to burst and, if applicable, load/speed test."**

*Add at the end of the part the following note:*

**"The inflation pressure to be used for measurement and tests is placed near the service description. It may either follow or be placed below it."**

*Annex 11*

*In the pictogram, amend to read:*

"250 ~~kPa~~ kPa MAX"

## II. Justification

The aim of this proposal is to improve the current Regulation No. 106 in order to:

- (a) Align some definitions and some contents of paragraphs with the other tyre regulations (Regulations Nos. 30, 54, 117, etc.);
- (b) Include a definition of "Manufacturer" extracted from the resolution "R.E.3";
- (c) Adopt a common definition and use of the terms "Manufacturer's name", "Brand name", "Trademark", "Trade description" and "Commercial name" and their links;
- (d) Clarify which markings shall be moulded on both sidewalls of the tyre; and those which shall be moulded on one sidewall only;
- (e) Add some information in the certificate to the attention of the Authorities for making easier the relationship between this one and the products;
- (f) Align some definitions to the ones in another EU Regulation (namely Regulation EU 167/2013) which defines vehicles in category S as "interchangeable towed equipment". Moreover tread patterns of 'implement traction tyres' may consist of blocks rather than of lugs or cleats;
- (g) Avoid double requirements on markings: the markings at present specified by paragraphs 3.1.12. and 3.2. are not additional markings as they are already part of the tyre size designation depicted in paragraphs 2.15.8., 2.15.9. and 2.15.10. and therefore they are already required by current paragraph 3.1.2.;

**(g-bis) In order to avoid misinterpretations, as Regulation No. 106 is in force since 1998 whilst new point 3.1.13 will apply only two years after the publication of the new Supplement to the Regulation, the specification of such Supplement is needed under the mentioned point.**

- (h) Add the information of the inflation pressure to be used for measurements and tests. Such information at present is just to be submitted by the tyre manufacturer in writing, in the application for approval document (see paragraphs 4.1.12. and 4.1.15.). Such inflation pressure, to be used for measurements and tyre testing, is correlated to the version of load capacity assigned to the tyre and shall not be confused with safety requirement of the "cold inflation pressure that shall not be exceeded for bead seating during tyre mounting" (see

paragraph 4.1.14) that has to be specifically marked inside the pictogram depicted in Annex 11. Adding to the tyre sidewall the proposed marking, in similitude to the requirements of Regulation No. 54, would inform directly the type approval authorities on the inflation pressure to be used for testing both in case of a new type approval and on the occasion of subsequent verifications for conformity of production. Moreover such information would be useful also for final user to know the reference inflation pressure in those cases where the same tyre size is available in various versions of load carrying capacities.

(h-bis) The deleted provision in the renumbered Paragraph 3.2.1 was something necessary in 1998 but not anymore. In addition ETRTO is confident that no tyre has been type approved to UN Regulation No. 106 before 01/01/2000.

(i) Align the current rules for calculating the dimensional limits within the Regulations for tyres and within the Regulations themselves. The current proposal aims at unifying the calculation rules to those used in ISO and all major tyre standards, e.g. ETRTO, Tyre and Rim Association (T&RA), Japan Automobile Tyre Manufacturers Association (JATMA), and is consistent with the corresponding amendments already proposed for Regulations Nos. 30, 54 and 75.

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