

Consolidated version of UN Regulation No. 108 including the amendments proposed with document ECE/TRANS/WP.29/GRBP/2024/13 amended by GRBP-79-24.

This document is aimed to facilitate the reading of the amended regulation

The references pertinent to the new UN Regulation on the uniform provisions concerning the approval of retreaded tyres with regard to their snow performance and/or classification as traction tyre (see document GRBP/2024/11) are highlighted in green

Regulation No. 108

Uniform provisions concerning the approval for the production of retreaded pneumatic tyres for motor vehicles and their trailers

Contents

	<i>Page</i>
Regulation	
1. Scope	3
2. Definitions	3
3. Markings.....	11
4. Application for approval.....	14
5. Approval.....	16
6. Requirements.....	17
7. Specifications.....	24
8. Modifications and extension of approval.....	26
9. Conformity of production.....	27
10. Penalties for non-conformity of production.....	28
11. Production definitely discontinued.....	28
12. Names and addresses of technical services responsible for conducting approval tests, of test laboratories, and of administrative departments	28
13. Transitional Provisions	29

Annexes

Annex 1 - Communication concerning the approval or extension or refusal or withdrawal of approval or production definitely discontinued of a retreading production unit pursuant to Regulation No. 108	30
Annex 2 - Arrangement of approval marks	31
Annex 3 - Arrangement of retread tyre markings.....	32
Annex 4 - Load-capacity indices.....	34
Annex 5 - Tyre size designation and dimensions	36
Annex 6 - Method of measuring pneumatic tyres	37
Annex 7 - Procedure for load/speed performance tests	38
Annex 8 - Explanatory figure.....	41

1. SCOPE

This Regulation covers the production of retreaded pneumatic tyres */ **/ designed primarily for vehicles of category M1, N1, O1 and O2. 1/ 2/. However, it does not apply to the production of:

- 1.1. Retreaded tyres with a speed category symbol below 120 km/h or above 300 km/h;
- 1.2. Tyres originally produced without speed symbols and load indices;
- 1.3. Tyres originally produced without Regulation No. 30 type approval;
- 1.4. Tyres designed primarily for the equipment of vintage cars;
- 1.5. Tyres designed primarily for competitions;
- 1.6. Tyres designated as "T-type" temporary use spares;
- 1.7. Tyres of "Run flat tyre" structure 3/.

2. DEFINITIONS - See also figure in annex 8

For the purpose of this Regulation:

- 2.1. "*Range of retreaded pneumatic tyres*" means a range of retreaded tyres as quoted in paragraph 4.1.4.
- 2.2. "*Structure*" of a tyre means the technical characteristics of the tyre's carcass. The following structures are distinguished in particular:
 - 2.2.1. "*Diagonal*" or "*bias-ply*" describes a tyre structure in which the ply cords that extend to the beads are laid at alternate angles substantially less than 90° to the centreline of the tread.
 - 2.2.2. "*Bias-belted*" describes a tyre structure in which the ply cords that extend to the beads are laid at alternate angles of substantially less than 90° to the centre line of the tread, the structure being restricted by a belt, comprising two or more layers of substantially inextensible cord material.
 - 2.2.3. "*Radial*" or "*radial-ply*" describes a tyre structure in which the ply cords extend to the beads and are laid substantially at 90° to the centre line of the tread in a zone including most of the side wall and located outside the bead and the essentially inextensible circumferential belt that stabilizes the carcass.
- 2.3. "Category of use":
 - 2.3.1. "*Normal tyre*" means a tyre intended for normal on-road use.
 - 2.3.2. "*Snow tyre*" means a tyre whose tread pattern, tread compound or construction is primarily designed to achieve, in mud and/or snow conditions

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

**/ Retreaded tyres are refurbished tyres after retreading process.

1/ As defined in Annex 7 to the Consolidated Resolution on the Construction of Vehicles (R.E.3).

2/ This Regulation defines requirements for tyres as a component. It does not limit their installation on any categories of vehicles.

3/ Tyres having the letters "RF" placed in front of the rim diameter marking (e.g. 235/45 RF 17).

-
- a performance better than that of a normal tyre with regard to its ability to initiate and control vehicle motion.
- 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.
- 2.3.4. "*Temporary use spare tyre*" is a tyre different from that intended to be fitted to any vehicle for normal driving conditions but intended only for temporary use under restricted driving conditions.
- 2.4. "*Bead*" means the part of a tyre which is of such shape and construction as to fit the rim and hold the tyre on it.
- 2.5. "*Cord*" means the strands forming the fabric of the plies in the pneumatic-tyre.
- 2.6. "*Ply*" means a layer of "rubber" coated parallel cords.
- 2.7. "*Belt*" applies to a radial ply or bias belted tyre and means a layer or layers of material or materials underneath the tread, laid substantially in the direction of the centre line of the tread to restrict the carcass in a circumferential direction.
- 2.8. "*Breaker*" applies to a diagonal ply tyre and means an intermediate ply between the carcass and tread.
- 2.9. "*Chafes*" means material in the bead area to protect the carcass against chafing or abrasion by the wheel rim.
- 2.10. "*Carcass*" means that structural part of a pneumatic-tyre other than the tread and outermost "rubber" of the sidewalls which, when inflated, supports the load.
- 2.11. "*Tread*" means that part of a pneumatic-tyre which is designed to come into contact with the ground, protects the carcass against mechanical damage and contributes to ground adhesion.
- 2.12. "*Sidewall*" means the part of a pneumatic tyre between the tread and the area designed to be covered by the rim flange.
- 2.13. "*Lower area of the sidewall*" means the area included between the line of maximum section width of the tyre and the area designed to be covered by the edge of the rim.
- 2.14. "*Tread pattern groove*" means the space between two adjacent ribs or blocks in the tread pattern.
- 2.15. "*Principal grooves*" means the wide circumferential grooves positioned in the central zone of the tyre tread, which have the tread-wear indicators located in the base.
- 2.16. "*Section width (S)*" means the linear distance between the outside of the sidewalls of an inflated pneumatic-tyre, when fitted to the specified measuring rim, but excluding elevations due to labelling (marking), decoration or protective bands or ribs.
- 2.17. "*Overall width*" means the linear distance between the outside of the sidewalls of an inflated pneumatic-tyre, when fitted to the specified measuring rim, and including labelling (marking), decoration or protective bands or ribs.
- 2.18. "*Section height (H)*" means a distance equal to half the difference between the outer diameter of the tyre and the nominal rim diameter.

- 2.19. "*Nominal aspect ratio (Ra)*" means one hundred times the number obtained by dividing the number expressing the nominal section height by the number expressing the nominal section width, both dimensions being in the same units.
- 2.20. "*Outer diameter (D)*" means the overall diameter of an inflated, newly retreaded tyre.
- 2.21. "*Tyre size designation*" means a designation showing:
- 2.21.1. The nominal section width (S_1). This must be expressed in millimetres, except in cases of tyres for which the size designation is shown in the first column of the tables in annex 5 to this Regulation.
- 2.21.1.1. Optionally the letter "P" in front of the nominal section width.
- 2.21.1.2. Optionally the letters "HL" in front of the nominal section width in the case of Extra Load tyres.
- 2.21.2. The nominal aspect ratio except in cases of tyres for which the size designation is shown in the first column of the tables in annex 5 to this Regulation, or, depending on the tyre design type, the nominal outer diameter expressed in mm.‡
- 2.21.3. An indication of the structure as follows:
- 2.21.3.1. on diagonal (bias-ply) tyres, no marking or the letter "D" placed in front of the rim diameter marking;
- 2.21.3.2. on radial-ply tyres, the letter "R" placed in front of the rim-diameter marking;
- 2.21.3.3. on bias-belted tyres, the letter "B" placed in front of the rim-diameter marking;
- 2.21.3.4. on radial-ply tyres suitable for speeds in excess of 240 km/h but not exceeding 300 km/h (tyres marked with the speed-category symbol "W" or "Y" as part of the service description), the letter "R", placed before the rim diameter marking, may be replaced with the inscription "ZR".
- 2.21.4. A conventional number "d" (the "d" symbol) denoting the nominal rim diameter of the rim and corresponding to its diameter expressed either by codes (numbers below 100) or in millimetres (numbers above 100). Numbers corresponding to both types of measurements may be used in the designation.
- 2.21.4.1. The values of the "d" symbols for code-designated rims expressed in millimetres are shown below:

Nominal Rim Diameter Code - "d"	Value of the "d" symbol expressed in mm
8	203
9	229
10	254
11	279
12	305
13	330
14	356
15	381
16	406
17	432
18	457

19	483
20	508
21	533
22	559
23	584
24	610
25	635
26	660
27	686
28	711
29	737
30	762

- 2.21.5. an indication of the tyre to rim fitment configuration when it differs from the standard configuration.
- 2.22. "*Nominal rim diameter (d)*" means the diameter of the rim on which a tyre is designed to be mounted.
- 2.23. "*Rim*" means the support, either for a tyre-and-tube assembly or for a tubeless tyre, on which the tyre beads are seated.
- 2.23.1. "*Tyre to rim fitment configuration*" means the type of rim to which the tyre is designed to be fitted. In the case of non-standard rims this will be identified by a symbol applied to the tyre, for example, "CT", "TR", "TD" or "A".
- 2.24. "*Measuring rim*" means the rim specified as a 'measuring rim width' or 'design rim width' for a particular tyre size designation in any edition of one or more of the International Tyre Standards.
- 2.25. "*Test rim*" means any rim specified as approved or recommended or permitted in one of the International Tyre Standards for a tyre of that size designation and type.
- 2.26. "*International Tyre Standard*" means any one of the following standard documents:
- (a) The European Tyre and Rim Technical Organisation (ETRTO) 4/: 'Standards Manual'
 - (b) The European Tyre and Rim Technical Organisation (ETRTO) 4/: 'Previous Standard Data';
 - (c) The Tire and Rim Association Inc. (TRA) 5/: 'Year Book'
 - (d) The Japan Automobile Tire Manufacturers Association (JATMA) 6/: 'Year Book'
 - (e) The Tyre and Rim Association of Australia (TRAA) 7/: 'Standards Manual'

The tyre standards can be obtained from the following addresses:

- 4/ ETRTO, Avenue d'Auderghem 22-28 - B 1040 Brussels, Belgium
- 5/ TRA, 175 Montrose West Avenue, Suite 150, Copley, Ohio, 44321 USA
- 6/ JATMA, 9th Floor, Toranomom Building No. 1-12, 1-Chome Toranomom Minato-ku, Tokyo 105, Japan
- 7/ TRAA, Suite 1, Hawthorn House, 795 Glenferrie Road, Hawthorn, Victoria, 3122 Australia

(f) The Associação Latino Americana de Pneus e Aros (ALAPA) ^{8/}: 'Manual de Normas Técnicas'

(g) The Scandinavian Tyre and Rim Organisation (STRO) ^{9/}: 'Data Book'

- 2.27. "*Chunking*" means the breaking away of pieces of rubber from the tread.
- 2.28. "*Cord separation*" means the parting of the cords from their rubber coating.
- 2.29. "*Ply separation*" means the parting of adjacent plies.
- 2.30. "*Tread separation*" means the pulling away of the tread from the carcass.
- 2.31. "*Tread wear indicators*" means the projections within the tread grooves designed to give a visual indication of the degree of wear of the tread.
- 2.32. "*Service description*" means the association of the load index with a speed-category symbol (for example, "94H").
- 2.33. "*Load-capacity index*" means a number associated to the reference mass a tyre can carry when operated in conformity with the requirements governing utilization specified by the original tyre manufacturer or the retreader.

The list of load indices and the corresponding loads are shown in annex 4 to this Regulation.

- 2.34. "*Speed category*" means:
- 2.34.1. The speeds, indicated by a symbol, at which the tyre can carry the load indicated by the associated load index.
- 2.34.2. The symbols of speed categories are as shown in the table below:

Speed category symbol	Corresponding speed (km/h)
L	120
M	130
N	140
P	150
Q	160
R	170
S	180
T	190
U	200
H	210
V	240
W	270
Y	300

- 2.35. "*Maximum load rating*" means the maximum mass which the tyre is rated to support.
- 2.35.1. For speeds not exceeding 210 km/h, the maximum load rating shall not exceed the value corresponding to the load index for the tyre.
- 2.35.2. For speeds greater than 210 km/h but not exceeding 300 km/h, the maximum load rating shall not exceed the percentage of the value associated with the

^{8/} ALAPA, Avenida Paulista 2444-12º Andar, conj. 124, 01310-300 Sao Paulo, S.P. Brazil

^{9/} STRO, Älggatan 48 A, Nb, S-216 15 Malmö, Sweden

load-capacity index of the tyre, given in the table below, with reference to the tyre speed category symbol and to the speed capability of the vehicle to which the tyre is to be fitted:

Tyre speed category symbol	Maximum speed – km/h	Maximum load rating - %
V	210	100.0
	215	98.5
	220	97.0
	225	95.5
	230	94.0
	235	92.5
	240	91.0
W	240	100
	250	95
	260	90
	270	85
Y	270	100
	280	95
	290	90
	300	85

For intermediate maximum speeds a linear interpolation of the maximum load rating is permissible.

- 2.36. "Retreader" means the person or body who is responsible to the Type Approval Authority (TAA) for all aspects of the type-approval under this Regulation and for ensuring the conformity of production.
- 2.36.1 "Retreading production unit" means a site or group of localized sites where finished retread tyres are produced.
- 2.37. "Retreading" means the generic term for refurbishing a used tyre by replacing the worn tread with new material. It may also include renovation of the outermost sidewall surface. It covers the following process methods:
- 2.37.1. "Top capping" - replacement of the tread.
- 2.37.2. "Re-capping" - replacement of the tread and with the new material extending over part of the sidewall.
- 2.37.3. "Bead to bead" - replacement of the tread and renovation of the sidewall including all or part of the lower area of the tyre.
- 2.38. "Casing" is the worn tyre comprising carcass and remaining tread and sidewall material.
- 2.39. "Buffing" is the process of removing old material from the casing to prepare the surface for the new material.
- 2.40. "Repair" is the remedial work carried out to damaged casings within recognized limits.
- 2.41. "Tread material" is material in a condition suitable for replacing the worn tread. It can be in several forms for example:

-
- 2.41.1. "*Camel-back*" - pre-cut lengths of material which have been extruded to give the required cross section profile and subsequently fitted cold to the prepared casing. The new material must be cured.
- 2.41.2. "*Strip-wound*" - a ribbon of tread material which is directly extruded and wound on to the prepared casing and built up to the required cross sectional contour. The new material must be cured.
- 2.41.3. "*Direct extrusion*" - tread material extruded to give the required cross sectional profile and directly extruded on to the prepared casing. The new material must be cured.
- 2.41.4. "*Pre-cured*" - a previously formed and cured tread applied directly to the prepared casing. The new material must be bonded to the casing.
- 2.42. "*Sidewall veneer*" is material used to cover the sidewalls of the casing thereby allowing the required markings to be formed.
- 2.43. "*Cushion gum*" is material used as a bonding layer between new tread and casing and for repairing minor damage.
- 2.44. "*Cement*" is an adhesive solution to hold new materials in place prior to the curing process.
- 2.45. "*Cure*" is the term used to describe the change in physical properties of the new material which is brought about usually by the application of heat and pressure for a set period of time under controlled conditions.
- 2.46. "*Radial run out*" means the variation in radius of the tyre measured around the outer circumference of the tread surface.
- 2.47. "*Imbalance*" means a measurement of the variation in distribution of mass around the centre axis of the tyre. It can be measured as either "Static" or "Dynamic" imbalance.
- 2.48. "*Supplier of the tread used for retreading process*" means the person or body who is responsible to the Type Approval Authority for all aspects of the type-approval under Regulation [XXX].
- 2.49. "*Tread used for retreading process*" means either a pre-cured tread or the specification of the major features of the tread used for mould cure process.
- 2.50. "*Tyre Manufacturer*" means the person or body who was responsible to the TAA having granted the original type approval of new tyres and for ensuring the conformity of production under the applicable Regulation for new tyres.
- 2.51. "*Material manufacturer / material supplier*" means the person or body who provides to the retreader the retreading or repair materials.
- 2.52. "*Brand name/trademark*" means the identification of the brand or trademark as defined by the retreader and marked on the sidewall(s) of the tyre. The brand name/trademark may be the same as that of the retreader.
- 2.53. "*Trade description/commercial name*" means an identification of a range of tyres as given by the retreader. It may coincide with the brand name/trademark.
- 2.54. "*Reinforced*" or "*Extra Load*" means a tyre 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 4000-1:2021.
- 2.55. "*Tyre for use in severe snow conditions*" means a snow tyre or a special use tyre whose major features including tread pattern are specifically designed to

be used in severe snow conditions and that fulfils the requirements of paragraph 6.1. of Regulation No. [XXX].

- 2.56. "*Professional off-road tyre*" is a special use tyre primarily used for service in severe off-road conditions.
- 2.57. "*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.
- 2.58. "*Extended Mobility Tyre (EMT)*" describes a tyre with a radial structure allowing the tyre, mounted on the appropriate wheel and in the absence of any supplementary component, to provide the vehicle with the basic tyre functions at a speed of 80 km/h and a distance of 80 km when operating in flat tyre running mode.
- 2.59. "*Flat tyre running mode*" describes the state of the tyre, essentially maintaining its structural integrity, while operating at an inflation pressure between 0 and 70 kPa.
- 2.60. "*Basic tyre functions*" means the normal capability of an inflated tyre in supporting a given load up to a given speed and transmitting the driving, the steering and the braking forces to the ground on which it runs.
- 2.61. "*Deflected section height*" is the difference between the deflected radius, measured from the centre of the rim to the surface of the drum, and one half the nominal rim diameter as defined in paragraph 2.26. of this Regulation.

3. MARKINGS

- 3.1. An example of the arrangement of retreaded tyre markings is shown in annex 3 to this Regulation.
- 3.2. Retreaded tyres shall display on both sidewalls in the case of symmetrical tyres and at least on the outer sidewall in the case of asymmetrical tyres:
- 3.2.1. The retreader's name or the brand name / trademark.
- 3.2.2. The trade description/commercial name (see paragraph 2. of this Regulation). However, the trade description is not required when it coincides with the brand name/trademark.
- 3.2.3. The tyre-size designation as defined in paragraph 2.21.
- 3.2.4. An indication of the structure as follows:
- 3.2.4.1. On diagonal (bias-ply) tyres; no indication, or the letter "D" placed in front of the rim diameter marking.
- 3.2.4.2. On radial-ply tyres; the letter "R" placed in front of the rim- diameter marking and optionally the word "RADIAL".
- 3.2.4.3. On bias belted tyres; the letter "B" placed in front of the rim diameter marking and in addition the words "BIAS-BELTED".
- 3.2. 5 The service description as defined in paragraph 2.32.
- 3.2. 6 The word "TUBELESS" if the tyre is designed for use without an inner tube.
- 3.2.7. The inscription M+S or MS or M.S. or M & S if the tyre is classified in the category of use "snow tyre" or if the tyre is classified in the category of use "special use tyre" when declared by the tyre manufacturer at paragraph 4.1.5.3.1. as complying also with the definition given in paragraph 2.3.2.

3.2.7.1. The "Alpine" symbol (3-peak-mountain with snowflake) if the snow tyre or the special use tyre is classified as "tyre for use in severe snow conditions". The "Alpine" symbol ("3-peak-mountain with snowflake") shall conform to the symbol described in Annex 7, Appendix 1 to Regulation No. 117.

3.2.7.2. The inscription "ET" and/or "POR" if the tyre is classified in the category of use "Special use tyre". 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.

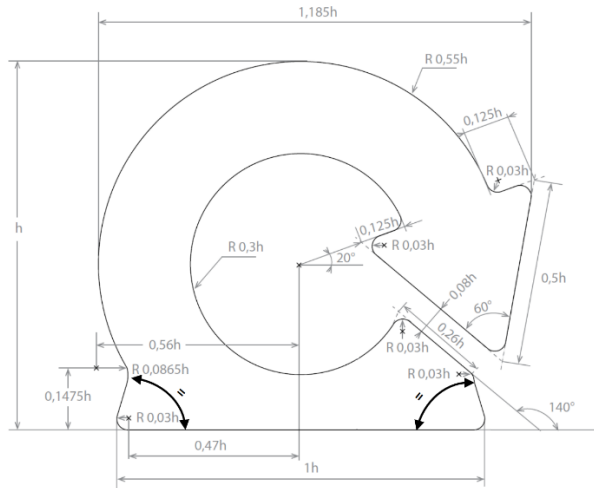
3.2.8. The word "REINFORCED" or the words "EXTRA LOAD" if the tyre is a reinforced tyre.

3.2.9. The date of retreading in the form of a group of four digits, the first two showing the week number and the second two showing the year in which the tyre was retreaded. The date code can cover a period of production from the week indicated by the week number up to and including the week number plus three. For example, the marking "2503" could indicate a tyre which was retreaded in weeks 25, 26, 27 or 28 of the year 2003.

The date code may be marked on one sidewall only.

3.2.10. The term "RETREAD". At the request of the retreader, the same term in other languages may also be added.

3.2.11. The symbol below if the tyre is an EMT, where "h" is at least 12 mm.



3.2.12. The letters "ERS" (meaning "Extended Radial Structure") for tyres with radial structure having a carcass where the ply cords are not laid substantially at 90° to the centre line of the tread across the complete cross section of the tyre.

3.2.13. Tyres manufactured using the "bead to bead" process as defined in paragraph 2.37.3., or any process in which the sidewall material is renewed, shall have the identification referred to in paragraph 2.21.5. placed only immediately after the rim diameter marking referred to in paragraph 2.21.4.

3.3. Prior to approval tyres shall exhibit a free space sufficiently large to accommodate an approval mark as referred to in paragraph 5.8. and as shown in annex 2 to this Regulation.

3.4. Following approval, the markings referred to in paragraph 5.8. and as shown in annex 2 to this Regulation shall be affixed in the free space referred to in paragraph 3.3. This marking may be affixed to one sidewall only.

3.4.1. In the case of retreaded tyre classified as "snow tyre for use in severe snow conditions", the approval mark referred to in paragraph 5.4 to the Regulation No. [XXX] and shown in its Annex 2 shall be affixed in addition.

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. They shall be raised above or sunk below the tyre surface or shall be permanently marked on to the tyre.

3.5.1. [Reserved]

3.5.2. In the case that the date of retreading as defined in paragraph 3.2.8. is not moulded, it shall be applied not later than 5 working days after the completion of the retreading process at the facility concerned.

3.6. As far as any of the original manufacturer's specifications are still legible after the tyres have been retreaded, they shall be regarded as specifications of the retreader for the retreaded tyre. If these original specifications do not apply after retreading they shall be completely removed.

3.7. The original "E" or "e" approval mark and approval number shall be removed.

4. APPLICATION FOR APPROVAL

The following procedures are applicable to the approval of a tyre retreading production unit.

4.1. The application for approval of a retreading production unit shall be submitted by the holder of the trade name or trade mark to be applied to the tyre or by his duly accredited representative. It shall specify:

4.1.1. An outline of the structure of the company producing the retreaded tyres.

4.1.2. A brief description of the quality management system, which ensures the effective control of the tyre retreading procedures to meet the requirements of this Regulation.

4.1.3. The brand name(s)/trademark(s) to be applied to the retreaded tyres produced.

4.1.4. The trade description(s)/commercial name(s) (see paragraph 2.) which could be applied to the retreaded tyres produced.

4.1.5. The following information in relation to the range of tyres to be retreaded:

4.1.5.1. the range of tyre sizes;

4.1.5.2. the structure of tyres (diagonal or bias ply, bias-belted or radial);

4.1.5.3. the category of use of tyres (normal tyre or snow tyres, or special use tyre, or for temporary use);

4.1.5.3.1. For the tyres belonging to the category of use "special use tyre" those which may bear the inscription M+S or M.S or M&S.

4.1.5.3.2. The list of tyres classified as tyres for use in severe snow conditions and/or as traction tyres.

4.1.5.3.2.1. For retreaded tyres produced by using either a pre-cured tread or mould cure process with the same 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). The following table is as example:

Tyre Size Designation, Load	TM1	TM2	TM3
-----------------------------	-----	-----	-----

<i>Tyre Size Designation, Load indexes, Speed symbol</i>			
185/60 R 14 82 H	TPM1/TPR1, TA1	↓	TPM2/TPR2, TA2
195/65 R 15 91 H	TPM1/TPR1, TA1	↓	↓
205/55 R 16 94 V XL	↓	TPM3/TPR3, TA3	TPM4/TPR4, TA4
235/60 R 17 102 H	↓	↓	↓
255/45 R 18 99 V	↓	TPM5/TPR5, TA5	↓

Notes:

TM: Brand name/trademark of the Pre-Cured Tread Manufacturer

TPM: Trade description/commercial name of the Tread Pattern by the Pre-Cured Tread Manufacturer

TPR: Trade description/commercial name of the Tread Pattern by the Retreader if different of TPM

TA: Number of the approval granted according to the Regulation No. [XXX] to the type of retreaded tyre produced by using either a pre-cured tread or mould cure process with a tread having the same major features including tread pattern.

4.1.5.3.2.2. For retreaded tyres produced by using either mould cure process or pre-cured tread material with the same major features including tread pattern(s) as a new type of tyre covered by paragraph 6.6.3.2. the list shall clearly identify the tyres in order to make the relevant link with the list(s) quoted in paragraph 6.6.3.2. b). The following table is an example:

<i>Tyre Size Designation, Load indexes, Speed symbol</i>	TM1	TM2	TM3
185/60 R 14 82 H	TPM1/TPR1, TA1	↓	TPM2/TPR2, TA2
195/65 R 15 91 H	TPM1/TPR1, TA1	↓	↓
205/55 R 16 94 V XL	↓	TPM3/TPR3, TA3	TPM4/TPR4, TA4
235/60 R 17 102 H	↓	↓	↓
255/45 R 18 99 V	↓	TPM5/TPR5, TA5	↓

Notes:

TM: Brand name/trademark of the Tyre Manufacturer

TPM: Trade description/commercial name of the Tread Pattern by the Tyre Manufacturer

TPR: Trade description/commercial name of the Tread Pattern by the Retreader

TA: Number of the approval granted according to UN Regulation No. [XXX] to the type of retreaded tyre produced by using a pre-cured tread or mould cure process with a tread having the same major features including tread pattern of new tyres approved according to UN Regulation No. 117.

4.1.5.3.2.3. For retreaded tyres produced by using mould cure process with a tread pattern 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). The following table is an example:

<i>Tyre Size Designation, Load indexes, Speed symbol</i>	TPR1	TPR2	TPR3
185/60 R 14 82 H	TA1	↓	TA3
195/65 R 15 91 H	TA1	↓	↓
205/55 R 16 94 V XL	↓	TA2	TA3
235/60 R 17 102 H	↓	↓	↓
255/45 R 18 99 V	↓	TA2	↓

Notes:

TPR: Trade description/commercial name of the Tread Pattern by the Retreader

TA: Number of the approval granted according to UN Regulation No. [XXX] to the type of retreaded.

- 4.1.5.4. the system of retreading and the method of application of the new materials to be used, as defined in paragraphs 2.37. and 2.41.;
- 4.1.5.5. the maximum speed symbol of the tyres to be retreaded;
- 4.1.5.6. the maximum load index of the tyres to be retreaded.
- 4.1.5.7. the nominated International Tyre Standard to which the range of tyres conform.
- 4.2. At the request of the Type Approval Authority, the Retreader shall submit samples of tyres for test or copies of test reports from the technical services, communicated as given in paragraph 12. of this Regulation.

5. APPROVAL

- 5.1. To retread tyres requires the approval of the retreading production unit by the responsible authorities in accordance with the requirements of this Regulation. The responsible authority takes the necessary measures as described in this Regulation in order to ensure that the tyres retreaded in the respective production unit will meet with the requirements stated in this Regulation. The retread production unit shall be fully responsible for ensuring that the retreaded tyres will meet the requirements of this Regulation and that they will perform adequately in normal use.
- 5.2. In addition to the normal requirements for the initial assessment of the tyre retreading production unit, the approval authority shall be satisfied that the procedures, operation, instructions and specification documentation provided by material suppliers are in a language readily understood by the tyre retreading production unit operatives.
- 5.3. The approval authority shall ensure that the procedures and operations documentation for each production unit contains specifications, appropriate to the repair materials and processes used, of the limits of repairable damage or penetrations to the tyre carcass, whether such damage is existing or is caused during the processes of preparation for retreading.
- 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 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 paragraph 6.7. and 6.8.
- 5.5. In the case of each failure being recorded during tests, two further samples of the same specification tyre shall be tested. If either or both of these second two samples fail, then a final submission of two samples shall be tested.

If either or both of the final two samples fail, then the application for approval of the retreading production unit shall be rejected.
- 5.6. If all the requirements of this Regulation are met, then approval shall be granted, and an approval number shall be assigned to each retreading production unit approved. The first two digits of this number 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 approval number shall be preceded by "108R" signifying that the approval

applies to a tyre retreaded as prescribed in this Regulation. The same authority shall not assign the same number to another production unit covered by this Regulation.

- 5.7. Notice of approval or of extension, refusal or withdrawal of approval or of production definitely discontinued pursuant to this Regulation shall be communicated to the Parties to the 1958 Agreement applying this Regulation, by means of a form conforming to the model in annex 1 to this Regulation.
- 5.8. There shall be affixed conspicuously to every retreaded tyre conforming to this Regulation, in the space referred to in paragraph 3.3. and in addition to the markings prescribed in paragraph 3.2., an international approval mark consisting of:
 - 5.8.1. A circle surrounding the letter "E" followed by the distinguishing number of the country which granted approval 10; and
 - 5.8.2. An approval number as described in paragraph 5.6.
- 5.9. Annex 2 to this Regulation gives an example of the arrangements of the approval mark.

6. REQUIREMENTS

- 6.1. Tyres shall not be accepted for retreading unless they have been type approved and bear either an "E" or "e" mark.
 - 6.1.1. High speed tyres which have only the inscription "ZR" within the tyre size designation and do not bear a service description shall not be retreaded.
- 6.2. Tyres which have been previously retreaded shall not be accepted for further retreading.
- 6.3. The age of the casing accepted for retreading shall not exceed 7 years, based on the digits showing the year of manufacture of the original tyre; e.g. the tyre marked with a date code "253" can be accepted for retreading till the end of the year 2000.
- 6.4. Conditions before retreading:
 - 6.4.1. Tyres shall be clean and dry before inspection.
 - 6.4.2. Before buffing, each tyre shall be thoroughly examined both internally and externally to ensure its suitability for retreading.

10/

1 for Germany, 2 for France, 3 for Italy, 4 for the Netherlands, 5 for Sweden, 6 for Belgium, 7 for Hungary, 8 for the Czech Republic, 9 for Spain, 10 for Yugoslavia, 11 for the United Kingdom, 12 for Austria, 13 for Luxembourg, 14 for Switzerland, 15 (vacant), 16 for Norway, 17 for Finland, 18 for Denmark, 19 for Romania, 20 for Poland, 21 for Portugal, 22 for the Russian Federation, 23 for Greece, 24 for Ireland, 25 for Croatia, 26 for Slovenia, 27 for Slovakia, 28 for Belarus, 29 for Estonia, 30 (vacant), 31 for Bosnia and Herzegovina, 32-36 (vacant), 37 for Turkey, 38-39 (vacant), 40 for The former Yugoslav Republic of Macedonia, 41 (vacant), 42 for the European Community (Approvals are granted by its Member States using their respective ECE symbol) and 43 for Japan. Subsequent numbers shall be assigned to other countries in the chronological order in which they ratify or accede to the Agreement Concerning the Adoption of Uniform Technical Prescriptions for Wheeled Vehicles, Equipment and Parts which can be Fitted and/or be Used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these Prescriptions, and the numbers thus assigned shall be communicated by the Secretary-General of the United Nations to the Contracting Parties to the Agreement.

-
- 6.4.3. Tyres where damage is visible which has resulted from overload or underinflation shall not be retreaded.
- 6.4.4. Tyres showing any of the following damage shall not be accepted for retreading:
- 6.4.4.1. (a) extensive cracking extending through to the carcass;
- (b) carcass penetrations or damage to casings above "H" speed symbol except where these casings are to be downrated to a lower speed symbol;
- (c) previous repairs to damage outside specified injury limits - see paragraph 5.3.;
- (d) carcass break up;
- (e) appreciable oil or chemical attack;
- (f) multiple damage too close together;
- (g) damaged or broken bead;
- (h) non repairable deterioration of or damage to inner liner;
- (i) bead damage other than minor "rubber" only damage;
- (j) exposed cords due to tread wear or sidewall scuffing;
- (k) non-repairable tread or sidewall material separation from the carcass;
- (l) structural damage in the area of the sidewall.
- 6.4.5. Radial ply tyre carcasses with separation in the belt, other than slight belt edge looseness, shall not be accepted for retreading.
- 6.5. Preparation:
- 6.5.1. After buffing, and before the application of new material, each tyre shall be thoroughly re-examined at least externally to ensure its continued suitability for retreading.
- 6.5.2. The entire surface to which new material is to be applied shall have been prepared without overheating. The buffed surface texture shall not contain deep buffing lacerations or loose material.
- 6.5.3. Where precured material is to be used the contours of the prepared area shall meet the requirements of the material manufacturer.
- 6.5.4. Loose cord ends are not permissible.
- 6.5.5. Casing cords shall not be damaged during the preparation process.
- 6.5.6. Buffing damage to the belt of radial tyres shall be limited to localised damage to the outermost layer only.
- 6.5.7. Buffing damage limits for diagonal ply tyres shall be as follows:
- 6.5.7.1. For two ply construction, there shall not be any damage to the carcass except for slight localised buffing damage to the casing joint.
- 6.5.7.2. For two ply plus breaker construction of tubeless type tyres, there shall not be any damage to the carcass or breaker.
- 6.5.7.3. For two ply plus breaker construction of tube type tyres, localised damage to the breaker is permissible.

-
- 6.5.7.4. For four ply, or more, construction of tubeless type tyres, there shall not be any damage to the carcass or breaker.
- 6.5.7.5. For four ply, or more, construction of tube type tyres, damage shall be limited to the outermost ply in the crown area only.
- 6.5.8. Exposed steel parts shall be treated as soon as possible with appropriate material as defined by the manufacturer of that appropriate material.
- 6.6. Retreading:
- 6.6.1. The retreader must ensure that either the manufacturer or the supplier of repair materials, including patches, is responsible for the following:
- (a) defining method(s) of application and storage, if requested by the retreader, in the national language of the country in which the materials are to be used;
 - (b) defining limits of damage for which the materials are designed, if requested by the retreader, in the national language of the country in which the materials are to be used;
 - (c) ensuring that reinforced patches for tyres, if correctly applied in carcass repairs, are suitable for the purpose;
 - (d) ensuring that the patches are capable of withstanding twice the maximum inflation pressure as given by the tyre manufacturer;
 - (e) ensuring the suitability of any other repair materials for the service intended.
- 6.6.2. The retreader shall be responsible for the correct application of the repair material and for ensuring that the repair is free from any defects which may affect the satisfactory service life of the tyre.
- 6.6.3. The retreader shall ensure that either the manufacturer or the supplier of tread and sidewall material issues specifications concerning the conditions of storage and use of the material in order to guarantee the material's qualities. If requested by the retreader, this information shall be in the national language of the country in which the materials are to be used.
- 6.6.3.1. For retreaded tyres produced by using pre-cured tread and/or by using mould cure process with the same tread pattern not covered by paragraph 6.6.3.2. and type approved pursuant to UN Regulation No. [XXX], the retreader shall ensure that the supplier(s) of the tread(s) used for retreading process provides to the Type Approval Authority and the Technical Service issuing the approval according to this regulation and optionally to the retreader:
- (a) A copy of the UN Regulation No. [XXX] certificate(s), as issued by the relevant Type Approval Authority.
 - (b) The list(s) of tyre sizes annexed to the UN Regulation No.[XXX] certificate(s). The list(s) shall include at least the tyres defined in paragraph 4.1.5.3.2.1.
 - (c) The drawing(s) of the tread pattern(s) covered by the UN Regulation No. [XXX] certificate(s) including the major features with respect to the snow performance;
 - (d) A copy of the last report of the Conformity of Production as required in Regulation No. [XXX].
- 6.6.3.2. For retreaded tyres produced by using either mould cure process or pre-cured tread with the same tread pattern(s) as a new type of tyre 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 to the Type Approval Authority and Technical Service issuing the approval according to this regulation and optionally to the retreader:

(a) A copy of the UN Regulation No. [XXX] certificate(s), as issued by the relevant Type Approval Authority based on the UN Regulation No. 117 certificate(s).

(b) The list(s) of tyre sizes annexed to the UN Regulation No. [XXX] certificate(s). The list(s) shall include at least the tyres defined in paragraph 4.1.5.3.2.2.

(c) The drawing(s) of the tread pattern(s) covered by the UN Regulation No. 117 certificate(s) including the major features with respect to the snow performance;

(d) A copy of the last report of the conformity of production as required in UN Regulation No. 117.

6.6.3.3. For retreaded tyres produced by using mould cure process not covered by paragraphs 6.6.3.1. or 6.6.3.2. and type approved pursuant the UN Regulation No. [XXX] 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 UN Regulation No. [XXX] certificate(s), as issued by the relevant Type Approval Authority;

(b) The list(s) of tyre sizes annexed to the UN Regulation No. [XXX] certificate(s). The list(s) shall include at least the tyres defined in paragraph 4.1.5.3.2.3.;

(c) The drawing(s) of the tread pattern(s) including the major features with respect to the snow performance;

(d) A copy of the last report of the Conformity of Production as required in UN Regulation No. [XXX].

6.6.3.4. For retreaded tyres produced by using pre-cured tread material(s) type approved pursuant the Regulation No. [XXX], the retreader shall ensure the packaging of the pre-cured tread material(s) bear the sticker with the approval marking till it is open and start to be used for the retreading process unless the approval marking is displayed on the tread shoulder.

6.6.4. The retreader must ensure that the repair material and/or compound is documented in a manufacturer's or supplier's certificate. The material compound must be suitable for the intended use of the tyre.

6.6.5. The processed tyre shall be cured as soon as possible after the completion of all repairs and building-up operations and at the latest according to the material manufacturer's specifications.

6.6.6. The tyre shall be cured for the length of time and at the temperature and pressure, appropriate to, and specified for, the materials and processing equipment used.

6.6.7. The dimensions of the mould shall be appropriate to the thickness of the new material and the size of the buffed casing. Radial ply tyres, when moulded, shall be cured in radial or radially divided moulds only.

6.6.8. The thickness of original material after buffing and the average thickness of any new material under the tread pattern after retreading shall be as given in paragraphs 6.6.8.1. and 6.6.8.2. The thickness of material at any point either across the breadth of the tread or around the circumference of the tyre shall be

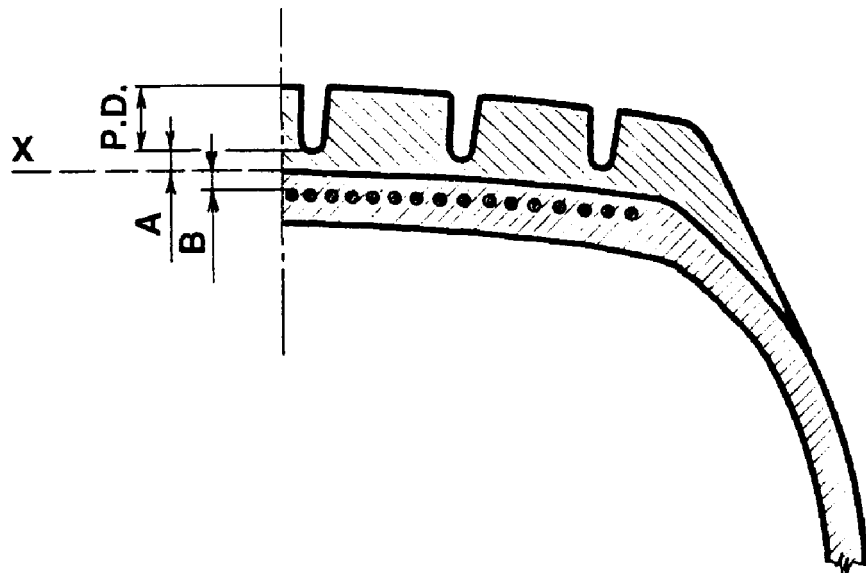
controlled in such a way that the provisions of paragraphs 6.7.5. and 6.7.6. are met.

6.6.8.1. For radial ply and bias belted tyres (mm):

$1.5 \leq (A+B) \leq 5$ (minimum 1.5 mm; maximum 5.0 mm)

$A \geq 1$ (minimum 1.0 mm)

$B \geq 0.5$ (minimum 0.5 mm)



P.D. = Pattern depth

X = Buff line

A = Average thickness of new material under pattern

B = Minimum thickness of original material above belt after buffing

6.6.8.2. For diagonal (Bias-ply) tyres:

The thickness of original material above the breaker shall be ≥ 0.00 mm.

The average thickness of new material above the buffed casing line shall be ≥ 2.00 mm.

The combined thickness of original and new material beneath the base of the grooves of the tread pattern shall be ≥ 2.00 and ≤ 5.00 mm.

6.6.9. The service description of a retreaded tyre shall not show either a higher speed symbol or a higher load index than that of the original, first life, tyre.

6.6.10. The minimum speed capability of a retreaded tyre shall be 120 km/h ("L" speed symbol) and the maximum shall be 300 km/h ("Y" speed symbol).

6.6.11. Tread wear indicators shall be incorporated as follows:

6.6.11.1. The retreaded pneumatic tyre shall include not less than six transverse rows of wear indicators, approximately equi-spaced and situated in the principal grooves of the tread. The tread wear indicators shall be such that they cannot be confused with the material ridges between the ribs or blocks of the tread.

-
- 6.6.11.2. However, in the case of tyres designed for mounting on rims of a nominal diameter of code 12 or less, four rows of tread wear indicators are permissible.
- 6.6.11.3. The tread wear indicators shall provide a means of indicating, with a tolerance of +0.60/-0.00 mm, when the tread grooves are no longer more than 1.6 mm deep.
- 6.6.11.4. The height of the tread wear indicators shall be determined by measuring the difference between the depth from the tread surface to the top of the tread wear indicators and the base of the tread grooves, close to the slope at the base of the tread wear indicators.
- 6.7. Inspection:
- 6.7.1. After curing, whilst a degree of heat is retained in a tyre, each retreaded tyre shall be examined to ensure that it is free from any apparent defects. During or after retreading the tyre must be inflated to at least 1.5 bar for examination. Where there is any apparent defect in the profile of the tyre (e.g. blister, depression, etc.) the tyre shall be specifically examined to determine the cause of this defect.
- 6.7.2. Before, during or after retreading the tyre shall be checked at least once for the integrity of its structure by means of a suitable inspection method.
- 6.7.3. For the purposes of quality control, a number of retreaded tyres shall be subjected to destructive and/or non-destructive testing or examination. The quantity of tyres checked and the results shall be recorded.
- 6.7.4. After retreading, the dimensions of the retreaded tyre, when measured in accordance with annex 6 to this Regulation, must conform either to dimensions calculated according to the procedures in paragraph 7 or to annex 5 to this Regulation.
- 6.7.5. The radial run out of the retreaded tyre shall not exceed 1.5 mm (+0.4 mm measuring tolerance).
- 6.7.6. The maximum static imbalance of the retreaded tyre, measured at the rim diameter, shall not exceed 1.5 per cent of the mass of the tyre.
- 6.7.7. Tread wear indicators shall conform to the requirements of paragraph 6.6.11.
- 6.8. Load/speed endurance test:
- 6.8.1. Tyres retreaded to comply with this Regulation shall be capable of meeting the load/speed endurance test as specified in annex 7 to this Regulation.
- 6.8.1.1. In case EMT retreaded tyres the above load speed test is carried out on one tyre, inflated as per paragraph 1. of Annex 7, at the load and speed conditions marked on the tyre. Another load/speed test must be carried out on a second sample of the same tyre type as specified in paragraph 3. of Annex 7. The second test may be carried out on the same sample if the manufacturer agrees.
- 6.8.2. A retreaded tyre which after undergoing the load/speed endurance test does not exhibit any tread separation, ply separation, cord separation, chunking or broken cords shall be deemed to have passed the test.
- 6.8.3. If an EMT which, after undergoing the test as specified in paragraph 3. of Annex 7, does not exhibit a change in the deflected section height, compared to the deflected section height at the start of the test, higher than 20 per cent and retains the tread connected to the two sidewalls, it is deemed to have passed the test.
- 6.8.4. Except for tyres with radial structure, the outer diameter of the tyre, measured six hours after the load/speed endurance test, must not differ by more than ± 3.5 per cent from the outer diameter as measured before the test.

7. SPECIFICATIONS

7.1. Tyres retreaded to comply with this Regulation shall conform to the following dimensions:

7.1.1. Section width:

7.1.1.1. The section width shall be calculated by the following formula:

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

where:

S : is the actual section width in millimetres as measured on the test rim;

S1: is the value of the 'Design Section Width', referred to the measuring rim, as quoted in the International Tyre Standard specified by the retreader for the tyre size in question;

A : is the width of the test rim in millimetres;

A1: is the width in millimetres of the measuring rim as quoted in the International Tyre Standard specified by the retreader for the tyre size in question.

K: is a factor and shall be taken to equal 0.4.

7.1.2. Outer diameter:

7.1.2.1. The theoretical outer diameter of a retreaded tyre shall be calculated by the following formula:

$$D = d + 2H$$

where:

D: is the theoretical outer diameter in millimetres;

d: is the conventional number defined in paragraph 2.21.3., in millimetres;

H: is nominal section height in millimetres and is equal to Sn multiplied by 0.01 Ra where:

Sn: is the nominal section width in millimetres;

Ra: is the nominal aspect ratio

All of the above symbols are as quoted in the tyre size designation as shown on the sidewall of the tyre in conformity with the requirements of paragraph 3.2.2. and as defined in paragraph 2.21.

7.1.2.2. However, for tyres whose designation is given in the first column of the tables in annex 5 to ECE Regulation No. 30, the outer diameter shall be that given in those tables.

7.1.3. Method of measuring retreaded tyres:

7.1.3.1. The dimensions of retreaded tyres shall be measured in accordance with the procedures given in annex 6 to this Regulation.

7.1.4. Section width specifications:

7.1.4.1. The actual overall width may be less than the section width or widths determined in paragraph 7.1.1.

- 7.1.4.2. The actual overall width may also exceed the value or values determined in paragraph 7.1. by:
- 7.1.4.2.1. 4 per cent in the case of radial ply tyres and
- 7.1.4.2.2. 6 per cent in the case of diagonal (bias-ply) or bias belted tyres.
- 7.1.4.2.3. in addition, if the tyre has a special protective band, the width may be greater by up to 8 mm above the tolerances given by paragraphs 7.1.4.2.1. and 7.1.4.2.2.
- 7.1.5. Outer diameter specifications:
- 7.1.5.1. The actual outer diameter of a retreaded tyre must not be outside the values of D_{min} and D_{max} obtained by the following formulae:
 $D_{min} = d + (2H \times a)$ $D_{max} = d + (2H \times b)$ where:
- 7.1.5.1.1. For sizes not given in the tables in annex 5 to this Regulation, "H" and "d" are as defined in paragraph 7.1.2.1.
- 7.1.5.1.2. For sizes mentioned in paragraph 7.1.2.2. above:
 $H = 0.5 (D - d)$
 where "D" is the outer diameter and "d" the Nominal rim diameter quoted in the above-mentioned tables for the size in question.
- 7.1.5.1.3. The coefficient "a" = 0.97
- 7.1.5.1.4. The coefficient "b" is:

	Radial tyres	Diagonal (bias-ply) and bias belted tyres
for normal use tyres	1.04	1.08

- 7.1.5.2. For snow tyres the maximum outer diameter (D_{max}) calculated in paragraph 7.1.5.1. may be exceeded by not more than 1 per cent.
- 7.2. In order to be categorized 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 ≥ 9 mm and
- (b) a void-to-fill ratio ≥ 30 per cent.
- 7.3. 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 and
- (b) a void-to-fill ratio ≥ 35 per cent and
- (c) a speed category of ≤ 160 km/h.

8. MODIFICATIONS AND EXTENSION OF APPROVAL

- 8.1. Every modification concerning a retreading production unit amending any of the information given by the retreading production unit in the Application for

-
- Approval, see paragraph 4, shall be notified to the approval authority which approved the retreading production unit. That authority may then either:
- 8.1.1. Consider that the modifications made are unlikely to have an appreciable adverse effect and that in any case the retreading production unit still meets the requirements; or
 - 8.1.2. Require a further investigation of the approval.
 - 8.2. Confirmation of, or refusal of, approval, specifying the modifications, shall be communicated by the procedure specified in paragraph 5.7. to the Parties to the Agreement which apply this Regulation.
 - 8.3. The Competent Authority issuing the extension of approval shall assign a series number for such an extension and inform thereof the other Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in Annex 1 to this Regulation.

9. CONFORMITY OF PRODUCTION

The conformity of production procedures shall comply with those set out in the Agreement, Appendix 2 (E/ECE/324-E/ECE/TRANS/505/Rev.3), with the following requirements.

- 9.1. The retreading production unit approved according to this Regulation shall conform to the requirements set out in paragraph 6.
- 9.2. The holder of the approval shall ensure that, at least the following number of tyres, representative of the range being produced, is checked and tested as prescribed in this Regulation:

0.01 per cent of the total annual production but in any case not less than 5 tyres and not necessarily more than 20 tyres during each year of production, and spread throughout that year.
- 9.3. If the requirements of paragraph 9.2. are carried out by or under the control of the approval authority, the results may be used as part of, or instead of, those prescribed in paragraph 9.4.
- 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. 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:

0.01 per cent of the total annual production but in any case not less than than 5 tyres and not necessarily more than 20 tyres during each and every production year.
- 9.5. The tests and checks of paragraph 9.4. may replace those required in paragraph 9.2.

10. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

- 10.1. The approval granted in respect of a retreading production unit pursuant to this Regulation may be withdrawn if the requirements of paragraph 9 are not complied with or if the retreading production unit or the retreaded tyres

produced by that retreading production unit have failed to meet the requirements prescribed in paragraph 9.

- 10.2. If a Party to the Agreement which applies this Regulation withdraws an approval it has previously granted, it shall forthwith so notify the other Contracting Parties to the 1958 Agreement applying this Regulation, by means of a communication form conforming to the model shown in annex 1 to this Regulation.

11. PRODUCTION DEFINITELY DISCONTINUED

The authority which granted the approval of the retreading production unit shall be informed if operations and manufacture of retreaded tyres approved within the scope of this Regulation cease. On receipt of this information the authority shall communicate this information to the other Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model shown in annex 1 to this Regulation.

12. NAMES AND ADDRESSES OF TECHNICAL SERVICES RESPONSIBLE FOR CONDUCTING APPROVAL TESTS, OF TEST LABORATORIES, AND OF ADMINISTRATIVE DEPARTMENTS

- 12.1. The 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 administrative departments which grant approval and to which forms certifying approval or extension of approval or refusal or withdrawal of approval, issued in other countries, are to be sent.
- 12.2. The Parties to the 1958 Agreement which apply this Regulation may designate laboratories of tyre manufacturers or retreading production units as approved test laboratories.
- 12.3. Where a Party to the 1958 Agreement applies paragraph 12.2., it may, if it so desires, be represented at the tests by one or more persons of its choice.

13. Transitional provisions

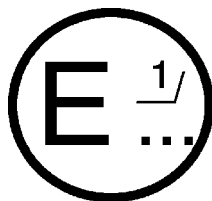
- 13.1. As from the official date of entry into force of the 01 series of amendments, no Contracting Party applying this Regulation shall refuse to grant or refuse to accept type approvals under this Regulation as amended by the 01 series of amendments.
- 13.2. Contracting Parties applying this Regulation shall continue to accept type approvals of, and to grant extensions of approvals to, the retreading production units to the preceding series of amendments to this Regulation which are not affected by the changes introduced by the 01 series of amendments.
- 13.3. As from 1 September 2025, Contracting Parties applying this Regulation shall not be obliged to accept type approvals issued according to the preceding series of amendments, first issued after 1 September 2025.
- 13.4. Until 1 September 2028, Contracting Parties applying this Regulation shall accept type approvals and shall grant extensions to type approvals issued

according to the preceding series of amendments, first issued before [1
September 2025].

Annex 1

COMMUNICATION

(maximum format: A4 (210 x 297 mm))



Issued by: Name of administration:

.....
.....
.....

Concerning: 2/ Approval granted
Approval extended
Approval refused
Approval withdrawn
Production definitively discontinued

of a retreading production unit pursuant to Regulation No. 108

Approval No.: Extension No.:

1. Retreaders's name or trade mark:
2. Name and address of retreading production unit:.....
3. If applicable, name and address of retreader's representative.....
4. Summarized description as in paragraphs 4.1.3. and 4.1.4. of this Regulation:
 - 4.1. Brand name(s)/trademark(s) 3/.....
 - 4.2. Trade description(s)/ Commercial name(s) 3/.....
 - 4.3. Information in relation to the range of tyres as defined in paragraphs 4.1.5. of this Regulation:
5. Technical service and, where applicable, test laboratory approved for purposes of approval or verification of conformity:
6. Date of report issued by that service:
7. Number of report issued by that service:
8. Reason(s) of extension (if applicable):
9. Any remarks:
10. Place:
11. Date:
12. Signature:
13. Annexed to this communication is a list of documents in the approval file deposited at the Approval Authority which has considered this approval and which can be obtained upon request.

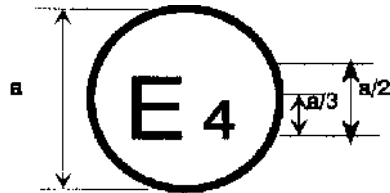
1/ Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in the Regulation).

2/ Delete that which does not apply.

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

Annex 2

ARRANGEMENT OF APPROVAL MARK



108 R - 012439 

$a = 12 \text{ mm min}$

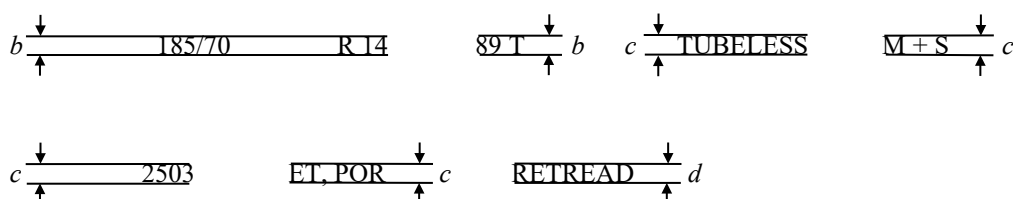
The above approval mark affixed to a retreaded tyre shows that the retreading production unit concerned has been approved in the Netherlands (E4) under approval number 108R012439, meeting the requirements of 01 series of amendments to this Regulation.

The approval number must be placed close to the circle and either above or below the "E" or left or right of that letter. The digits of the approval number must be on the same side of the "E" and face in the same direction. The use of Roman numerals as approval numbers should be avoided so as to prevent any confusion with other symbols.

Annex 3

ARRANGEMENT OF RETREAD TYRE MARKINGS

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");

complying with the definition of snow tyre (M+S);

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

complying with the requirement of special use tyre (ET) and professional off-road tyre (POR).

2. In the particular case of tyres having a tyre to rim fitment configuration "A", the marking shall be in the form of the following example:

185-560 R 400A where:

185 is the nominal section width in mm

560 is the outer diameter expressed in mm

R is an indication of the structure of the tyre (see paragraph 3.2.3. of this Regulation).

400 is the nominal diameter of the rim expressed in mm

A is the tyre to rim fitment configuration.

The marking of the load index, speed category date of manufacture and other markings, shall be as given in the example above.

3. The positioning and order of
- (a) the size designation as defined in paragraph 2.21. of this Regulation shall be grouped as shown in the above example:
185/70 R 14 and 185-560 R 400A
 - (b) the service description comprising the load index and the speed symbol shall be placed immediately after the tyre size designation as defined in the paragraph 2.21. of this Regulation;
 - (c) the symbols "TUBELESS", "REINFORCED" or "EXTRA LOAD", "M + S" and "ET" and "POR" may be at a distance from the size designation.
 - (d) the word "RETREAD" may be at a distance from the size designation.

Annex 4

LOAD-CAPACITY INDICES

Li = Load-capacity index

kg = Corresponding mass of the vehicle which is to be carried.

Li	kg	Li	kg	Li	kg	Li	kg
0	45	31	109	61	257	91	615
1	46.2	32	112	62	265	92	630
2	47.5	33	115	63	272	93	650
3	48.7	34	118	64	280	94	670
4	50	35	121	65	290	95	690
5	51.5	36	125	66	300	96	710
6	53	37	128	67	307	97	730
7	54.5	38	132	68	315	98	750
8	56	39	136	69	325	99	775
9	58	40	140	70	335	100	800
10	60	41	145	71	345	101	825
11	61.5	42	150	72	355	102	850
12	63	43	155	73	365	103	875
13	65	44	160	74	375	104	900
14	67	45	165	75	387	105	925
15	69	46	170	76	400	106	950
16	71	47	175	77	412	107	975
17	73	48	180	78	425	108	1 000
18	75	49	185	79	437	109	1 030
19	77.5	50	190	80	450	110	1 060
20	80	51	195	81	462	111	1 090
21	82.5	52	200	82	475	112	1 120
22	85	53	206	83	487	113	1 150
23	87.5	54	212	84	500	114	1 180
24	90	55	218	85	515	115	1 215
25	92.5	56	224	86	530	116	1 250
26	95	57	230	87	545	117	1 285
27	97.5	58	236	88	560	118	1 320
28	100	59	243	89	580	119	1 360
29	103	60	250	90	600	120	1 400
30	106						

Annex 5

TYRE SIZE DESIGNATION AND DIMENSIONS

(IN ACCORDANCE WITH ECE REGULATION No. 30)

FOR THIS INFORMATION REFER TO ANNEX 5 OF ECE REGULATION No. 30

Annex 6

METHOD OF MEASURING PNEUMATIC TYRES

1. Preparing the tyre

1.1. The tyre shall be mounted on the test rim specified by the retreader and inflated to the pressure of 300 to 350 kPa.

1.2. The tyre pressure shall be adjusted as follows:

1.2.1. for standard bias belted tyres - to 170 kPa;

1.2.2. for diagonal (bias ply) tyres - to:

Ply rating	Pressure (kPa)		
	Speed category symbol		
	L, M, N	P, Q, R, S	T, U, H, V
4	170	200	-
6	210	240	260
8	250	280	300

1.2.3. for standard radial tyres - to 180 kPa;

1.2.4. for reinforced tyres - to 220 kPa.

2. Measuring procedure

2.1. The tyre, mounted on its rim, shall be conditioned at the ambient room temperature for not less than 24 hr, save as otherwise required by paragraph 6.8.3. of this Regulation.

2.2. The tyre pressure shall be readjusted to the level specified in paragraph 1.2. of this annex.

2.3. The overall width shall be measured at six equally spaced points around the tyre, taking account of the thickness of any protective ribs or bands. The highest reading obtained shall be taken as the overall width.

2.4. The outer diameter shall be calculated from a measurement of the maximum circumference of the inflated tyre.

Annex 7

PROCEDURE FOR LOAD/SPEED PERFORMANCE TESTS

(IN PRINCIPLE IN ACCORDANCE WITH ANNEX 7 OF REGULATION No. 30)

1. Preparing the tyre

- 1.1. Mount a retreaded tyre on the test rim specified by the retreader.
- 1.2. Inflate the tyre to the appropriate pressure as given (in kPa) in the table below:

Speed-category symbol	Diagonal (bias-ply) tyres			Radial Tyres		Bias-belted tyres
	Ply-rating			Standard	Reinforced	Standard
	4	6	8			
L, M, N	230	270	300	240	-	-
P, Q, R, S	260	300	330	260	300	260
T, U, H	280	320	350	280	320	280
V	300	340	370	300	340	-
W, Y	-	-	-	320	360	-

- 1.3. The retreading production unit may request, giving reasons, the use of a test inflation pressure different from those given in paragraph 1.2. of this annex. In this case the tyre shall be inflated to the requested pressure.
 - 1.4. Condition the tyre and wheel assembly at test-room temperature for not less than three hours.
 - 1.5. Readjust the tyre pressure to that specified in paragraph 1.2. or 1.3. of this annex.
2. Test procedure
- 2.1. Mount the tyre and wheel assembly on a test axle and press it against the outer face of a smooth surfaced power driven test drum either 1.70 m \pm 1 per cent or 2.00 m \pm 1 per cent diameter.
 - 2.2. Apply to the test axle a load equal to 80 per cent of:
 - 2.2.1. the maximum load rating corresponding to the load-capacity index for tyres with Speed Symbols L to H inclusive,
 - 2.2.2. the maximum load rating associated with a maximum speed (see paragraph 2.35.2 of this Regulation) of:
 - 240 km/h in case of tyres speed category symbol "V",
 - 270 km/h in case of tyres speed category symbol "W",
 - 300 km/h in case of tyres speed category symbol "Y".
 - 2.3. Throughout the test the tyre pressure must not be corrected and the test load must be kept constant.

-
- 2.4. During the test the temperature in the test-room must be maintained at between 20°C and 30°C unless the tyre manufacturer or retreader agrees to a higher temperature.
 - 2.5. The endurance test programme shall be carried out without interruption and shall be as follows:
 - 2.5.1. time taken from zero speed to initial test speed: 10 minutes;
 - 2.5.2. initial test speed: prescribed maximum speed for the tyre concerned, less 40 km/h in the case of a test drum of 1.70 m \pm 1 per cent diameter or less 30 km/h in the case of a test drum of 2.00m \pm 1 per cent diameter;
 - 2.5.3. successive speed increments: 10 km/h up to the maximum test speed;
 - 2.5.4. duration of test at each speed step except the last: 10 minutes;
 - 2.5.5. duration of test at last speed step: 20 minutes;
 - 2.5.6. maximum test speed: prescribed maximum speed for the tyre concerned, less 10 km/h in the case of a test drum of 1.70 m \pm 1 per cent diameter or the prescribed maximum speed in the case of a test drum of 2.00 m \pm 1 per cent diameter.
 - 2.5.7. however, for tyres suitable for maximum speed of 300 km/h (speed symbol "Y"), the duration of the test is 20 minutes at the initial test speed step and 10 minutes at the last speed step.
 3. Procedure to assess the "flat tyre running mode" of "extended mobility tyres"
 - 3.1. Mount a new tyre on a test rim corresponding to the following specifications:
 - (a) Measuring rim width, according to ISO 4000-1
 - (b) Contour with hump (round or flat) on both rim sides, according to ISO 4000 2.
 - 3.2. Inflate it to an inflation pressure of 250 kPa and condition the tyre-and-wheel assembly at a test room temperature at 25 °C \pm 3 °C for not less than three hours.
 - 3.3. Remove the valve insert and wait until the tyre deflates completely.
 - 3.4. Mount the tyre-and-wheel assembly to a test axle and press it against the outer surface of a smooth wheel 1.70 m \pm 1 per cent or 2.0 m \pm 1 per cent in diameter.
 - 3.5. Apply to the test axle the test load equal to 60 per cent of the maximum load rating corresponding to the load capacity index of the tyre.
 - 3.6. Test speed: 80 km/h in case of 2.0 m \pm 1 per cent drum diameter, or 75 km/h in case of 1.7 m \pm 1 per cent drum diameter
 - 3.7. During the test the temperature of the test room must be maintained at 25°C \pm 3°C.

The temperature sensor shall be at a distance not less than 0.15 m and not more than 1.00 m from the tyre sidewall.
 - 3.8. Conduct the test, without interruption in conformity with the following particulars:
 - 3.8.1. Accelerate the tyre-and-wheel assembly from zero speed to the constant test speed within 5 minutes;
 - 3.8.2. Measure the deflected section height (Z1).

-
- 3.8.3. Run the tyre-and-wheel assembly at the constant test speed and the constant test load for 60 minutes;
 - 3.8.4. Measure the deflected section height (Z_2).
 - 3.9. Calculate the change in per cent of the deflected section height compared to the deflected section height at the start of the test as $[(Z_1 - Z_2) / Z_1] \times 100$.
 4. Equivalent test methods
If a method other than that described in paragraph 2 of this annex is used, its equivalence must be demonstrated.

Annex 8

EXPLANATORY FIGURE

See paragraph 2 of this Regulation

