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#### Working Party on Brakes and Running Gear

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Item 6(d) of the provisional agenda

**Tyres – Regulation No. 117 (Tyres - Rolling resistance, rolling noise and wet grip)**

### **Proposal for amendment to the 02 series of amendments to Regulation No. 117 (Tyres - Rolling resistance, rolling noise and wet grip)**

#### **Submitted by the experts from the European Tyre and Rim Technical Organisation \***

The text reproduced below was prepared by the experts from the European Tyre and Rim Technical Organisation (ETRTO) in order to add specific performance requirements for C3 snow Tyres. The modifications to the existing text of the Regulation 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 2010–2014 (ECE/TRANS/208, para. 106 and ECE/TRANS/2010/8, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

## I. Proposal

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 **F2870 (2011) for the size 315/70R22.5**
- (a) E1136-93 (2003) **for the** ~~(size P195/75R14)~~
  - (b) **F2872 (2011) for the size 225/75 R 16 C**
  - (c) **F2870 (2011) for the size 315/70R22.5"**

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. ~~4.15.~~ of Annex 5 **and paragraph 3.4.3. of Annex 7** to this Regulation."

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

Paragraph 6.4., amend to read:

- "6.4. In order to be classified in the category of use "snow tyre", a tyre is required to meet performance requirements based on a test method by which:
- (a) the mean fully developed deceleration ("mfdd") in a braking test,
  - (b) or alternatively an average traction force in a traction test,
  - (c) or alternatively the ~~mean fully developed~~ **average** acceleration in an acceleration test ~~\*/~~

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

The relative performance shall be indicated by a snow index.

~~\*/ This test procedure is currently under development."~~

Paragraph 6.4.1.1., amend to read:

"6.4.1.1. Class C1, ~~and C2 and C3~~ 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 gripe index (brake on snow method) <sup>(a)</sup>	Snow grip index (spin traction method) <sup>(b)</sup>	Snow grip index (acceleration method) <sup>(c)</sup>
	<b>Ref. = C1 – SRTT 14</b>	<b>Ref. = C1 – SRTT 14</b>	<b>Ref. = C3N – SRTT 19.5</b> <b>Ref. = C3W – SRTT 22.5</b>
C1	1.07	1.10	<b>No</b>
C2	<del>N/A</del> <b>No</b>	1.10	<b>No</b>
<b>C3</b>	<b>No</b>	<b>No</b>	<b>1.25</b>

<sup>(a)</sup> See paragraph 3 of Annex 7 to this Regulation

<sup>(b)</sup> See paragraph 2 of Annex 7 to this Regulation

<sup>(c)</sup> See paragraph 4 of Annex 7 to this Regulation "

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, insert new paragraph 1.4., to read:

"1.4. **"Acceleration test"** means a series of specified number of traction controlled acceleration test runs of the same tyre repeated within a short timeframe."

Annex 7, paragraph 3.1.2., amend to read:

"3.1.2. Vehicle

The test shall be conducted with a standard production ~~passenger-car~~ **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 moulding process. Tyres shall be trimmed and broken in prior to testing by driving at least 100 km on dry pavement.** 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, insert new paragraphs 3.4.3. to 4.10., 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.**

**3. Acceleration method for Class C3 tyres**

**According to the definition of C3 tyres reported into paragraph 2.4.3., the additional classification for the purpose of this test method only applies:**

**(a) C3Narrow (C3N), when the C3 tyre Nominal Section Width is lower than 285 mm**

**(b) C3Wide (C3W), when the C3 tyre Nominal Section Width is greater or equal to 285 mm**

**4.2. Methods for measuring Snow Grip Index**

**Snow performance is based on a test method by which the average acceleration in an acceleration test, of a candidate tyre is compared to that of a standard reference tyre.**

**The relative performance shall be indicated by a Snow Grip Index (SG).**

**When tested in accordance with the acceleration test in paragraph 4.7., the average acceleration of a candidate snow tyre shall be at least 1.25**

compared to one of the two equivalent SRTTs – ASTM F 2870 and ASTM F 2871.

#### 4.3. Measuring equipment

4.3.1. A sensor suitable for measuring speed and distance covered on snow/ice surface between two speeds must be used.

To measure vehicle speed, a fifth wheel or non-contact speed-measuring system (including radar, GPS ...) shall be used.

4.3.2. The following tolerances shall be respected:

(a) for speed measurements :  $\pm 1$  per cent (km/h) or 0.5 km/h whichever is greater.

(b) for distance measurements:  $\pm 1 \times 10^{-1}$  m

4.3.3. A display of the measured speed or the difference between the measured speed and the reference speed for the test is recommended inside the vehicle so that the driver can adjust the speed of the vehicle.

4.3.4. For Acceleration test covered in paragraph 4.7., a display of the slip ratio of the driven tyres is recommended inside the vehicle and shall be used in the particular not recommended case of paragraph 4.7.2.1.1.

The slip ratio is calculated by

$$\text{Slip Ratio \%} = \left[ \frac{\text{Wheel Speed} - \text{Vehicle Speed}}{\text{Vehicle Speed}} \right] \times 100$$

(a) Vehicle speed is measured as defined in 4.3.1. (m/s)

(b) Wheel speed is calculated on a tyre of the driven axle by measuring its angular velocity and its loaded diameter

$$\text{Wheel Speed} = \pi \times \text{loaded diameter} \times \text{angular speed}$$

Where,  $\pi = 3.1416$  (m/360deg), the loaded diameter (m) and the angular speed (revolution per second = 360 deg/sec).

4.3.5. A data acquisition system can be used for storing the measurements.

#### 4.4. General conditions

##### 4.4.1. Test course

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

4.4.1.1. 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.

4.4.1.2. The snow compaction index measured with a CTI penetrometer shall be between 80 and 90. Refer to the appendix of ASTM F1805 for additional details on measuring method.

4.4.1.3. 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.

Air temperature shall not vary more than 10 deg C during the test.

- 4.5. Tyres preparation and break-in
- 4.5.1. Fit the test tyres on rims as per ISO 4209-1 using conventional mounting methods. Ensure proper bead seating by the use of a suitable lubricant. Excessive use of lubricant should be avoided to prevent slipping of the tyre on the wheel rim.
- 4.5.2. The tyres should be "broken-in" prior to testing to remove spew, compound nodules or flashes resulting from moulding process.
- 4.5.3. Tyres shall be conditioned at the outdoor ambient temperature at least two hours before their mounting for tests.
- They should be placed such that they all have the same ambient temperature prior to testing and be shielded from the sun to avoid excessive heating by solar radiation.
- The tyre surface in contact with snow shall be cleaned before performing a test.
- Tyre pressures shall then be adjusted to the values specified for the test.
- 4.6. Testing sequence
- If only one candidate tyre is to be evaluated, the order of testing shall be:  
R1 . T. R2
- where:
- R1 is the initial test of the SRTT, R2 is the repeat test of the SRTT and T is the test of the candidate tyre to be evaluated.
- A maximum of 3 candidate tyres may be tested before repeating the SRTT test, for example: R1 . T1 . T2 . T3 R2
- Recommendations are that the zones where acceleration is fully applied shall not overlap without reworking and when a new set of tyres is tested;
- the runs are performed after shifting the vehicle trajectory in order not to accelerate on the tracks of the previous tyre; when it is no longer possible not to overlap full acceleration zones, the test course should be re-groomed.
- 4.7. Acceleration on Snow Test Procedure for Snow Grip Index of Class C3N and C3W
- 4.7.1. Principle
- The test method covers a procedure for measuring the Snow Grip performance of commercial vehicle tyres during acceleration, using a commercial vehicle having a Traction Control System (TCS, ASR, etc.).
- Starting with a defined initial speed, the full throttle is applied to activate the Traction Control system, the Average acceleration is calculated between two defined speeds.
- 4.7.2. Vehicle
- 4.7.2.1 The test shall be conducted with a 2 axles standard model commercial vehicle in good running conditions equipped with:

- (a) Low rear axle weight and enough powerful engine to ensure the average percentage of slip during the test as required in points 4.7.5.1. and 4.7.5.2.1. below;
- (b) A manual gearbox (automatic gearbox with manual shift allowed) having a gear ratio covering a 19 km/h range between 4 and 30 km/h;
- (c) Blocking differential on driven axle is recommended as increasing repeatability;
- (d) A standard commercial system controlling/limiting the slip of the driving axle when accelerating (called Traction Control, ASR, TCS, etc.).

4.7.2.1.1. In the particular case where it is not possible to find a standard commercial vehicle equipped with a traction control system, a vehicle without Traction Control/ASR/TCS is allowed with a mandatory display of the percentage slip as stated in 4.3.4. and a mandatory blocking differential on the driven axle to put in practice the operating procedure 4.7.5.2.1.

4.7.2.2. The permitted modifications are:

- (a) those allowing to increase the number of tyre sizes capable to be mounted on the vehicle;
- (b) those permitting to install an automatic activation of the acceleration and the measurements.

Any other modification of the acceleration system is prohibited.

4.7.3. Vehicle fitting

The rear driven axle may be indifferently fitted with 2 or 4 test tyres if respecting the loading by tyre.

The front steer non driven axle is equipped with 2 tyres having a size suitable for the axle load. These 2 front tyres could be maintained along the test.

4.7.4. Load and inflation pressure

4.7.4.1. The static load on each rear driven test tyres must be between 20 per cent and 55 per cent of the tested tyre load capacity written on the sidewall.

The vehicle front steer total static axle load should be between 60 per cent and 160 per cent of the driven rear total axle load.

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

4.7.4.2. The driven tyres inflation pressure shall be 70 per cent of the one written on the sidewall.

The steer tyres are inflated at nominal sidewall pressure

4.7.5. Testing Runs

4.7.5.1. Mount first the set of reference tyres on the vehicle and when on the testing area.

Drive the vehicle at an initial constant speed between 4 km/h and 11 km/h and the gear ratio capable of covering the speed range of 19 km/h.

Recommended Gear ratio selected is 3rd or 4th shall give minimum 13 per cent average slip ratio in the measured range of speed.

- 4.7.5.2. In case of Traction Control system equipped vehicles (already switched "on" before the run) apply full throttle until the vehicle has reached the final speed.

Final speed = Initial speed + 15 km/h

No rearward restraining force shall be applied to the test vehicle.

- 4.7.5.2.1. In the particular case 4.7.2.1.1 where it is not possible to find a standard commercial vehicle having the Traction Control system, the driver maintains manually the averaged slip ratio range of 20 per cent ± 10 per cent (Controlled Slip procedure in place of the Full Slip) in the same range of speeds. All the tyres and runs in the test session are performed with Controlled Slip procedure.

- 4.7.5.3. Measure the distance and the time between the initial speed and the final speed.

- 4.7.5.4. For every candidate tyre and the standard reference tyre, the acceleration test runs shall be repeated a minimum of 6 times and the coefficients of variation (standard deviation/average\*100) calculated for minimum 6 valid runs on the distance and the time should be lower than or equal to 6 per cent.

- 4.7.5.5. In case of Traction Control System equipped vehicle, the Average Slip ratio shall be in the range from 13 per cent to 40 per cent (calculated as per 4.3.4.)

- 4.7.5.6. Apply testing sequence as defined in 4.6.

- 4.8. Processing of measurement results

- 4.8.1. Calculation of the Average Acceleration AA

Each time the measurement is repeated, the average acceleration AA (m · s<sup>-2</sup>) is calculated by

$$AA = \frac{S_f^2 - S_i^2}{2D}$$

Where D (m) is the distance covered between the initial speed S<sub>i</sub> (m.s<sup>-1</sup>) and the final speed S<sub>f</sub> (m.s<sup>-1</sup>).

- 4.8.2. Validation of results

For the candidate tyres:

The coefficients of variation of the Average Acceleration is calculated for all the candidate tyres. If one coefficient of variation is greater than 6 per cent, discard the data for this candidate tyre and repeat the test.



$$\text{coefficient of variation} = \frac{\text{stdev}}{\text{average}} \times 100$$

For the reference tyre:

If the coefficient of variation of the average Acceleration "AA" for each group of min 6 runs of the reference tyre is higher than 6 per cent, discard all data and repeat the test for all tyres (the candidate tyres and the reference tyre).

In addition and in order to take in account possible test evolution, the coefficient of validation is calculated on the basis of the average values of any two consecutive groups of min 6 runs of the reference tyre. If the coefficient of validation is greater than 6 per cent, discard the data for all the candidate tyres and repeat the test.

$$\text{coefficient of validation} = \left| \frac{\text{Average2} - \text{Average1}}{\text{Average1}} \right| \times 100$$

**4.8.3. Calculation of the "average AA"**

If R1 is the average of the "AA" values in the first test of the reference tyre, R2 is the average of the "AA" values in the second test of the reference tyre, the following operations are performed, according to Table 1:

Table 1

If the number of sets of candidate tyres between two successive runs of the reference tyre is :	and the set of candidate tyres to be qualified is :	then "Ra" is calculated by applying the following :
1 ⇔ R - T1 - R	T1	Ra = 1/2 (R1 + R2)
2 ⇔ R - T1 - T2 - R	T1	Ra = 2/3 R1 + 1/3 R2
	T2	Ra = 1/3 R1 + 2/3 R2
3 ⇔ R - T1 - T2 - T3 - R	T1	Ra = 3/4 R1 + 1/4 R2
	T2	Ra = 1/2 (R1 + R2)
	T3	Ra = 1/4 R1 + 3/4 R2

"Ta" (a = 1, 2, ...) is the average of the AA values for a test of a candidate tyre.

**4.8.4 "AFC" Calculation (Acceleration Force Coefficient)**

Also called AFC Acceleration Force Coefficient

Calculation on of AFC(Ta) and AFC(Ra) as defined in table 2 :

Table 2

	The Acceleration Force Coefficient "AFC" is :
Reference tyre	$AFC(R) = \frac{Ra}{g}$
Candidate tyre	$AFC(T) = \frac{Ta}{g}$
<i>Ra and Ta are in m/s<sup>2</sup></i> <i>"g"= gravity acceleration (rounded to 9.81 m/s<sup>2</sup>)</i>	

#### 4.8.5. Calculation of the relative Snow performance Index of the tyre

The Snow grip index represents the relative performance of the candidate tyre compared to the reference tyre.

$$\text{Snow Grip Index} = \frac{AFC(T)}{AFC(R)}$$

#### 4.8.6. Calculation of the Slip Ratio

The slip ratio can be calculated as the average of Slip ratio as 4.3.4. or by comparing the average distance 4.7.5.3. of the min 6 runs to the distance of a run done without slip (very low acceleration)

$$\text{Slip Ratio } \% = \left[ \frac{\text{Average distance} - \text{No slip distance}}{\text{No slip distance}} \right] \times 100$$

#### 4.9. Snow grip performance comparison between a candidate tyre and a reference tyre using a control tyre

##### 4.9.1. Scope

When the candidate tyre size is significantly different from the reference tyre a direct comparison on the same vehicle may be not possible. This is an approach using an intermediate tyre, hereinafter called the control tyre.

##### 4.9.2. Principle of the approach

The principle lies upon the use of a control tyre and 2 different vehicles for the assessment of a candidate tyre in comparison with a reference tyre.

One vehicle can fit the reference tyre and the control tyre, the other the control tyre and the candidate tyre. All conditions are in conformity with paragraph 4.7.

The first assessment is a comparison between the control tyre and the reference tyre. The result (Snow Grip Index 1) is the relative efficiency of the control tyre compared to the reference tyre.

The second assessment is a comparison between the candidate tyre and the control tyre. The result (Snow grip index 2) is the relative efficiency of the candidate tyre compared to the control tyre.

The second assessment is done on the same track as the first one. The air temperature must be in the range of +/- 5 deg C of the temperature of the first assessment. The control tyre set is the same set as the set used for the first assessment.

The Snow Grip performance Index of the candidate tyre compared to the reference tyre is deduced by multiplying the relative efficiencies calculated above:

$$Snow\ Grip\ Index = SG1 \times SG2$$

**4.9.3. Selection of a set of tyres as a control tyre set**

A control tyre set is a group of identical tyres made in the same factory during one week period.

**4.10. Storage and preservation**

Before the first assessment (control tyre / reference tyre), normal storage conditions can be used. It is necessary that all the tyres of a control tyre set have been stored in the same conditions.

As soon as the control tyre set has been assessed in comparison with the reference tyre, specific storage conditions shall be applied for Control tyres replacement.

When irregular wear or damage results from tests, or when wear influences the test results, the use of the tyre shall be discontinued."

Annex 7, Appendix 2, 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 <b>F/R</b> (kPa)				

"

Annex 7, insert Appendix 3, to read:

**"Annex 7**

**Appendix 3**

**Test Reports and Test Data for C3 tyres**

*Part 1 - Report*

1. Type approval authority or Technical Service: .....
2. Name and address of applicant:.....

- 3. Test report No.: .....
- 4. Manufacturer and brand name or trade description: .....
- 5. Tyre class: .....
- 6. Category of use: .....
- 7. Snow index relative to SRTT according to paragraph 8.5
- 7.1. Test procedure and SRTT used .....
- 8. Comments (if any): .....
- 9. Date: .....
- 10. Signature: .....

*Part 2 - Test data*

- 1. Date of test:.....
- 2. Location of test track:.....
- 2.1. Test track characteristics:

	<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			80 to 90
other			

- 3. Test vehicle (make, model and type, year):.....
- 4. Test tyre details .....
- 4.1. Tyre size designation and service description: .....
- 4.2. Tyre brand and trade description: .....
- 4.3. Test tyre data: .....

	<i>SRTT (1st test)</i>	<i>Candidate 1</i>	<i>Candidate 2</i>	<i>Candidate 3</i>	<i>SRTT (2nd test)</i>
Tyre dimensions					
Test rim width code					
Tyre loads F/R (kg)					
Load index F/R (per cent)					
Tyre pressure F/R (kPa)					

**5. Test results: average accelerations (m/s<sup>2</sup>)**

<i>Run number</i>	<i>Specification</i>	<i>SRTT (1st test)</i>	<i>Candidate 1</i>	<i>Candidate 2</i>	<i>Candidate 3</i>	<i>SRTT (2nd test)</i>
1						
2						
3						
4						
5						
6						
Mean						
Std-deviation						
Slip ratio (per cent)						
CV (per cent)	< 6 per cent					
Validation SRTT	(SRTT) < 5 per cent					
SRTT average						
Snow index		1,00				

"

**II. Justification**

1. The 02 series of amendments to Regulation No. 117 introduced the main following changes compared to the 01 series of amendment:

- (a) New testing procedures and requirements for tyre rolling resistance;
- (b) Lower noise limit values; and

(c) New, more robust, definitions for snow tyres, special use tyres and traction tyres for which additional allowances in respect of the rolling resistance and noise requirements mentioned above will be granted.

2. Both the reduction of rolling resistance and rolling noise present challenges to tyre manufacturers, and there are some categories for which the standard proposed limits would not be technically feasible. Therefore additional allowances have been added to the limit values for these tyres. However, to ensure that the allowances are only given to the tyre

categories where there is a justified need, the definitions are linked to specific design or performance requirements.

3. This document proposes amendments to Regulation No. 117-02 adding specific performance requirements in paragraph 4 of Annex 7 for Snow Tyres in Class C3 which, so far, were missing. It is based on the acceleration test procedure.

4. In order to qualify as a snow tyre a tyre has to achieve a performance which is at least 25 per cent better than a standard reference C3 tyre in the acceleration test.

5. Tyres meeting this performance can be marked with an 'alpine' symbol.

6. In addition, the following changes have been done:

(a) Paragraph 2.16.: to add the two new reference tyres in Class C3.

(b) Paragraph 2.17.: to add specific definitions for the snow grip tests

(c) Paragraph 6.4 to add the specific requirements for a tyre of Class C3 to be classified in the category of use "snow tyre".

(d) Annex 5 paragraph 2.2.2.1.15.1. and 5.: Editorial corrections.

(e) Annex 7 paragraph 1.4.: to introduce the definition of the acceleration test for Class C3 tyres.

(f) Annex 7 paragraph 3.1.2.: editorial correction.

(g) Annex 7 paragraph 3.1.3.: the tyre preparation before the test does not require to run 100 km; the distance should be such that the tread surface becomes as required.

(h) Annex 7 paragraph 3.4.3. Control tyre: 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, referred to as "control tyres", and two different vehicles.

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