

24 June 2014

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## 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\***

(Revision 2, including the amendments which entered into force on 16 October 1995)

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#### **Addendum 116 – Regulation No. 117**

#### **Revision 3 - Amendment 1**

Supplement 5 to the 02 series of amendments – Date of entry into force: 10 June 2014

#### **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**



**UNITED NATIONS**

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\* Former title 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.

*Annex 7,*

*Paragraph 4.7.2.1., amend to read:*

- "4.7.2.1. The test shall be conducted with a standard 2 axle commercial vehicle in good running order with:
- (a) Low rear axle weight and an engine powerful enough to maintain the average percentage of slip during the test as required in paragraphs 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 the speed range of at least 19 km/h between 4 km/h and 30 km/h;
  - (c) Differential lock on driven axle is recommended to improve repeatability;
  - (d) A standard commercial system controlling/limiting the slip of the driving axle during acceleration (Traction Control, ASR, TCS, etc.)."

*Paragraph 4.7.2.1.1., amend to read:*

- "4.7.2.1.1. In the particular case where a standard commercial vehicle equipped with a traction control system is not available, a vehicle without Traction Control/ASR/TCS is permitted provided the vehicle is fitted with a system to display the percentage slip as stated in paragraph 4.3.4. of this annex and a mandatory differential lock on the driven axle used in accordance with operating procedure 4.7.5.2.1. below. If a differential lock is available it shall be used; if the differential lock, however, is not available, the average slip ratio should be measured on the left and right driven wheel."

*Paragraph 4.7.4.2., amend to read:*

- "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.

If the pressure is not marked on the sidewall, refer to the specified pressure in applicable tyre standards manuals corresponding to maximum load capacity."

*Paragraph 4.7.5.1., amend to read:*

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

Drive the vehicle at a constant speed between 4 km/h and 11 km/h and the gear ratio capable of covering the speed range of at least 19 km/h for the complete test programme (e.g. R-T1-T2-T3-R).

The Recommended Gear ratio selected is 3rd or 4th and shall give a minimum 10 per cent average slip ratio in the measured range of speed."

*Paragraph 4.7.5.2.1.*, amend to read:

"4.7.5.2.1. In the particular case of paragraph 4.7.2.1.1. of this annex where a standard commercial vehicle equipped with a Traction Control system is not available, the driver shall manually maintain the average slip ratio between 10 and 40 per cent (Controlled Slip procedure in place of the Full Slip) within the prescribed range of speeds. If a differential lock is not available, the averaged slip ratio difference between the left and right driven wheel shall not be higher than 8 per cent for each run. All the tyres and runs in the test session are performed with Controlled Slip procedure."

*Paragraph 4.7.5.3.*, amend to read:

"4.7.5.3. Measure the distance between the initial speed and the final speed."

*Paragraph 4.7.5.4.*, amend to read:

"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 shall be lower than or equal to 6 per cent."

*Paragraph 4.7.5.5.*, amend to read:

"4.7.5.5. In case of Traction Control System equipped vehicle, the Average Slip ratio shall be in the range from 10 per cent to 40 per cent (calculated as per paragraph 4.3.4. of this annex)."

*Paragraph 4.8.6.*, amend to read:

"4.8.6. Calculation of the Slip Ratio

The slip ratio can be calculated as the average of Slip ratio as mentioned in paragraph 4.3.4. of this annex or by comparing the average distance referred to in paragraph 4.7.5.3. of this annex of the minimum 6 runs to the distance of a run done without slip (very low acceleration)

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

No slip distance means the wheel distance calculated on a run done with a constant speed or a continuous low acceleration."

Appendix 3,

Paragraph 5., amend to read:

"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) ≤ 6 per cent	X	X	X	X	
SRTT average			X	X	X	X
Snow index		1.00				X

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