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Working Party on Brakes and Running Gear

**REPORT OF THE WORKING PARTY ON BRAKES AND RUNNING GEAR
ON ITS SIXTY-FIRST SESSION
(5 – 9 February 2007)**

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I. ATTENDANCE

1. The Working Party on Brakes and Running Gear (GRRF) held its sixty-first session from 5-9 February 2007 under the Chairmanship of Mr. I. Yarnold (United Kingdom). Experts from the following countries participated in the work, following Rule 1(a) of the rules of procedure of WP.29 (TRANS/WP.29/690): Canada; China; Croatia; Czech Republic; Denmark; Finland; France; Germany; Hungary; India; Italy; Japan; Netherlands; Norway; Republic of Korea; Republic of South Africa; Russian Federation; Slovakia; Spain; Sweden; Switzerland; United Kingdom; and United States of America. A representative of the European Commission (EC) also participated. Experts from the following non-governmental organizations participated: European Association of Automobile Suppliers (CLEPA); European Tyre and Rim Technical Organization (ETRTO); International Motorcycle Manufacturers Association (IMMA); International Organization for Standardization (ISO); International Organization of Motor Vehicle Manufacturers (OICA); International Road Transport Union (IRU). Upon the special invitation of the Chairman, experts from the following non-governmental organizations participated: Bureau International Permanent des Associations de Vendeurs et rechapeurs de pneu (BIPAVER), Comité de Liaison des Constructeurs de Carrosseries et Remorques (CLCCR), and Federation of European Manufacturers of Friction Materials (FEMFM).

2. The informal documents distributed during the session are listed in Annex I to this report.

II. REGULATIONS Nos. 13 AND 13-H (Braking) (Agenda item 2.)**A. Further development (Agenda item 2.1.)**

Documentation: Informal documents Nos. GRRF-61-05, GRRF-61-06, GRRF-61-07 and GRRF-61-15 of Annex I to the report

3. GRRF considered a number of corrections (GRRF-61-05, GRRF-61-06, GRRF-61-07 and GRRF-61-15) to the new consolidated version (Revision 6) of Regulation No. 13 (ECE/TRANS/WP.29/2007/2) and to Regulation No. 13-H (ECE/TRANS/WP.29/2007/3). GRRF adopted the amendments as reproduced in ECE/TRANS/WP.29/2007/2/Corr.1 and

ECE/TRANS/WP.29/2007/3/Corr.1 and requested the secretariat to submit them to WP.29 and AC.1 for consideration at their March 2007 sessions.

1. Endurance brake systems (Agenda item 2.1.1.)

Documentation: Informal documents Nos. GRRF-61-19 and Rev.1 of Annex I to the report

4. The expert from CLEPA introduced GRRF-61-19 regarding the insertion into Regulation No. 13 of special requirements for the illumination of stop lamps for vehicles equipped with endurance brakes. The document received a number of comments. Following the discussion, GRRF agreed on the text as reproduced in GRRF-61-19-Rev.1 and requested the secretariat to distribute it with an official symbol for a final review at the next GRRF session in September 2007. For that purpose, the Chairman invited all GRRF experts to think about the need to submit the proposal as a new series of amendments or as a Supplement to the Regulation.

2. Requirements for trailer ABS in case of failure (Agenda item 2.1.2.)

Documentation: ECE/TRANS/WP.29/GRRF/2007/3; Informal documents Nos. GRRF-61-35 and GRRF-61-36 of Annex I to the report

5. The expert from CLEPA presented ECE/TRANS/WP.29/GRRF/2007/3 to clarify in the existing text of Regulation No. 13 the requirements for the residual braking performance of vehicles with an anti-lock braking (ABS) function either inside an electronic brake control or inside an ABS systems. GRRF noted a number of comments. Following the discussion, the expert from CLEPA tabled GRRF-61-35 underlining the inconsistencies in the current text of the performance requirements for trailers (either 30 per cent or 80 per cent). He introduced GRRF-61-36 proposing an alternative amendment to the Regulation.

6. GRRF agreed to resume consideration on this subject at its next session and requested the secretariat to distribute GRRF-61-36 with an official symbol.

3. Temporary use spare wheels/tyres (Agenda item 2.1.3.)

Documentation: ECE/TRANS/WP.29/GRRF/2007/4

7. The expert from the United Kingdom introduced ECE/TRANS/WP.29/GRRF/2007/4 regarding the need to insert into Regulation No. 13-H test requirements for vehicles of categories M₁ and N₁ which are equipped with temporary use spare wheels/tyres. The document received a number of reservations. GRRF agreed to resume its consideration at its next session, if necessary, on the basis of a new proposal by the United Kingdom, taking into account the comments received.

4. Other business (Agenda item 2.1.4.)

Documentation: Informal documents Nos. GRRF-61-04, GRRF-61-08 and GRRF-61-09 of Annex I to the report

8. The expert from CLEPA proposed an amendment to Regulation No. 13-H concerning a more efficient warning to the vehicle driver in situations when electric control transmission faults occur (GRRF-61-04). GRRF welcomed the document and agreed to resume its consideration at the next GRRF session. The secretariat was requested to distribute GRRF-61-04 with an official symbol. GRRF noted that the similar amendments have to be prepared for Regulation No. 13.

9. The expert from OICA introduced GRRF-61-09 regarding some inconsistencies of Supplement 3 to the 10 series of amendments to Regulation No. 13. GRRF agreed on GRRF-61-09 which aims at aligning the French version with the English one. The secretariat was requested to make the necessary corrections to accomplish the alignment.

10. GRRF noted some comments on GRRF-61-08 and agreed to resume consideration of this item at its next session on the basis of a new proposal by OICA.

B. Facilitation of testing of vehicles in service (Agenda item 2.2.)

11. The experts from Italy and OICA questioned the possibility for manufacturers to apply for extensions of existing type approvals after the entry into force of Supplement 4 to the 10 series of amendments to Regulation No. 13. GRRF referred to the transitional provisions of paragraph 12.1.5. and confirmed that this paragraph permits the extension of approvals according to all technical aspects of the preceding Supplement to the 10 series of amendments.

C. Development of a passenger vehicle braking gtr (Agenda item 2.3.)

Documentation: Informal document No. GRRF-61-33 of Annex I to the report

12. The GRRF Chairman, also chairing the informal working group on the development of a gtr on passenger car braking (PVGTR), introduced GRRF-61-33 concerning the need for an exchange of views on the priority to continue the work on such a global technical regulation (gtr) and the necessity to commit resources to support the activities. He invited all Contracting Parties to the 1998 Agreement to send him their written comments on this subject not later than 28 February 2007.

III. MOTORCYCLE BRAKING (Agenda item 3.)

A. Harmonization of motorcycle braking requirements (Agenda item 3.1.)

Documentation: Informal documents Nos. GRRF-61-03, GRRF-61-18 and GRRF-61-25 of Annex I to the report

13. The expert from IMMA introduced a proposal (GRRF-61-03) aimed at aligning the technical provisions of gtr No. 3 (Motorcycle brake systems) with those amendments to Regulation No. 78. The proposal received some comments. The expert from India expressed his preference to review the efficacy of the current method for qualifying the test track (GRRF-61-25). Referring to his statement expressed at the previous GRRF session (see report

ECE/TRANS/WP.29/GRRF/60, para. 21), the expert from Germany volunteered to prepare a proposal to improve the text of the gtr.

14. GRRF agreed to keep GRRF-61-25 on its agenda and resume consideration of this subject at its next session in September 2007. For that purpose, the secretariat was requested to distribute the amendments related to Regulation No. 78 (first part of GRRF-61-03) as an official document. The expert from Canada (as the technical sponsor of the gtr) was invited to submit a parallel amendment to gtr No. 3 (second part of GRRF-61-03) to WP.29 and AC.3 pursuant to Article 6.4. of the 1998 Agreement.

15. The expert from Japan introduced GRRF-61-18 proposing to correct an error in the 03 series of amendments to Regulation No. 78, adopted by WP.29 and AC.1 at their November 2006 sessions on the basis of ECE/TRANS/WP.29/2006/133. GRRF welcomed that proposal and requested the secretariat to ensure the appropriate action necessary to correct the final text.

IV. REGULATION No. 90 (Replacement brake linings) (Agenda item 4.)

Documentation: Informal documents Nos. GRRF-61-13 and GRRF-61-22 of Annex I to the report

16. The expert from Germany, chairing the informal group on Replacement Discs and Drums (RD&D), reported on the progress made by the informal group. He added that the informal group could nevertheless not agree on the scope of application of these new provisions to original equipment spares, aftermarket replacement spares, or both. Thus, he introduced GRRF-61-13 proposing a compromise and sought guidance of GRRF. The expert from OICA raised strong concerns on the proposal and preferred to align the scope to replacement discs and drums, which were not supplied by the vehicle manufacturer, in the same way than in Regulation No. 124 on replacement wheels. He added that no safety gain would be achieved for original parts and that even a marking would not prevent such parts from being counterfeited.

17. Following the discussion, a large number of delegations supported the compromise proposed by the informal group's Chairman as reproduced in GRRF-61-13. GRRF invited the informal group to resume its work and to finalize the proposal for amendments to Regulation No. 90 on that basis.

18. The expert from FEMFM, chairing the informal group on Brake Linings, informed GRRF on the group's progress of work. He introduced GRRF-61-22 proposing the insertion into Regulation No. 90 of new performance requirements for brake linings. GRRF welcomed the proposal and agreed to resume its consideration at the next GRRF session. For that purpose, the secretariat was requested to distribute GRRF-61-22 with an official symbol. GRRF encouraged the informal group to conclude on the outstanding issues.

V. REGULATION No. 79 (Steering equipment) (Agenda item 5.)

Documentation: Informal documents Nos. GRRF-61-01 and GRRF-61-34 of Annex I to the report

19. Upon the request of GRRF at its fifty-ninth session (see ECE/TRANS/WP.29/GRRF/59, para. 17), the expert from the Russian Federation presented GRRF-61-01 proposing new prescriptions for the evaluation of the safety aspects of vehicles equipped with complex electronic vehicle control systems. He also introduced GRRF-61-34 justifying the need for the insertion of those amendments into Regulation No. 79. GRRF welcomed the proposal, but questioned the need for such an amendment.

20. GRRF noted a number of comments and study reservations. The expert from the Russian volunteered to prepare a new proposal taking into account the comments received. He volunteered to supplement the proposal with transitional provisions and to substantiate the justification with additional information on the need for such amendments. Concluding the discussion, the GRRF Chairman suggested having a detailed consideration of this subject at the sixty-third GRRF session and invited all experts to provide data on cost-benefit analyses, if available.

VI. TYRES (Agenda item 6.)

A. Harmonization of tyre Regulations (Agenda item 6.1.)

21. The Secretary of the informal group on the development of a global technical regulation on tyres (TYRE-gtr) reported on the progress of work made by the group during the meeting held on Monday (full day) prior to the GRRF session proper. He stated that the informal group had left the scope as defined at the last session. He informed GRRF that the group had agreed on the major tyre sidewall markings, but was still awaiting the decision of WP.29 and AC.3 whether these tyre markings should be mandatory or optional (see WP.29-140-7). He added that the omission of the marking for radial and tubeless tyres would need further discussion. He announced the informal group's agreement that the Tyre Identification Number (TIN) was an appropriate way to identify a tyre in the context of the gtr.

22. The TYRE-gtr Secretary (ETRTO) also reported that, with regard to the dimensions test, the informal group was close to an agreement pending the question of tolerances. Concerning the performance requirements for tyres, he stated that for the high speed test, the informal group had not endorsed the development of a new test procedure, but had considered to merge the existing test requirements of UNECE Regulation No. 30 and the United States standard FMVSS No. 139. He added that, under the proposal being developed by the informal group, the performance requirements for high speed tyres (for speed symbol "S" or "T" and higher) would be subject to similar provisions as those in Regulation No. 30 and that other tyres would have to follow the provisions of FMVSS No. 139. The informal group looked forward to receiving further data before finalizing the new approach. The group was to continue to work on the endurance/low pressure test, subject to modifications that had been negotiated. Both tests, the plunger energy test and the bead-unseating test, were proposed only for bias ply tyres. He announced the informal group's intention to prepare a roadmap for the sixty-third GRRF session and to finalize the draft gtr by the end of 2008. He concluded that all working papers of the TYRE-gtr informal group are available at:

<<http://www.unece.org/trans/main/wp29/wp29wgs/wp29grrf/grrf-infityre2.html>>

23. The GRRF Chairman questioned the group's decision not to develop a new high speed performance test method but to merge the requirements of the UNECE Regulation and the FMVSS. Thus, GRRF agreed to seek the advice of WP.29/AC.3 at the March 2007 session.

24. GRRF agreed with the Chairman's suggestion that the TYRE-gtr informal group should also meet again in Geneva, in conjunction with the sixty-second GRRF session.

B. Regulation No. 30 (Pneumatic tyres) (Agenda item 6.2.)

25. The expert from ETRTO gave a presentation on the work progress regarding the development of a proposal on tyre rolling resistance aimed at including new provisions from the revised ISO standard ISO 28 580 CD. The expert from the Russian Federation acknowledged the fruitful collaboration with ETRTO to develop a new test procedure for rolling resistance of tyres. GRRF welcomed that initiative and noted a number of comments.

26. GRRF agreed to develop, in a first step, a harmonized test procedure for rolling resistance of tyres and to insert, in a further step, a set of performance requirements (i.e. limit values). A number of delegates suggested the insertion of this test method also into Regulation No. 54 and the draft gtr on tyres.

27. The Chairman suggested deferring to a later time point the discussion on the need for the inclusion of requirements for Tyre Pressure Monitoring Systems (TPMS). GRRF agreed to resume consideration on this subject at its next session on the basis of a concrete proposal jointly prepared by the Russian Federation and ETRTO on rolling resistance issues.

C. Regulation No. 64 (Temporary use spare wheels/tyres) (Agenda item 6.3.)

Documentation: ECE/TRANS/WP.29/GRRF/2002/17/Rev.7; Informal documents Nos. GRRF-61-10, GRRF-61-12, GRRF-61-20 and GRRF-61-31 of Annex I to this report

28. Recalling the discussion at the previous GRRF session on Regulation No. 64, the expert from the United Kingdom presented ECE/TRANS/WP.29/GRRF/2002/17/Rev.7 proposing to clarify the existing requirements for vehicles fitted with run-flat tyres. GRRF noted some comments on the installation of such tyres on vehicles. The expert from Germany maintained his reservation on that proposal. Referring to ECE/TRANS/WP.29/GRRF/2006/23 presented at the previous GRRF session, the expert from ETRTO introduced GRRF-61-31 requesting further amendments to the proposal tabled by the United Kingdom. GRRF welcomed the technical information by Japan (GRRF-61-12) on performance conditions of direct run-flat warning system (RFWS). The expert from ETRTO raised concerns on the performance conditions presented. The expert from OICA introduced GRRF-61-10 proposing, as an option, improved amendments to the requirements of ECE/TRANS/WP.29/GRRF/2002/17/Rev.7.

29. Following the discussion, GRRF agreed on ECE/TRANS/WP.29/GRRF/2002/17/Rev.7 as amended by Annex II to this report. The amended proposal was adopted by all delegations with the exception of Germany and ETRTO. The secretariat requested to submit the adopted proposal, as draft 01 series of amendments to Regulation No. 64, to WP.29 and AC.1 for consideration at their June 2007 sessions.

30. ETRTO regretted that not all amendments proposed in ECE/TRANS/WP.29/GRRF/2006/23 had been taken into account.

31. GRRF noted the request (GRRF-61-20) by the Working Party on the Transport of Dangerous Goods (WP.15) to insert in the GRRF programme of work a new item concerning the prevention of fire risk involving tyres. GRRF acknowledged that fire on vehicles were mostly originated by problems of the engine. In some cases, heat could be built up in the hubs due to the generation of heat by braking or pressure loss in the tyres. In the event that the hub seal is defective or deteriorates due to the heat generation this would result in a loss of lubricant. This leakage could ignite and cause a fire risk. In order to prevent fire risks, GRRF recommended that vehicle operators have a regular service maintenance schedule for their vehicles (especially tyres, brakes, engine) and to provide good instructions to the vehicle drivers and the maintenance staff regarding inspections. Furthermore, the tyre pressure monitoring systems (TPMS), especially those that also record temperature, could be a possible solution to reduce fire risks involving tyres as well as over-heating hubs and brakes.

32. The Chairman recalled the discussion during the previous GRRF session (see report ECE/TRANS/WP.29/GRRF/60, para. 32) on the need to establish an informal working group on TPMS. Even the fact that TPMS could contribute to reduce tyre rolling resistance and, as a result, the fuel consumption, GRRF agreed that TPMS has mainly to be considered as safety systems with a high potential of safety improvement for all vehicle categories.

33. GRRF agreed to establish a new informal group on tyre pressure monitoring systems (TPMS) under the chairmanship of Germany. The GRRF Chairman announced his intention to seek WP.29's consent, at the March 2007 session, on that establishment. The expert from Germany was invited to prepare the terms of reference and the rules of procedure of the informal group for consideration at the next GRRF session

D. Regulation No. 109 (Retreaded pneumatic tyres for commercial vehicles and their trailers) (Agenda item 6.4.)

Documentation: ECE/TRANS/WP.29/GRRF/2006/26; Informal documents Nos. GRRF-61-23 and GRRF-61-24 of Annex I to this report

34. Recalling the purpose of ECE/TRANS/WP.29/GRRF/2006/26 discussed during the previous GRRF session, the expert from BIPAVÉR presented a revised proposal to insert new requirements for retreaded tyres with additional sidewall protection (GRRF-61-23). He complemented the proposal with explanatory information (GRRF-61-24). The experts from France, the Netherlands and OICA raised concerns on asymmetric tyre types as well as on the marking and the production tolerances of such tyres. GRRF noted their study reservations and agreed to resume consideration on this subject at its next session on the basis of a new proposal by BIPAVÉR. For that purpose, GRRF experts were invited to send him, in due time, their written comments.

E. Exchange of information on national and international tyre requirements
(Agenda item 6.5.)

Documentation: Informal document No. GRRF-61-26 of Annex I to this report

35. Upon the request of GRRF at its fifty-ninth session (see ECE/TRANS/WP.29/GRRF/59, para. 31), the expert from India presented his position on the use of sidewall marking on tyres in his country (GRRF-61-26). He added that for the Indian market all types of tyres would have to pass additional tests (such as the plunger test, the bead unseating test, etc.) which were not included in UNECE Regulations Nos. 30 and 54. He stated that the test conditions in India were even different from those applied in the United States of America. He volunteered to prepare a document on this issue for consideration at the next session of the TYRE-gtr informal group. Concluding his presentation, he announced that India initiated the process to consider joining the 1958 Agreement.

VII. OTHER BUSINESS (Agenda item 7.)

A. Electronically controlled stability enhancement systems (Agenda item 7.1.)

Documentation: ECE/TRANS/WP.29/GRRF/2006/34; Informal documents Nos. GRRF-61-14, GRRF-61-16, GRRF-61-17, GRRF-61-29, GRRF-61-30 and GRRF-61-32 of Annex I to this report

36. Mr. L. Palkovics (Hungary), chairing the informal group on Electronic Vehicle Stability Control (EVSC), reported on the good progress made by the group. Referring to ECE/TRANS/WP.29/GRRF/2006/34, he presented a revised proposal (GRRF-61-14) to insert into Regulation No. 13 new provisions for electronically controlled vehicle stability enhancement systems. The expert from France expressed concerns about the lack of precisions on the scope of application of EVSC and possible interpretation problems. GRRF welcomed GRRF-61-16 (by the United Kingdom) proposing some clarifications to the technical requirements.

37. The expert from the EC introduced GRRF-61-17 proposing the transitional provisions for the mandatory installation of stability control systems for certain categories of vehicles. He complemented his proposal with a summary of a cost-benefit analysis on EVSC for heavy vehicles (GRRF-61-32). GRRF noted that the proposed provisions in GRRF-61-29 were already reflected in the current text (para. 12.4.1.) of Regulation No. 13.

38. A number of delegates expressed concerns about the proposed transitional provisions for the mandatory installation of stability control systems on all vehicle categories, except M₁ and N₁. As no agreement could be found on the transitional provisions, GRRF agreed with the Chairman's suggestion to keep those provisions in square brackets and to submit the document to the WP.29 session in November 2007, subject to a final review in the sixty-second GRRF session in September 2007. GRRF also agreed to submit the document to WP.15 for consideration at its May 2007 session and for endorsement of the transitional provisions in paragraph 12.4. GRRF adopted ECE/TRANS/WP.29/GRRF/2006/34, as reproduced by Annex III to this report and requested the secretariat to submit the adopted proposal, as

draft 11 series of amendments to Regulation No. 13, to WP.29 and AC.1 for consideration at their November 2007 sessions. In this respect, the Chairman invited the expert from the EC to consider the timetable contained in GRRF-61-17.

39. The expert from the United States of America informed GRRF about the progress of their national rulemaking procedure concerning electronic stability control. He announced the submission by his country of an official proposal for the development of a gtr on electronic stability control (see ECE/TRANS/WP.29/2007/17) to WP.29 and AC.3. for consideration at their March sessions. He also announced to submit by summer 2007 the draft standard to be added to the compendium of candidate gtrs. He invited all stakeholders to the 1998 Agreement to provide standards or their national/regional regulations which might be eligible for the compendium. GRRF expressed full support to the initiative of the United States of America and acknowledged urgency on this issue.

40. GRRF agreed with the comments by the EVSC informal group (GRRF-61-30) suggesting keeping separate the development of a gtr on electronic stability control for vehicles having a maximum gross mass of 4536 kg or less, and the development of the EVSC test method under UNECE Regulation No. 13 for heavy vehicles.

B. Clarification of the scope of Regulations covered by GRRF (Agenda item 7.2.)

Documentation: ECE/TRANS/WP.29/GRRF/2007/2; Informal document No. GRRF-61-11 of Annex I to this report

41. The EC expert introduced ECE/TRANS/WP.29/GRRF/2007/2 regarding the clarification of the scopes of Regulations Nos. 30, 54, 75, 108 and 109. GRRF noted a number of comments. The expert from OICA introduced GRRF-61-11 proposing further amendments to the scope of Regulation No. 54. Following the discussion, GRRF only adopted the amendments to Regulation No. 75 (proposal A.3.) and requested the secretariat to submit the adopted amendments, as draft Supplement 12 to Regulation No. 75, to WP.29 and AC.1 for consideration at their June 2007 sessions.

42. As no common agreement could be reached on the scope of the other Regulations, GRRF agreed to resume consideration of this subject at the next GRRF session on the basis of a new proposal jointly prepared by the EC, Germany, Japan and OICA.

C. Regulation No. 55 (Mechanical couplings) (Agenda item 7.3.)

43. On behalf of the informal group on mechanical couplings, the expert from Germany reported the progress of work made by the group during its informal meetings on November 2006 and February 2007 in Darmstadt (Germany). He added the group's intention to convene again in Sochaux (France) on 3 May 2007 and to present, at the next GRRF session, a detailed situation. GRRF welcomed the good progress made on this subject and agreed to resume its consideration at the next session.

D. Exchange of information on national and international safety requirements
(Agenda item 7.4.)

Documentation: Informal documents Nos. GRRF-61-27, GRRF-61-28 and GRRF-61-37 of Annex I to this report

44. GRRF noted GRRF-61-27 and GRRF-61-28 relating to active safety measures in Japan concerning collision damage mitigation braking and brake assist systems respectively. GRRF also noted GRRF-61-37 concerning the results of a research by the United Kingdom on commercial vehicle wheel detachment and fixings.

E. Regulation No. 89 (Speed limitation device) (Agenda item 7.5.)

Documentation: Informal document No. GRRF-61-21 of Annex I to this report

45. The expert from France introduced GRRF-61-21 proposing some editorial corrections to the current text of the Regulation. GRRF agreed to resume consideration of this subject at its next session and requested the secretariat to distribute GRRF-61-21 with an official symbol.

F. Tributes to Messrs. Lesage and Hörner

46. Learning that Mr. Luc Lesage (France) and Manfred Hörner (OICA) would no longer attend the GRRF sessions, the Chairman acknowledged their fruitful and professional contributions during all the years of participation and wished them all the best for their future. GRRF honoured them with a long applause.

VIII. AGENDA FOR THE NEXT SESSION

47. GRRF did not consider the agenda for the sixty-second session to be held in Geneva, from 25 (14.30 h) to 28 (12.30 h) September 2007. It was agreed that the Chairman, jointly with the secretariat, would propose a draft agenda. 1/

1/ To help delegates make arrangements for travel and accommodation, the Chairman advises delegates that tyres items will be discussed at the end of the session.

Annex ILIST OF INFORMAL DOCUMENTS DISTRIBUTED WITHOUT A SYMBOL
DURING THE SIXTY-FIRST SESSION (GRRF-61-....)

No.	Transmitted by	Agenda item	Language	Title	Follow- up
01.	Russian Federation	4.	E/R	Proposal for amendments to UNECE Regulation No. 79 (steering equipment)	(a)
02.	Chairman	-	E	Provisional agenda, running order	(a)
03.	IMMA	3.	E	Draft amendments to the 03 series of amendments to Regulation No. 78 and alignment of gtr No. 3 on motorcycle braking	(b)
04.	CLEPA	2.1.4.	E	Proposal for draft amendments to Regulation No. 13-H	(b)
05.	OICA	2.1.	E	Proposal for a corrigendum to ECE/TRANS/WP.29/GRRF/60	(a)
06.	OICA	2.1.	E	Proposal for amendments to Regulation No. 13 and Regulation No. 13-H	(a)
07.	OICA	2.1.	E	Proposal for amendments to Annexes 4 and 5 to the official report	(a)
08.	OICA	2.1.4.	F	Proposition de complément 4 au Règlement No 13-H	(a)
09.	OICA	2.1.4.	F	Proposition de complément 3 à la série 10 d'amendements au Règlement No 13	(a)
10.	OICA	6.3.	E	Proposal for development of Regulation No. 64	(a)
11.	OICA	7.2.	E	Proposal for amendments to document ECE/TRANS/WP.29/GRRF/2007/2	(a)
12.	Japan	6.3.	E	Technical information of run flat warning systems (Regulation No. 64)	(b)
13.	D/RD&D	4.	E	Status report by the informal group on ECE- Regulation No. 90 – Replacement Discs and Drums (RD&D)	(a)
14.	EVSC	7.1.	E	Proposed amendments to Regulation No. 13 (Insertion of new provisions for electronically controlled vehicle stability enhancement systems (EVSC))	(a)
15.	Secretariat	2.1.	E	Proposal for a Corrigendum to ECE/TRANS/WP.29/2007/2 (Draft Revision 6 of Regulation No. 13)	(a)
16.	United Kingdom	7.1.	E	Proposal for draft amendments to Regulation No. 13 (ECE/TRANS/WP.29/GRRF/2006/34)	(a)
17.	European Commission	7.1.	E	Proposed amendments to Regulation No. 13 (Braking)	(a)
18.	Japan	3.	E	Proposal for a Corrigendum to ECE/TRANS/WP.29/2006/133 (Draft 03 series of amendments to Regulation No. 78)	(a)
19.- Rev.1	CLEPA	2.1.1.	E	Proposal for draft amendments to Regulation No. 13	(b)

No.	Transmitted by	Agenda item	Language	Title	Follow-up
20.	Secretariat	6.3.	E	Prevention of fire risk involving tyres	(a)
21.	France	7.5.	E	Proposal for a Corrigendum to ECE Regulation No. 89	(b)
22.	Brake linings	5.2.	E	Proposal for draft amendments to Regulation No. 90	(b)
23	BIPAVÉR	6.4.	E	Proposal for draft amendments to Regulation No. 109	(a)
24	BIPAVÉR	6.4.	E	ASP – Additional Sidewall Protection	(a)
25	India	3.1.	E	Comments on informal document No. GRRF-61-03	(a)
26	India	6.5.	E	India's position on sidewall marking on tyres	(a)
27	Japan	7.4.	E	The promotion of active safety measures in Japan – collision damage mitigation brake	(a)
28	Japan	7.4.	E	Investigation on the activation timing and additional deceleration of brake assist systems (BAS)	(a)
29	Japan	7.1.	E	Proposed amendments to Regulation No. 13 (Braking)	(a)
30	EVSC	7.1.	E	Global technical regulation on electronic stability control	(a)
31	ETRTO	6.3.	E	Comments on the document ECE/TRANS/WP.29/GRRF/2002/17/Rev.7	(a)
32	European Commission	7.1.	E	Summary of cost-benefit data on ESC for heavy vehicles	(a)
33	United Kingdom	2.3.	E	Passenger car braking gtr	(a)
34	Russian Federation	5.	E	ECE Regulation No. 70: proposal for amendments	(a)
35	CLEPA	2.1.2.	E	Problems associated with differences in performance requirements of vehicles with ABS function and ABS system	(a)
36	CLEPA	2.1.2.	E	Proposal for amendments to Regulation No. 13	(b)
37	United Kingdom	7.4.	E	Commercial vehicle wheel detachment and fixings	(a)

Notes:

- (a) Consideration completed or superseded
(b) Continue consideration at the next session with official symbol

Annex II

Amendments to ECE/TRANS/WP.29/GRRF/2002/17/Rev.7
(adopted by GRRF at its sixty-first session, see para. 29)

Paragraph 2.13., amend to read:

"2.13. "Run-Flat Warning System" - describes a system **which delivers** information to the driver that a tyre is operating in the flat tyre running mode."

Paragraph 5.1.6., amend to read:

"5.1.6. In the case of vehicles equipped with run-flat/self supporting tyres or run-flat/extended mobility system the vehicle shall also be fitted with a Run-Flat Warning System (defined in paragraph 2.13.). **The run-flat warning system shall be capable of operating within a speed range from 40 km/h to the maximum design speed of the vehicle.**"

Paragraphs 5.1.6.3. and 5.1.6.4., amend to read:

"5.1.6.3. **A warning shall be indicated to the driver by the operation of the warning signal referred to in paragraph 5.1.6.1. at the latest when one tyre is detected to be in the flat tyre running mode.**

5.1.6.4. Electrical failure or sensor anomaly that affects the Run-Flat Warning System, including failure of the electrical source, supply or transmission of the output signal, shall be indicated to the driver by **an optical yellow run flat malfunction signal**. If the warning signal **described in paragraph 5.1.6.1.** is used to indicate both ..."

Paragraph 12.1., amend to read:

"12.1. As from **36** months after the date of entry into force of the 01 series of amendments, Contracting Parties applying this Regulation with respect to the temporary use spare wheels/tyres, run flat tyres or a run flat system shall grant approvals only if the vehicle meets the requirements of this Regulation as amended by the 01 series of amendments."

Annex 4,

Paragraph 2.1.4., amend to read:

"2.1.4. **Within** 5 minutes after reducing the inflation pressure of the tyre, **drive** the vehicle normally between 40 and 100 km/h."

Paragraph 2.2.3., amend to read:

"2.2.3. When:

(a) the run flat **malfunction signal** as described in paragraph **5.1.6.4.** has activated or,

- (b) a period of 20 minutes has elapsed, when determined in accordance with paragraph 2.3., from the time the test speed has been reached. If the warning does not activate the test has failed,
the vehicle shall be brought to a halt and the ignition switched off."

Annex III

Revision to ECE/TRANS/WP.29/GRRF/2006/34 (Regulation No. 13 on braking)
(adopted by GRRF at its sixty-first session, see para. 38)

Add new paragraphs 2.32. to 2.32.2.2., to read:

- "2.32. "Vehicle Stability Function" means an electronic control function for a vehicle which improves the dynamic stability of the vehicle.
- 2.32.1. A vehicle stability function includes one or both of the following:
(a) directional control
(b) roll-over control
- 2.32.2. Control functions within a vehicle stability function:
- 2.32.2.1. "Directional control" means a function within a vehicle stability function that assists the driver, in the event of under steer and over steer conditions, within the physical limits of the vehicle in maintaining the direction intended by the driver in the case of a power-driven vehicle, and assists in maintaining the direction of the trailer with that of the towing vehicle in the case of a trailer.
- 2.32.2.2. "Roll-over control" means a function within a vehicle stability function that reacts to an impending roll-over in order to stabilise the power-driven vehicle or towing vehicle and trailer combination or the trailer during dynamic manoeuvres within the physical limits of the vehicle."

Add new paragraph 5.2.1.32., to read:

- "5.2.1.32. Subject to the provisions of paragraph 12.4. to this Regulation, all vehicles in categories M₂, M₃, N₂ and N₃ shall be equipped with a stability control function. This shall include roll-over control and directional control and meet the technical requirements of Annex 21."

Add new paragraph 5.2.2.23., to read:

- "5.2.2.23. Subject to the provisions of paragraph 12.4. to this Regulation, all vehicles in categories O₃ and O₄ shall be equipped with a stability control function. This shall include at least roll-over control and meet the technical requirements of Annex 21."

Add a new paragraph 12.1.7., to read (including the footnote */):

"12.1.7. As from the official date of entry into force of the 11 series of amendments, no Contracting Party applying this Regulation shall refuse to grant type-approval under this regulation as amended by the 11 series of amendments. */

*/ Nothing in this paragraph shall prevent Contracting Parties mandating electronic vehicle stability control systems meeting the requirements of this Regulation."

Add a new paragraph 12.4., to read (including the footnote **/):

"[12.4. Mandatory provisions for vehicles equipped with stability function

12.4.1. Requirements for the equipment of vehicles with vehicle stability functions as specified in paragraphs 5.2.1.32. and 5.2.2.23. of this Regulation, as amended by the 11 series of amendments, shall be applied as follows:

Vehicle Category	Application date (period after entry into force of the 11 series of amendments)		Applicable requirements (paragraph)
	Contracting Parties may/shall refuse type approval to vehicles not meeting the applicable requirements.	Contracting Parties may/shall refuse first entry into service of vehicles not meeting the applicable requirements	
M ₂	48 months	72 months	5.2.1.32.
M ₃ (class III) **/	12 months	36 months	5.2.1.32.
M ₃ (other than above)	48 months	72 months	5.2.1.32.
N ₂	48 months	72 months	5.2.1.32.
N ₃ (covered by the provisions of Annex V to this Regulation)	12 months	36 months	5.2.1.32.
N ₃ (other than above)	24 months	48 months	5.2.1.32.
Semi-trailers of O ₃ and O ₄ (covered by the provisions of Annex V to this Regulation)	12 months	36 months	5.2.2.23.
Semi-trailers of O ₃ and O ₄ (other than above)	24 months	48 months	5.2.2.23.
Trailers (other than semi-trailers) of categories O ₃ and O ₄	36 months	60 months	5.2.2.23.

**/ Class III tourist coaches as defined in UNECE Regulation No. 107.] "

Paragraphs 12.4. and 12.4.1. (former), renumber as paragraphs 12.5. and 12.5.1.

Annex 2, add new items 14.14. and 14.14.1., to read:

"14.14. The vehicle is equipped with a vehicle stability function: Yes/No 2/
If yes:
The vehicle stability function has been tested according to
and fulfils the requirements of Annex 21: Yes/No 2/
Vehicle stability function is optional equipment: Yes/No 2/
Vehicle stability function includes directional control: Yes/No 2/
Vehicle stability function includes roll-over control: Yes/No 2/

14.14.1. Where an Annex 19 test report has been utilised, the test report number shall be stated: "

Annex 10, paragraph 1.3.1., footnote **/, amend to read:

"**/ In the case of multiple axles, where the axle spread between one axle and its adjacent axle is greater than 2.0 m, each individual axle shall be considered as an independent axle group."

Annex 19

Add a new paragraph 1.1.5., to read:

"1.1.5. Vehicle stability function (refer to paragraph 6.)."

Add new paragraphs 6. to 6.6.1., to read:

"6. Vehicle stability function

6.1. General

6.1.1. This section defines a test procedure to determine the dynamic characteristics of a vehicle equipped with a vehicle stability function consisting of at least one of the following functions:

- (a) directional control
- (b) roll-over control

6.2. Information document

6.2.1. The system/vehicle manufacturer shall supply to the Technical Service an Information Document of the control function(s) for which performance verification is required. This document shall contain at least the information defined in Appendix 7 to this Annex.

- 6.3. Definition of test vehicle(s)
- 6.3.1. Based on the stability control function(s) and their application(s) defined in the manufacturer's information document the Technical Service shall carry out a performance verification. This may include one or more dynamic manoeuvres as defined in paragraph 2.2.3. of Annex 21 to this Regulation on a trailer(s) having up to three axles which is representative of the application(s) defined in paragraph 2.1. of the manufacturers information document.
- 6.3.1.1. When selecting the trailer(s) for evaluation, consideration shall also be given to the following:
- (a) Suspension type: for each suspension group, e.g. balanced pneumatic, a trailer of that specification shall be evaluated.
 - (b) Wheel base: wheel base shall not be a limiting factor.
 - (c) Brake type: approval shall be limited to trailers with S-cam or disc brakes but should other types become available, then comparative testing may be required.
 - (d) Braking system: the braking system of the trailer(s) to be evaluated shall comply with all of the relevant requirements of this Regulation.
- 6.4. Test schedule
- 6.4.1. To evaluate the vehicle stability control function the tests used shall be agreed between the system/vehicle manufacturer and the Technical Service and shall include conditions, appropriate to the function being evaluated, that would without the intervention of the stability control function result in loss of directional control or roll-over. The dynamic manoeuvres, test conditions and results shall be included in the test report.
- 6.5. Towing vehicle
- 6.5.1. The towing vehicle used for evaluating the performance of the vehicle (trailer) stability function shall have the necessary pneumatic and electrical connections and if the towing vehicle is equipped with a vehicle stability function as defined in paragraph 2.32. of this Regulation that function shall be disabled.
- 6.6. Test report
- 6.6.1. A test report shall be produced, the content of which shall be at least that defined in Appendix 8 to this Annex."

Add a new Appendix 7 to Annex 19, to read:

"Annex 19 – Appendix 7

VEHICLE STABILITY FUNCTION INFORMATION DOCUMENT

1. General
 - 1.1. Name of manufacturer
 - 1.2. System name
 - 1.3. System variations
 - 1.4. Control function (directional / roll-over / both) including an explanation of the basic function and/or philosophy of the control
 - 1.5. System configurations (where appropriate)
 - 1.6. System identification

2. Applications
 - 2.1. List of trailer types and configurations for which approval is required
 - 2.2. Schematic diagrams of the respective configurations installed on the trailers defined in item 2.1. above with consideration given to the following:
 - (a) Lift axles
 - (b) Steering axles
 - (c) Anti-lock braking configurations
 - 2.3. Scope of application with respect to suspension type:
 - (a) Air suspension: any type of balanced "trailing arm" air suspension
 - (b) Other suspensions: individually identified by manufacturer, model and type (balanced/unbalanced).
 - 2.4. Additional information (if applicable) to the application of the directional control and/or the roll-over control function(s)

3. Component Description
 - 3.1. Sensors external to the controller
 - (a) Function
 - (b) Limitations on the location of the sensors
 - (c) Identification, e.g. part numbers
 - 3.2. Controller(s)
 - (a) General description and function
 - (b) Identification e.g. part numbers
 - (c) Limitations on the location of the controller(s).
 - (d) Additional features
 - 3.3. Modulators
 - (a) General description and function
 - (b) Identification
 - (c) Limitations

- 3.4. Electrical Equipment
 - (a) Circuit diagrams
 - (b) Powering methods
- 3.5. Pneumatic circuits

System schematics including anti-lock braking configurations associated with the trailer types defined in paragraph 6.2.1. of this Annex.
- 3.6. Safety aspects of the electronic system in accordance with Annex 18 to this Regulation
- 3.7. Electro-magnetic compatibility
 - 3.7.1. Documentation demonstrating compliance with Regulation No. 10 including the 02 series of amendments."

Add a new Appendix 8 to Annex 19, to read:

"Annex 19 – Appendix 8

VEHICLE STABILITY FUNCTION TEST REPORT

Test Report No:

- 1. Identification:
 - 1.1. Manufacturer of the vehicle stability function (name and address)
 - 1.2. System name / model
 - 1.3. Control function
- 2. System(s) and installations approved:
 - 2.1. Anti-lock braking configurations (where appropriate)
 - 2.2. Range of application (trailer type(s) and number of axles)
 - 2.3. System identification
 - 2.4. Additional features
- 3. Test data and results:
 - 3.1. Test vehicle data (including the specification and functionality of the towing vehicle)
 - 3.2. Test surface information
 - 3.3. Additional Information
 - 3.4. Demonstrative tests/simulations used for the purpose of evaluating the directional control and the roll-over control as appropriate.
 - 3.5. Test results
 - 3.6. Assessment in accordance with Annex 18 to this Regulation

4. Limits of installation
 - 4.1. Suspension type
 - 4.2. Brake type
 - 4.3. Location of components on the trailer
 - 4.4. Anti-lock braking configurations
 - 4.5. Other recommendations/limitations (e.g. lifting axles, steering axles, etc.)
5. Attachments
6. Date of test:
7. This test has been carried out and the results reported in accordance with Annex 19 to ECE Regulation No. 13 as last amended by the series of amendments.

Technical Service 1/ conducting the test

Signed: Date:

8. Approval Authority 1/

Signed: Date:

1/ To be signed by different persons even when the Technical Service and Approval Authority are the same or alternatively, a separate Approval Authority Authorisation issued with the report."

Appendix 7 (former), renumbered as Appendix 9.

Annex 20

Paragraph 2.1.3., amend to read:

"2.1.3. A documentation package that contains the relevant verification information including the relevant calculations, where appropriate, for the following:

Performance Requirements	Annex 20 Reference
Cold service braking performance	3.
Parking brake performance	4.
Automatic (emergency) brake performance	5.
Failure of brake distribution system	6.
Anti-lock braking	7.
Vehicle stability function	8.
Functional checks	9.

"

Add new paragraphs 8. to 8.2.1.4., to read:

- "8. Alternative procedure for demonstrating the performance of a trailer equipped with a vehicle stability function.
- 8.1. Evaluation of a trailer in accordance with paragraph 2. of Annex 21 to this Regulation may be waived at the time of trailer type approval provided that the vehicle stability function complies with the relevant requirements of Annex 19 to this Regulation.
- 8.2. Verification
- 8.2.1. Verification of components and installation

The specification of the braking system, in which the stability control function is integrated and installed on the trailer to be type approved shall be verified by satisfying each of the following criteria:

	Condition	Criteria
8.2.1.1.	(a) Sensor(s)	No change allowed
	(b) Controller(s)	No change allowed
	(c) Modulator(s)	No change allowed
8.2.1.2.	Trailer types as defined in the test report	No change allowed
8.2.1.3.	Installation configurations as defined in the test report	No change allowed
8.2.1.4.	For other limitations refer to paragraph 4. of the test report as described in Appendix 8 of Annex 19 to this Regulation.	No change allowed

"

Paragraph 9.1.8. (former), renumber as paragraph 9.1.9.

Add new paragraphs 9.1.8. and 9.1.8.1., to read:

- "9.1.8. Vehicle stability function
- 9.1.8.1. For practical reasons verification of the vehicle stability function shall be limited to an installation check as defined in paragraph 8.2. above and observation of the correct warning signal sequence to ensure no faults are present."

Add a new Annex 21, to read (including its Appendices 1 to 3):

"Annex 21

SPECIAL REQUIREMENTS FOR VEHICLES EQUIPPED WITH A
VEHICLE STABILITY FUNCTION

1. GENERAL

This annex defines the special requirements for vehicles equipped with a vehicle stability function, pursuant to paragraphs 5.2.1.32. and 5.2.2.23. of this Regulation.

2. REQUIREMENTS

2.1. Power-driven vehicles

2.1.1. Where a vehicle is equipped with a vehicle stability function as defined in paragraph 2.32. of this Regulation, the following shall apply:

In the case of directional control the function shall have the ability to automatically control individually the speed of the left and right wheels on each axle or an axle of each axle group */ by selective braking based on the evaluation of actual vehicle behaviour in comparison with a determination of vehicle behaviour demanded by the driver. 1/

In the case of roll-over control the function shall have the ability to automatically control the wheel speeds on at least two wheels of each axle or axle group */ by selective braking or automatically commanded braking based on the evaluation of actual vehicle behaviour that may lead to vehicle roll-over. 1/

In both cases, the function is not required when the vehicle is in reverse mode or when the vehicle speed is below 10 km/h.

*/ In the case of multiple axles, where the spread between one axle and its adjacent axle is greater than 2m, each individual axle shall be considered as an independent axle group.

1/ Additional interaction with other vehicle systems or components is allowed. Where these systems or components are subject to special Regulations, such interaction shall comply with the requirements of those Regulations, e.g. interaction with the steering system shall comply with the requirements set out in Regulation No. 79 for corrective steering.

2.1.2. To realise the functionality defined above a vehicle stability function shall include, in addition to selective braking and/or automatically commanded braking, at least the following:

(a) The ability to control engine power output.

(b) In the case of directional control: The determination of actual vehicle behaviour from values of yaw rate, lateral acceleration, wheel speeds, and from the driver's control inputs to the braking and steering systems and to the engine. Only on-board

generated information shall be used. If these values are not directly measured, the evidence of the appropriate correlation with directly measured values under all driving conditions (e.g. including driving in a tunnel) shall be shown to the technical service at the time of type approval.

- (c) In the case of roll-over control: The determination of actual vehicle behaviour from values of the vertical force on the tyre(s) (or at least lateral acceleration and wheel speeds) and from the driver's control inputs to the braking system and to the engine. Only on-board generated information shall be used. If these values are not directly measured, the evidence of the appropriate correlation with directly measured values under all driving conditions (e.g. including driving in a tunnel) shall be shown to the technical service at the time of type approval.
- (d) In the case of a towing vehicle equipped according to paragraph 5.1.3.1. of this Regulation: The ability to apply the service brakes of the trailer via the respective control line(s) independently of the driver.

- 2.1.3. The vehicle stability function shall be demonstrated to the Technical Service by dynamic manoeuvres on one vehicle. This may be realized by a comparison of results obtained with the vehicle stability function enabled and disabled for a given load condition. As an alternative to carrying-out dynamic manoeuvres for other vehicles and other load conditions, fitted with the same vehicle stability system, the results from actual vehicle tests or computer simulations may be submitted.

The use of the simulator is defined in Appendix 1 to this Annex.

The specification and validation of the simulator is defined in Appendix 2 to this Annex.

Until unified test procedures are agreed, the method by which this demonstration is carried out shall be agreed between the vehicle manufacturer and the Technical Service and shall include the critical conditions of directional control and roll-over control as appropriate to the vehicle stability function installed on the vehicle with the method of demonstration and results being appended to the type approval report. This may be carried-out other than at the time of type approval.

As a means of demonstrating the vehicle stability function any of the following dynamic manoeuvres shall be used */:

*/ Should the use of any of the above defined manoeuvres not result in loss of directional control or roll-over as appropriate an alternative manoeuvre may be used in agreement with the technical service.

Directional Control	Roll-Over Control
Reducing radius test	Steady state circular test
Step steer input test	J-turn
Sine with dwell	
J-turn	
μ -split single lane change	
Double lane change	
Reversed steering test or "fish hook" test	
Asymmetrical one period sine steer or pulse steer input test	

To demonstrate repeatability the vehicle will be subject to a second demonstration using the selected manoeuvre(s).

- 2.1.4. Interventions of the vehicle stability function shall be indicated to the driver by a specific optical warning signal. The indication shall be present as long as the vehicle stability function is in an intervention mode. The warning signals specified in paragraph 5.2.1.29. of this Regulation shall not be used for this purpose.

Interventions of the vehicle stability function used in any learning process to determine the vehicle operational characteristics shall not generate the above signal.

The signal shall be visible to the driver, even in daylight, such that the driver can easily verify the satisfactory condition of the signal without leaving the driver's seat.

- 2.1.5. A vehicle stability function failure or defect shall be detected and indicated to the driver by the specific optical warning signal referred to in paragraph 5.2.1.29. of this Regulation.

The warning signal shall be constant and remain displayed as long as the failure or defect persists and the ignition (start) switch is in the 'on' (run) position.

- 2.1.6. In the case of a power-driven vehicle equipped with an electric control line and electrically connected to a trailer with an electric control line the driver shall be warned by a specific optical warning signal whenever the trailer provides the information "VDC Active" via the data communications part of the electric control line. The optical signal defined in paragraph 2.1.4. above may be used for this purpose.

2.2. Trailers

- 2.2.1. Where a trailer is equipped with a vehicle stability function as defined in paragraph 2.32. of this Regulation, the following shall apply:

In the case of directional control the function shall have the ability to automatically control individually the speed of the left and right wheels on each axle or an axle of each axle group **/ by selective braking based on the evaluation of actual trailer

behaviour in comparison with a determination of the relative behaviour of the towing vehicle. 1/

In the case of roll-over control the function shall have the ability to automatically control the wheel speeds on at least two wheels of each axle or axle group **/ by selective braking or automatically commanded braking based on the evaluation of actual trailer behaviour that may lead to roll-over. 1/

**/ In the case of multiple axles, where the spread between one axle and its adjacent axle is greater than 2 m, each individual axle shall be considered as an independent axle group.

1/ Additional interaction with other vehicle systems or components is allowed. Where these systems or components are subject to special Regulations, such interaction shall comply with the requirements of those Regulations, e.g. interaction with the steering system shall comply with the requirements set out in Regulation No. 79 for corrective steering.

2.2.2. To realise the functionality defined above a vehicle stability function shall include, in addition to automatically commanded braking and where appropriate selective braking, at least the following:

(a) The determination of actual trailer behaviour from values of the vertical force on the tyre(s), or at least lateral acceleration and wheel speeds. Only on-board generated information shall be used. If these values are not directly measured, the evidence of the appropriate correlation with directly measured values under all driving conditions (e.g. including driving in a tunnel) shall be shown to the technical service at the time of type approval.

2.2.3. The vehicle stability function shall be demonstrated to the Technical Service by dynamic manoeuvres on one vehicle. This may be done by a comparison of results obtained with the vehicle stability function enabled and disabled for a given load condition. As an alternative to carrying-out dynamic manoeuvres for other vehicles and other load conditions, fitted with the same vehicle stability system, the results from actual vehicle tests or computer simulations may be submitted.

The use of the simulator is defined in Appendix 1 to this Annex.

The specification and validation of the simulator is defined in Appendix 2 to this Annex.

Until unified test procedures are agreed, the method by which this demonstration is carried out shall be agreed between the trailer manufacturer and the Technical Service and shall include the critical conditions of roll-over control and directional control as appropriate to the vehicle stability function installed on the trailer with the method of demonstration and results being appended to the type approval report. This may be carried-out other than at the time of type approval.

As a means of demonstrating the vehicle stability function any of the following dynamic manoeuvres shall be used */:

Directional Control	Roll-Over Control
Reducing radius test	Steady state circular test
Step steer input test	J-turn
Sine with dwell	
J-turn	
μ -split single lane change	
Double lane change	
Reversed steering test or "fish hook" test	
Asymmetrical one period sine steer or pulse steer input test	

To demonstrate repeatability the vehicle will be subject to a second demonstration using the selected manoeuvre(s).

- 2.2.4. Trailers equipped with an electric control line, when electrically connected to a towing vehicle with an electric control line, shall provide the information "VDC active" via the data communications part of the electric control line when the vehicle stability function is in an intervention mode. Interventions of the vehicle stability function used in any learning process to determine the trailer operational characteristics shall not generate the above information.
- 2.2.5. To maximise the performance of trailers that utilise "select-low" such trailers are permitted to change control mode to "select-high" during an intervention of the "Vehicle Stability Function".

Annex 21 - Appendix 1

USE OF THE DYNAMIC STABILITY SIMULATION

The effectiveness of the directional and/or roll-over stability control function of power-driven vehicles and trailers of categories M, N and O, may be determined by computer simulation.

1. USE OF THE SIMULATION

- 1.1 The vehicle stability function shall be demonstrated by the vehicle manufacturer to the Type Approval Authority or Technical Service with the same dynamic manoeuvre(s) as for the practical demonstration in paragraph 2.1.3. or 2.2.3. of Annex 21.

*/ Should the use of any of the above defined manoeuvres not result in loss of directional control or roll-over as appropriate an alternative manoeuvre may be used in agreement with the technical service.

- 1.2. The simulation shall be a means whereby the vehicle stability performance may be demonstrated with the vehicle stability function enabled or disabled, and in the laden and unladen conditions.
- 1.3. The simulations shall be carried out with a validated modelling and simulation tool. The verification shall be carried out using the same manoeuvre(s) as defined in paragraph 1.1. above.

The method by which the simulation tool is validated is given in Annex 21, Appendix 2.

Annex 21 - Appendix 2

DYNAMIC STABILITY SIMULATION TOOL AND ITS VALIDATION

1. SPECIFICATION OF THE SIMULATION TOOL

- 1.1. The simulation method shall take into account the main factors which influence the directional and roll motion of the vehicle. A typical model may include the following vehicle parameters in an explicit or implicit form:
 - (a) Axle/wheel
 - (b) Suspension
 - (c) Tyre
 - (d) Chassis/vehicle body
 - (e) Power train/driveline, if applicable
 - (f) Brake system
 - (g) Payload
- 1.2. The Vehicle Stability Function shall be added to the simulation model by means of:
 - a) a subsystem (software model) of the simulation tool, or
 - b) the electronic control box in a hardware-in-the-loop configuration.
- 1.3. In the case of a trailer, the simulation shall be carried out with the trailer coupled to a representative towing vehicle.
- 1.4. Vehicle loading condition
 - 1.4.1. The simulator shall be able to take into account the laden and unladen conditions.
 - 1.4.2. The load shall be considered to be a fixed load with properties (mass, mass distribution and maximum recommended height of the centre of gravity) specified by the manufacturer.

2. VALIDATION OF THE SIMULATION TOOL

- 2.1. The validity of the applied modelling and simulation tool shall be verified by means of comparisons with a practical vehicle test(s). The test(s) utilised for the validation shall be those which, without control action, would result in loss of directional control (under-steer and over-steer) or roll-over control as appropriate to the functionality of the stability control function installed on a representative vehicle.

During the test(s) the following motion variables, as appropriate, shall be recorded or calculated in accordance with ISO 15037 Part 1:2005: General conditions for passenger cars or Part 2:2002: General conditions for heavy vehicles and buses (depending on the vehicle category):

- (a) yaw velocity;
 - (b) lateral acceleration;
 - (c) wheel load or wheel lift;
 - (d) forward velocity;
 - (e) driver input.
- 2.2. The objective is to show that the simulated vehicle behaviour and operation of the vehicle stability function is comparable with that seen in practical vehicle tests.
- 2.3. The simulator shall be deemed to be validated when its output is comparable to the practical test results produced by a given vehicle type during the selected manoeuvre(s) from those defined with paragraph 2.1.3. or 2.2.3. of Annex 21, as appropriate.

In the case of the steady state circular test the under-steer gradient shall be the means of making the comparison.

In the case of a dynamic manoeuvre, the relationship of activation and sequence of the vehicle stability function in the simulation and in the practical vehicle test shall be the means of making the comparison.

- 2.4. The physical parameters that are different between the reference vehicle and simulated vehicle configurations shall be modified accordingly in the simulation.
- 2.5. A simulator test report shall be produced, a model of which is defined in Appendix 3 of this annex, and a copy attached to the vehicle approval report.

Annex 21 - Appendix 3

VEHICLE STABILITY FUNCTION SIMULATION TOOL TEST REPORT

Test Report Number:

- 1. Identification
 - 1.1. Name and address of the simulation tool manufacturer

- 1.2. Simulation tool identification: name/model/number (hardware and software)

- 2. Scope of application
 - 2.1. Vehicle type: (e.g. truck, tractor, bus, semi-trailer, centre-axle trailer, full trailer)
 - 2.2. Vehicle configuration: (e.g. 4x2, 4x4, 6x2, 6x4, 6x6)
 - 2.3. Limiting factors: (e.g. mechanical suspension only)
 - 2.4. Manoeuvre(s) for which the simulator has been validated:

- 3. Verifying vehicle test(s)
 - 3.1. Description of vehicle(s) including the towing vehicle in case of trailer testing:
 - 3.1.1. Vehicle(s) identification: make/model/VIN
 - 3.1.1.1. Non-standard fitments:
 - 3.1.2. Vehicle description, including axle configuration/suspension/wheels, engine and drive line, braking system(s) and vehicle stability function content (directional control/roll-over control), steering system, with name/model/number identification:
 - 3.1.3. Vehicle data used in the simulation (explicit):
 - 3.2. Description of test(s) including location(s), road/test area surface conditions, temperature and date(s):
 - 3.3. Results laden and unladen with the vehicle stability function switched on and off, including the motion variables referred to in Annex 21, Appendix 2, paragraph 2.1. as appropriate:

- 4. Simulation results
 - 4.1. Vehicle parameters and the values used in the simulation that are not taken from the actual test vehicle (implicit):
 - 4.2. Results laden and unladen with the vehicle stability function switched on and off for each test conducted under paragraph 3.2. of this Appendix, including the motion variables referred to in Annex 21, Appendix 2, paragraph 2.1. as appropriate:

- 5. This test has been carried out and the results reported in accordance with Appendix 2 of Annex 21 to ECE Regulation No. 13 as last amended by the series of amendments.

Technical Service conducting the test 1/

Signed:

Date:

Approval Authority 1/

Signed:

Date:

1/ To be signed by different persons if the Technical Service and the Approval Authority is the same organisation."

Annex IV

GRRF INFORMAL GROUPS

<u>Informal group on</u>	<u>Chairperson</u>	<u>Secretary</u>
Passenger vehicle braking gtr (PVGTR)	Mr. I. Yarnold Tel: 44 207 944 2080 Fax: 44 207 944 2169 E-mail: ian.yarnold@dft.gsi.gov.uk	Mr. M. Brearley (CLEPA) E-mail: malcolm.brearley-contr@trw.com
TYRE gtr	Mr. I. Yarnold Tel: 44 207 944 2080 Fax: 44 207 944 2169 E-mail: ian.yarnold@dft.gsi.gov.uk	Mr. J.-C. Noirhomme (ETRTO) Tel: 32 2 344 4059 Fax: 32 2 344 1234 E-mail: info@etrto.org
Brake linings	Mr. W. Rothmann Tel: 49 2171 501 577 Fax: 49 2171 501 530 E-mail: wrothmann@tmdfriction.com	<u>1/</u>
Replacement Discs and Drums (RD&D)	Mr. W. Gaupp Tel: 49 201 825 4139 Fax: 49 201 825 4185 E-mail: wgaupp@tuev-nord.de	<u>1/</u>
Electronic Vehicle Stability Control (EVSC)	Mr. L. Palkovics (c/o: Mr. G. Brett) Tel: 36 1 371 5950 Fax: 36 1 203 1167 E-mail: brett@tuvnord.hu	CLEPA
Mechanical couplings	Mr. A. Sigwart Tel: 49 221 903 4700 Fax: 49 221 903 2938 E-mail: asigwart@ford.com	Mr. J. Westphäling Tel: 49 89 32950 722 Fax: 49 89 32950 720 E-mail: juergen.westphaeling@tuev-sued.de
Tyre Pressure Monitoring Systems (TPMS)	Mr. W. Reithmaier Tel: 49 895 190 3453 Fax: 49 895 190 3547 E-mail: walter.reithmaier@tuev-sued.de	<u>1/</u>

1/ To be determined
