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Economic Commission for Europe**Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on Lighting and Light-Signalling****Eighty-fifth session**

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Item 4 (e) of the provisional agenda

Simplification of lighting and light-signalling UN Regulations:**Simplification of UN Regulations Nos. 48, 53, 74 and 86****Proposal for a new supplement to the 06, 07 and 08 series of amendments to UN Regulation No. 48****Submitted by the Informal Working Group on Simplification of Lighting and Light-Signalling Regulations***

The text reproduced below was prepared by the Informal Working Group on Simplification of Lighting and Light-Signalling Regulations (IWG SLR). It is based on informal document GRE-84-05 and aims to introduce a simple performance-oriented criterion and to add an objective value for the visibility of the red light towards the front and white light towards the rear of the vehicle. Additionally, the proposal allows for additional contributors to the driving beam without an adaptive front-lighting system (AFS). The proposal also introduces alternative references to UN Regulation No. 48, makes corrections to references which were missing or incorrect and improves a term used in the communication form. The modifications to the existing text of UN Regulation No. 48 are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2021 as outlined in proposed programme budget for 2021 (A/75/6 (Sect.20), para 20.51), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.



I. Proposal

A. Proposal for a new Supplement to the 06 series of amendments to UN Regulation No. 48

Add a new paragraph 2.5.1.1. to read:

- “2.5.1.1. “Auxiliary driving-beam (auxiliary main-beam) lamp” means a driving-beam approved as separate lamp in such a way that it is supplementing a driving-beam of another class.”**

Paragraph 5.10. and its sub-paragraphs, amend to read:

- ~~“5.10. No red light which could give rise to confusion shall be emitted from a lamp as defined in paragraph 2.1.5. in a forward direction and no white light which could give rise to confusion, shall be emitted from a lamp as defined in paragraph 2.1.5. in a rearward direction. No account shall be taken of lighting devices fitted for the interior lighting of the vehicle. In case of doubt, this requirement shall be verified as follows:~~

Provisions regarding light which could give rise to confusion:

- ~~5.10.1. For the visibility of red light towards the front of a vehicle, with the exception of a red rearmost side marker lamp, there shall be no direct visibility of the apparent surface of a red lamp if viewed by an observer moving within Zone 1 in a transverse plane situated 25 m in front of the vehicle (see Annex 4);~~

Red light emitted by a lamp fitted on the rear of the vehicle (as defined in paragraph 2.1.5.) shall not be visible from the front of the vehicle.

- ~~5.10.2. For the visibility of white light towards the rear of a vehicle, with the exception of reversing lamps and white side conspicuity markings, there shall be no direct visibility of the apparent surface of a white lamp if viewed by an observer moving within Zone 2 in a transverse plane situated 25 m behind the vehicle (see Annex 4);~~

White light emitted by a lamp fitted on the front of the vehicle (as defined in paragraph 2.1.5.) shall not be visible from the rear of the vehicle.

- ~~5.10.3. In their respective planes, the zones 1 and 2 explored by the eye of the observer are bounded:~~

No account shall be taken of light emitted by devices for the interior lighting of the vehicle.

- ~~5.10.3.1. In height, by two horizontal planes 1 m and 2.2 m respectively above the ground;~~

- ~~5.10.3.2. In width, by two vertical planes which, forming to the front and to the rear respectively an angle of 15° outwards from the vehicle's median longitudinal plane, pass through the point or points of contact of vertical planes parallel to the vehicle's median longitudinal plane delimiting the vehicle's overall width; if there are several points of contact, the foremost shall correspond to the forward plane and the rearmost to the rearward plane.~~

- 5.10.4. To verify paragraphs 5.10.1. and 5.10.2.:**

- 5.10.4.1. For the visibility of red light towards the front of a vehicle, with the exception of a red rearmost side-marker lamp, there shall be no direct visibility of the apparent surface of a red lamp if viewed by an observer moving within Zone 1 in a transverse plane situated 25 m in front of the vehicle (see Annex 4);**

- 5.10.4.2. For the visibility of white light towards the rear of a vehicle, with the exception of reversing lamps and white side conspicuity markings, there**

shall be no direct visibility of the apparent surface of a white lamp if viewed by an observer moving within Zone 2 in a transverse plane situated 25 m behind the vehicle (see Annex 4);

- 5.10.4.3. In case of doubt, the requirement above shall be deemed fulfilled if the luminous intensity of the red light emitted to the front and/or the white light emitted to the rear, as verified during type approval of the lamps, is less than 0.25 cd per lamp taking into account the influence of the vehicle body if applicable.”

Paragraph 6.1.2., amend to read:

“6.1.2. Number

Two ~~or four~~, type approved according to:

(a) ~~— Regulations Nos. 98 or 112, excluding Class A headlamp~~

~~or~~

(b) ~~— UN Regulation [RID], Classes B and D headlamps only~~

- UN Regulation No. 98,

or

- Class B of UN Regulation No. 112,

or

- Classes B or D of the 00 series of amendments to UN Regulation No. 149,

or

- Class B of the 01 and subsequent series of amendments to UN Regulation No. 149.

Optionally, one or more additional pair(s) type approved according to:

- UN Regulation No. 98,

and/or

- Classes A and/or B of UN Regulation No. 112,

and/or

- Classes A and/or B and/or RA of UN Regulation No. 149.

~~For vehicles of the category N3: Two extra main beam headlamps may be installed.~~

~~Where a vehicle is fitted with four concealable headlamps the installation of two additional headlamps shall only be authorized for the purpose of light-signalling, consisting of intermittent illumination, at short intervals (see paragraph 5.12. above) in daylight. ”~~

Paragraph 6.1.7.4., amend to read:

- “6.1.7.4. The main-beam headlamps may be switched ~~on~~ ON either simultaneously or in pairs. ~~In case the extra two main beam headlamps are installed, as permitted under paragraph 6.1.2. for vehicles of the category N3 only, no more than two pairs may be simultaneously lit.~~

For changing over from the dipped to the main beam at least one pair of main-beam headlamps shall be switched ~~on~~ ON. For changing over from the main-beam to the dipped-beam all main-beam headlamps shall be switched ~~off~~ OFF simultaneously.

The auxiliary driving-beam(s), class RA, shall only be switched ON together with the driving-beams of another class, except when one or more

pair(s) of auxiliary driving-beams, class RA, are used to produce light signals consisting of intermittent switching ON at short intervals (paragraph 5.12.)."

Paragraph 6.1.7.6., delete.

Paragraph 6.1.9.2., amend to read:

"6.1.9.2. This maximum intensity shall be obtained by adding together the individual reference marks which are indicated on the several headlamps. ~~The reference mark "10" shall be given to each of the headlamps marked "R" or "CR".~~"

Paragraph 6.2.2., amend to read:

"6.2.2. Number

Two, type approved according to:

~~(a) UN Regulation No. 98 or 112, excluding Class A headlamp,~~

~~or~~

~~(b) UN Regulation [RID], Classes B and D headlamps only.~~

- **UN Regulations Nos. 98 or 112, excluding Class A,**

or

- **Classes B or D of the 00 series of amendments to UN Regulation No. 149,**

or

- **Class C of the 01 and subsequent series of amendments to UN Regulation No. 149."**

Paragraph 6.3.9., amend to read:

"6.3.9. Other requirements

In the case where there is a positive indication in the communication form in **item 10.9. of Annex 1 of Regulation No. 19 or item 9.5.8. in of Annex 1 of Regulation No. [RID] 149** the alignment and the luminous intensities of the class "F3" front fog beam may be automatically adapted in relation to the prevailing ambient conditions. Any variations of the luminous intensities or alignment shall be performed automatically and in such a way that no discomfort, neither ..."

Paragraph 6.22.6.1.2.1., amend to read:

"6.22.6.1.2.1. In case the passing-beam is generated by several beams from different lighting units, the provisions according to paragraph 6.22.6.1.2. above apply to each said beam's "cut-off" (if any), which is designed to project into the angular zone, as indicated under item ~~9.3~~ **9.4.** of the communication form conforming to the model in Annex 1 to Regulations Nos. 123 or ~~item 9.3.3. in Annex 1 to UN Regulation No. [RID] 149.~~"

Paragraph 6.22.9.1., amend to read:

"6.22.9.1. An AFS shall be permitted only in conjunction with the installation of headlamp cleaning device(s) according to Regulation No. 4518 for at least those lighting units, which are indicated under item 9.3. of the communication form conforming to the model in Annex 1 to Regulation No. 123 or under item ~~9.3.2.3.~~ **9.3.3.** in Annex 1 to Regulation No. [RID] 149, if the total objective luminous flux of the light sources of these units exceeds 2,000 lm per side, and which..."

Paragraph 6.26.9.2., amend to read:

"6.26.9.2. At the request of the applicant and with the consent of the Technical Service the requirement of 6.26.9.1 may be verified by a drawing or simulation or

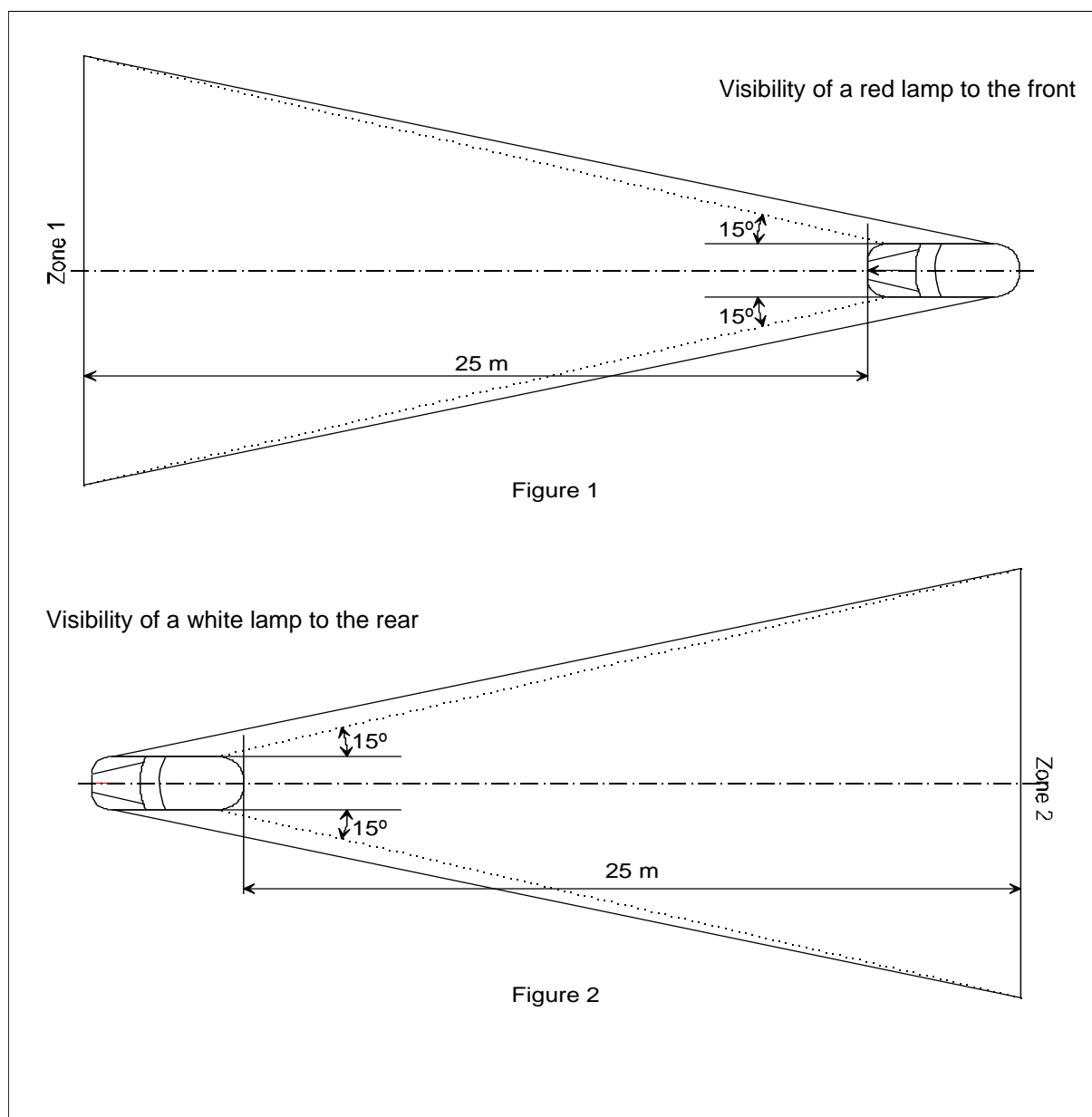
deemed be satisfied if the installation conditions comply with paragraph 6.2.2. of UN Regulation No. 23 or paragraph 5.10.2. of **the 00 series of amendments to UN Regulation No. 148 or paragraph 5.10.1.2. of the 01 and subsequent series of amendments to UN Regulation No. 148**, as noted ~~noticed~~ in the communication document in Annex 1, paragraph 9."

Annex 4, amend to read:

“Annex 4

Visibility of a red lamp to the front and visibility of a white lamp to the rear

(See paragraphs ~~5.10.1. and 5.10.2.~~ **5.10.4.** of this Regulation)



In their respective planes, the zones 1 and 2 explored by the eye of the observer are bounded:

- In height, by two horizontal planes 1 m and 2.2 m respectively above the ground;

- In width, by two vertical planes which, forming to the front and to the rear respectively an angle of 15° outwards from the vehicle's median longitudinal plane, pass through the point or points of contact of vertical planes parallel to the vehicle's median longitudinal plane delimiting the vehicle's overall width; if there are several points of contact, the foremost shall correspond to the forward plane and the rearmost to the rearward plane.”

B. Proposal for a new Supplement to the 07 and 08 series of amendments to UN Regulation No. 48

Add a new paragraph 2.5.1.1. to read:

“2.5.1.1. “Auxiliary driving-beam (auxiliary main-beam) lamp” means a driving-beam approved as separate lamp in such a way that it is supplementing a driving-beam of another class.”

Paragraph 5.10. and its sub-paragraphs, amend to read:

~~“5.10. No red light which could give rise to confusion shall be emitted from a lamp as defined in paragraph 2.1.5. in a forward direction and no white light which could give rise to confusion, shall be emitted from a lamp as defined in paragraph 2.1.5. in a rearward direction. No account shall be taken of lighting devices fitted for the interior lighting of the vehicle. In case of doubt, this requirement shall be verified as follows:~~

Provisions regarding light which could give rise to confusion:

5.10.1. ~~For the visibility of red light towards the front of a vehicle, with the exception of a red rearmost side marker lamp, there shall be no direct visibility of the apparent surface of a red lamp if viewed by an observer moving within Zone 1 in a transverse plane situated 25 m in front of the vehicle (see Annex 4);~~

Red light emitted by a lamp fitted on the rear of the vehicle (as defined in paragraph 2.1.5.) shall not be visible from the front of the vehicle.

5.10.2. ~~For the visibility of white light towards the rear of a vehicle, with the exception of reversing lamps and white side conspicuity markings, there shall be no direct visibility of the apparent surface of a white lamp if viewed by an observer moving within Zone 2 in a transverse plane situated 25 m behind the vehicle (see Annex 4);~~

White light emitted by a lamp fitted on the front of the vehicle (as defined in paragraph 2.1.5.) shall not be visible from the rear of the vehicle.

5.10.3. ~~In their respective planes, the zones 1 and 2 explored by the eye of the observer are bounded:~~

No account shall be taken of light emitted by devices for the interior lighting of the vehicle.

~~5.10.3.1. In height, by two horizontal planes 1 m and 2.2 m respectively above the ground;~~

~~5.10.3.2. In width, by two vertical planes which, forming to the front and to the rear respectively an angle of 15° outwards from the vehicle's median longitudinal plane, pass through the point or points of contact of vertical planes parallel to the vehicle's median longitudinal plane delimiting the vehicle's overall width; if there are several points of contact, the foremost shall correspond to the forward plane and the rearmost to the rearward plane.~~

5.10.4. To verify paragraphs 5.10.1. and 5.10.2.:

5.10.4.1. For the visibility of red light towards the front of a vehicle, with the exception of a red rearmost side-marker lamp, there shall be no direct

visibility of the apparent surface of a red lamp if viewed by an observer moving within Zone 1 in a transverse plane situated 25 m in front of the vehicle (see Annex 4);

- 5.10.4.2. For the visibility of white light towards the rear of a vehicle, with the exception of reversing lamps and white side conspicuity markings, there shall be no direct visibility of the apparent surface of a white lamp if viewed by an observer moving within Zone 2 in a transverse plane situated 25 m behind the vehicle (see Annex 4);
- 5.10.4.3. In case of doubt, the requirement above shall be deemed fulfilled if the luminous intensity of the red light emitted to the front and/or the white light emitted to the rear, as verified during type approval of the lamps, is less than 0.25 cd per lamp taking into account the influence of the vehicle body if applicable.”

Paragraph 6.1.2., amend to read:

“6.1.2. Number

Two ~~or four~~, type approved according to:

~~(c) — Regulations Nos. 98 or 112, excluding Class A headlamp~~

~~or~~

~~(d) — UN Regulation [RID], Classes B and D headlamps only~~

- UN Regulation No. 98,
- or
- Class B of UN Regulation No. 112,
- or
- Classes B or D of the 00 series of amendments to UN Regulation No. 149,
- or
- Class B of the 01 and subsequent series of amendments to UN Regulation No. 149.

Optionally, one or more additional pair(s) type approved according to:

- UN Regulation No. 98,
- and/or
- Classes A and/or B of UN Regulation No. 112,
- and/or
- Classes A and/or B and/or RA of UN Regulation No. 149.

~~For vehicles of the category N3: Two extra main beam headlamps may be installed.~~

~~Where a vehicle is fitted with four concealable headlamps the installation of two additional headlamps shall only be authorized for the purpose of light signalling, consisting of intermittent illumination, at short intervals (see paragraph 5.12. above) in daylight. ”~~

Paragraph 6.1.7.4., amend to read:

- “6.1.7.4. The main-beam headlamps may be switched ~~on~~ ON either simultaneously or in pairs. ~~In case the extra two main beam headlamps are installed, as permitted under paragraph 6.1.2. for vehicles of the category N3 only, no more than two pairs may be simultaneously lit.~~

For changing over from the dipped to the main beam at least one pair of main-beam headlamps shall be switched ~~on~~ **ON**. For changing over from the main-beam to the dipped-beam all main-beam headlamps shall be switched ~~off~~ **OFF** simultaneously.

The auxiliary driving-beam(s), class RA, shall only be switched ON together with the driving-beams of another class, except when one or more pair(s) of auxiliary driving-beams, class RA, are used to produce light signals consisting of intermittent switching ON at short intervals (paragraph 5.12.)."

Paragraph 6.1.7.6., delete.

Paragraph 6.1.9.2., amend to read:

"6.1.9.2. This maximum intensity shall be obtained by adding together the individual reference marks which are indicated on the several headlamps. ~~The reference mark "10" shall be given to each of the headlamps marked "R" or "CR".~~ "

Paragraph 6.2.2., amend to read:

"6.2.2. Number

Two, type approved according to:

~~(e) — UN Regulation No. 98 or 112, excluding Class A headlamp,~~

~~or~~

~~(d) — UN Regulation [RID], Classes B and D headlamps only.~~

- **UN Regulations Nos. 98 or 112, excluding Class A,**
- or**
- **Classes B or D of the 00 series of amendments to UN Regulation No. 149,**
- or**
- **Class C of the 01 and subsequent series of amendments to UN Regulation No. 149."**

Paragraph 6.3.9., amend to read:

"6.3.9. Other requirements

In the case where there is a positive indication in the communication form in **item 10.9. of Annex 1 of Regulation No. 19 or item 9.5.8. in of Annex 1 of Regulation No. [RID] 149** the alignment and the luminous intensities of the class "F3" front fog beam may be automatically adapted in relation to the prevailing ambient conditions. Any variations of the luminous intensities or alignment shall be performed automatically and in such a way that no discomfort, neither ..."

Paragraph 6.22.6.1.2.1., amend to read:

"6.22.6.1.2.1. In case the passing-beam is generated by several beams from different lighting units, the provisions according to paragraph 6.22.6.1.2. above apply to each said beam's "cut-off" (if any), which is designed to project into the angular zone, as indicated under item ~~9.3~~ **9.4.** of the communication form conforming to the model in Annex 1 to Regulations Nos. 123 or ~~item 9.3.3. in Annex 1 to UN Regulation No. [RID] 149.~~"

Paragraph 6.22.8.2., amend to read:

"6.22.8.2. A visual failure tell-tale for AFS is mandatory. It shall be non-flashing. It shall be activated whenever a failure is detected with respect to the AFS control signals or when a failure signal is received in accordance with paragraph 5.9. of UN Regulation No. 123 **or paragraph 4.13. of UN Regulation No. 149.** It

shall remain activated while the failure is present. It may be cancelled temporarily, but shall be repeated whenever the device which starts and stops the propulsion system is switched ON and OFF.”

Paragraph 6.22.9.1., amend to read:

"6.22.9.1. An AFS shall be permitted only in conjunction with the installation of headlamp cleaning device(s) according to Regulation No. 4518 for at least those lighting units, which are indicated under item 9.3. of the communication form conforming to the model in Annex 1 to Regulation No. 123 or under item ~~9.3.2.3.~~ **9.3.3.** in Annex 1 to Regulation No. ~~[RID]~~ **149**, if the total objective luminous flux of the light sources of these units exceeds 2,000 lm per side, and which...”

Paragraph 6.26.9.2., amend to read:

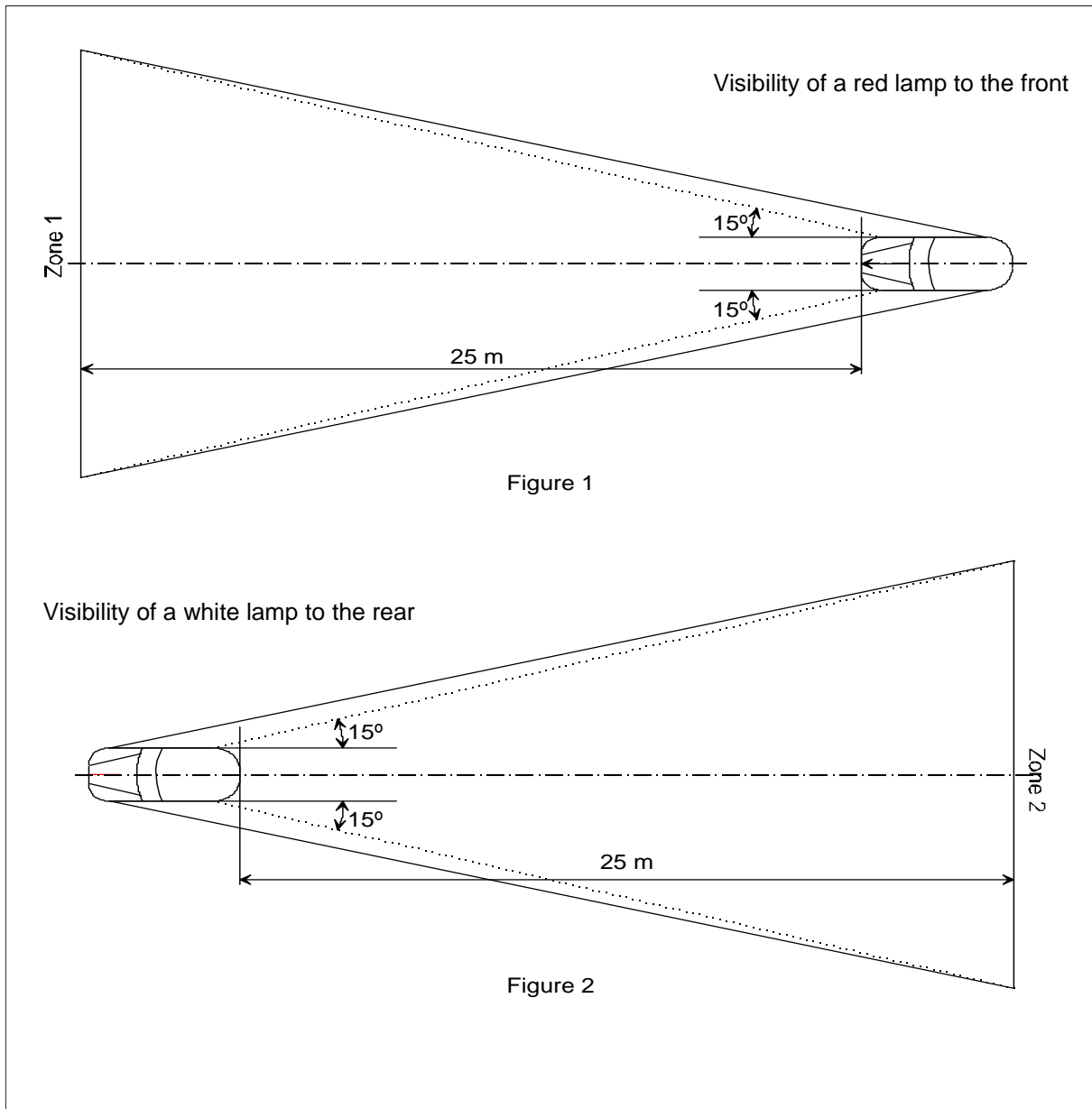
"6.26.9.2. At the request of the applicant and with the consent of the Technical Service the requirement of 6.26.9.1 may be verified by a drawing or simulation or deemed be satisfied if the installation conditions comply with paragraph 6.2.2. of UN Regulation No. 23 or paragraph 5.10.2. of **the 00 series of amendments to UN Regulation No. 148 or paragraph 5.10.1.2. of the 01 and subsequent series of amendments to UN Regulation No. 148**, as ~~noted~~ ~~noticed~~ in the communication document in Annex 1, paragraph 9."

Annex 4, amend to read:

“Annex 4

Visibility of a red lamp to the front and visibility of a white lamp to the rear

(See paragraphs ~~5.10.1. and 5.10.2.~~ **5.10.4.** of this Regulation)



In their respective planes, the zones 1 and 2 explored by the eye of the observer are bounded:

- In height, by two horizontal planes 1 m and 2.2 m respectively above the ground;
- In width, by two vertical planes which, forming to the front and to the rear respectively an angle of 15° outwards from the vehicle's median longitudinal plane, pass through the point or points of contact of vertical planes parallel to the vehicle's median longitudinal plane delimiting the vehicle's overall width; if there are several points of contact, the foremost shall correspond to the forward plane and the rearmost to the rearward plane.”

II. Justification

1. IWG SLR wishes to clarify the requirement in paragraph 5.10. that can be difficult for the applicant or the type approval authority to verify in cases where the lighting device and/or the vehicle has a complex shape.
2. The existing method is not performance oriented. It does not relate to visible red or white light but to the apparent surface of the function which can cause confusion. In some

cases, the zones specified in Annex 4 have been used to determine visible light, not visibility of the apparent surface.

3. The SLR proposal is based on simple performance-oriented criteria, to add an objective value to define the visibility of red light towards the front and white light towards the rear of the vehicle. Indeed, in some cases, due to the complex shape of some vehicles, it is not easy to confirm if we see the apparent surfaces of red light to the front or the apparent surfaces of white light to the rear. In these cases, we propose an alternative solution to measure the light output, instead of only a subjective approval.

4. In case of doubt, or if the applicant wants to be sure that they will respect the requirement during the design phase, IWG SLR proposes an objective criterion, based on optical measurement (that can be simulated during the design phase). This measurement may be done by technical services during type approval according to UN Regulations Nos. 148 and 149.

5. IWG SLR has defined the maximum accepted value at 0.25 cd. This value is also the maximum value in UN Regulation No. 148 for the side marker lamp from 60 to 90 degrees in the horizontal direction and $\pm 0^\circ$ in the vertical direction towards the front of the vehicle. This 0.25 cd threshold is consistent between UN Regulations Nos. 148, 149 and 48.

6. The requirement specified in paragraph 5.10.4. of UN Regulation No. 48 shall be deemed fulfilled if the luminous intensity of the red light emitted to the front and/or the white light emitted to the rear, as verified during type approval of the lamps, is less than 0.25 cd per lamp. In that case, we believe it shall be clearly communicated whether or not this additional test was conducted at the lamp type approval in the communication form of UN Regulations Nos. 148 and 149. Therefore, we propose to make it a rule to note whether the additional test was conducted or not, in the communication form of Annex 1 of UN Regulations Nos. 148 and 149.

7. In the current UN Regulation No. 48, it is already possible to have some additional contributors for the driving-beam (more than four) in relation with AFS requirements (paragraph 6.22.4.1.2.).

8. This proposal is intended to extend such a possibility to the driving-beam also without AFS (paragraph 6.1.). The maximum intensity will be always limited by the requirements in paragraph 6.1.9.1. (I_{\max} value 430,000 cd for all driving-beam headlamps switched ON simultaneously). In case of additional modules, the surface of the driving-beam will increase and its luminance will decrease. Consequently, an oncoming driver would not receive any additional glare.

9. Since the introduction of Supplement 12 to the 06 series of amendments to UN Regulation No. 48, references to the new device UN Regulations Nos. 148, 149 and 150 have been included into UN Regulation No. 48.

10. With the entry into force of the new 01 series of amendments to UN Regulation No. 149 produced by IWG SLR it is necessary to introduce alternative references to UN Regulation No. 48. This amendment deals with such additional references for the 06, 07 and 08 series amendments to UN Regulation No. 48.

11. The proposed amendment to paragraph 6.22.8.2. of the 07 and 08 series of amendments to UN Regulation No. 48 is intended to add a missing reference to paragraph 4.13. of UN Regulation No. 149.

12. In paragraph 6.26.9.2. the reference to paragraph 5.10.2. was no longer correct with the development of the 01 series of amendments to UN Regulation No. 148. The correct paragraph reference was added accordingly to the 01 and subsequent series of amendments.

13. In the communication document, the term 'noticed' was corrected to 'noted'.