



Vehicle Standard (Australian Design Rule 96/00 – Commercial Vehicle Tyres) 2018

I, ANDREW BROAD, Assistant Minister to the Deputy Prime Minister, determine this vehicle standard under section 7 of the *Motor Vehicle Standards Act 1989*.

Dated 25 October 2018

[SIGNED]

Andrew Broad

Assistant Minister to the Deputy Prime Minister

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1. LEGISLATIVE PROVISIONS

- 1.1. Name of Standard
 - 1.1.1. This Standard is the Vehicle Standard (Australian Design Rule 96/00 – Commercial Vehicle Tyres) 2018.
 - 1.1.2. This Standard may also be cited as Australian Design Rule 96/00 – Commercial Vehicle Tyres.
- 1.2. Commencement
 - 1.2.1. This Standard commences on the day after it is registered.

2. FUNCTION

- 2.1. The function of this vehicle standard is to specify requirements for new pneumatic tyres designed primarily for commercial vehicles.

3. APPLICABILITY

- 3.1. The circumstances under which vehicles must comply with this standard are set out in the Australian Design Rule 95/... – Installation of Tyres.
- 3.2. This standard does not apply to passenger car tyres (otherwise known as Class C1 tyres; and designed primarily for vehicles of UN categories M₁, N₁, O₁ and O₂).
- 3.3. This standard does not apply to re-treaded tyres fitted to trailers.
- 3.4. This standard does not apply to any temporary-use spare unit(s) supplied with a vehicle.

4. DEFINITIONS

- 4.1. For vehicle categories, definitions and meanings used in this standard, refer to:
 - 4.1.1. Vehicle Standard (Australian Design Rule Definitions and Vehicle Categories) 2005; and
 - 4.1.2. Definitions in Appendix A of this standard or the alternative standards at clause 7.

5. REQUIREMENTS

- 5.1. For vehicles fitted with new light truck or new truck/bus (commercial vehicle) tyres, the tyres fitted must comply with the requirements of:
 - (a) Appendix A, except as varied by Section 6 Exemptions and Alternative Procedures; or
 - (b) at least one of the alternative standards at clause 7.

6. EXEMPTIONS AND ALTERNATIVE PROCEDURES

6.1. Subject to clause 6.2 below, compliance with the following parts, sections and annexes of Appendix A is not required for the purposes of this standard:

Section 3	Markings
Section 4	Application for approval
Section 5	Approval
Section 7	Modification and extension of approval of a tyre type
Section 8	Conformity of production
Section 9	Penalties for non-conformity of production
Section 10	Production definitively discontinued
Section 11	Names and addresses of Technical Services responsible for conducting approval tests, and of Type Approval Authorities

Annexes

Annex 1	Communication
Annex 2	Arrangement of approval mark
Annex 9	Communication – Upgrade of service description for the purposes of re-treading in accordance with UN Regulation No. 109

6.2. In the case of a tyre type for which the manufacturer has elected, as permitted by clause 6.1 above, not to meet the full requirements of Appendix A – Section 3 – Markings, each tyre must at least bear:

- (a) the markings referred to in paragraphs 3.1.1 to 3.1.8 of Appendix A, on both side walls in the case of symmetrical tyres or at least on the outer side wall in the case of asymmetrical tyres;
- (b) 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, on at least one side wall;
- (c) the inflation pressure used, in either psi or kPa, for the dimension measurement and the load/speed endurance test, on at least one side wall; and
- (d) where applicable, the markings referred to in paragraphs 3.1.13 to 3.1.16 of Appendix A, on both side walls in the case of symmetrical tyres or at least on the outer side wall in the case of asymmetrical tyres.

6.2.1. Each required marking must be moulded onto or into the tyre. They must be clearly legible and must, except for the marking referred to in paragraph 3.1.1 of Appendix A, be situated in the lower half of at least one of its side walls.

7. ALTERNATIVE STANDARDS

- 7.1. The technical requirements of the United Nations Regulation No. 54 – UNIFORM PROVISIONS CONCERNING THE APPROVAL OF PNEUMATIC TYRES FOR COMMERCIAL VEHICLES AND THEIR TRAILERS, incorporating the 00 series of amendments.
- 7.2. The technical requirements of the United States Federal Motor Vehicle Safety Standard (FMVSS) No. 119 (49 CFR 571.119) – 10-1-17 Edition, for new pneumatic tires for motor vehicles with a GVWR of more than 4,536 kilograms.
- 7.3. The technical requirements of the Japanese Industrial Standard (JIS) D4230:1998 (Automobile tyres), for light truck and truck/bus tyres.
- 7.4. The technical requirements of the Australian/New Zealand Standard (AS/NZS) 2230:1999 (New pneumatic tyres for light trucks and trucks/buses).

APPENDIX A

Agreement

Concerning the Adoption of Harmonized Technical United Nations Regulations 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 United Nations Regulations*

(Revision 3, including the amendments, which entered into force on 14 September 2017)

Addendum 53: UN Regulation No. 54

Incorporating by the Department of Infrastructure, Regional Development and Cities, all valid text up to:

Corrigendum 1 to Supplement 15 to the original version of the Regulation – Date of entry into force: 23 June 2004

Supplement 16 to the original version of the Regulation – Date of entry into force: 13 November 2004

Corrigendum 1 to Revision 2 of the Regulation – Date of entry into force: 9 March 2005

Supplement 17 to the original version of the Regulation – Date of entry into force: 17 March 2010

Erratum to Revision 2 of the Regulation (English only)

Supplement 18 to the original version of the Regulation – Date of entry into force: 27 January 2013

Corrigendum 1 to Revision 3 of the Regulation (Erratum by the secretariat)

Corrigendum 2 to Revision 3 of the Regulation – Date of entry into force: 25 June 2014

Supplement 19 to the original version of the Regulation – Date of entry into force: 22 January 2015

Supplement 20 to the original version of the Regulation – Date of entry into force: 20 January 2016

Supplement 21 to the original version of the Regulation – Date of entry into force: 9 February 2017

Uniform provisions concerning the approval of pneumatic tyres for commercial vehicles and their trailers

* Former titles of the Agreement:

Agreement Concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts, done at Geneva on 20 March 1958 (original version);

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, done at Geneva on 5 October 1995 (Revision 2).

UN Regulation No. 54

Uniform provisions concerning the approval of pneumatic tyres for commercial vehicles and their trailers

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1. Scope

This Regulation covers new pneumatic tyres * designed primarily for vehicles of categories M₂, M₃, N, O₃ and O₄.^{1 2} However, it does not apply to tyre types identified by speed category symbols corresponding to speeds below eighty (80) km/h.

2. Definitions

For the purposes of this Regulation:

- 2.1. *"Type of tyre"* means tyres which do not differ in such essential characteristics as:
- (a) The manufacturer's name;
 - (b) Tyre-size designation;
 - (c) Category of use (normal tyre, snow tyre, special use tyre);
 - (d) Structure (diagonal (bias-ply); radial);
 - (e) Speed category symbol;
 - (f) Load-capacity indexes;
 - (g) Tyre Cross-section;
- 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.
- 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.
- 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.
- 2.5. Category of use:
- 2.5.1. *"Normal tyre"* means a tyre intended for normal, on-road use;
 - 2.5.2. *"Snow tyre"* means a tyre whose tread pattern, tread compound or structure is primarily designed to achieve in snow conditions a performance better than that of a normal tyre with regard to its ability to initiate or maintain vehicle motion;
 - 2.5.3. *"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;

¹ As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.2, para. 2. - www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html

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

* For the purpose of this Regulation, "tyres" means "pneumatic tyres"

- 2.5.3.1. "Professional off-road tyre" is a special use tyre primarily used for service in severe off-road conditions;
- 2.6. "Structure" of a tyre means the technical characteristics of the tyre's carcass. A distinction is made between the following structures in particular:
- 2.6.1. "Diagonal" or "bias-ply" describes a tyre structure in which the ply cords extend to the beads and are laid at alternate angles substantially less than 90° to the centreline of the tread;
- 2.6.2. "Radial" describes a tyre structure in which the ply cords extend to the beads and are laid substantially at 90° to the centreline of the tread, the carcass being stabilized by an essentially inextensible circumferential belt;
- 2.7. "Bead" means the part of a tyre which is of such shape and structure as to fit the rim and to hold the tyre on it³;
- 2.8. "Cord" means the strands forming the fabric of the plies in the tyre³;
- 2.9. "Ply" means a layer of rubber-coated parallel cords³;
- 2.10. "Carcass" means that part of a tyre other than the tread and the rubber sidewalls which, when inflated, bears the load³;
- 2.11. "Tread" means that part of a pneumatic tyre which comes into contact with the ground, protects the carcass against mechanical damage and contributes to ground adhesion³;
- 2.12. "Sidewall" means the part of a tyre between the tread and the area designed to be covered by the rim flange³;
- 2.13. "Lower sidewall" means the area included between the line of maximum section width of the tyre and the area designed to be covered by the rim flange³;
- 2.13.1. However, in case of tyres identified by the "tyre to rim fitment configuration" (see paragraph 3.1.12.) symbol "A", it means the area of the tyre which is seating on the rim;
- 2.14. "Tread groove" means the space between two adjacent ribs and/or blocks in the tread pattern³;
- 2.15. "Section width (S)" means the linear distance between the outsides of the sidewalls of an inflated tyre, excluding elevations due to labelling (marking), decoration or protective bands or ribs³;
- 2.16. "Over-all width" means the linear distance between the outsides of the sidewalls of an inflated tyre, including labelling (marking), decoration and protective bands or ribs³;
- 2.17. "Section height (H)" means a distance equal to half the difference between the outer diameter of the tyre and the nominal rim diameter;
- 2.18. "Nominal aspect ratio (Ra)" means one hundred times the number obtained by dividing the number expressing the section height (H) by the number expressing the nominal section width (S₁), both dimensions expressed in the same units;
- 2.19. "Outer diameter (D)" means the overall diameter of an inflated new tyre³;
- 2.20. "Tyre-size designation" means:

³ See explanatory figure.

- 2.20.1. A designation showing:
 - 2.20.1.1. The nominal section width (S_1). This width must be expressed in mm, except in the case of types of tyre for which the size designation is shown in the first column of the tables in Annex 5 to this Regulation;
 - 2.20.1.2. The nominal aspect ratio, except in the case of certain types of tyre 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;
 - 2.20.1.3. A conventional number "d" (the "d" symbol) denoting the nominal diameter of the rim and corresponding to its diameter expressed either in codes (number below 100) or in millimetres (numbers above 100). Numbers corresponding to both types of measurement may be used together in the designation;
 - 2.20.1.3.1. The values of the "d" symbols expressed in millimetres are shown below:

<i>Nominal rim diameter code ("d" symbol)</i>	<i>Value of the "d" symbol expressed in mm</i>
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
24	610
25	635
14.5	368
16.5	419
17.5	445
19.5	495
20.5	521
22.5	572
24.5	622
26	660
28	711
30	762

- 2.20.1.4. An indication of the tyre to rim fitment configuration when it differs from the standard configuration and is not already expressed by the symbol "d" denoting the nominal rim diameter code;

- 2.21. "Nominal rim diameter (*d*)" means the diameter of the rim on which a tyre is designed to be mounted³;
- 2.22. "Rim" means the support for a tyre-and-tube assembly, or for a tubeless tyre, on which support the tyre beads are seated³;
- 2.23. "Theoretical rim" means a rim whose width would be equal to *x* times the nominal section width of a tyre; the value of *x* shall be specified by the manufacturer of the type;
- 2.24. "Measuring rim" means the rim on which a tyre must be fitted for dimensional measurements;
- 2.25. "Test rim" means the rim on which a tyre must be fitted for load/speed endurance testing;
- 2.26. "Chunking" means the breaking away of pieces of rubber from the tread;
- 2.27. "Cord separation" means the parting of the cords from their coating;
- 2.28. "Ply separation" means the parting of adjacent plies;
- 2.29. "Tread separation" means the pulling away of the tread from the carcass;
- 2.30. "Load-capacity index" means one or two numbers, which indicate the load the tyre can carry in single or in single and dual operation at the speed corresponding to the associated speed category and when operated in conformity with the requirements governing utilization specified by the manufacturer. A type of tyre can have either one or two sets of load capacity indices depending on whether or not the provisions of paragraph 6.2.5. are applied. The list of these indices and their corresponding loads is given in Annex 4;
- 2.31. "Speed category" means:
 - 2.31.1. The speeds, indicated by a symbol, at which the tyre can carry the load indicated by the associated load-capacity index;
 - 2.31.2. The speed categories are as shown in the table below⁴:

<i>Speed-category symbol</i>	<i>Corresponding speed (km/h)</i>
F	80
G	90
J	100
K	110
L	120
M	130
N	140
P	150
Q	160
R	170
S	180
T	190

³ See explanatory figure


⁴ For consistency, the symbols and speeds shown in this table are the same as those for passenger cars (as in Regulation No. 30). They should not be taken to indicate the speeds at which commercial vehicles fitted with such tyres may be operated on the roads.

<i>Speed-category symbol</i>	<i>Corresponding speed (km/h)</i>
U	200
H	210

- 2.32. "Table load-capacity variation with speed" means:
The table, in Annex 8, showing as a function of the load-capacity indices and nominal-speed-category symbols the load variations, which a tyre can withstand when used at speeds different from that conforming to its nominal-speed-category symbol. The load variations do not apply in the case of the additional load capacity symbol and speed category obtained when the provisions of paragraph 6.2.5. are applied;
- 2.33. "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;
- 2.34. "Tyre Class" means one of the following groupings:
- 2.34.1. Class C2 tyres: Tyres identified by a load capacity index in single formation lower or equal to 121 and a speed category symbol higher or equal to "N";
- 2.34.2. Class C3 tyres: Tyres identified by:
- (a) A load capacity index in single formation higher or equal to 122; or
 - (b) A load capacity index in single formation lower or equal to 121 and a speed category symbol lower or equal to "M".

3. Markings

- 3.1. Tyres submitted for approval shall bear on both side walls in the case of symmetrical tyres and at least on the outer side wall in the case of asymmetrical tyres:
- 3.1.1. The manufacturer's name or the Brand name/trademark;
 - 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.
 - 3.1.3. The tyre-size designation as defined in paragraph 2.20. of this Regulation;
 - 3.1.4. An indication of the structure as follows:
 - 3.1.4.1. On diagonal (bias-ply) tyres: no indication, or the letter "D";
 - 3.1.4.2. On radial-ply tyres: the letter "R" placed in front of the rim-diameter marking and, optionally, the word "RADIAL";
 - 3.1.5. The speed-category symbol (or symbols);
 - 3.1.5.1. An indication of the tyre's nominal speed category in the form of the symbol prescribed in paragraph 2.31.2. above;
 - 3.1.5.2. An indication of a second speed category in cases where paragraph 6.2.5. below is applied;
 - 3.1.6. The inscription M+S 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 4.1.3. as complying also with the definition given in paragraph 2.5.2.

- 3.1.7. The load-capacity indices as defined in paragraph 2.30. of this Regulation;
- 3.1.8. The word "TUBELESS" if the tyre is designed for use without an inner tube;
- 3.1.9. 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, which it is permissible to restrict to one sidewall, shall not be mandatory, on any tyre submitted for approval, until two years after the date of entry into force of this Regulation⁵;
- 3.1.10. In the case of tyres which can be re-grooved, the symbol

at least 20 mm in diameter, or the word "REGROOVABLE", moulded into or on to each sidewall;
- 3.1.11. An indication, by the "PSI" index, of the inflation pressure to be adopted for the load/speed endurance tests, as explained in Annex 7, Appendix 2. However, this indication, which it is permissible to restrict to one sidewall, shall not be mandatory, on any tyre submitted for approval, until two years after the date of entry into force of this Regulation. 5

For tyres first approved after 1 January 2018, the inflation pressure for the dimension measurement and for the load/speed endurance test, pursuant to paragraph 4.1.12. of this Regulation, shall be indicated in kilopascals, replacing the "PSI" index.

It is allowed to use kPa marking instead of PSI for tyres first type approved before 1 January 2018;
- 3.1.12. In the case of tyres first approved after 1 March 2004 the identification referred to in paragraph 2.20.1.4. shall be placed only immediately after the rim diameter marking referred to in paragraph 2.20.1.3;
- 3.1.13. The inscription "MPT" (or alternatively "ML" or "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, "ML" stands for Mining and Logging, "MPT" means Multi-Purpose Truck and "POR" means Professional Off Road⁶;
- 3.1.14. The prefix "LT" before the tyre size designation, or the suffix "C" or "LT" after the rim diameter marking referred to in paragraph 2.20.1.3., and, if applicable, after the tyre to rim fitment configuration referred to in paragraph 2.20.1.4., or the suffix "LT" after the service description.
- 3.1.14.1. This marking is optional in the case of tyres fitted on 5° drop centre rims, suitable for single and dual fitment, having a load capacity index in single lower or equal to 121 and destined for the equipment of motor vehicles;
- 3.1.14.2. This marking is mandatory in the case of tyres fitted on 5° drop centre rims, suitable for single fitment only, having a load capacity index higher or equal to 122 and destined for the equipment of motor vehicles;

⁵ Before 1 January 2000, the date of manufacture may be indicated by a group of three digits, the first two showing the week and the last one the year of manufacture.

- 3.1.15. The suffix "CP" after the rim diameter marking referred to in paragraph 2.20.1.3., and, if applicable, after the tyre to rim fitment configuration referred to in paragraph 2.20.1.4. This marking is mandatory in the case of tyres fitted on 5° drop centre rims, having a load capacity index in single lower or equal to 121 and specifically designed for the equipment of motor caravans;
- 3.1.16. The inscription "FRT" (Free Rolling Tyre) in case of tyres designed for the equipment of trailer axles and axles of motor vehicles other than front steering and drive axles.
- 3.2. Tyres shall exhibit a free space sufficiently large to accommodate an approval mark as shown in Annex 2 to this Regulation.
- 3.3. Annex 3 to this Regulation gives an example of an arrangement of the tyre markings.
- 3.4. The markings referred to in paragraph 3.1. and the approval mark prescribed in paragraph 5.4. of this Regulation shall be moulded on to or into the tyres. They shall be clearly legible and shall, except for the marking referred to in paragraph 3.1.1. above, be located on at least one lower sidewall.
- 3.4.1. However, for tyres identified by the "tyre to rim fitment configuration" (see paragraph 3.1.12.) symbol "A", the markings may be placed anywhere on the sidewall of the tyre.

4. Application for approval

- 4.1. The application for approval of a type of tyre with regard to this Regulation shall be submitted by the tyre manufacturer or by his duly accredited representative. It shall specify:
 - 4.1.1. The tyre-size designation as defined in paragraph 2.20. of this Regulation;
 - 4.1.2. 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).
 - 4.1.3. The category of use (normal, snow tyres, special use tyres);
 - 4.1.3.1. 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.
 - 4.1.4. Structure: diagonal (bias ply) or radial;
 - 4.1.5. The speed category;
 - 4.1.6. The load-capacity indexes;
 - 4.1.7. Whether the tyre is intended to be used with or without an inner tube;
 - 4.1.8. The overall dimensions: overall section width and outer diameter;
 - 4.1.9. The factor "x" referred to in paragraph 2.23. above;
 - 4.1.10. The rims on which the tyre can be mounted;
 - 4.1.11. The measuring rim and test rim;
 - 4.1.12. The inflation pressure for the dimension measurement and for the load/speed endurance test pressure;

- 4.1.13. The additional load/speed combinations in cases where paragraph 6.2.5. below is applied.
- 4.2. The application for approval shall be accompanied (all in triplicate) by a sketch, or a representative photograph, which identify the tyre tread pattern and a sketch of the envelope of the inflated tyre mounted on the measuring rim showing the relevant dimensions (see paragraphs 6.1.1. and 6.1.2.) of the type submitted for approval. It shall also be accompanied either by the test report issued by the approved test laboratory or by one or two samples of the tyre type, at the discretion of the competent authority. Drawings or photographs of the side wall and tread of the tyre shall be submitted once production has been established, no later than one year after the date of issue of the type approval.
- 4.3. The competent authority shall verify the existence of satisfactory arrangements for ensuring effective control of the conformity of production before type approval is granted.
- 4.4. Where a tyre manufacturer submits application for type approval for a range of tyres, it is not considered necessary to carry out a load/speed test on every type of tyre in the range. Worst case selection may be made at the discretion of the approval authority.

5. Approval

- 5.1. If the type of tyre submitted for approval in pursuance of this Regulation meets the requirements of paragraph 6. below, approval of that type of tyre shall be granted.
- 5.2. An approval number shall be assigned to each type approved; 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 not assign the same number to another type of tyre.
- 5.3. Notice of approval or of refusal of approval of a type of tyre pursuant to this Regulation shall be communicated to the Parties to the Agreement, which apply this Regulation by means of a form conforming to the model in Annex 1 to this Regulation.
- 5.4. There shall be affixed, conspicuously, to every tyre conforming to a type of tyre approved under this Regulation, in the space referred to in paragraph 3.2. above and in addition to the markings prescribed in paragraph 3.1. above, an international approval mark consisting of:
- 5.4.1. A circle surrounding the letter "E" followed by the distinguishing number of the country which has granted approval⁶; and
- 5.4.2. An approval number.
- 5.5. The approval mark shall be clearly legible and be indelible.
- 5.6. Annex 2 to this Regulation gives an example of the arrangement of the approval mark.

⁶ The distinguishing numbers of the Contracting Parties to the 1958 Agreement are reproduced in Annex 3 to the Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev.2/Amend.3 - www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html

5.7. Subsequent re-treading in accordance with Regulation No. 109

In the case where, during the course of production of a particular tyre type, the manufacturer has obtained a new approval for that same tyre type to be marked with a service description indicating a higher load index or different speed symbol than the earlier marking and where the tyre manufacturer authorizes the earlier tyre type to be re-treaded and marked with the later service description, the tyre manufacturer shall complete the Communication document given in Annex 9 to this Regulation and shall submit this to the Type Approval Authority that has granted the new approval. If the authorization for upgrading only applies to tyres from a particular manufacturing plant, or produced during particular production periods, the information necessary to identify the tyres shall be stated on the Communication document.

The Type Approval Authority shall communicate this information to other Parties to the Agreement, which apply this Regulation, and tyre manufacturers or Type Approval Authorities shall release this information on the request of any re-treading production unit that is approved in accordance with Regulation No. 109.

6. Specifications

6.1. Dimensions of tyres

6.1.1. Section width of a tyre

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

$$S = S_1 + K (A - A_1),$$

Where:

S is the "section width" rounded to the nearest millimetre and measured on the measuring rim;

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

A is the width of the measuring rim in millimetres, as shown by the manufacturer in the descriptive note; and

A₁ is the width of the theoretical rim in millimetres.

A₁ shall be taken to equal S₁ multiplied by the factor x as specified by the manufacturer, and K shall be taken to equal 0.4.

6.1.1.2. However, for the existing types of tyres whose designation is given in the first column of the tables in Annex 5 to this Regulation, the section width shall be deemed to be that given opposite the tyre designation in those tables.

6.1.1.3. However, for tyres identified by the "tyre to rim fitment configuration" (see paragraph 3.1.12.) symbol "A", K shall be taken to equal 0.6.

6.1.2. Outer diameter of a tyre

6.1.2.1. The outer diameter of a tyre shall be obtained by means of the following formula:

$$D = d + 2H$$

where:

- D is the outer diameter expressed in millimetres;
- d is the conventional number defined in paragraph 2.20.1.3. above, expressed in millimetres;
- H is the nominal section height rounded to the nearest millimetre and is equal to
- $$H = S_1 \cdot 0.01 Ra, \text{ where}$$
- S_1 is the nominal section width in millimetres;
- Ra is the nominal aspect ratio;

all as shown on the sidewall of the tyre in the tyre-size designation in conformity with the requirements of paragraph 3.4. above.

6.1.2.2. However, for the existing types of tyres whose designation is given in the first column of the tables in Annex 5 to this Regulation, the outer diameter shall be deemed to be that given opposite the tyre designation in those tables.

6.1.2.3. However, for tyres identified by the "tyre to rim fitment configuration" (see paragraph 3.1.12.) symbol "A", the outer diameter shall be that specified in the tyre-size designation as shown on the sidewall of the tyre.

6.1.3. Method of measuring tyres

The dimensions of tyres shall be measured by the procedure described in Annex 6 to this Regulation.

6.1.4. Tyre section width specifications

6.1.4.1. The overall width of a tyre may be less than the section width or widths determined pursuant to paragraph 6.1.1. above.

6.1.4.2. It may exceed that value by 4 per cent in case of radial-ply tyres and by 8 per cent in the case of diagonal (bias-ply) tyres. However, for tyres with nominal section width exceeding 305 mm intended for dual mounting (twinning), the value determined pursuant to paragraph 6.1.1. above shall not be exceeded by more than 2 per cent for radial-ply tyres with nominal aspect ratio higher than 60, or 4 per cent for diagonal (bias-ply) tyres. The respective limits shall be rounded to the nearest millimetre (mm).

6.1.4.3. However, for tyres identified by the "tyre to rim fitment configuration" (see paragraph 3.1.12.) symbol "A", the overall width of the tyre, in the lower area of the tyre, equals the nominal width of the rim on which the tyre is mounted, as shown by the manufacturer in the descriptive note, increased by 27 mm.

6.1.5. Tyre outer diameter specifications

The outer diameter of a tyre must not be outside the values d_{\min} and d_{\max} obtained from the following formulae:

$$D_{\min} = d + 2 \cdot H_{\min}$$

$$D_{\max} = d + 2 \cdot H_{\max}$$

where:

$$H_{\min} = H \cdot a \quad \text{rounded to the nearest mm}$$

$$H_{\max} = H \cdot b \quad \text{rounded to the nearest mm}$$

6.1.5.1. For sizes listed in Annex 5 and for tyres identified by the "tyre to rim fitment configuration" (see paragraph 3.1.12.) symbol "A", the nominal section height H is equal to:

- H = 0.5 (D-d), rounded to the nearest mm - for references see paragraph 6.1.2.1.
- 6.1.5.2. For other sizes, not listed in Annex 5
"H" and "d" are as defined in paragraph 6.1.2.1.
- 6.1.5.3. Coefficients "a" and "b" are respectively:
- 6.1.5.3.1. Coefficient "a" = .97
- 6.1.5.3.2. Coefficient "b" Radial Diagonal
- | | | |
|-----------------------|------|------|
| For normal use tyres | 1.04 | 1.07 |
| For special use tyres | 1.06 | 1.09 |
- 6.1.5.3.3. For snow tyres the outer diameter shall not exceed the following value
- $$D_{\max, \text{snow}} = 1.01 \cdot D_{\max} \quad \text{rounded to the nearest mm}$$
- where D_{\max} is the maximum outer diameter established in conformity with the above.
- For tyres of the category of use, "snow tyre" the outer diameter (D_{\max}) established in conformity with the above may be exceeded by one per cent.
- 6.2. Load/speed endurance test
- 6.2.1. Each type of tyre shall undergo at least one load/speed endurance tests carried out by the procedure described in Annex 7 to this Regulation.
- 6.2.2. A tyre which, after undergoing the endurance test, does not exhibit any tread separation, ply separation, cord separation, chunking or broken cords shall be deemed to have passed the test.
- 6.2.3. 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.
- 6.2.4. Where application is made for the approval of a type of tyre for the load/speed combinations given in the table in Annex 8, the endurance test prescribed in paragraph 6.2.1. above need not be carried out for load and speed values other than the nominal values.
- 6.2.5. Where application is made for the approval of a type of tyre, which has a load/speed combination in addition to the one that is subject to the variation of load with speed given in the table in Annex 8, the endurance test prescribed in paragraph 6.2.1. above shall also be carried out on a second tyre of the same type at the additional load/speed combination.
- 6.3. Tread pattern of a tyre
- 6.3.1. In order to be classified as a "special use tyre" a tyre shall have a block tread pattern in which the blocks are larger and more widely spaced than for normal tyres and have the following characteristics:
- For C2 tyres: a tread depth \geq 11 mm and void to fill ratio \geq 35 per cent
- For C3 tyres: a tread depth \geq 16 mm and void to fill ratio \geq 35 per cent
- 6.3.2. In order to be classified as a 'professional off-road tyre', a tyre shall have all of the following characteristics:
- (a) For C2 tyres:
- (i) A tread depth \geq 11 mm;

- (ii) A void to fill ratio ≥ 35 per cent;
 - (iii) A maximum speed rating of $\leq Q$.
- (b) For C3 tyres:
- (i) A tread depth ≥ 16 mm;
 - (ii) A void to fill ratio ≥ 35 per cent;
 - (iii) A maximum speed rating of $\leq K$.

7. Modification and extension of approval of a tyre type

- 7.1. Every modification of a tyre type shall be notified to the Type Approval Authority, which approved the tyre type. That Authority may then either:
- 7.1.1. Consider that the modifications made are unlikely to have an appreciable adverse effect and that in any case the tyre still meets the requirements; or
 - 7.1.2. Require a further test report from the Technical Service responsible for carrying out the tests.
- 7.2. A modification of the tread pattern of the tyre shall not be considered to necessitate a repetition of the tests prescribed in paragraph 6. of this Regulation.
- 7.3. Confirmation or refusal of approval, specifying the alterations, shall be communicated by the procedure specified in paragraph 5.3. above to the Parties to the Agreement which apply this Regulation.
- 7.4. The competent Type Approval 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.

8. Conformity of production

The conformity of production procedures shall comply with those set out in the 1958 Agreement, Schedule 1 (E/ECE/TRANS/505/Rev.3) with the following requirements:

- 8.1. Tyres approved under this Regulation shall be so manufactured as to conform to the type approved, by meeting the requirements set forth in paragraph 6. above.
- 8.2. The Type Approval Authority, which has granted type approval, may at any time verify the conformity control methods applied in each production facility. For each production facility, the normal frequency of these verifications shall be once every two years.

9. Penalties for non-conformity of production

- 9.1. The approval granted in respect of a type of tyre pursuant to this Regulation may be withdrawn if the requirement laid down in paragraph 8.1. above is not complied with or if the tyres taken from the series have failed to pass the tests prescribed in that paragraph.

- 9.2. 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 applying this Regulation, by means of a communication form conforming to the model in annex 1 to this Regulation.

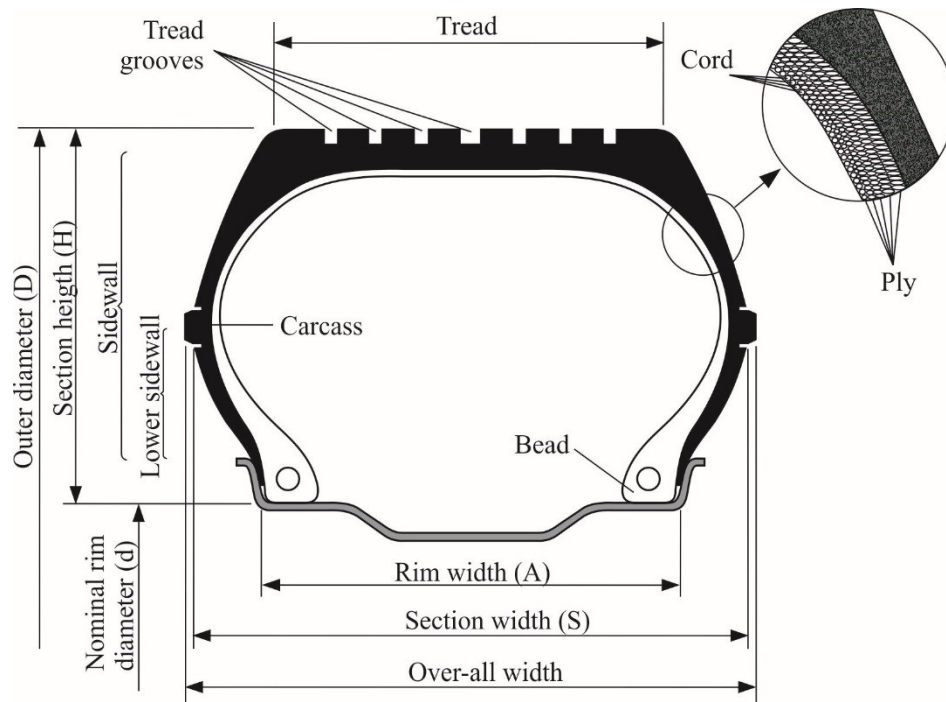
10. Production definitively discontinued

If the holder of an approval completely ceases to manufacture a type of tyre approved in accordance with this Regulation, he shall so inform the Type Approval Authority, which granted the approval. Upon receiving, the relevant communication that Authority shall inform thereof the other Parties to the 1958 Agreement applying this Regulation by means of copies of the communication form conforming to the model in Annex 1 to this Regulation.

11. Names and addresses of Technical Services responsible for conducting approval tests, and of Type Approval Authorities

- 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 designate laboratories of tyre manufacturers, as approved, test laboratories.
- 11.3. Where a Contracting Party to the 1958 Agreement applies paragraph 11.2. above, it may, if it so desires, be represented at the tests by one or more persons of its choice.

Explanatory figure
(See paragraph 2. of the Regulation)



Annex 1

Communication

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



issued by : Name of administration:

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

concerning²: Approval granted
Approval extended
Approval refused
Approval withdrawn
Production definitively discontinued

of a type of tyre for motor vehicles pursuant to Regulation No. 54

Approval No.: Extension No.:

1. Manufacturer's name and address:
2. Tyre type designation³
- 2.1. Brand name(s)/trademark(s):
- 2.2. Trade description(s)/ Commercial name(s)/.....
3. If applicable, name and address of manufacturer's representative:
.....
.....
4. Summarized description:
 - 4.1. Size of tyre
 - 4.2. Category of use: normal/snow/special²
 - 4.3. Structure: diagonal (bias-ply)/radial²
 - 4.4. Tyre class: C2 / C3²
 - 4.5. Speed category symbol:
 - 4.5.1. Nominal:
 - 4.5.2. Additional (if applicable):

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

² Strike out what 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

- 4.6. Load-capacity indices:
 - 4.6.1. Corresponding to nominal speed: single twinned (dual)
 - 4.6.2. Corresponding to additional speed: single twinned (dual)
- 5. Technical Service and, where applicable, test laboratory approved for purposes of approval or of verification of conformity:
- 6. Date of report issued by that Service:
- 7. Number of report issued by that Service:
- 8. Reasons(s) of extension (if applicable):
- 9. Any remarks:
- 10. Place:
- 11. Date:
- 12. Signature:
- 12. Annexed to this communication is a list of documents in the approval file deposited at the Type Approval Authorities having delivered the approval and which can be obtained upon request.

Annex 2

Arrangement of approval mark



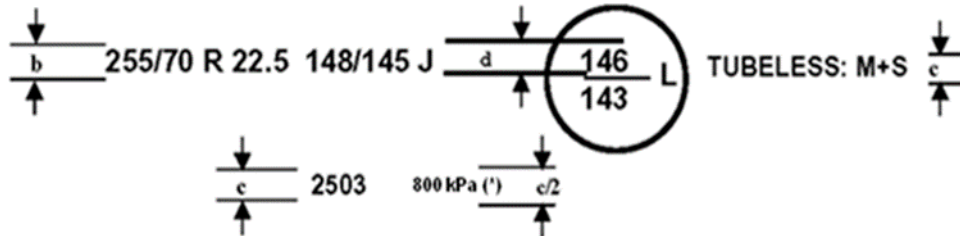
a = 12 mm (min.)

The above approval mark affixed to a tyre shows that the type of tyre concerned has been approved in the Netherlands (E 4) under approval number 002439. The first two digits of the approval number indicate that the approval was granted in accordance with the requirements of Regulation No. 54 in its original form.

Note: The approval number must be placed close to the circle and either above or below the "E" or to 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 tyre markings



(*) PSI marking instead of kPa is allowed for tyres first type approved before 1 January 2018.

	<i>Minimum heights of markings (mm)</i>	
	<i>Tyres of nominal rim diameter < 508 mm (Code 20) or of nominal section width ≤ 235 mm (Code 9)</i>	<i>Tyres of nominal rim diameter ≥ 508 mm (Code 20) or of nominal section width > 235 mm (Code 9)</i>
B	6	9
C	4	
D	6	

- These markings define a tyre:
 - Having a nominal section width of 255;
 - Having a nominal aspect ratio of 70;
 - Of radial-ply structure (R);
 - Having a nominal rim diameter of 572 mm, for which the symbol is 22.5;
 - Having load capacities of 3,150 kg when single and 2,900 kg when twinned (dual), corresponding respectively to the load indices 148 and 145 shown in Annex 4 to this Regulation;
 - Having a reference speed of 100 km/h corresponding to speed category symbol: J;
 - Classified in the category of use Snow: M+S;
 - Able to be used additionally at 120 km/h (speed category symbol L) with a load capacity of 3,000 kg when single and 2,725 kg when twinned (dual), corresponding respectively to the load indices 145 and 143 shown in Annex 4 to this Regulation;
 - Capable of being fitted without inner tube: "TUBELESS";
 - Manufactured during the twenty-fifth week of the year 2003, and

Requiring to be inflated to 620 kPa for load/speed endurance tests, for which the PSI symbol is 90.

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:

235-700 R 450A

Where:

235 is the nominal section width in mm

700 is the outer diameter expressed in mm

R is an indication of the structure of the tyre - see paragraph 3.1.4. of this Regulation

450 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 symbol, date of manufacture and other markings, shall be as given in the example above.

3. The positioning and order of the markings constituting the tyre designation shall be the following:

- a) The tyre-size designation as defined in paragraph 2.20. of this Regulation shall be grouped as shown in the example above: 255/70 R 22.5 or 235-700 R 450A;
- b) The service description comprising the load index/indices and the speed symbol shall be placed immediately after the tyre-size designation as defined in paragraph 2.20. of this Regulation;
- c) The symbols "TUBELESS" and "M+S" or "FRT" or "MPT" (and equivalents) may be at a distance from the tyre-size designation
- d) If paragraph 6.2.5. of this Regulation is applied, the additional load-capacity indices and speed-category symbol must be shown inside a circle near the nominal load-capacity indices and speed-category-symbol appearing on the tyre sidewall.

Annex 4

List of symbols of load-capacity indices

<i>Load-capacity index</i>	<i>Corresponding maximum mass to be carried (kg)</i>
60	250
61	257
62	265
63	272
64	280
65	290
66	300
67	307
68	315
69	325
70	335
71	345
72	355
73	365
74	375
75	387
76	400
77	412
78	425
79	437
80	450
81	462
82	475
83	487
84	500
85	515
86	530
87	545
88	560
89	580
90	600
91	615
92	630
93	650
94	670
95	690
96	710
97	730

<i>Load-capacity index</i>	<i>Corresponding maximum mass to be carried (kg)</i>
98	750
99	775
100	800
101	825
102	850
103	875
104	900
105	925
106	950
107	975
108	1 000
109	1 030
110	1 060
111	1 090
112	1 120
113	1 150
114	1 180
115	1 215
116	1 250
117	1 285
118	1 320
119	1 360
120	1 400
121	1 450
122	1 500
123	1 550
124	1 600
125	1 650
126	1 700
127	1 750
128	1 800
129	1 850
130	1 900
131	1 950
132	2 000
133	2 060
134	2 120
135	2 180
136	2 240
137	2 300
138	2 360
139	2 430
140	2 500
141	2 575

<i>Load-capacity index</i>	<i>Corresponding maximum mass to be carried (kg)</i>
142	2 650
143	2 725
144	2 800
145	2 900
146	3 000
147	3 075
148	3 150
149	3 250
150	3 350
151	3 450
152	3 550
153	3 650
154	3 750
155	3 875
156	4 000
157	4 125
158	4 250
159	4 375
160	4 500
161	4 625
162	4 750
163	4 875
164	5 000
165	5 150
166	5 300
167	5 450
168	5 600
169	5 800
170	6 000
171	6 150
172	6 300
173	6 500
174	6 700
175	6 900
176	7 100
177	7 300
178	7 500
179	7 750
180	8 000
181	8 250
182	8 500
183	8 750
184	9 000
185	9 250

<i>Load-capacity index</i>	<i>Corresponding maximum mass to be carried (kg)</i>
186	9 500
187	9 750
188	10 000
189	10 300
190	10 600
191	10 900
192	11 200
193	11 500
194	11 800
195	12 150
196	12 500
197	12 850
198	13 200
199	13 600
200	14 000

Annex 5

Tyre-size designation and dimensions

Part I - European tyres

Table A
**Code designated sizes mounted on 5° tapered rims or flat base rims.
Radial and diagonal constructions**

Tyre-size designation (+)	Measuring rim width code	Nominal rim diameter d (mm)	Outer diameter D (mm)		Section width S (mm)	
			Radial	Diagonal	Radial	Diagonal
Std. series						
4.00R8 (*)	2.50	203	414	414	107	107
4.00R10(*)	3.00	254	466	466	108	108
	3.00	305	517	517	108	108
4.00R12(*)4.10/3	2.5	152	-	320	-	95
.50-6	2.5	203	-	394	-	103
3.50-8	3.5	254	-	480		124
4.40-10	3.50	203	439	439	125	125
4.50R8 (*)	3.50	254	490	490	125	125
4.50R10(*)	3.50	305	545	545	125	128
4.50R12(*)	3.00	203	467	467	132	132
5.00R8 (*)	3.50	254	516	516	134	134
5.00R10(*)	3.50	305	568	568	134	137
5.00R12(*)	4.00	229	540	540	160	160
6.00R9	4.50	356	626	625	158	158
6.00R14C	4.50	406	728	730	170	170
6.00R16(*)	5.00	254	588	588	177	177
6.50R10	5.00	356	640	650	170	172
6.50R14C	4.50	406	742	748	176	176
6.50R16(*)	5.00	508	860	-	181	-
6.50R20(*)	5.00	305	672	672	192	192
7.00R12	5.00	356	650	668	180	182
7.00R14C	5.00	381	746	752	197	198
7.00R15(*)	5.50	406	778	778	198	198
7.00R16C	5.50	406	784	774	198	198
7.00R16	5.50	508	892	898	198	198
7.00R20	5.50	254	645	645	207	207
7.50R10	5.50	356	686	692	195	192
7.50R14C	6.00	381	772	772	212	212
7.50R15(*)	6.00	406	802	806	210	210
7.50R16(*)	6.00	432	852	852	210	210

Tyre-size designation (+)	Measuring rim width code	Nominal rim diameter d (mm)	Outer diameter		Section width	
			D (mm)		S (mm)	
7.50R17(*)	6.00	508	928	928	210	213
7.50R20	6.50	381	836	836	230	234
8.25R15	6.50	406	860	860	230	234
8.25R16	6.50	432	886	895	230	234
8.25R17	6.50	508	962	970	230	234
8.25R20						
9.00R15	6.00	381	840	840	249	249
9.00R16(*)	6.50	406	912	900	246	252
9.00R20	7.00	508	1018	1012	258	256
10.00R15	7.50	381	918	918	275	275
10.00R20	7.50	508	1052	1050	275	275
10.00R22	7.50	559	1102	1102	275	275
11.00R16	6.50	406	980	952	279	272
11.00R20	8.00	508	1082	1080	286	291
11.00R22	8.00	559	1132	1130	286	291
11.00R24	8.00	610	1182	1180	286	291
12.00R20	8.50	508	1122	1120	313	312
12.00R22	8.50	559	1174	1174	313	312
12.00R24	8.50	610	1226	1220	313	312
13.00R20	9.00	508	1176	1170	336	342
14.00R20	10.00	508	1238	1238	370	375
14.00R24	10.00	610	1340	1340	370	375
16.00R20	13.00	508	1370	1370	446	446
80 Series						
12/80 R 20	8.50	508	1008	-	305	-
13/80 R 20	9.00	508	1048	-	326	-
14/80 R 20	10.00	508	1090	-	350	-
14/80 R 24	10.00	610	1192	-	350	-
14.75/80 R 20	10.00	508	1124	-	370	-
15.5/80 R 20	10.00	508	1158	-	384	-
Wide Base Tyres for Multipurpose Trucks						
7.50 R 18 MPT	5.50	457		885		208
10.5 R 18 MPT	9	457		905	276	270
10.5 R 20 MPT	9	508		955	276	270
12.5 R 18 MPT	11	457		990	330	325
12.5 R 20 MPT	11	508		1040	330	325
14.5 R 20 MPT	11	508		1095	362	355
14.5 R 24 MPT	11	610		1195	362	355

(+) Tyres in diagonal construction are identified by an hyphen in place of the letter 'R' (e.g. 5.00-8).

(*) The tyre-size designation may be supplemented with the letter 'C' (e.g. 6.00-16C).

Table B

Code designated sizes mounted on 15° tapered rims - Radial

<i>Tyre-size designation</i>	<i>Measuring rim width code</i>	<i>Nominal rim diameter d (mm)</i>	<i>Outer diameter D (mm)</i>	<i>Section width S (mm)</i>
7 R 17.5 (*)	5.25	445	752	185
7 R 19.5	5.25	495	800	185
8 R 17.5 (*)	6.00	445	784	208
8 R 19.5	6.00	495	856	208
8 R 22.5	6.00	572	936	208
8.5 R 17.5	6.00	445	802	215
9 R 17.5	6.75	445	820	230
9 R 19.5	6.75	495	894	230
9 R 22.5	6.75	572	970	230
9.5 R 17.5	6.75	445	842	240
9.5 R 19.5	6.75	495	916	240
10 R 17.5	7.50	445	858	254
10 R 19.5	7.50	495	936	254
10 R 22.5	7.50	572	1020	254
11 R 22.5	8.25	572	1050	279
11 R 24.5	8.25	622	1100	279
12 R 22.5	9.00	572	1084	300
13 R 22.5	9.75	572	1124	320
15 R 19.5	11.75	495	998	387
15 R 22.5	11.75	572	1074	387
16.5 R 19.5	13.00	495	1046	425
16.5 R 22.5	13.00	572	1122	425
18 R 19.5	14.00	495	1082	457
18 R 22.5	14.00	572	1158	457
70 Series				
10/70 R 22.5	7.50	572	928	254
11/70 R 22.5	8.25	572	962	279
12/70 R 22.5	9.00	572	1000	305
13/70 R 22.5	9.75	572	1033	330

(*) The tyre-size designation may be supplemented with the letter 'C' (e.g. 7 R 17.5C).

Table C

Tyres for light commercial vehicles - Radial and diagonal constructions

Tyre-size designation (+)	Measuring rim width code	Nominal rim diameter d (mm)	Outer diameter D (mm)		Section width S (mm)	
			Radial	Diagonal	Radial	Diagonal
Metric Designated						
145 R 10 C	4.00	254	492	-	147	-
145 R 12 C	4.00	305	542	-	147	-
145 R 13 C	4.00	330	566	-	147	-
145 R 14 C	4.00	356	590	-	147	-
145 R 15 C	4.00	381	616	-	147	-
155 R 12 C	4.50	305	550	-	157	-
155 R 13 C	4.50	330	578	-	157	-
155 R 14 C	4.50	356	604	-	157	-
165 R 13 C	4.50	330	596	-	167	-
165 R 14 C	4.50	356	622	-	167	-
165 R 15 C	4.50	381	646	-	167	-
175 R 13 C	5.00	330	608	-	178	-
175 R 14 C	5.00	356	634	-	178	-
175 R 16 C	5.00	406	684	-	178	-
185 R 13 C	5.50	330	624	-	188	-
185 R 14 C	5.50	356	650	-	188	-
185 R 15 C	5.50	381	674	-	188	-
185 R 16 C	5.50	406	700	-	188	-
195 R 14 C	5.50	356	666	-	198	-
195 R 15 C	5.50	381	690	-	198	-
195 R 16 C	5.50	406	716	-	198	-
205 R 14 C	6.00	356	686	-	208	-
205 R 15 C	6.00	381	710	-	208	-
205 R 16 C	6.00	406	736	-	208	-
215 R 14 C	6.00	356	700	-	218	-
215 R 15 C	6.00	381	724	-	218	-
215 R 16 C	6.00	406	750	-	218	-
245 R 16 C	7.00	406	798	798	248	248
17 R 15 C	5.00	381	678	-	178	-
17 R 380 C	5.00	381	678	-	178	-
17 R 400 C	150 mm	400	698	-	186	-
19 R 400 C	150 mm	400	728	-	200	-
Code Designated						
5.60 R 12 C	4.00	305	570	572	150	148
6.40 R 13 C	5.00	330	648	640	172	172
6.70 R 13 C	5.00	330	660	662	180	180
6.70 R 14 C	5.00	356	688	688	180	180
6.70 R 15 C	5.00	381	712	714	180	180

(+) Tyres in diagonal construction are identified by an hyphen in place of the letter 'R' (e.g. 145-10 C).

Table D
Tyres for special applications - Radial and diagonal construction

<i>Tyre-size designation (+)</i>	<i>Measuring rim width code</i>	<i>Nominal rim diameter d (mm)</i>	<i>Outer diameter D (mm)</i>	<i>Section width S (mm)</i>
Code Designated				
15x4 1/2-8	3.25	203	385	122
16x6-8	4.33	203	425	152
16.5x6.5-8	5.375	203	411	165
18x7	4.33	203	462	173
18x7-8	4.33	203	462	173
21x8-9	6.00	229	535	200
21x4	2.32	330	565	113
22x4 1/2	3.11	330	595	132
23x5	3.75	330	635	155
23x9-10	6.50	254	595	225
25x6	3.75	330	680	170
27x10-12	8.00	305	690	255
28x9-15	7.00	381	707	216
Metric designated				
200-15	6.50	381	730	205
250-15	7.50	381	735	250
300-15	8.00	381	840	300

(+) Tyres in radial construction are identified by the letter 'R' in place of the hyphen '-' (e.g. 15x4 1/2 R 8).

Part II - United States tyres

- Tolerances shown at the bottom of the tables apply in place of those shown in paragraphs 6.1.4.2. and 6.1.5.3.
- Outer diameters are listed for the various categories of use: Normal, Snow, Special.

Table A
Tyres for light commercial vehicles (LT tyres)
Diagonal and radial

Tyre-size designation ¹	Measuring rim width code	Nominal rim diameter d(mm)	Outer diameter D (mm) ²		Section width S (mm) ³
			Normal	Snow	
6.00-16LT	4.50	406	732	743	173
6.50-16LT	4.50	406	755	767	182
6.70-16LT	5.00	406	722	733	191
7.00-13LT	5.00	330	647	658	187
7.00-14LT	5.00	356	670	681	187
7.00-15LT	5.50	381	752	763	202
7.00-16LT	5.50	406	778	788	202
7.10-15LT	5.00	381	738	749	199
7.50-15LT	6.00	381	782	794	220
7.50-16LT	6.00	406	808	819	220
8.25-16LT	6.50	406	859	869	241
9.00-16LT	6.50	406	890	903	257
G78-15LT	6.00	381	711	722	212
H78-15LT	6.00	381	727	739	222
L78-15LT	6.50	381	749	760	236
L78-16LT	6.50	406	775	786	236
7-14.5LT⁴	6.00	368	677		185
8-14.5LT⁴	6.00	368	707		203
9-14.5LT⁴	7.00	368	711		241
7-17.5LT	5.25	445	758	769	189
8-17.5LT	5.25	445	788	799	199

¹ Tyres in Radial construction are identified by the letter "R" in place of "-" (e.g. 6.00 R 16LT).

² Coefficient "b" for the calculation of Dmax: 1.08.

³ Overall width may exceed this value up to +8 per cent.

⁴ The suffix "MH" may replace "LT" in the tyre-size designation (e.g. 7-14.5 MH).

Table B
Tyres for light commercial vehicles (high flotation tyres)
Diagonal and radial

Tyre-size designation ¹	Measuring rim width code	Nominal rim diameter d (mm)	Outer diameter D (mm) ²		Section width S (mm) ³
			Normal	Snow	
9-15LT	8.00	381	744	755	254
10-15LT	8.00	381	773	783	264
11-15LT	8.00	381	777	788	279
24x7.50-13LT	6.00	330	597	604	191
27x8.50-14LT	7.00	356	674	680	218
28x8.50-15LT	7.00	381	699	705	218
29x9.50-15LT	7.50	381	724	731	240
30x9.50-15LT	7.50	381	750	756	240
31x10.50-15LT	8.50	381	775	781	268
31x11.50-15LT	9.00	381	775	781	290
31x12.50R15LT	10.00	381	775	781	318
31x13.50-15LT	11.00	381	775	781	345
31x15.50-15LT	12.00	381	775	781	390
32x11.50-15LT	9.00	381	801	807	290
33x9.50 R15LT	7.50	381	826	832	240
33x10.50R15LT	8.50	381	826	832	268
33x10.50R17LT	8.50	432	826	832	268
33x10.50R18LT	8.50	457	826	832	268
33x11.50R18LT	9.00	457	826	832	290
33x12.50-15LT	10.00	381	826	832	318
33x12.50R17LT	10.00	432	826	832	318
33x12.50R18LT	10.00	457	826	832	318
33x12.50R20LT	10.00	508	826	832	318
33x12.50R22LT	10.00	559	826	832	318
33x13.50R15LT	11.00	381	826	832	345
33x15.50R15LT	12.00	381	826	832	390
34x10.50R17LT	8.50	432	851	858	268
34x12.50R18LT	10.00	457	851	858	318
35x12.50-15LT	10.00	381	877	883	318
35x12.50R17LT	10.00	432	877	883	318
35x12.50R18LT	10.00	457	877	883	318
35x12.50R20LT	10.00	508	877	883	318
35x12.50R22LT	10.00	559	877	883	318
35x13.50R15LT	11.00	381	877	883	345
35x13.50R18LT	11.00	457	877	883	345
35x13.50R20LT	11.00	508	877	883	345
35x14.50R15LT	12.00	381	877	883	372
36x13.50R18LT	11.00	457	902	908	345

Tyre-size designation ¹	Measuring rim width code	Nominal rim diameter d (mm)	Outer diameter D (mm) ²		Section width S (mm) ³
			Normal	Snow	
36x14.50R15LT	12.00	381	902	908	372
36x14.50R17LT	12.00	432	902	908	372
36x14.50R18LT	12.00	457	902	908	372
36x15.50R15LT	12.00	381	902	908	390
37x12.50-15LT	10.00	381	928	934	318
37x12.50 R17LT	10.00	432	928	934	318
37x12.50R18LT	10.00	457	928	934	318
37x12.50R20LT	10.00	508	928	934	318
37x12.50R22LT	10.00	559	928	934	318
37x13.50R15LT	11.00	381	928	934	345
37x13.50R17LT	11.00	432	928	934	345
37x13.50R18LT	11.00	457	928	934	345
37x13.50R20LT	11.00	508	928	934	345
37x13.50R22LT	11.00	559	928	934	345
37x13.50R24LT	11.00	610	928	934	345
37x14.50-15LT	12.00	381	928	934	372
38x13.50R17LT	11.00	432	953	959	345
38x13.50R20LT	11.00	508	953	959	345
38x13.50R24LT	11.00	610	953	959	345
38x14.50R17LT	12.00	432	953	959	372
38x14.50R18LT	12.00	457	953	959	372
38x14.50R20LT	12.00	508	953	959	372
38x15.50R15LT	12.00	381	953	959	390
38x15.50R17LT	12.00	432	953	959	390
38x15.50R18LT	12.00	457	953	959	390
38x15.50R20LT	12.00	508	953	959	390
39x13.50R17LT	11.00	432	978	985	345
40x13.50R17LT	11.00	432	1004	1010	345
40x13.50R20LT	11.00	508	1004	1010	345
40x14.50R17LT	12.00	432	1004	1010	372
40x14.50R18LT	12.00	457	1004	1010	372
40x14.50R20LT	12.00	508	1004	1010	372
40x15.50R20LT	12.00	508	1004	1010	390
40x15.50R22LT	12.00	559	1004	1010	390
40x15.50R24LT	12.00	610	1004	1010	390
42x14.50R17LT	12.00	432	1055	1061	372
42x14.50R20LT	12.00	508	1055	1061	372
8.00-16.5LT	6.00	419	720	730	203
8.75-16.5LT	6.75	419	748	759	222
9.50-16.5LT	6.75	419	776	787	241

<i>Tyre-size designation¹</i>	<i>Measuring rim width code</i>	<i>Nominal rim diameter d (mm)</i>	<i>Outer diameter D (mm)²</i>		<i>Section width S (mm)³</i>
			<i>Normal</i>	<i>Snow</i>	
10-16.5LT	8.25	419	762	773	264
12-16.5LT	9.75	419	818	831	307
30x9.50-16.5LT	7.50	419	750	761	240
31x10.50-16.5LT	8.25	419	775	787	266
33x12.50-16.5LT	9.75	419	826	838	315
35x12.50 R16.5LT	10.00	419	877	883	318
37x12.50-16.5LT	9.75	419	928	939	315
37x14.50-16.5LT	11.25	419	928	939	365

¹ Tyres in Radial construction are identified by the letter "R" in place of "-" (e.g. 24x7.50 R 13LT).

² Coefficient 'b' for the calculation of D_{max} : 1.07.

³ Overall width may exceed this value up to +7 per cent.

Table C
Code designated tyres mounted on 5° tapered or flat base rims
Diagonal and radial

Tyre-size designation ¹	Measuring rim width code	Nominal rim diameter d (mm)	Outer diameter D (mm) ²			Section width S (mm) ³
			Normal		Snow	
			(a)	(b)		
6.50-20	5	508	878		893	184
7.00-15TR	5.5	381	777		792	199
7.00-18	5.5	457	853		868	199
7.00-20	5.5	508	904		919	199
7.50-15TR	6	381	808		825	215
7.50-17	6	432	859		876	215
7.50-18	6	457	884		901	215
7.50-20	6	508	935		952	215
8.25-15TR	6.5	381	847	855	865	236
8.25-20	6.5	508	974	982	992	236
9.00-15TR	7	381	891	904	911	259
9.00-20	7	508	1019	1031	1038	259
10.00-15TR	7.5	381	927	940	946	278
10.00-20	7.5	508	1054	1067	1073	278
10.00-22	7.5	559	1104	1118	1123	278
11.00-20	8	508	1085	1099	1104	293
11.00-22	8	559	1135	1150	1155	293
11.00-24	8	610	1186	1201	1206	293
11.50-20	8	508	1085	1099	1104	296
12.00-20	8.5	508	1125		1146	315
12.00-24	8.5	610	1226		1247	315
14.00-20	10	508	1241		1266	375
14.00-24	10	610	1343		1368	375

¹ Tyres in Radial construction are identified by the letter "R" in place of "-"(e.g. 6.50 R 20).

² Coefficient 'b' for the calculation of Dmax : 1.06 . Category of use: Normal Service tyres: (a) Highway tread (b) Heavy tread

³ Overall width may exceed this value up to +6 per cent.

Table D
Code designated tyres for special services
Diagonal and radial

Tyre-size designation	Measuring rim width code	Nominal rim diameter d (mm)	Outer diameter D (mm) ¹		Section width S (mm) ²
			(a)	(b)	
10.00-20ML	7.5	508	1073	1099	278
11.00-22ML	8	559	1155	1182	293
13.00-24ML	9	610	1302		340
14.00-20ML	10	508	1266		375
14.00-24ML	10	610	1368		375
15-19.5ML	11.75	495	1019		389
24 R 21	18	533	1372	-	610

¹ Coefficient "b" for the calculation of Dmax : 1.06.

Category of use: special (a) Traction tread (b) Heavy tread

² Overall width may exceed this value up to +8 per cent.

Table E
Code designated tyres mounted on 15° tapered rims
Diagonal and radial

Tyre-size designation ¹	Measuring rim width code	Nominal rim diameter d (mm)	Outer diameter D (mm) ²			Section width S (mm) ³
			Normal		Snow	
			(a)	(b)		
8-19.5	6.00	495	859		876	203
8-22.5	6.00	572	935		952	203
9-22.5	6.75	572	974	982	992	229
10-22.5	7.50	572	1019	1031	1038	254
11-22.5	8.25	572	1054	1067	1073	279
11-24.5	8.25	622	1104	1118	1123	279
12-22.5	9.00	572	1085	1099	1104	300
12-24.5	9.00	622	1135	1150	1155	300
12.5-22.5	9.00	572	1085	1099	1104	302
12.5-24.5	9.00	622	1135	1150	1155	302
14-17.5	10.50	445	907		921	349 (-)
15-19.5	11.75	495	1005		1019	389 (-)
15-22.5	11.75	572	1082		1095	389 (-)
16.5-22.5	13.00	572	1128		1144	425 (-)
18-19.5	14.00	495	1080		1096	457 (-)
18-22.5	14.00	572	1158		1172	457 (-)

¹ Tyres in Radial construction are identified by the letter "R" in place of "-" (e.g. 8R19.5).

² Coefficient "b" for the calculation of Dmax : 1.05.

³ Category of use: Normal Service tyres: (a) Highway tread (b) Heavy tread

Overall width may exceed this value up to +6 per cent

(-) Overall width may exceed this value up to +5 per cent.

Annex 6

Method of measuring pneumatic tyres

1. The tyre is mounted on the measuring rim specified by the manufacturer pursuant to paragraph 4.1.11. of this Regulation and is inflated to a pressure specified by the manufacturer pursuant to paragraph 4.1.12. of this Regulation.
2. The tyre fitted on its rim is conditioned to the ambient temperature of the laboratory for at least 24 hours.
3. The pressure is readjusted to the value specified in paragraph 1. above.
4. The overall width is measured by caliper at six equally-spaced points, account being taken of the thickness of the protective ribs or bands. The highest measurement so obtained is taken as the overall width.
5. The outer diameter is calculated from the maximum circumference.

Annex 7

Procedure for load/speed endurance tests

1. Preparing the tyre
 - 1.1. Mount a new tyre on the test rim specified by the manufacturer pursuant to paragraph 4.1.11. of this Regulation.
 - 1.2. Use a new inner tube or combination of inner tube, valve and flap (as required) when testing tyres with inner tubes.
 - 1.3. Inflate the tyre to the pressure corresponding to the pressure index specified by the manufacturer pursuant to paragraph 4.1.12. of this Regulation.
 - 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 1.3. above.
2. Test procedure
 - 2.1. Mount the tyre-and-wheel assembly on the test axle and press it against the outer face of a smooth power-driven test drum 1.70 m ∇ 1 per cent in diameter having a surface at least as wide as the tyre tread.
 - 2.2. Apply to the test axle a series of test loads expressed in per cent of the load indicated, in Annex 4 to this Regulation, opposite the load index engraved on the sidewall of the tyre, in accordance with the test programme below. Where the tyre has load-capacity indices for both single and twinned utilization, the reference load for single utilization shall be taken as the basis for the test loads.
 - 2.2.1. In the case of tyres with a speed category symbol above P, test procedures are as specified in paragraph 3.
 - 2.2.2. For all other tyre types, the endurance test programme is shown in Appendix 1 to this annex.
 - 2.3. The tyre pressure must not be corrected throughout the test and the test load must be kept constant throughout each of the three test stages.
 - 2.4. During the test the temperature in the test-room must be maintained at between 20 °C and 30 °C or at a higher temperature if the manufacturer so agrees.
 - 2.5. The endurance-test programme shall be carried out without interruption.
3. Load/speed test programme for tyre with speed category symbol Q and above
 - 3.1. This programme applies to:
 - 3.1.1. All tyres marked with load capacity index in single 121 or less.
 - 3.1.2. Tyres marked with load capacity index in single 122 and above and with the additional marking "C", or "LT", referred to in paragraph 3.1.13. of this Regulation.
 - 3.2. Load placed on the wheel as a percentage of the load corresponding to the load index:

- 3.2.1. 90 per cent when tested on a test drum 1.70 m ∇ 1 per cent in diameter;
- 3.2.2. 92 per cent when tested on a test drum 2.0 m ∇ 1 per cent in diameter.
- 3.3. Initial test speed: speed corresponding to the speed category symbol less 20 km/h;
 - 3.3.1. Time to reach the initial test speed 10 min.
 - 3.3.2. Duration of the first step = 10 min.
- 3.4. Second test speed: speed corresponding to the speed category symbol less 10 km/h;
 - 3.4.1. Duration of the second step = 10 min.
- 3.5. Final test speed: speed corresponding to the speed category symbol:
- 3.5.1. Duration of the final step = 30 min.
- 3.6. Total test duration: 1 h.
- 4. Equivalent test methods
If a method other than that described in paragraph 2. above is used, its equivalence must be demonstrated.

Annex 7 - Appendix 1

Endurance-test programme

Load index	Tyre speed category symbol	Test-drum speed		Load placed on the wheel as a percentage of the load corresponding to the load index		
		Radial-ply km.h ⁻¹	Diagonal (bias-ply) km.h ⁻¹	7 h.	16 h.	24 h.
122 or more	F	32	32	66 %	84 %	101 %
	G	40	32			
	J	48	40			
	K	56	48			
	L	64	-			
	M	72	-			
121 or less	F	32	32	<u>70 %</u>	<u>88 %</u>	106 %
	G	40	40			
	J	48	48	<u>4 h.</u>	<u>6 h.</u>	114 %
	K	56	56			
	L	64	56	75 %	97 %	114 %
	M	80	64	75 %	97 %	114 %
	N	88	-	75 %	97 %	114 %
	P	96	-	75 %	97 %	114 %

Notes:

- (1) "Special-use" tyres (see paragraph 2.1.3. of this regulation) should be tested at a speed equal to 85 per cent of the speed prescribed for equivalent normal tyres.
- (2) Tyres with load index 122 or more, speed category symbols N or P and the additional marking "LT", or "C", referred to in paragraph 3.1.13. of this regulation, shall be tested with the same programme as specified in the above table for tyres with load index 121 or less.

Annex 7 - Appendix 2

Relation between the pressure index and the units of pressure

<i>Pressure Index ("PSI")</i>	<i>Bar</i>	<i>kPa</i>
20	1.4	140
25	1.7	170
30	2.1	210
35	2.4	240
40	2.8	280
45	3.1	310
50	3.4	340
55	3.8	380
60	4.1	410
65	4.5	450
70	4.8	480
75	5.2	520
80	5.5	550
85	5.9	590
90	6.2	620
95	6.6	660
100	6.9	690
105	7.2	720
110	7.6	760
115	7.9	790
120	8.3	830
125	8.6	860
130	9.0	900
135	9.3	930
140	9.7	970
145	10.0	1000
150	10.3	1030
...

Annex 8

Variation of load capacity with speed commercial vehicles tyres - Radial and diagonal

(See paras. 2.27. and 2.29.)

<i>Variation of load capacity (per cent)</i>										
<i>Speed (km/h)</i>	<i>All load indices</i>				<i>Load indices ≥ 122¹</i>		<i>Load indices ≤ 121¹</i>			
	<i>Speed category symbol</i>				<i>Speed category symbol</i>		<i>Speed category symbol</i>			
	F	G	J	K	L	M	L	M	N	P ²
0	+150	+150	+150	+150	+150	+150	+110	+110	+110	+110
5	+110	+110	+110	+110	+110	+110	+90	+90	+90	+90
10	+80	+80	+80	+80	+80	+80	+75	+75	+75	+75
15	+65	+65	+65	+65	+65	+65	+60	+60	+60	+60
20	+50	+50	+50	+50	+50	+50	+50	+50	+50	+50
25	+35	+35	+35	+35	+35	+35	+42	+42	+42	+42
30	+25	+25	+25	+25	+25	+25	+35	+35	+35	+35
35	+19	+19	+19	+19	+19	+19	+29	+29	+29	+29
40	+15	+15	+15	+15	+15	+15	+25	+25	+25	+25
45	+13	+13	+13	+13	+13	+13	+22	+22	+22	+22
50	+12	+12	+12	+12	+12	+12	+20	+20	+20	+20
55	+11	+11	+11	+11	+11	+11	+17.5	+17.5	+17.5	+17.5
60	+10	+10	+10	+10	+10	+10	+15.0	+15.0	+15.0	+15.0
65	+7.5	+8.5	+8.5	+8.5	+8.5	+8.5	+13.5	+13.5	+13.5	+13.5
70	+5.0	+7.0	+7.0	+7.0	+7.0	+7.0	+12.5	+12.5	+12.5	+12.5
75	+2.5	+5.5	+5.5	+5.5	+5.5	+5.5	+11.0	+11.0	+11.0	+11.0
80	0	+4.0	+4.0	+4.0	+4.0	+4.0	+10.0	+10.0	+10.0	+10.0
85	-3	+2.0	+3.0	+3.0	+3.0	+3.0	+8.5	+8.5	+8.5	+8.5
90	-6	0	+2.0	+2.0	+2.0	+2.0	+7.5	+7.5	+7.5	+7.5
95	-10	-2.5	+1.0	+1.0	+1.0	+1.0	+6.5	+6.5	+6.5	+6.5
100	-15	-5	0	0	0	0	+5.0	+5.0	+5.0	+5.0
105		-8	-2	0	0	0	+3.75	+3.75	+3.75	+3.75
110		-13	-4	0	0	0	+2.5	+2.5	+2.5	+2.5
115			-7	-3	0	0	+1.25	+1.25	+1.25	+1.25
120			-12	-7	0	0	0	0	0	0
125						0	-2.5	0	0	0
130						0	-5.0	0	0	0
135							-7.5	-2.5	0	0
140							-10	-5	0	0

<i>Variation of load capacity (per cent)</i>										
<i>Speed (km/h)</i>	<i>All load indices</i>				<i>Load indices $\geq 122^1$</i>		<i>Load indices $\leq 121^1$</i>			
	<i>Speed category symbol</i>				<i>Speed category symbol</i>		<i>Speed category symbol</i>			
145								-7.5	-2.5	0
150								-10.0	-5.0	0
155									-7.5	-2.5
160									-10.0	-5.0

¹ The load capacity indices refer to a single operation.

² Load variations are not allowed for speeds above 160 km/h. For speed category symbols "Q" and above the speed category corresponding to the speed category symbol (see paragraph 2.28.2.) specifies the maximum speed permitted for the tyre.

Annex 9

Communication

Upgrade of service description for the purposes of retreading in accordance with Regulation No. 109

(Maximum format: A4 [210 x 297mm])

Issued by (Name and address of tyre manufacturer):

Declaration:

The tyre corresponding to the following details has been approved to operate at a higher service description than that of the tyre originally approved. It is therefore permitted, subject to any limitations given in paragraph 4.1.1. below, for a tyre bearing the original service description and approval number, to be retreaded to the upgraded service description.

It is also agreed that this information may be released by an approval authority to any retreading production unit that is approved in accordance with Regulation No. 109.

1. Manufacturer's name or trade mark on the tyre:
2. Manufacturer's tyre type, model or design designation:
3. Tyre-size designation:
- 3.1. Category of use (Normal, Snow or Special):
4. Service description
 - 4.1. Original tyre:
 - Approval No. pursuant to Regulation No. 54.
- Granted by:
- 4.1.1. Where applicable, the production plant in which tyres suitable for upgrading were produced, the production periods concerned, and the means of identifying either or both of these issues:

- 4.2. Upgraded tyre:
 - Approval No. pursuant to Regulation No. 54.
 - Granted by:
 - 5. Authorized by (tyre manufacturer’s representative):
 - 5.1. Name (Block capitals):
 - 5.2. Department:
 - 5.3. Signature:
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