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Report of the Working Party on General Safety Provisions on its 113th session (10-13 October 2017)

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I. Attendance

1. The Working Party on General Safety Provisions (GRSG) held its 113th session from 10 to 13 October 2017 in Geneva. The meeting was chaired by Mr. A. Erario (Italy). Experts from the following countries participated in the work, following Rule 1(a) of the Rules of Procedure of the World Forum for Harmonization of Vehicle Regulations (WP.29) (TRANS/WP.29/690, ECE/TRANS/WP.29/690/Amend.1 and Amend.2): Belgium, Canada, China, Czechia, Finland, France, Germany, Hungary, India, Italy, Japan, Kuwait, Latvia, Luxembourg, Netherlands, Norway, Poland, Republic of Korea, Romania, Russian Federation, Serbia, Spain, Sweden, Switzerland, Turkey, United Kingdom of Great Britain and Northern Ireland (United Kingdom) and United States of America. An expert from the European Commission (EC) also participated. Experts from the following non-governmental organizations participated: European Association of Automotive Suppliers (CLEPA), European Liquefied Petroleum Gas Association (AEGPL), International Motorcycle Manufacturers Association (IMMA), International Organization for Standardization (ISO), International Organization of Motor Vehicle Manufacturers (OICA) and International Association for Natural Gas Vehicles (NGV Global). Upon the special invitation of the Chair, experts from the International Association for Public Transport (UITP) and the International Association of the Body and Trailer Building Industry (CLCCR) participated.

II. Adoption of the agenda (agenda item 1)

Documentation: ECE/TRANS/WP.29/GRSG/2017/13 and Add.1
Informal documents GRSG-113-01 and GRSG-113-07

2. GRSG considered and adopted the agenda proposed for the 113th session (ECE/TRANS/WP.29/GRSG/2017/13 and Add.1).

3. GRSG also adopted the running order (GRSG-113-01) for the session as proposed by the Chair. GRSG noted GRSG-113-07 on the main decisions and recommendations of the World Forum WP.29 taken during its June 2017 session (see also report ECE/TRANS/WP.29/1131).

4. The informal documents distributed during the session are listed in Annex I to this report. The GRSG informal working groups are listed in Annex VI.

III. Amendments to regulation on buses and coaches (agenda item 2)

A. Regulation No. 107 (M₂ and M₃ vehicles)

Documentation: ECE/TRANS/WP.29/GRSG/2016/20 and Corr.1
ECE/TRANS/WP.29/GRSG/2017/14
Informal documents GRSG-111-21, GRSG-112-35, GRSG-113-15-Rev.2 and GRSG-113-29

5. The expert from Germany recalled the purpose of ECE/TRANS/WP.29/GRSG/2016/20 to improve the accommodation and accessibility for passengers with reduced mobility. He added that GRSG had adopted the document in principle at its previous session as reproduced in GRSG-112-35 subject to the insertion of transitional provisions. Thus, the expert from OICA introduced GRSG-113-15-Rev.1. The

expert from Sweden underlined the need to delete the amendments to Annex 8, paragraph 3.2.4. GRSG adopted ECE/TRANS/WP.29/GRSG/2016/20 as reproduced in Annex V to this report (based on GRSG-113-15-Rev.2) and requested the secretariat to submit it to WP.29 and AC.1 as draft 08 series of amendments to UN Regulation No. 107 for consideration at their March 2018 sessions.

6. The expert from Czechia introduced ECE/TRANS/WP.29/GRSG/2017/14 to improve the safety requirements for trolleybuses, particularly the double insulation of circuits directly connected to the overhead lines. GRSG adopted ECE/TRANS/WP.29/GRSG/2017/14 and requested the secretariat to submit it to WP.29 and AC.1 as draft Supplement 7 to the 06 series of amendments, as draft Supplement 6 to the 07 series of amendments and as part (see para. 5) of draft 08 series of amendments to UN Regulation No. 107 for consideration at their March 2018 sessions.

7. In the absence of a concrete proposal to align the provisions of UN Regulation No. 107 with those of the European Union Regulation 1230/2012 on masses and dimensions in the definition of the 'mass in running order', GRSG decided to remove this item from the agenda of the next session.

8. Referring to GRSG-111-21 on a detailed analysis of the technical requirements for trolley buses presented at previous sessions, the expert from Belgium informed GRSG that full alignment of the provisions of UN Regulations Nos. 100 and 107 had not been achieved. GRSG agreed to remove this item from the agenda of the next GRSG session.

B. Regulation No. 118 (Burning behaviour of materials)

Documentation: ECE/TRANS/WP.29/GRSG/2017/21
Informal documents GRSG-113-04, GRSG-113-05, GRSG-113-23 and GRSG-113-34

9. The expert from Germany introduced ECE/TRANS/WP.29/GRSG/2017/21 to correct the current text of the definition on interior compartment by replacing the word "roof" by "ceiling". GRSG adopted the proposal and requested the secretariat to submit it to WP.29 and AC.1 as draft Supplement 4 to the 02 series of amendments and for Supplement 1 to the 03 series of amendments to Regulation No. 118.

10. Referring to the final report (GRSG-113-05) and its summary (GRSG-113-04) on the severe collision between a coach and a heavy duty vehicle that occurred in Puisseguin (France) on 23 October 2015, the expert from France presented GRSG-113-23 on the research and conclusions of the final report. GRSG recognized the detailed work done by France and acknowledged the results of the technical investigation on this tragic accident. GRSG welcomed of the recommendations by the French investigation body listing a number of preventative measures to mitigate and even avoid such accidents in future. The expert from France suggested establishing an informal working group to develop concrete proposals for amendments to UN Regulations Nos. 107 and 118.

11. The expert from UK expressed his concerns about the serious accident and appealed for the responsibility of GRSG to take actions to avoid such accidents in future and to further strengthen the provisions on emergency exits, flammability of materials used in vehicles. The expert from Japan gave a presentation on their national requirements for emergency exits in school buses (GRSG-113-34) i.e. the mandatory installation of an emergency exit at the opposite side of the bus-entry.

12. The expert from the United States of America informed GRSG experts about some safety research conducted by his organization that was publicly available under docket NHTSA-2007-28793 located at www.regulations.gov. He added that two further evacuation

studies and a motorcoach wheel well fire simulation were also available in docket items 0024, 0022, 0026 and 0027 at: www.nhtsa.gov/sites/nhtsa.dot.gov/files/812213-motorcoachfiresafetyreport.pdf.pdf. Furthermore, he referred to a report on fire suppression and fire detection research, available at: www.nhtsa.gov/sites/nhtsa.dot.gov/files/812213-motorcoachfiresafetyreport.pdf.pdf.

13. Following the discussion, the Chair invited the expert from France to organize a task force meeting with all interested experts to investigate the need to set up a new Informal Working Group (IWG) on the behavior of the general construction of M₂/M₃ vehicles in case of a fire and also to develop, if necessary, the draft terms of reference and rules of procedures for consideration and adoption at the forthcoming session of GRSG.

IV. Regulation No. 34 (Prevention of fire risks) (agenda item 3)

Documentation: ECE/TRANS/WP.29/GRSG/2017/28

14. The expert from OICA introduced ECE/TRANS/WP.29/GRSG/2017/28 to clarify the provisions in UN Regulation No. 34 on the protection of the tank. GRSG noted some support and a number of comments. The expert from Germany raised a study reservation and underlined that the original text in the proposal does not reflect the current text of the Regulation.

15. Following the discussion, GRSG agreed to resume consideration of this subject at its next session in April 2018. Thus, the expert from France volunteered to prepare, jointly with the experts from Germany and OICA, a revised document taking into account the comments received.

V. Amendments to safety glazing regulations (agenda item 4)

Documentation: Informal document GRSG-113-33

16. The expert from the Republic of Korea, chairing the IWG on Panoramic Sunroof Glazing (PSG), introduced GRSG-113-33 on the work progress of the Group during its eighth meeting held on 9 October 2017. He added that the United States National Highway Traffic Safety Administration (US-NHTSA) was expected to begin research and testing activities on ceramic printer areas of glazing material. He concluded that the IWG would resume then its consideration on a best possible adaptation of the provisions of the safety glazing regulations.

17. Learning that Mr. Damm (Germany) would no longer ensure the Co-Chairmanship of the IWG, GRSG acknowledged his considerable contributions to the activities of GRSG and especially his dedication as Co-Chair of the IWG on PSG. GRSG agreed to resume consideration of this subject at the next session and welcomed Mr. Fuhrmann (Germany) as new Co-Chair of the IWG.

A. Regulation No. 43 (Safety glazing)

Documentation: ECE/TRANS/WP.29/GRSG/2017/15
ECE/TRANS/WP.29/2017/111
Informal documents GRSG-113-16 and GRSG-113-30

18. The expert from OICA introduced ECE/TRANS/WP.29/GRSG/2017/15 as amended by GRSG-113-16 and GRSG-113-30 to fully align the provisions of UN Regulation No. 43 with those of UN Global Technical Regulation (GTR) No. 6. GRSG adopted

ECE/TRANS/WP.29/GRSG/2017/15 as reproduced in Annex II to this report and requested the secretariat to submit it to WP.29 and AC.1 as draft Supplement 7 to the 01 series of amendments to UN Regulation No. 43 for consideration at their March 2018 sessions.

19. Referring to Figure 4-2 in ECE/TRANS/WP.29/2017/111, GRSG recalled the adoption at its last session of draft Supplement 6 to the 01 series of amendments to UN Regulation No. 43 and reconfirmed that the values in the figure were rounded to integers.

B. Global Technical Regulation No. 6 (Safety glazing)

Documentation: ECE/TRANS/WP.29/2017/142

20. GRSG reconfirmed its submission to WP.29 and to the Executive Committee of the 1998 Agreement (AC.3) of Corrigendum 2 (ECE/TRANS/WP.29/2017/142) to Global Technical Regulation No. 6 for consideration and adoption at their November 2017 sessions.

VI. Awareness of the proximity of Vulnerable Road Users (agenda item 5)

Documentation: Informal documents GRSG-113-14, GRSG-113-27 and GRSG-113-35

21. In his function as Secretary of the IWG on Awareness of Vulnerable Road Users Proximity (VRU-Proxi), the expert from OICA presented GRSG-113-35 on the work progress made by the group during its recent meetings. He introduced GRSG-113-27 on the collection of accident data, aimed to select the best road safety approach to be developed by the IWG.

22. The Chair invited all governmental experts to fill in the tables with their national accident data and to send it back to the Secretary of the IWG before 10 November 2017 to allow the IWG to have a clear vision of worldwide accidents.

23. The Secretary of the IWG on VRU-Proxi also introduced GRSG-113-14 on the revised terms of references and rules of procedures of the IWG. GRSG welcomed the information received and adopted the terms of references and rules of procedures of the IWG as reproduced in Annex III to this report.

A. Regulation No. 46 (Devices for indirect vision)

Documentation: Informal documents GRSG-113-17-Rev.1, GRSG-113-28 and GRSG-113-31-Rev.1

24. The expert from OICA introduced GRSG-113-17 to clarify the requirements of UN Regulation No. 46 on overlays in Camera Monitor Systems with respect of the spirit of the decisions of the IWG. The proposal received a number of comments. GRSG noted concerns of possible interpretation risks of the text in the three official languages. Following the discussion, GRSG agreed on the proposed English text as reflected in GRSG-113-17-Rev.1. The expert from OICA volunteered to submit, in due time, the proposed text in the three official languages for consideration by GRSG at its next session on the basis of an official document.

25. The expert from the Netherlands proposed to correct in UN Regulation No. 46 the communication form in Annex 3 (GRSG-113-31-Rev.1). GRSG adopted the proposal as reproduced below and requested the secretariat to submit it to WP.29 and AC.1 as

Corrigenda to Revisions 5 and 6 of UN Regulation No. 46 for consideration at their March 2018 sessions.

Annex 3, item 9, amend to read (replacing the letter "S" by class "VII" and keeping the reference to footnote ² unchanged):

"9. Brief description

Identification of the device: mirror, camera/monitor, other devices for indirect vision of Classes I, II, III, IV, V, VI, **VII** ²

Symbol as "

26. The expert from Spain sought the advice of GRSG on the possibility to type approve a taximeter that is integrated into the indirect vision device of Class I (taximeter visible for the passenger) and that maintains the function of an interior mirror for the driver (GRSG-113-28). A number of GRSG experts were of the opinion that a type approval according to UN Regulation No. 46 as a separate technical unit would not be sufficient. The installation of such a device for indirect vision would need to be covered, in addition, by an approval granted to the vehicle manufacturer only. The expert from Germany explained that, for the after-market in Germany, a national approval for the installation of a device for indirect vision might be granted to the manufacturer of the device for indirect vision, if its installation is in line with the respective requirements of UN Regulation No. 46. The GRSG Chair invited all experts to send their written comments to the expert from Spain and suggested further discussion of this subject at other fora, such as the European Union Type Approval Authority Meetings.

B. New Regulation on Blind Spot Information Systems (BSIS)

Documentation: ECE/TRANS/WP.29/GRSG/2017/11

27. The expert from Germany reported that ECE/TRANS/WP.29/GRSG/2017/11 was still under consideration by the IWG on VRU-Proxi. He announced the intention of the IWG to further review the proposal at its forthcoming meetings and to submit it to GRSG for consideration at the next session in April 2018. GRSG agreed to keep ECE/TRANS/WP.29/GRSG/2017/11 on the agenda as a reference document, awaiting submission by the IWG of the revised proposal.

VII. Amendments to gas-fuelled vehicle regulations (agenda item 6)

A. Regulation No. 67 (LPG vehicles)

Documentation: ECE/TRANS/WP.29/GRSG/2017/10
ECE/TRANS/WP.29/GRSG/2017/16
ECE/TRANS/WP.29/GRSG/2017/22
ECE/TRANS/WP.29/GRSG/2017/26
ECE/TRANS/WP.29/GRSG/2017/27
ECE/TRANS/WP.29/GRSG/2017/30
Informal documents GRSG-113-08, GRSG-113-09, GRSG-113-10,
GRSG-113-18, GRSG-113-19, GRSG-113-32 and GRSG-113-36

28. The expert from Germany presented ECE/TRANS/WP.29/GRSG/2017/16 that amends the provisions of UN Regulation No. 67 to improve the specifications for the Liquefied Petroleum Gas (LPG) connecting the pressure relief valve with the gaseous phase

for multi-valve in the vehicle tanks and those for the installation and inspection of LPG containers and their accessories. The expert from OICA introduced GRSG-113-18 on modifications to the ageing test requirements of some rubber materials and on further transitional provisions. The expert from AEGPL endorsed the proposal to avoid a ban of some technologies and materials. Both proposals received a number of comments.

29. GRSG agreed on the need to revise the requirements on pipes for multivalves on LPG containers and to keep, at the same time, the testing provisions technology neutral. Thus, GRSG agreed to set up a Task Force under the leadership of Germany to find a compromise and to prepare a revised proposal for consideration at the next GRSG. It was also agreed to keep ECE/TRANS/WP.29/GRSG/2017/16 on the agenda as a reference document. The secretariat was requested, in the absence of a revised proposal by the task force, to circulate GRSG-113-18 with an official symbol.

30. The expert from Turkey introduced ECE/TRANS/WP.29/GRSG/2017/22 proposing to insert new provisions on the location on the vehicle of the filling unit and a limitation of the service life of LPG containers. The expert from OICA introduced a counter proposal for transitional provisions (GRSG-113-19). The expert from AEGPL raised concerns on the location of filling unit on the vehicle and the limitation of the service life of LPG containers. He proposed to amend the provisions on the location of the filling unit and to insert a limitation of the service life as reflected in GRSG-113-32. GRSG noted a number of comments and study reservations. Following the discussion, the expert from Turkey volunteered to prepare a revised proposal for consideration at the next GRSG session, taking into account the comments received.

31. The expert from AEGPL presented ECE/TRANS/WP.29/GRSG/2017/26 proposing to insert new safety provisions into UN Regulation No. 67 on LPG systems that have hydraulic interconnections with the petrol or diesel fuelling system through which inter-flows of fuels may occur. GRSG adopted the proposal, as amended below, and requested the secretariat to submit it to WP.29 and AC.1 as draft Supplement 15 to the 01 series of amendments to UN Regulation No. 67 for consideration at their March 2018 sessions.

New paragraph 2.22., replace "Interconnected LPG-system" by "Interconnected LPG-system (ICS)".

32. Referring to ECE/TRANS/WP.29/GRSG/2017/27, the expert from AEGPL recalled the purpose of his proposal to clarify the provisions in UN Regulation No. 67 on the use of non-seamless gas tubes in LPG vehicles. GRSG adopted the document, as amended below, and requested the secretariat to submit it to WP.29 and AC.1 as part (see para. 31 above) of draft Supplement 15 to the 01 series of amendments to UN Regulation No. 67 for consideration at their March 2018 sessions.

Paragraph 2.2., subparagraph (s), amend to read:

"(s) Non-seamless **and seamless** gas tubes and their couplings;"

New paragraph 17.7.1.2., amend to read:

"17.7.1.2. The outer diameter of **Class 1** gas tubes made of copper shall not exceed 12 mm with a wall thickness of at least 0.8 mm, gas tubes **of Class 1** from steel and stainless steel shall not exceed 25 mm with, for gas services, an appropriate wall thickness."

Paragraph 17.7.4., amend to read:

"17.7.4. Gas **pipes** made of a non-metallic material shall comply with the requirements of this Regulation, paragraph 6.7."

*Annex 15, paragraph 5., replace "Only longitudinal welding" by "Only **straight** longitudinal*

welding".

33. Recalling the discussion on ECE/TRANS/WP.29/GRSG/2017/10 at the previous GRSG session, the expert from AEGPL presented ECE/TRANS/WP.29/GRSG/2017/30 to further clarify the provisions for type approved accessories fitted to LPG containers and to insert an additional indication mark. The expert from Poland raised a study reservation and introduced the obligation to mark the products with the designation of the version, variant and the extension number of the type-approval certificate (GRSG-113-09). Both proposals received a number of comments.

34. Finally, GRSG considered a revised proposal (GRSG-113-36) and adopted ECE/TRANS/WP.29/GRSG/2017/30 as amended below.

Part I, paragraph 4.2., amend to read:

"4.2. All equipment shall have drawings referred to in paragraph 3.2.2. above. **In the case of limited space for the approval mark(s), other means of identification that link it to the approval mark shall be provided.**"

35. The secretariat was requested to submit the proposal to WP.29 and AC.1 as part (see paras. 31 and 32 above) of draft Supplement 15 to the 01 series of amendments to UN Regulation No. 67 for consideration at their March 2018 sessions.

36. The expert from Poland introduced GRSG-113-08 proposing to amend the provisions of Annex 2B on the layout of the communication form and to insert new items for information on the type, variant, version and class of the approved LPG equipment. The document received a number of comments. Following the discussion, GRSG agreed to resume consideration of this subject at its next session in April 2018 on the basis of a revised proposal by Poland.

37. Referring to GRSG-113-10, the expert from Poland also proposed to remove the trade name or trade mark from the definition of a type of LPG container. GRSG noted some comments and general support. The expert from Poland volunteered to review his proposal taking into account the comments received and to submit, in due time, a combined official document for consideration at the next GRSG session.

B. Regulation No. 110 (CNG and LNG vehicles)

Documentation: ECE/TRANS/WP.29/GRSG/2017/17
ECE/TRANS/WP.29/GRSG/2017/29
ECE/TRANS/WP.29/GRSG/2017/31
Informal documents GRSG-113-02, GRSG-113-03, GRSG-113-06,
GRSG-113-20, GRSG-113-21, GRSG-113-24, GRSG-113-25, GRSG-
113-26, GRSG-113-37 and GRSG-113-38-Rev.1

38. The expert from ISO introduced GRSG-113-02 and GRSG-113-37 justifying the alignment of the provisions in the UN Regulation with those in the latest version of ISO 11439:2013 (as proposed in ECE/TRANS/WP.29/GRSG/2017/31). The expert from OICA expressed his preference to adopt the proposal as a new series of amendments and suggested inserting transitional provisions (GRSG-113-21). GRSG agreed on the need to insert transitional provisions and to replace the dynamic references to international standards by static ones. Following the discussion, the expert from ISO presented GRSG-113-38 taking into account the comments received. GRSG considered the document in detail and adopted the proposal as reproduced in Annex IV (based on GRSG-113-38-Rev.1). The secretariat was requested to submit it to WP.29 and AC.1, as a new draft 03 series of amendments to UN Regulation No. 110, for consideration at their March 2018 sessions.

39. The expert from Germany introduced ECE/TRANS/WP.29/GRSG/2017/17 to improve the specifications for the installation and inspection of Compressed Natural Gas (CNG) cylinders or of Liquefied Natural Gas (LNG) tanks and their accessories. GRSG welcomed the proposal and noted that WP.29 and the Administrative Committee of the 1997 Agreement were expected to consider and adopt ECE/TRANS/WP.29/2017/134 on a new UN Rule on Periodical Technical Inspections of motor vehicles using CNG and/or LNG in their propulsion system. The proposal from Germany received a number of comments, especially on the need to align the recommendations for the periodical technical inspections of such vehicles with the specifications for the re-qualification of the CNG cylinders or LNG tanks. GRSG noted the comments received by the experts from NGV Global (GRSG-113-03) and OICA (GRSG-113-20).

40. The expert from Italy proposed to amend in Annex 3A of the Regulation the test requirements for the periodic requalification of CNG cylinders to avoid structural failures during their service life (ECE/TRANS/WP.29/GRSG/2017/29). The expert from the Netherlands raised his concern on the access by inspection centres to detailed provisions for the inspection of such cylinders. Thus, he underlined the need that cylinder manufacturers should make available cylinder inspection manuals. GRSG welcomed the offer by Germany to take the lead of a Task Force to review ECE/TRANS/WP.29/GRSG/2017/17 and ECE/TRANS/WP.29/GRSG/2017/29. It was agreed to also involve the International Motor Vehicle Inspection Committee (CITA) in the discussion and to resume consideration of this subject at its next GRSG session in April 2018.

41. The expert from the Netherlands presented GRSG-113-24 and GRSG-113-25 justifying the need to introduce in the Regulation new requirements for components used in LNG/CNG systems such as the "CNG accumulator" and the "CNG compressor". GRSG noted general support on the proposals. The Chair invited all GRSG experts to send their comments, in due time, to the expert from the Netherlands. GRSG agreed to resume consideration of this subject at its next session on the basis of an official document, prepared by the Netherlands, taking into account the comments received.

42. The expert from the Netherlands introduced GRSG-113-26 proposing to correct and clarify the references to Annex 5Q in UN Regulation No. 110. GRSG welcomed the proposal and invited the expert from the Netherlands to prepare an official document for consideration at the next session of GRSG in April 2018.

43. The expert from the NGV Global proposed to correct Table 6.4. on the cylinder design qualification tests (GRSG-113-06). GRSG noted general support on the proposal and agreed to take a final position on this subject at its next session. The secretariat was requested to circulate GRSG-113-06 with an official symbol.

VIII. Regulation No. 73 (Lateral Protective Devices) (agenda item 7)

Documentation: Informal documents GRSG-113-11-Rev.1, GRSG-113-12 and GRSG-113-13

44. The expert from France presented an evolution study of UN Regulation No. 73 on lateral protection devices and proposed to review the test requirements with respect to the geometric and loading/displacement criteria (GRSG-113-11-Rev.1). Thus, he introduced GRSG-113-12 amending the geometric criteria and GRSG-113-13 amending the static force. GRSG welcomed the research study and the proposed amendments. GRSG noted general support and agreed to resume consideration of this subject at its next session in April 2018. The secretariat was requested to circulate GRSG-113-12 and GRSG-113-13 with official symbols and to keep GRSG-113-11-Rev.1 as a reference document.

IX. Regulation No. 93 (Front Underrun Protective Devices) (agenda item 8)

45. In the absence of an expert from Transport and Environment (T&E), GRSG agreed to remove the item from the agenda of its next session.

X. Regulation No. 116 (Anti-theft and alarm systems) (agenda item 9)

Documentation: ECE/TRANS/WP.29/GRSG/2017/23
ECE/TRANS/WP.29/GRSG/2017/24
ECE/TRANS/WP.29/GRSG/2017/25 and Corr.1
Informal documents GRSG-113-22 and GRSG-113-41

46. The expert from OICA presented GRSG-113-22 to remove from UN Regulation No. 116 the references to the European standards on frequencies, as the specifications on radio transmission were not yet harmonized and still regulated on a national or a regional level. GRSG noted some comments and agreed on the need to clarify this fact in the scope of the Regulation. The expert from OICA volunteered to review his proposal and to submit, in due time, a revised document for consideration at the next GRSG session in April 2018.


47. As GRSG ambassador on the International Whole Vehicle Type Approval (IWVTA), the expert from OICA presented GRSG-113-41 on the status of the splitting of the provisions of UN Regulation No. 116 into three separate Regulations. He briefly introduced (a) ECE/TRANS/WP.29/GRSG/2017/23 containing the prescriptions for devices against un-authorized use as an amendment to UN Regulation No. 116, (b) ECE/TRANS/WP.29/GRSG/2017/24 as a new draft UN Regulation on vehicle immobilizers and (c) ECE/TRANS/WP.29/GRSG/2017/25 and Corr.1 as a new draft UN Regulation on vehicle alarm systems. He added that ECE/TRANS/WP.29/GRSG/2017/23 would still need to be reviewed and should be submitted to WP.29 as a new series of amendments and, thus, supplemented with transitional provisions.

48. GRSG agreed to resume consideration of this subject at its next session in April 2018 on the basis of revised official documents to be submitted by the GRSG ambassador.

XI. Regulation No. 121 (Identification of controls, tell-tales and indicators) (agenda item 10)

Documentation: ECE/TRANS/WP.29/GRSG/2017/18
Informal documents GRSG-113-39 and GRSG-113-42

49. The expert from OICA presented ECE/TRANS/WP.29/GRSG/2017/18 to clarify footnote ¹⁸ where tell-tales Nos. 1 and 19 were combined. Some experts were of the opinion that footnote ¹² already offers that possibility. Following the discussion, the expert from OICA offered an alternative proposal GRSG-113-39 that simplifies the handling of colour changes of tell-tales and to remove footnote ¹⁸ and all references to it. The expert from France preferred to keep the existing text of footnote ¹⁸ and to only insert under symbol No. 1 a reference to footnote ¹⁸, as reflected in GRSG-113-42. GRSG agreed to go forward with a two-step approach and adopted ECE/TRANS/WP.29/GRSG/2017/18 as reproduced below.

No.	Column 1	Column 2	Column 3	Column 4	Column 5
	Item	Symbol ²	Function	Illumination	Colour
1.	Master lighting switch Tell-tale may not act as the tell-tale for the position (side) lamps	 1, 18	Control Tell-tale ¹²	No Yes	 Green
...

50. The secretariat was requested to submit the proposal to WP.29 and AC.1 as draft Supplement 10 to the original series of amendments and Supplement 3 to the 01 series of amendments to UN Regulation No. 121 for consideration at their March 2018 sessions, subject to the endorsement of the Working Party on Lighting and Light Signalling (GRE) at its October 2017 session. (*Note by the secretariat: At its seventy-eighth session, GRE endorsed the principles for amending UN Regulation No. 121 as proposed by GRSG.*)

51. As a second step, GRSG requested the secretariat to distribute GRSG-113-39 with an official symbol, for consideration at the next GRSG session and to also circulate it all WP.29 Working Parties concerned.

XII. Regulation No. 122 (Heating systems) (agenda item 11)

Documentation: ECE/TRANS/WP.29/GRSG/2017/19

52. The expert from France introduced ECE/TRANS/WP.29/GRSG/2017/19, proposing an amendment to UN Regulation No. 122 on the application of the annexes for heaters located outside the passenger compartment and using water as the transfer medium. GRSG adopted the proposal and requested the secretariat to submit it to WP.29 and AC.1 as draft Supplement 4 to UN Regulation No. 122 for consideration at their March 2018 sessions.

XIII. Accident Emergency Call Systems (AECS) (agenda item 12)

Documentation: ECE/TRANS/WP.29/2017/132
Informal document GRSG-111-06-Rev.1

53. The expert from the Russian Federation, chairing the IWG on AECS, recalled the detailed consideration of GRSG at its previous session of the new UN Regulation on AECS on the basis of ECE/TRANS/WP.29/GRSG/2017/12. He informed GRSG that the IWG had again reviewed the proposal to remove some editorial inconsistencies. He added that the latter ones have been taken into account in the official document ECE/TRANS/WP.29/2017/132 which was submitted to WP.29 and AC.1 for consideration at their November 2017 sessions. He concluded that further work needed to be done. As Secretary of the IWG on AECS, the expert from OICA introduced the revised justification document (GRSG-111-06-Rev.1) on draft UN Regulation on AECS. He reiterated his concern that Contracting Parties to the 1958 Agreement which intend to apply the Regulation should ensure the necessary infrastructure for the application of the new UN Regulation, once it enters into force.

54. GRSG reconfirmed its adoption of ECE/TRANS/WP.29/2017/132 and agreed to resume consideration on this subject at its forthcoming session, especially on the need for further developments to the new UN Regulation.

XIV. International Whole Vehicle Type Approval (IWVTA) (agenda item 13)

Documentation: ECE/TRANS/WP.29/2017/107, Add.1 and Corr.1
ECE/TRANS/WP.29/2017/108
ECE/TRANS/WP.29/2017/109
ECE/TRANS/WP.29/2017/131
Informal document GRSG-113-40

55. GRSG noted that Revision 3 of the 1958 Agreement entered into force on 14 September 2017 (as published at: www.unece.org/trans/main/wp29/wp29regs.html). GRSG welcomed the Question&Answer document on Revision 3 (ECE/TRANS/WP.29/2017/131) as well as the draft UN Regulation on IWVTA (ECE/TRANS/WP.29/2017/108) and the explanation (ECE/TRANS/WP.29/2017/109). GRSG noted that these documents were expected to be considered and adopted by WP.29 at its session in November 2017.

56. Upon the request of the World Forum and the IWG on IWVTA, GRSG considered the general guidelines for UN regulatory procedures and transitional provisions in UN Regulations (ECE/TRANS/WP.29/2017/107, Add.1 and Corr.1). GRSG endorsed the guideline documents and recommended the IWG on IWVTA to consider further amendments as reflected in GRSG-113-40.

57. GRSG also noted that with the entry into force of Revision 3, the experts should take into account, when preparing future proposal for amendments to UN Regulations, alignments of the new provisions of the 1958 Agreement such as: (a) the conformity of production should reference to Schedule 1, (b) the use of the unique identifier UI should refer to Schedule 5, and (c) the reference to "UN" Regulations. The Chair suggested resuming the discussion of this subject at the next GRSG session in April 2018.

XV. Consolidated Resolution on the Construction of Vehicles (R.E.3) (agenda item 14)

Documentation: ECE/TRANS/WP.29/GRSG/2017/20
ECE/TRANS/WP.29/78/Rev.6

58. Upon the request of the Working Party on Noise (GRB), the expert from the Russian Federation proposed ECE/TRANS/WP.29/GRSG/2017/20 to change, in the current version of R.E.3 (ECE/TRANS/WP.29/78/Rev.6), the units for vehicle masses from tonnes to kilograms.

59. The document received the full support of GRSG. The secretariat was requested to submit ECE/TRANS/WP.29/GRSG/2017/20 to WP.29 as an amendment to R.E.3, for consideration at its March 2018 session.

XVI. Election of officers (agenda item 15)

60. In compliance with Rule 37 of the Rules of Procedure (TRANS/WP.29/690 as amended by Amendments 1 and 2), GRSG called for the election of officers on Wednesday afternoon, 11 October 2017. Mr. A. Erario (Italy) was unanimously re-elected as Chair and Mr. K. Hendershot (Canada) as Vice-Chair for the GRSG sessions scheduled for 2018.

XVII. Other business (agenda item 16)

Tributes to Messrs. G. Mendoni and J. Marmy

61. GRSG noted that M. Jacques Marmy had to end his activities with the International Road Transport Union (IRU) for economic reasons and, therefore, would no longer attend the sessions. GRSG acknowledged his continued support during the long period of participation in the sessions and wished him all the best for his future activities.

62. Learning that Mr. Giulio Mendoni (Italy) would be retiring, GRSG thanked him for his considerable contributions over the last decades to the activities of GRSG. GRSG recognized his commitment with a long applause and wished him a long and happy retirement.

XVIII. Provisional agenda for the 114th session

63. The following provisional agenda was adopted for the 114th session of GRSG, scheduled to be held in Geneva from 9 (starting at 2.30 p.m.) to 13 April (concluding at 12.30 p.m.) 2018:¹

1. Adoption of the agenda.
2. Amendments to regulations on buses and coaches:
 - (a) Regulation No. 107 (M₂ and M₃ vehicles).
 - (b) Regulation No. 118 (Burning behaviour of materials).
3. Regulation No. 34 (Prevention of fire risks).
4. Amendments to safety glazing regulations:
 - (a) Global Technical Regulation No. 6 (Safety glazing).
 - (b) Regulation No. 43 (Safety glazing).
5. Awareness of the proximity of Vulnerable Road Users:
 - (a) Regulation No. 46 (Devices for indirect vision).
 - (b) New Regulation on Blind Spot Information Systems (BSIS).
6. Amendments to gas-fuelled vehicle regulations:
 - (a) Regulation No. 67 (LPG vehicles).
 - (b) Regulation No. 110 (CNG and LNG vehicles).
7. Regulation No. 73 (Lateral protection devices).
8. Regulation No. 116 (Anti-theft and alarm systems).
9. Regulation No. 121 (Identification of controls, tell-tales and indicators).
10. Regulation No. 122 (Heating systems).
11. Accident Emergency Call Systems (AECS).
12. International Whole Vehicle Type Approval (IWVTA).
13. Other business.

¹ GRSG noted that the deadline for submission of official documents to the UNECE secretariat was 12 January 2018, twelve weeks prior to the session.

Annex I

List of informal documents considered during the session

List of informal documents (GRSG-113-...) distributed during the session (English only)

<i>No.</i>	<i>(Author) Title</i>	<i>Follow-up</i>
1	(GRSG Chair) Running order of the 113th session of GRSG (10 – 13 October 2017)	(f)
2	(ISO) Rationale for the proposed amendments to Regulation No. 110 (CNG/LNG vehicles)	(f)
3	(NGV Global) Comments on the proposed amendments to UN Regulation No. 110	(f)
4	(France) Résumé du rapport d'enquête technique sur la collision suivie d'un incendie survenue entre un autocar et un poids lourd le 23 octobre 2015 sur la RD 17 à Puisseguin (33) en France	(f)
5	(France) Report following technical investigation into the collision (and resulting fire) between a coach and a HGV that occurred on October 23rd 2015 on Departmental Road No 17 near the town of Puisseguin (South-West of France)	(f)
6	(ISO and NGV Global) Proposal for a corrigendum to Revision 3 of UN Regulation No. 110 (CNG/LNG vehicles)	(c)
7	(Secretariat) General information and highlights of WP.29 at its June 2017 session	(f)
8	(Poland) UN Regulation No. 67 (LPG) - Layout of the type-approval certificate, published in Annex 2B	(c/e)
9	(Poland) UN Regulation No. 67 (LPG) -Identification of components	(f)
10	(Poland) UN Regulation No. 67 (LPG) - Definition of a LPG container type	(c/e)
11-Rev.1	(France) Lateral Protection Devices (UN Regulation No. 73)	(d)
12	(France) Proposal for the 02 series of amendments to UN Regulation No. 73 (Lateral Protection Devices - Geometrical criteria)	(c)
13	(France) Proposal for the 02 series of amendments to UN Regulation No. 73 (Lateral Protection Devices - Static force)	(c)
14	(VRU-Proxi) Terms of Reference and Rules of Procedure of the GRSG informal working group on awareness of Vulnerable Road Users proximity in low speed manoeuvres (VRU-Proxi)	(a)
15-Rev.2	(OICA) Revised proposal for draft 08 series of amendments to UN Regulation No. 107 (as adopted by GRSG at its 112th session)	(a)
16	(OICA) Proposal for draft amendments to UN Regulation No. 43 (Safety glazing)	(b)
17-Rev.1	(OICA) Revised proposal for amendments to UN Regulation No. 46, 04 series of amendments	(c)
18	(OICA) Proposal for amendments to the draft 02 series of amendments to Regulation No. 67 (LPG vehicles)	(c/e)
19	(OICA) Comments on ECE/TRANS/WP.29/GRSG/2017/22 - proposal for amendments to Regulation No. 67 (LPG vehicles) from Turkey	(f)
20	(OICA) Proposal for amendments to UN Regulation No. 110 (CNG/LNG vehicles) - Periodic requalification	(f)
21	(OICA) Proposal for amendments to UN Regulation No. 110 (CNG/LNG vehicles) - Transitional provisions	(b)
22	(OICA) Proposal for Supplement 6 to the original series of amendments to UN Regulation No. 116 (Protection of vehicles against unauthorized use)	(c)
23	(France) Report following technical investigation into the collision (and resulting fire) between a coach and a HGV that occurred on October 23rd 2015 on Departmental Road	(f)

<i>No.</i>	<i>(Author) Title</i>	<i>Follow-up</i>
	No 17 near the town of Puisseguin (South-West of France) - Presentation	
24	(The Netherlands) Proposal for amendments to Regulation No. 110 (CNG/LNG vehicles) - CNG accumulator	(c)
25	(The Netherlands) Proposal for amendments to Regulation No. 110 (CNG/LNG vehicles) - CNG compressor	(c)
26	(The Netherlands) Proposal for amendments to Regulation No. 110 (CNG/LNG vehicles) - Annex 5 references	(c)
27	(OICA) VRU-Proxi matrix of accident data collection	(g)
28	(Spain) Question of possible certification under UN Regulation No. 46.04 for an indirect device class I (interior mirror) acting as a taximeter	(f)
29	(India) Comment on document ECE/TRANS/WP.29/GRSG/2016/20 - Proposal for amendments to Regulation No. 107 (M2 and M3 vehicles)	(a)
30	(India) Comment on document ECE/TRANS/WP.29/GRSG/2017/15 - Proposal for Supplement 7 to the 01 series of amendments to Regulation No. 43 (Safety glazing)	(a)
31-Rev.1	(The Netherlands) Revised proposal for amendments to UN Regulation No. 46 – Devices for indirect vision	(a)
32	(AEGPL) Proposal for Supplement 15 to the 01 series of amendments to UN Regulation No. 67 (LPG vehicles)	(f)
33	(Republic of Korea) Progress report by PSG IWG	(f)
34	(Japan) Japanese Emergency Exit requirements	(f)
35	(OICA) GRSG 113: Awareness of vulnerable road users proximity	(f)
36	(The Netherlands & AEGPL) Proposal for Supplement 15 to the 01 series of amendments to Regulation No. 67 (LPG vehicles)	(a)
37	(ISO) Harmonization of UN Regulation No. 110 and ISO 11439:2013	(f)
38-Rev.1	(ISO) Revised proposal for amendments to Regulation No. 110 (CNG and LNG vehicles)	(a)
39	(OICA) Proposal for Supplement 10 to the original series of amendments and Supplement 2 to the 01 series of amendments to Regulation No. 121 (Identification of controls, tell-tales and indicators)	(c)
40	(GRSG) Draft General Guidelines for United Nations regulatory procedures and transitional provisions in UN Regulations	(f)
41	(OICA) UN Regulation No. 116 - Splitting	(f)
42	(OICA) Proposal for Supplement 10 to the original series of amendments and Supplement 2 to the 01 series of amendments to Regulation No. 121 (Identification of controls, tell-tales and indicators)	(a)

List of informal documents distributed at previous sessions of GRSG

<i>No.</i>	<i>(Author) Title</i>	<i>Follow-up</i>
GRSG-111-06-Rev.1	(AECS) Revised justification to document ECE/TRANS/WP.29/GRSG/2017/12 (Draft UN Regulation on AECS)	(f)
GRSG-111-21	(Belgium) A detailed analysis on the compatibility or incompatibility of the scopes and technical provisions for trolleybuses of UN Regulations Nos. 100 and 107	(f)
GRSG-112-35	(Secretariat) Proposal for Supplement 2 to the 07 series of amendments to UN Regulation No. 107 (as adopted by GRSG at its 112th session)	(f)

Notes:

- (a) Adopted/endorsed with no change for consideration at WP.29.
- (b) Adopted/endorsed with changes for consideration at WP.29.
- (c) Resume consideration on the basis of an official document.
- (d) Keep as a reference document/continue consideration.
- (e) Revised proposal for the next session.
- (f) Consideration completed or to be superseded.
- (g) Circulated to all governmental experts to be filled in.

Annex II

**Corrigendum 7 to Revision 3 and as Corrigendum 2 to
Revision 4 of UN Regulation No. 43 (Safety glazing) (para. 18)**

Annex 21, Table 2, amend to read:

"

<i>Seat-back angle (in °)</i>	<i>Horizontal coordinates X</i>	<i>Vertical coordinates Z</i>	<i>Seat-back angle (in °)</i>	<i>Horizontal coordinates X</i>	<i>Vertical coordinates Z</i>
5	- 186 mm	28 mm	23	- 18 mm	5 mm
6	- 177 mm	27 mm	24	- 9 mm	3 mm
7	- 167 mm	27 mm	25	0 mm	0 mm
8	- 157 mm	27 mm	26	9 mm	- 3 mm
9	- 147 mm	26 mm	27	17 mm	- 5 mm
10	- 137 mm	25 mm	28	26 mm	- 8 mm
11	- 128 mm	24 mm	29	34 mm	- 11 mm
12	- 118 mm	23 mm	30	43 mm	- 14 mm
13	- 109 mm	22 mm	31	51 mm	- 18 mm
14	- 99 mm	21 mm	32	59 mm	- 21 mm
15	- 90 mm	20 mm	33	67 mm	- 24 mm
16	- 81 mm	18 mm	34	76 mm	- 28 mm
17	- 72 mm	17 mm	35	84 mm	- 32 mm
18	- 62 mm	15 mm	36	92 mm	- 35 mm
19	- 53 mm	13 mm	37	100 mm	- 39 mm
20	- 44 mm	11 mm	38	108 mm	- 43 mm
21	- 35 mm	9 mm	39	115 mm	- 48 mm
22	- 26 mm	7 mm	40	123 mm	- 52 mm

"

Annex III

Terms of Reference and Rules of Procedure of the GRSG informal working group on awareness of Vulnerable Road Users in proximity at low speed manoeuvres (VRU-Proxi) (para. 23)

A. Terms of Reference

1. The Informal Working Group (IWG) shall develop a draft regulatory proposal that will enhance the driver's ability to detect Vulnerable Road Users (VRU). It shall consider:

- (a) The approval of vehicles with regard to the direct Field of Vision (FOV) of the vehicle driver;
- (b) The approval of systems for the detection of VRU and their installation on the vehicles;
- (c) The approval of devices for indirect vision and their installation on the vehicles.

It shall not cover intervening systems such as those intervening on the braking system or the steering system.

The IWG shall primarily focus on low speed manoeuvres in any direction based on accident data.

2. When developing the regulatory proposal, the IWG should take into account existing technology, data and research. Furthermore, it should consider pre-existing standards as well as national and international legislations covering the same scope.

3. The group shall focus on vehicles of categories M and N. The IWG shall consider the relevance of addressing the vehicles of category O.

4. The target completion dates for the work of the IWG shall be:

- (a) Forward motion:
 - (i) Vehicle turning: Completion of the proposal by Germany on new provisions for Blind Spot Information Systems (BSIS) at the 115th session of GRSG (October 2018);
 - (ii) Vehicle driving straight or taking off from standstill at the 118th session of GRSG (April 2020), e.g. Camera Monitoring Systems (CMS) or detection system.
- (b) Reversing motion (e.g. CMS or detection system) at the 116th session of GRSG (April 2019);
- (c) Direct vision: 120th session of GRSG (April 2021).

5. The IWG is expected to draft a regulatory proposal on driver's visibility and system detection of VRU. The adoption process remains under the responsibility of GRSG, WP.29 and AC.1 in line with the administrative procedures as defined in the 1958 Agreement.

The IWG is expected to take into account the work performed by other Working Parties subsidiary to WP.29.

B. Rules of Procedure

1. The IWG is a subsidiary body of GRSG and is open to all Contracting Parties to the Agreements administered by WP.29, vehicle manufacturers and their suppliers, Technical Services and the participants of all Working Parties (GRs) subsidiary to WP.29.

Additional experts may attend on a case-by-case basis as invited by a consensual decision of the IWG. These experts shall not be part of the decision process.

2. A Chair, a Vice-Chair and a Secretary will manage the IWG.

- (a) The chairmanship shall be under the responsibility of Japan;
- (b) The vice-chairmanship shall be under the responsibility of the European Commission;
- (c) The secretariat shall be under the responsibility of OICA.

3. The working language of the IWG will be English.

4. All documents and/or proposals shall be submitted to the Secretary of the group in a suitable electronic format in advance of the meeting. The group may refuse to discuss and endorse any item or proposal which has not been circulated 10 working days prior to that meeting.

5. An agenda and related documents will be made available on the website by the Secretary, in advance of all scheduled meetings.

6. Decisions will be reached by consensus. When consensus cannot be reached, the Chair of the group shall present the different points of view to GRSG. The Chair may seek guidance from GRSG, as appropriate.

7. The progress of the IWG will be routinely reported to GRSG – wherever possible as an informal document and presented by the Chair, the Vice-Chair, the Secretary or their representative(s).

8. All working documents should be distributed in digital format. Meeting documents should be made available to the Secretary for publication on the website of WP.29.

Annex IV

Draft 03 series of amendments to UN Regulation No. 110 (CNG and LNG vehicles) (para. 38)

Table of contents, Annexe 3A, remove the entry for Appendix H.

Paragraph 2. (References), amend to read:

"2. References

The following standards contain provisions that, through reference in this text, constitute provisions of this Regulation.

ASTM Standards²

ASTM B117-90	Test method of Salt Spray (Fog) Testing
ASTM B154-92	Mercurous Nitrate Test for Copper and Copper Alloys
ASTM D522-92	Mandrel Bend Test of attached Organic Coatings
ASTM D1308-87	Effect of Household Chemicals on Clear and Pigmented Organic Finishes
ASTM D2344-84	Test Method for Apparent interlaminar Shear Strength of Parallel Fibre Composites by Short Beam Method
ASTM D2794-92	Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D3170-87	Chipping Resistance of Coatings
ASTM D3418-83	Test Method for Transition Temperatures Polymers by Thermal Analysis
ASTM D4814-17	Standard Specification for Automotive Spark-Ignition Engine Fuel
ASTM E647-93	Standard Test, Method for Measurement of Fatigue Crack Growth Rates
ASTM E813-89	Test Method for J _{IC} , a Measure of Fracture Toughness
ASTM G154-16	Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials

BSI Standards³

² American Society for Testing and Materials.

³ British Standards Institution.

BS 5045	Part 1 (1982) Transportable Gas Containers – Specification for Seamless Steel Gas Containers Above 0.5 litre Water Capacity
BS 7448-91	Fracture Mechanics Toughness Tests Part I – Method for Determination of K_{IC} , Critical COD and Critical J Values of BS PD 6493-1991. Guidance and Methods for Assessing the Acceptability of Flaws in Fusion Welded Structures; Metallic Materials
EN Standards ⁴	
EN1251-2 2000	Cryogenic vessels. Vacuum insulated vessels of not more than 1,000 litres volume
EN 895:1995	Destructive tests on welds in metallic materials. Transverse tensile test
EN 910:1996	Destructive test methods on welds in metallic materials. Bend tests
EN 1435:1997	Non-destructive examination of welds. Radiographic examination of welded joints
EN 6892-1:2016	Metallic materials. Tensile test
EN 10045-1:1990	Charpy impact test on metallic materials. Test method (V- and U-notches)
ISO Standards ⁵	
ISO 37:2011	Rubber, vulcanized or thermoplastic – Determination of tensile stress-strain properties.
ISO 148-1983	Steel – Charpy Impact Test (v-notch)
ISO 188:2011	Rubber, vulcanized or thermoplastic – Accelerated ageing and heat resistance tests
ISO 306:2004	Plastics - Thermoplastic Materials – Determination of Vicat Softening Temperature
ISO 527-2:2012	Plastics – Determination of tensile properties – Part 2: Test conditions for moulding and extrusion plastics
ISO 642:1999	Steel-Hardenability Test by End Quenching (Jominy Test)
ISO1307:2006	Rubber and plastics hoses – Hose sizes, minimum and maximum inside diameters, and tolerances on cut-to-length hoses
ISO 1402:2009	Rubber and plastics hoses and hose assemblies – Hydrostatic testing
ISO 1431:2009	Rubber, vulcanized or thermoplastic – Resistance to ozone cracking

⁴ European Norm.

⁵ International Organization for Standardization.

ISO 1436:2009	Rubber hoses and hose assemblies – Wire-braid-reinforced hydraulic types for oil-based or water-based fluids – Specification
ISO 1817:2015	Rubber, vulcanized or thermoplastic – Determination of the effect of liquids
ISO 2808:2007	Paints and Varnishes – Determination of film Thickness
ISO 4080:2009	Rubber and plastics hoses and hose assemblies – Determination of permeability to gas
ISO 4624:2016	Plastics and Varnishes – Pull-off Test for adhesion
ISO 10619:2011	Rubber and plastics hoses and tubing - Measurement of flexibility and stiffness - Part 2: Bending tests at sub-ambient temperatures
ISO 6892:2016	Metallic Materials – Tensile Testing
ISO 6506-1:2014	Metallic Materials – Brinell hardness test – Part 1: Test method
ISO 6508-1:2015	Metallic Materials – Rockwell hardness Test – Part 1: Test method
ISO 7225:2005	Precautionary Labels for Gas Cylinders
ISO 7866:2012	Refillable seamless aluminium alloy cylinders – Design, construction and testing
ISO 9001:2015	Quality Assurance in Design/Development, Production, Installation and Servicing
ISO/TS 9002:2016	Quality management systems - Guidelines for the application of ISO 9001:2015
ISO12991:2012	Liquefied natural gas (LNG) – transportable tanks for use on board of vehicles
ISO14469:2017	Road Vehicles: compressed natural gas CNG refuelling connector
ISO15500-2:2016	Road vehicles – Compressed natural gas (CNG) fuel system components Part 2: Performance and general test methods
ISO 15500-17:2012	Road vehicles - Compressed natural gas (CNG) fuel system components - Part 17: Flexible fuel line
ISO 21028-1:2016	Cryogenic vessels – Toughness requirements for materials at cryogenic temperature – Part I: Temperatures below -80 °C
ISO 21029-1:2015	Cryogenic vessels – Transportable vacuum insulated vessels of not more than 1,000 litres volume – Part I: Design, fabrication, inspection and tests
ISO/IEC 17025:2005	General requirements for the competence of testing and calibration laboratories

ISO 9809-1:2010	Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 1: Quenched and tempered steel cylinders with tensile strength less than 1,100 MPa
ISO 11439:2013	Gas cylinders — High pressure cylinders for the on-board storage of natural gas as a fuel for automotive vehicles
NACE Standard ⁶	
NACE TM0177-90	Laboratory Testing of Metals for Resistance to Sulphide Stress Cracking in H ₂ S Environments
ECE Regulations ⁷	
Regulation No. 10	Uniform provisions concerning the approval of vehicles with regard to electromagnetic compatibility
USA Federal Regulations ⁸	
49 CFR 393.67	Liquid fuel tanks (as amended in 78 FR 58484 on 24 September 2013)
SAE Standards ⁹	
SAE J2343-2008	Recommended Practice for LNG Medium and Heavy-Duty Powered Vehicles"

Insert new paragraphs 24.15. to 24.21., to read:

- "24.15. 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 or refuse to accept UN type-approvals under this Regulation as amended by the 03 series of amendments.**
- 24.16. As from 1 September 2019, Contracting Parties applying this Regulation shall not be obliged to accept UN type-approvals of components approved to the requirements of Part I of this Regulation to the 02 series of amendments, first issued after 1 September 2019.**
- 24.17. As from 1 September 2021, Contracting Parties applying this Regulation shall not be obliged to accept UN type-approvals of vehicles approved to the requirements of Part II of this Regulation to the 02 series of amendments, first issued after 1 September 2021.**
- 24.18. Contracting Parties applying this Regulation shall continue to accept UN type-approvals issued according to the 02 series of amendments to this Regulation first issued before 1 September 2019 in the case of components approved to the requirements of Part I of this Regulation, and before 1 September 2021 in the case of vehicles approved to the requirements of Part II of this Regulation.**

⁶ National Association of Corrosion Engineers.

⁷ United Nations Economic Commission for Europe; Regulations.

⁸ United States of America Federal Regulations.

⁹ Society of Automotive Engineers.

- 24.19. Contracting Parties applying this Regulation shall not refuse to grant UN type-approvals according to any preceding series of amendments to this Regulation or extensions thereof.
- 24.20. Contracting Parties applying this Regulation shall continue to accept UN type-approvals of, and to grant extensions of approvals to the equipment and part to the preceding series of amendments to this Regulation which are not affected by the changes introduced by the 03 series of amendments.
- 24.21. Contracting Parties applying this Regulation shall continue to accept UN type-approvals to the 02 series of amendments to this Regulation, first issued before 1 September 2021."

Annex 3A

Table 6.4, replace the entry "Acid environment test" by "**Environmental test**".

Paragraph 6.3.6., amend to read:

"6.3.6. Plastic liners

The tensile yield strength and ultimate elongation shall be determined in accordance with paragraph A.22. (Appendix A to this annex). Tests shall demonstrate the ductile properties of the plastic liner material at temperatures of -50 °C or lower by meeting the values specified by the manufacturer; the polymeric material shall be compatible with the service conditions specified in paragraph 4. of this annex. In accordance with the method described in paragraph A.23. (Appendix A to this annex), the softening temperature shall be at least **100 °C**."

Paragraph 6.12., amend to read:

"6.12. Exterior environmental protection

The exterior of cylinders shall meet the requirements of the environmental test conditions of paragraph A.14. (Appendix A to this annex). Exterior protection **shall** be provided by using any of the following:

- (a) A surface finish giving adequate protection (e.g. metal sprayed on aluminium, anodizing); or
- (b) The use of a suitable fibre and matrix material (e.g. carbon fibre in resin); or
- (c) A protective coating (e.g. organic coating, paint) that shall meet the requirements of paragraph A.9. (Appendix A to this annex).

Any coatings applied to cylinders shall be such that the application process does not adversely affect the mechanical properties of the cylinder. The coating shall be designed to facilitate subsequent in service inspection and the manufacturer shall provide guidance on coating treatment during such inspection to ensure the continued integrity of the cylinder."

Paragraph 8.6.4., amend to read:

"8.6.4. **Environment test**"

Annex 3A, Appendix A

Paragraph A.14., amend to read (inserting new sub-paragraphs A.14.1. to A14.6., based mainly on the text of Annex 3A, Appendix H):

"A.14. **Environmental test**

A.14.1. Scope

This test is applicable to type CNG-2, CNG-3 and CNG-4 designs only.

A.14.2. Cylinder set-up and preparation

The upper section of the cylinder will be divided into 5 distinct areas and marked for preconditioning and fluid exposure (see Figure A.1). The areas will be nominally 100 mm in diameter. The areas shall not overlap on the cylinder surface. While convenient for testing, the areas need not be oriented along a single line, but shall not overlap the immersed section of the cylinder.

Although preconditioning and fluid exposure is performed on the cylindrical section of the cylinder, all of the cylinder, including the domed sections, should be as resistant to the exposure environments as are the exposed areas.

Figure A.1
Cylinder orientation and layout of exposure areas



A.14.3. Pendulum impact preconditioning

The impact body shall be of steel and have the shape of a pyramid with equilateral triangle faces and a square base, the summit and the edges being rounded to a radius of 3 mm. The centre of percussion of the pendulum shall coincide with the centre of gravity of the pyramid; its distance from the axis of rotation of the pendulum shall be 1 m. The total mass of the pendulum referred to its centre of percussion shall be 15 kg. The energy of the pendulum at the moment of impact shall be not less than 30 Nm and as close to that value as possible.

During pendulum impact, the cylinder shall be held in position by the end bosses or by the intended mounting brackets. The cylinder shall be un-pressurized during preconditioning.

A.14.4. Environmental fluids for exposure

Each marked area is to be exposed to one of five solutions for 30 minutes. The same environment shall be used for each location throughout the test. The solutions are:

- Sulphuric acid:** 19 per cent solution by volume in water;
- Sodium hydroxide:** 25 per cent solution by weight in water;
- 5% Methanol/95% gasoline:** gasoline concentration of M5 fuel meeting the requirements of ASTM D4814;
- Ammonium nitrate:** 28 per cent by weight in water;
- Windshield washer fluid** 50 per cent by volume solution of methyl alcohol and water.

When exposed, the test sample will be oriented with the exposure area uppermost. A pad of glass wool (approximately 0.5 mm thick and between 90 and 100 mm in diameter) shall be placed on the exposure area. Apply an amount of the test fluid to the glass wool sufficient to ensure that the pad is wetted evenly across its surface and through its thickness for the duration of the test, and that the concentration of the fluid is not changed significantly during the duration of the test.

A.14.5. Pressure cycle and hold

The cylinder shall be hydraulically pressure cycled between not more than 2 MPa and not less than 26 MPa for a total of 3,000 cycles. The maximum pressurization rate shall be 2.75 MPa per second. After pressure cycling, the cylinder shall be pressurized to 26 MPa and held at that pressure a minimum of 24 hours and until the elapsed exposure time (pressure cycling and pressure hold) to the environmental fluids equals 48 hours.

A.14.6. Acceptable results

The cylinder shall be hydraulically tested to destruction in accordance with the procedure in paragraph A.12. The burst pressure of the cylinder shall be not less than 85 per cent of the minimum design burst pressure."

Through the whole text of the Regulation, replace the references to "acid environmental test" by "environment test" and delete the references to Annex 3A, Appendix H.

Paragraph A.16., amend to read:

"A.16. Penetration tests

A cylinder pressurised to 20 MPa \pm 1 MPa with compressed gas shall be penetrated by an armour piercing bullet with a diameter of 7.62 mm or greater. The bullet shall completely penetrate at least one side wall of the cylinder. **For type CNG-1 designs, the projectile shall impact the side wall at 90°.** For type CNG-2, CNG-3 and CNG-4 designs, the projectile shall impact the side wall at an approximate angle of 45°. The cylinder shall reveal no evidence of fragmentation failure. Loss of small pieces of material, each not weighing more than 45 grams, shall not constitute failure of the test. The approximate size of entrance and exit openings and their locations shall be recorded."

Paragraph A.22., amend to read:

"A.22. Tensile properties of plastics

The tensile yield strength and ultimate elongation of plastic liner material shall be determined at -50 °C using ISO 527-2, and meet the requirements of paragraph 6.3.6. of Annex 3A."

Paragraph A.23., amend to read:

"A.23. **Softening** temperature of plastics

Polymeric materials from finished liners shall be tested in accordance with the method described in ISO 306. **The softening temperature shall be at least 100 °C.**"

Annex 3A, Appendix F, paragraph F.2.1., subparagraph (c), amend to read:

- "(c) Fracture toughness of the finished cylinder or the liner from a finished cylinder, as determined at room temperature for aluminium and at -40 °C for

steel, shall be established using a standardized testing technique (either ASTM 813-89 or BS 7448) in accordance with Sections 8.4 and 8.5 of BS PD6493"

Annex 3A, Appendix H, shall be deleted.

Annex 4F, paragraph 2.2., amend to read:

"2.2. CNG filling units designed in accordance with ISO 14469 and meeting all the requirements therein are deemed to fulfill the requirements of paragraphs 3. and 4. of this annex."

Annex 4J, paragraph 3.1.5., amend to read:

"3.1.5. The LNG filling receptacle shall be made out of non-sparking material and should comply with the no igniting evaluation tests described in ISO 14469."

Annex V

Draft 08 series of amendments to UN Regulation No. 107 (M₂ and M₃ vehicles) (paras. 5 and 6)

List of contents, amend to read:

"Annex 5 **Requirements to establish the visual contrast**"

Insert new paragraphs 2.44. to 2.48. (Definitions), to read:

- "2.44. **"Visual contrast"** (luminance contrast) means the brightness ratio between an object and its immediate background/surrounding which allows the object to be distinguished from its background/surroundings.
- 2.45. **"Reflectance"** ρ (rho) is the quantitative ratio between reflected light and the incident light on the surface of a flat material. It consists of various portions of "regular reflectance" and "diffuse reflectance".
- 2.46. **"Regular reflectance"** ρ_r is the reflection without diffusion in accordance with the laws of optical reflection as in a mirror.
- 2.47. **"Diffuse reflectance"** ρ_d is the ratio of the light that has undergone diffuse reflection to the incident light.
- 2.48. **"Luminous flux"** Φ (phi) describes the power of a light source."

Insert new paragraphs 10.19. to 10.23., to read:

- "10.19. As from the official date of entry into force of the 08 series of amendments, no Contracting Party applying this Regulation shall refuse to grant or refuse to accept UN type-approvals under this Regulation as amended by the 08 series of amendments.
- 10.20. As from 1 September 2020, Contracting Parties applying this Regulation shall not be obliged to accept UN type-approvals to the preceding series of amendments, first issued after 1 September 2020.
- 10.21. Until 1 September 2022, Contracting Parties applying this Regulation shall accept UN type-approvals to the preceding series of amendments, first issued before 1 September 2020.
- 10.22. As from 1 September 2022, Contracting Parties applying this Regulation shall not be obliged to accept type-approvals issued to the preceding series of amendments to this Regulation.
- 10.23. Contracting Parties applying this Regulation shall not refuse to grant UN type-approvals according to any preceding series of amendments to this Regulation or extensions thereof."

Annex 3

Paragraph 7.11.4., amend to read:

"7.11.4. **Handrails and handholds in toilets.**"

Insert new paragraph 7.11.4.1., to read:

"7.11.4.1. **If a toilet is fitted, a suitable handrail or handhold shall be provided in the interior.**"

Annex 5, amend to read:

"Annex 5

Requirements to establish the visual contrast per paragraph 3.3.3. of Annex 8

1. The visual contrast C shall be established according to the following formula:

$$C = \frac{|\rho_1 - \rho_2|}{\rho_1 + \rho_2}$$

With: ρ_1 = the reflectance of the material of the object to be seen

ρ_2 = the reflectance of the area respectively material surrounding the contrast object

2. For determination of the reflectance values ρ_1 , ρ_2 and ρ_d an integrating sphere according to CIE 38:1977 shall be used.

The reflectance shall be either read directly from the indicating instrument or calculated according to the following formula:

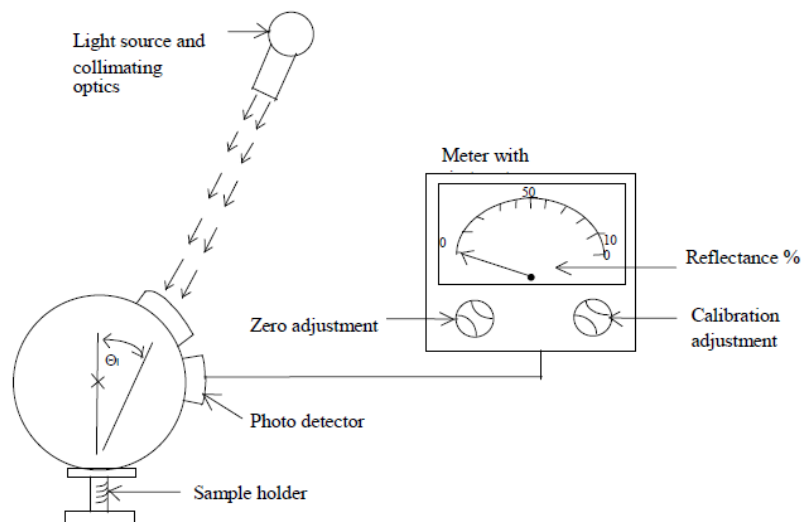
$$\rho = \frac{\Phi_2}{\Phi_1}$$

Where:

Φ_1 = luminous flux of the incident light on the material sample;

Φ_2 = luminous flux of the reflected light (reflectance).

- 2.1. The illumination angle of the luminous flux of the incident light on the sample Θ_i shall be equal to $8^\circ \pm 0.5^\circ$.
- 2.2. The luminous flux of the incident light on the sample shall be determined by using a diffuse reflectance standard calibrated by an accredited laboratory. The extended measurement uncertainty shall be lower than 3 per cent.
3. Example of an integrating sphere according to CIE 38:1977:



*Annex 8**Paragraph 3.3.3.*, amend to read:

- "3.3.3. **These communication devices shall:**
- 3.3.3.1. provide either a visual contrast of $C \geq 0.4$ and a diffuse reflectance ρ_d of at least 0.5 according to Annex 5 or be white or yellow,**
- 3.3.3.2. provide a tactile surface, i.e. protrude from the surrounding areas,**
- 3.3.3.3. provide an audible and visible signal to confirm successful activation."**

Paragraph 3.5., amend to read:

- "3.5. Floor slope
- The slope of any gangway, access passage or floor area between any priority seat and at least one entrance and one exit or a combined entrance and exit shall not exceed 8 per cent. **The slope of any gangway, access passage or floor area between any wheelchair space and at least one entrance and one exit or a combined entrance and exit shall not exceed 5 per cent.** Such sloping areas shall be provided with a slip-resistant surface. **However, in the gangway, access passages or floor area where differently directed slopes merge, these limits may be exceeded provided the total amount of these areas is not greater than 25 per cent of the total amount of the area swept by the wheelchair to reach the wheelchair area."**

Paragraph 3.6.1., amend to read:

- "3.6.1. For each wheelchair user provided for in the passenger compartment there shall be a special area at least 750 mm wide and 1,300 mm long **and 1,400 mm high**. The longitudinal plane of the special area shall be parallel to the longitudinal plane of the vehicle and the floor surface of the special area shall be slip resistant and the maximum slope in ~~any~~ **forward and rearward** direction shall not exceed 5 per cent. **In the lateral direction the slope shall not exceed 3 per cent. However, at the rear end of the wheelchair area where differently directed slopes merge, these limits may be exceeded provided the total amount of these areas is not greater than 25 per cent of the wheelchair area. Furthermore,** in the case of a rearward facing wheelchair complying with the requirements specified in paragraph 3.8.4., the slope in the longitudinal direction shall not exceed 8 per cent provided that this slope inclines upwards from the front end to the rear end of the special area.

In the case of a wheelchair space ... as shown in Annex 4, Figure 22."

Annex 12, paragraph 3.10.12., amend to read:

- "3.10.12. Each of the insulations ...
- ... AC value.
- Circuits directly connected to overhead line shall be double insulated."**

Annex VI**GRSG informal groups**

<i>Informal group</i>	<i>Chair</i>	<i>Secretary</i>
Panoramic Sunroof Glazing (PSG)	Mr. S. B. Eom (Republic of Korea) (co-chaired by Mr. Th. Fuhrmann (Germany)) Tel: +82 31 3690217 email: sbeom@ts2020.kr	Mr. S. Müller von Kralik (CLEPA) Tel: +49 89 85794 1625 email: Bianca.Reutr@webasto.com
Awareness of Vulnerable Road Users proximity (VRU-Proxi)	Mr. Yasuhiro Matsui (Chair) Mr. P. Broertjes (EC) (Vice-Chair) Tel: +81 422 41 3371 email: ymatsui@ntsel.go.jp Tel: +32 2 299 49 33 email: peter.broertjes@ec.europa.eu	Mr. O. Fontaine (OICA) Tel: +33 1-43590013 email: ofontaine@oica.net
