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Inland Transport Committee
World Forum for Harmonization of Vehicle Regulations
Working Party on Lighting and Light-Signalling
Seventy-fourth session

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Report of the Working Party on Lighting and Light-Signalling on its seventy-fourth session
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Annex III

Adopted Terms of Reference and Rules of Procedure for the "Informal Working Group on Visibility, Glare and Levelling (IWG VGL)"

I. Introduction

1. At its sixty-fifth session, GRE considered ECE/TRANS/WP.29/GRE/2011/27, introducing mandatory automatic levelling for headlamps (superseding ECE/TRANS/WP.29/GRE/2011/2 and ECE/TRANS/WP.29/GRE/2011/22). The proposal received comments from the experts of GTB (GRE-65-03 and GRE-65-17) and OICA (GRE-65-16) among others. The expert from Poland presented "Analysis of the influence of aiming, on visibility distance and glare" (GRE-65-30) concerning important aspects of present state of aiming/levelling in Regulation No. 48.
2. GRE adopted ECE/TRANS/WP.29/GRE/2011/27, as amended by Annex IV to this report. GRE agreed that this adoption was subject to the development of a further proposal to be prepared by the expert from GTB who would lead a comprehensive study of the whole issue of glare and visibility during night-time driving. Accordingly, it was agreed in case the results of the study revealed alternatives to the adopted mandatory requirements for automatic levelling and cleaning, the provisions of Regulation No. 48 would be re-examined at any time during the 90 months transitional period provided by ECE/TRANS/WP.29/GRE/2011/27. It was further agreed that, while the study would be managed by a dedicated working group based on the GTB structure, participation would be open to any GRE expert wishing to contribute. The secretariat was requested to submit ECE/TRANS/WP.29/GRE/2011/27 to WP.29 and AC.1 at their November 2011 sessions as draft [06] series of amendments to Regulation No. 48 (ECE/TRANS/WP.29/GRE/65, para. 17).
3. At its 155th session, WP.29 agreed to defer consideration of document ECE/TRANS/WP.29/2011/99 and Corr.1 to its June 2012 session, subject to a final review by GRE at its March 2012 session (ECE/TRANS/WP.29/1093, para. 55).
4. At its 156th session, WP.29 agreed to defer consideration of the amendments to Regulations under agenda items 4.16.1 to 4.16.3 to the next session of WP.29 (ECE/TRANS/WP.29/1093, para. 79).
5. At its 157th session, WP.29 also agreed to refer back the documents of agenda item 4.14.2 to GRE for its further consideration. In this respect, the EU requested a cost/benefit analysis (ECE/TRANS/WP.29/1097, para. 55).
6. In conjunction with the further consideration in GRE, GTB (Groupe de Travail "Bruxelles 1952") established a Task Force Coordination of Automotive Visibility and Glare Studies (TF CAVGS). The tasks of TF CAVGS were defined as follows: project management and quality control of activities by GTB working groups in relation to automotive visibility and glare studies; informal communication with GRE, OICA and CLEPA through liaisons in this TF, optional collaboration with SAE and CIE through liaisons; communication via GTB to GRE and to a public accessible section on the GTB web site.
7. In the meantime, the expert from Poland prepared for all consecutive GRE sessions formal and informal documents with proposals based on the basic analysis of photometry and geometry with explanations according GRE comments and suggestions (ECE/TRANS/WP.29/GRE/2011/32 (initial Polish proposal for aiming/levelling tolerance connected with objective road illumination distance of 75m +/- 25 m), GRE-66-17,

ECE/TRANS/WP.29/GRE/ 2012/21, GRE-67-33, GRE-67-37, ECE/TRANS/WP.29/GRE/2012/27, GRE-68-31, GRE-68-32, GRE-68-34, ECE/TRANS/WP.29/GRE/2013/15, GRE-70-41, ECE/TRANS/WP.29/GRE/2013/57 and ECE/TRANS/WP.29/GRE/2014/11 (coming back to the values in the initial Polish proposal)). The Polish proposals aimed to guarantee the minimum range of illuminated road while ensuring the avoidance of glare regardless of the historical requirements oriented to the design.

8. At the seventy-first session of GRE, the experts from GTB presented the outcome of a study on visibility and glare of automotive low beam headlamps (GRE-71-32). The study concentrated on levelling in relation to load. The major objectives of the study were to improve the understanding of different factors that influence visibility and glare and to identify results of the study that might reveal alternatives for automatic static levelling. According to the GRE suggestion, it also included the studies done by Poland (GRE-71-32). The resulting proposal for amendments to Regulation No. 48 based on this study was presented to the seventy-second session of GRE (GRE-72-07).

9. At its seventy-third session, GRE considered a joint proposal by the experts from the International Organization of Motor Vehicle Manufacturers (OICA) and GTB to introduce new criteria on the automatic levelling of headlamps based on the GTB glare and visibility studies (ECE/TRANS/WP.29/GRE/2015/5). The expert from Poland suggested further modifications to this proposal (GRE-73-18 and GRE-73-28). The experts from Germany and Japan proposed to impose automatic levelling in all cases, in order to reduce glare problems for drivers (GRE-73-17). Following an in-depth exchange of views on these three documents, GRE realized that no consensus could be found as long as there was no single proposal.

10. To make progress on this issue and prepare a comprising proposal, GRE decided to establish an Informal Working Group with a draft title "on Visibility, Glare and Levelling" (IWG VGL), for which the experts from Germany and Poland agreed to act as Chair and Secretary, respectively. GRE requested IWG VGL to submit its terms of reference for consideration at the next session of GRE and mandated the Chair to obtain, in June 2015, the consent of WP.29 for the establishment of this IWG (ECE/TRANS/WP.29/GRE/73, paras. 17 and 18).

11. During the 166th session of WP.29, AC.2 considered the possibility of establishing an Informal Working Group (IWG) on Visibility, Glare and Levelling. Germany expressed its interest to chair the group, Poland to be Vice-Chair and OICA the secretary. WP.29 was requested to provide advice on this issue (ECE/TRANS/WP.29/1116, paragraph 12). WP.29 noted that, to prepare a consolidated proposal on new criteria for the automatic levelling of headlamps, GRE decided to establish a new Informal Working Group on Visibility, Glare and Levelling (IWG on VGL). WP.29 gave its consent for establishing this IWG (ECE/TRANS/WP.29/1116, para. 25).

12. At the same session of WP.29, the representative of France proposed to delete a design restrictive requirement in Regulation No. 48 for auto-levelling of headlamps equipped with any Light Emitting Diodes (LED) light sources (ECE/TRANS/WP.29/GRE/2015/21, ECE/TRANS/WP.29/GRE/73 and WP.29-166-23). The representative explained that, if LED were treated the same way as other light sources, more LED headlamps would be fitted on new vehicles, and thus improving road safety and reducing CO₂ emissions. WP.29 noted that recent studies indicate that the type of light source does not seem to be a major factor of headlamp glare, and that GRE had established an IWG to review all levelling requirements in Regulation No. 48. The EU representative stressed that also for this subject OLA should be involved to provide their analysis and preferred option.

13. WP.29 stressed that, in line with the text and spirit of the 1958 Agreement, Regulations should be technologically neutral and performance based. Therefore, WP.29

advocated the French proposal and invited GRE to adopt it and to submit it to WP.29 for consideration. WP.29 also pointed out the importance of the newly established IWG for finding a general solution for glare and visibility issues. WP.29 also instructed IWG and GRE to verify, as a matter of priority, that LED headlamps do not produce more glare compared to other light sources, to review all levelling requirements and to report back to WP.29 (ECE/TRANS/WP.29/1116, paras. 50 and 51).

14. At its seventy-fourth session, GRE reverted to the proposal by the expert from France to delete a design restrictive requirement in Regulation No. 48 for an auto-levelling device for low beam produced by light emitting diodes (LED) light sources (ECE/TRANS/WP.29/GRE/2015/21 and ECE/TRANS/WP.29/GRE/73, para. 20). The secretariat informed GRE about the discussion on this issue at the June 2015 session of WP.29. The World Forum had stressed that Regulations should be technologically neutral and invited GRE to adopt the French proposal and to submit it to WP.29 for consideration (ECE/TRANS/WP.29/1116, paras. 50 and 51).

15. GRE was not in a position to reach a consensus on this matter. The experts from Germany and Japan did not support the French proposal and suggested that it first be referred to the Informal Working Group on Visibility, Glare and Levelling (IWG VGL) and considered in one package with various other proposals. The experts from Belgium, Italy, Finland, France, Spain, EC, CLEPA and OICA supported the French proposal and called for its adoption independently from the IWG VGL activities. The experts from Austria and Poland reserved their positions. Finally, in view of the WP.29 guidance, GRE agreed to adopt the proposal in ECE/TRANS/WP.29/GRE/2015/21 and to submit it to the March 2016 session of WP.29 for a final decision. The Chair was also requested to brief WP.29 on the different views expressed by experts in GRE (ECE/TRANS/WP.29/GRE/74, paras. 14 and 15).

II. Objectives

16. The following Terms of Reference describe the principle tasks of the new IWG focusing at the development of a proposal to Regulation No. 48, which takes into account the visibility and glare concerns.

17. The IWG on VGL shall:

Phase 1

- (a) Define technology neutral requirements as instructed by WP.29, in particular to find a general solution for glare and visibility issues, and to review all levelling requirements.

Phase 2

- (b) Identify, review and assess the status of various researches being carried out by various governments, universities and non-governmental organizations on visibility and glare.
- (c) Invite, consult with and consider the input of safety experts.
- (d) Develop if necessary additional researches and studies related to visibility and glare issue.
- (e) Determine potential visibility and glare characteristics and mechanisms that convey desired vehicle performance information to the human by focusing on:

- (i) the relevant general data (roads, environment and ecology, standard use of vehicles, future technologies, etc.) explaining the different situations of glaring and the critically situations with regard to visibility;
 - (ii) the relevant parameters for installation of headlamps with regard to visibility and glare, taking into account:
 - aiming of the headlamps;
 - levelling of the passing beam pattern;
 - mounting height of the headlamps, with a clear definition of reference condition;
 - ergonomic aspects to be investigated;
 - washing;
 - other requirements.
- (f) Develop test procedures for evaluating the conformity of visibility and glare characteristics and mechanisms. Define as good as possible the essential requirements in performance (technology neutral) terms to provide opportunities for innovation and to prepare acceptable transitional provisions.
- (g) Develop a proposal for amendment to Regulation No. 48 accordingly and if needed headlamps beam pattern will have to be considered with necessary additional amendment to headlamps Regulations.
- (h) Determine the costs and benefits associated with this proposal of amendment of Regulation No. 48. Note that the analysis is not intended to address specific countries or regions, but rather general considerations each Contracting Party (to WP.29) should consider when implementing the potential proposal.
- (i) Provide a draft proposal to the GRE by April 2017 and to the WP.29/AC.1 by November 2017.

III. Rules of Procedure

18. The Informal Working Group on Visibility, Glare and Levelling (IWG on VGL) is a subgroup of GRE and is open to all participants of GRE, including Contracting Parties to the 1958 and 1998 Agreements and non-governmental organisations. However, it is recommended that a maximum of three technical experts per country and organization participate in this group.

19. IWG will be chaired by Germany and co-chaired by Poland. OICA will act as Secretary.

20. The official language of the informal group will be English.

21. An agenda and related documents shall be made available on the dedicated UNECE website (<https://www2.unece.org/wiki/pages/viewpage.action?pageId=26903055>) by the Secretary of the group in advance of all scheduled meetings.

22. All documents and/or proposals shall be submitted to the Secretary of the group in a suitable electronic format in advance of the meetings. The group may postpone discussing any item or proposal which has not been circulated five working days in advance of the scheduled meeting.

23. The Secretary of the group shall distribute the draft meeting minutes to the informal group members within fifteen working days after the meeting of the group. The draft minutes

shall be considered and adopted at the next session of IWG. The adopted minutes shall be submitted to GRE and will be used by the IWG Chair as a basis for his reporting to GRE about the activities of the IWG.

24. IWG shall develop its opinions and draft proposals by consensus, and submit these to GRE for further consideration and decision. If IWG cannot reach common agreement on particular items or proposals, the Chair shall present the issue to the GRE and/or the WP.29/AC.1 for resolution. The IWG Chair may seek guidance from GRE as appropriate.

25. Sessions shall be held in agreement with the majority of the participants after the group has been established in a constitutional meeting. Sessions may be in person or virtual using web-based technology.

26. A provisional agenda shall be drawn up by the Secretary in accordance with the proposals and requests received from the members of the group and with the agreement of the Chair. The first item upon the provisional agenda for each session shall be the adoption of the agenda.

27. The second item on the provisional agenda shall be the discussion on matters arising and adoption of the minutes of the previous session.

28. IWG shall provide GRE with status reports at each GRE session.

IV. Work plan and time schedule

29. The aim of IWG VGL is to present an informal document related to Phase 1 for consideration at the seventy-fifth and seventy-sixth sessions of GRE in April 2016 and October 2016, respectively.

30. The final objective of IWG is to present a formal document related to Phase 1 for consideration at the seventy-seventh session of GRE in April 2017 and then for consideration at the 173th session of WP.29 in November 2017.

31. The time-line for Phase 2 shall be proposed at the seventy-sixth session of GRE in October 2016.

32. Meetings of the informal group shall be scheduled to meet the timeline for deliverables. These meetings may be “in-person” or virtual (WebEx or similar).

Annex IV

Adopted amendments to ECE/TRANS/WP.29/GRE/2015/39

Insert a new paragraph 2.32., to read:

"2.32. "Sequential activation" means an electrical connection where the individual light sources of a lamp are wired such that they are activated in a predetermined sequence."

Insert a new paragraph 5.8.1., to read:

"5.8.1. The photometric characteristics of a direction indicator lamp except for categories 5 and 6 specified in Regulation No. 6, and of a direction indicator lamp specified in Regulation No. 50 may be varied during a flash by sequential activation of light sources as specified in paragraph 5.6. of Regulation No. 6 or in paragraph 6.8. of Regulation No. 50.

This provision shall not apply when direction indicator lamps of categories 2a and 2b of Regulation No. 6 or category 12 of Regulation No. 50 are operated as emergency stop signal according to paragraph 6.14. of this Regulation."

Annex V

Adopted amendments to Regulation No. 53

Paragraph 6.1.1. to 6.1.1.2., amend to read:

"6.1.1. Number:

6.1.1.1. For motorcycles having a cylinder capacity $\leq 125 \text{ cm}^3$

One or two of approved type according to:

- (a) Class ~~B~~ C, D or E of Regulation No. 113;
- (b) Regulation No. 112;
- (c) Regulation No. 1;
- (d) Regulation No. 8;
- (e) Regulation No. 20;
- (f) Regulation No. 57;
- (g) Regulation No. 72;
- (h) Regulation No. 98.

6.1.1.2. For motorcycles having a cylinder capacity $> 125 \text{ cm}^3$

One or two of approved type according to:

- (a) Class ~~B~~ D or E of Regulation No. 113;
- (b) Regulation No. 112;
- (c) Regulation No. 1;
- (d) Regulation No. 8;
- (e) Regulation No. 20;
- (f) Regulation No. 72;
- (g) Regulation No. 98.

Two of approved type according to:

- (h) Class C of Regulation No. 113."

Paragraph 6.2.1 to 6.2.1.2., amend to read:

"6.2.1. Number:

6.2.1.1. For motorcycles having a cylinder capacity $\leq 125 \text{ cm}^3$

One or two of approved type according to:

- (a) Class ~~B~~ C, D or E of Regulation No. 113;
- (b) Regulation No. 112;
- (c) Regulation No. 1;
- (d) Regulation No. 8;
- (e) Regulation No. 20;

- (f) Regulation No. 57;
- (g) Regulation No. 72;
- (h) Regulation No. 98.

6.2.1.2. For motorcycles having a cylinder capacity > 125 cm³

One or two of approved type according to:

- (a) Class ~~B~~, D or E of Regulation No. 113;
- (b) Regulation No. 112;
- (c) Regulation No. 1;
- (d) Regulation No. 8;
- (e) Regulation No. 20;
- (f) Regulation No. 72;
- (g) Regulation No. 98.

Two of approved type according to:

- (h) Class C of ~~draft~~ Regulation No. 113."

Insert new paragraphs 11.4. to 11.6., to read:

- "11.4. As from the official date of entry into force of the 02 series of amendments, no Contracting Party applying this Regulation shall refuse to grant approvals under this Regulation as amended by the 02 series of amendments.**
- 11.5. As from 48 months after the date of entry into force mentioned in paragraph 11.4. above, Contracting Parties applying this Regulation shall grant approvals only if the vehicle type with regard to the number and mode of installation of the lighting and light-signalling devices corresponds to the requirements of the 02 series of amendments to this Regulation.**
- 11.6. Existing approvals granted under this Regulation before the date mentioned in paragraph 11.5. above shall remain valid."**

Annex VI

GRE informal groups

<i>Informal group</i>	<i>Chair(s)</i>	<i>Secretary</i>
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¹ The mandate of AVLI expired in October 2015.