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Item 12 of the provisional agenda

Regulation No. 113 (Headlamps emitting a symmetrical passing beam)

Proposal for the 01 series of amendments

Submitted by the expert from the Working Party "Brussels 1952"*

The text reproduced below was prepared by the expert from the Working Party "Brussels 1952" (GTB) to change the basis for the photometric requirements from 12.0 V to 13.2 V and to update the requirements in line with technical progress. The modifications to the existing text of the Regulation are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2010-2014 (ECE/TRANS/208, para. 106, 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.

I. Proposal

The list of contents,

Insert a new paragraph 13, to read:

"Contents

...

13. Transitional provisions....."

The list of Annexes, amend to read:

"Annexes

...

3. ~~"Measuring screen~~ **The Spherical Coordinate Measuring System and Test Point Locations**

..."

Paragraph 4.1.3., amend to read:

"4.1.3. An approval number shall be assigned to each type approved. Its first two digits (~~at present 00~~) shall indicate"

Paragraph 4.2.2.6., amend to read:

"4.2.2.6. On headlamps, other than Class A, ... paragraph ~~6.3.3.1.2.~~ **6.3.4.** below, placed near the circle surrounding the letter "E";"

Paragraph 4.2.4., amend to read:

"4.2.4. The two digits of the approval number (~~at present 00~~) which..."

Paragraph 5.3.1., amend to read:

"5.3.1. It is possible to use two filament light sources for the passing beam and several filament light sources for the driving beam.

Any Regulation No. 37 filament lamp may be used, provided that:

...

(b) For Class A and B, its reference luminous flux **at 13.2 V** for dipped-beam does not exceed ~~600~~ **900** lm;

(c) For Class C and D, its ~~objective~~ **reference** luminous flux **at 13.2 V** for dipped-beam does not exceed 2,000 lm.

The design of ..."

Paragraph 5.7.2., amend to read:

"5.7.2. ~~In the case of failure it shall automatically obtain the passing beam position;~~ **In the case of failure it must be possible to obtain automatically a passing beam or a state with respect to the photometric conditions which yields values not exceeding 1200 cd in Zone 1 and at least 2400 cd at 0,86D-V by such means as e.g. switching off, dimming, aiming downwards, and/or functional substitution;**"

Paragraph 6.1.2., amend to read:

- "6.1.2. ~~The illumination produced by the headlamp shall be determined by means of a vertical screen set up 25 m forward of the headlamp and at right angles to its axes as shown in Annex 3 to this Regulation. The luminous intensity produced by the headlamp shall be measured at 25 m distance by means of a photoelectric cell having a useful area comprised within a square of 65 mm side. The point HV is the centre-point of the coordinate system with a vertical polar axis. Line h is the horizontal through HV (see Annex 3 of this Regulation).~~"

Paragraph 6.1.3.1., amend to read:

- "6.1.3.1. ~~Apart from (an) LED module(s), the headlamps shall be checked by means of an uncoloured standard (étalon) filament lamp designed for a rated voltage as indicated in the relevant data sheet of Regulation No. 37. During the checking of the headlamp, the voltage at the terminals of the filament lamp shall be regulated so as to obtain the reference luminous flux as indicated at the relevant data sheet of Regulation No. 37.~~ shall be checked by means of an uncoloured standard (étalon) filament lamp designed for a rated voltage of 12 V. During the checking of the headlamp, the voltage at the terminals of the filament lamp shall be regulated so as to obtain the reference luminous flux at 13.2 V as indicated at the relevant data sheet of Regulation No. 37.

In order to protect the standard (étalon) filament lamp during the process of photometric measurement it is permissible to carry out the measurements at a luminous flux that differs from the reference luminous flux at 13.2 V. If the test laboratory chooses to carry out measurements in such a manner the luminous intensity shall be corrected by multiplying the measured value by the individual factor F_{lamp} of the standard (étalon) filament lamp in order to verify the compliance with the photometric requirements where:

$$F_{\text{lamp}} = \Phi_{\text{reference}} / \Phi_{\text{test}}$$

$\Phi_{\text{reference}}$ is the reference luminous flux at 13,2 V as specified in the relevant data sheet of Regulation No. 37

Φ_{test} is the actual luminous flux used for the measurement."

Paragraph 6.1.3.3., amend to read:

- "6.1.3.3. LED module(s) shall be measured at 6.3 V or 13.2 V respectively, if not otherwise specified within this Regulation. LED module(s) operated by an electronic light source control gear, shall be measured as specified by the applicant. ~~The values obtained by the LED module(s) shall be multiplied by a factor of 0.7 prior to check for compliance.~~"

Paragraph 6.1.4.1., amend to read:

- "6.1.4.1. The headlamp shall ...

...

... to Regulation No. 99 it shall be a production non-replaceable light source.

The voltage applied to the terminals of the ballast(s) is: either: 13.2 V ± 0.1 V for 12 V systems or: as otherwise specified (see Annex 11)."

Paragraph 6.1.4.3., amend to read:

- "6.1.4.3. Four seconds after ignition of a headlamp which has not been operated for 30 minutes or more, **at least 37500 cd** ~~at least~~ must be reached at point HV of a driving beam and **3750 cd** at point 2 (0.86D-V) of a passing beam for headlamps incorporating driving beam and passing beam functions, or **3750 cd** at point 2 (0.86D-V) for headlamps having only a passing beam function. The power supply shall be sufficient to secure the quick rise of the high current pulse."

Paragraph 6.2.1., amend to read:

- "6.2.1. For a correct aiming the passing beam shall produce a sufficiently sharp "cut-off" to permit a satisfactory visual adjustment with its aid as indicated in paragraph 6.2.2 below. **The aiming shall be carried out using a flat vertical screen set up at a distance of 10 or 25 m forward of the headlamp and at right angles to the H-V. The screen shall be sufficiently wide to allow examination and adjustment of the "cut-off" of the passing beam over at least 3° on either side of the V-V line.** The "cut-off" shall be substantially"

Paragraph 6.2.2.2., amend to read:

- "6.2.2.2. For vertical adjustment: the horizontal part of the "cut-off" line is adjusted to its nominal position ~~1 per cent~~ **(0.57 degrees)** below the H-H line. ~~which is 10 cm below the headlamp axis on the screen at 10 m distance or which is 25 cm below the headlamp axis on the screen at 25 m distance.~~"
- If, however, ...adjustment."

Paragraph 6.2.3., amend to read:

- "6.2.3. When so aimed, the headlamp must, if its approval is sought solely for provision of a passing beam¹⁰, comply with the requirements set out in paragraphs 6.2.5. to ~~6.2.7.1.~~ **6.2.6.** below; if it is ... in paragraphs 6.2.5., 6.2.6. and 6.3."

Paragraph 6.2.4., amend to read:

- "6.2.4. Where a headlamp so aimed does not meet the requirements set out in paragraphs 6.2.5., 6.2.6. and 6.3., its alignment may be changed, except for headlamps that have no mechanism to adjust horizontal aim, on condition that the axis of the beam is not displaced laterally by more than ~~± 0.5 degree~~ **(± 44 cm)** to the right or left¹¹ **and vertically by not more than 0.25 degrees up or down.** To facilitate alignment by means of the "cut-off", the headlamp may be partially occulted in order to sharpen the "cut-off". However, the "cut-off" should not extend beyond the line H-H."

Footnote 11, shall be deleted.

Paragraphs 6.2.5. to 6.2.5.3., amend to read:

- "6.2.5. **The passing beam shall meet the requirements as shown in the applicable table below and the applicable figure as shown in Annex 3.**

Notes:

For Class E headlamps the voltage applied to the terminals of the ballast(s) is either 13.2 V ± 0.1 V for 12 V systems or as otherwise specified (see Annex 11).

"D" means under the H-H line.
 "U" means above the H-H line.
 "R" means right of the V-V line.
 "L" means left of the V-V line.

6.2.5.1. For Class A headlamps (Figure B in Annex 3):

<i>Test point/ line/zone</i>	<i>Angular coordinates - degrees*</i>		<i>Required luminous intensity in cd</i>
Any point in Zone 1	0° to 15°U	5°L to 5°R	≤ 320 cd
Any point on line 25L to 25R	1.72°D	5°L to 5°R	≥ 1,100 cd
Any point on line 12.5L to 12.5R	3.43°D	5°L to 5°R	≥ 550 cd

* 0.25° tolerance allowed independently at each test point for photometry unless indicated otherwise

6.2.5.2. For Class B headlamps (Figure C in Annex 3):

<i>Test/point/ line/zone</i>	<i>Angular coordinates - degree*</i>		<i>Required luminous intensity in cd</i>
Any point in Zone 1	0° to 15°U	5°L to 5°R	≤ 700 cd
Any point on line 50L to 50R except 50V	0.86°D	2.5°L to 2.5°R	≥ 1,100 cd
Point 50V	0.86°D	0	≥ 2,200 cd
Any point on line 25L to 25R	1.72°D	5°L to 5°R	≥ 2,200 cd
Any point in Zone 2	0.86°D to 1.72°D	5°L to 5°R	≥ 1,100 cd

* 0.25° tolerance allowed independently at each test point for photometry unless indicated otherwise

6.2.5.3. For Class C, D or E headlamp (Figure D in Annex 3):

Test point/ line/ zone	Test point angular coordinates - degrees*		Required luminous intensity in cd			
			Minimum			Maximum
			Class C	Class D	Class E	Class C,D,E
1	0.86°D	3.5°R	2,000	2,000	2,500	13,750
2	0.86°D	0	2,450	4,900	4,900	-
3	0.86°D	3.5°L	2,000	2,000	2,500	13,750
4	0.50°U	1.50°L and 1.50°R	--	--	--	900
5	2.00°D	15°L and 15°R	550	1,100	1,100	--
6	4.00°D	20°L and 20°R	150	300	600	-
7	0	0	--	--	--	1,700
Line 1	2.00°D	9°L to 9°R	1,350	1,350	1,900	-
8**	4.00°U	8.0°L	$\sum 8 + 9 + 10 \geq 150 \text{ cd}^{**}$			700
9**	4.00°U	0				700
10**	4.00°U	8.0°R				700
11**	2.00°U	4.0°L	$\sum 11 + 12 + 13 \geq 300 \text{ cd}^{**}$			900
12**	2.00°U	0				900
13**	2.00°U	4.0°R				900
14**	0	8.0°L and 8.0°R	50 cd**	50 cd**	50 cd**	-
15**	0	4.0°L and 4.0°R	100 cd**	100 cd**	100 cd**	900
Zone 1	1°U/8°L-4°U/8°L-4°U/8°R- 1°U/8°R-0/4°R-0/1°R-0.6°U/0- 0/1°L-0/4°L-1°U/8°L		--	--	--	900
Zone 2	>4U to <15 U	8°L to 8°R	--	--	--	700

* 0.25° tolerance allowed independently at each test point for photometry unless indicated otherwise

** On request of the applicant during measurement of these points, the front position lamp approved to Regulation No. 50 or Regulation No. 7 ; if combined, grouped, or reciprocally incorporated-shall be switched ON."

Paragraph 6.2.6., amend to read:

"6.2.6. The light shall be as evenly distributed as possible within zones 1 and 2, and 3-for Class C, D or E headlamps."

Paragraph 6.2.7. and 6.2.7.1., shall be deleted.

Paragraph 6.2.8., renumber as paragraph 6.2.7.

Paragraph 6.3.1., amend to read:

- "6.3.1. In the case of a headlamp designed to provide a driving beam and a passing beam, measurements of the ~~illumination produced on the screen by the~~ **luminous intensity of the** driving beam shall be taken with the same headlamp alignment as applied to the condition of paragraphs 6.2. above; in the case of a headlamp providing a driving beam only, it shall be so adjusted that the area of maximum **luminous intensity (I_M)** is centred on the point of intersection of lines H-H and V-V; such a headlamp need only meet the requirements referred to in paragraph 6.3."

Paragraphs 6.3.3. to 6.3.3.2, amend to read:

- "6.3.3. **Except for Class A headlamps the luminous intensity produced by the driving beam shall either conform to the requirements of paragraph 6.3.3.1. (Primary Driving Beam) or paragraph 6.3.3.2. (Secondary Driving Beam).**

A Primary Driving Beam according to the requirements of paragraph 6.3.3.1 can be approved in any case.

A Secondary Driving beam according to the requirements of paragraph 6.3.3.2. can only be approved in the case where the driving beam is operated together with a passing beam or a primary driving beam. This shall be clearly indicated in the communication form of Annex 1, under item 9.1.

- 6.3.3.1. The luminous intensity of a Primary Driving Beam shall conform to the following table (Figure E in Annex 3):**

Test point number	Test point angular coordinates - degrees*	Required luminous intensity [cd]					
		Class B		Class C		Class D, E	
		MIN	MAX	MIN	MAX	MIN	MAX
1	H-V	16,000	---	20,000	---	30,000	---
2	H-2.5°R and 2.5°L	9,000	---	10,000	---	20,000	---
3	H-5°R and 5°L	2,500	---	3,500	---	5,000	---
4	H-9°R and 9°L	---	---	2000	---	3,400	---
5	H-12°R and 12°L	---	---	600	---	1,000	---
6	2°U-V	---	---	1000	---	1,700	---
	MIN luminous intensity of the maximum (I_M)	20,000	---	25,000	---	40,000	---
	MAX luminous intensity of the maximum (I_M)	---	215,000	---	215,000	---	215,000

* 0.25° tolerance allowed independently at each test point for photometry unless indicated otherwise.

6.3.3.2. The luminous intensity of a Secondary Driving Beam shall conform to the following table (Figure F in Annex 3):

Test point number	Test point angular coordinates - degrees*	Required luminous intensity [cd]					
		Class B		Class C		Class D, E	
		MIN	MAX	MIN	MAX	MIN	MAX
1	H-V	16,000	---	20,000	---	30,000	---
2	H-2.5°R and 2.5°L	9,000	---	10,000	---	20,000	---
3	H-5°R and 5°L	2,500	---	3,500	---	5,000	---
6	2°U-V	---	---	1,000	---	1,700	---
	MIN luminous intensity of the maximum (I_M)	20,000	---	25,000	---	40,000	---
	MAX luminous intensity of the maximum (I_M)	---	215,000	---	215,000	---	215,000

* 0.25° tolerance allowed independently at each test point for photometry unless indicated otherwise.

6.3.4. The reference mark (I'_M) of the maximum luminous intensity (I_M), referred to in paragraph 4.2.2.6. and 6.3.3.1. or 6.3.3.2. shall be obtained by the ratio:

$$I'_M = I_M/4300$$

This value shall be rounded off to the value 7.5 - 10 - 12.5 - 17.5 - 20 - 25 - 27.5 - 30 - 37.5 - 40 - 45 - 50."

Insert a new paragraph 9.6., to read:

"9.6. The measuring points 8 to 15 from paragraph 6.2.5.3. of this Regulation are disregarded."

Insert new paragraphs 13. to 13.5., to read:

"13. Transitional provisions

13.1. From the date of entry into force of the 01 series of amendments to this Regulation, no Contracting Party applying it shall refuse to grant approvals under this Regulation as amended by the 01 series of amendments.

13.2. Until 60 months after the date of entry into force of the 01 series of amendments to this Regulation with regard to the changes introduced by the 01 series of amendments concerning the photometric testing procedures involving the use of the spherical coordinate system and the specification of luminous intensity values, and in order to allow the Technical Services (test laboratories) to update their testing equipment, no Contracting Party applying this Regulation shall refuse to grant approvals under this Regulation as amended by the 01 series of amendments where existing testing equipment is used with suitable

conversion of the values, to the satisfaction of the authority responsible for type approval.

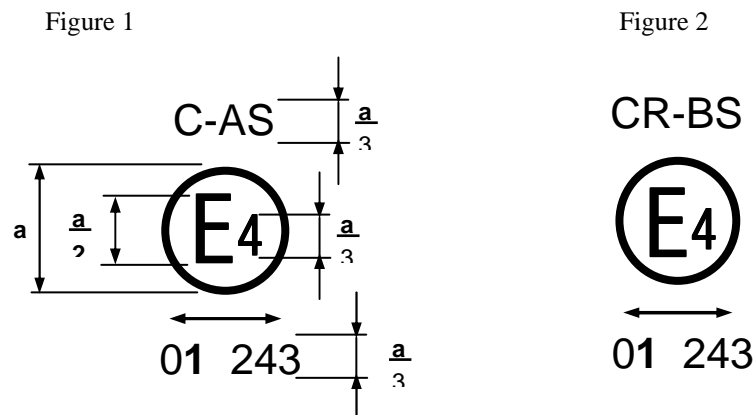
- 13.3. As from 60 months after the date of entry into force of the 01 series of amendments, Contracting Parties applying this Regulation shall grant approvals only if the headlamp meets the requirements of this Regulation as amended by the 01 series of amendments.
- 13.4. Existing approvals for headlamps already granted under this Regulation before the date of entry into force of the 01 series of amendments shall remain valid indefinitely.
- 13.5. Contracting Parties applying this Regulation shall not refuse to grant extensions of approvals to the preceding series to this Regulation."

Annex 1, insert a new item, 9.1., to read:

- "9.1. **Primary Driving Beam: yes / no**²
Secondary Driving Beam: yes / no²
The Secondary Driving Beam shall only be operated together with a passing beam or a primary driving beam."

Annex 2, amend to read:

"Examples of arrangement of approval marks



$a \geq 5$ mm for Class A headlamp

$a \geq 8$ mm for Class B, C, D and E headlamp

The headlamp bearing one of the above approval marks has been approved in the Netherlands (E 4) pursuant to Regulation No. 113 under approval number 243, meeting the requirements of this Regulation ~~in its original form (00)~~ **as amended by the 01 series of amendments**. The letters C-AS (figure 1) indicate that it concerns a Class A passing beam headlamp and the letters CR-BS (figure 2) indicate that it concerns a Class B passing and driving beam headlamp.

Note: The approval number and additional symbols shall be placed close to the circle and either above or below the letter "E", or to the right or left of that letter. The digits of the approval number shall be on the same side of the letter "E" and face in the same direction.

The use of Roman numerals as approval numbers should be avoided so as to prevent any confusion with other symbols.

Figure 3

C-BS PL

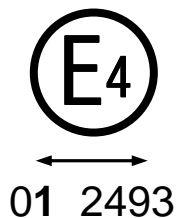
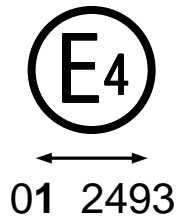


Figure 4

CR-BS PL



The headlamp bearing the above approval mark is a headlamp incorporating a lens of plastic material meeting the requirements of this Regulation and is designed:

Figure 3: Class B in respect of the passing beam only.

Figure 4: Class B in respect of the passing beam and driving beam.

Figure 5

C/R-BS

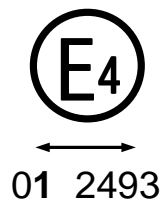


Figure 6

C/-BS



The headlamp bearing the above approval mark is a headlamp meeting the requirements of this Regulation:

Figure 5: Class B in respect of the passing beam and driving beam.

Figure 6: Class B in respect of the passing beam only.

The passing beam shall not be operated simultaneously with the driving beam and/or another reciprocally incorporated headlamp.

Figure 7

WC-CS PL

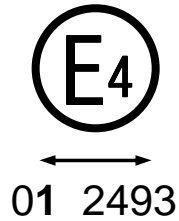
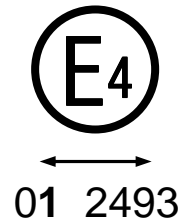


Figure 8

WCR-CS PL



The headlamp bearing the above approval mark is a headlamp incorporating a lens of plastic material meeting the requirements of this Regulation and is designed:

Figure 7: Class C in respect of the passing beam only.

Figure 8: Class C in respect of the passing beam and driving beam.

Figure 9

WC-DS PL

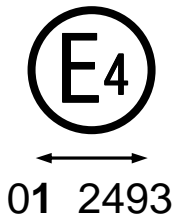
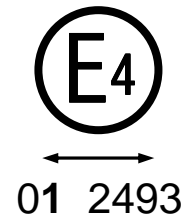


Figure 10

WCR-DS PL



The headlamp bearing the above approval mark is a headlamp meeting the requirements of this Regulation:

Figure 9: Class D in respect of the passing beam only.

Figure 10: Class D in respect of the passing beam and driving beam.

The passing beam shall not be operated simultaneously with the driving beam and/or another reciprocally incorporated headlamp.

Figure 11

WC-ES PL

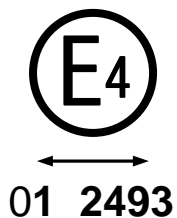
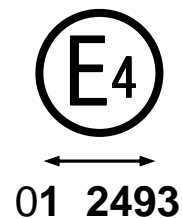


Figure 12

WCR-ES PL



The headlamp bearing the above approval mark is a headlamp meeting the requirements of this Regulation:

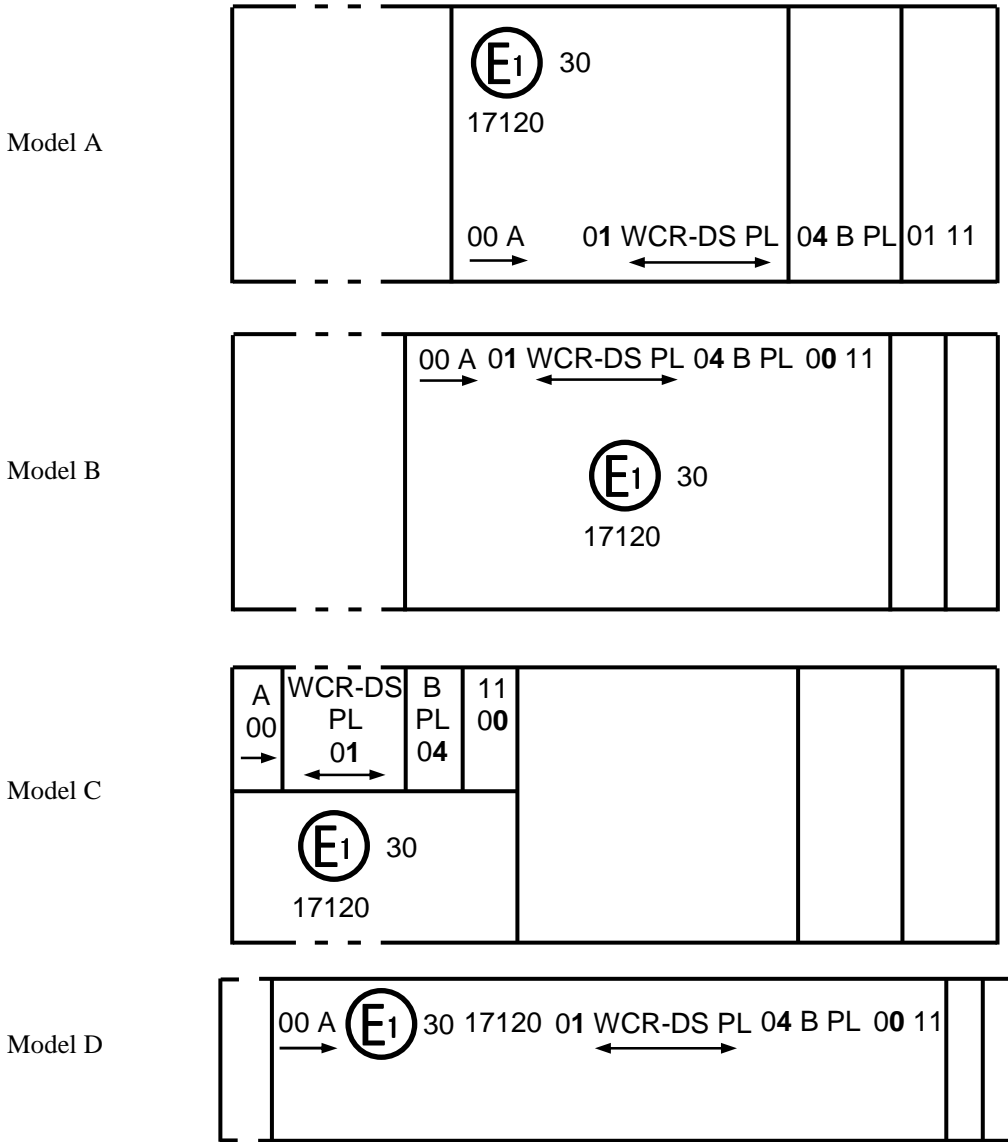
Figure 11: Class E in respect of the passing beam only.

Figure 12: Class E in respect of the passing beam and driving beam.

Figure 13

Simplified marking for grouped, combined or reciprocally incorporated lamps

(The vertical and horizontal lines schematize the shape of the light-signalling device. They are not part of the approval mark).



Note: The four examples above correspond to a lighting device bearing an approval mark comprising:

A front position lamp approved in accordance with Regulation No. 50 in its original form (00),

A headlamp, Class D, with a passing beam and a driving beam with a maximum intensity comprised between ~~86,250 and 101,250~~ **123,625 and 145,125 candelas** (as indicated by the number 30), approved in accordance with the requirements of this Regulation ~~in its original form (00)~~ **as amended by the 01 series of amendments** and incorporating a lens of plastic material,

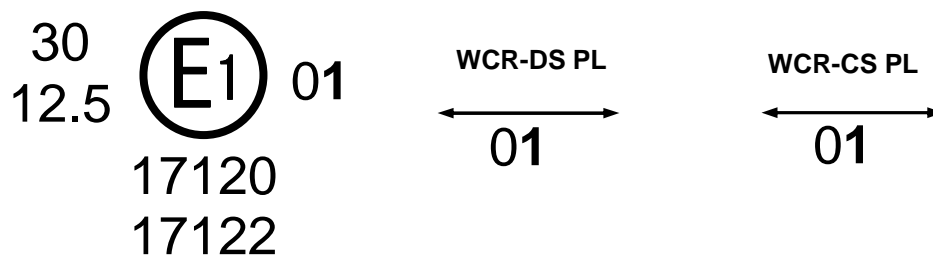
A **class B** front fog lamp approved in accordance with the **03** series of amendments to Regulation No. 19 and incorporating a lens of plastic material,

A front direction indicator lamp of Category 11 approved in accordance with the **00 04** series of amendments to Regulation No. 50.

Figure 14

Lamp reciprocally incorporated with a headlamp

~~Example 1~~



The above example corresponds to the marking of a lens of plastic material intended to be used in different types of headlamps, namely:

Either a headlamp, Class D, with a passing and a driving beam with a maximum luminous intensity comprised between ~~86,250 and 101,250 candelas~~ **86,250 123,625 and 145,125** (as indicated by the number 30), approved in Germany (E1) in accordance with the requirements of this Regulation ~~in its original form (00)~~ **as amended by the 01 series of amendments**, which is reciprocally incorporated with a front position lamp approved in accordance with Regulation No. 50 in its original form (00);

or

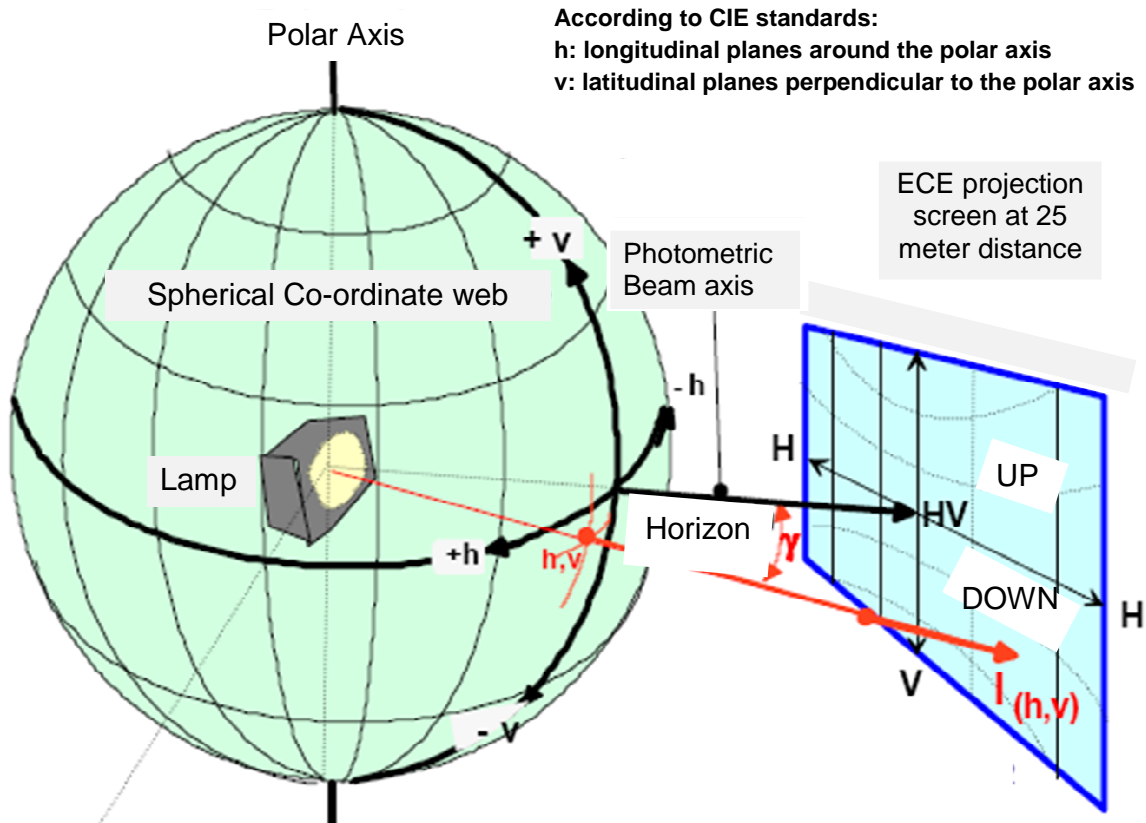
A headlamp, Class C, with a passing beam and a driving beam with a maximum luminous intensity comprised between ~~33,750 cd and 45,000 cd~~ **48,375 and 64,500 candelas** (as indicated by the number 12.5), approved in Germany (E1) in accordance with the requirements of this Regulation ~~in its original form (00)~~ **as amended by the 01 series of amendments**, which is reciprocally incorporated with the same front position lamp as above;

...."

Annex 3, amend to read:

"Spherical Coordinate Measuring System and Test Point Locations

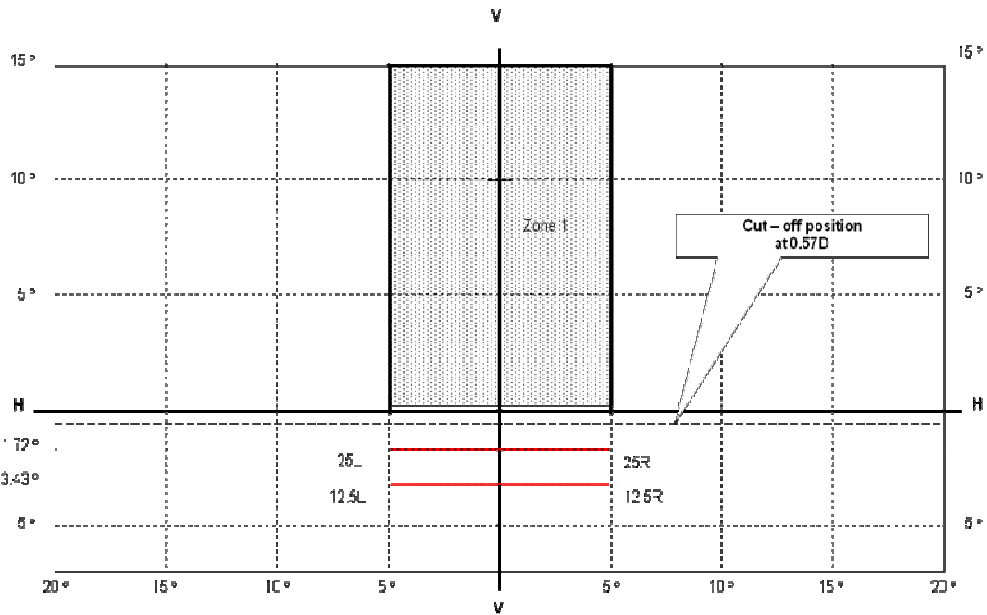
Figure A
Spherical Coordinate Measuring System



$$E_{25m} = I_{(h,v)} \times \cos \gamma / r^2$$

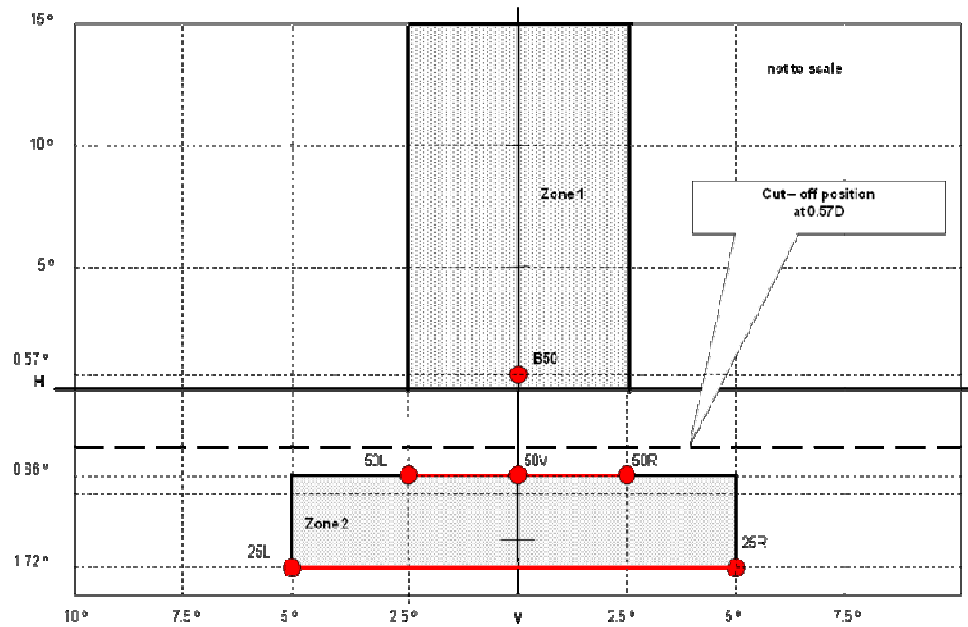
The angular co-ordinates are specified in degrees on a sphere with a vertical polar axis according to CIE publication No. 70-1987 "The measurement of absolute luminous intensity distributions", i.e. corresponding to a goniometer with a horizontal ("elevation") axis fixed to the ground and a second, moveable ("rotation") axis perpendicular to the fixed horizontal axis.

Figure B
 Passing beam - test points and Zones for Class A headlamp(s):



H-H: horizontal plane passing through
 V-V: vertical plane focus of headlamp

Figure C
 Passing beam test points and Zones for Class B headlamp(s):



H-H: horizontal plane passing through
 V-V: vertical plane focus of headlamp

Figure D
 Passing beam - position of test points and zones for Class C, D and E headlamp(s):

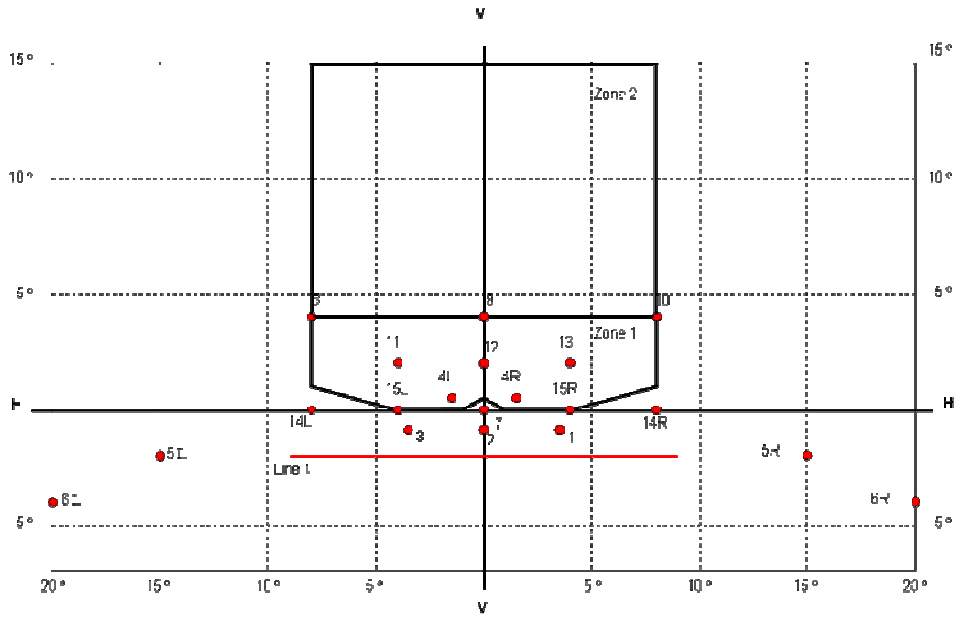


Figure E
 Primary Driving Beam - position of test points

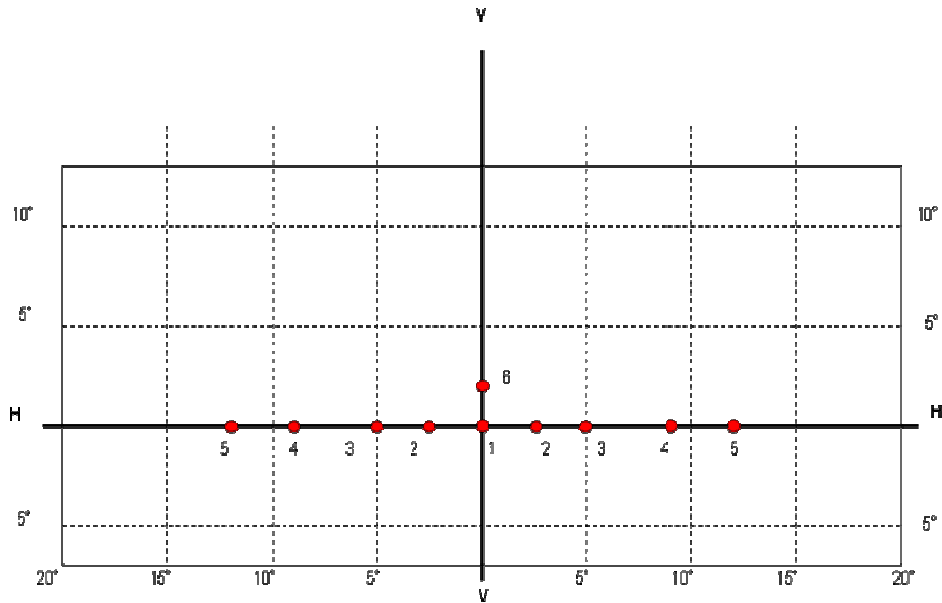
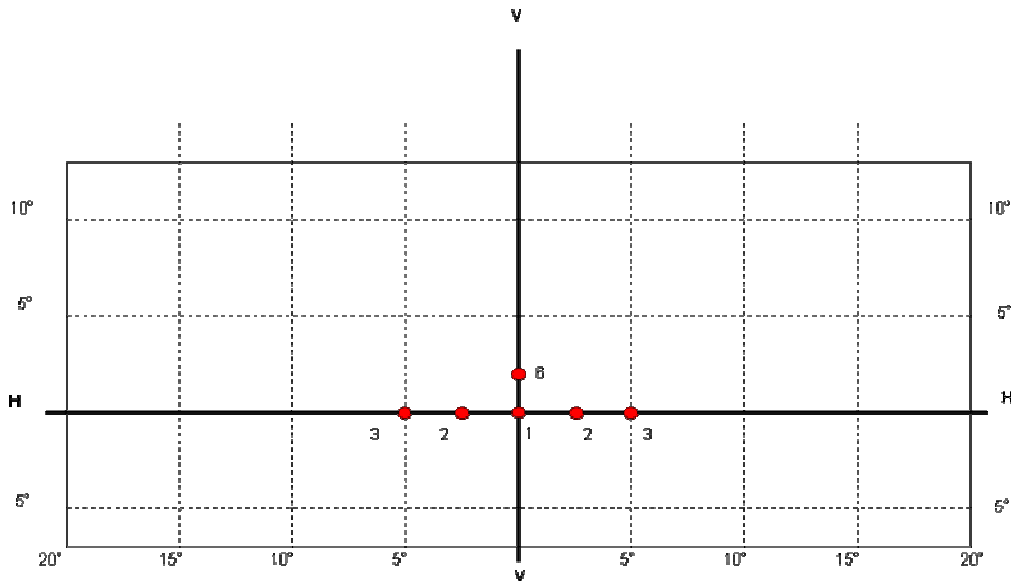


Figure F
Secondary Driving Beam - position of test points



Annex 4,

First paragraph, amend to read:

"Tests for stability of photometric performance of headlamps in operation

Tests on complete Class B, C, D and E headlamps

Once the photometric values have been measured according to the prescriptions of this Regulation, in the point for E_{\max} I_{\max} for driving beam and in....."

Paragraph 1.1.2.2., amend to read:

"1.1.2.2. Photometric test

To comply with the requirements of this Regulation, the photometric values shall be verified in the following points:

For Class B headlamp:

Passing beam: 50R - 50L - HV.

Driving beam: Point of E_{\max} I_{\max}

For Class C, D and E headlamp:

Passing beam: 0.86D/3.5R - 0.86D/3.5L - 0.50U/1.5L and 1.5R - HV.

Driving beam: Point of E_{\max} I_{\max}

Another aiming may be carried out to allow for any deformation of the headlamp base due to heat (the change of the position of the "cut-off" line is covered in paragraph 2. of this annex).

A 10 per cent discrepancy between the photometric characteristics and the values measured prior to the test is permissible including the tolerances of the photometric procedure."

Paragraph 2., amend to read:

"2. Test for change in vertical position of the "cut-off" line under the influence of heat

This test consists of verifying that the vertical drift of the "cut-off" line under the influence of heat does not exceed a specified value for an operating ~~passing lamp~~ **headlamp producing a passing beam**.

The headlamp tested in accordance with paragraph 1., shall be subjected to the test described in paragraph 2.1., without being removed from or readjusted in relation to its test fixture."

Paragraph 2.2.1., amend to read:

"2.2.1. The result in milliradians (mrad) shall be considered as acceptable for a ~~passing lamp~~ **headlamp producing a passing beam**, only when the absolute value $\Delta r_1 = |r_3 - r_{60}|$ recorded on the headlamp is not more than 1.0 mrad ($\Delta r_1 \leq 1.0$ mrad)."

Annex 5,

Paragraph 1.2.3.1., amend to read:

"1.2.3.1. No measured value deviates unfavourably by more than 20 per cent from the value prescribed in this Regulation. For values in ~~zone III, for Class B headlamp~~, **zone 1** for Class **B**, C and D headlamps, the maximum unfavourable deviation may be respectively:

~~0.3 lux~~ **255 cd** equivalent 20 per cent

~~0.45 lux~~ **380 cd** equivalent 30 per cent"

Paragraph 1.2.3.2., amend to read:

"1.2.3.2. And if, for the driving beam, ~~HV being situated within the isolux $0.75 I_{max}$~~ , a tolerance of + 20 per cent for maximum values and - 20 per cent for minimum values is observed for the photometric values at any measuring point specified in paragraphs 6.3.3.1. **or** 6.3.3.2. this Regulation."

Insert a new paragraph 1.2.5., to read:

- "1.2.5. If the results of the tests described above do not meet the requirements, the alignment of the headlamp may be changed, provided that the axis of the beam is not displaced laterally by more than 0.5 degrees to the right or left and not by more than 0.2 degrees up or down."

Paragraph 1.3.1., amend to read:

- "1.3.1. For Class E headlamps measured at $13.2\text{ V} \pm 0.1\text{ V}$, or as otherwise specified, and equipped with:
- (a) a removable standard gas-discharge light source according to Regulation No. 99. In this case the luminous flux of this gas-discharge light source may differ from the reference luminous flux specified in Regulation No. 99 and the illuminances shall be corrected accordingly;
- or
- (b) a serial production gas-discharge light source and a serial ballast. In this case the luminous flux of this light source may deviate from the nominal luminous flux due to light source and ballast tolerances as specified in Regulation No. 99 and accordingly the measured illuminances may be corrected by 20 per cent in the favourable direction;
- or
- (c) LED modules as present in the lamp;
- the conformity of mass-produced headlamps, chosen at random and equipped with a Gas Discharge lamp and / or LED module(s) present in the headlamp, with respect to photometric performance shall not be contested provided that;"

Paragraph 1.3.2., amend to read:

- "1.3.2. No measured value deviates unfavourably by more than 20 per cent from the value prescribed in this Regulation. For values in zone 1, the maximum unfavourable deviation may be respectively:
- ~~0.3 lux~~ **255 cd** equivalent 20 per cent
- ~~0.45 lux~~ **380 cd** equivalent 30 per cent."

Paragraph 1.3.3., amend to read:

- "1.3.3. And if, for the driving beam, ~~HV being situated within the isolux~~ $0.75 I_{\max}$, a tolerance of + 20 per cent for maximum values and - 20 per cent for minimum values is observed for the photometric values at any measuring point specified in paragraphs 6.3.3.1. or 6.3.3.2. of this Regulation."

Paragraph 2.4.2., amend to read:

- "2.4.2. For Class B headlamps: E_{\max} , I_{\max} , HV¹, in the case of the driving beam, and to the points HV, 50R, 50L, in the case of the passing beam."

Paragraph 2.4.3., amend to read:

"2.4.3. For Class C, D and E headlamps: E_{\max} I_{\max} , HV¹, in the case of the driving beam, and to the points HV, 0.86D/3.5R, 0.86D/3.5L, in the case of the passing beam."

Annex 6, paragraph 2.1.2.1., amend to read:

"2.1.2.1. Method

...

...a passing/driving lamp;

E_{\max} I_{\max} , for the driving beam of a driving lamp or a passing/driving lamp;"

Annex 7,

Paragraph 1.2.3.1., amend to read:

"1.2.3.1. No measured value deviates unfavourably by more than 20 per cent from the value prescribed in this Regulation. For values in ~~zone III, for Class B headlamp~~, **zone 1** for Class **B**, C and D headlamps, the maximum unfavourable deviation may be respectively:

~~0.3 lux~~ **255 cd** equivalent 20 per cent

~~0.45 lux~~ **380 cd** equivalent 30 per cent"

Paragraph 1.2.3.2., amend to read:

"1.2.3.2. and if for the driving beam, ~~HV being situated within the isolux $0.75 I_{\max}$~~ , a tolerance of + 20 per cent for maximum values and - 20 per cent for minimum values is observed for the photometric values at any measuring point specified in paragraphs **6.3.3.1. or 6.3.3.2.** of this Regulation."

Insert a new paragraph 1.2.5., to read to read:

"1.2.5. If the results of the tests described above do not meet the requirements, the alignment of the headlamp may be changed, provided that the axis of the beam is not displaced laterally by more than 0.5 degrees to the right or left and not by more than 0.2 degrees up or down."

Paragraphs 1.3.1. to 1.3.1.2., amend to read:

"1.3.1. For Class E headlamps measured at $13.2 \text{ V} \pm 0.1 \text{ V}$, or as otherwise specified, and equipped with:

(a) a removable standard gas-discharge light source according to Regulation No. 99. In this case the luminous flux of this gas-discharge light source may differ from the reference luminous flux specified in Regulation No. 99 and the illuminances shall be corrected accordingly;

or

(b) a serial production gas-discharge light source and a serial ballast. In this case the luminous flux of this light source may deviate from the nominal luminous flux due to light source and ballast tolerances as specified in Regulation No. 99 and accordingly the measured illuminances may be corrected by 20 per cent in the favourable direction;

or

(c) **LED modules as present in the lamp;**

the conformity of mass-produced headlamps, chosen at random and equipped with a Gas Discharge lamp and / or LED module(s) present in the headlamp, with respect to photometric performance shall not be contested provided that;"

Paragraph 1.3.2., amend to read:

"1.3.2. No measured value deviates unfavourably by more than 20 per cent from the value prescribed in this Regulation. For values in zone 1, the maximum unfavourable deviation may be respectively:

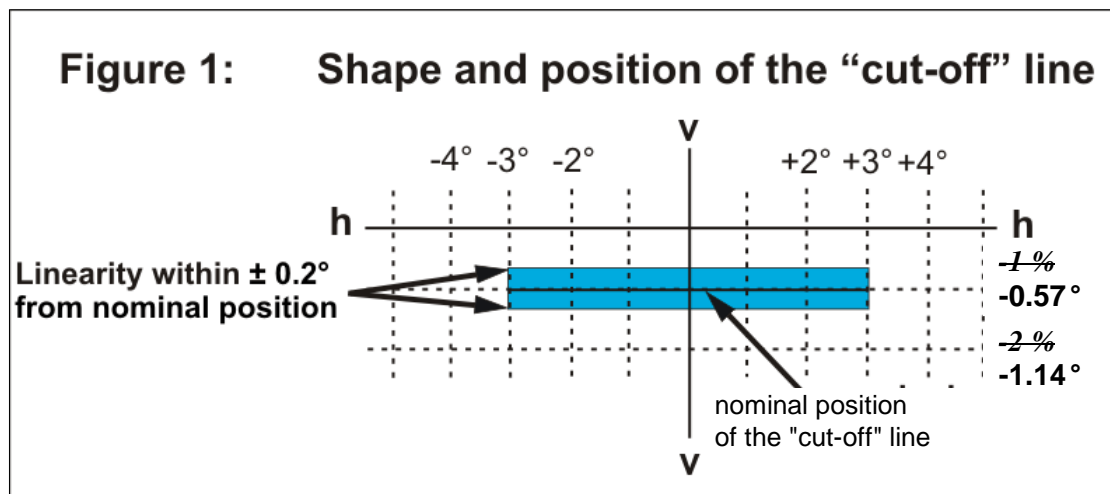
~~0.3 lux~~ **255 cd** equivalent 20 per cent

~~0.45 lux~~ **380 cd** equivalent 30 per cent."

Paragraph 1.3.3., amend to read:

"1.3.3. And if, for the driving beam, ~~HV being situated within the isolux $0.75 I_{max}$~~ , a tolerance of + 20 per cent for maximum values and - 20 per cent for minimum values is observed for the photometric values at any measuring point specified in paragraphs 6.3.3.1. **or** 6.3.3.2. of this Regulation."

Annex 9, paragraph 2.1., figure 1, amend to read:



Annex 12, paragraph 4.3.1.5., amend to read:

"4.3.1.5. The ~~illuminance~~ **luminous intensity values** measured after one minute and after photometric stability has occurred shall comply with the minimum and maximum requirements."

II. Justification

This proposal completely updates Regulation No. 113. In particular the following changes have been incorporated:

(a) The conversion from type approval at reference luminous flux at approximately 12V to reference luminous flux at approximately 13.2V.

(b) The specification of luminous intensity on a 25m sphere instead of illuminance on a flat screen.

(c) A general update of the content in line with the recently adopted provisions in the 01 series of amendments to Regulations Nos. 98, 112 and 123.

(d) The removal of discrepancies for the Classes C and D.

(e) A rewording of the paragraph 1.3.1 in Annexes 5 and 7 to correct inconsistencies between the two annexes and to also correct the English text to remove possible misinterpretation.

(f) A proposal for transitional provisions associated with the introduction of the 01 series of amendments to the Regulation. This includes a special provision to allow for the changes to be made to the equipment in the photometric laboratories to accommodate the revised measurement protocols.
