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Informal Document GRB-56-19
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**GRB Proposal for amendments to ECE/TRANS/WP.29/2012/54
Proposal for Supplement 2 to the 02 series of amendments to
Regulation No. 117 (Tyres - Rolling resistance, rolling noise and
wet grip)**

The text reproduced below was adopted by the Working Party on Brakes and Running Gear (GRRF) at its seventy-second session in order to add specific performance requirements for C2 snow Tyres. It is based on ECE/TRANS/WP.29/GRRF/2011/29, ECE/TRANS/WP.29/GRRF/2012/10 and on GRRF-72-13, as reproduced in Annex VII to the report (ECE/TRANS/WP.29/GRRF/72, paras. 25, 32 and 34). It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Administrative Committee (AC.1) for consideration.

The document ECE/TRANS/WP.29/2012/54 has been reviewed by GRB during its recent 56th session, held on 3-5 September 2012. The modifications proposed by GRB are marked in red or strikethrough characters.

Title of the Regulation on pages 1 and 3, amend to read:

"Uniform Provisions concerning the Approval of Tyres with regard to Rolling Sound Emissions and/or to Adhesion on Wet Surfaces and/or to Rolling Resistance"

The list of contents, the title of Annex I on page 1, amend to read:

"Communication concerning the approval or extension or refusal or withdrawal of approval or production definitely discontinued of a type of tyre with regard to "rolling sound emission level" and/or "adhesion performance on wet surfaces" and/or to "rolling resistance" pursuant to Regulation No. 117"

The list of contents, the list of Annexes, amend the entry for Annex 7, to read:

"7. Procedures for snow performance testing relative to snow tyre for use in severe snow conditions 74"

Paragraph 2.5., amend to read:

"2.5. "Representative tyre size" means the tyre size which is submitted to the test described in Annex 3 to this Regulation with regard to rolling sound emissions, or Annex 5 for adhesion on wet surfaces or Annex 6 for rolling resistance to assess the conformity for the Type Approval of the type of tyre, or Annex 7 for use in severe snow conditions."

Paragraph 2.11., amend to read:

"2.11. "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."

Insert a new paragraph 2.11.1., to read

"2.11.1. "Snow tyre for use in severe snow conditions": means a snow tyre whose tread pattern, tread compound or structure is specifically designed to be used in severe snow conditions and that fulfils the requirements of paragraph 6.4."

Paragraph 2.16., amend to read:

"2.16. "Standard reference test tyre" (SRTT) means a tyre that is produced, controlled and stored in accordance with the ASTM (American Society for Testing and Materials) standards

(a) E1136-93 (2003) for the size P195/75R14.

(b) F2872 (2011) for the size 225/75 R 16 C."

Paragraph 2.17., amend to read:

"2.17. Wet Grip or Snow Grip measurements – Specific definitions"

Paragraph 2.17.3., amend to read:

"2.17.3. "Control tyre" means a normal production tyre that is used to establish the wet grip or snow grip performance of tyre sizes unable to be fitted to the same vehicle as the standard reference test tyre – see paragraph 2.2.2.15. of Annex 5 and paragraph 3.4.3. of Annex 7 to this Regulation."

Insert a new paragraph 2.17.5., to read:

"2.17.5. "Snow grip index ("SG")" means the ratio between the performance of the candidate tyre and the performance of the standard reference test tyre."

Paragraphs 2.17.5. to 2.17.7. (former), renumber as paragraphs 2.17.6. to 2.17.8.

Paragraph 3.1.1., amend to read:

"3.1.1. The performance characteristics to be assessed for the tyre type; "rolling sound emissions level" and/or "adhesion performance level on wet surfaces" and/or "rolling resistance level". Tyre "snow performance level" in cases of "snow tyre for use in severe snow conditions";"

Paragraph 4.2.5., amend to read:

"4.2.5. The inscription "TRACTION"¹¹ if the tyre is classified as "traction tyre";"

Paragraph 4.2.6., ~~amend to read: shall be deleted~~

~~"4.2.6. The inscription "M+S" or "M.S" or "M&S" if the tyre is classified in the category of use "snow tyre"."~~

Insert a new paragraph 4.2.6.~~4~~, to read:

"4.2.6.~~4~~ The "Alpine" symbol ("3-peak-mountain with snowflake" conforming to the symbol described in Annex 7 Appendix 1) ~~shall~~ ~~may~~ be added if the snow tyre is classified as "snow tyre for use in severe snow conditions"."

Paragraph 4.2.7. shall be deleted

Paragraph 4.2.8. (former), renumber as paragraph 4.2.7.

Paragraph 6.1.1, the table, amend to read:

"6.1.1.

Stage 2	
Nominal Section Width	Limit dB(A)
185 and lower	70
Over 185 up to 245	71
Over 245 up to 275	72
Over 275	74
The above limits shall be increased by 1 dB(A) for "snow tyre for use in severe snow conditions", extra load tyres or reinforced tyres, or any combination of these classifications.	

Paragraph 6.1.2, the tables, amend to read (include removing of the footnote *):

"6.1.2.

<i>Stage 1</i>	
<i>Category of use</i>	<i>Limit dB(A)</i>
Normal tyre	75
Snow tyre	77
Special use tyre	78

<i>Stage 2</i>			
<i>Category of use</i>		<i>Limit dB(A)</i>	
		<i>Other</i>	<i>Traction Tyres</i>
Normal tyre		72	73
Snow tyre		72	73
	Snow tyre for use in severe snow conditions	73	75
Special use tyre		74	75

Paragraph 6.1.3, the tables, amend to read (include removing of the footnote *):

"6.1.3.

<i>Stage 1</i>	
<i>Category of use</i>	<i>Limit dB(A)</i>
Normal tyre	76
Snow tyre	78
Special use tyre	79

<i>Stage 2</i>			
<i>Category of use</i>		<i>Limit dB(A)</i>	
		<i>Other</i>	<i>Traction tyres</i>
Normal tyre		73	75
Snow tyre		73	75
	Snow tyre for use in severe snow conditions	74	76
Special use tyre		75	77

Paragraph 6.2.1, the table, amend to read:

"6.2.1.

<i>Category of use</i>		<i>Wet grip index (G)</i>
Normal tyre		≥ 1.1
Snow tyre		≥ 1.1
	"Snow tyre for use in severe snow conditions" and with a speed symbol ("R" and above, including "H") indicating a maximum permissible speed greater than 160 km/h	≥ 1.0
	"Snow tyre for use in severe snow conditions" and with a speed symbol ("Q" or below excluding "H") indicating a maximum permissible speed not greater than 160 km/h	≥ 0.9
Special use tyre		Not defined

"

Paragraphs 6.3.1. and 6.3.2., the tables, amend to read:

"6.3.1. The maximum values for stage 1 for the rolling resistance coefficient shall not exceed the following (value in N/kN is equivalent to value in kg/tonne):

<i>Tyre class</i>	<i>Max value (N/kN)</i>
C1	12.0
C2	10.5
C3	8.0
For "snow tyre for use in severe snow conditions", the limits shall be increased by 1 N/kN.	

6.3.2. The maximum values for stage 2 for the rolling resistance coefficient shall not exceed the following (value in N/kN is equivalent to value in kg/tonne):

<i>Tyre class</i>	<i>Max value (N/kN)</i>
C1	10.5
C2	9.0
C3	6.5
For "snow tyre for use in severe snow conditions", the limits shall be increased by 1 N/kN.	

"

Paragraph 6.4., amend to read:

"6.4. In order to be classified as a "snow tyre for use in severe snow conditions" the tyre shall meet the performance requirements of paragraph 6.4.1. The tyre shall meet these requirements based on a test method of Annex 7 by which:

.....

of the candidate tyre is compared to that of a standard reference tyre.

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

Paragraph 6.4.1.1., amend to read:

"6.4.1.1. Class C1 and C2 tyres

The minimum snow index value, as calculated in the procedure described in Annex 7 and compared with the SRTT shall be as follows:

Class of tyre	Snow grip index (brake on snow method) ^(a)		Snow grip index (spin traction method) ^(b)
	Ref. = C1 – SRTT 14	Ref. = C2 – SRTT 16C	Ref. = C1 – SRTT 14
C1	1.07	No	1.10
C2	No	1.02	1.10

^(a) See paragraph 3 of Annex 7 to this Regulation

^(b) See paragraph 2 of Annex 7 to this Regulation"

Annex 1, footnote 7 of paragraph 14.1., amend to read:

"14.1. A list of documents in the approval file deposited at the Administration services having delivered the approval and which can be obtained upon request⁷.

⁷ In the case of "snow tyre for use in severe snow conditions" a test report according to Appendix 2 of Annex 7 shall be submitted."

Annex 5, paragraph 2.2.2.15.1., amend to read:

"2.2.2.15.1. The wet grip index of the control tyre relative to the SRTT (G1) and of the candidate tyre relative to the control tyre (G2) shall be established using the procedure in paragraphs 2.2.2.1 to 2.2.2.14."

Annex 5, paragraph 2.2.2.15.5., amend to read:

"2.2.2.15.5. The SRTT and control tyres shall be discarded if there is irregular wear or damage or when the performance appears to have been deteriorated."

Annex 7, the title, amend to read:

"Procedures for snow performance testing relative to snow tyre for use in severe snow conditions"

Annex 7, paragraph 1., amend to read:

"1. Specific definitions for snow test when different from existing ones"

Annex 7, paragraph 2., amend to read:

- "2. Spin traction method for Class C1 and C2 tyres (traction force test per paragraph 6.4 (b))"

Annex 7, paragraph 3., amend to read:

- "3. Braking on snow method for Class C1 and C2 tyres"

Annex 7, paragraph 3.1.1., amend to read (footnote 1 remains unchanged):

- "3.1.1. Test course

The braking tests shall be done on a flat test surface of sufficient length and width, with a maximum 2 per cent gradient, covered with packed snow.

The snow surface shall be composed of a hard packed snow base at least 3 cm thick and a surface layer of medium packed and prepared snow about 2 cm thick.

The air temperature, measured about one meter above the ground, shall be between -2 °C and -15 °C; the snow temperature, measured at a depth of about one centimetre, shall be between 4 °C and -15 °C.

It is recommended to avoid direct sunlight, large variations of sunlight or humidity, as well as wind.

The snow compaction index measured with a CTI penetrometer¹ shall be between 75 and 85.

¹ See appendix of ASTM standard F1805-06 for details."

Annex 7, paragraph 3.1.2., amend to read:

- "3.1.2. Vehicle

The test shall be conducted with a standard production vehicle in good running order and equipped with an ABS system.

The vehicle used shall be such that the loads on each wheel are appropriate to the tyres being tested. Several different tyre sizes can be tested on the same vehicle."

Annex 7, paragraph 3.1.3., amend to read and to amend numbering:

- "3.1.3. Tyres

The tyres should be "broken-in" prior to testing to remove spew, compound nodules or flashes resulting from the moulding process. The tyre surface in contact with snow shall be cleaned before performing a test.

Tyres shall be conditioned at the outdoor ambient temperature at least two hours before their mounting for tests. Tyre pressures shall then be adjusted to the values specified for the test.

In case a vehicle cannot accommodate both the reference and candidate tyres, a third tyre ("control" tyre) may be used as an intermediate. First test control vs. reference on another vehicle, then test candidate vs. control on the vehicle."

Annex 7, paragraph 3.1.4., amend to read:

"3.1.4 Load and pressure:"

Annex 7, insert new paragraphs 3.1.4.1. and 3.1.4.2., to read:

3.1.4.1. For C1 tyres, the vehicle load shall be such that the resulting loads on the tyres are between 60 per cent and 90 per cent of the load corresponding to the tyre load index.

The cold inflation pressure shall be 240 kPa.

3.1.4.2. For C2 tyres, the vehicle load shall be such that the resulting loads on the tyres are between 60 per cent and 100 per cent of the load corresponding to the tyre load index.

The static tyre load on the same axle should not differ by more than 10 per cent.

The inflation pressure is calculated to run at constant deflection:

For a vertical load higher or equal to 75 per cent of the load capacity of the tyre, a constant deflection is applied, hence the test inflation pressure "Pt" shall be calculated as follows:

$$P_t = P_r \left(\frac{Q_t}{Q_r} \right)^{1.25}$$

Qr is the maximum load associated to the load capacity index of the tyre written on the sidewall

Pr is the reference pressure corresponding to the maximum load capacity Qr

Qt is the static test load of the tyre

For a vertical load lower than 75 per cent of the load capacity of the tyre, a constant inflation pressure is applied, hence the test inflation pressure Pt shall be calculated as follows:

$$P_t = P_r (0.75)^{1.25} = (0.7)P_r$$

Pr is the reference pressure corresponding to the maximum load capacity Qr

Check the tyre pressure just prior to testing at ambient temperature."

Annex 7, paragraph 3.4.1.3., amend to read:

"3.4.1.3. The snow grip index (SG) in per cent of a candidate tyre shall be computed as:

$$\text{Snow Grip Index (candidate)} = \frac{\text{Mean (candidate)}}{wa (SRTT)} "$$

Annex 7, insert new paragraphs 3.4.3. to 3.4.3.5., to read:

- "3.4.3. In the case where the candidate tyres cannot be fitted to the same vehicle as the SRTT, for example, due to tyre size, inability to achieve required loading and so on, comparison shall be made using intermediate tyres, hereinafter referred to as "control tyres", and two different vehicles. One vehicle shall be capable of being fitted with the SRTT and the control tyre and the other vehicle shall be capable of being fitted with the control tyre and the candidate tyre.
- 3.4.3.1. The snow grip index of the control tyre relative to the SRTT (SG1) and of the candidate tyre relative to the control tyre (SG2) shall be established using the procedure in paragraphs 3.1. to 3.4.2.
- The snow grip index of the candidate tyre relative to the SRTT shall be the product of the two resulting snow grip indices that is $SG1 \times SG2$.
- 3.4.3.2. The ambient conditions shall be comparable. All tests shall be completed within the same day.
- 3.4.3.3. The same set of control tyres shall be used for comparison with the SRTT and with the candidate tyre and shall be fitted in the same wheel positions.
- 3.4.3.4. Control tyres that have been used for testing shall subsequently be stored under the same conditions as required for the SRTT.
- 3.4.3.5. The SRTT and control tyres shall be discarded if there is irregular wear or damage or when the performance appears to have been deteriorated."

Annex 7, Appendix 1, amend to read:

"Minimum 15 mm base and 15 mm height, ~~placed adjacent to the M+S inscription.~~"

Annex 7, Appendix 2,

The title, amend to read:

"Test Reports and Test Data for C1 and C2 tyres"

Paragraph 2.1., amend the table to read:

"

	<i>At start of tests</i>	<i>At end of tests</i>	<i>specification</i>
weather			
ambient temperature			-2 °C to -15 °C
snow temperature			4 °C to -15 °C
CTI index			75 to 85
other			

"

Paragraph 4.3., amend the table to read:

"

	<i>SRTT</i> (1st test)	<i>Candidate</i>	<i>Candidate</i>	<i>SRTT</i> (2nd test)
Tyre dimensions				
Test rim width code				
Tyre loads F/R (kg)				
Load index F/R (per cent)				
Tyre pressure F/R(kPa)				

"
