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agenda item 15.)

PROPOSED AMENDMENTS TO ECE Regulations Nos. 112, 48, and 98

ECE Regulation No. 112

6. ILLUMINATION

6.1. General provisions

Original:
6.1.1. Headlamps shall be so made that they give adequate illumination without dazzle when emitting the passing beam, and good illumination when emitting the driving beam.

Proposed:
6.1.1. Headlamps shall be so made that they give adequate illumination, without dazzle, **within safe braking distance** when emitting the passing beam, and good illumination when emitting the driving beam.

6.2. Provisions concerning passing beams

Original:
6.2.1. The passing beam must produce a sufficiently sharp "cut-off" to permit a satisfactory adjustment with its aid. The "cut-off" must be a horizontal straight line on the side opposite to the direction of the traffic for which the headlamp is intended; on the other side, it must not extend beyond either the broken line HV H1 H4 formed by a straight line HV H1 making a 45E angle with the horizontal and the straight line H1 H4, 25 cm above the straight line h-h , or the straight line HV H3, inclined at an angle of 15E above the horizontal (see annex 3). A cut-off extending beyond both line HV H2 and line H2 H4 and resulting from a combination of the two above possibilities shall in no circumstances be permitted.

Proposed:
6.2.1. The passing beam must produce a sufficiently sharp "cut-off" to permit a satisfactory adjustment with its aid. The "cut-off" must be a horizontal straight line on the side opposite to the direction of the traffic for which the headlamp is intended; **on the other hand, it must not extend beyond either the hT- hT horizontal line, 22.5 cm above the straight line h-h, or the straight line HV H3, inclined at an angle of 15E above the horizontal (see annex 3). A cut-off extending beyond either line H5 H2 H3 or H5 H2 H4 shall in no circumstances be permitted.**

Original:
6.2.2.1. in the case of headlamps designed to meet the requirements of right-hand traffic, the "cut-off" on the left-half of the screen 8/ is horizontal and, in the case of headlamps designed to meet the requirements of left-hand traffic, the "cut-off" on the right-half of the screen is horizontal;

Proposed:
6.2.2.1. in the case of headlamps designed to meet the requirements of right-hand traffic, **the H2 H5 "cut-off ", starting from Point H2, on the left-half of the screen is horizontal and, in the case of headlamps designed to meet the requirements of left-hand traffic, the H2 H5 "cut-off", starting from Point H2, on the right-half of the screen is horizontal, both on the hT- hT line.**

Original:
6.2.2.2. this horizontal part of the "cut-off" is situated on the screen 25 cm below the level h-h (see annex 3);

Proposed:
6.2.2.2. Horizontal "cut-off" line, hT-hT, is situated on the screen 22.5 cm above the level h-h (see annex 3);

Original:
6.2.2.3. the "elbow" of the "cut-off" is on line vv. 9/

Proposed:
6.2.2.3. this item shall be canceled.

Original:

6.2.5. The illumination produced on the screen by the passing beam shall meet the following requirements:

Point on measuring screen		Required illumination in lux	
Headlamps for right-hand traffic	Headlamps for left-hand traffic	Class A headlamp	Class B headlamp
Point B 50 L	Point B 50 R	≤ 0.4	≤ 0.4
Point 75 R	Point 75 L	≥ 6	≥ 12
Point 75 L	Point 75 R	≤ 12	≤ 12
Point 50 L	Point 50 R	≤ 15	≤ 15
Point 50 R	Point 50 L	≥ 6	≥ 12
Point 50 V	Point 50 V	-	≥ 6
Point 25 L	Point 25 R	≥ 1.5	≥ 2
Point 25 R	Point 25 L	≥ 1.5	≥ 2
Any point in zone III		≤ 0.7	≤ 0.7
Any point in zone IV		≥ 2	≥ 3
Any point in zone I		≤ 20	≤ 2E */
*/ E is the actually measured value in points 50R respectively 50L			

Proposed:

6.2.5. The illumination produced on the screen by the passing beam shall meet the following requirements:

Point on measuring screen		**Required illumination in lux**	
Headlamps for right-hand traffic	**Headlamps for left-hand traffic**	**Class A headlamp**	**Class B headlamp**
Point B 50 L	Point B 50 R	≤0,4	≤0,4
Point 75 R	Point 75 L	≥6	≥12
Point 75 L	Point 75 R	≤12	≤12
Point 50 L	Point 50 R	≤15	≤15
Point 50 R	Point 50 L	≥6	≥12
Point 50 V	Point 50 V	-	≥6
Point 25 L	Point 25 R	≥1,5	≥2
Point 25 R	Point 25 L	≥1,5	≥2
Any point in zone III		≤0,7	≤0,7
Any point in zone IV		≥2	≥3
Any point in zone I		≤20	≤2 E *)
Any point in zone V **)		**≤12**	**≤12**
*) E is the actually measured value in points 50R respectively 50L ****) Specifies the proposed light intensity in the newly formed Zone V which is in Zone III in the standard table.**			

Original:

10. CONFORMITY OF PRODUCTION
11. PENALTIES FOR NON-CONFORMITY OF PRODUCTION
12. PRODUCTION DEFINITELY DISCONTINUED
Annex 5, 2.5 Criteria governing acceptability

Proposed:

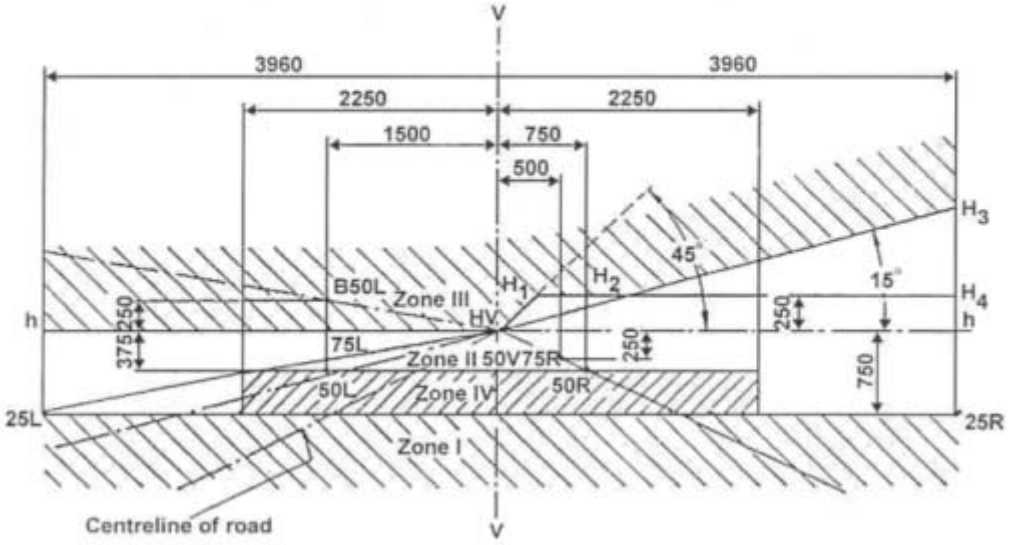
Items 10, 11, 12, Annex 5, 2.5, and other relevant items contained in the Regulation may be redrafted based on our proposal.

ECE R112 **Annex 3**

Measuring Screen

A. Headlamp for right-hand traffic (**Original**)

(Dimension in mm with screen at 25 m distance)



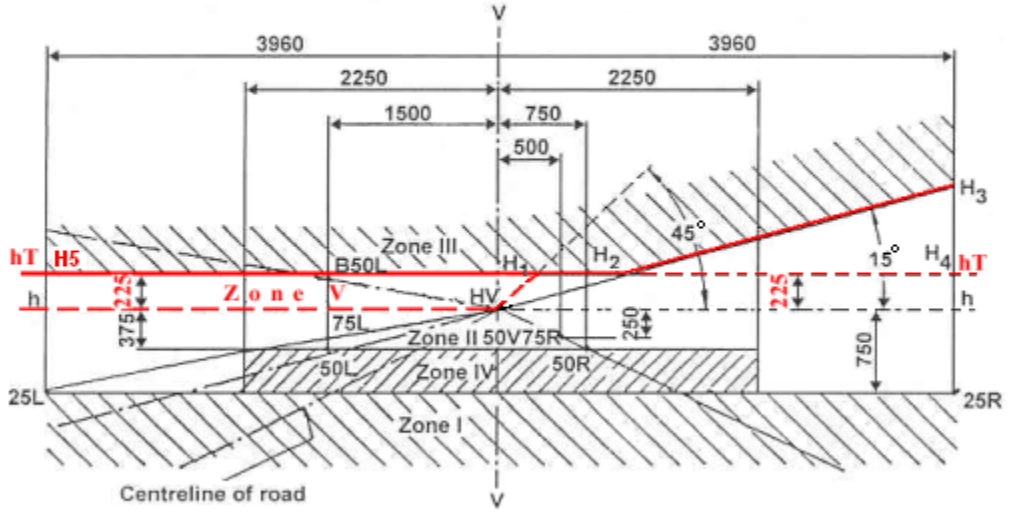
h - h: horizontal plane
v - v: vertical planer
} passing through focus of headlamp

ECE R112 **Annex 3**

Measuring Screen

A. Headlamp for right-hand traffic (**Proposed**)

(Dimension in mm with screen at 25 m distance)



hT-hT : horizontal plane, passes throught the focal point of the headlamp

h-h : horizontal plane, is located 225 mm below the hT-hT plane in the measuring screen

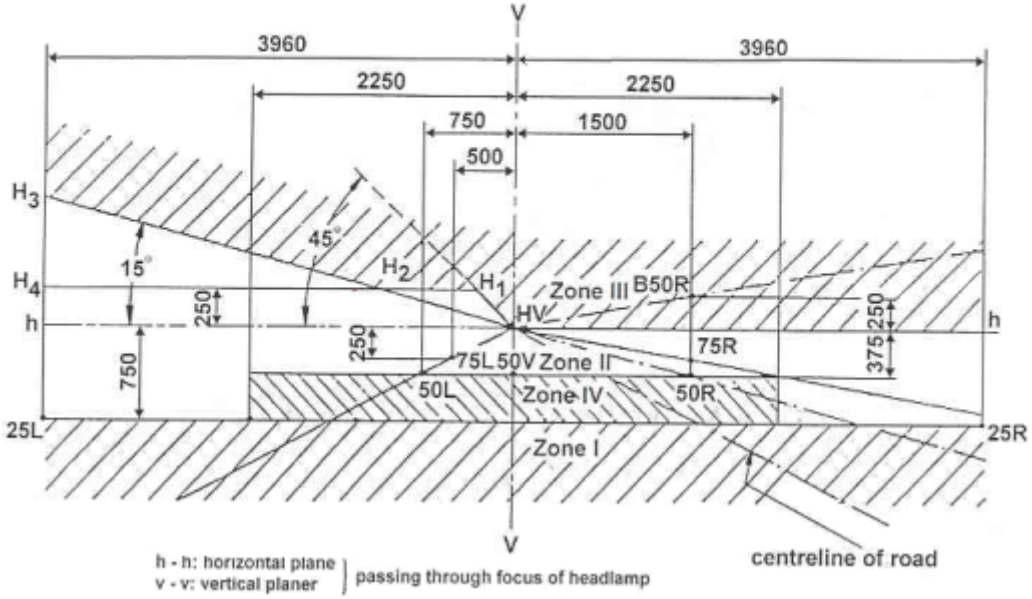
v-v : vertical plane, passes throught the focal point of the headlamp

ECE R112 Annex 3

Measuring Screen

B. Headlamp for left-hand traffic (**Original**)

(Dimension in mm with screen at 25 m distance)

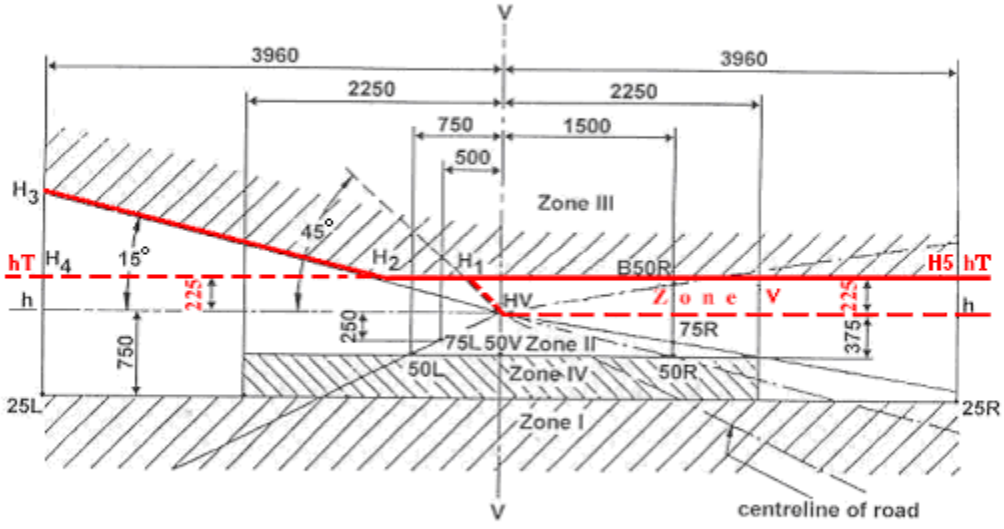


ECE R112 Annex 3

Measuring Screen

B. Headlamp for left-hand traffic (**Proposed**)

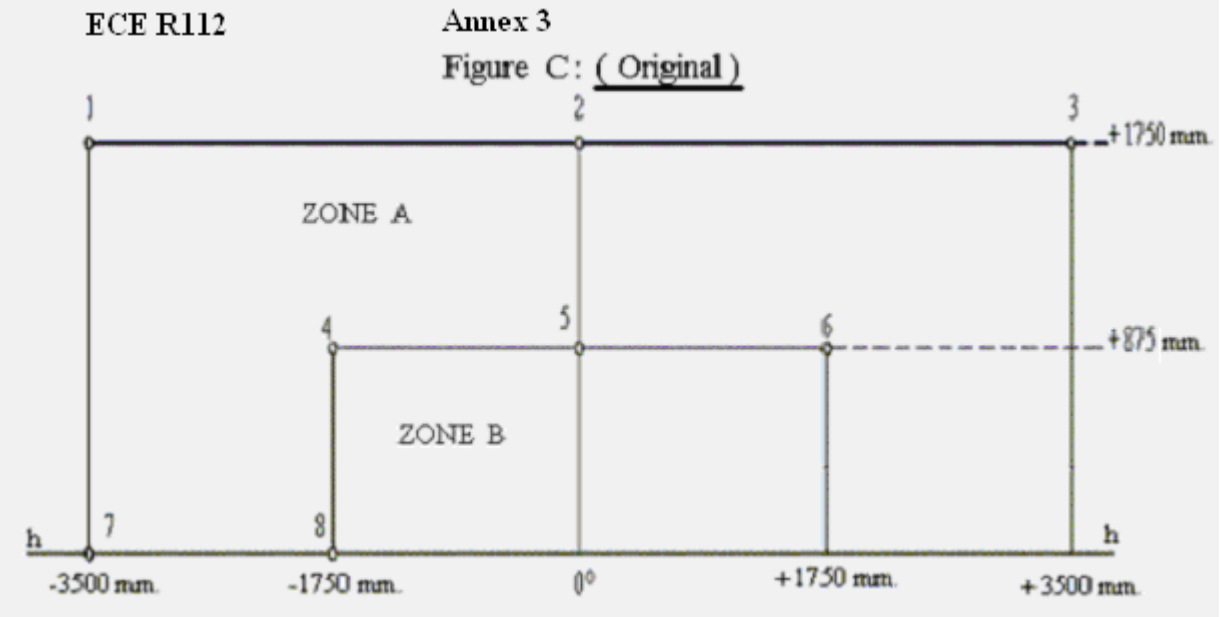
(Dimension in mm with screen at 25 m distance)



hT-hT : horizontal plane, passes throught the focal point of the headlamp
h-h : horizontal plane, is located 225 mm below the hT-hT plane in the measuring screen
v-v : vertical plane, passes throught the focal point of the headlamp

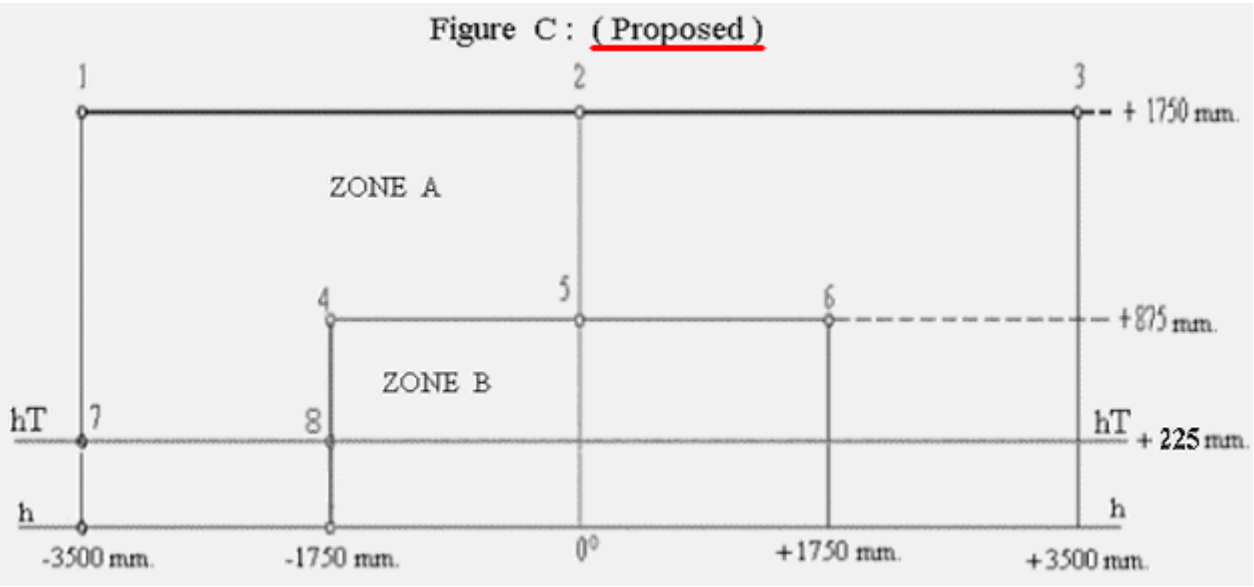
ECE R112 Annex 3

Figure C: (Original)



Note:
Figure C shows the measuring points for right-hand traffic. Points 7 and 8 move to their corresponding location at the right-hand side of the picture for left-hand traffic.

Figure C : (Proposed)

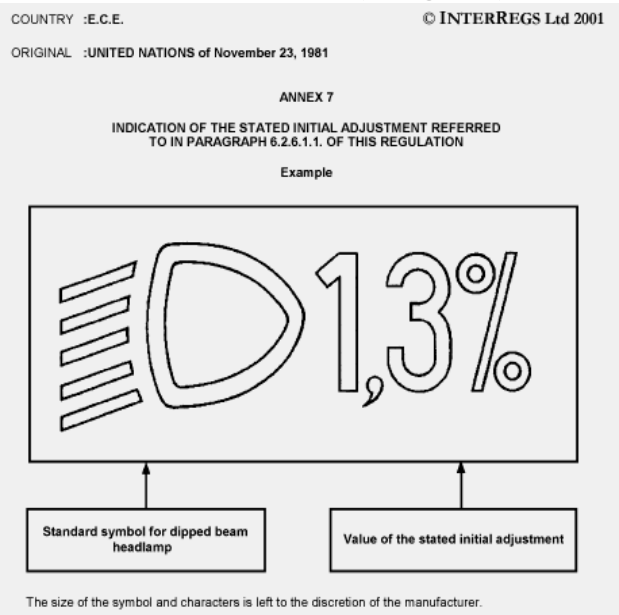


Note:
Figure C shows the measuring points for right-hand traffic. Points 7 and 8 move to their corresponding location at the right-hand side of the picture for left-hand traffic. Points 7 and 8 on the h-h line and in the original Figure C are on the hT-hT plane 225 mm upwards the h-h plane in the proposed Figure C. Area under the hT-hT line is the illumination zone.

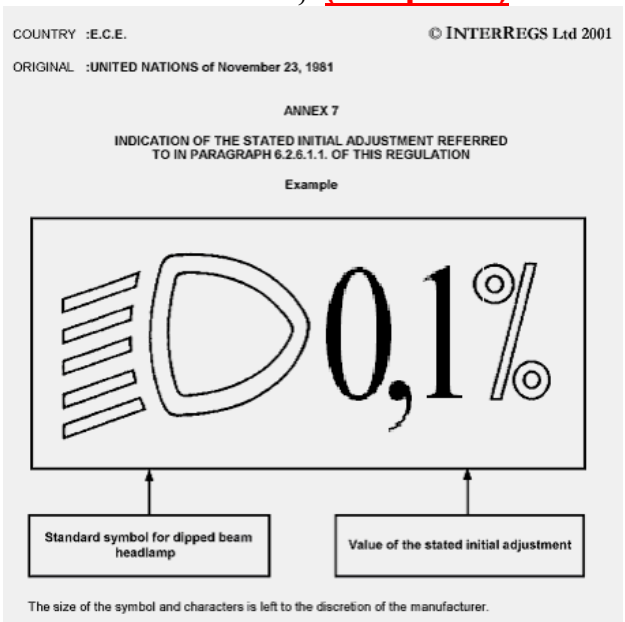
* * *

ECE Regulation No. 48

Annex 7, (Original)



Annex 7, (Proposed)



Annex 7 - Proposed: In Annex 7 of ECE R48, The "Standard symbol for dipped beam headlamp", "Value of the stated initial adjustment", 1.3%, for the unladen vehicle has been changed to 0.1% .

Original:

6.2.6.1. Vertical orientation

6.2.6.2. Headlamp leveling device

Proposed:

Items 6.2.6.1. , 6.2.6.2. and other relevant items contained in the Regulation may be redrafted accordingly where required.

* * *

ECE Regulation No. 98

6. ILLUMINATION

6.1. General provisions

Original:
6.1.1. Headlamps shall be so made that with suitable gas-discharge light source they give adequate illuminance without dazzle when emitting the passing beam, and good illumination when emitting the driving beam.

Proposed:
6.1.1.
Headlamps shall be so made that with suitable gas-discharge light source they give adequate illuminance without dazzle, **within safe braking distance** when emitting the passing beam, and good illumination when emitting the driving beam.

6.2. Provisions concerning passing beams

Original:
6.2.1. The passing beam must produce a sufficiently sharp "cut-off" to permit a satisfactory adjustment with its aid. The "cut-off" must be a horizontal straight line on the side opposite to the direction of the traffic for which the headlamp is intended; on the other side, it must not extend either above the line HV/H2 of annex 3, Screen 1, or above the line HV/H3/H4 of annex 3, Screen 2. A cut-off extending above a combination of these lines shall in no circumstances be permitted.

Proposed:
6.2.1.
For Screen 1 :
The passing beam must produce a sufficiently sharp "cut-off" to permit a satisfactory adjustment with its aid. The "cut-off" must be a horizontal straight line on the side opposite to the direction of the traffic for which the headlamp is intended; on **the other hand, it must not extend beyond either the hT-hT horizontal line, 22.5 cm above the straight line H-H, passing through Points 2, and H5, H3, H4, or above the straight line H3 H2, inclined at an angle of 15^{o} above the horizontal (see annex 3). A cut-off extending beyond line H5 H3 H2 shall in no circumstances be permitted.**

For Screen 2 :
The passing beam must produce a sufficiently sharp "cut-off" to permit a satisfactory adjustment with its aid. The "cut-off" must be a horizontal straight line on the side opposite to the direction of the traffic for which the headlamp is intended; **on the other hand, it must not extend beyond the hT- hT horizontal line, 22.5 cm above the straight line H-H, passing through points 2, and H5, H3, H4, (see annex 3). A cut-off extending beyond straight line H5 H3 H4 (hT-hT horizontal line) shall in no circumstances be permitted.**

Original:
6.2.2.1. in the case of headlamps designed to meet the requirements of right-hand traffic, the "cut-off" on the left-half of the screen 9/ is horizontal and, in the case of headlamps designed to meet the requirements of left-hand traffic, the "cut-off" on the right-half of the screen is horizontal;

Proposed:

6.2.2.1.
For Screen 1 :
in the case of headlamps designed to meet the requirements of right-hand traffic, **the H3 H5 "cut-off", starting from Point H3, on the left-half of the screen is horizontal and, in the case of headlamps designed to meet the requirements of left-hand traffic, the H3 H5 "cut-off", starting from Point H3, on the right-half of the screen is horizontal, both being on the hT-hT line.**

For Screen 2 :
in the case of headlamps designed to meet the requirements of right-, and left-hand traffic, H5 H3 H4 "cut-off ", on the whole screen is horizontal, on the hT-hT line.

Original:
6.2.2.2. this horizontal part of the "cut-off" is situated on the screen 25 cm below the level H-H (see annex 3). The kink of the elbow of the cut-off shall be on the V-V line.

Proposed:
6.2.2.2. Horizontal "cut-off" line, hT-hT, is situated on the screen 22.5 cm above the level H-H (see annex 3);

Original Table:

6.2.6.

POINTS or SEGMENTS	Designation	Illuminances (lux)	HORIZONTAL Distances (cm)	VERTICAL Distances (cm)
	On and above line H/H2, or On and above line H/H3/H4	1 max		
1	HV	1 max	0	0
2	B 50 L	0.5 max	L 150	U 25
3	75 R	20 min	R 50	D 25
4	50 L	20 max	L 150	D 37.5
5	25 L1	30 max	L 150	D 75
6	50 V	12 min	0	D 37.5
7	50 R	20 min	R 75	D 37.5
8	25 L2	4 min	L 396	D 75
9	25 R1	4 min	R 396	D 75
10	25 L3	2 min	L 670	D 75
11	25 R2	2 min	R 670	D 75
12	15 L	1 min	L 910	D 125
13	15 R	1 min	R 910	D 125
14		0.1 min	L 350	U 175
15		0.1 min	0	U 175
16		0.1 min	R 350	U 175
17		0.2 min	L 175	U 87.5
18		0.2 min	0	U 87.5
19		0.2 min	R 175	U 87.5
20		0.1 min	L 350	0
21		0.2 min	L 175	0
A to B	Segment I	6 min	L 225 to R 225	D 37.5
C to D	Segment II	6 max	R 140 to R 396	U 45
E to F	Segment III and under	20 max	L 417 to R 375	D 187.5
	E max R	70 max	Right of VV line	Above D 75
	E max L	50 max	Left of VV line	

Proposed Table:

6.2.6.

POINTS or SEGMENTS	Designation	Illuminances (lux)	HORIZONTAL Distances (cm)	VERTICAL Distances (cm)
	On and above line H5 H1 H3 H2, or On and above line H5 H1 H3 H4	1 max		
0	**H1** *	1 max	**0**	**0**
1	HV	**12 min**	**0**	**D 37.5**
2	B 50 L	0.5 max	L 150	U 25
3	75 R	20 min	R 50	D 25
4	50 L	20 max	L 150	D 37.5
5	25 L1	30 max	L 150	D 75
6	50 V	12 min	0	D 37.5
7	50 R	20 min	R 75	D 37.5
8	25 L2	4 min	L 396	D 75
9	25 R1	4 min	R 396	D 75
10	25 L3	2 min	L 670	D 75
11	25 R2	2 min	R 670	D 75
12	15 L	1 min	L 910	D 125
13	15 R	1 min	R 910	D 125
14		0.1 min	L 350	U 175
15		0.1 min	0	U 175
16		0.1 min	R 350	U 175
17		0.2 min	L 175	U 87.5
18		0.2 min	0	U 87.5
19		0.2 min	R 175	U 87.5
20		0.1 min	L 350	0
21		0.2 min	L 175	0
A to B	Segment I	6 min	L 225 to R 225	D 37.5
C to D	Segment II	6 max	R 140 to R 396	U 45
E to F	Segment III and under	20 max	L 417 to R 375	D 187.5
H5 to H3	**Segment IV and under**	**6min**	**L 225 to R 225**	**D 37.5**
	E max R	70 max	Right of VV line	Above D 75
	E max L	50 max	Left of VV line	

* **H1 - Point on the intersection of hT-hT line with VV line, 22.5 cm. above point HV.**

Original:

10. CONFORMITY OF PRODUCTION

11. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

12. PRODUCTION DEFINITELY DISCONTINUED

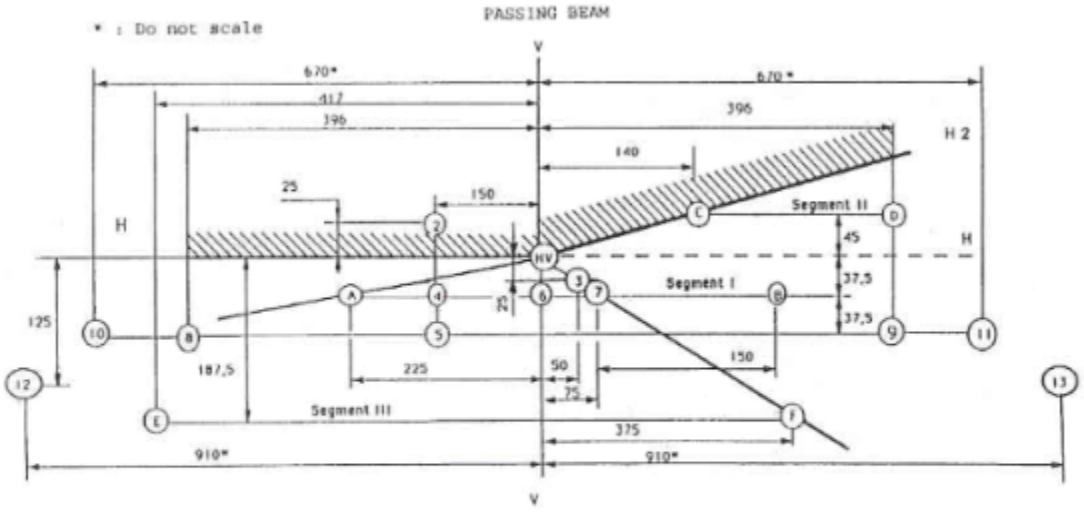
Annex 8, 2.5 Criteria governing acceptability

Proposed:

Items 10, 11, 12, Annex 8, 2.5 and other relevant items contained in the Regulation may be redrafted accordingly where required.

ECE R98 **Annex 3**

Figure A : Measuring screen 1 **(Original)**

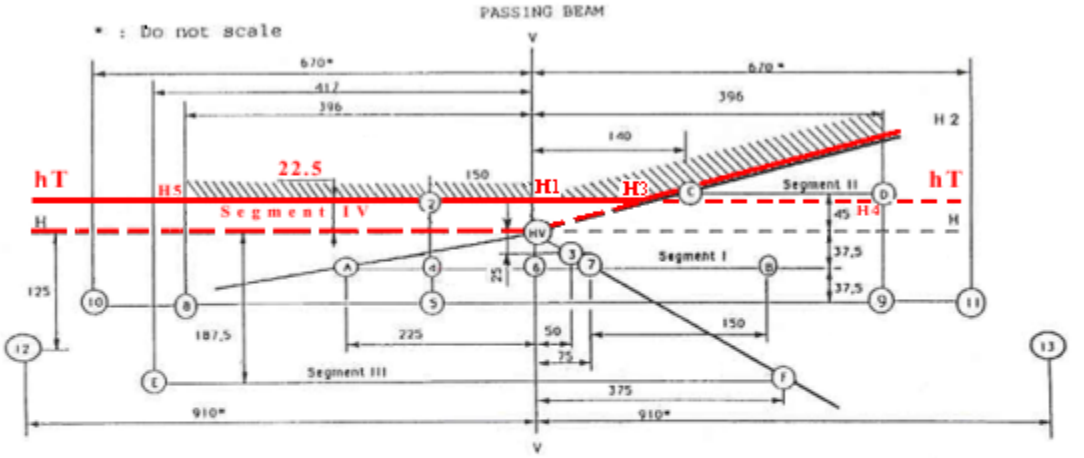


Dimensions are in cm on a flat vertical screen at 25 m. The HH and VV lines are the intersections with this screen of the horizontal and vertical planes passing through the axis of reference of the passing beam as declared by the applicant. The above screen describes a right-hand traffic passing beam. The screen for left-hand traffic passing beam is mirrored about the VV line. Angle HVH2-HH - 15°.

H-H : horizantal plane) passing through
v-v : vertical plane) focus headlamp

ECE R98 **Annex 3**

Figure A : Measuring screen 1 **(Proposed)**

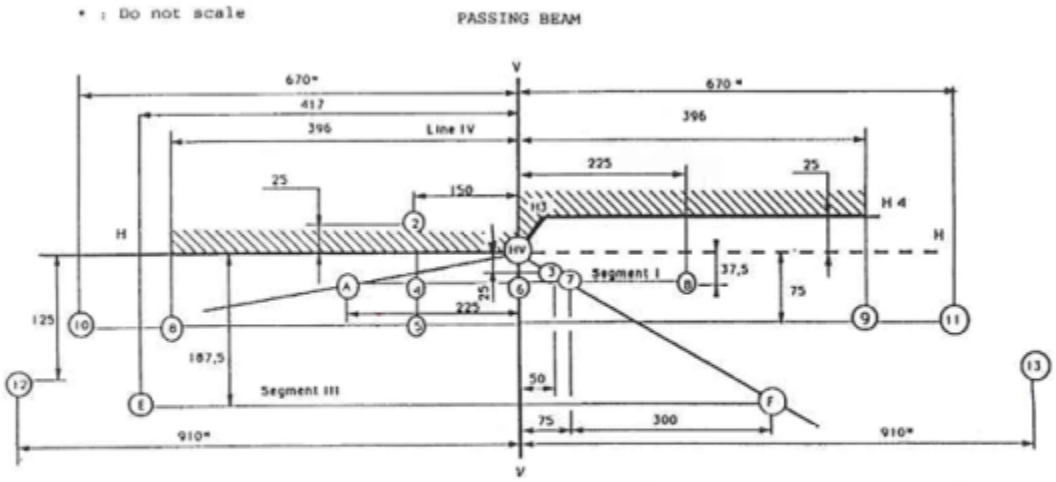


Dimensions are in cm on a flat vertical screen at 25 m. The HH and VV lines are the intersections with this screen of the horizontal and vertical planes passing through the axis of reference of the passing beam as declared by the applicant. The above screen describes a right-hand traffic passing beam. The screen for left-hand traffic passing beam is mirrored about the VV line. Angle **H3 H2 - hT hT - 15°**

H-H : horizontal plane
v-v : vertical plane
hT-hT : the proposed horizontal line, which is at the level of the focal point of the headlamp, and 22.5 cm above the H-H plane.

ECE R98 **Annex 3**

Figure B : Measuring screen 2 **(Original)**

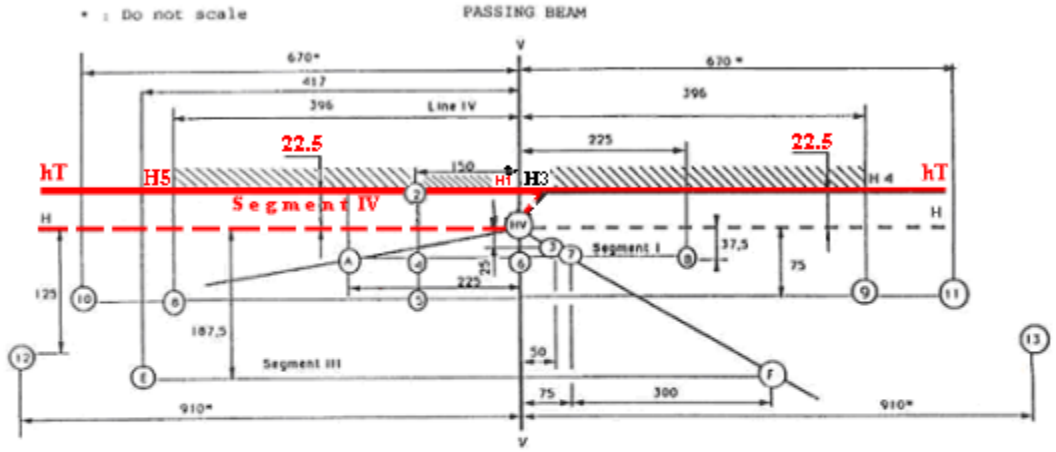


Dimensions are in cm on a flat vertical screen at 25 m. The HH and VV lines are the intersections with this screen of the horizontal and vertical planes passing through the axis of reference of the passing beam as declared by the applicant. The above screen describes a right-hand traffic passing beam. The screen for left-hand traffic passing beam is mirrored about the VV line. Angle HVH2-HH - 15°.

H-H : horizantal plane) passing through
v-v : vertical plane) focus headlamp

ECE R98 **Annex 3**

Figure B : Measuring screen 2 **(Proposed)**



Dimensions are in cm on a flat vertical screen at 25 m. The HH and VV lines are the intersections with this screen of the horizontal and vertical planes passing through the axis of reference of the passing beam as declared by the applicant. The above screen describes a right-hand traffic passing beam. The screen for left-hand traffic passing beam is mirrored about the VV line. Angle **H5 H3 - H3 H4 - 0°**

H-H : horizontal plane
v-v : vertical plane
hT-hT : the proposed horizontal line, which is at the level of the focal point of the headlamp, and 22.5 cm above the H-H plane.

ECE R 98 Annex 3

Figure C (Original) : Measuring points for illumination values

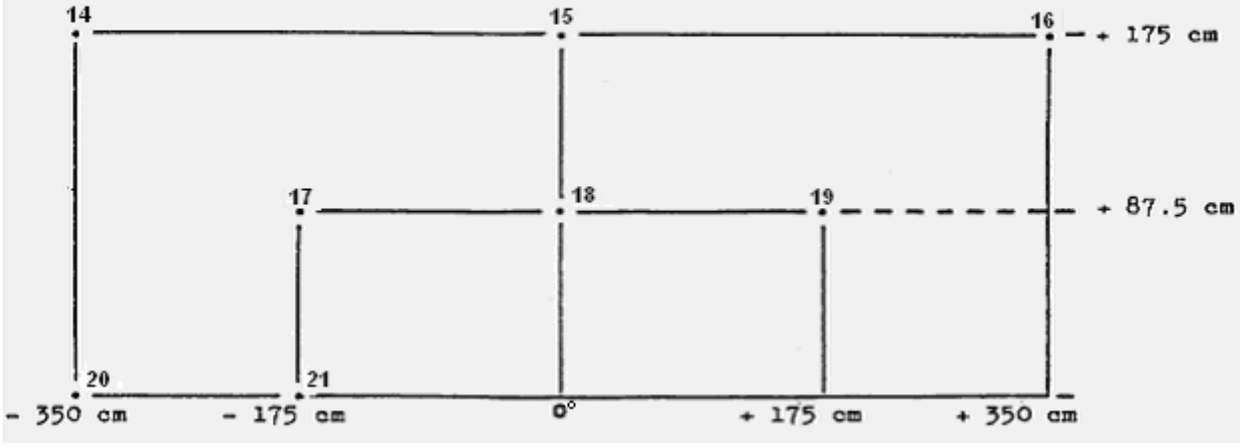
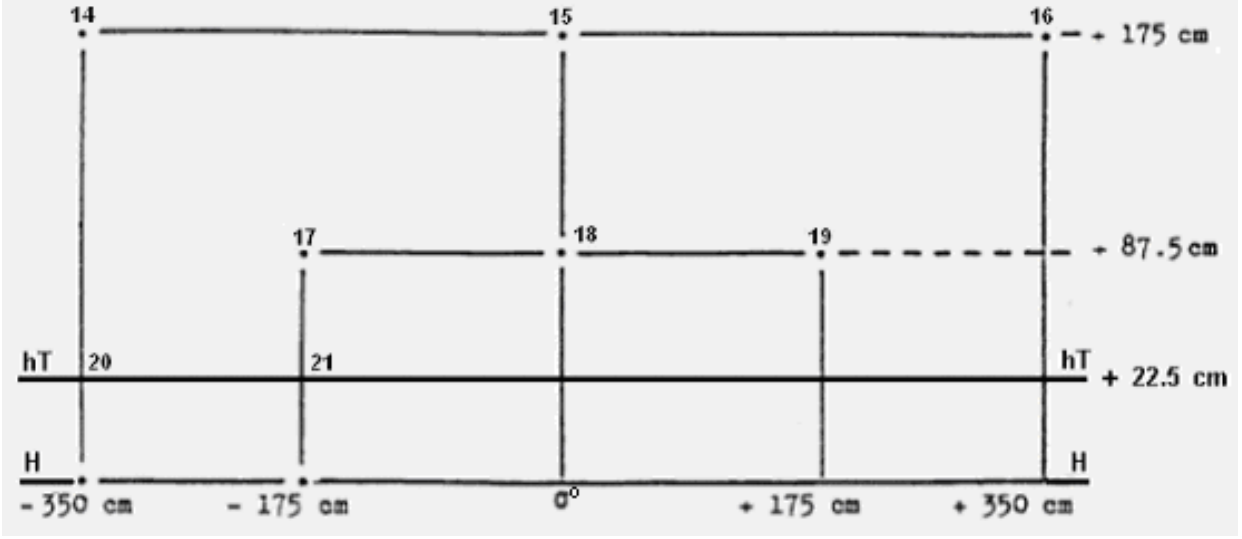


Figure C (Proposed) : Measuring points for illumination values



Note:

Figure C shows the measuring points for right-hand traffic. Points 20 and 21 move to their corresponding location at the right-hand side of the picture for left-hand traffic. Points 20 and 21 on the H-H line in the standard Figure C are on the hT-hT plane, 22.5 cm upwards to H-H plane in the proposed Figure C. Area under hT-hT line is the illumination zone.

* * *

JUSTIFICATION FOR THE PROPOSED AMENDMENTS TO ECE Regulations Nos. 112, 48, and 98

General:

The latest improvements in motor vehicles are based on driving comfort, as well as life safety. Although there have been important developments in this field, such as ABS braking system, air bags, and protective side bars, an passing beam illumination system which can illuminate the safe braking distance could not be developed until now; in fact, the term "Long-Distance Illumination Without Glaring (Dazzling) Effects" was added to the headlamp literature for the first time. The passing beam systems based on ECE R112, ECE R48, and ECE R98, which use Halogen or Gas Discharge (HID) light sources can not provide illumination of the safe braking distance. For example, the emergency braking distance of a vehicle driving at 100 km/h is at least 50-60 meters, including the human reaction time. On the other hand, a standard passing beam system with a cut-off inclination of 1% can provide illumination for a distance of about 25-30 meters. Hence, in case of emergency, vehicles cannot stop within a visible range of 25-30 meters, and many accidents may therefore happen. The aim of this study is to propose a new passing beam standard which enables continuous illumination along a safe braking distance of approximately 60-70 meters. It is also aimed to prevent the dazzling effect in the rear view mirror during night drive, caused by the illumination coming from the vehicles behind, thereby providing a safer and more comfortable drive by enabling use of the rear view mirror in the daylight setting. The proposed system is also intended to improve the vision distance at turns without suing any additional headlamp mechanism. The issues discussed herein may also be considered for other Regulations concerning the passing beam illumination.

Justifications for items in ECE Regulation No. 112:

6.1.1 -
The headlamp hardware in all the vehicles applying the passing beam currently in use and according to ECE R112 can not illuminate the safe braking distance in case of emergency, under normal weather and road conditions, and the vehicle may come to complete stop in the dark region. Many accidents with casualties, and life and property losses may occur due to this reason. The purpose of this amendment proposal is to establish a passing beam system which is based on the safe braking distance in emergency cases, or at least to establish a passing beam system which enables the driver to see the distance where he can take necessary precautions.

6.2.1 -
The "cut-off line" of the passing beam system based on ECE R112 can not provide sufficient illumination for the left-hand side in the right-hand traffic system, or vice versa. In illumination standard passing beam systems with a cut-off inclination of 1%, when the entire road is considered, the illumination distance that can be achieved is about 25-30 meters. On the hand, when the illumination distance is increased manually or by means of electronic devices, to increase the illumination distance, the dazzling effect on the side opposite to the direction of the traffic is increased, and even temporary blindness may be caused, and this may cause many traffic accidents. The proposed "cut-off line" can provide illumination in the safe braking

distance, without causing any dazzling effect on the side opposite to the direction of the traffic, and enables safe and comfortable night drives.

6.2.2.1 -
The "cut-off line" of the passing beam system in accordance with ECE R112 can not provide sufficient illumination for the left-hand side in the right-hand traffic system, or vice versa. The proposed "cut-off line" can provide illumination of the safe braking distance, without causing any dazzling effect on the side opposite to the direction of the traffic, and enables safe and comfortable night drives.

6.2.2.2 -
The "cut-off line" proposed as an alternative to the passing beam system in accordance with ECE R112 does not cause any dazzling effect on the opposite traffic.

6.2.2.3 -
The 45E elbow in the passing beam "cut-off line" in accordance with ECE R112 is included in the illuminated zone with the proposed "cut-off line". Therefore, the cancellation of this item is proposed.

6.2.5 -
Part of the Zone III which functions as dark area in the standard passing beam table according to ECE R112 has been rearranged as Zone V with the proposed illumination table, and is included in the illuminated zone, and illumination with sufficient luminous intensity has been enabled in Zone V.

6.2.6 -
In the proposed table, the dark points P7 and P8 in Zone III above the standard passing beam cut-off line according to ECE R112 are located on the hT-hT line, which is 225 mm above the h-h line in the standard table. The luminous intensities at P7 and P8 remain the same.

Items 10, 11, 12 and Annex 5-2.5

The items 10, 11, 12, and Annex 5-2.5 related to the conformity of production and Criteria governing acceptability in ECE R112 may be adjusted considering the proposed amendments.

ECE R112 Annex III, "cut-off lines" proposed for both right- and left-hand traffic are indicated in the proposed photometric measurement tables based on European standards.

In ECE R112 Annex III Figure C, hT-hT horizontal line and points 7 and 8 are 225 mm upwards the h-h line along the v-v axis.

Justifications for ECE Regulation No. 48 items:

Annex 7:

"Standard symbol for dipped beam headlamp", "Value of the stated initial adjustment" in ECE R48 Annex 7, 1.3 %, which is the initial light beam inclination angle of the passing beam in unladen vehicles has been changed as 0.1 % to comply with the proposed amendments.

Items 6.2.6.1 and 6.2.6.2.

ECE R48 Items 6.2.6.1. Vertical orientation and 6.2.6.2. Headlamp leveling device and other relevant items may be redrafted accordingly where required.

Justifications for ECE Regulation No. 98 items :

6.1.1 -
The headlamp hardware in all the vehicles applying the passing beam currently in use and is based on ECE R98 can not illuminate the safe braking distance in case of emergency, under normal weather and road conditions, and the vehicle may come to complete stop in the dark region. Many accidents with casualties, and life and property losses may occur due to this reason. The purpose of this amendment proposal is to establish a passing beam system which is based on the safe braking distance in emergency cases, or at least to establish a passing beam system which enables the driver to see the distance where he can take necessary precautions.

6.2.2 -
No type of the "cut-off line" of the passing beam system (Annex 3, Figure A and B) according to ECE R98 can provide sufficient illumination for the left-hand side in the right-hand traffic system, or vice versa. In the standard passing beam illumination systems with a cut-off inclination of 1%, when the entire road is considered, the illumination distance that can be achieved is about 25-30 meters. On the other hand, when the illumination distance is increased manually or by means of electronic devices, to increase the illumination distance, the dazzling effect on the side opposite to the direction of the traffic is increased, and even temporary blindness may be caused, and this may cause many traffic accidents. The proposed "cut-off line" can provide illumination in the safe braking distance, without causing any dazzling effect on the side opposite to the direction of the traffic, and enables safe and comfortable night drives.

6.2.2.1 -
No type of the "cut-off line" of the passing beam system (Annex 3, Figure A and B) based on ECE R98 can provide sufficient illumination in the safe braking distance for the left-hand side in the right-hand traffic system, or vice versa. The proposed "cut-off line" can provide illumination of the safe braking distance, without causing any dazzling effect on the side opposite to the direction of the traffic, and enables safe and comfortable night drives.

6.2.2.2 -
The "cut-off line" proposed as an alternative to the passing beam system according to ECE R98 does not cause any dazzling effect on the opposite traffic and provides long-distance illumination..

6.2.6. -
The photometric values in the standard passing beam illumination table have been adjusted according to the cut-off lines in the proposed table. The proposed H1 point is 22.5 cm above the point HV, and is located on the hT-hT line. The proposed Segment IV is located on the hT-hT line, between points H5 and H3, and is the illumination area below hT-hT line.

Items 10, 11, 12 and Annex 8-2.5

The items 10, 11, 12, and Annex 8-2.5 related to the conformity of production and Criteria governing acceptability in ECE R98 may be adjusted according to the proposed amendments.

ECE R98 Annex III, "cut-off lines" proposed for both the right- and left-hand traffic are indicated in the proposed photometric measurement tables based on European standards.

In ECE R98 Annex III Figure C, hT-hT horizontal line and points 20 and 21 are 22.5 cm upwards the H-H line along the v-v axis.