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Global Registry

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Addendum 16: United Nations Global Technical Regulation No. 16

United Nations Global Technical Regulation on Tyres

Amendment 2 – Appendix 1

(Established in the Global Registry on 24 June 2020)

Proposal and report pursuant to Article 6, paragraph 6.2.7., of the Agreement

- Proposal to develop Amendment 2 to UN GTR No. 16 (Tyres) (ECE/TRANS/WP.29/AC.3/48).
- Technical report on the development of Amendment 2 to UN GTR No. 16 (Tyres) (ECE/TRANS/WP.29/2020/42).



UNITED NATIONS

Authorization to develop Amendment 2 to UN Global Technical Regulation No. 16 (Tyres)

I. Objective

1. The objective of this proposal is to develop, in the framework of the 1998 Agreement, an amendment to UN Global Technical Regulation (UN GTR) No. 16 on tyres aimed at further harmonization of its provisions and adaptation of UN GTR No. 16 to the technical progress.

II. Background

2. UN GTR No. 16 on tyres was established in the Global Registry on 13 November 2014. The informal working group on the Tyre GTR was challenged by reaching harmonization of technical provisions making those acceptable both for type approval and self-certification compliance assessment systems.

3. The draft Amendment No. 1 to UN GTR No. 16, subject to consideration and vote by AC.3 at its November 2016 session, was developed with the purpose of its adaptation to the technical progress by including the newly developed provisions to wet grip performance, rolling resistance and qualification for use at severe snow conditions both for passenger car (PC) and light truck / commercial (LT/C) tyres, recently adopted within UN Regulation No. 117.

4. In the initial version of UN GTR No. 16, the harmonized requirements apply only to tyres for passenger cars. The following table describes the non-harmonized tests applicable to LT/C tyres (para. 23 of Part I of UN GTR No. 16).

<i>LT/C tyres</i>	<i>C type tyres</i>	<i>LT type tyres</i>
<i>Test name</i>	<i>Paragraphs related to Regulation No. 54</i>	<i>Paragraphs related to FMVSS 139</i>
Marking and tread wear indicators	3.2., 3.3. and 3.4.	3.2., 3.3. and 3.4.
Physical dimensions	3.21.	3.20.
High speed test	3.16.	3.19.
Endurance test	3.16.	3.17.
Low pressure test	None	3.18.
Wet grip test	None	None
Run flat test	None	None
Strength test	None	3.14.
Bead unseating test	None	3.15.
Rolling sound emissions	3.8.	None

5. The Amendment No. 2 to UN GTR No. 16 addresses the harmonization of Physical Dimensions Test ("phase 2A") and High Speed Test ("phase 2B").

6. The Amendment No. 2 to UN GTR No. 16 will also cover the most recent updates of UN Regulations Nos. 30 and 54 as well as FMVSS of the United States.

7. The Government of the Russian Federation with reference to the statement made at the 165th WP.29 session in March 2015 (ECE/TRANS/WP.29/1114, para. 39) assumes the duties of the technical sponsor and will lead the development of the Amendment No. 2 to UN GTR No. 16.

II. Subject of the amendment

8. The Amendment No. 2 to UN GTR No. 16 shall include amendment of Part II - Text of the global technical regulation:

- (a) Addition of new definitions (Section 2);
- (b) Harmonization of the Load Range concept in relationship to Inflation Pressure (Section 2);
- (c) Alignment of the provisions for tyre marking and physical dimensions of PC tyres with the most recent developments in UN Regulations Nos. 30 and 54 (Sections 3.3 and 3.5);
- (d) Harmonization of FMVSS 139 requirements relative to UNECE PSI index (Sections 3.14 and 3.15);
- (e) Deletion of provisions for physical dimensions of LT/C tyres based on FMVSS 139 (Section 3.20) an UN Regulation No. 54 (Section 3.21) and addition of new harmonized provisions for physical dimensions of LT/C tyres (new Section 3.20);
- (f) Deletion of provisions for high speed test for LT/C tyres based on FMVSS 139 (Section 3.19) and UN Regulation No. 54 (Section 3.16) and addition of new harmonized provisions for high speed test for LT/C tyres (new Section 3.16);
- (g) Updates of the Annexes 3 and 6 with regard to the most recent developments in UN Regulations Nos. 30 and 54.

9. Other topics to be discussed within the informal working group for the Phase 2 of development of UN GTR No. 16

- (a) Consideration of feasibility of harmonization of endurance test for LT/C tyres (Sections 3.16 and 3.17);
- (b) Consideration of feasibility of development of provisions for global tyre marking.

IV. Organization of process and timeline

10. For the development of the Amendment No. 2 to UN GTR No. 16 the informal working group (IWG) as a sub group of GRRF will be established. For practical reasons this IWG shall be considered as the reinstated IWG on Tyre GTR. The Terms of Reference and the Rules of Procedure of this IWG were endorsed by GRRF at its 82nd session on September 2016. The IWG meetings primarily shall be organized in conjunction with the GRRF regular sessions. The IWG will be chaired by the UN GTR No. 16 technical sponsor (Russian Federation). ETRTO will act as a Secretary.

11. The proposed action plan:

- (a) January 2017: Introduction and consideration of the proposal for phase 2A at the eighty-third GRRF session as an informal document;
- (b) September 2017: Introduction and consideration of the proposal for phase 2B at the eighty-fourth GRRF session as an informal document;
- (c) February 2018: Submitting to the GRRF the consolidated working document. Consideration of remaining issues (if any) at the eighty-fifth GRRF session;
- (d) June 2018: Adoption of the proposal by AC.3, if no remaining issues had existed;
- (e) November 2018: Adoption of the proposal by AC.3, if all remaining issues had been solved.

12. The progress of works will be reported to AC.3 at its sessions in 2017 and 2018.

Technical report for Amendment No. 2 to UN GTR No. 16 (Tyres)

I. Introduction

1. The Executive Committee for the 1998 Agreement (AC.3), at its forty-eighth session in March 2017, adopted ECE/TRANS/WP.29/2017/52 tabled by the Russian Federation to request authorization to start work on developing Amendment No. 2 to UN GTR No. 16 (ECE/TRANS/WP.29/1129, para. 153). After the adoption, this document was assigned reference number ECE/TRANS/WP.29/AC.3/48.
2. The Government of the Russian Federation assumed the duties of the technical sponsor for the development of draft Amendment No. 2 to UN GTR No. 16. The European Tyre and Rim Technical Organisation (ETRTO), in cooperation with other tyre manufacturers' associations, agreed to work on that development.
3. The Working Party on Brakes and Running Gear (GRRF), at its eighty-second session in September 2016, endorsed the establishment (reinstating) the Informal Working Group (IWG Tyre GTR) dealing with development of Amendment No. 2 to UN GTR No. 16 and consideration of issues addressed to possible further developments of UN GTR No. 16, in particular, feasibility of harmonization of endurance test for LT/C tyres and introduction of global tyre marking. The expert from the Russian Federation proposed his leadership to develop this amendment and volunteered to request the authorization to develop Amendment No. 2 to UN GTR No. 16 from AC.3 (ECE/TRANS/WP.29/GRRF/82, para. 28).
4. At its nineteenth meeting, IWG Tyre GTR acknowledged and agreed that, following the decision by World Forum for Harmonization of Vehicle Regulations (WP.29) at its 175th session to reallocate the tasks related to tyres from the former GRRF to the Working Party on Noise and Tyres (GRBP), IWG Tyre GTR would become a subgroup of GRBP.

II. Development of the Amendment No. 2 to UN GTR No. 16

5. IWG Tyre GTR executed the development of Amendment No. 2 to UN GTR No. 16 in accordance with the authorization adopted by AC.3 (ECE/TRANS/WP.29/AC.3/48).
6. The subject of Amendment No. 2 was preliminary considered at the fifteenth IWG Tyre GTR meeting in January 2017, where the preliminary proposals by the industry with regard to harmonization of the physical dimensions of LT/C tyres and the load range assignment based on the inflation pressure corresponding to the maximum load rating were discussed.
7. The case-by-case consideration of the relevant proposed amendments to UN GTR No. 16 text started at the sixteenth IWG Tyre GTR meeting held in Moscow in June 2017. During discussions on the proposed amendments regarding to harmonization of the physical dimensions, the tyre industry identified incompatibilities in some cases regarding the UN Regulations and the United States of America Federal Vehicle Motor Vehicle Safety Standards (FMVSS), which have to be addressed in the harmonized GTR text. Moreover, the assessment of FMVSS 139 High Speed test versus the UN Regulation No. 54 Load/Speed test made by the tyre industry indicated uncertainty in terms of severity of test methods for tyres with 'R' and 'S' speed symbols. Therefore, IWG Tyre GTR decided on extending its mandate for two years (until November 2019) in order to give the tyre industry a possibility of confirming the initial results on the High Speed harmonized test method. GRRF, at its eighty-fourth session in September 2017 supported this request, which was further the subject of consent by AC.3 at its fiftieth session in November 2017.
8. At its next seventeenth meeting held in November 2017 in Brussels, IWG Tyre GTR made significant progress towards resolving incompatibilities in the UN Regulations and US FMVSS standards. The industry introduced a high speed test program proposal in order to clarify the test method for tyres with 'R' and 'S' speed symbols, with the aim to present the

results to the eighty-seventh GRRF session in September 2018. This proposal was endorsed by IWG Tyre GTR as follows:

- (a) Program 1: Assess the current UN Regulation No. 54 test at 25 °C vs FMVSS 139 test at 38 °C with steps above limits (SAL) (+5 km/h/10') applying from the current limit:
 - (i) 30' at speed corresponding to speed category symbol for UN Regulation No. 54 Load/Speed test;
 - (ii) 30' at 160 km/h for FMVSS 139 High Speed test;
- (b) Program 2: Same as Program 1, but UN Regulation No. 54 test to be made more severe by increasing test temperature to 38 °C;
- (c) Program 3: UN Regulation No. 54 test to be made more severe by increasing test temperature to 38 °C, and SAL applying from:
 - (i) 60' at speed corresponding to speed category symbol for UN Regulation No. 54 Load/Speed test;
 - (ii) 30' at 160 km/h for FMVSS 139 High Speed test.

9. At the following eighteenth meeting held in Ottawa in June 2018, IWG Tyre GTR endorsed adding new harmonized provisions for the physical dimensions of LT/C tyres in the new Section 3.5 (old Sections 3.20 & 3.21 to be deleted). The provisions were subdivided in the following three categories:

- (a) Physical dimension for metric sizes (excluding all sizes listed in Annex 6) – Most stringent requirements from FMVSS 139/UN Regulation No. 54 retained;
- (b) Physical dimension for high flotation sizes (excluding all sizes listed in Annex 6) approved at the eighty-sixth GRRF session and adopted by the Administrative Committee for the 1958 Agreement (AC.1) at its June 2018 session (ECE/TRANS/WP.29/2018/55);
- (c) Physical dimension for sizes listed in Annex 6 (Legacy).

10. At the same meeting, the tyre industry presented to IWG the technical assessment and proposal for a harmonized high speed test, which was introduced in the new Section 3.6 (old Sections 3.16 & 3.19 to be deleted). The proposed text was endorsed by IWG Tyre GTR at its nineteenth session held in Geneva in September 2018.

11. At the same meeting, IWG Tyre GTR agreed with the industry opinion that due to the high complexity in harmonizing the endurance test for the LT/C tyres, the proposal would be to keep the tests non-harmonized for the time being. However, the both tests were represented in one Section 3.9 as two different tests based on the provisions of FMVSS 139 and UN Regulation No. 54 in the sub-sections 3.9.1 and 3.9.2 respectively. This Section is reserved for a future harmonized endurance test. It currently contains two non-harmonized endurance tests. When transposing the provisions of this Regulation to the national/regional legislation, Contracting Parties wishing to include this kind of test are encouraged to review the sub-sections 3.9.1 and 3.9.2.

12. IWG Tyre GTR mandated the expert from the Russian Federation to introduce the concept for global tyre marking at the eighty-sixth GRRF session in February 2018. At that GRRF session, the Chair of IWG Tyre GTR introduced a memorandum on a "global marking for tyres". He invited the Contracting Parties to the 1998 Agreement to review this memorandum and assess, whether the approach for tyre global marking in UN GTR No. 16 could be supported and whether it would be feasible to recognize a global tyre marking as an alternative to the existing national/regional tyre marking. The Chair invited GRRF delegates to respond to the memorandum. Meanwhile the tyre industry assessed of the today's situation on tyres bearing four marks (DOT, E, CCC and ISI) and two marks (DOT and E). Depending on the approach to the market research, its results indicated that 7.7 per cent of stock keeping units bear the four aforesaid marks and 43 per cent of those bear both DOT and E marks, which is a considerable amount. Those tyres may be considered as candidates for a global mark, if it were introduced. The industry has assessed the situation and estimated the potential benefit of introduction of a global mark. Further impact assessment on the introduction of a global marking would be needed.

13. In parallel, IWG Tyre GTR at its sixteenth meeting started identifying divergences between the current version of UN GTR No. 16 and China tyre regulations, with the significant help of the Chinese experts. IWG Tyre GTR agreed that the relevant text containing alternative level of requirements, as proposed by China, may be included in UN GTR No. 16 as per Article 4.2 of the 1998 Agreement subject to the appropriate case-by-case consideration. GRRF, at its 84th session, welcomed both the engagement of China in the work on UN GTR No. 16 and the remarkable amount of work done to consider the Chinese national regulations.

14. IWG Tyre GTR also considered the number of proposals made by China and India aimed at harmonization of the provisions of its domestic legislation with those of UN GTR No. 16 as follows:

(a) A proposal by China to use relations between the load range and ply rating is considered as obsolete and should be replaced by load index for LT/C tyres. The industry prepared a table showing the relation between the load range and ply rating. This table is added to Part A of GTR (technical rationale);

(b) A proposal by China in regards to paragraph 3.4., for reduction of the number of tread wear indicators, will be reflected in Part A of GTR (technical rationale) indicating that Contracting Parties do not have to transpose in their national law the entire GTR text;

(c) In paragraph 3.7 "Strength test", where the GTR requirements are indicated as general requirements, India specific requirements for rim diameter codes 13 and below became part of the revised table of requirements. The provisions in UN GTR No. 16 are based on US standards that are currently undergoing a review. Therefore, IWG Tyre GTR developed compromise language in Amendment No. 2;

(d) IWG Tyre GTR evaluated a proposal made by India to include additional minimum breaking energy values in the strength test (3.7) for small diameter tyres. IWG Tyre GTR verified that the values for small diameter tubeless radial tyres are included in the UN GTR No. 16 text;

(e) China proposal for a new paragraph 3.16.1. "Requirements for High-Speed test" were considered together with the new provisions for the harmonized high speed test. Current China requirement is to adopt UN Regulation No. 54 type High speed test for all tyres. It was confirmed that China proposal for High speed test for LT/C tyres is less stringent than the harmonized High speed test for LT/C tyres;

(f) The new Annex 11 was introduced in a table format including the requirements for test equipment based on the proposal by China;

(g) Considering the outcome of the China assessment of the required and optional tyre markings, the reference table was added to Part A of GTR (technical rationale) with the clarification that Contracting Parties may keep optional markings in their national regulations; and

(h) A new paragraph 1.2.(e) was introduced that some Class C3 tyres with Load Index between 122 and 131 that contain "LT" or "C" in the size designation were possibly equipped on a vehicle with a gross vehicle mass of 4,536 kg or less.

15. IWG Tyre GTR discussed whether to remove the publication year of the American Society for Testing and Materials (ASTM) standards for the various standard reference test tyre (SRTT) standards. IWG Tyre GTR reviewed the detailed and rigorous quality assurance and control measures in place to assure that SRTT performance remains consistent. In addition, IWG Tyre GTR noted that the revision year is not included on the sidewall of any SRTT. IWG Tyre GTR agreed to remove the revision years from the ASTM SRTT standards listed in 2.77 but recognized that a Contracting Party may choose to include a revision year in its national regulations even though it may be difficult or impossible to obtain and impossible to verify a SRTT from a previous revision year.

16. The nineteenth IWG Tyre GTR meeting acknowledged the completion of research on the subject of Amendment No. 2 to UN GTR No. 16 and addressed the preparation of the final text of draft Amendment No. 2, the Statement on Technical Rationale and Justification

and the Technical Report. This activity was continued at the twentieth, twenty-first, twenty-second and twenty-third IWG Tyre GTR meetings.

17. Finally, the UN GTR text was restructured to reflect on the harmonized requirements and merge similar test procedures in the same sections. The new structure of the administrative and technical provisions is represented in the table below.

<i>Test name</i>	<i>Harmonized</i>		<i>Not harmonized</i>
	<i>Passenger car tyres</i>	<i>LT/C type tyres</i>	<i>LT/C type tyres</i>
3.1. Plant codes	3.1.		-
3.2. Marking	3.2.		-
3.3. Other sidewall marking	3.3.		-
3.4. Tread wear indicators	3.4.		-
3.5. Physical dimensions	3.5.1.	3.5.2.	-
3.6. High speed performance test	3.6.1.	3.6.2.	-
3.7. Strength test	3.7.1.	3.7.2.	-
3.8. Bead unseating resistance test for tubeless tyres	3.8.1.	3.8.2.	-
3.9. Endurance tests	3.9.1.	-	3.9.2. 3.9.2.1. Endurance and Low inflation pressure performance test from FMVSS139 3.9.2.2. Endurance test from UN Regulation No. 54
3.10. Flat tyre running mode test	3.10.1.	-	-
3.11. Tyre rolling sound emission test	3.11.		-
3.12. Test for adhesion performance on wet surfaces	3.12.		-
3.13. Tyre rolling resistance test	3.13.		-
3.14. Snow performance test relative to snow tyre for use in severe snow conditions	3.14.		-

18. The interim results of IWG Tyre GTR work were reported to the eighty-third, eighty-fourth and eighty-sixth GRRF sessions, sixty-eighth, sixty-ninth and seventieth GRBP sessions and to the forty-ninth, fiftieth, fifty-first, fifty-second, fifty-third, fifty-fourth, fifty-fifth, fifty-sixth and fifty-seventh AC.3 sessions.

19. GRBP, at its seventieth session, adopted the working documents on Amendment No. 2 to UN GTR No. 16 and the final report on Phase 2 on the development of UN GTR No. 16, subject to consideration by WP.29 and AC.3 at their sessions on March 2020.

III. Future work

20. IWG Tyre GTR acknowledged that it is necessary to include in UN GTR No. 16 the provisions related to North American all-season tyres, following additional evaluation of the adhesion performance on wet surfaces; a future additional category of use might be necessary for certain tyre types typical in the North American market. These provisions could be developed in a further amendment to UN GTR No. 16.

21. The tubeless tyre bead unseating resistance test for passenger car tyres is also under review by the US National Highway Traffic Safety Administration (NHTSA). If NHTSA had amended or eliminated the requirements, the UN GTR No. 16 should be amended at that time.

22. IWG Tyre GTR recommended that UN Regulations No. 30 and No. 54 be amended to remove the maximum outer growth diameter requirements for radial tyres that have completed the high speed test and the load/speed endurance test. These provisions have been incorporated in the UN GTR No. 16. If those provisions were removed from UN Regulations No. 30 and No. 54, the similar provisions should be removed from the UN GTR No. 16 as well in a future amendment.

23. The informal working group recommended that potential future amendments be considered pursuant to articles 6.3 and 6.4 of the 1998 Agreement when Regulations in the Compendium of Candidates are amended.

IV. Conclusion

24. Following the adoption of the draft Amendment No. 2 to UN GTR No. 16 at its seventieth session, GRBP requested AC.3 voting for establishing this Amendment No. 2 (ECE/TRANS/WP.29/2020/41) in the Global Registry.
