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Working Party on Brakes and Running Gear (GRRF)
(Fifty-fifth session 2-6 February 2004,
agenda item 6.2.)

PROPOSAL FOR DRAFT AMENDMENT TO REGULATION No. 30

(Pneumatic tyres)

Transmitted on behalf of the GRRF Ad-Hoc tyre wet grip group

Note: The text reproduced below has been prepared by the experts from the GRRF ad-hoc tyre wet grip group in order to introduce a standardized protocol for the testing of tyres to include wet grip requirements.

Note: This document is distributed to the Experts on Brakes and Running Gear only.

A. PROPOSAL

The list of contents:

Add a new annex 8, to read:

"Annex 8 - Procedure for wet grip performance tests"

The text of the Regulation;

Paragraph 1, amend to read:

"….. in excess of 300 km/h.

It does not apply to studded tyres as defined in paragraph 2.2.1. but does apply to the base tyre into which studs can be fitted.

The requirements of paragraph 6.4. with regard to wet grip performance, shall not apply to temporary use spare tyres and "T type" temporary use spare tyres as defined in paragraphs 2.3.5. and 2.3.6. of this Regulation."

Paragraph 2.1., amend to read:

"2.1. "Type of pneumatic tyre" means a pneumatic tyre, or range of pneumatic tyres, which do not differ in certain essential characteristics as given in paragraph 4.;

Paragraphs 2.1.1. to 2.1.7., should be deleted.

Insert a new paragraph 2.2.1., to read:

"2.2.1. "Studded tyre" means a tyre, usually a snow tyre, fitted with studs inserted in holes provided for that purpose in the tread area of the tyre. The studs are of a hard material, usually metal, and project some distance from the surface of the tread."

Insert new paragraphs 2.32. to 2.37., to read:

"2.32. "Standard Reference Test Tyre (SRTT)" means a tyre that is produced, controlled and stored in accordance with the American Society for Testing and Materials (ASTM) Standard E 1136 - 93 (Re-approved 1998);

2.33. "Candidate tyre" means a tyre, representative of the type, that is submitted for approval in accordance with this Regulation;"

2.34. "Control tyre" means a normal production tyre that is used to establish the wet grip performance of tyre sizes unable to be fitted to the same vehicle as the Standard Reference Test Tyre - see paragraph 2.2.2.16. of annex 8 to this Regulation;

2.35. "Wet grip index (G)" means the ratio between the performance of the candidate tyre and the performance of the Standard Reference Test Tyre;

2.36. "Peak Brake Force Coefficient (pbfc)" means the maximum value of the ratio of braking force to vertical load on the tyre prior to wheel lock-up;

2.37. "Mean fully developed deceleration (mfdd)" means the average deceleration calculated on the basis of the measured distance recorded when decelerating a vehicle between two specified speeds."

Paragraph 4.1., amend to read:

"4.1. The application for approval of a type of pneumatic tyre shall be submitted by the manufacturer or by his duly accredited representative. It shall specify:"

Insert new paragraph 4.1.1., to read:

"4.1.1. The manufacturer;"

Paragraph 4.1.1. (former), renumber as paragraph 4.1.7.

Paragraph 4.1.2., amend to read:

"4.1.2. The address of the manufacturer;"

Insert a new paragraph 4.1.3., to read:

"4.1.3. The name and address of the manufacturing plants in which the tyre is to be produced;"

Paragraph 4.1.3. (former), renumber as paragraph 4.1.5.

Insert a new paragraph 4.1.4., to read:

"4.1.4. A list of all Brand Names, Trade Names, Trade Descriptions or Trade Marks to be applied to the tyre type (Note: this information is to register all names under which the approved tyre is to be marketed, that is, to take account of the practice of "own branding");"

Insert new paragraph 4.1.5.1., to read:

"4.1.5.1. The category of use with regard to the requirements for wet grip performance (see paragraph 6.4.), that is, ordinary (road type), snow tyre (marked "M+S", "M.S" or "M&S") having a speed capability up to and including 160 km/h (speed symbol up to "Q" except "H"), or snow tyre (marked "M+S", "M.S" or "M&S") and having a speed capability greater than 160 km/h (speed symbol "R" and above, plus "H")."

Paragraph 4.1.4. (former), renumber as paragraph 4.1.6.

Paragraphs 4.1.5. to 4.1.10. (former), renumber as paragraphs 4.1.8. to 4.1.13.

Insert a new paragraph 4.1.14., to read:

"4.1.14. The tyre cross section, that is the envelope of the inflated tyre mounted on the measuring rim, showing the relevant dimensions (see paragraphs 6.1.1. and 6.1.2.)."

Paragraphs 4.1.11. to 4.1.15. (former), renumber as paragraphs 4.1.15. to 4.1.19.

Insert a new paragraph 4.1.20., to read:

"4.1.20. The tyre type identification with regards to the requirements of paragraph 6.4. (wet grip performance) and, where appropriate, details of existing test reports relevant to this tyre type.

In the case where this is the first application for approval of a tyre type to the requirements of paragraph 6.4. (wet grip performance), which will subsequently form the basis of approval of a range of tyres within the definition of type given in paragraph 4.3.1., a list of tyre size designations, speed category symbols, load capacity indices or ply rating numbers in the case of diagonal ply tyres, shall be submitted regarding the tyres to be manufactured within that range."

Paragraph 4.2., amend to read:

"4.2. The application …….. submitted for approval. The details shall be sufficient to allow the Type Approval Authority or Technical Service to assess the effect of any changes on the wet grip performance of the tyre. The effect of any minor changes will normally be apparent during Conformity of Production checks. It shall also …….. competent authority. Drawings or …….. type approval."

Insert new paragraphs 4.3. and 4.3.1., to read:

"4.3. For the purposes of defining "type" with respect to compliance with the requirements of paragraphs 6.1. to 6.3. inclusive, the tyre shall not differ in such essential characteristics as those given in the information required by paragraphs 4.1.1. and 4.1.5. to 4.1.13. inclusive.

4.3.1. For the purposes of defining "type" with respect to compliance with the requirements of paragraph 6.4., the range of tyres shall not differ in such essential characteristics as those given in the information required by paragraphs 4.1.1., 4.1.5.1., 4.1.6. and the tread pattern as indicated by the information required by paragraph 4.2."

Paragraph 4.3. (former), renumber as paragraph 4.5.

Paragraph 4.4., amend to read:

"4.4. Where a tyre …….. it is not considered necessary for the purposes of compliance with the requirements of paragraph 6.2., to carry out ……. range. Worst case ….. approval authority.

For the purposes of compliance with paragraph 6.4., the type approval authority may make a worst case selection from the range of tyres covered by the information required by paragraph 4.1.20."

Paragraph 5.1., amend to read:

"5.1. If the candidate pneumatic tyre …….. be granted."

Paragraph 5.2., amend to read:

"5.2. An approval number in the form "30R 03XXXX" shall be assigned to each type approved. The first two digits following "30R" [(at present 03)] shall …… approval. The same ……. this Regulation."

Insert new paragraphs 6.4. to 6.4.1.3. to read:

"6.4. 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).

6.4.1. When tested in accordance with either procedure given in Annex 8 the tyre shall meet the following requirements:

6.4.1.1. In the case of an ordinary (road type) tyre, the Wet grip index (G) shall be ≥ 1,1;

6.4.1.2. In the case of a Snow tyre, that is, a tyre marked in accordance with paragraph 3.1.5. and that bears a speed symbol indicating a maximum permissible speed not greater than 160km/h ("Q"), the Wet grip index (G) shall be ≥ 0,9;

6.4.1.3. In the case of a Snow tyre, that is, a tyre marked in accordance with paragraph 3.1.5. and that bears a speed symbol indicating a maximum permissible speed greater than 160 km/h ("R" and above, plus "H") the Wet grip index (G) shall be ≥ 1,0."

Paragraph 7.1., amend to read:

"7.1. Every modification of the type of pneumatic tyre or change to the information given in the Application for Approval, paragraph 4., shall be notified …… pneumatic tyre. The department ….. either:"

Paragraph 7.2., amend to read:

"7.2. A modification ……. paragraph 6.2. of this Regulation."

Paragraph 8.2., amend to read:

"8.2. The authority ……. facility. For each ……. frequency of verification checks with respect to the requirements given in paragraphs 6.1. to 6.3. inclusive, shall be at least once every two years."

Insert a new paragraph 8.2.1., to read:

"8.2.1. In the case of verifications with regard to approvals in accordance with paragraph 6.4, these shall be carried out using the same procedure (see annex 8 to this Regulation) as that adopted for original approval and the type approval authority shall satisfy itself that all tyres falling within an approved type comply with the approval requirement. The assessment shall be based upon the production volume of the tyre type at each manufacturing facility, taking into account the quality management system(s) operated by the manufacturer. Where the test procedure involves testing a number of tyres at the same time, for example a set of four tyres for the purpose of testing wet grip performance in accordance with the Standard Vehicle procedure given in annex 8 to this Regulation, then the set shall be considered as being one unit for the purposes of calculating the number of tyres to be tested."

Paragraph 11.1., amend to read:

"11.1. As from the official date of entry into force of the 03 series of amendments, no Contracting Party applying this Regulation shall refuse to grant ECE approval under this Regulation as amended by the 03 series of amendments."

Paragraph 11.1. (former), renumber as paragraph 11.2.

Paragraphs 11.2. to 11.3.2., should be deleted.

Insert new paragraphs 11.3. to 11.8., to read:

"11.3. From the date of entry into force of the 03 series of amendments a Contracting Party applying this Regulation shall be permitted to refuse to accept for sale or entry into service, a tyre approved to previous series of amendments.

11.4. Contracting Parties applying this Regulation shall be permitted to accept existing approvals granted in accordance with the 02 series of amendments, subsequent to the amendments made by Supplement 4, as evidence of compliance with paragraphs 6.1. to 6.3. inclusive. Provided that tyres meet the additional requirements of paragraph 6.4., approval to the 03 series of amendments can be granted and an appropriate new approval number issued.

The type approval authority granting approval in the accordance with the 03 series of amendments shall thereafter be responsible for the Conformity of Production of all requirements covered by this Regulation.

11.5. [New text to be inserted to address approval to former specific version of Regulation 30. Final version subject to consideration by WP.29 at 131/132 sessions.]

11.6. From the date of entry into force of the 03 series of amendments any further amendments to the 02 series of amendments shall not be permitted.

11.7. Approvals granted in accordance with the 02 series of amendments subsequent to the date of entry into force of the 03 series of amendments, shall not be acceptable as evidence of compliance with the requirements of paragraphs 6.1. to 6.3. inclusive for the purpose of approval to the 03 series of amendments.

11.8. The form and arrangement of the approval mark shown in the example in Annex 2 to this Regulation, that is, "30R 032439", shall be used as soon as is practicable following the date of entry into force of the 03 series of amendments but shall be required for all tyres from [1 January 2010] at the latest. Prior to this date, and at the discretion of the manufacturer, an approval number in the form, for example, "032439", may be used as an alternative.]"

Note: All amendments to paragraph 11. are in square brackets.

Paragraph 12.2., amend to read:

"12.2. Only until [31 December 2005] may Contracting Parties applying this Regulation designate the tyre manufacturer as a Technical Service. However, following this date a type approval authority may, at its discretion, continue to use the laboratories and test facilities of the manufacturer for the purpose of carrying out the necessary tests for approval."

Paragraph 12.3., amend to read:

"12.3. Where a Contracting Party applying this Regulation has designated a manufacturer as a Technical Service as permitted by paragraph 12.2., that Party, if it so desires, may be represented at the tests by one or more persons of its choice."

Annex 1,

Items 1 and 2, amend to read:

"1. Name of manufacturer: ……

2. All Brand Names, Trade Names, Trade Descriptions or Trade Marks to be applied to the tyre type (Note: this information is to record all names under which the approved tyre is to be marketed, that is, to take account of the practice of "own branding"): ……"

Insert a new item 2.1., to read:

"2.1. For each Brand Name, Trade Name, Trade Description or Trade Mark, the tyre type designation used for the tyre type approved: ……... ……..……"

Insert a new item 3.1., to read:

"3.1. The name and address of the manufacturing plants in which the tyre is to be produced: ……"

Annex 2, amend as follows:

The approval number example shown in the illustration below the international approval mark "E4" within the circle should read:

30R 032439

The paragraph immediately below the illustration should be amended to read:

The above ……. under approval number "30R 032439".

The "Note" should be amended to read:

Note: The first two digits following "30R" of the …… the 03 series of amendments.

Insert a new annex 8, to read:

"Annex 8

TEST PROCEDURE FOR MEASURING WET GRIP

1. General Test Conditions

1.1. Track Characteristics

The track shall have a dense asphalt surface with a gradient in any direction not exceeding 2 per cent. It shall be of uniform age, composition, and wear and shall be free of loose material or foreign deposits.

The surface friction value for the wetted track shall be established by one or other of the following methods:

1.1.1. Standard Reference Test Tyre (SRTT) method

When tested using the SRTT and the method given in 2.1. the average peak brake force coefficient (pbfc) shall be between 0.6 and 0.8. The measured values shall be corrected for the effects of temperature as follows:

Pbfc = Pbfc (measured) + 0.003 5(t – 20) where "t" is the wetted track surface temperature in degrees Celsius.

The test shall be conducted using the lanes and length of the track to be used for the wet grip test.

1.1.2. British Pendulum Number (BPN) method

The averaged British Pendulum Number (BPN) of the wetted track, measured in accordance with the procedure given in the American Society for Testing and Materials (ASTM) Standard 303-93 (Re-approved 1998) and using the Pad as specified in ASTM Standard E 501 - 94, shall be between 40 and 60 after temperature correction. Unless temperature correction recommendations are indicated by the pendulum manufacturer, the following formula can be used:

BPN = BPN (Measured value) + 0,34t – 0,0018 t^2 – 6,1 where "t" is the wetted track surface temperature in degrees Celsius

The BPN shall be measured at intervals of 10 m along the length of the lanes and at 200 mm intervals across the width of the lanes of the track to be used during the wet grip tests. The BPN shall be measured 5 times at each point and the coefficient of variation of the BPN averages shall not exceed by 10 per cent.

1.1.2.1. The type approval authority shall satisfy itself of the characteristics of the track on the basis of evidence produced in test reports.

1.2. Wetting conditions

The surface may be wetted from the track-side or by a wetting system incorporated into the test vehicle or the trailer.

If a track-side system is used, the test surface shall be wetted for at least half an hour prior to testing in order to equalise the surface temperature and water temperature. It is recommended that track-side wetting be continuously applied throughout testing.

The water depth shall be between 0.5 and 1.5 mm.

1.3. The wind conditions shall not interfere with wetting of the surface (Wind-shields are permitted).

The wetted surface temperature shall be between 5°C and 35°C and shall not vary during the test by more than 10°C.

2. Test Procedure

The comparative wet grip performance shall be established using either:

- a trailer or special purpose tyre evaluation vehicle, or

- a standard production passenger carrying vehicle (M1 category as defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3) contained in document TRANS/WP.29/78/Rev.1.)

2.1. Trailer or special purpose tyre evaluation vehicle procedure

2.1.1. The trailer, together with the towing vehicle, or the tyre evaluation vehicle shall comply with the following requirements:

2.1.1.1. Be capable of exceeding the upper limit for the test speed of 67 km/h and of maintaining the test speed requirement of 65 ± 2 km/h at the maximum level of application of braking forces;

2.1.1.2. Be equipped with an axle providing one test position having an hydraulic brake and actuation system that can be operated from the towing vehicle if applicable. The braking system shall be capable of providing sufficient braking torque to achieve the peak brake force coefficient over the range of tyre sizes and tyre loads to be tested;

2.1.1.3. Be capable of maintaining longitudinal alignment (toe) and camber of the test wheel and tyre assembly throughout the test within ± 0.5° of the static figures achieved at the test tyre loaded condition.

2.1.1.4. In the case of a trailer, the mechanical coupling device between the towing vehicle and trailer shall be such that, when the towing vehicle and trailer are coupled together, the drawbar, or part of the drawbar, of a trailer that incorporates the braking force measurement sensing is horizontal or slopes downwards from rear to front at a maximum angle of [5°]. [The longitudinal distance from the centre line of the articulation point of the coupling to the transverse centre line of the axle of the trailer shall be at least [ten times] the loaded radius of the test tyre.]

2.1.1.5. In the case of vehicles that incorporate a track wetting system, the water delivery nozzle(s) shall be such that the resulting water film is of uniform section extending at least 25 mm beyond the width of the tyre contact patch. The nozzle(s) shall be directed downwards at an angle of 20° to 30° and shall contact the track surface between 250 mm and 450 mm in front of the centre of the tyre contact patch. The height of the nozzle(s) shall be 25 mm or the minimum to avoid any obstacles on the track surface without exceeding a maximum of 100 mm. Water delivery rate shall ensure a water depth of 0.5 mm to 1.5 mm and shall be consistent throughout the test to within ± 10 per cent. Note that a typical rate for testing at 65 km/h will be $18ls^{-1}$ per metre of wetted track surface width.

The system shall be able to deliver the water such that the tyre, and track surface in front of the tyre, is wetted before the start of braking and throughout the duration of the test.

2.1.2. Test procedure

2.1.2.1. The test tyre shall be trimmed to remove any moulding protrusions that are likely to affect the test.

2.1.2.2. The test tyre shall be mounted on the test rim declared by the tyre manufacturer in the approval application and shall be inflated to 180 kPa in the case of the SRTT and standard load tyre or 210 kPa in the case of a Reinforced or Extra Load tyre.

2.1.2.3. The tyre shall be conditioned for a minimum of two hours adjacent to the test track such that it is stabilized at the ambient temperature of the test track area.

2.1.2.4. The tyre shall be loaded to:

- between 445 kg and 508 kg in the case of the SRTT and

- between 70 per cent and 80 per cent of the load value corresponding to the Load Index of the tyre in any other case.

2.1.2.5. Shortly before testing, the track shall be conditioned by carrying out at least ten braking tests on the part of the track to be used for the performance test programme but using a tyre not involved in that programme.

2.1.2.6. Immediately prior to testing, the tyre inflation pressure shall be checked and reset, if necessary, to the values given in paragraph 2.1.2.2.

2.1.2.7. The test speed shall be between 63 km/h and 67 km/h and shall be maintained between these limits throughout the test run.

2.1.2.8. The direction of the test shall be the same for each set of tests and shall be the same for the test tyre as that used for the SRTT with which its performance is to be compared.

2.1.2.9. The brakes of the test wheel assembly shall be applied such that peak braking force is achieved within 0.2 s and 0.5 s of brake application.

2.1.2.10. In the case of a new tyre, two test runs shall be carried out to condition the tyre. These tests may be used to check the operation of the recording equipment but the results shall not be taken into account in the performance assessment.

2.1.2.11. For the evaluation of the performance of any tyre compared with that of the SRTT, the braking test shall be carried out from the same point and in the same lane of the test track.

2.1.2.12. 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 three candidate tyres may be tested before repeating the SRTT test, for example:

R1–T1 – T2 – T3 – R2

2.1.2.13. The average value of peak brake force coefficient (pbfc) shall be calculated over at least [four] valid results.

For results to be considered to be valid, the coefficient of variation as determined by the standard deviation divided by the average result, expressed as a percentage, shall be within 5 per cent. If this is cannot achieved with the repeat testing of the SRTT, the evaluation of the candidate tyre(s) shall be discarded and the entire order of testing shall be repeated.

2.1.2.14. Using the value of the average pbfc for each series of test runs:

In the case of the order of testing R1 – T – R2, the pbfc of the SRTT to be used in the comparison of the performance of the candidate tyre shall be taken to be:
of the SRTT shall be taken to be:

(R1 + R2)/2 where:

R1 is the average pbfc for the first series of test runs of the SRTT and R2 is the average pbfc for the second series of test runs of the SRTT

In the case of the order of testing R1 – T1 – T2 – R2, the pbfc of the SRTT shall be taken to be:

2/3R1 + 1/3R2 for comparison with the candidate tyre T1 and

1/3R1 + 2/3R2 for comparison with the candidate tyre T2

In the case of the order of testing R1 – T1 – T2 – T3 – R2, the pbfc of the SRTT shall be taken to be:

3/4R1 + 1/4R2 for comparison with the candidate tyre T1;

(R1 + R2)/2 for comparison with the candidate tyre T2 and

1/4R1 + 3/4R2 for comparison with the candidate tyre T3

2.1.2.15. The wet grip index (G) shall be calculated as:

G = pbfc of candidate tyre ÷ pbfc of SRTT

2.2. Standard vehicle procedure

2.2.1. The vehicle shall be a standard M1 Category vehicle, capable of a minimum speed of 90 km/h and equipped with an anti-lock braking system (ABS).

2.2.1.1. The vehicle shall not be modified except:

- to allow the fitting of an increased range of wheel and tyre sizes

- to allow mechanical (including hydraulic, electrical or pneumatic) operation of the service brake control. The system may be operated automatically by signals from devices incorporated in, or adjacent to, the track.

2.2.2. Test procedure

2.2.2.1. The test tyres shall be trimmed to remove any moulding protrusions that are likely to affect the test.

2.2.2.2. The test tyre shall be mounted on the test rim declared by the tyre manufacturer in the approval application and shall be inflated to 220 Pa in all cases.

2.2.2.3. The tyre shall be conditioned for a minimum of two hours adjacent to the test track such that it is stabilized at the ambient temperature of the test track area.

2.2.2.4. The static load on the tyre shall be:

- between 381 kg and 572 kg in the case of the SRTT and

- between 60 per cent and 90 per cent of the load value corresponding to the Load Index of the tyre in any other case.

The variation in load on tyres on the same axle shall be such that the load borne by the more lightly loaded tyre shall not be less than 90 per cent of that of the tyre bearing the greater load.

2.2.2.5. Shortly before testing, the track shall be conditioned by carrying out at least ten braking tests from 90 km/h to 20 km/h on the part of the track to be used for the performance test programme but using tyres not involved in that programme.

2.2.2.6. Immediately prior to testing, the tyre inflation pressure shall be checked and reset, if necessary, to the values given in paragraph 2.2.2.2.

2.2.2.7. Starting from an initial speed of between 87 km/h and 83 km/h, a constant force sufficient to cause operation of the ABS on all wheels of the vehicle and to result in stable deceleration of the vehicle prior to the speed being reduced to 80 km/h, shall be applied to the service brake control and this force shall be maintained until the vehicle has been brought to rest.

The braking test shall be carried out with the clutch of a manual transmission disengaged or with the selector of an automatic transmission in the neutral position.

2.2.2.8. The direction of the test shall be the same for each set of tests and shall be the same for the candidate test tyre as that used for the SRTT with which its performance is to be compared.

2.2.2.9. In the case of new tyres, two test runs shall be carried out to condition the tyres. These tests may be used to check the operation of the recording equipment but the results shall not be taken into account in the performance assessment.

2.2.2.10. Each SRTT shall be discarded after a maximum of 60 braking test runs.

2.2.2.11. For the evaluation of the performance of any tyre compared with that of the SRTT, the braking test shall be carried out from the same point and in the same lane of the test track.

2.2.2.12. 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 three candidate tyres may be tested before repeating the SRTT test, for example:

R1–T1 – T2 – T3 - R2

2.2.2.13. The mean fully developed deceleration (mfdd) between 80 km/h and 20 km/h shall be calculated for at least three valid results in the case of the SRTT and 6 valid results in the case of the candidate tyres.

The mean fully developed deceleration (mfdd) is given by:

AD = 231.48 / s where:

S is the measured stopping distance between 80 km/h and 20 km/h

For results to be considered to be valid, the coefficient of variation as determined by the standard deviation divided by the average result, expressed as a percentage, shall be within 3 per cent. If this is cannot achieved with the repeat testing of the SRTT, the evaluation of the candidate tyre(s) shall be discarded and the entire order of testing shall be repeated.

The results shall be invalid if the initial and repeat tests of the SRTT are not within 2.5 per cent of each other.

The average of the calculated values of mfdd shall be determined for each series of test runs.

2.2.2.14. Using the value of the average mfdd for each series of test runs:

In the case of the order of testing R1 – T – R2, the mfdd of the SRTT to be used in the comparison of the performance of the candidate tyre shall be taken to be:

(R1 + R2)/2 where;

R1 is the average mfdd for the first series of test runs of the SRTT and R2 is the average mfdd for the second series of test runs of the SRTT

In the case of the order of testing R1 – T1 – T2 – R2, the mfdd of the SRTT shall be taken to be:

2/3R1 + 1/3R2 for comparison with the candidate tyre T1 and

1/3R1 + 2/3R2 for comparison with the candidate tyre T2

In the case of the order of testing R1 – T1 – T2 – T3 – R2, the mfdd of the SRTT shall be taken to be:

3/4R1 + 1/4R2 for comparison with the candidate tyre T1;

(R1 + R2)/2 for comparison with the candidate tyre T2 and

1/4R1 + 3/4R2 for comparison with the candidate tyre T3

2.2.2.15. The wet grip index (G) shall be calculated as:

G = average mfdd of candidate tyre ÷ mfdd of SRTT

2.2.2.16. 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.

2.2.2.16.1. 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 2.2.2.15.

The wet grip index of the candidate tyre relative to the SRTT shall be the product of the two resulting wet grip indices, that is G1 x G2.

2.2.2.16.2. The track, and the portion of the track, shall be the same for all of the tests and the ambient conditions shall be comparable, for example, the surface temperature of the wetted track shall be within ± 5°C. All tests shall be completed within the same day.

2.2.2.16.3. 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.

2.2.2.16.4. Control tyres that have been used for testing shall subsequently be stored under the same conditions as required for the SRTT, that is, in accordance with
ASTM E 1136 – 93 (Re-approved in 1998).

2.2.2.16.5. Control tyres shall be discarded if there is irregular wear or damage or when the performance appears to have deteriorated."

* * *

B. JUSTIFICATION

Following the introduction by the European Union of regulatory controls on tyre to road noise emissions, it was agreed to set up an ad-hoc group within GRRF to establish test procedures and performance levels for wet grip of both passenger car and truck tyres. The group wishes to submit this proposal for amendments to the existing Regulation No. 30 for consideration by GRRF.

Tyre design is the result of compromise between several performance parameters including both dry and wet grip, aquaplaning, tyre to road noise emissions, rolling resistance, passenger comfort and so on. The recent introduction of regulatory controls on tyre to road noise emissions has led to concerns that this may have adverse effects on the basic safety requirement of a tyre, that is, its wet grip performance. Consequently, WP.29 agreed to establish an ad-hoc group within GRRF to develop test procedures and limit values for the wet grip performance of both car and commercial vehicle tyres, in order to preserve the levels of grip found for tyres currently supplied on the market.

The ad-hoc group has held twelve meetings, although the early meetings were held in conjunction with those held for work on Global Harmonization of the tyre regulations, and the above proposals are the results following the last meeting held in Brussels on 17/18 November 2003. As far as the test procedure is concerned, the ad-hoc group has received invaluable help from parallel discussions within an International Organization for Standardization (ISO) working group and the procedures given in the proposed new annex 8 to the Regulation are largely based on a draft ISO Standard.

The requirements are a substantial change to the existing Regulation and the group recommends that, if these proposals are accepted, the Regulation is consolidated and issued as the 03 Series of Amendments. The resulting revised marking of "30R 03 ……" on the sidewall of the tyre will give an immediate indication that a particular tyre has been approved in respect of its wet grip performance.

The proposed new annex 8 to the Regulation contains two alternative methods for establishing the wet grip performance of a tyre. Whilst this may be considered to be undesirable, both methods simply compare the performance of a tyre submitted for approval with that of a standard reference test tyre and the group recommends that both methods be retained as they give valid and acceptable results. A tyre that achieves the performance requirement when tested by one method is unlikely to fail if tested by the alternative method.
