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Item 4.2.42 of the provisional agenda

1958 AGREEMENT

Consideration of draft amendments to existing Regulations

Proposal for the 01 series of amendments to Regulation No. 123
(Adaptive front-lighting systems)

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-second session. It is based on ECE/TRANS/WP.29/GRE/2009/47, 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 (ECE/TRANS/WP.29/GRE/62, para. 20).

*/ In accordance with the programme of work of the Inland Transport Committee for 2006-2010 (ECE/TRANS/166/Add.1, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance performance of vehicles. The present document is submitted in conformity with that mandate.

The list of contents, amend to read:

"1.
... ..
13. Transitional provisions"

Paragraph 2.2.2., amend to read:

"2.2.2. ...
(g) the indication(s) 3/ according to the provisions of paragraph 6.4.6. of this Regulation with respect to the paragraphs 6.22.6.1.2.1. of Regulation No. 48;
..."

Paragraph 3.4., shall be deleted

Paragraphs 3.5. to 3.7., renumber as paragraphs 3.4. to 3.6.

Paragraph 4.1.3., amend to read:

"4.1.3. An approval number shall be assigned to each type approved. Its first two digits shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party may not assign the same number to another type of system covered by this Regulation."

Paragraph 4.2.2.2., amend to read:

"4.2.2.2. in addition to each symbol and above it a score, if the lighting function or mode thereof is provided by more than one installation unit from one side;"

Paragraph 4.2.4., amend to read:

"4.2.4. The two digits of the approval number which indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval and, if necessary, the required arrow may be marked close to the above additional symbols."

Paragraph 5.7.1., amend to read:

"5.7.1. the device is robust enough to withstand 50,000 operations under normal conditions of use. In order to verify compliance with this requirement, the Technical Service responsible for approval tests may:
(a) require the applicant to supply the equipment necessary to perform the test;

(b) forego the test if the headlamp presented by the applicant is accompanied by a test report, issued by a Technical Service responsible for approval tests for

headlamps of the same construction (assembly), confirming compliance with this requirement."

Paragraph 5.7.3., amend to read:

"5.7.3. 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 1300 cd in the zone III b as defined in Annex 3 to this Regulation and at least 3400 cd in a point of "segment Emax", by such means as e.g. switching off, dimming, aiming downwards, and/or functional substitution;

When performing the tests to verify compliance with these requirements, the Technical Service responsible for approval tests shall refer to the instructions supplied by the applicant."

Paragraphs 5.8.2.1. and 5.8.2.2., amend to read:

"5.8.2.1. Passing beam designed for right-hand traffic and adapted to left-hand traffic:

at 0.86D-1.72L at least 2500 cd
at 0.57U-3.43R not more than 880 cd

5.8.2.2. Passing beam designed for left-hand traffic and adapted to right-hand traffic:

at 0.86D-1.72R at least 2500 cd
at 0.57U-3.43L not more than 880 cd "

Paragraph 6.2.2., amend to read:

"6.2.2 The system or part(s) thereof shall be aimed according to the requirements of Annex 8 so that the position of the cut-off complies with the requirements indicated in the Table 2 of Annex 3 to this Regulation."

Paragraph 6.2.4., shall be deleted and renumber subsequent paragraphs:

Paragraph 6.2.5. to 6.2.6.2.(former), renumber as paragraph 6.2.4. to 6.2.5.2.

Paragraph 6.2.6.3.(former), renumber as paragraph 6.2.5.3. and amend to read:

"6.2.5.3. when the T-signal corresponds to the vehicle's smallest turn radius to the left (or right), the sum of the luminous intensity values provided by all contributors of the right or the left side of the system shall be at least 2500 cd at one or more points in the zone extending from H-H to 2 deg below H-H and from 10 to 45 deg left (or right)."

Paragraph 6.2.6.4.(former), renumber as paragraph 6.2.5.4.

Para.6.2.6.5.(former), renumber as paragraph 6.2.5.5. and amend to read:

"6.2.5.5. if approval is sought for a category 1 bending mode, the system is designed so that, in the case of a failure affecting the lateral movement or modification of the illumination, it must be possible to obtain automatically either photometric conditions corresponding to paragraph 6.2.4. above or a state with respect to the photometric conditions which yields values not exceeding 1300 cd in the zone IIIb, as defined in Annex 3 to this Regulation, and at least 3400 cd in a point of "segment Emax";"

Paragraph 6.2.6.5.1.(former), renumber as paragraph 6.2.5.5.1. and amend to read:

"6.2.5.5.1. however, this is not needed, if for positions, relative to the system reference axis up to 5 deg left, at 0.3 deg up from H-H, and greater than 5 deg left, at 0.57 deg up, a value of 880 cd is in no case exceeded."

Paragraphs 6.2.7. to 6.2.9. (former), renumber as paragraphs 6.2.6. to 6.2.8.

Paragraph 6.2.9.1.(former), renumber as paragraph 6.2.8.1. and amend to read:

"6.2.8.1. any specified passing beam mode provides at least 2500cd at point 50V from each side of the system;
the mode(s) of the Class V passing beam are exempted from this requirement;"

Paragraph 6.2.9.2.(former), renumber as paragraph 6.2.8.2. and amend to read:

"6.2.8.2. In case of the passing beam using a gas-discharge light source, four seconds after switching on the system, which has not been operated for 30 minutes or more, at least 5 lx must be reached at point 50V of the class C passing beam;"

Paragraph 6.2.9.3.(former), renumber as paragraph 6.2.8.3.

Paragraphs 6.3.2. and 6.3.2.1., amend to read:

"6.3.2. When measured according to the provisions laid down in Annex 9 to this Regulation the illumination shall meet the following requirements:

Test Point	Angular Coordinates Degrees	Required luminous intensity cd
		Min
Im		40500
H-5L	0.0 , 5.0 L	5100
H-2.5L	0.0 , 2.5 L	20300
H-2.5R	0.0 , 2.5 R	20300
H-5R	0.0 , 5.0 R	5100

6.3.2.1. The point of intersection (HV) of lines h h and v v shall be situated within the isolux 80 per cent of maximum luminous intensity (I_{max})."

Paragraph 6.3.2.1.1., amend to read:

"6.3.2.1.1. The maximum value (I_M) shall in no circumstances exceed 215000 cd."

Paragraph 6.3.2.1.2., shall be deleted:

Paragraph 6.3.2.1.3.(former), renumber as paragraph 6.3.2.1.2 and amend to read:

"6.3.2.1.2. The reference mark (I'_M) of this maximum intensity, referred to in paragraph 4.2.2.9. above, shall be obtained by the ratio:

$$I'_m = I_m/4300$$

This value shall be rounded off to the value of: 5 - 10 - 12.5 - 17.5 - 20 - 25 - 27.5 - 30 - 37.5 - 40 - 45 - 50."

Paragraph 6.3.2.2., shall be deleted:

Paragraph 6.3.4.1., amend to read:

"6.3.4.1. the lighting unit(s) of the right side and of the left side provide each at least half of the minimum luminous intensity value of the driving beam as specified by the paragraph 6.3.2.2. above:"

Paragraph 6.3.4.2., amend to read:

"6.3.4.2. In case of the driving beam using a gas-discharge light source, four seconds after ignition of a headlamp that has not been operated for 30 minutes or more:

6.3.4.2.1 At least 37500cd shall be attained at point HV, for a headlamp producing driving beam only.

6.3.4.2.2 At least 6250cd shall be attained at point 50V for headlamps producing passing beam only or alternately passing and driving beam functions as described in paragraph 5.4. of this Regulation.

6.3.4.2.3 In either case the power supply shall be sufficient to secure the required rise of the high current pulse."

Insert new paragraphs 13. to 13.4., 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. 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 system meets the requirements of this Regulation as amended by the 01 series of amendments.
- 13.3. Existing approvals for systems already granted under this Regulation before the date of entry into force of the 01 series of amendments shall remain valid indefinitely.
- 13.4. Contracting Parties applying this Regulation shall not refuse to grant extensions of approvals to the preceding series to this Regulation."

Annex 1,

Item 9.3., amend to read:

- "9.3. (a) Indications according to paragraph 6.4.6. of this Regulation (which lighting unit(s) provide a "cut-off" as defined in Annex 8 of this Regulation, that projects into a zone extending from 6 deg left to 4 deg right and upwards from a horizontal line positioned at 0.8 deg down).....
- (b) The adjustment of the "cut-off" has been determined at 10 m / 25 m. 2/
- (c) The determination of the minimum sharpness of the "cut-off" has been carried out at 10 m / 25 m. 2/"

Insert a new paragraph 9.8., to read:

- "9.8 The adjustment of the "cut-off" has been determined at 10 m / 25 m. 2/

The determination of the minimum sharpness of the "cut-off" has been carried out at 10 m / 25 m. 4/"

Annex 2,

Example 1, amend to read:

"Example 1

...

The installation unit ... a class W passing beam and a driving beam.

Number 30 indicates that the maximum luminous intensity of the driving beam is between 123625 and 145125 candelas.

..."

Example 6, amend to read:

"Example 6: ...

Installation unit 1

A front position lamp approved in accordance with the 02 series of amendments of Regulation No. 7;

One or more lighting unit(s), with a class C passing beam with bending mode provided to work with one or more other installation unit(s) on the same side of the system (as indicated by the score above "C") and a class V passing beam, both designed for right- and left-hand traffic and a driving beam with a maximum intensity comprised between 123625 and 145125 candelas approved in accordance with the requirements of this Regulation in its original form (00) and incorporating a lens of plastic material;

A daytime running light ..."

Example 7, amend to read:

"Example 7:

...

The installation unit 1 (or 2) of the system bearing the above approval marks meeting the requirements of this Regulation (00 series of amendments) in respect of both a class C passing beam for left-hand traffic and a driving beam with a maximum luminous intensity comprised between 123625 and 145125 candelas. (indicated by the number 30), grouped with a front direction indicator lamp of category 1a, approved in accordance with the 01 series of amendments of Regulation No. 6.

..."

Annex 3,

Table 1, amend to read:

"Table 1: Passing beam photometric requirements

tabled requirements expressed in cd			Position /deg			passing beam							
			horizontal		vertical	class C		class V		class E		class W	
No	Element		at/ from	to	at	min	max	min	max	min	max	min	max
Part A	1	B50L <u>4/</u>	L 3.43		U 0.57		350		350		625 <u>8/</u>		625
	2	HV <u>4/</u>	V		H		625		625				
	3	BR <u>4/</u>	R 2.5		U 1		1750		880		1750		2650
	4	Segment BRR <u>4/</u>	R 8	R 20	U 0.57		3550		880		3550		5300
	5	Segment BLL <u>4/</u>	L 8	L 20	U 0.57		625		880		880		880
	6	P	L 7		H	63						63	
	7	Zone III (as specified by Table 3 of this annex)					625		625		880		880
	8a	S50, S50LL, S50RR <u>5/</u>			U 4	63 <u>7/</u>					63 <u>7/</u>		63 <u>7/</u>
	9a	S100, S100LL, S100RR <u>5/</u>			U 2	125 <u>7/</u>					125 <u>7/</u>		125 <u>7/</u>
	10	50 R	R 1.72		D 0.86				5100				
	11	75 R	R 1.15		D 0.57	10100					15200		20300
	12	50 V	V		D 0.86	5100			5100		10100		10100
	13	50 L	L 3.43		D 0.86	3550	13200 <u>9/</u>	3550	13200 <u>9/</u>	6800		6800	26400 <u>9/</u>
	14	25 LL	L 16		D 1.72	1180			845		1180		3400
	15	25 RR	R 11		D 1.72	1180			845		1180		3400
	16	Segment 20 and below it	L 3.5	V	D 2								17600 <u>2/</u>
	17	Segment 10 and below it	L 4.5	R 2.0	D 4		12300 <u>1/</u>		12300 <u>1/</u>		12300 <u>1/</u>		7100 <u>2/</u>
	18	E _{max} <u>3/</u>				16900	44100	8400	44100	16900	79300 <u>8/</u>	29530	70500 <u>2/</u>

Part B (bending modes): Table 1 Part A applies, however with the lines Nos. 1, 2, 7, 13 and 18 being replaced by those listed hereunder

Part B	1	B50L <u>4/</u>	L 3.43		U 0.57		530		530				790
	2	HV <u>4/</u>					880		880				
	7	Zone III (as specified by Table 3 of this annex)					880		880		880		880
	13	50L	L 3.43		D 0.86	1700		1700		3400		3400	
	18	E _{max} <u>6/</u>				10100	44100	5100	44100	10100	79300 <u>8/</u>	20300	70500 <u>2/</u>

1/ max 15900cd, if the system is designed to provide also a class W passing beam.

3/ Position requirements according to the provisions of Table 2 below ("Segment Emax").

5/ Position requirements according to the provisions of Table 5 below.

7/ One pair of position lamps, being incorporated with the system or being intended to be installed together with the system may be activated according to the indications of the applicant.

8/ Requirements according to the provisions indicated in Table 6 below apply in addition.

2/ Requirements according to the provisions indicated in Table 4 below apply in addition

4/ The contribution of each side of the system, when measured according to the provisions of Annex 9 to this Regulation shall not be less than 85 cd.

6/ Position requirements as indicated in paragraph 6.2.6.2. of this Regulation

9/ The max. value may be multiplied by 1.4, if it is guaranteed according to the manufacturer's description that this value will not be exceeded in use, either by means of the system or, if the system's use is confined to vehicles, providing a corresponding stabilization/ limitation of the system's supply, as indicated in the communication form.

..."

Table 2, amend to read:

"Table 2: Passing beam elements angular position/extend, additional requirements

No	angular position / extend in deg beam part designation and requirement	Class C passing beam		Class V passing beam		Class E passing beam		Class W passing beam	
		horizontal	vertical	horizontal	vertical	horizontal	vertical	horizontal	vertical
2.1.	E _{max} shall not be positioned outside of the rectangle extending (above "segment E _{max} ")	0.5 L to 3 R	0.3 D to 1.72D		0.3 D to 1.72D	0.5 L to 3 R	0.1 D to 1.72D	0.5 L to 3 R	0.3 D to 1.72D
2.2.	the "cut-off" and part(s) of shall:								
	(a) comply with the requirements of paragraph 1. of Annex 8 to this Regulation and								
	(b) be positioned with its "flat horizontal part"		at V = 0.57 D		not above 0.57D not below		not above 0.23D g/ not below		not above 0.23D not below

g/ Requirements according to the provisions indicated in Table 6 below apply in addition.

"

Table 4, amend to read:

"Table 4: Additional provisions for class W passing beam, expressed in cd

4.1.	Definition and Requirements for Segments E, F1, F2, and F3 (not shown in Fig.1 above)
	Not more than 175 cd is allowed: a) on a segment E extending at U 10 deg from L 20 to R 20 deg and b) on three vertical segments F1, F2 and F3 at horizontal positions L10 deg, V and R 10 deg, each extending from U 10 to U 60 deg.
4.2.	Alternative/ Additional Set of Requirements for I _{max} , segment 20 and segment 10: Table 1 Part A or B applies, however with the max requirements in lines No. 16, 17 and 18 being replaced by those indicated hereunder
	If, according to the applicants specification according to paragraph 2.2.2.(e) of this Regulation a class W passing beam is designed to produce on segment 20 and below it not more than 8800 cd and on segment 10 and below it not more than 3550 cd, the design value for I _{max} of that beam shall not exceed 88100 cd

"

Table 6, amend to read:

"Table 6: Additional provisions for class E passing beam

Table 1 Part A or B and Table 2 above apply, however with the lines No.1 and 18 of Table 1 and item 2.2. of Table 2 being replaced as indicated hereunder				
Item	Designation	Line 1 of Table 1 above, Part A or B	Line 18 of Table 1 above, Part A or B	Item 2.2. of Table 2 above
No.	Data Set	EB50L in cd	I _{max} in cd	cut-off flat part aimed in deg
		max	max	not above
6.1.	E1	530	70500	0.34 D
6.2.	E2	440	61700	0.45 D
6.3.	E3	350	52900	0.57 D

"

Table headed "For information only", shall be deleted

Annex 4,

Paragraph 1.1.1.2., amend to read:

".....

- (b) In case of replaceable gas discharge light source(s): The test voltage for the electronic light source control-gear is 13.2 + 0.1 volts for 12 V vehicle voltage system, or otherwise specified in the application for approval.
- (c) In the case of non-replaceable light source operated directly under vehicle voltage system conditions: All measurements on lighting units equipped with nonreplaceable light sources (filament light sources and/or others) shall be made at 6.3V, 13.2V or 28.0 V or at other voltages according to the vehicle voltage system as specified by the applicant respectively.
- (d)
- (e) LED module(s) shall be measured at 6.3V, 13.2V or 28.0 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."

Paragraphs 1.2.1.1. and 1.2.1.2., amend to read:

"1.2.1.1. For a system or parts thereof with the outside lens in glass: A mixture of water and polluting agent to be applied to the test sample shall be composed of:

9 parts by weight of silica sand with a particle size of 0-100 micro meter corresponding to distribution prescribed in paragraph 1.2.1.3.,

1 part by weight of vegetable carbon dust (beechwood) with a particle size of 0-100 micro meter,

0.2 parts by weight of NaCMC 5/, and

an appropriate quantity of distilled water with a conductivity of less than 1 mS/m.

1.2.1.2. For a system or parts thereof with the outside lens in plastic material:

The mixture of water and polluting agent to be applied to the test sample shall be composed of:

9 parts by weight of silica sand with a particle size of 0-100 micro meter corresponding to distribution prescribed in paragraph 1.2.1.3.,

1 part by weight of vegetable carbon dust (beechwood) with a particle size of 0-100 micro meter, 0.2 parts by weight of NaCMC 5/,

5 parts by weight of sodium chloride (pure at 99 per cent),
13 parts by weight of distilled water with a conductivity of less than 1 mS/m, and

2 + 1 parts by weight of surface-actant."

Annex 5,

Paragraph 1.2.1.1., amend to read:

"1.2.1.1. For the following values of the passing beam and its modes, the maximum unfavourable deviation may be respectively:

- (a) maximum values at point B50L 170 cd equivalent 20 per cent and 255 cd equivalent 30 per cent;
- (b) maximum values at zone III, HV and segment BLL: 255 cd equivalent 20 per cent and 380 cd equivalent 30 per cent;
- (c) maximum values at segments E, F1, F2 and F3: 170 cd equivalent 20 per cent and 255 cd equivalent 30 per cent;
- (d) minimum values at BR, P, S 50, S 50LL, S 50RR, S 100, S 100LL, S 100RR, and those required by footnote 4/ of Table 1 in Annex 3 of this Regulation (B50L, HV, BR, BRR, BLL): half of the required value equivalent 20 per cent and three quarter of the required value equivalent 30 per cent;"

Paragraph 1.2.1.2., amend to read:

"1.2.1.2. 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 paragraph 6.3.2. of this Regulation."

Annex 7,

Paragraph 1.2.1.1., amend to read:

"1.2.1.1. For the following values of the passing beam and its modes, the maximum unfavourable deviation may be respectively:

- (a) maximum values at point B50L 170 cd equivalent 20 per cent and 255 cd equivalent 30 per cent;
- (b) maximum values at zone III, HV and segment BLL: 255 cd equivalent 20 per cent and 380 cd equivalent 30 per cent;

- (c) maximum values at segments E, F1, F2 and F3: 170 cd equivalent 20 per cent and 255 cd equivalent 30 per cent;
- (d) minimum values at BR, P, S 50, S 50LL, S 50RR, S 100, S 100LL, S 100RR, and those required by footnote 4/ of Table 1 in Annex 3 of this Regulation (B50L, HV, BR, BRR, BLL): half of the required value equivalent 20 per cent and three quarter of the required value equivalent 30 per cent;"

Paragraph 1.2.1.2., amend to read:

"1.2.1.2. 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 paragraph 6.3.2. of this Regulation."

Paragraph 3., amend to read:

"3. REPEATED SAMPLING

In the case of A3, B2, B3 a repeated sampling, third sample C of two systems and fourth sample D of two systems, selected from stock manufactured after alignment, is necessary within two months' time after the notification."

Annex 8.

The title, delete the reference to footnote 1/ and footnote 1/.

Paragraphs 1 to 1.1.2., amend to read:

"1. Cut-off definition
The "cut-off", when projected on the aiming screen shall be sufficiently sharp to permit aiming; it shall comply with the following requirements.

1.1. Shape See Figure 1

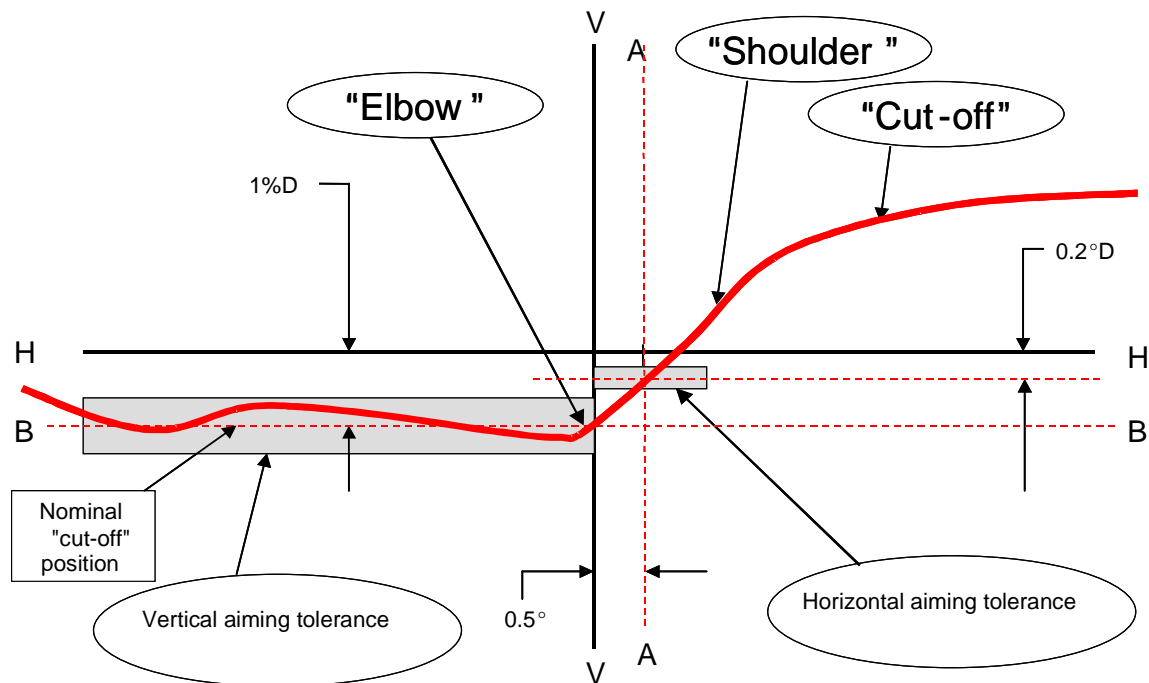
The "cut-off" shall provide:

- (i) a straight "horizontal part" towards the left;
- (ii) a raised "elbow - shoulder" part towards the right.

In each case the "elbow – shoulder" part shall have a sharp edge."

Paragraphs 2.2. and 2.3., amend to read:

- "2.2. The beam shall be visually aimed by means of the "cut-off" (see figure 1 below). The aiming shall be carried out using a flat vertical screen set up at a distance of 10 m or 25 m (as indicated in section 9 of Annex 1) forward of the headlamp and at right angles to the H-V axis. The screen shall be sufficiently wide to allow examination and adjustment of the "cut-off" of the passing beam over at least 5° on either side of the V-V line.
- 2.3. for vertical adjustment: the horizontal part of the "cut-off" is moved upward from below line B and adjusted to its nominal position one per cent (25 cm) below the H-H line;



Note: The scales are different for vertical and horizontal lines."

Figure 1

Insert new paragraphs 2.4. to 2.7., to read:

- "2.4. for horizontal adjustment: the "elbow-shoulder" part of the "cut-off" shall be moved:
- (a) from right to left and shall be horizontally positioned after its movement so that:
 - (b) above the line $0.2^\circ D$ its "shoulder" shall not exceed the line A to the left and

- (c) on the the line 0.2° D or below its "shoulder" should cross the line A and
- (d) the kink of the "elbow" is basically located within ± 0.5 degrees to the left or right of the V-V line.

or

for left hand traffic:

- (a) from left to right and shall be horizontally positioned after its movement so that:
- (b) above the line 0.2° D its "shoulder" shall not exceed the line A to the right and
- (c) on the the line 0.2° D or below its "shoulder" should cross the line A and
- (d) the kink of the "elbow" is basically located within ± 0.5 degrees to the left or right of the V-V line.

2.5. Where a headlamp so aimed does not meet the requirements set out in annex 3 its alignment may be changed, provided that the axis of the beam is not displaced:

Horizontally, from line A by more than: 0.5° to the left or 0.75° to the right

Vertically not more than 0.25° up or down from line B.

2.6. If, however, vertical adjustment cannot be performed repeatedly to the required position within the tolerances described in paragraph 2.5. above, the instrumental method described in paragraph 3 shall be applied to test compliance with the required minimum quality of the "cut-off" (as defined in paragraph 2.7.) and to perform the vertical and horizontal adjustment of the beam."

2.7 MEASUREMENT OF THE QUALITY OF THE "CUT-OFF"

To determine the minimum sharpness, measurements shall be performed by vertically scanning through the horizontal part of the "cut-off" in angular steps of 0.05° at either a measurement distance of:

- (a) 10 m with a detector having a diameter of approximately 10 mm or
- (b) 25 m with a detector having a diameter of approximately 30 mm.

The measuring distance at which the test was carried out shall be recorded in item 9.8 of the communication form (see Annex 1 of this Regulation).

To determine the maximum sharpness, measurements shall be performed by vertically scanning through the horizontal part of the "cut-off" in angular steps

of 0.05° exclusively at a measurement distance of 25 m and with a detector having a diameter of approximately 30 mm.

The "cut-off" quality shall be considered acceptable if the requirements of paragraph 2.1. to 2.3. below comply with at least one set of measurements.

2.7.1. Not more than one "cut-off" shall be visible ^{1/}

2.7.2. Sharpness of "cut-off"

The sharpness factor G is determined by scanning vertically through the horizontal part of the "cut-off" at 2.5° from the V-V where:

$G = (\log E_{\beta} - \log E_{(\beta + 0.1^{\circ})})$ where β = the vertical position in degrees.

The value of G shall not be less than 0.13 (minimum sharpness) and not greater than 0.40 (maximum sharpness).

2.7.3. Linearity

The part of the horizontal "cut-off" that serves for vertical adjustment shall be horizontal between 1.5° and 3.5° from the V-V line (see figure 1 of paragraph 3 below):

- (a) The inflection points of the "cut-off" gradient at the vertical lines at 1.5°, 2.5° and 3.5° shall be determined by the equation:

$$(d^2 (\log E) / d\beta^2 = 0).$$
- (b) The maximum vertical distance between the inflection points determined shall not exceed 0.2 °.

^{1/} This paragraph should be amended when an objective test method is available."

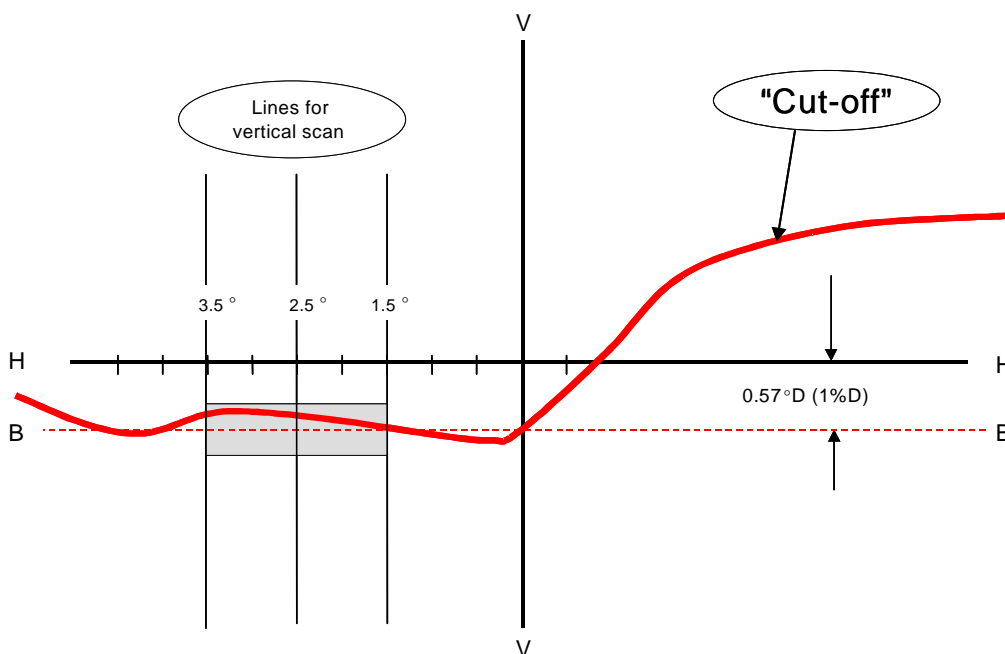
Paragraphs 2.3.1. to 2.7.(former), renumber as paragraphs 2.8. to 2.12.

Figures A-8-1 and A-8-2., shall be deleted.

Insert new paragraphs 3 to 3.2., to read:

"3. VERTICAL AND HORIZONTAL ADJUSTMENT

If the "cut-off" complies with the quality requirements of paragraph 2. of this annex, the beam adjustment may be performed instrumentally.



Note: The scales are different for vertical and horizontal lines.

Figure 1: Measurement of "cut-off" quality

3.1. Vertical adjustment

Moving upward from below the line B (see figure 2 below), a vertical scan is carried out through the horizontal part of the "cut-off" at 2.5° from V-V. The inflection point (where $d^2(\log E) / dv^2 = 0$) is determined and positioned on the line B situated one per cent below H-H.

3.2. Horizontal adjustment

The applicant shall specify one of the following horizontal aim methods:

- (a) The "0.2 D line" method (see figure 2 below).

A single horizontal line at 0.2° D shall be scanned from 5° left to 5° right after the lamp has been aimed vertically. The maximum gradient "G" determined using the

formula $G = (\log E_{\beta} - \log E_{(\beta + 0.1^{\circ})})$ where β is the horizontal position in degrees, shall not be less than 0.08.

The inflection point found on the 0.2 D line shall be positioned on the line A.

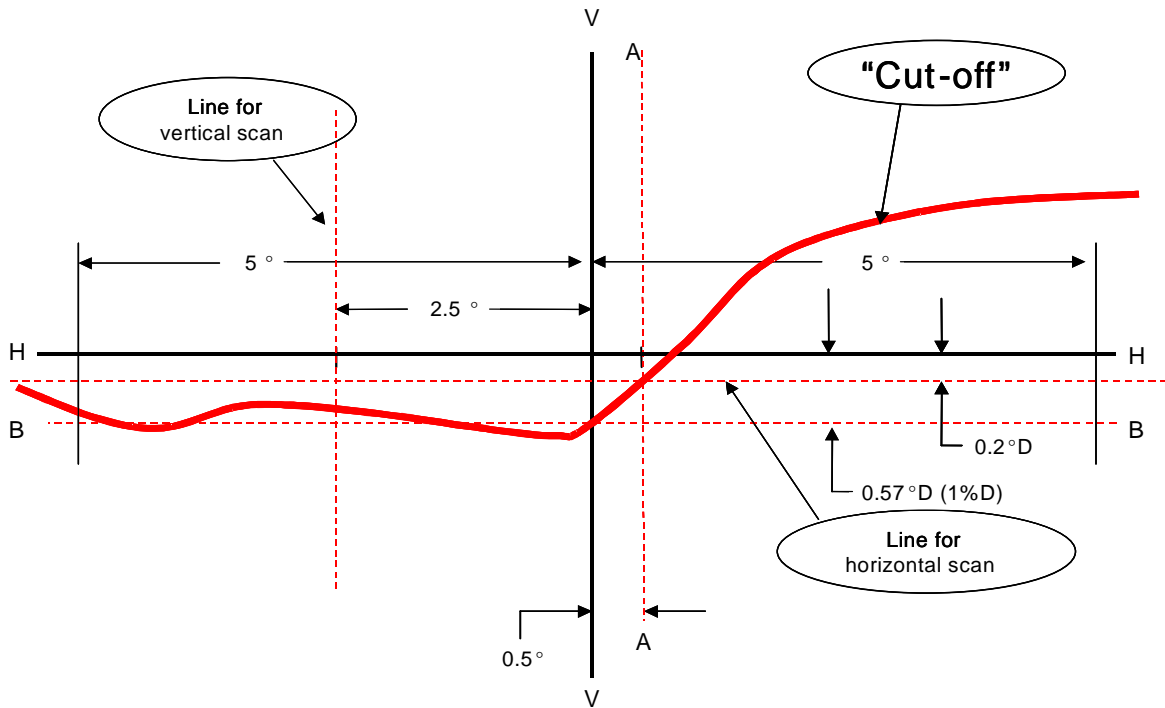


Figure 2

Note: The scales are different for vertical and horizontal lines.

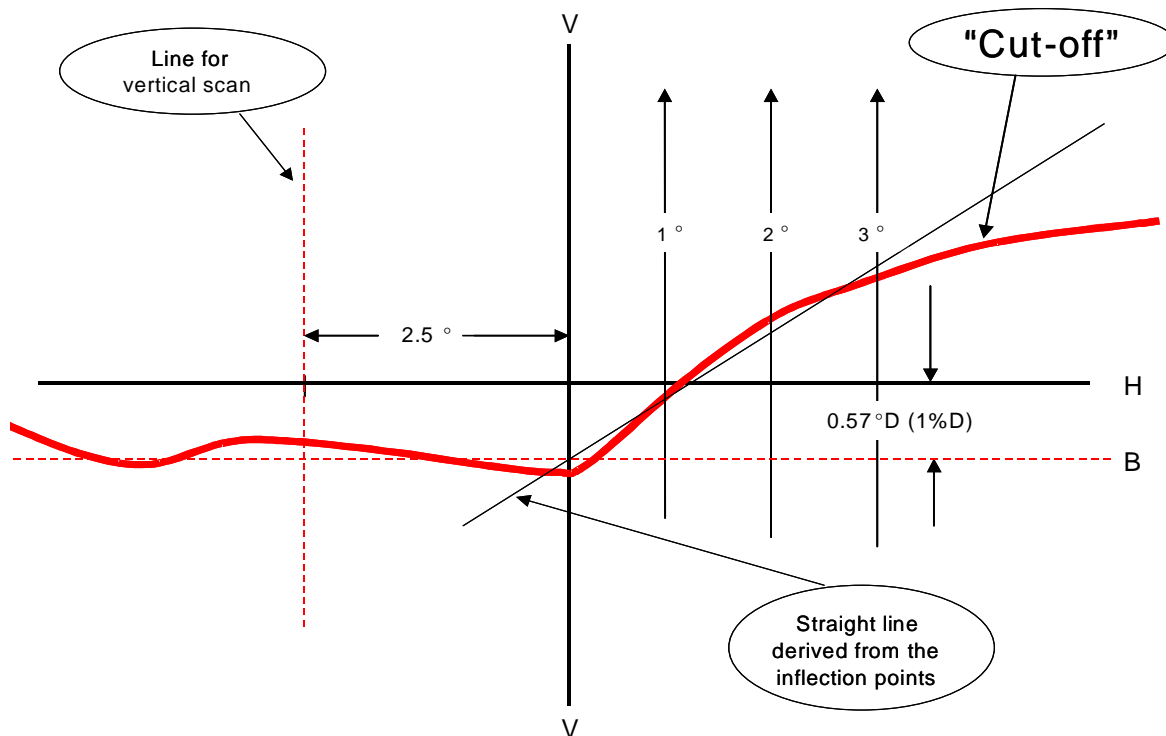
Figure 2: Instrumental vertical and horizontal adjustment- horizontal line scan method
 (b) The "3 line" method (see figure 3 below)

Three vertical lines shall be scanned from 2° D to 2° U at 1°R, 2°R, and 3°R after the lamp has been aimed vertically. The respective maximum gradients "G" determined using the formula:

$$G = (\log E_{\beta} - \log E_{(\beta + 0.1^{\circ})})$$

where β is the vertical position in degrees, shall not be less than 0.08. The inflection points found on the three lines shall be used to derive a straight line. The intersection

of this line and the line B found while performing vertical aim shall be placed on the V line.



Note: The scales are different for vertical and horizontal lines.

Figure 3: Instrumental vertical and horizontal adjustment-three line scan method "

Annex 9,

Paragraph 1.2., amend to read:

"1.2. The luminous intensity values shall be determined by means of a photoreceptor contained within a square of 65mm side and set up to a distance of at least 25m forward of the centre of reference of each lighting unit perpendicular to the measurement axis from the origin of the goniometer;"

Paragraph 1.4., amend to read:

"1.4. The luminous intensities are measured at a nominal distance of 25 m."

For the measurements, the flux of this filament lamp may differ from the reference luminous flux at 13.2 V specified in Regulation No. 37. In this case, the luminous intensity shall be corrected accordingly by the individual factor of the standard (étalon) filament lamp ($F = \Phi_{obj.} / \Phi(\text{Voltage})$).

The system or parts thereof shall be considered acceptable if the requirements of paragraph 6. of this Regulation are met with at least one standard (étalon) filament lamp, which may be submitted with the system.

2.2. In the case of a replaceable gas-discharge light source:

The voltage applied to the terminals of the ballast(s) is 13.2 V +/- 0.1 for 12 V systems.

The system or parts thereof using a replaceable gas-discharge light source shall comply with the photometric requirements set out in the relevant paragraphs of this Regulation with at least one standard (étalon) light source, which has been aged during at least 15 cycles, as specified in Regulation No. 99. The luminous flux of this gas-discharge light source may differ from the objective luminous flux specified in Regulation No. 99.

In this case, the measured photometric values shall be corrected accordingly.

2.3. In the case of a non-replaceable light source operating directly under vehicle voltage system conditions:

All measurements on lamps equipped with non-replaceable light sources (filament lamps and other) shall be made at 6.3V, 13.2 V or 28.0 V, or at a voltage as specified by the applicant with respect to any other vehicle voltage system.

2.4. In the case of a light source, replaceable or non-replaceable, which is operated independently from vehicle supply voltage and fully controlled by the system, or in the case of a light source supplied by a special power supply, the test voltage as specified in paragraph 2.3. above shall be applied to the input terminals of that system/power supply. The test laboratory may require from the manufacturer this special power supply needed to supply the light sources.

2.5. LED module(s) shall be measured at 6.3 V, 13.2 V or 28.0 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."
