Transmitted by the expert from China

Informal Document No. **GRRF-67-26-Rev.1**
(67th GRRF, 2 - 5 February 2010,
agenda item 9(a))

PROPOSAL FOR AMENDMENT TO TYRE GTR-08-01e

Note: The text reproduced below has been prepared by the experts from the People's Republic of China in order to improve the proposed GTR. The modifications to the existing text of the Regulation are marked in **bold italic** characters. Some general comments on the high speed performance test are also included.

A. Tyre Wet Grip Test

PROPOSAL:
Paragraph 4.11.1, amends to read:
4.11.1 Requirements
~~Passenger tyres (Class C1 tyres) shall meet the following requirements:~~
Contracting Parties may choose at their discretions to mandate the following requirements for passenger tyres (Class C1 tyres) :

JUSTIFICATION:
Wet grip test has not been adopted widely enough to mandate it by all Contracting parties. The harmonized GTR should consider the different situations of Contracting Parties. It is a proper solution to allow the Contracting Parties at their own discretions to mandate the Wet Grip Index (G) limits.

B. Tyre Organization Information

PROPOSAL:
Paragraph 4.4.5.4, amends to read:
4.4.5.4 For other tyre sizes for which dimensions cannot be calculated, the dimensions including allowance for growth in service, shall comply with those given in standards publications of the following organizations and which were current either at the date of manufacture of the tyre or at any later date:

The Tire and Rim Association, Inc.
……
South Africa Bureau of Standards
China Association for Standardization

JUSTIFICATION:
As a large tyre market and supplier, China also publishes "China's Tyre & Rim and Valve Standard Yearbook" annually to providing detailed tyre size information. The name of this organization to publish tyre dimensions in China is ***China Association for Standardization***. It also should be listed in this GTR.

C. Test Drum Diameter

PROPOSAL:
Paragraph 4.7.3.1, amends to read:
…….a diameter of ~~2.0~~***1.7*** **m** +/- 1%. (~~1.7~~***2.0*** m +/- 1% is also acceptable ~~since it is always more severe~~)

JUSTIFICATION:
Although some test drums with a diameter of 2.0m are available in some countries, most test drums for tyre test have a diameter of 1.7m in the world. If there is no obvious evidence showing test drum with a diameter of 2.0m will be more popular than that with a diameter of 1.7m in future, the recommended size of test drum should be 1.7m that is currently most common in use..

D. Strength Test

PROPOSAL:

Table in paragraph 4.5.1, amends to read:

Size Designation		**Maximum Permissible Inflation (kPa)**				
		240	280	300	340	350
Below 160 mm	joules…..…	220	441	220	441	220
	in-lbs.....	1,950	3,900	1,950	3,900	1,950
160 mm or above	Joules…….	294	588	294	***588***	294
	In-lbs……..	2,600	5,200	2,600	5,200	2,600

Paragraph 4.5.6-4.5.8, amends to read:

~~4.5.6 Record the force and penetration at five test points equally spaced around the circumference of the tyre. If the tyre fails to break before the plunger is stopped by reaching the rim, record the force and penetration as the rim is reached and use these values in the following paragraph (4.5.7) below. If the tyre fails to break before plunger is stopped on reaching the rim and the required minimum breaking energy is not achieved, then the required minimum breaking energy is deemed to have been achieved at that point.~~

4.5.6 Record the force and penetration at five test points equally spaced around the circumference of the tyre.

4.5.7 ***If the tyre fails to break before the plunger is stopped by reaching the rim, record the force and penetration as the rim is reached and use these values in the following paragraph (4.5.9) below.***

4.5.8 ***If the tyre fails to break before plunger is stopped on reaching the rim and the required minimum breaking energy is not achieved, then the required minimum breaking energy is deemed to have been achieved at that point.***

4.5.9 The breaking energy, W, in Joules, shall be calculated from:

$$W = [(F \times P)/2] \times 10^{-3} \text{ (joules)}$$

Note : To calculate in Joules (1 Joule = 1 Newton x meter) from Newtons and millimeters, the coefficient should be 10 to the negative 3, not positive 3.

Where:

W = Energy in Joules
F = Force in Newtons applied to the plunger
P = Penetration of the plunger in mm

or

$$W = [FxP]/2]$$

Where:

W = Energy, inch-pounds;
F = Force, pounds; and
P = Penetration, inches.

~~Determine the breaking energy value for the tyre by computing the average of the five values obtained.~~

4.5.10 ***If the calculated breaking energy at one point in paragraph 4.5.7 is less than the corresponding minimum value specified in paragraph 4.5.1,the tyre shall be demmed to fail to meet the strenth test.***

4.5.11 In the case of tubeless tyres, equipment may be provided to ensure the retention of the inflation pressure throughout the test provided that such equipment does not adversely affect the test.

JUSTIFICATION:

The purpose of strength test is to determine the energy to breaking a tyre . Considering cask effect, the overall strength of a tyre is limited to the weakest point where the breaking energy is the smallest. If we use the average breaking energy to indicate the strength of a tyre, the weak points of the tyre may be ignored, although it may be impossible to find the weakest point of the tyre by measuring the breaking energy at only 5 points. However, it is a proper philosophy to indicate the strength of a tyre by the smallest breaking energy value instead of the average value. From the point of view of test, it will also simplify the practice. Therefore, the tested tyre shall be justified to fail to meet the strength requirement if the breaking energy at one of the 5 points is less than the minimum value specified in table in paragraph 4.5.1.

E. High Speed Performance Test

According to paragraph 4.9.3.7, tyres with Speed Symbols “S” and below, excluding “H”, shall be tested continuously and uninterrupted for ninety minutes through three thirty-minute consecutive test stages at the following speeds:140, 150 and 160 km/h. However, the maximum speed for tyres with Speed Symbol “P” and below is less than 160km/h. It is not reasonable for these tyres to be tested at speed of 140, 150 and 160km/h.

It is more reasonable to set the requirement for high speed performance of a tyre based on its speed symbol. Therefore, test conditions should be related to the speed symbol of the test tyre， as detailed in Table 1.

Table 1-Test procedures for passenger tyres

Test phase	For tyres of speed symbol “L” through “W”, including “H”		For tyres of speed symbol “Y”	
	Test speed in km/h	Test time in min	Test speed in km/h	Test time in min
1	0～ITS [a]	10	0~260	10
2	ITS	10	260	20
3	ITS+10	10	270	10
4	ITS+20	10	280	10
5	ITS+30	10 [b]	290	10
6 c	ITS+40	10 [c]		

a ITS = 40 km/h below the tyre’s speed symbol on a 1.7m±1% drum and 30 km/h below the tyre’s speed symbol on a 2.0m±1% drum;

b 20 mins for test on a 2.0m±1% drum;

c Only for test on a 1.7m±1% drum.

Based on the above philosophy, the structure of wording for high speed performance test shall be restructured to be more simple and readable.

F. General comments on test load for high speed performance test

It may be easier for the reader if the test load relating to the speed symbol can be given in a direct way. Table may be a proper solution and the following table 2 may be for reference.

Table 2- Inflation pressure and test load for high speed performance test for passenger tyres

	Inflation Pressure, kPa		
Speed Symbol	Standard Load, Light Load	Reinforced, Extra Load	Test Load in kg
L, M, N,P, Q, R, S	220	260	85% of the load capacity index
T, U, H	280	320	80% of the load capacity index
V	300	340	73% of the load capacity index
W	300	340	68% of the load capacity index
Y	300	340	68% of the load capacity index

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