

**Economic and Social Council**Distr.: General  
21 December 2012

Original: English

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**Economic Commission for Europe****Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****159<sup>th</sup> session**

Geneva, 12-15 March 2013

Item 4.9.10. of the provisional agenda

**1958 Agreement – Consideration of draft amendments  
to existing Regulations submitted by GRE****Proposal for Supplement 2 to the 06 series of amendments to  
Regulation No. 48 (Installation of lighting and light-signalling  
devices)****Submitted by the Working Party on Lighting and Light Signalling\***

The text reproduced below was adopted by the Working Party on Lighting and Light Signalling (GRE) at its sixty-eighth session (ECE/TRANS/WP.29/GRE/68, paras. 6-8, 23-24). It is based on ECE/TRANS/WP.29/GRE/2012/26, not amended, ECE/TRANS/WP.29/GRE/2012/28, as amended by para. 6 of the report, ECE/TRANS/WP.29/GRE/2012/29, as amended by Annex III to the report and ECE/TRANS/WP.29/GRE/2012/43, as amended by Annex V to the report. It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Administrative Committee AC.1 for consideration.

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\* In accordance with the programme of work of the Inland Transport Committee for 2010–2014 (ECE/TRANS/208, para. 106 and ECE/TRANS/2010/8, programme activity 02.4), the World Forum will develop, harmonize and update regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

*Insert a new paragraph 2.35. to read:*

"2.35. "H plane" means the horizontal plane containing the centre of reference of the lamp."

*Paragraph 5.8., renumber subparagraphs and amend to read:*

"5.8. The maximum height above the ground shall be measured from the highest point and the minimum height from the lowest point of the apparent surface in the direction of the reference axis.

Where the (maximum and minimum) height above the ground clearly meets the requirements of the Regulation, the exact edges of any surface need not be determined.

5.8.1. For the purposes of reducing the geometric visibility angles, the position of a lamp with regard to height above the ground, shall be measured from the H plane.

5.8.2. In the case of dipped-beam headlamp, the minimum height in relation to the ground is measured from the lowest point of the effective outlet of the optical system (e.g. reflector, lens, projection lens) independent of its utilisation.

5.8.3. The position, as regards width, will be determined from that edge of the apparent surface in the direction of the reference axis which is the furthest from the median longitudinal plane of the vehicle when referred to the overall width, and from the inner edges of the apparent surface in the direction of the reference axis when referred to the distance between lamps.

Where the position, as regards width, clearly meets the requirements of the Regulation, the exact edges of any surface need not be determined."

*Paragraph 6.1.7.3., amend to read:*

"6.1.7.3. It shall always be possible to switch the main-beam headlamps ON and OFF manually and to manually switch OFF the automatic control of the main-beam headlamps.

Moreover, the switching OFF, of the main-beam headlamps and of their automatic control, shall be by means of a simple and immediate manual operation; the use of sub-menus is not allowed."

*Paragraph 6.1.9.3.1.1., amend to read:*

"6.1.9.3.1.1. The boundaries of the minimum fields in which the sensor is able to detect light emitted from other vehicles defined in paragraph 6.1.7.1. are defined by the angles indicated below."

*Paragraph 6.1.9.3.1.2., amend to read:*

"6.1.9.3.1.2. The sensor system shall be able to detect on a straight level road:

- (a) An oncoming power driven vehicle at a distance extending to at least 400 m;
- (b) A preceding power driven vehicle or a vehicle-trailers combination at a distance extending to at least 100 m;
- (c) An oncoming bicycle at a distance extending to at least 75 m, its illumination represented by a white lamp with a luminous intensity of 150 cd with a light emitting area of  $10 \text{ cm}^2 \pm 3 \text{ cm}^2$  and a height above a ground of 0.8 m.

To verify compliance with (a) and (b) above, the oncoming and preceding power driven vehicle (or vehicle-trailer combination) shall have position lamps (if applicable) and dipped-beam headlamps switched ON."

*Paragraph 6.2.5.*; amend to read:

"6.2.5. Geometric visibility

Defined by angles  $\alpha$  and  $\beta$  as specified in paragraph 2.13.:

$\alpha = 15^\circ$  upwards and  $10^\circ$  downwards,

$\beta = 45^\circ$  outwards and  $10^\circ$  inwards.

The presence of partitions or other items of equipment near the headlamp shall not give rise to secondary effects causing discomfort to other road users."

*Paragraph 6.3.5.*, amend to read:

"6.3.5. Geometric visibility

Defined by angles  $\alpha$  and  $\beta$  as specified in paragraph 2.13.,

$\alpha = 5^\circ$  upwards and downwards,

$\beta = 45^\circ$  outwards and  $10^\circ$  inwards.

The presence of partitions or other items of equipment near..."

*Paragraphs 6.5.5. to 6.5.5.2., including the figures,* amend to read:

"6.5.5. Geometric visibility

6.5.5.1. Horizontal angles: (see figure below)

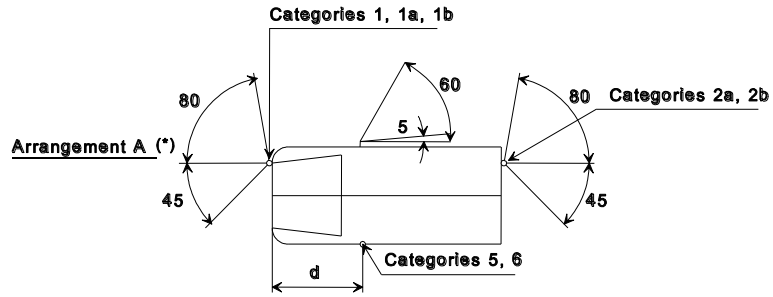
Vertical angles:  $15^\circ$  above and below the horizontal for direction indicator lamps of categories 1, 1a, 1b, 2a, 2b and 5.

However:

- (a) Where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the downward angle of  $15^\circ$  may be reduced to  $5^\circ$ ;
- (b) Where an optional rear lamp is mounted above 2,100 mm (measured according to the provisions of paragraph 5.8.1) the upward angle of  $15^\circ$  may be reduced to  $5^\circ$ .

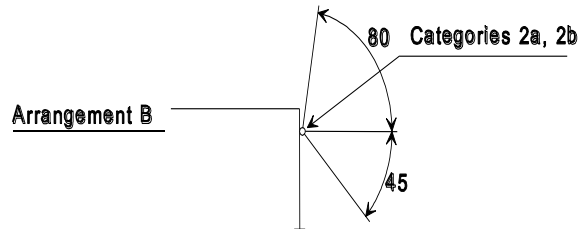
$30^\circ$  above and  $5^\circ$  below the horizontal for direction indicator lamps of category 6.

Figure (see paragraph 6.5.)



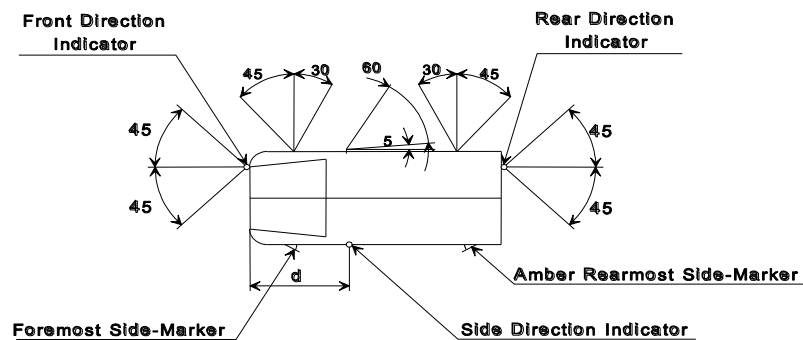
(\*) The value of 5° given for dead angle of visibility to the rear of the side direction-indicator is an upper limit  $d \leq 1.80$  m (for  $M_1$  and  $N_1$  category vehicles  $d \leq 2.50$  m).

For the direction indicator lamps of categories 1, 1a, or 1b, 2a and 2b mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the inward angle of 45° may be reduced to 20° under the H plane.



6.5.5.2. Or, at the discretion of the manufacturer, for  $M_1$  and  $N_1$  category vehicles: Front and rear direction indicator lamps, as well as side-marker lamps (\*\*).

Horizontal angles: (see figure below)



(\*\*) The value of 5° given for the dead angle of visibility to the rear of the side direction-indicator is an upper limit.  $d \leq 2.50$  m

However, for the direction indicator lamps of categories 1, 1a, or 1b, 2a and 2b mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the inward angle of 45° may be reduced to 20° under the H plane.

Vertical angles: 15° above and below the horizontal. However, where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the downward angle of 15° may be reduced to 5°.

To be considered visible, the lamp must provide an unobstructed view of the apparent surface of at least 12.5 square centimetres, except for side direction-indicators of categories 5 and 6. The illuminating surface area of any retro-reflector that does not transmit light shall be excluded."

*Paragraph 6.7.5.*, amend to read:

"6.7.5. Geometric visibility

Horizontal angle:

For S1 or S2 categories devices: 45° to the left and to the right of the longitudinal axis of the vehicle.

However, for the stop lamps of categories S1 and S2 mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the inward angle of 45° may be reduced to 20° under the H plane.

For S3 or S4 categories devices: 10° to the left and to the right of the longitudinal axis of the vehicle;

Vertical angle:

For S1 or S2 categories devices: 15° above and below the horizontal.

However,

- (a) Where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the downward angle of 15° may be reduced to 5°;
- (b) Where an optional lamp is mounted above 2,100 mm (measured according to the provisions of paragraph 5.8.1) the upward angle of 15° may be reduced to 5°.

For S3 or S4 categories devices: 10° above and 5° below the horizontal."

*Paragraphs 6.9.5. to 6.9.5.2.*, amend to read:

"6.9.5. Geometric visibility

6.9.5.1. Horizontal angle: 45° inwards and 80° outwards.

However, where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the inward angle of 45° may be reduced to 20° under the H plane.

In the case of trailers, the angle inwards may be reduced to 5°.

Vertical angle: 15° above and below the horizontal. However, where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the downward angle of 15° may be reduced to 5°.

6.9.5.2. For M<sub>1</sub> and N<sub>1</sub> category vehicles, as an alternative to paragraph 6.9.5.1., at the discretion of the manufacturer or his duly accredited representative, and only if a front side-marker lamp is installed on the vehicle:

Horizontal angle: 45° outwards to 45° inwards.

However, where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the inward angle of 45° may be reduced to 20° under the H plane.

Vertical angle: 15° above and below the horizontal.

However, where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the downward angle of 15° may be reduced to 5°.

To be considered visible, the lamp must provide an unobstructed view of the apparent surface of at least 12.5 cm<sup>2</sup>. The illuminating surface area of any retro-reflector that does not transmit light shall be excluded."

*Paragraphs 6.10.5. to 6.10.5.2., amend to read:*

"6.10.5. Geometric visibility

6.10.5.1. Horizontal angle: 45° inwards and 80° outwards.

However, where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the inward angle of 45° may be reduced to 20° under the H plane.

Vertical angle: 15° above and below the horizontal.

However,

- (a) Where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the downward angle of 15° may be reduced to 5°;
- (b) Where an optional lamp is mounted above 2,100 mm (measured according to the provisions of paragraph 5.8.1) the upward angle of 15° may be reduced to 5°.

6.10.5.2. For M<sub>1</sub> and N<sub>1</sub> category vehicles, as an alternative to paragraph 6.10.5.1., at the discretion of the manufacturer or his duly accredited representative, and only if a rear side-marker lamp is installed on the vehicle,

Horizontal angle: 45° outwards to 45° inwards. However, where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the inward angle of 45° may be reduced to 20° under the H plane.

Vertical angle: 15° above and below the horizontal.

However, where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the downward angle of 15° may be reduced to 5°.

To be considered visible, the lamp must provide an unobstructed view of the apparent surface of at least 12.5 square centimetres. The illuminating surface area of any retro-reflector that does not transmit light shall be excluded."

*Paragraph 6.12.5., amend to read:*

"6.12.5. Geometric visibility

Horizontal angle: 45° outwards, forwards and rearwards.

However, where a front or rear parking lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the inward angle of 45° may be reduced to 20° under the H plane.

Vertical angle: 15° above and below the horizontal.

However, where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the downward angle of 15° may be reduced to 5°."

*Paragraph 6.14.5.*, amend to read:

"6.14.5. Geometric visibility

Horizontal angle: 30° inwards and outwards.

Vertical angle: 10° above and below horizontal.

However, where a retro-reflector is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the downward angle of 10° may be reduced to 5°."

*Paragraph 6.15.5.*, amend to read:

"6.15.5. Geometric visibility

Horizontal angle: 30° inwards and outwards.

Vertical angle: 15° above and below the horizontal. However, where a retro-reflector is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the downward angle of 15° may be reduced to 5°."

*Paragraph 6.16.5.*, amend to read:

"6.16.5. Geometric visibility

Horizontal angle: 30° inwards and outwards. In the case of trailers, the angle inwards may be reduced to 10°. If because of the construction of the trailers this angle cannot be met by the mandatory retro-reflectors, then additional (supplementary) retro-reflectors shall be fitted, without the width limitation (paragraph 6.16.4.1.), which shall, in conjunction with the mandatory retro-reflectors, give the necessary visibility angle.

Vertical angle: 10° above and below the horizontal. However, where a retro-reflector is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the downward angle of 10° may be reduced to 5°."

*Paragraph 6.17.5.*, amend to read:

"6.17.5. Geometric visibility

Horizontal angle: 45° to the front and to the rear.

Vertical angle: 10° above and below the horizontal. However, where a retro-reflector is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the downward angle of 10° may be reduced to 5°."

*Paragraph 6.18.5.*, amend to read:

"6.18.5. Geometric visibility

Horizontal angle: 45° to the front and to the rear; however for vehicles on which the installation of the side-marker lamps is optional this value can be reduced to 30°.

If the vehicle is equipped with side-marker lamps used to supplement the reduced geometric visibility of front and rear direction indicator lamps conforming to paragraph 6.5.5.2. and/or position lamps conforming to

paragraphs 6.9.5.2. and 6.10.5.2., the angles are 45° towards the front and rear ends of the vehicle and 30° towards the centre of the vehicle (see the figure in paragraph 6.5.5.2. above).

Vertical angle: 10° above and below the horizontal. However, where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.8.1), the downward angle of 10° may be reduced to 5°."

*Paragraph 6.22.7.1.3.*, amend to read:

"6.22.7.1.3. It shall always be possible to switch the main-beam headlamps, adaptive or non-adaptive, ON and OFF manually and to manually switch OFF the automatic control.

Moreover, the switching OFF, of the main-beam headlamps and of their automatic control, shall be by means of a simple and immediate manual operation; the use of sub-menus is not allowed."

*Paragraph 6.22.9.3.1.1.*, amend to read:

"6.22.9.3.1.1. The boundaries of the minimum fields in which the sensor is able to detect light emitted from other vehicles as defined in paragraph 6.22.7.1.2. are given by the angles indicated in paragraph 6.1.9.3.1.1. to this Regulation."

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