AUTOMOTIVE INDUSTRY STANDARD

Provisions concerning the Approval of Headlamps emitting a Symmetrical Passing Beam or a Driving Beam or Both and equipped with Filament Lamps or Gas-Discharge Light Sources

(Revision 1)

PRINTED BY
THE AUTOMOTIVE RESEARCH ASSOCIATION OF INDIA
P.B. NO. 832, PUNE 411 004

ON BEHALF OF
AUTOMOTIVE INDUSTRY STANDARDS COMMITTEE

UNDER
CENTRAL MOTOR VEHICLE RULES – TECHNICAL STANDING COMMITTEE

SET-UP BY
MINISTRY OF ROAD TRANSPORT & HIGHWAYS
(DEPARTMENT OF ROAD TRANSPORT & HIGHWAYS)
GOVERNMENT OF INDIA

December 2010

Status chart of the standard to be used by the purchaser for updating the record

Sr. No.	Corrigenda.	Amendment	Revision	Date	Remark	Misc.
General remarks :						

INTRODUCTION

0 The Government of India felt the need for a permanent agency to expedite the publication of standards and development of test facilities in parallel when the work on the preparation of the standards is going on, as the development of improved safety critical parts can be undertaken only after the publication of the standard and commissioning of test facilities. To this end, the erstwhile Ministry of Surface Transport (MOST) has constituted a permanent Automotive Industry Standards Committee (AISC) vide order No.RT-11028/11/97-MVL dated September 15, 1997. The standards prepared by AISC will be approved by the permanent CMVR Technical Standing Committee (CTSC). After approval, the Automotive Research Association of India, (ARAI), Pune, being the Secretariat of the AIS Committee, has published this standard. For better dissemination of this information ARAI may publish this document on their Web site.

0.1 Accordingly AIS-010 covering mandatory requirements regarding performance of lighting and light signaling devices for use in two and three wheelers has been published in 2004 and has been implemented thereafter in 2005.

0.2 With technological developments in lighting and light signaling devices, AIS-010 was taken up for revision and now is prepared in five parts.

This part covers the Approval of headlamps emitting an symmetrical passing beam or a driving beam or both and equipped with Filament lamps or Gas-Discharge Light Sources as applicable to all categories of vehicles. The permission to use headlamps covered by this standard for a vehicle category is governed by requirements specified by the standard for installation of requirements of that category of vehicles.

0.3 This part is based on the ECE R113, Rev. 1, Amendment 3 (Supplement 8 to the original version of regulation. Date of entry to the force 22 July 2009)

0.4 While preparing this standard attempts have been made to align with the above ECE regulation. However, certain changes were necessary in the Indian context.

0.5 The following standards contain provisions, which through reference in this text constitute provisions of the standard.

AIS-008 (Rev.1): 2010	Installation Requirements of Lighting and Light – Signaling Devices for Motor Vehicle having more than Three Wheels, Trailer and Semi -Trailer excluding Agricultural Tractor and Special Purpose Vehicle.

AIS-009	Automotive Vehicles - Installation Requirements of Lighting and Light - Signaling Devices for 2 and 3 Wheelers, their Trailers and Semi-Trailers.
AIS-053	Automotive Vehicles – Types – Terminology
AIS-004 (Part 3)	Automotive Vehicles – Requirements for Electromagnetic compatibility
AIS-010 (Part 5) (Rev. 1):2010	Requirements of Chromaticity Co-ordinates of Colour of Light Emitted from Lighting and Light-Signalling Devices
AIS-010 (Part 1) (Rev. 1) : 2010	Provisions concerning the Approval of Headlamps Emitting an Asymmetrical Passing Beam or a Driving Beam or both and equipped with Filament Lamps and/or LED Modules
AIS-034 (Part 1) (Rev. 1):2010	Provisions concerning the Approval of Filament Lamps for use in Approved Lamp Units on Power Driven Vehicles and their Trailers
AIS-034 (Part 2) (Rev. 1):2010	Provisions concerning the Approval of Gas discharge Light Sources for use in approved Gas Discharge Lamp Units of Power Driven Vehicles
AIS-037	Procedure for Type Approval and Establishing Conformity of Production for Safety Critical Components
AIS-012	Performance Requirements of Lighting and Light Signalling Devices for Motor Vehicle having more than Three wheels, Trailer and Semi-trailer
IEC Publication 61-2, third edition, 1969	Lamp Caps and Holders together with Gauges for the Control of Interchangeability and Safety- Part 2 : Lamp Holders.
IEC Publication 60061	Lamp Caps and Holders together with Gauges for the Control of Interchangeability and Safety.

0.6 The AISC panel and Automotive Industry Standards Committee (AISC) responsible for preparation of this standard are given in Annex M are Annex N respectively.

Provisions concerning the Approval of Headlamps emitting a Symmetrical Passing Beam or a Driving Beam or Both and equipped with Filament Lamps or Gas-Discharge Light Sources

Provisions concerning the Approval of Headlamps emitting a Symmetrical Passing Beam or a Driving Beam or both and equipped with Filament Lamps or Gas-Discharge Light Sources

0 SCOPE

This standard lays down the performance requirements of headlamps emitting an symmetrical passing beam or a driving beam or both and equipped with filament lamps or Gas-Discharge Light Sources for L and A categories of vehicles as defined in AIS-053.

Note : The permission to use headlamps covered by this standard are governed by requirements specified by the standard for installation of requirements of that category of vehicles.

1. DEFINITIONS

In addition to the following definition, the definitions given in AIS-008, AIS-009, AIS-010 (Part 5) and their amendments in force at the time of application for type approval shall apply to this standard.

1.1 "**Lens**" means the outermost component of the headlamp (unit) which transmits light through the illuminating surface;

1.2 "**Coating**" means any product or products applied in one or more layers to the outer face of a lens;

1.3 "**Headlamps** of different types" mean headlamps which differ in such essential respects as:

1.3.1 The trade name or mark;

1.3.2 The characteristics of the optical system;

1.3.3 The inclusion or elimination of components capable of altering the optical effects by reflection, refraction, absorption and/or deformation during operation;

1.3.4 The kind of beam produced (passing beam, driving beam or both);

1.3.5 The materials constituting the lenses and coating, if any;

1.3.6 The category of filament or gas-discharge light source;

1.4 **"Headlamps of different "Classes" (A or B or C or D or E)"** mean headlamps identified by particular photometric provisions.

1.5 Reserved

1.6 However, in the case of a system consisting of two headlamps a device intended for the installation on the left side of the vehicle and the corresponding device intended for the installation on the right side of the vehicle shall be considered to be of the same type.

1.7 Same as 1.5 of Part 1 of this standard

1.8 "**Ballast**" means the electrical supply of the gas-discharge light source. This ballast may be partly or completely inside or outside the headlamp.

2. APPLICATION FOR APPROVAL OF HEADLAMP

2.1. Information to be submitted at the time of applying for type approval of the headlamp shall be as given in Annex A.

2.1.1. Reserved

2.1.2. Reserved

2.1.3. Reserved

2.1.4. Reserved

2.2. Every application for approval shall be accompanied by:

2.2.1. Reserved

2.2.2. Reserved

2.2.3. two samples of each type of headlamp, In the case of a system consisting of two headlamps one sample intended for the installation on the left side of the vehicle and one sample intended for the installation of the right side of the vehicle.

2.2.4. For Class B or C or D or E headlamps only, for the test of plastic material of which the lenses are made:

2.2.4.1. For Class B or C or D, thirteen lenses; for Class E, fourteen lenses;

2.2.4.1.1. For Class B or C or D, six of these lenses may be replaced by six samples of material at least 60 x 80 mm in size, having a flat or convex outer surface and a substantially flat area (radius of curvature not less than 300 mm) in the middle measuring at least 15 x 15 mm;
For Class E, seven of these lenses may be replaced by seven samples of material at least 60 x 80 mm in size, having a flat or convex outer surface and a substantially flat area (radius of curvature not less than 300 mm) in the middle measuring at least 15 x 15 mm;

2.2.4.1.2. Every such lens or sample of material shall be produced by the method to be used in mass production.

2.2.4.2. a reflector to which the lenses can be fitted in accordance with the manufacturer's instructions.

2.2.5. For Class E headlamps only, for testing the UV-resistance of light transmitting components made of plastic material against UV radiation of gas-discharge light sources inside the headlamp:

2.2.5.1. one sample of each of the relevant material as being used in the headlamp or one headlamp sample containing these. Each material sample shall have the same appearance and surface treatment, if any, as intended for use in the headlamp to be approved.

2.2.5.2. The UV-resistance testing of internal materials to light source radiation is not necessary:

2.2.5.2.1 If low-UV-type gas-discharge light sources are being applied as specified in AIS-034 (Part 2)(Rev. 1) or;

2.2.5.2.2. If provisions are taken to shield the relevant headlamp components from UV radiation, e.g. by glass filters.

2.3. The materials making up the lenses and coatings, if any, shall be accompanied by the test report of the characteristics of these materials and coatings if they have already been tested.

3. MARKINGS

3.1 Headlamps submitted for approval shall bear the trade name or mark of the headlamp manufacturer.

3.2 They shall comprise, on the lens and on the main body, (See 3.2.1) spaces of sufficient size for the approval mark and the additional symbols referred to in 4; these spaces shall be indicated on the drawings referred to in A-9 of Annex A.

3.2.1 If the lens cannot be detached from the main body of the headlamp, a unique marking as per 4.2.5 shall be sufficient.

3.3 on the back of the headlamp the indication of the category of filament lamp or gas-discharge light source used.

3.4 Class E headlamps may bear on their light-emitting surface a centre of reference as shown in Annex K.

3.5 Class E headlamps shall bear the voltage markings as shown in Annex L.

3.6 On the prototype for type approval, the markings may be provided by suitable temporary methods and need not necessary be obtained from the tools used for series production.

4 APPROVAL

4.1. General

4.1.1 If all the samples of a type of headlamp submitted pursuant to 2 satisfy the provisions of this standard, approval shall be granted.

4.1.2 Where grouped, combined or reciprocally incorporated lamps satisfy the requirements of more than one part of this standard or other AIS, a single approval mark may be affixed provided that each of the grouped, combined or reciprocally incorporated lamps satisfies the provisions applicable to it.

4.1.3 Reserved

4.1.4 Reserved

4.1.5. In addition to the mark prescribed in 3.1., an approval mark as described in 4.2 and 4.3 below shall be affixed in the spaces referred to in 3.2 above to every headlamp conforming to a type approved under this standard.

4.2 Composition of the approval mark

The approval mark shall consist of:

4.2.1 Approval mark shall be as per AIS-037.

4.2.1.1. Reserved

4.2.1.2. Reserved

4.2.2. the following additional symbol (or symbols):

4.2.2.1 a horizontal arrow with a head on each end, pointing to the left and to the right;

4.2.2.2. On headlamps meeting the requirements of this standard in respect of the passing beam only, the letters "C-AS" for Class A headlamps or "C-BS" for Class B headlamps or "WC-CS" for Class C headlamp or "WC-DS" for Class D headlamp or "WC-ES" for Class E headlamps;

4.2.2.3 On headlamps meeting the requirements of this standard in respect of the driving beam only, "R-BS" for Class B headlamps or "WR-CS" for Class C headlamp or "WR-DS" for Class D headlamp or "WR-ES" for Class E headlamps;

4.2.2.4 On headlamps meeting the requirements of this standard in respect of both the passing beam and the driving beam, the letters "CR-BS" for Class B headlamps or "WCR-CS" for Class C headlamp or "WCR-DS" for Class D headlamp or "WCR-ES" for Class E headlamps;

4.2.2.5. On headlamps incorporating a lens of plastic material, the group of letters "PL" to be affixed near the symbols prescribed in 4.2.1 and 4.2.2 above.

4.2.2.6 On headlamps, other than Class A, meeting the requirements of this standard in respect of the driving beam, an indication of the maximum luminous intensity expressed by a reference mark, as defined in 6.3.2.1.2.

4.2.3. In every case the relevant operating mode used during the test procedure according to paragraph D-1.1.1.1. of Annex D and the permitted voltage(s) according to paragraph D-1.1.1.2. of Annex D shall be stipulated on the test report.

In the corresponding cases the device shall be marked as follows:

4.2.3.1. On headlamps meeting the requirements of this standard which are so designed that the filament and/or gas-discharge light source of the passing beam shall not be lit simultaneously with that of any other lighting function with which it may be reciprocally incorporated: an oblique stroke (/) shall be placed behind the passing lamp symbol in the approval mark.

4.2.4 Reserved

4.2.5. The marks and symbols referred to in 4.2.1 to 4.2.3 above shall be clearly legible and be indelible. They may be placed on an inner or outer part (transparent or not) of the headlamp, which cannot be separated from the transparent part of the headlamp emitting the light. In any case they shall be visible when the headlamp is fitted on the vehicle or when a movable part is opened.

4.3 **Arrangement of the approval mark**

4.3.1. Independent lamps

4.3.1.1 Annex 2, figures 1 to 12 of the ECE R113, Rev. 1, Amendment 3 (Supplement 8 to original version of the regulation) may be used for the relative location of approval marking and other marking.

4.3.2 Grouped, combined or reciprocally incorporated lamps:

4.3.2.1 Where grouped, combined or reciprocally incorporated lamps have been found to comply with the requirements of several standards, a single approval mark may be affixed, This approval mark may be located anywhere on the grouped, combined or reciprocally incorporated lamps, provided that:

4.3.2.1.1. It is visible as per 4.2.5.

4.3.2.1.2 No part of the grouped, combined or reciprocally incorporated lamps that transmits light can be removed without at the same time removing the approval mark.

4.3.2.2. The identification symbol for each lamp appropriate to each standard under which approval has been granted, together with the corresponding series of amendments incorporating the most recent major technical amendments to the standard at the time of issue of the approval, and if necessary, the required arrow shall be marked:

4.3.2.2.1 Either on the appropriate light-emitting surface.

4.3.2.2.2. Or in a group, in such a way that each of the grouped, combined or reciprocally incorporated lamps may be clearly identified.

4.3.2.3. The size of the components of a single approval mark shall not be less than the minimum size required for the smallest of the individual marks by the standard under which approval has been granted.

4.3.2.4. Reserved

4.3.2.5 Annex 2, figure 13 of ECE R113, Rev. 1, Amendment 3 (Supplement 8 to original version of the regulation) may be used as examples of arrangements of approval marks for grouped, combined or reciprocally incorporated lamps with all the above mentioned additional symbols.

4.3.3 Lamps, the lens of which are used for different types of headlamps and which may be reciprocally incorporated or grouped with other lamps:

The provisions laid down in 4.3.2 above are applicable.

4.3.3.1. In addition, where the same lens is used, the latter may bear the different approval marks relating to the different types of headlamps or units of lamps, provided that the main body of the headlamp, even if it cannot be separated from the lens, also comprises the space described in 3.2 above and bears the approval marks of the actual functions. If different types of headlamps comprise the same main body, the latter may bear the different approval marks.

4.3.3.2 Annex 2, figure 14 of ECE R113, Rev. 1, Amendment 3 (Supplement 8 to original version of the regulation) may be used as examples of arrangements of approval marks relating to the above case.

4.4 On the prototype for type approval, the markings may be provided by suitable temporary methods and need not necessary be obtained from the tools used for series production.

5 GENERAL SPECIFICATIONS

5.1 Each sample shall conform to the specifications set forth in 6 to 8 below.

5.2 Headlamps shall be so made as to retain their prescribed photometric characteristics and to remain in good working order when in normal use, in spite of the vibrations to which they may be subjected.

Note : Requirements of 5.2 above are deemed to be satisfied, if requirements specified in this standard are complied with.

5.2.1 Headlamps shall be fitted with a device enabling them to be so adjusted on the vehicles as to comply with the rules applicable to them. Such a device may or may not provide horizontal adjustment, provided that the headlamps are so designed that they can maintain a proper horizontal aiming even after the vertical aiming adjustment. Such a device need not be fitted on units in which the reflector and the diffusing lens cannot be separated, provided the use of such units is confined to vehicles on which the headlamp setting can be adjusted by other means.

Where a headlamp providing a passing beam and a headlamp providing a driving beam, each equipped with its own filament lamp and/or gas-discharge light source, are assembled to form a composite unit the adjusting device shall enable each optical system individually to be duly adjusted.

5.2.2 However, these provisions (5.2.1.) shall not apply to headlamp assemblies whose reflectors are indivisible. For this type of assembly the requirements of 6.3 of this standard apply.

5.3. **For Class A or B or C or D**

5.3.1 The headlamp shall be equipped with filament lamp(s) specified in AIS-034 (Part 1)(Rev. 1). Any such filament lamp may be used, provided that:

(a) no restriction on the application is made in the table of contents of that standard

(b) for Class A and B, headlamps, its reference luminous flux for dipped-beam does not exceed 600 lm;

(c) for Class C and D headlamps, its total objective luminous flux for dipped-beam does not exceed 2000 lm.

5.3.2 The design of the device shall be such that the filament lamp can be fixed in no other position but the correct one.

Note: A headlamp is regarded as satisfying the requirements of this paragraph if the filament lamp can be easily fitted into the headlamp and the positioning lugs can be correctly fitted into their slots even in darkness.

5.3.3 The filament lamp holder shall conform to the characteristics given in IEC Publication 60061.The holder data sheet relevant to the category of filament lamp used, applies.

Note: Conditions of 5.3.3 are to be verified by using appropriate gauge or a standard reference filament lamp.

5.4. **For Class E**

5.4.1. The headlamp shall be equipped with gas-discharge light source(s) approved according to AIS-034 (Part 2)(Rev. 1)

5.4.2. In the case of replaceable gas-discharge light sources the lamp holder shall conform to the dimensional characteristics as given on the data sheet of IEC Publication 60061-2, relevant to the category of gas-discharge light source used. The gas-discharge light source shall fit easily into the headlamp.

Note: Conditions of 5.4.2 are to be verified by using appropriate gauge or a standard reference gas discharge light source.

5.5 In addition, Class B or C or D or E headlamps shall be complementary tested according to the requirements of Annex D to ensure that in use there is no excessive change in photometric performance.

5.6 If the lens of Class B or C or D or E headlamp is of plastic material, tests shall be done according to the requirements of Annex F.

5.7. On headlamps designed to provide alternately a driving beam and a passing beam, any mechanical, electromechanical or other device incorporated in the headlamp for switching from one beam to the other shall be so constructed that:

5.7.1. the device is strong enough to withstand 50,000 operations without suffering damage despite the vibrations to which it may be subjected in normal use;

5.7.2. in the case of failure it shall automatically obtain the passing beam position;

5.7.3. either the passing beam or the driving beam shall always be obtained without any possibility of the mechanism stopping in between the two positions;

5.7.4 the user cannot, with ordinary tools, change the shape or position of the moving parts.

5.8 For Class E, the headlamp and ballast system shall not generate radiated or power line disturbances to cause a malfunction of other electric/electronic systems of the vehicle. (See Note below)

Note: Compliance with the requirements for electromagnetic compatibility is relevant to the individual vehicle type. Verification of this requirement shall be as per relevant part of AIS-004 (Part 3) as and when implemented.

6. ILLUMINATION

6.1 General provisions

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.

Note: Requirements of 6.1.1 above are deemed to be satisfied, if requirements specified in this standard are complied with.

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 C.

6.1.3 **For Class A or B or C or D**

6.1.3.1 Headlamps shall be checked by means of (an) uncoloured standard (étalon) filament lamp(s) designed for a rated voltage as indicated in the relevant data sheet of AIS-034 (Part 1)(Rev. 1). 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 AIS-034 (Part 1) (Rev. 1).

6.1.3.2 Depending on the number of filament lamps for which the headlamp is designed, it shall be considered acceptable if it meets the requirements of 6 with the same number of standard (étalon) filament lamp(s), which may be submitted with the headlamp.

6.1.4 **For Class E**

6.1.4.1. The headlamp shall be deemed satisfactory if the photometric requirements set in the present 6 are met with one light source, which has been aged during at least 15 cycles, in accordance with D-4 of Annex D of AIS-034 (Part 2)(Rev. 1).

Where the gas-discharge light source is approved according to AIS-034 (Part 2)(Rev. 1). it shall be a standard (étalon) light-source and its luminous flux may differ from the objective luminous flux specified in AIS-034 (Part 2)(Rev. 1). In this case, the illuminances shall be corrected accordingly.

The above correction does not apply to distributed lighting systems using a non-replaceable gas-discharge light source or to headlamps with the ballast(s) totally or partially integrated.

Where the gas-discharge light source is not approved according to AIS-034 (Part 2)(Rev. 1), it shall be a production non-replaceable light source.

6.1.4.2. The dimensions determining the position of the arc inside the standard gas-discharge light source are shown in the relevant data sheet of AIS-034 (Part 2)(Rev. 1).

6.1.4.3. Four seconds after ignition of a headlamp which has not been operated for 30 minutes or more, 60 lux at least shall be reached at point HV of a driving beam and 6 lux at point 2 (0.86D-V) of a passing beam for headlamps incorporating driving beam and passing beam functions, or 6 lux at point 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

6.2. **Provisions concerning passing beams**

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 6. The "cut-off" shall be substantially horizontal and shall be as straight as possible from at least 3° L to 3° R. In case that visual aim leads to problems or ambiguous positions, the instrumental J-2 and J-4 of Annex J, , shall be applied and the quality or rather the method as specified in sharpness of the "cut-off" and the linearity shall be checked on performance.

6.2.2 The headlamp shall be so aimed that:

6.2.2.1 For horizontal adjustment: The beam is as symmetrical as possible with reference to line V-V.

6.2.2.2. For vertical adjustment: The horizontal part of the "cut-off" line is adjusted to its nominal position 1 per cent 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, vertical adjustment cannot be performed repeatedly to the required position within the allowed tolerances, the instrumental method of J-4 and J-5 of Annex J, shall be applied to test compliance with the required minimum quality of the "cut-off" line and to perform the beam vertical adjustment.

6.2.3 When so aimed, the headlamp needs, if its approval is sought solely for provision of a passing beam (see 6.2.3.1) to comply with the requirements set out in 6.2.5 to 6.2.7.1 below if it is intended to provide both a passing beam and a driving beam, it shall comply with the requirements set out in . 6.2.5, 6.2.6 and 6.3.

6.2.3.1 Such a special "passing beam" headlamp shall not incorporate a driving beam not subject to requirements.

6.2.4. Where a headlamp so aimed does not meet the requirements set out in 6.2.5 to 6.2.6 and 6.3, its alignment may be changed, except headlamps that have no mechanism to adjust horizontal aim on condition that the axis of the beam is not displaced laterally by more than 1° (= 44 cm) to the right or left. (See 6.2.4.1) 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 line H-H.

6.2.4.1 The limit of re-alignment of 1° towards the right or left is not incompatible with upward or downward vertical re-alignment. The latter is limited only by the requirements of 6.3

(The provisions of 6.3 are not applicable to passing beam headlamps).

6.2.5 The illumination produced by the passing beam on the screens in Annex C shall meet the following illumination requirements:

6.2.5.1 **For Class A headlamps**

Any point on and above the line H-H	≤ 0.32 lux
Any point on line 25L-25R	≥ 1.28 lux
Any point on line 12.5L-12.5R	≥ 0.64 lux

6.2.5.2 **For Class B headlamps**

Any point on and above the line H-H	≤ 0.7 lux
Any point on line 50L- 50R except 50V*	≥ 1.5 lux
Point 50V	≥ 3 lux
Any point on line 25L-25R	≥ 3 lux
Any point in Zone IV	≥ 1.5 lux
* Ratio of intensities 50R/50L	≥ 0.25

6.2.5.3 **For Class C & D headlamps**: The requirements are given in Table 1.

Table 1 (See 6.2.5.3)

Photometric requirements for passing beam for Class C & D headlamps

Test Point/ Line/ Zone	Position in B-β Grid in angular degrees Vertical β**/ Horizontal B**/		Required illumination in lux at 25 m			
			Minimum		Maximum	
			Class D	Class C	Class D	Class C
1	0.86 D	3.5 R	2.3		15.4	
2	0.86 D	0	5.8	2.9	-	
3	0.86 D	3.5 L	2.3		15.4	
4	0.50 U	1.50 L & 1.50 R	-		1.08	
6	2.00 D	15 L & 15 R	1.28	0.64	-	

7	4.00 D	20 L & 20 R	0.38	0.19	-
8	0	0	-		1.92
Line 11	2.00 D	9 L to 9 R	1.6		-
Line 12	7.00 U	10 L to 10 R	-		0.3; but 0.96 if within 2° cone
Line 13	10.00 U	10 L to 10 R	-		0.15; but 0.64 if within 2° cone
Line 14	10 U to 90 U	0	-		0.15; but 0.64 if within 2° cone
15 */	4.00 U	8.0 L	0.1 */		1.08
16 */	4.00 U	0	0.1 */		1.08
17 */	4.00 U	8.0 R	0.1 */		1.08
18 */	2.00 U	4.0 L	0.2 */		1.08
19 */	2.00 U	0	0.2 */		1.08
20 */	2.00 U	4.0 R	0.2 */		1.08
21 */	0	8.0 L & 8.0 R	0.1 */		-
22 */	0	4.0 L & 4.0 R	0.2 */		1.08
Zone 1	1U/8L-4U/8L-4U/8R-1U/8R-0/4R-0/1R-0.6U/0-0/1L-0/4L-1U/8L		-		1.08
Zone 2	>4U to <10 U	10 L to 10 R	-		0.3; but 0.96 if within 2° cone
Zone 3	10 U to 90 U	10 L to 10 R	-		0.15; but 0.64 if within 2° cone

Notes:

"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.

*/	During measurement of these points, the front position lamp as per AIS-010 (Part 3)(Rev. 1) or AIS-012 (Part 6)(Rev. 1) if combined, grouped, or reciprocally incorporated-shall be switched on.
**/	0.25° tolerance allowed independently at each test point for photometry unless indicated otherwise.

Other general text:			
type approval at reference luminous flux according to AIS-034 (Part 1) (Rev. 1) or (Part 2) (Rev. 1) as applicable.			
Nominal aim for photometry:			
Vertical:	1 per cent D (0.57°D)	Horizontal:	0°
Allowed tolerances for photometry:			
Vertical:	0.3°D to 0.8°D	Horizontal:	± 0.5°D L-R

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

6.2.7. For Class E headlamp (gas-discharge headlamp for motorcycles):

Test point/ line/ zone	Position in B-β grid in angular degrees		Required illumination in Lux at 25 m	
	Vertical β[**/]	Horizontal β[**/]	Minimum	Maximum
1	0.86 D	3.5 R	4	20
2	0.86 D	0	8	-
3	0.86 D	3.5 L	4	20
4	0.50 U	1.50 L and 1.50 R	-	1.08
6	2.00 D	15 L and 15 R	2	-
7	4.00 D	20 L and 20 R	1	-
8	0	0	-	1.92
Line 11	2.00 D	9 L to 9 R	3	-
Line 12	7.00 U	10 L to 10 R	-	1.08
Line 13	10.00 U	10 L to 10 R	-	1.08
Line 14	10 U to 90 U	0	-	1.08
15 [*/]	4.00 U	8.0 L	0.1 [*/]	1.08
16 [*/]	4.00 U	0	0.1 [*/]	1.08
17 [*/]	4.00 U	8.0 R	0.1 [*/]	1.08
18 [*/]	2.00 U	4.0 L	0.2 [*/]	1.08
19 [*/]	2.00 U	0	0.2 [*/]	1.08
20 [*/]	2.00 U	4.0 R	0.2 [*/]	1.08
21 [*/]	0	8.0 L and 8.0 R	0.1 [*/]	-

22 */	0	4.0 L and 4.0 R	0.2 */	1.08
Zone 1	1U/8L-4U/8L-4U/8R-1U/8R-0/4R-0/1R-0.6U/0-0/1L-0/4L-1U/8L		-	1.08
Zone 2	>4U to <10 U	10 L to 10 R	-	1.08
Zone 3	10 U to 90 U	10 L to 10 R	-	1.08

Notes:

"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.

*/ During measurement of these points, the front position lamp approved to AIS-010 (Part 3) (Rev. 1) or AIS-012 (Part 6) (Rev. 1) if combined, grouped, or reciprocally incorporated, shall be switched on.

**/ A 0.25° photometry tolerance is allowed independently at each test point, unless indicated otherwise.

6.2.7.1 The voltage applied to the terminals of the ballast(s) is: either: 13.5 V ± 0.1 V for 12 V systems or otherwise specified in Annex L.

6.3 **Provisions concerning driving beams**

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 driving beam shall be taken with the same headlamp alignment as applied to the condition of 6.2 above; in the case of a headlamp providing a driving beam only, it shall be so adjusted that the area of maximum illumination is centred on the point of intersection of lines H-H and V-V; such a headlamp need meet only the requirements referred to in 6.3.

6.3.2 Except for Class A headlamp, the illumination produced on the screen by the driving beam shall meet the following requirements.

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 illumination. This maximum value (E_M) shall not be less than 32 lux for Class B or C headlamps, 51.2 lux for Class D headlamps and 70 lux for Class E headlamps. The maximum value shall in no circumstances exceed 240 lux in the case of Class B headlamps and 180 lux in the case of Class C, D and E headlamps

6.3.2.1.1. The maximum intensity (I_M) of the driving beam expressed in thousands of candelas shall be calculated by the formula:
$I_M = 0.625\ E_M$

6.3.2.1.2. The reference mark (I'_M) of this maximum intensity, referred to in 4.2.2.6 above, shall be obtained by the ratio:

$I'_M = I_M/3 = 0.208\ E_M$

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

6.3.2.2 Starting from point HV, horizontally to the right and left, the illumination shall be not less than 12 lux for Class B headlamp to a distance of 1,125 mm and not less than 3 lux for Class B headlamp to a distance of 2,250 mm.

In the case of a Class C, D or E headlamp, the intensities shall conform to the tables A or B in Annex C. Table A applies in the case where a primary driving beam is being produced with a single light source. Table B applies in the case where the driving beam is being produced by a secondary driving beam headlamp operated with a harmonized passing beam headlamp or a primary driving beam headlamp.

6.4 In the case of headlamps with an adjustable reflector, additional tests shall be made after the reflector has been moved vertically ± 2 degrees or at least into the maximum position, if less than 2 degrees, from its initial position by means of the headlamp adjusting device. The whole headlamp shall then be re-positioned (for example by means of the goniometer) by moving it through the same number of degrees in the opposite direction to the movement of the reflector. The following measurements shall be made and the points shall be within the required limits:

passing beam: points HV and 0.86D-V

driving beam: I_M and point HV (percentage of I_M).

6.5 The screen illumination values mentioned in 6.2 and 6.3 above shall be measured by means of a photoreceptor, the effective area of which shall be contained within a square of 65 mm side.

7. COLOUR

7.1 The colour of the light emitted shall be white. (Refer AIS-010 (Part 5)(Rev 1) for chromaticity coordinates)

8. EXTENSION OF TYPE APPROVAL

8.1 Details given in 9.0 of part 1 of this standard are applicable to this part also.

8.1.1 Reserved

8.1.2 Reserved

8.2. Reserved

8.3. Reserved

9 CONFORMITY OF PRODUCTION

The conformity of production procedures shall comply with those set out in the AIS-037 with the following requirements:

9.1. Headlamps approved under this standard shall be so manufactured as to conform to the type approved by meeting the requirements set forth in 6 and 7.

9.2. the minimum requirements for conformity of production control procedures set fourth in Annex E to this standard shall be complied with.

9.3. The minimum requirements for sampling by testing agency set forth in Annex G to this standard shall be complied with.

9.4. The normal frequency of these verifications shall be once every two years.

9.5. Headlamps with apparent defects are disregarded.

9.6. The reference mark is disregarded.

10 PENALTIES FOR NON-CONFORMITY OF PRODUCTION

10.1. Penalties for non-conformity of production shall be as prescribed in AIS-037.

11 Reserved.

12 Reserved.

13 TRANSITIONAL PROVISION

13.1 At the request of the applicant, type approvals for compliance to headlamp of class A or class B of AIS-010(Part 2) (Rev.1):2010, shall be granted by testing agencies from 27th October 2010 (date of adoption in CMVR-TSC). Such type approvals shall be deemed to be compliance to headlamp covered under Annex D or Annex E of AIS-010:2004.

13.2 At the request of applicant, type approval to the compliance to Annex D or Annex E of AIS-010:2004 shall be granted up to the notified date of implementation of AIS-010 (Part 2) (Rev.1):2010.

13.3 Type approvals issued for compliance to Annex D or Annex E of AIS-010 : 2004 shall be extended to approval of Class A or Class B of AIS-010 (Part 2) (Rev.1):2010 subject to satisfactory compliance of the following:

13.3.1 Marking as per 3.0 and sub-clauses for 4.0 applicable for marking.

13.3.2 In case of "E/e" approved devices, requirements specified in 14.

13.3.3 In case of type approved headlamps as per Annex D of AIS-010:2004, Photometric requirements as per 6.2.5.1.

Note: Additional verification for the above need not be carried out, if compliance to the above requirements has already been established during the type approval as per Annex D or Annex E of AIS-010:2004.

13.4 Extension of Approvals for engineering and administrative changes:

13.4.1 In the case of 13.1, extensions shall be granted subject to the conditions of AIS-010 (Part 2) (Rev.1):2010. Such extensions shall be deemed to be compliance to AIS-010:2004.

13.4.2 In the case of 13.2, extensions shall be granted subject to conditions of AIS-010:2004 till the notified date of implementation of AIS-010 (Part 2) (Rev.1):2010.

13.5 Type approvals for compliance to AIS-037, already been granted, shall continue to be valid for AIS-010 (Part 2) (Rev.1):2010.

Note : Necessary corrections to the reference of verification reports as per this standard shall be incorporated while issuing the next COP certificate. In the meantime for issuing of vehicle certificate, test/verification report as per this standard shall deemed to be the proof of compliance of AIS-037.

14 ESTABLISHING COMPLIANCE OF E/e APPROVED HEADLAMPS TO THIS STANDARDS

14.1 As an exception to 7.4 of AIS-037, (or related administrative decisions) for certifying compliance of "E"/"e" approved headlamps to this standard, the test for the following shall be carried out by testing agency

14.1.1 Provision concerning passing beam. (6.2 of this standard)

14.1.2 Provision concerning driving beam. (6.3 of this standard)

14.1.3 In the case of 14.1.1 and 14.1.2 above, no measured value deviates unfavourably by more than 20 per cent from the value prescribed in this standard. For values B 50 R and zone III, the maximum unfavourable deviation may be respectively:

14.1.3.1 **Class A headlamp:** No measured value deviates unfavourably by more than 20 per cent from the value prescribed in this standard.

14.1.3.2 **Class B, C and D headlamp**

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

0.3 lux equivalent 20 per cent

0.45 lux equivalent 30 per cent

14.1.3.3 **For Class E headlamp:**

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

0.3 lux equivalent 20 per cent
0.45 lux equivalent 30 per cent

14.1.4 Tests for stability of photometric performance of headlamps in operation D-2.2 and Annex D of this standard.

15 AMENDMENTS TO ECE REGULATIONS AFTER THE LEVEL DESCRIBED IN 0.3 OF FOREWORD

15.1 Supplements

In case of changes in ECE regulation, which are issued as supplements (Supplements do not affect the earlier type approvals) at the request of applicant, approval of compliance to this standard shall be issued taking into account the changes arising out of such supplement(s) to ECE regulation with approval from Chairman AISC.
This shall be incorporated in the test report.

Note : Such changes will be considered for inclusion in this standard at the time of its next amendment /revision.

15.2 Series of amendments

Changes in ECE regulation, which are issued as series of amendments (series of amendments may affect the earlier type approvals) will not be considered for issuing approval to this standard.

However, Chairman, AISC may, on a case to case basis, permit to accept latest series of amendments.

This shall be incorporated in the test report.

Note : Such changes will be considered for inclusion in this standard at the time of its next revision.

ANNEX A
(See 2.1)

INFORMATION AND SAMPLES TO BE SUBMITTED AT THE TIME OF APPLICATION FOR TYPE APPROVAL

A-1. Trade name or mark of the device:

A-2. Manufacturer's name for the type of device:

A-3. Manufacturer's name and address:

A-3.1 Telephone No

A-3.2 FAX. No.

A-3.3 E mail address

A-3.4 Contact person

A-4. If applicable, name and address of manufacturer's representative:

A-5 whether the headlamp is intended to provide both a passing beam and a driving beam or only one of these beams;

A-6 Whether it concerns a Class A or B or C or D or E headlamp;

A-7 The category of the filament lamp(s) used, as listed in AIS-034 (Part 1)(Rev. 1) and its amendments in force at the time of application for type approval, if any.

A-8 The category of gas-discharge light source as listed in AIS-034 (Part 2)(Rev. 1) if any.

A-9 Drawings in triplicate in sufficient detail to permit identification of the type and representing a frontal view of the headlamp, with details of lens ribbing if any, and the cross-section; the drawings shall indicate the space reserved for the approval mark;

A-10 A brief technical description, if any, including the make and type of the ballast(s);

ANNEX B (Reserved)

ANNEX C

(See 6.1.2)

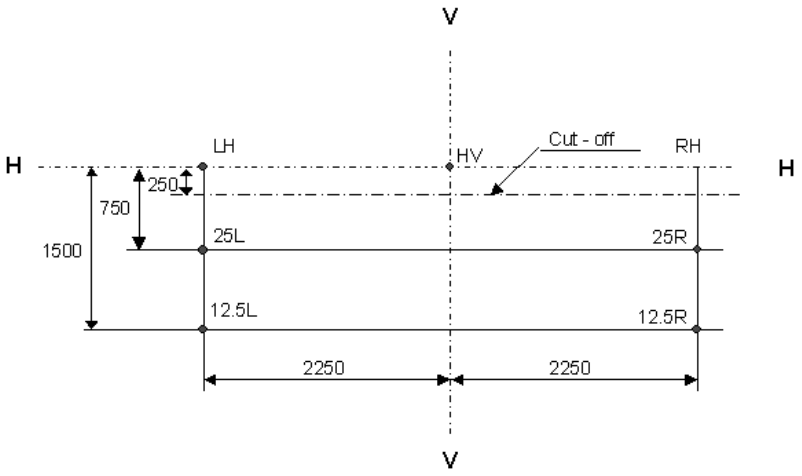
MEASURING SCREEN

Figure A

Measuring Screen

For Class A headlamps

(Dimensions in mm with screen at 25 m distance)



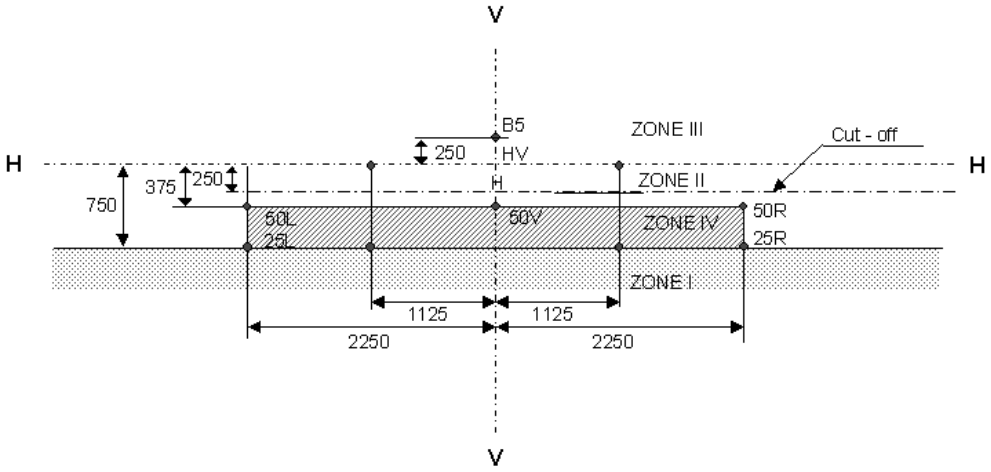
H-H : horizontal plane) passing through
V-V : vertical plane) focus of headlamp

Figure B

Measuring Screen

For Class B headlamps

(Dimensions in mm with screen at 25 m distance)



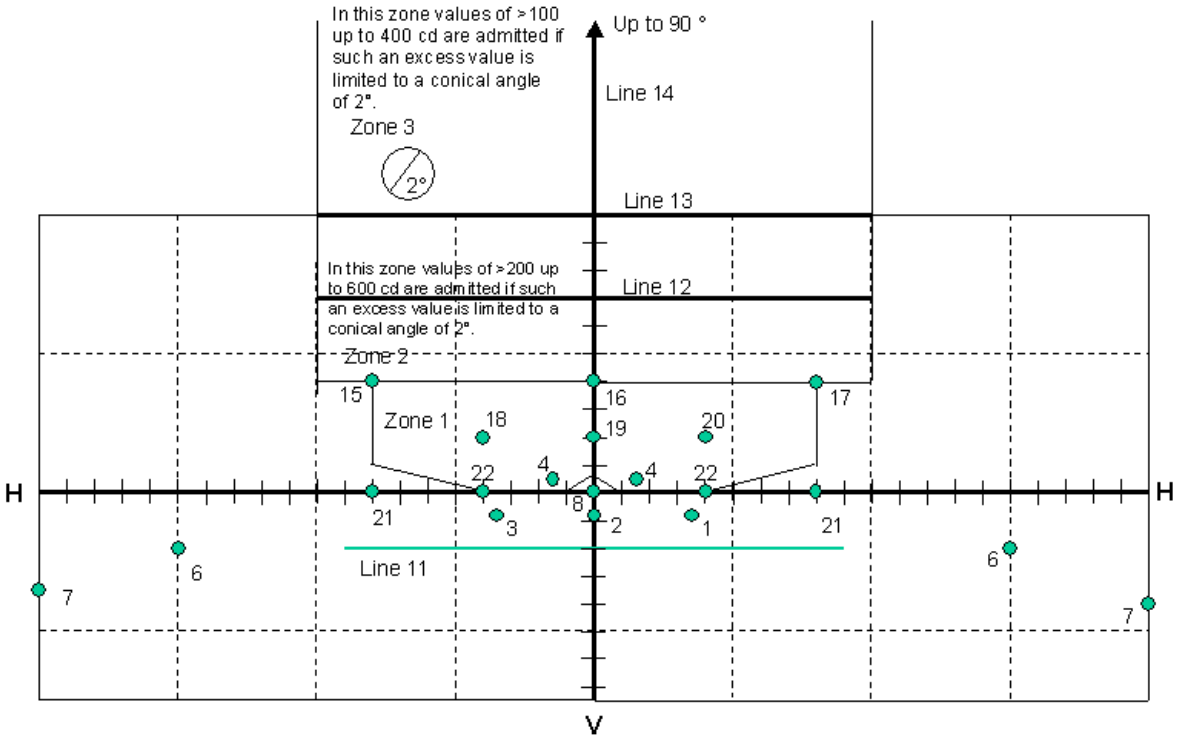
H-H : horizontal plane) passing through
V-V : vertical plane) focus of headlamp

Figure C

Measuring Screen

for Class C, D and E headlamps

(Dimensions in mm with screen at 25 m distance)



Note: The luminous intensity of zones 2 and 3 above are not applied to Class E.

Table A

Primary high beam headlamp

(Refer to Figure D for details of test point positions)

Test point number	Test point location	Required illumination in lux					
		Class D		Class C		Class E	
		MIN	MAX	MIN	MAX	MIN	MAX
1	H-V 1/	1/	---	1/	---	1/	---
2	H-3R and 3L	19.2	---	12.8	---	30	---
3	H-6R and 6L	6.4	---	4.16	---	10	---
4	H-9R and 9L	3.84	---	2.56	---	6	---
5	H-12R and 12L	1.28	---	0.8	---	2	---
6	2U-V	1.92	---	1.28	---	3	---
7	4D-V	---	2/	---	2/	---	2/
	MIN luminous intensity of the maximum	51.2	---	32	---	70	---
	MAX luminous intensity	---	180.0	---	180.0	---	180.0

1/ Intensity at H-V shall be equal to or greater than 80 per cent of the maximum intensity in the beam pattern.

2/ Intensity at 4D-V shall be equal to or less than 30 per cent of the maximum intensity in the beam pattern.

Table B

Secondary high beam headlamp operated with a harmonized passing beam headlamp or a primary driving beam headlamp

(Refer to Figure E for details of test point positions)

Test point number	Test point location	Required illumination in lux					
		Class D		Class C		Class E	
		MIN	MAX	MIN	MAX	MIN	MAX
1	H-V 1/	1/	---	1/	---	1/	---
2	H-3R and 3L	19.2	---	12.8	---	30	---
3	H-6R and 6L	6.4	---	4.16	---	10	---
6	2U-V	1.92	---	1.28	---	3	---
7	4D-V	---	2/	---	2/	---	2/
	MIN luminous intensity of the maximum	51.2	---	32	---	70	---
	MAX luminous intensity	---	180.0	---	180.0	---	180.0

1/ Intensity at H-V shall be equal to or greater than 80 per cent of the maximum intensity in the beam pattern.

2/ Intensity at 4D-V shall be equal to or less than 30 per cent of the maximum intensity in the beam pattern.

Figure D
Primary driving beam

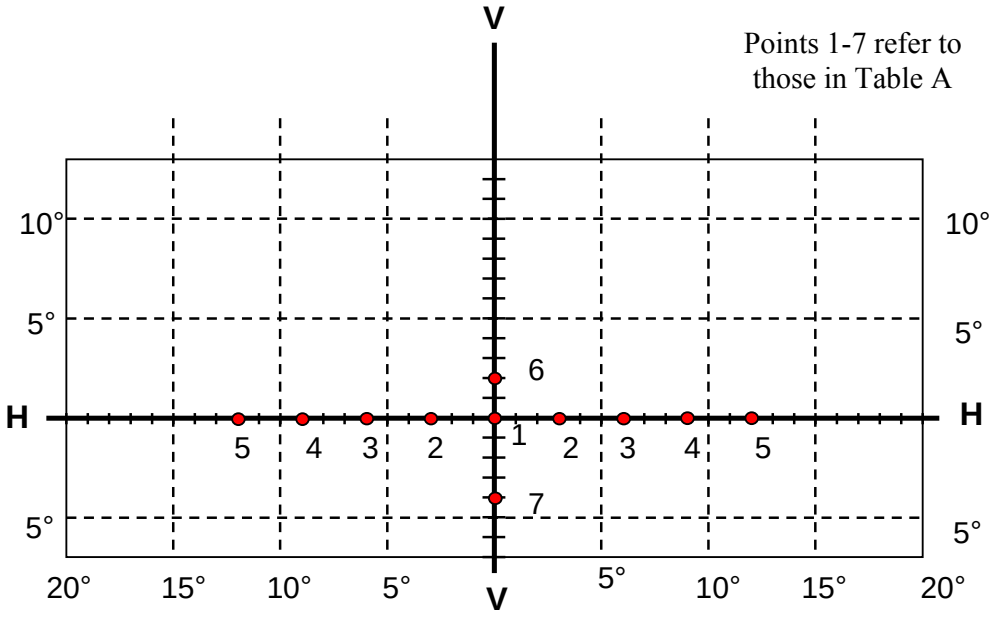
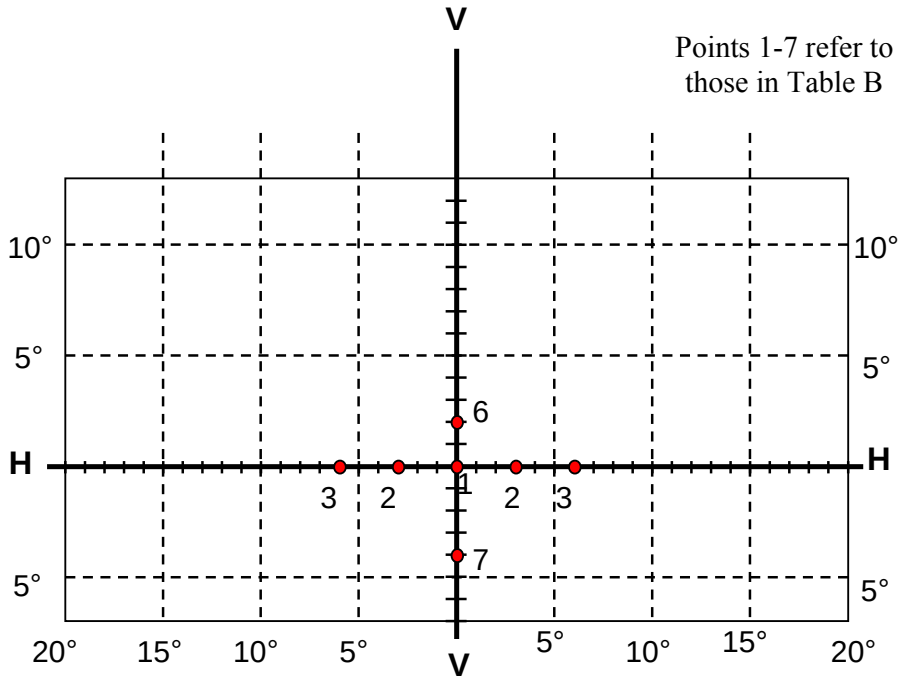


Figure E
Secondary driving beam



ANNEX D

(See 5.5)

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 standard , in the point for E_{max} for driving beam and in points HV, 50R, 50L and B50 for Class B passing beam and in points 0.86D-3.5R, 0.86D-3.5L, 0.50U-1.5L, 0.50U-1.5R and HV for Class C, D and E, for passing beam a complete headlamp sample shall be tested for stability of photometric performance in operation. "Complete headlamp" shall be understood to mean the complete lamp itself including those surrounding body parts and lamps which could influence its thermal dissipation.

D-1 Test for stability of photometric performance

The tests shall be carried out in a dry and still atmosphere at an ambient temperature of 23°C $\pm$ 5°C, the complete headlamp being mounted on a base representing the correct installation on the vehicle.

D-1.1 **Clean headlamp**

Test Procedure:

The headlamp shall be operated for 12 hours as described in D-1.1.1 and checked as prescribed in D-1.1.2.

For the test schedule see Annex H.

D-1.1.1. The headlamp shall be operated for a period according to the specified time, so that:

D-1.1.1.1 (a) In the case where only one lighting function driving or passing beam or front fog lamp is to be approved, the corresponding light source is lit for the prescribed time. (See note below)

Note : When the tested headlamp includes signalling lamps, the latter shall be lit for the duration of the test. In the case of a direction indicator lamp, it shall be lit in flashing mode with an on/off time of approximately one to one.

(b) In the case of a headlamp with a passing beam and one or more driving beams or in case of a headlamp with a passing beam and a front fog lamp:

(i) the headlamp shall be subjected to the following cycle until the time specified is reached:

- 15 minutes, passing-beam filament lit;
- 5 minutes, all functions lit.

(ii) if the applicant declares that the headlamp is to be used with only the passing beam lit or only the driving beam(s) lit {See note below} at a time, the test shall be carried out in accordance with this condition, activating {See note under D-1.1.1.1 (a)} successively the passing beam half of the time and the driving beam(s) (simultaneously) for half the time specified in D-1.1 above

Note : Should two or more lamp light source be simultaneously lit when headlamp flashing is used, this shall not be considered as being normal use of the light source simultaneously.

(c) in the case of a headlamp with a front fog lamp and one or more driving beams:

(i) the headlamp shall be subjected to the following cycle until the time specified is reached:

- 15 minutes, front fog lamp lit;
- 5 minutes, all functions lit.

(ii) if the applicant declares that the headlamp is to be used with only the front fog lamp lit or only the driving beam(s) lit {See note under D-1.1.1.1 (b)} at a time, the test shall be carried out in accordance with this condition, activating {See note under D-1.1.1.1 (a)} below) successively the front fog lamp half of the time and the driving beam(s) (simultaneously) for half the time specified in D-1.1 above.

(d) in the case of headlamp with a passing beam, one or more driving beams and a front fog lamp:

(i) the headlamp shall be subjected to the following cycle until the time specified is reached:

- 15 minutes, passing-beam filament lit;
- 5 minutes, all functions lit.

(ii) if the applicant declares that the headlamp is to be used with only the passing beam lit or only the driving beam(s) {See note under D-1.1.1.1 (b)} lit at a time, the test shall be carried out in accordance with this condition, activating {See note under D-1.1.1.1 (a)} successively the passing beam half of the time and the driving beam(s) for half the time specified in D-1.1 above, while the front fog lamp is subjected to a cycle of 15 minutes off and 5 minutes lit for half of the time and during the operation of the driving beam;

(iii) if the applicant declares that the headlamp is to be used with only the passing beam lit or only the front fog lamp {See note under D-1.1.1.1 (b)} lit at a time, the test shall be carried out in accordance with this condition, activating {See note under D-1.1.1.1 (a)} successively the passing beam half of the time and the front fog lamp for half of the time specified in D-1.1 above, while the driving beam(s) is(are) subjected to a cycle of 15 minutes off and 5 minutes lit for half of the time and during the operation of the passing beam;

(iv) if the applicant declares that the headlamp is to be used with only the passing beam lit or only the driving beam(s) {See note under D-1.1.1.1 (b)} lit or only the front fog lamp {See note under D-1.1.1.1 (b)} lit at a time, the test shall be carried out in accordance with this condition, activating {See note under D-1.1.1.1 (a)} successively the passing beam one third of the time, the driving beam(s) one third of the time and the front fog lamp for one third of the time specified in D-1.1 above.

D-1.1.1.2. **Test voltage**

In the case of a Class B, C and D headlamp, the voltage shall be adjusted so as to supply 90 per cent of the maximum wattage specified in AIS-034 (Part 1)(Rev. 1)for the filament lamp(s) used.

The applied wattage shall in all cases comply with the corresponding value of a filament lamp of 12 V rated voltage, except if the applicant for approval specifies that the headlamp may be used at a different voltage.

In the case of a Class E headlamps, the test voltage for the ballast is 13.5 ± 0.1 Volts for 12 V network system, or otherwise specified in the application for approval. If there are reciprocally incorporated filament lamps, the voltage producing the reference flux shall be used.

D-1.1.2. **Test results**

D-1.1.2.1. **Visual inspection**

Once the headlamp has been stabilized to the ambient temperature, the headlamp lens and the external lens, if any, shall be cleaned with a clean, damp cotton cloth. It shall then be inspected visually; no distortion, deformation, cracking or change in colour of either the headlamp lens or the external lens, if any, shall be noticeable.

D-1.1.2.2. **Photometric test**

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

For Class B headlamp:

Passing beam: 50R - 50L - B50 - HV.
Driving beam: Point of E_{max}

For Class C, D and E headlamps:

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

Driving beam: Point of E_{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 D-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.

D-1.2. **Dirty headlamp**

After being tested as specified in D-1.1 above, the headlamp shall be operated for one hour as described in D-1.1.1., after being prepared as prescribed in D-1.2.1., and checked as prescribed in D-1.1.2.

D-1.2.1. **Preparations of the headlamp**

D-1.2.1.1. **Test mixture**

D-1.2.1.1.1. Same as D-1.2.1.1.1 to D-1.2.1.1.4 of Annex D of Part 1.

D-1.2.1.2. **Application of the test mixture to the headlamp**

The test mixture shall be uniformly applied to the entire light-emitting surface of the headlamp and then left to dry.

This procedure shall be repeated until the illumination value has dropped to 15-20 per cent of the values measured for each following point under the conditions described in this annex:

For Class B headlamp:

Passing beam/driving beam and driving beam only: Point of E_{max}
Passing beam only: B 50 and 50 V

For Class C D and E headlamps

Passing beam/driving beam and driving beam only: Point of E_{max}
Passing beam only: 0.50U/1.5L & 1.5R and 0.86D/V

D-1.2.1.3 **Measuring equipment**

The measuring equipment shall be equivalent to that used during headlamp approval tests. A standard (étalon) filament lamp or gas-discharge light source supplied by the applicant shall be used for the photometric verification.

D-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.

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

D-2.1. Test

The test shall be carried out in a dry and still atmosphere at an ambient temperature of $23^{O}C \pm 5^{O}C$.

Using a mass production filament lamp which has been aged for at least one hour or a mass production gas-discharge light source which has been aged for at least 15 hours, the headlamp shall be operated on passing beam without being dismounted from or readjusted in relation to its test fixture. (For the purpose of this test, the voltage shall be adjusted as specified in D-1.1.1.2.).

The position of the "cut-off" line in its horizontal part (between the vertical lines passing through point 50 L and 50 R for Class B headlamp, 3.5 L and 3.5 R for Class C, D and E headlamp) shall be verified 3 minutes (r_3) and 60 minutes (r_{60}) respectively after operation.

The measurement of the variation in the cut-off line position as described above shall be carried out by any method giving acceptable accuracy and reproducible results.

D-2.2. **Test results**

Same as D-2.2.of Annex D of Part 1 of this standard

ANNEX E

(See 9.2)

MINIMUM REQUIREMENTS FOR CONFORMITY OF PRODUCTION CONTROL PROCEDURES

E-1. General

E-1.1. The conformity requirements shall be considered satisfied from a mechanical and a geometrical standpoint, if the differences do not exceed inevitable manufacturing deviations within the requirements of this standard. This condition also applies to colour.

E-1.2. **For Class A, B, C and D headlamp**

E-1.2.1 With respect to photometric performances, the conformity of mass-produced headlamps shall not be contested if, when testing photometric performances of any headlamp chosen at random and equipped with a standard filament lamp.

E-1.2.2. **Class A headlamp:** No measured value deviates unfavourably by more than 20 per cent from the value prescribed in this standard.

E-1.2.3. **Class B, C and D headlamp**

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

0.3 lux equivalent 20 per cent

0.45 lux equivalent 30 per cent

E-1.2.3.2. And if, for the driving beam, HV being situated within the isolux 0.75 E_{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 6.2.3.2 and 6.3.2.2 of this standard.

E-1.2.4. If the results of the tests described above do not meet the requirements tests shall be repeated using another standard filament lamp.

E-1.3. **For Class E headlamp**

E-1.3.1 With respect to photometric performance, the conformity of mass-produced headlamps shall not be contested when testing photometric performance of any headlamp chosen at random and measured at 13.5 V ± 0.1 V or as otherwise specified if either equipped with a removable standard gas-discharge light source. The luminous flux of this gas-discharge light source may differ from the reference luminous flux specified in AIS-034 (Part 2)(Rev. 1). In this case, the illuminances shall be corrected accordingly; or

Equipped with the serial production gas-discharge light source and the serial ballast. The luminous flux of this light source may deviate from the nominal luminous flux due to light source and ballast tolerances as specified in AIS-034 (Part 2)(Rev. 1); accordingly the measured illuminances may be corrected by 20 per cent in the favourable direction.

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

0.3 lux equivalent 20 per cent
0.45 lux equivalent 30 per cent

E-1.3.3. And if, for the driving beam, HV being situated within the isolux 0.75 E_{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 6.3.2.1 and 6.3.2.2 of this standard

E-1.3.4. 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.

E-1.3.5. If the results of the tests described above do not meet the requirements, tests on the headlamp shall be repeated using another standard gas-discharge light source or gas-discharge light source and ballast, whatever is applicable according to E-1.3.1 above.

E-1.4 With respect to the verification of the change in vertical position of the "cut-off" line under the influence of heat, the following procedure shall be applied (Class B, C, D and E headlamps only):

One of the sampled headlamps shall be tested according to the procedure described in D-2.1 of Annex D after being subjected three consecutive times to the cycle described in D-2.2.2 of Annex D.

The headlamp shall be considered as acceptable if Δr does not exceed 1.5 mrad

If this value exceeds 1.5 mrad but is not more than 2.0 mrad, a second sample shall be subjected to the test after which the mean of the absolute values recorded on both samples shall not exceed 1.5 mrad.

E-1.5 Headlamps with apparent defects are disregarded.

E-1.6 If, however, for a series of samples vertical adjustment cannot be performed repeatedly to the required position within the allowed tolerances, the quality of "cut-off" shall be tested on one of the headlamps from the series of samples, according to the procedure described in J-2 and J-4 of Annex J.

E-2. Minimum requirements for verification of conformity by the manufacturer

For each type of headlamp the holder of the approval mark shall carry out at least the following tests, at appropriate intervals. The tests shall be carried out in accordance with the provision of this standard.

If any sampling shows non-conformity with regard to the type of test concerned, further samples shall be taken and tested. The manufacturer shall take steps to ensure the conformity of the production concerned.

E-2.1. **Nature of tests**

Tests of conformity in this standard shall cover the photometric characteristics and for Class B, C, D and E headlamps the verification of the change in vertical position of the cut-off line under influence of heat.

E-2.2. Methods used in tests

Same as E-2.2.of Annex E of Part 1 of this standard.

E-2.3. Nature of sampling

Same as E-2.3.of Annex E of Part 1 of this standard.

E-2.4. Measured and recorded photometric characteristics

The sampled headlamps shall be subjected to photometric measurements at the points provided for in the standard, the reading being limited at the points:

E-2.4.1. For Class A headlamps: HV, LH, RH, 12.5L and 12.5R

E-2.4.2. For Class B headlamps: E_{max}, HV (See note below) in the case of the driving beam, and to the points HV, 50R, 50L, in the case of the passing beam.

Note : When the driving beam is reciprocally incorporated with the passing beam, HV in the case of the driving beam shall be the same measuring point as in the case of the passing beam.

E-2.4.3 For Class C, D and E headlamps: E_{max}, HV, (See note below E-2.4.2.) 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.

E-2.5. **Criteria governing acceptability**

The manufacturer is responsible for carrying out a statistical study of the test results and for defining, in agreement with the testing agency, criteria governing acceptability of his products in order to meet the specification laid down for verification of conformity of products in 9.1 of this standard.

The criteria governing acceptability shall be such that, with a confidence level of 95 per cent, the minimum probability of passing a spot check in accordance with Annex G (first sampling) would be 0.95.

ANNEX F

(See 5.6)

REQUIREMENTS FOR HEADLAMPS INCORPORATING LENSES OF PLASTIC MATERIAL - TESTING OF LENS OR MATERIAL SAMPLES AND OF COMPLETE HEADLAMPS

F-1 General specifications

F-1.1 The samples supplied pursuant to 2.2.4 of this standard shall satisfy the specifications indicated in F-2.1 to F-2.5 below.

F-1.2 The two samples of complete headlamps supplied pursuant to 2.2.3 of this standard and incorporating lenses of plastic material shall, with regard to the lens material, satisfy the specifications indicated in F-2.6 below.

F-1.3 The samples of lenses of plastic material or samples of material shall be subjected, with the reflector to which they are intended to be fitted (where applicable), to approval tests in the chronological order indicated in A of Table F1 of this Annex.

F-1.4 However, if the headlamp manufacturer can prove that the product has already passed the tests prescribed in F-2.1 to F-2.5 below, or the equivalent tests pursuant to another standard, those tests need not be repeated; only the tests prescribed in B of Table F-1, shall be mandatory.

F-2 Test

F-2.1 **Resistance to temperature changes**

F-2.1.1 Tests

Same as F-2.1.1 of Annex F of Part 1 of this standard.

F-2.1.2 **Photometric measurements**

F-2.1.2.1 **Method**

Photometric measurements shall be carried out on the samples before and after the test.

These measurements shall be made using a standard (étalon) lamp, or standard gas-discharge light source, at the following points:

B 50, 50L and 50R for Class B headlamp,

0.86D/3.5R, 0.86D/3.5L, 0.50U/1.5L and 1.5R for Class C, D and E headlamp for the passing beam or a passing/driving lamp;

E_{max} for the driving beam of a driving lamp or a passing/driving lamp;

F-2.1.2.2 **Results**

Same as F-2.1.2.2 of Annex F of Part 1 of this standard.

F-2.2 **Resistance to atmospheric and chemical agents**

F-2.2.1 **Resistance to atmospheric agents**

Same as F-2.2.1 of Annex F of Part 1 of this standard.

F-2.2.2 **Resistance to chemical agents:**

Same as F-2.2.2 and F-2.2.3. of Annex F of Part 1 of this standard.

F-2.3 **Resistance to detergents and hydrocarbons**

F-2.3.1 Same as F-2.3 of Annex F of Part 1 of this standard.

F-2.4 **Resistance to mechanical deterioration**

Same as F-2.4 of Annex F of Part 1 of this standard.

F-2.5 **Test of adherence of coatings, if any**

F-2.5.1 to F-2.5.3. Same as F-2.5.1 to 2.5.3 of Annex F of Part 1 of this standard.

F-2.5.4. **Resistance to light source radiations for Class E**

Subject to conditions prescribed in 2.2.5.2, the following test shall be done:

Flat samples of each light transmitting plastic component of the headlamp are exposed to the light of the gas-discharge light source. The parameters such as angles and distances of these samples shall be the same as in the headlamp. These samples shall have the same colour and surface treatment, if any, as the parts of the headlamp.
After 1,500 hours of continuous exposure, the colorimetric specifications of the transmitted light shall be met with a new standard gas-discharge light source, and the surfaces of the samples shall be free of cracks, scratches, scalings or deformation

F-2.6 **Tests of the complete headlamp incorporating a lens of plastic material**

F-2.6.1 **Resistance to mechanical deterioration of the lens surface**

F-2.6.1.1 **Tests**

The lens of headlamp sample No. 1 shall be subjected to the test described in F-2.4.1 of Annex F of Part 1 of this standard.

F-2.6.1.2 **Results**

After the test, the results of photometric measurements carried out on the headlamp in accordance with this standard shall not exceed by more than 30 per cent the maximum values prescribed at point HV and not be more than 10 per cent below the minimum values prescribed at point 50 L and 50 R for Class B headlamp, 0.86D/3.5R, 0.86D/3.5L for Class C, D and E headlamp.

F-2.6.2 Test of adherence of coatings, if any.

Same as F-2.6.2 of Annex F of Part 1 of this standard.

F-3 Verification of the Conformity of Production

F-3.1 Same as F-3 of Annex F of Part 1.

F-4 Method of Measurement of the Diffusion and Transmission of Light

Same as F-4 of Annex F of Part 1.

F-5 Spray Testing Method

Same as F-5 of Annex F of Part 1.

F-6 Adhesive Tape Adherence Test

Same as F-6 of Annex F of Part 1.

Table F-1

(See F-1.3 and F-1.4)

CHRONOLOGICAL ORDER OF APPROVAL TESTS

A. Tests on plastic materials (lenses or samples of material supplied pursuant to paragraph 2.2.4**.** of this standard).

Samples / Tests	Lenses or samples of material							Lenses						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.1. Limited photometry (para. F-2.1.2.)											x	x	x	
1.1.1. Temperature change (para. F-2.1.1.)											x	x	x	
1.1.2. Limited photometry (para. F-2.1.2.)											x	x	x	
1.2.1. Transmission measurement	x	x	x	x	x	x		x	x	x				
1.2.2. Diffusion measurement	x	x	x					x	x	x				
1.3. Atmospheric agents (para. F-2.2.1.)	x	x	x											
1.3.1. Transmission measurement	x	x	x											
1.4. Chemical agents (para. F-2.2.2.)	x	x	x											
1.4.1. Diffusion measurement	x	x	x											
1.5. Detergents (para. F-2.3.1.)				x	x	x								
1.6. Hydrocarbons (para. F-2.3.2.)				x	x	x								
1.6.1. Transmission measurement				x	x	x								
1.7. Deterioration (para. F-2.4.1.)								x	x	x				
1.7.1. Transmission measurement								x	x	x				
1.7.2. Diffusion measurement								x	x	x				
1.8. Adherence (para. F-2.5.)														x
1.9. Resistance to light source radiations (para. F-2.5.4.)							x							

B. Tests on complete headlamps (supplied pursuant to paragraph 2.2.3.of this standard).

Tests	Complete headlamp	
	Sample No.	
	1	2
2.1. Deterioration (para. F-2.6.1.1.)	x	
2.2. Photometry (para. F-2.6.1.2.)	x	
2.3. Adherence (para. F-2.6.2.)		x

ANNEX G

(See 9.3)

MINIMUM REQUIREMENTS FOR SAMPLING BY TESTING AGENCY

G-1. General

G-1.1. The conformity requirements shall be considered satisfied from a mechanical and a geometrical standpoint in accordance with the requirements of this standard, if any, if the differences do not exceed inevitable manufacturing deviations. This condition also applies to colour.

G-1.2. **For Class A, B, C and D headlamp:**

G-1.2.1. With respect to photometric performances, the conformity of mass-produced headlamps shall not be contested if, when testing photometric performances of any headlamp chosen at random and equipped with a standard filament lamp:

G-1.2.2. Class A headlamps: no measured value deviates unfavourably by more than 20 per cent from the value prescribed in this standard.

G-1.2.3. **Class B, C and D headlamps:**

G-1.2.3.1. No measured value deviates unfavourably by more than 20 per cent from the value prescribed in this standard. For values in zone III for Class B headlamp, zone I for Class C and D headlamp, the maximum unfavourable deviation may be respectively

0.3 lux equivalent 20 per cent
0.45 lux equivalent 30 per cent

G-1.2.3.2. And if for the driving beam, HV being situated within the isolux 0.75 E_{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 6.2.3.2 and 6.3.2.2 of this standard.

G-1.2.4. If the results of the tests described above do not meet the requirements, tests shall be repeated using another standard filament lamp.

G-1.3. **For Class E headlamp:**

G-1.3.1. With respect to photometric performance, the conformity of mass-produced headlamps shall not be contested when testing photometric performance of any headlamp chosen at random and measured at 13.5 V ± 0.1 V or as otherwise specified if:

Either equipped with a removable standard gas-discharge light source. The luminous flux of this gas-discharge light source may

differ from the reference luminous flux specified in AIS-034 (Part 2)(Rev. 1). In this case, the illuminances shall be corrected accordingly; or

Equipped with the serial production gas-discharge light source and the serial ballast. The luminous flux of this light source may deviate from the nominal luminous flux due to light source and ballast tolerances as specified in AIS-034 (Part 2)(Rev. 1), accordingly the measured illuminances may be corrected by 20 per cent in the favourable direction.

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

0.3 lux equivalent 20 per cent
0.45 lux equivalent 30 per cent

G-1.3.3. And if, for the driving beam, HV being situated within the isolux 0.75 E_{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 6.3.2.1 and 6.3.2.2 of this standard.

G-1.3.4. 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..

G-1.3.5. If the results of the tests described above do not meet the requirements, tests on the headlamp shall be repeated using another standard gas-discharge light source or gas-discharge light source and ballast, whatever is applicable according to G-1.3.1 above.

G-1.4 Headlamps with apparent defects are disregarded.

G-1.5 If, however, for a series of samples vertical adjustment cannot be performed repeatedly to the required position within the allowed tolerances, the quality of "cut-off" shall be tested on one of the headlamps from the series of samples, according to the procedure described in J-2 and J-4 Annex J.

G-2. FIRST SAMPLING

In the first sampling four headlamps are selected at random. The first sample of two is marked A, the second sample of two is marked B.

G-2.1. The conformity is not contested

G-2.1.1. Same as G-2.1.1 to G-2.1.1.2 of Annex G of Part 1 of this standard.

G-2.2. The conformity is contested

G-2.2.1. Same as G-2.2.1 to G-2.2.1.2 of Annex G of Part 1 of this standard.

G-2.3. **Non conformity established**

Conformity shall be contested and conditions of 10 applied if, following the sampling procedure shown in Figure G-1 of this annex the deviations of the measured values of the headlamps are:

G-2.3.1. Same as G-2.3.1 of Annex G of Part 1 of this standard.

G-2.3.2. Same as G-2.3.2 of Annex G of Part 1 of this standard.

G-3. Repeated Sampling

Same as G-3 of Annex G of Part 1 of this standard.

G-3.1. **The conformity is not contested**

G-3.1.1. Same as G-3.1.1, to G-3.1.1.2 of Annex G of Part 1 of this standard.

G-3.1.1.1. sample C

G-3.2. The conformity is contested

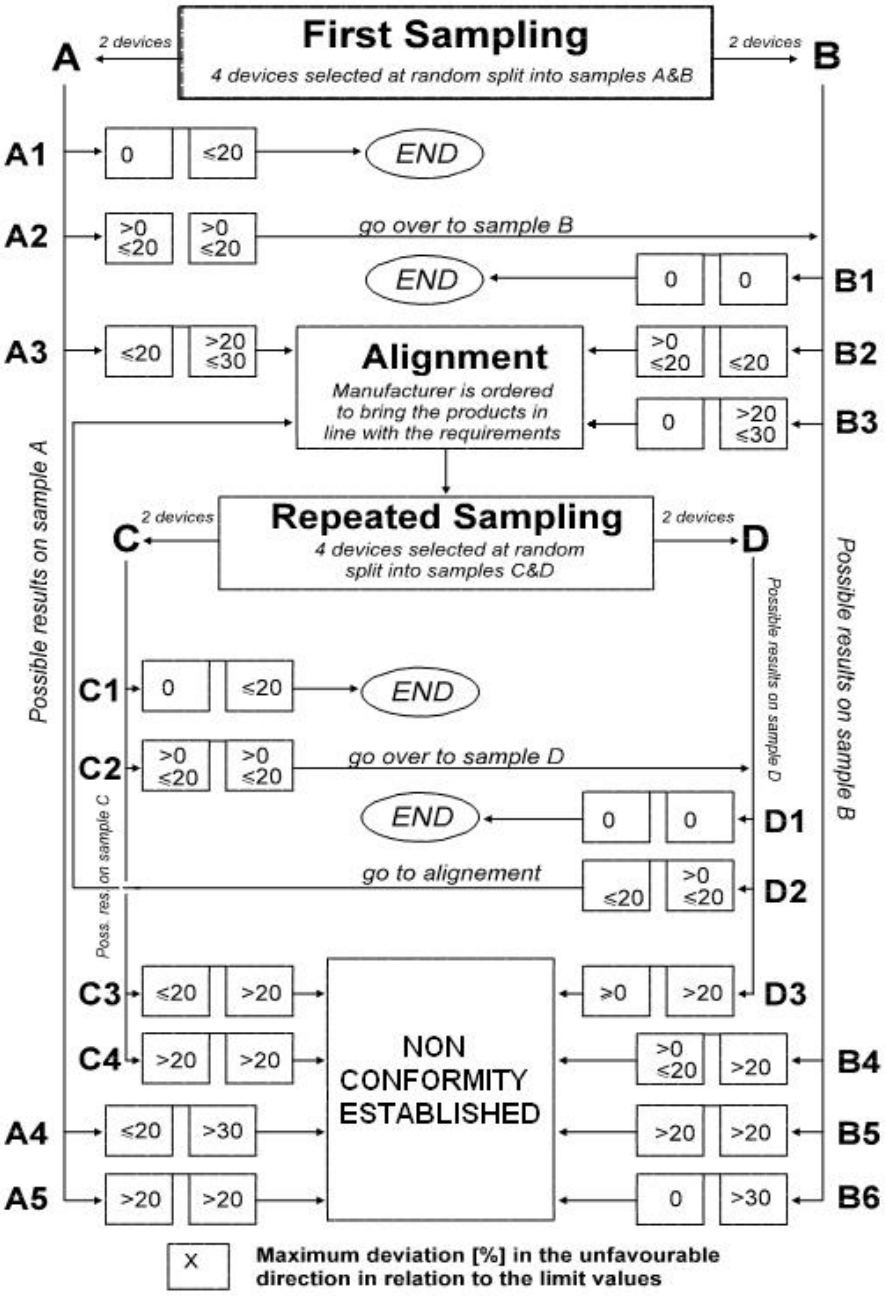
G-3.2.1. Same as G-3.2.1, G-3.2.1.1. of Annex G of Part 1 of this standard.

G-3.3. Non Compliance Established.

Conformity shall be contested and conditions of 10 applied if, following the sampling procedure shown in Figure G-1 of this annex AIS-010 (Part 1)(Rev. 1), the deviations of the measured values of the headlamps are:

G-3.3.1. Same as G-3.3.1 and G-3.3.2 of Annex G of Part 1 of this standard.

Figure G-1


First Sampling
4 devices selected at random split into samples A&B
2 devices
2 devices
A
B
A1
A2
A3
A4
A5
B1
B2
B3
B4
B5
B6
0
≤20
>0 ≤20
>20 ≤30
>30
END
go over to sample B
Alignment
Manufacturer is ordered to bring the products in line with the requirements
Repeated Sampling
4 devices selected at random split into samples C&D
C
D
C1
C2
C3
C4
D1
D2
D3
go over to sample D
go to alignement
NON CONFORMITY ESTABLISHED
Possible results on sample A
Possible results on sample B
Possible results on sample C
Possible results on sample D
X
Maximum deviation [%] in the unfavourable direction in relation to the limit values

ANNEX H

(See D-1.1 of Annex D)

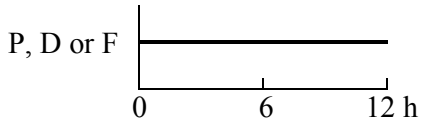
OVERVIEW OF OPERATIONAL PERIODS CONCERNING TEST FOR STABILITY OF PHOTOMETRIC PERFORMANCE

Abbreviations: P: passing beam lamp
D: driving beam lamp (D_1 + D_2 means two driving beams)
F: front fog lamp

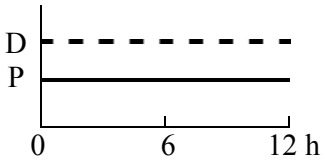
– – – – – – : means a cycle of 15 minutes off and 5 minutes lit.

All following grouped headlamps and front fog lamps together with the added class B marking symbols are given as examples and are not exhaustive.

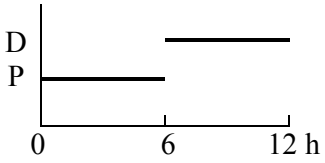
D-1. P or D or F (C-BS or R-BS or B)



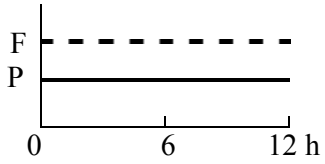
D-2. P+D (CR-BS) or P+D_1+D_2 (CR-BS R-BS)



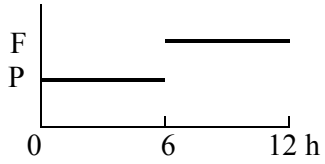
D-3. P+D (C/R-BS) or P+D_1+D_2 (C/R-BS R-BS)



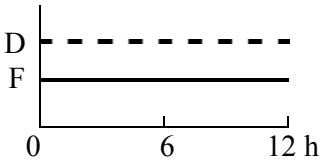
D-4. P+F (C-BS B)



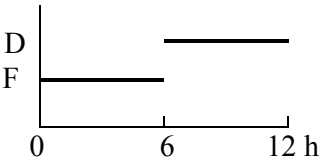
D-5. P+F (C-BS B/) or C-BS/B



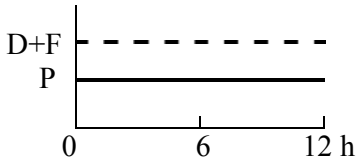
D-6. D+F (R-BS B) or D_1+D_2+F (R-BS R-BS B)



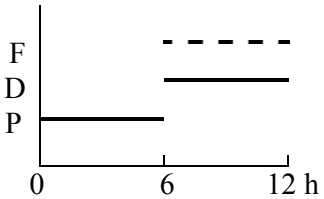
D-7. D+F (R-BS B/) or D_1+D_2+F (R-BS R-BS B/)



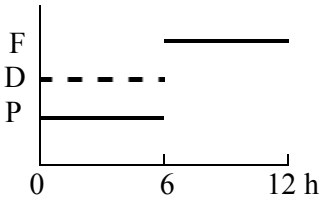
D-8. P+D+F (CR-BS B) or P+D_1+D_2+F (CR-BS R-BS B)



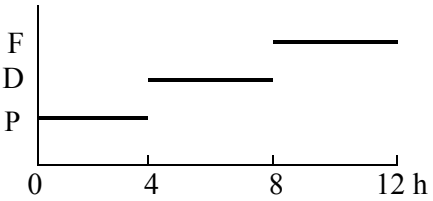
D-9. P+D+F (C/R-BS B) or P+D_1+D_2+F (C/R-BS R-BS B)



D-10. P+D+F (CR-BS B/) or P+D_1+D_2+F (CR-BS R-BS B/)



D-11. P+D+F (C/R-BS B/) or P+D_1+D_2+F (C/R-BS R-BS/B)



ANNEX J

(See 6.2.1 & E-1.6)

DEFINITION AND SHARPNESS OF THE "CUT-OFF" LINE FOR SYMMETRICAL PASSING-BEAM HEADLAMPS AND AIMING PROCEDURE BY MEANS OF THIS "CUT-OFF" LINE

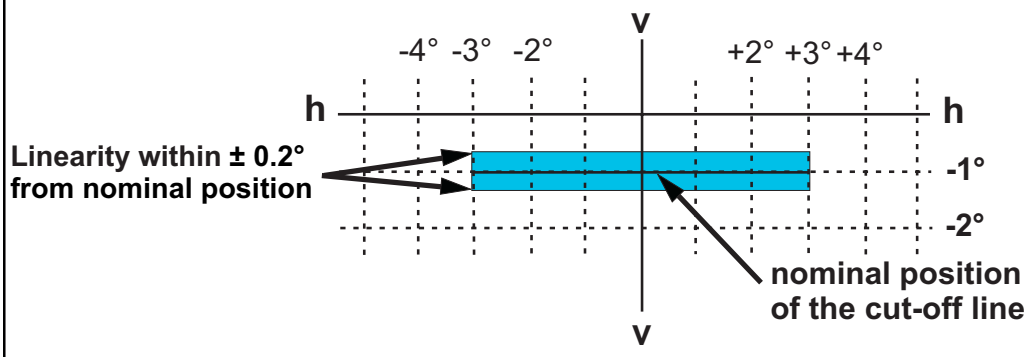
J-1. General

J-1.1. The luminous intensity distribution of the symmetrical passing-beam headlamps shall incorporate a "cut-off" line which enables the symmetrical passing-beam headlamp to be adjusted correctly for the photometric measurements and for the aiming on the vehicle. The characteristics of the "cut-off" line shall comply with the requirements set out in J-2 to J-4 below:

J-2. Shape of the "Cut-off" line

J-2.1. For visual adjustment of the symmetrical passing-beam headlamp the cut-off line shall provide: a horizontal line for vertical adjustment of the symmetrical passing-beam headlamp extending to either side of the v-v-line (see Figure 1) as specified in 6.2.1 of this standard.

Figure 1: Shape and position of the "cut-off" line



J-3. Adjustment of the symmetrical passing-beam headlamp:

J-3.1. Horizontal adjustment: The beam with the "cut-off" line shall be so positioned that the projected beam pattern appears approximately symmetrical to the v-v-line.

J-3.2. Vertical adjustment: After horizontal adjustment of the symmetrical passing-beam headlamp according to J-3.1 above, the vertical adjustment shall be performed in such a way that the beam with its cut-off line is moved upwards from the lower position until the cut-off line is situated at nominal vertical position. For nominal vertical adjustment the cut-off line is positioned on the v-v-line at 1 percent below the h-h-line.

If the horizontal part is not straight but slightly curved or inclined, the cut-off line shall not exceed the vertical range formed by two horizontal lines which are situated from 3° left to 3° right of the v-v-line at 0.2° for class B and 0.3° for class A, C, D and E head lamps above and below the nominal position of the cut-off (see Figure 1).

J-3.3. When the vertical adjustments of three different individuals differs by more than 0.2° for class B and 0.3° for class A, C, D and E head lamps, the horizontal part of the cut-off line is assumed not to provide sufficient linearity or sharpness for performing visual adjustment. In this case the quality of cut-off shall be tested instrumentally for compliance with requirements as follows.

J-4. Measurement of the quality of "Cut-off"

J-4.1 Measurements shall be performed by vertically scanning through the horizontal part of the cut-off line in angular steps not exceeding 0.05°

(a) - at either a measurement distance of 10 m and a detector with a diameter of approximately 10 mm.

(b) - or at a measurement distance of 25 m and a detector with a diameter of approximately 30 mm.

The measurement of the cut-off quality shall be considered acceptable if the requirements of the J-4.1.2 shall comply with at least one measurement at 10 m or 25 m.

The measuring distance at which the test was determined shall be noted down in the test report.

The scanning is performed from its lower position upwards through the cut-off line along the vertical lines at –3° to -1.5°, +1.5° to +3° from the v-v-line. When so measured, the quality of the "cut-off" line shall meet the following requirements:

J-4.1.1. Not more than one cut-off line shall be visible.

J-4.1.2. Sharpness of cut-off: if scanned vertically through the horizontal part of the cut-off line along the ±2.5 -lines, the maximum value measured for:

$$G = (\log E_V - \log E_{(V + 0.1°)})$$

is called the sharpness factor G of the cut-off line. The value of G shall not be less than 0.13 for class B and 0.08 for classes A, C, D and E

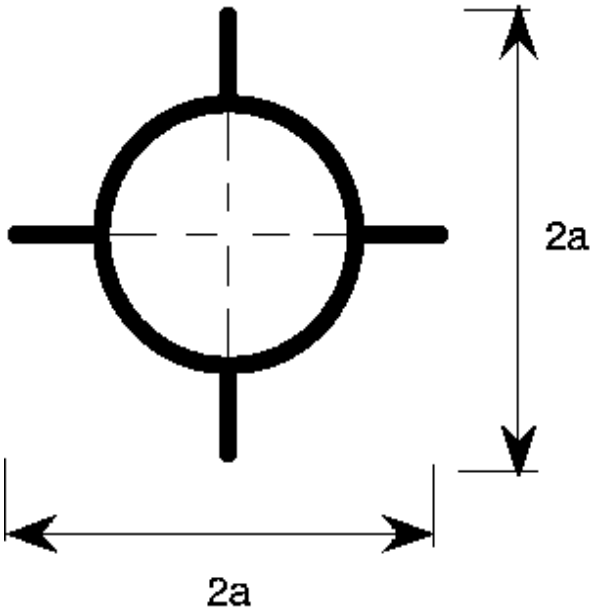
J-4.1.3. Linearity: the part of the cut-off line which serves for vertical adjustment shall be horizontal from 3°L to 3°R of the v-v-line. This requirement is deemed to be met if the vertical positions of the inflection points according to J-3.2 above at 3° left and right of the v-v-line do not differ by more than 0.2° for class B and 0.3° for class A, C, D and E head lamps from the nominal position at the v-v-line.

J-5. **Instrumental vertical adjustment:** if the cut-off line complies with the above quality requirements, the vertical beam adjustment can be performed instrumentally. For this purpose the inflection point where $d^2 (\log E) / dv^2 = 0$ is positioned on the v-v-line in its nominal position below the h-h-line. The movement for measuring and adjusting the "cut-off" line shall be upwards from below the nominal position.

ANNEX K

CENTRE OF REFERENCE

Diameter = a



a = 2 mm min.

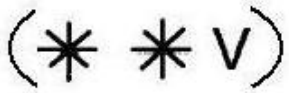
This optional mark of the centre of reference shall be positioned on the lens at its intersection with the reference axis of the passing beam, and also on the lenses of the driving beams when they are neither grouped nor combined nor reciprocally incorporated with a passing beam.

The above drawing represents the mark of the centre of reference as projected on a plane substantially tangent to the lens about the centre of the circle. The lines constituting this mark may either be solid or dotted.

ANNEX L

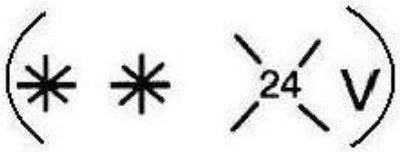
(See 3.5)

VOLTAGE MARKINGS



This marking shall be placed on the main body of each headlamp containing only gas discharge light sources and ballast, and on each external part of the ballast.

The ballast(s) is(are) designed for a ** Volts network system.



This marking shall be placed on the main body of each headlamp containing at least one gas discharge light source and ballast.

The ballast(s) is(are) designed for a ** Volts network system.

None of the filament lamps which the headlamp contains is designed for a 24 Volts network system.

ANNEX M

(See Introduction)

COMPOSITION OF AISC PANEL ON LIGHTING AND LIGHT SIGNALLING DEVICES*

Convener	
Mr. T. M. Balaraman	Bajaj Auto Ltd., (SIAM)
Members	**Representing**
Mr. A. S. Bhale	The Automotive Research Association of India (ARAI)
Mr. B. V. Shamsundara	The Automotive Research Association of India (ARAI)
Mr. D. P. Saste	Central Institute of Road Transport (CIRT)
Mr. V. D. Chavan	Central Institute of Road Transport (CIRT)
Dr. Madhusudan Joshi	International Centre for Automotive Technology (ICAT)
Mr. G.R.M. Rao	Vehicle Research & Dev. Estt. (VRDE)
Dr. N. Karuppaiah	National Automotive Testing and R&D Infrastructure Project (NATRIP)
Mr. K. K. Gandhi	Society of Indian Automobile Manufacturers (SIAM)
Mr. G. K. Binani	Society of Indian Automobile Manufacturers (SIAM) (Tata Motors Ltd)
Mr. P. K. Banerjee	Society of Indian Automobile Manufacturers (SIAM) (Tata Motors Ltd)
Mr. R. M. Kanitkar	Society of Indian Automobile Manufacturers (SIAM) (Force Motors Ltd.)
Mr. Z. A. Mujawar	Society of Indian Automobile Manufacturers (SIAM) (Mahindra and Mahindra Ltd)
Mr. Nagendra H. V.	Society of Indian Automobile Manufacturers (SIAM) (Toyota Kirloskar Motor Pvt. Ltd)
Mr. Prakash Vemali	Society of Indian Automobile Manufacturers (SIAM) (Mercedes Benz India Ltd.)
Mr. Jitendra Malhotra	Society of Indian Automobile Manufacturers (SIAM) (Maruti Suzuki India Ltd)
Mr. Sumit Sharma	Society of Indian Automobile Manufacturers (SIAM) (Volkswagen India Private Ltd.)
Mr. Harjeet Singh	Society of Indian Automobile Manufacturers (SIAM) (Hero Honda Motors Ltd)
Mr. Harsh Agrawal	Society of Indian Automobile Manufacturers (SIAM) (Hero Honda Motors Ltd)
Mr. S Ramiah	Society of Indian Automobile Manufacturers (SIAM) (TVS Motor Company Limited)

Mr. T.C. Gopalan,	Tractor Manufacturers Association (TMA)
Mr. K. N. D. Nambudiripad	Automotive Component Manufacturers Association (ACMA)
Mr. G. V. George	FIEM Industries Ltd. (ACMA)
Mr. Rajagopalan	FIEM Industries Ltd. (ACMA)
Mr. Virendra Sachdev	Lumax Industries Ltd. (ACMA)
Mr. Sagar Kulkarni	Rinder India Pvt. Ltd. (ACMA)
Mr. T. V. Singh	Bureau of Indian Standards (BIS)
Mr. Rajiv Agarwal	All India Auto & Miniature Bulbs & Component Mfrs. Association
Mr. C. K. Choudhari	All India Auto & Miniature Bulbs & Component Mfrs. Association

* At the time of approval of this Automotive Industry Standard (AIS)

ANNEX N

(See Introduction)

COMMITTEE COMPOSITION *

Automotive Industry Standards Committee

Chairman	
Shri Shrikant R. Marathe	Director The Automotive Research Association of India, Pune
Members	**Representing**
Representative from	Ministry of Road Transport & Highways (Dept. of Road Transport & Highways), New Delhi
Representative from	Ministry of Heavy Industries & Public Enterprises (Department of Heavy Industry), New Delhi
Shri S. M. Ahuja	Office of the Development Commissioner, MSME, Ministry of Micro, Small & Medium Enterprises, New Delhi
Shri T. V. Singh	Bureau of Indian Standards, New Delhi
Director Shri D. P. Saste (Alternate)	Central Institute of Road Transport, Pune
Dr. M. O. Garg	Indian Institute of Petroleum, Dehra Dun
Shri C. P. Ramnarayanan	Vehicles Research & Development Establishment, Ahmednagar
Representatives from	Society of Indian Automobile Manufacturers
Shri T.C. Gopalan	Tractor Manufacturers Association, New Delhi
Shri K.N.D. Nambudiripad	Automotive Components Manufacturers Association of India, New Delhi

Member Secretary
Mrs. Rashmi Urdhwareshe
Deputy Director
The Automotive Research Association of India, Pune

* At the time of approval of this Automotive Industry Standard (AIS)