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**Economic Commission for Europe****Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on Noise****Sixty-ninth session**

Geneva, 22-25 January 2019

Item 7 (c) of the provisional agenda

**Tyres: UN Regulation No. 117 (Tyre rolling resistance, rolling noise and wet grip)****Proposal for a Supplement to UN Regulation No. 117****Submitted by the expert from the Netherlands\***

The text reproduced below was prepared by the expert from the Netherlands to update and amend UN Regulation No. 117. This proposal introduces two extra stages with limits (stage 3 and stage 4) for the rolling sound emission, wet grip performance and rolling resistance coefficient. Stage 2 for wet grip performance does not exist until now and is omitted intentionally in this proposal. The modifications to the existing text are marked in bold for new or strikethrough for deleted characters.

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\* In accordance with the programme of work of the Inland Transport Committee for 2018–2019 (ECE/TRANS/274, para. 123 and ECE/TRANS/2018/21/Add.1, Cluster 3), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

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Please recycle The recycling symbol, consisting of three chasing arrows forming a triangle.



## I. Proposal

Paragraph 6.1., insert three new tables marked “stage 3” and three new tables marked “stage 4”, amend to read:

"6.1. Rolling sound emission limits, as measured by the method described in Annex 3 to this Regulation.

6.1.1. For Class C1 tyres, the rolling sound emission value shall not exceed the values pertinent to the applicable stage given below. These values refer to the nominal section width as given in paragraph 2.17.1.1. of UN Regulation No. 30:

<i>Stage 1</i>	
<i>Nominal section width</i>	<i>Limit dB(A)</i>
145 and lower	72
Over 145 up to 165	73
Over 165 up to 185	74
Over 185 up to 215	75
Over 215	76

The above limits shall be increased by 1 dB(A) for extra load tyres or reinforced tyres and by 2 dB(A) for "special use tyres".

<i>Stage 2</i>	
<i>Nominal section width</i>	<i>Limit dB(A)</i>
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.

<i>Stage 3</i>	
<i>Nominal section width</i>	<i>Limit dB(A)</i>
<b>185 and lower</b>	<b>69</b>
<b>Over 185 up to 245</b>	<b>70</b>
<b>Over 245 up to 275</b>	<b>71</b>
<b>Over 275</b>	<b>73</b>

<i>Stage 4</i>	
<i>Nominal section width</i>	<i>Limit dB(A)</i>
<b>185 and lower</b>	<b>67</b>
<b>Over 185 up to 245</b>	<b>68</b>
<b>Over 245 up to 275</b>	<b>69</b>
<b>Over 275</b>	<b>71</b>

- 6.1.2. For Class C2 tyres, the rolling sound emission value with reference to its category of use (see paragraph 2.1. above) shall not exceed the values pertinent to the applicable stage given below:

<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

<i>Stage 3</i>			
<i>Category of use</i>		<i>Limit dB(A)</i>	
		<i>Other</i>	<i>Traction tyres</i>
<b>Normal tyre</b>		<b>71</b>	<b>72</b>
<b>Snow tyre</b>		<b>71</b>	<b>72</b>
	<b>Snow tyre for use in severe snow conditions</b>	<b>72</b>	<b>74</b>
<b>Special use tyre</b>		<b>73</b>	<b>74</b>

<i>Stage 4</i>			
<i>Category of use</i>		<i>Limit dB(A)</i>	
		<i>Other</i>	<i>Traction tyres</i>
<b>Normal tyre</b>		<b>70</b>	<b>71</b>
<b>Snow tyre</b>		<b>70</b>	<b>71</b>
	<b>Snow tyre for use in severe snow conditions</b>	<b>71</b>	<b>73</b>
<b>Special use tyre</b>		<b>72</b>	<b>73</b>

- 6.1.3. For Class C3 tyres, the rolling sound emission value with reference to its category of use (see paragraph 2.1. above) shall not exceed the values pertinent to the applicable stage given below:

<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

<i>Stage 3</i>			
<i>Category of use</i>		<i>Limit dB(A)</i>	
		<i>Other</i>	<i>Traction tyres</i>
<b>Normal tyre</b>		<b>71</b>	<b>73</b>
<b>Snow tyre</b>		<b>71</b>	<b>73</b>
	<b>Snow tyre for use in severe snow conditions</b>	<b>72</b>	<b>74</b>
<b>Special use tyre</b>		<b>73</b>	<b>75</b>

<i>Stage 4</i>		
<i>Category of use</i>	<i>Limit dB(A)</i>	
	<i>Other</i>	<i>Traction tyres</i>
<b>Normal tyre</b>	<b>69</b>	<b>71</b>
<b>Snow tyre</b>	<b>69</b>	<b>71</b>
	<b>Snow tyre for use in severe snow conditions</b>	<b>70</b>
<b>Special use tyre</b>	<b>71</b>	<b>73</b>

Paragraph 6.2., rename the current tables into "stage 1" and insert three new tables marked "stage 3" and three new tables marked "stage 4", amend to read:

"6.2. The wet grip performance will be based on a procedure that compares either peak brake force coefficient ("pbfc") or mean fully developed deceleration ("mfdd") against values achieved by a standard reference test tyre (SRTT). The relative performance shall be indicated by a wet grip index (G).

6.2.1. For Class C1 tyres, tested in accordance with either procedure given in Annex 5, Part (A), to this Regulation, the tyre shall meet the following requirements:

<i>Stage 1</i>		
<i>Category of use</i>		<i>Wet grip index (G)</i>
Normal tyre		$\geq 1.1$
Snow tyre		$\geq 1.1$
	"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	$\geq 1.0$
	"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	$\geq 0.9$
Special use tyre		Not defined

<i>Stage 3</i>		
<i>Category of use</i>		<i>Wet grip index (G)</i>
<b>Normal tyre</b>		$\geq 1.45$
<b>Snow tyre</b>		$\geq 1.45$
	<b>"Snow tyre for use in severe snow conditions" and with a speed symbol ("R" and above, including "H") indicating a</b>	$\geq 1.35$

<i>Stage 3</i>		
<i>Category of use</i>		<i>Wet grip index (G)</i>
	maximum permissible speed greater than 160 km/h	
	"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	≥ 1.25
Special use tyre		Not defined

<i>Stage 4</i>		
<i>Category of use</i>		<i>Wet grip index (G)</i>
Normal tyre		≥ 1.6
Snow tyre		≥ 1.6
	"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	≥ 1.5
	"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	≥ 1.4
Special use tyre		Not defined

- 6.2.2. For Class C2 tyres, tested in accordance with either procedure given in Annex 5, Part (B), to this Regulation, the tyre shall meet the following requirements:

<i>Stage 1</i>			
<i>Category of use</i>		<i>Wet grip index (G)</i>	
		<i>Other</i>	<i>Traction tyres</i>
Normal tyre		≥ 0.95	≥ 0.85
Snow tyre		≥ 0.95	≥ 0.85
	Snow tyre for use in severe snow conditions	≥ 0.85	≥ 0.85
Special use tyre		≥ 0.85	≥ 0.85

<i>Stage 3</i>			
<i>Category of use</i>		<i>Wet grip index (G)</i>	
		<i>Other</i>	<i>Traction tyres</i>
<b>Normal tyre</b>		$\geq 1.25$	$\geq 1.15$
<b>Snow tyre</b>		$\geq 1.25$	$\geq 1.15$
	<b>Snow tyre for use in severe snow conditions</b>	$\geq 1.15$	$\geq 1.15$
<b>Special use tyre</b>		$\geq 1.15$	$\geq 1.15$

<i>Stage 4</i>			
<i>Category of use</i>		<i>Wet grip index (G)</i>	
		<i>Other</i>	<i>Traction tyres</i>
<b>Normal tyre</b>		$\geq 1.35$	$\geq 1.25$
<b>Snow tyre</b>		$\geq 1.35$	$\geq 1.25$
	<b>Snow tyre for use in severe snow conditions</b>	$\geq 1.25$	$\geq 1.25$
<b>Special use tyre</b>		$\geq 1.25$	$\geq 1.25$

- 6.2.3. For Class C3 tyres, tested in accordance with either procedure given in Annex 5, Part (B), to this Regulation, the tyre shall meet the following requirements:

<i>Stage 1</i>			
<i>Category of use</i>		<i>Wet grip index (G)</i>	
		<i>Other</i>	<i>Traction tyres</i>
<b>Normal tyre</b>		$\geq 0.80$	$\geq 0.65$
<b>Snow tyre</b>		$\geq 0.65$	$\geq 0.65$
	<b>Snow tyre for use in severe snow conditions</b>	$\geq 0.65$	$\geq 0.65$
<b>Special use tyre</b>		$\geq 0.65$	$\geq 0.65$

<i>Stage 3</i>			
<i>Category of use</i>		<i>Wet grip index (G)</i>	
		<b>Other</b>	<b>Traction tyres</b>
<b>Normal tyre</b>		$\geq 1.10$	$\geq 0.95$
<b>Snow tyre</b>		$\geq 0.95$	$\geq 0.95$
	<b>Snow tyre for use in severe snow conditions</b>	$\geq 0.95$	$\geq 0.95$

<i>Stage 3</i>			
<b>Special use tyre</b>		<b>≥ 0.95</b>	<b>≥ 0.95</b>

<i>Stage 4</i>			
<i>Category of use</i>		<i>Wet grip index (G)</i>	
		<b>Other</b>	<b>Traction tyres</b>
<b>Normal tyre</b>		<b>≥ 1.2</b>	<b>≥ 1.05</b>
<b>Snow tyre</b>		<b>≥ 1.05</b>	<b>≥ 1.05</b>
	<b>Snow tyre for use in severe snow conditions</b>	<b>≥ 1.05</b>	<b>≥ 1.05</b>
<b>Special use tyre</b>		<b>≥ 1.05</b>	<b>≥ 1.05</b>

Paragraph 6.3., insert a new paragraph 6.3.3. for "stage 3 limits" and a new paragraph 6.3.4. for "stage 4 limits", amend to read:

"6.3. Rolling resistance coefficient limits, as measured by the method described in Annex 6 to this Regulation.

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.

**6.3.3. The maximum values for stage 3 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	9.0
C2	8.0
C3	6.0

For "snow tyre for use in severe snow conditions", the limits shall be increased by 1 N/kN.

- 6.3.4. The maximum values for stage 4 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	8.0
C2	7.0
C3	5.5

For "snow tyre for use in severe snow conditions", the limits shall be increased by 1 N/kN.

"

Insert new paragraphs 12.9. to 12.12. to read:

- "12.9. As from 1 November 2020, Contracting Parties applying this Regulation shall refuse to grant approvals if the tyre type to be approved does not meet the requirements of this Regulation as amended by the 02 series of amendments including the stage 3 rolling sound emission requirements set out in paragraph 6.1. of this Regulation and the stage 3 wet grip requirements set out in paragraph 6.2. of this Regulation and the stage 3 rolling resistance requirements set out in paragraph 6.3. of this Regulation.

- 12.10. As from the dates given below, any Contracting Party applying this Regulation may refuse to allow the sale or entry into service of a tyre which does not meet the requirements of this Regulation as amended by the 02 series, and which does not meet the stage 3 rolling sound emission requirements set out in paragraph 6.1. of this Regulation and the stage 3 wet grip requirements set out in paragraph 6.2. of this Regulation and the stage 3 rolling resistance requirements set out in paragraph 6.3. of this Regulation:

<i>Tyre class</i>	<i>Date</i>
C1 and C2	1 November 2022
C3	1 November 2024

- 12.11. As from 1 November 2030, Contracting Parties applying this Regulation shall refuse to grant approvals if the tyre type to be approved does not meet the requirements of this Regulation as amended by the 02 series of amendments including the stage 4 rolling sound emission requirements set out in paragraph 6.1. of this Regulation and the stage 4 wet grip requirements set out in paragraph 6.2. of this Regulation and the stage 4

rolling resistance requirements set out in paragraph 6.3. of this Regulation.

- 12.12. As from the dates given below, any Contracting Party applying this Regulation may refuse to allow the sale or entry into service of a tyre which does not meet the requirements of this Regulation as amended by the 02 series, and which does not meet the stage 4 rolling sound emission requirements set out in paragraph 6.1. of this Regulation and the stage 4 wet grip requirements set out in paragraph 6.2. of this Regulation and the stage 4 rolling resistance requirements set out in paragraph 6.3. of this Regulation:

<i>Tyre class</i>	<i>Date</i>
C1 and C2	1 November 2032
C3	1 November 2034

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## II. Justification

1. A further improvement of tyre performance levels would increase the level of environmental protection and safety. Doing so has a very profitable cost/benefit ratio. The proposed limits are technically achievable for a fast growing percentage of existing tyres. It is expected that with "business as usual" in 2020 around 50% of the new tyres meet all the three limits proposed under stage 3. The table below gives some statistics from recent years.

**Table IIa**

**Percentage of the tyres that meet all three criteria simultaneously of the proposed stage 3 limits:**

	<i>2013</i>	<i>2016</i>	<i>2018</i>
C1 summer tyres	26%	35%	41%
C2 summer tyres	15%	20%	29%
C3 steering tyres	22%	30%	32%
Average	21%	28%	34%

*Notes:* (i) The proposed limits are based on these "base categories". For winter/traction/special tyres different limits and percentages may apply.

(ii) The percentage are based on a statistic analysis of the tyre label values, representing more than 90 per cent of the tyres sold in the Netherlands (informal document GRB-66-01).

2. Indicating future limits will allow industry to anticipate such developments in time and to incorporate the necessary design changes in new tyre types at reasonable costs.

3. A detailed justification has been prepared by the Netherlands as informal document GRB-66-01 "Tyres in Europe" for the sixty-sixth session of GRB. Further justification and references can be found in the following informal documents: GRB-60-03, GRB-60-08, GRB-60-12, GRB-60-13, GRB-60-14, GRB-61-03, GRB-62-02, GRB-62-09, GRB-62-11, GRB-62-11-Rev.1, GRB-62-14, GRB-65-27, GRB-66-01 and Add.1, GRB-66-03 and GRB-68-27.