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AGREEMENT

CONCERNING THE ADOPTION OF UNIFORM CONDITIONS OF APPROVAL AND RECIPROCAL RECOGNITION OF APPROVAL FOR MOTOR VEHICLE EQUIPMENT AND PARTS

done at Geneva on 20 March 1958

Addendum 71: Regulation No. 72

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**UNIFORM PROVISIONS CONCERNING THE APPROVAL OF MOTOR CYCLE
HEADLAMPS EMITTING AN ASYMMETRICAL PASSING BEAM AND A
DRIVING BEAM AND EQUIPPED WITH HALOGEN LAMPS (HS₁ LAMPS)**



UNITED NATIONS

Regulation No.72

UNIFORM PROVISIONS CONCERNING THE APPROVAL OF MOTOR CYCLE
HEADLAMPS EMITTING AN ASYMMETRICAL PASSING BEAM AND A
DRIVING BEAM AND EQUIPPED WITH HALOGEN LAMPS (HS₁ LAMPS)

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ANNEXES

- Annex 1 Communication concerning the approval or refusal or extension or withdrawal of approval or production definitely discontinued of a type of motor cycle headlamp pursuant to Regulation No. 72
- Annex 2 Verification of conformity of production of headlamps equipped with HS₁ lamps
- Annex 3 Arrangements of approval marks
- Annex 4 Measuring screen
- Annex 5 Tests for stability of photometric performance of headlamps in operation

Regulation No. 72

UNIFORM PROVISIONS CONCERNING THE APPROVAL OF MOTOR CYCLE
HEADLAMPS EMITTING AN ASYMMETRICAL PASSING BEAM AND A
DRIVING BEAM AND EQUIPPED WITH HALOGEN LAMPS (HS₁ LAMPS)

1. SCOPE

This Regulation applies to the approval of headlamps equipped with halogen filament lamps (HS₁ lamps), which are provided for the equipment of motor cycles and vehicles treated as such.

2. DEFINITION OF "TYPE"

Headlamps of different "types" means headlamps which differ in such essential respects as:

2.1 The trade name or mark;

2.2 The characteristics of the optical systems;

2.3 The inclusion or elimination of components capable of altering the optical effects by reflection, refraction or absorption and/or deformation during operation. A change in the colour of the beams emitted by headlamps whose other characteristics are not changed does not constitute a change of headlamp type. The same approval number shall accordingly be assigned to such headlamps;

2.4 Suitability for right-hand or left-hand traffic or for both traffic systems.

3. APPLICATION FOR APPROVAL

3.1 The application for approval of a headlamp shall be submitted by the holder of the trade name or mark or by his duly accredited representative. The application shall specify:

3.1.1 Whether the headlamp is designed for both left-hand and right-hand traffic or for either left-hand or right-hand traffic only.

3.2 Any application for approval shall be accompanied by:

3.2.1 Drawings in triplicate, sufficiently detailed to permit identification of the type (see paragraphs 4.2 and 5.3) and showing the headlamp in cross (vertical) section and in front elevation, with details of the flutings, if any, of the glass;

3.2.2 A brief technical description;

3.2.3 Samples, as follows:

3.2.3.1 Two samples with colourless glasses;

3.2.3.2 For the testing of a coloured filter or coloured screen (or of a

coloured glass): two samples.

4. MARKINGS 1/

- 4.1 Headlamps submitted for approval shall bear the trade name or mark of the applicant; this mark must be clearly legible and be indelible.
- 4.2 A space of sufficient size to accommodate the approval mark and the additional symbols provided for in paragraph 5.4.2 below shall be provided both on the lens and on the main body 2/ of every headlamp; these spaces shall be shown on the drawings referred to in paragraph/3.2.1 above.
- 4.3 Headlamps designed to satisfy the requirements both of right-hand and of left-hand traffic shall bear markings indicating the two settings of the optical unit on the vehicle or of the lamp on the reflector; these markings shall consist of the letters "R/D" for the position for right-hand traffic and the letters "L/G" for the position for left-hand traffic.
- 4.4 In every case the relevant operation mode used during the test procedure according to paragraph/1.1.1.1 of annex 5 and the allowed voltage(s) according to paragraph/1.1.1.2 of annex 5 shall be stipulated on the approval certificates and on the notice transmitted to the countries which are Contracting Parties to Agreement and which apply this Regulation.

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

On units meeting the requirements of this Regulation which are so designed that the filament 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.

5. APPROVAL

- 5.1 If all the samples of a type of headlamp which are submitted in accordance with paragraph 3.2.3 above meet the requirements of this Regulation, approval shall be granted.
- 5.2 An approval number shall be assigned to each type approved. Its first two digits (at present 00 for the Regulation in its original form) shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The number so assigned shall not be assigned by the same Contracting Party to another type of headlamp covered by this Regulation. 3/
- 5.3 Notice of approval or of refusal or of extension or withdrawal of approval or production definitely discontinued of a headlamp type pursuant to this Regulation shall be communicated to the Parties to

the Agreement which apply this Regulation, by means of a form conforming to the model in annex 1 to this Regulation.

- 5.4 There shall be placed on every headlamp conforming to a type approved under this Regulation, in the spaces referred to in paragraph 4.2 above, in addition to the mark prescribed in paragraph 4.1 above, an international approval mark 4/ consisting of:
- 5.4.1 A circle surrounding the letter "E" followed by the distinguishing number of the country which has granted approval; 5/
- 5.4.2 The approval number and the following additional symbol or symbols placed close to the circle:
- 5.4.2.1 On headlamps meeting left-hand traffic requirements only, a horizontal arrow pointing to the right of an observer facing the headlamp, i.e. to the side of the road on which traffic moves;
- 5.4.2.2 On headlamps designed to meet the requirements of both traffic systems by means of an appropriate adjustment of the setting of the optical unit or the lamp, a horizontal arrow with a head on each end, the heads pointing respectively to the left and to the right;
- 5.4.2.3 The letters "MBH" placed opposite to the approval number.
- 5.5 The marks and symbols referred to in paragraph 5.4 above shall be clearly legible and be indelible.
- 5.6 Annex 3 to this Regulation gives examples of arrangements of approval marks and additional symbols referred to above.
6. GENERAL SPECIFICATIONS
- 6.1 Each sample shall conform to the specifications set forth in paragraphs 7 to 9 below.
- 6.2 Headlamps shall be so designed and constructed that, in normal use, in spite of the vibration to which they may then be subjected, their satisfactory operation continues to be ensured and they retain the characteristics prescribed by this Regulation.
- 6.2.1 Headlamps shall be fitted with a device enabling them to be so adjusted on the vehicle as to comply with the rules applicable to them. Such a device need not be fitted on components in which the reflector and the diffusing lens cannot be separated, provided the use of such components is confined to vehicles on which the headlamps setting can be adjusted by other means.

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

6.2.2 However, these provisions shall not apply to headlamp assemblies whose reflectors are indivisible. For this type of assembly the requirements of paragraph 7.3 of the present Regulation shall apply. Where more than one light source is used to provide the main beam, the combined functions shall be used to determine the maximum value of the illumination (E_m).

6.3 The components by which the filament lamp is fixed to the reflector shall be so made that, even in darkness, the filament lamp can be fixed in no position but the correct one.

6.4 The correct position of the lens in relation to the optical system shall be unequivocally marked and be blocked against rotation in service.

6.5 Headlamps designed to satisfy the requirements both of right-hand and of left-hand traffic may be adapted for traffic on a given side of the road either by an appropriate initial setting when fitted on the vehicle or by selective setting by the user. Such initial or selective setting may consist, for example, of fixing either the optical unit at a given angle on the vehicle or the lamp at a given angle in relation to the optical unit. In all cases, only two different and clearly distinct settings, one for right-hand and one for left-hand traffic, shall be possible, and the design shall preclude inadvertent shifting from one setting to the other or setting in an intermediate position. Where two different setting positions are provided for the lamp, the components for attaching the lamp to the reflector must be so designed and made that, in each of its two settings, the lamp will be held in position with the precision required for headlamps designed for traffic on only one side of the road. Conformity with the requirements of this paragraph shall be verified by visual inspection and, where necessary, by a test fitting.

6.6 Complementary tests shall be done according to the requirements of annex 5 to ensure that in use there is no excessive change in photometric performance.

7. REQUIREMENTS FOR ILLUMINATION

7.1 General provisions

7.1.1 Headlamps shall be so made that with suitable HS₁ lamps they give adequate illumination without dazzle when emitting the passing beam, and good illumination when emitting the driving beam.

7.1.2 The illumination produced by the headlamp shall be determined by means of a vertical screen set up 25 m forward of the headlamp as shown in annex 4 to this Regulation.

7.1.3 The headlamps shall be checked by means of an uncoloured standard (reference) lamp designed for a rated voltage of 12 V. In the case of headlamps which may be fitted with selective-yellow filters 6/ such filters shall be replaced by geometrically identical uncoloured filters with a transmission factor of at least 80 per cent. During the checking of the headlamp the voltage at the terminals of the lamp must be regulated so as to obtain the following characteristics:

	Consumption in watts	Light flux in lumens
passing filament	approx. 35	450
driving filament	approx. 35	700

The headlamp shall be considered acceptable if it meets the requirements of this paragraph 7 with at least one standard (reference) lamp, which may be submitted with the headlamp.

7.1.4 The dimensions determining the position of the filaments inside the HS₁ standard filament lamp are shown in Regulation No. 37.

7.1.5 The bulb of the standard filament lamp must be of such shape and optical quality that it causes a minimum of reflection and refraction adversely affecting the light distribution.

7.2 Provisions concerning passing beams

7.2.1 The passing beam must produce a sufficiently sharp "cut-off" to permit 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 45° angle with the horizontal and the straight line H₁ H₄, 1 per cent above the straight line hh or the straight line HV H₃, inclined at an angle of 15° above the horizontal (see annex 4). 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.

7.2.2 The headlamp shall be so aimed that:

7.2.2.1 In the case of headlamps designed to meet the requirements of right-hand traffic, the "cut-off" on the left half of the screen 7/ 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;

7.2.2.2 This horizontal part of the "cut-off" is situated on the screen 25/cm

below the level of the horizontal plane passing through the focus of the headlamp (see annex 4);

7.2.2.3 The "apex" of the "cut-off" is on line vv. 8/

7.2.3 When so aimed, the headlamp shall comply with the requirements set out in paragraphs 7.2.5 to 7.2.7 and 7.3.

7.2.4 Where a headlamp so directed does not meet the requirements set out in paragraphs 7.2.5 to 7.2.7 and 7.3 its alignment may be changed provided that the axis of the beam is not displaced laterally by more than 1° (= 44 cm) to the right or left. 9/ To facilitate alignment by means of the "cut-off", the headlamp may be partially occulted in order to sharpen the "cut-off".

7.2.5 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		
Point B	50 L	Point B	50 R	≤0.3
Point	75 R	Point	75 L	≥6
Point	50 R	Point	50 L	≥6
Point	25 L	Point	25 R	≥1.5
Point	25 R	Point	25 L	≥1.5
Any point in zone III				≤0.7
Any point in zone IV				≤2
Any point in zone I				≤20

7.2.6 There shall be no lateral variations detrimental to good visibility in any of the zones I, II, III and IV.

7.2.7 Headlamps designed to meet the requirements of both right-hand and left-hand traffic must, in each of the two setting positions of the optical unit or of the lamp, meet the requirements set forth above for the corresponding direction of traffic.

7.3 Provisions concerning driving beams

- 7.3.1 Measurements of the illumination produced on the screen by the driving beam shall be taken with the same headlamp alignment as for measurements under paragraphs 7.2.5 to 7.2.7 above.
- 7.3.2 The illumination produced on the screen by the driving beam shall meet the following requirements:
- 7.3.2.1 The point of intersection HV of lines hh and vv shall be situated within the isolux 90 per cent of maximum illumination. The maximum value (E_M) shall not be less than 32 lux. The maximum value shall not exceed 240 lux.
- 7.3.2.2 Starting from point HV, horizontally to the right and left, the illumination shall be not less than 16 lux up to a distance of 1.125 m and not less than 4 lux up to a distance of 2.25 m.
- 7.4 The screen illumination values mentioned in paragraphs 7.2.5 to 7.2.7 and 7.3 above shall be measured by means of a photo-receptor, the effective area of which shall be contained within a square of 65 mm side.

8. PROVISIONS CONCERNING COLOURED GLASSES AND FILTERS

- 8.1 Approval may be obtained for headlamps emitting either colourless or selective-yellow lights with an uncoloured lamp. Expressed in CIE trichromatic co-ordinates, the corresponding colorimetric characteristics for yellow glasses or filters are as follows:

Selective-yellow filter (screen or glass)

Limit towards red	$y \geq 0.138 + 0.58 x$
Limit towards green	$y \leq 1.29 x - 0.1$
Limit towards white	$y \geq - x + 0.966$
Limit towards spectral value	$y \leq - x + 0.992$

which can also be expressed as follows:

dominant wave-length	575 - 585 nm
purity factor	0.90 - 0.98
The transmission factor must be	≥ 0.78

The transmission factor shall be determined by using a light source with a colour temperature of 2856°K. 10/

8.2 The filter must be part of the headlamp, and must be attached to it in such a way that the user cannot remove it either inadvertently or, with ordinary tools, intentionally.

9. STANDARD (REFERENCE) HEADLAMP 11/

A headlamp shall be deemed to be a standard (reference) headlamp if it:

9.1 Satisfies the above-mentioned requirements for approval;

9.2 Has an effective diameter of not less than 160 mm;

9.3 Provides, with a standard (reference) lamp, at the various points and in the various zones referred to in paragraph 7.2.5, illumination equal to:

9.3.1 Not more than 90 per cent of the maximum limits and

9.3.2 Not less than 120 per cent of the minimum limits, prescribed in the table in paragraph 7.2.5.

10. OBSERVATION CONCERNING COLOUR

Since any approval under this Regulation is granted, pursuant to paragraph/8.1 above, for a type of headlamp emitting either colourless light or selective-yellow light, article 3 of the Agreement to which the regulation is annexed shall not prevent the Contracting Parties from prohibiting headlamps emitting a beam of uncoloured or selective-yellow light on vehicles registered by them.

11. CONFORMITY OF PRODUCTION

Every headlamp bearing an approval mark as prescribed under this Regulation shall conform to the approved type and meet the photometric requirements set forth above. Compliance with these provisions shall be verified in accordance with annex/2 and paragraph/3 of annex 5 to this Regulation.

12. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

12.1 The approval granted in respect of a headlamp type pursuant to this Regulation may be withdrawn if the requirements set forth above are not met.

12.2 If a Contracting Party to the Agreement applying this Regulation withdraws an approval it has previously granted, it shall forthwith so notify the other Contracting Parties applying this Regulation, by means of a communication form conforming to the model in annex 1 to this Regulation.

13. MODIFICATION OF HEADLAMP TYPE AND EXTENSION OF APPROVAL

13.1 Every modification of the headlamp type shall be notified to the administrative department which granted the type approval. The department may then either:

13.1.1 Consider that the modifications made are unlikely to have appreciable adverse effects and that in any case the type of headlamp complies with the requirements; or

13.1.2 Require a further test report from the technical service responsible for conducting the tests.

13.2 Confirmation or refusal of approval, specifying the alterations, shall be notified by the procedure specified in paragraph 5.3 above to the Parties to the Agreement applying this Regulation.

13.3 The competent authority issuing the extension of approval shall assign a series number for such an extension and inform thereof the other Contracting Parties applying this Regulation by means of a communication form conforming to the model in annex 1 to this Regulation.

14. PRODUCTION DEFINITELY DISCONTINUED

If the holder of the approval completely ceases to manufacture a headlamp approved in accordance with this Regulation, he shall so inform the authority which granted the approval. Upon receiving the relevant communication that authority shall inform thereof the other Parties to the Agreement applying this Regulation by means of a communication form conforming to the model in Annex 1 to this Regulation.

15. NAMES AND ADDRESSES OF TECHNICAL SERVICES RESPONSIBLE FOR CONDUCTING APPROVAL TESTS AND OF ADMINISTRATIVE DEPARTMENTS

The Parties to the Agreement applying this Regulation shall communicate to the United Nations Secretariat the names and addresses of the technical services responsible for conducting approval tests and of the administrative departments which grant approval and to which forms certifying approval or extension or refusal or withdrawal of approval, issued in other countries, are to be sent.

Notes

1/ In the case of headlamps designed to meet the requirements of traffic moving on one side of the road only (either right or left), it is further recommended that the area which can be occulted to prevent discomfort to users in a country where traffic moves on the side of the road opposite to that of the country for which the headlamp was designed should be outlined indelibly on the front glass. This marking is not necessary, however, where the area is clearly apparent from the design.

2/ If the glass cannot be separated from the main body, the provision of such a space on the lens will suffice.

3/ A change in the colour of the beams emitted by headlamps whose other characteristics are not changed does not constitute a change of headlamp type. The same approval number shall accordingly be assigned to such headlamps (see paragraph 2.3).

4/ If different types of headlamps have an identical glass, the glass may bear the several approval marks of these types of headlamps, on condition that the main body of the headlamp, even if it cannot be separated from the glass, is also provided with the space referred to in paragraph 4.2 above and bears the approval mark of the type of headlamp. If different types of headlamps have an identical main body, it may bear the several approval marks for these types of headlamps.

5/ 1 for the Federal Republic of Germany, 2 for France, 3 for Italy, 4 for the Netherlands, 5 for Sweden, 6 for Belgium, 7 for Hungary, 8 for Czechoslovakia, 9 for Spain, 10 for Yugoslavia, 11 for the United Kingdom, 12 for Austria, 13 for Luxembourg, 14 for Switzerland, 15 for the German Democratic Republic, 16 for Norway, 17 for Finland, 18 for Denmark, 19 for Romania, 20 for Poland, 21 for Portugal and 22 for the Union of Soviet Socialist Republics. Subsequent numbers shall be assigned to other countries in the chronological order in which they ratify or accede to the Agreement concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts, and the numbers thus assigned shall be communicated by the Secretary-General of the United Nations to the Contracting Parties to the Agreement.

6/ These filters shall consist of all the components, including the glass, intended to colour the light.

7/ The test screen must be sufficiently wide to allow examination of the "cut-off" over a range of at least 5° on either side of the line vv.

8/ If the beam does not have a cut-off with a clear "apex", the lateral adjustment shall be effected in the manner which best satisfies the requirements for illumination at points 75 R and 50 R for right-hand traffic and for points 75 L and 50 L for left-hand traffic.

9/ The limit of realignment of 1° towards the right or left is not incompatible with upward or downward vertical realignment. The latter is limited only by the requirements of paragraph 7.3. However, the horizontal part of the "cut-off" should not extend beyond the line hh.

10/ Corresponding to illuminant A of the International Commission on Illumination (CIE).

11/ Different values may be accepted provisionally. In the absence of definitive specifications, the use of an approved headlamp is recommended.

10. Number of report issued by that service
11. Approval granted/refused/extended/withdrawn 2/
12. Maximum illumination (in lux) of the driving beam at 25/m from the headlamp (average for two headlamps)
13. Place
14. Date
15. Signature
16. The attached drawing No. ... shows the headlamp.

Annex 2

VERIFICATION OF CONFORMITY OF PRODUCTION OF HEADLAMPS
EQUIPPED WITH HS₁ LAMPS

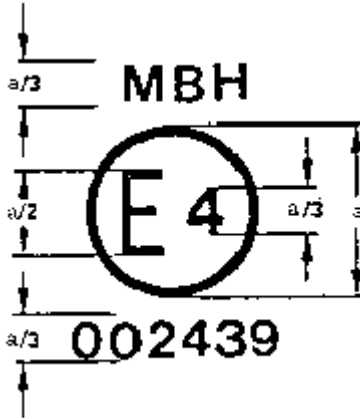
1. Headlamps bearing an approval mark shall conform to the approved type.
2. The requirement of conformity shall be deemed satisfied from a mechanical and geometrical standpoint if the discrepancies do not exceed inevitable manufacturing errors.
3. As regards photometric performance, the conformity of headlamps of the series will not be contested 1/ if, during photometric tests of any headlamp, selected at random and equipped with a standard (reference) lamp;
 - 3.1 None of the values measured deviates unfavourably by more than 20 per cent from the prescribed value (for values B 50 R or L and zone III, the maximum unfavourable deviation may be 0.2 lux (B 50 R or L), or 0.3 lux (zone III));
 - 3.2 or if
 - 3.2.1 for the passing beam, the prescribed values are met at HV (with a tolerance of 0.2 lux) and at least one point of the area delimited on the measuring screen (at 25 m) by a circle 15 cm in radius around points B 50 R or L (with a tolerance of 0.1 lux), 75 R or L, 50/R or L, 25 R or L, and in the entire area of zone IV which is not more than 22.5 cm above line 25 R and 25 L;
 - 3.2.2 and if, for the driving beam, HV being situated within the isolux $0.75/E_{\max}$, a tolerance of 20 per cent is observed for the photometric values.
4. If the results of the tests described in paragraph 3 above do not satisfy the requirements, the tests for the headlamp in question shall be repeated with another standard (reference) lamp.

1/ It is recommended that the authorities of the country of manufacture should refer to the results of any statistical checks made by the manufacturer rather than undertake the checks mentioned in paragraph 3.

Annex 3

ARRANGEMENTS OF APPROVAL MARKS

(see paragraph 5 of this Regulation)



a = 12 mm min.

Figure 1

The headlamp bearing the above approval mark is a headlamp meeting the requirements of this Regulation and is designed for right-hand traffic only.

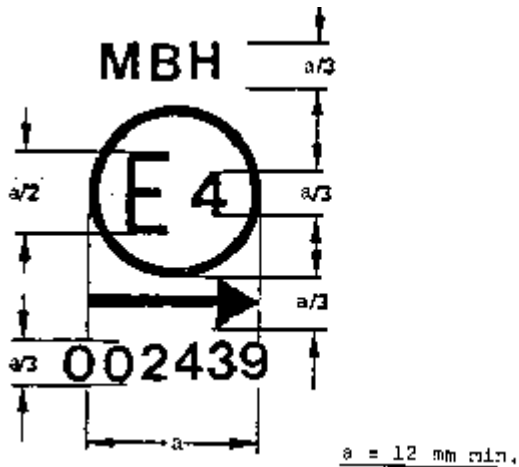


Figure 2

The headlamp bearing the above approval mark is a headlamp meeting the requirements of this Regulation and is designed:
For left-hand traffic only.



Figure 3

For both traffic systems
by means of an appropriate
adjustment of the setting
of the optical unit or the
lamp on the vehicle

a = 12 mm min.

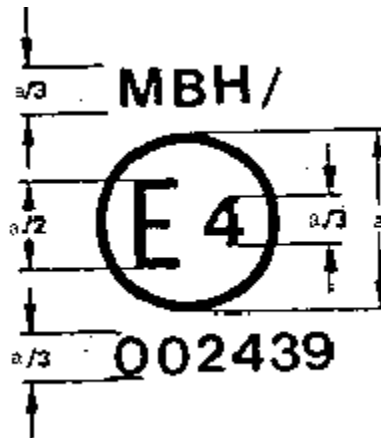


Figure 4

The headlamp bearing the above approval mark is a headlamp meeting the requirements of this Regulation and is so designed that the filament of the passing lamp shall not be lit together simultaneously with the driving beam and/or another reciprocally incorporated lighting function.

Note: The above headlamps bearing the above approval marks have been approved in the Netherlands (E/4) under No./002439. The approval number indicates that the approval was granted in accordance with the requirements of this Regulation in its original form.

The approval number must be placed close to the circle and either above or below the "E" or to left or right of that letter. The digits of the approval number must be on the same side of the "E" and face in the same direction. The use of Roman numerals as approval numbers should be avoided so as to prevent any confusion with other symbols.

Annex 5

TESTS FOR STABILITY OF PHOTOMETRIC PERFORMANCE
OF HEADLAMPS IN OPERATION

Compliance with the requirements of this annex is not sufficient for the approval of headlamps incorporating lenses of plastic material.

TESTS ON COMPLETE HEADLAMPS

Once the photometric values have been measured according to the prescriptions of this Regulation, in points for E_{max} for driving beam and HV, 50 R, B 50 L for passing beam (or HV, 50 L, B 50 R for headlamps designed for left-hand traffic) 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.

1. TEST FOR STABILITY OF PHOTOMETRIC PERFORMANCE

The tests shall be carried out in a dry and still atmosphere at an ambient temperature of $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, the complete headlamps being mounted on a base representative of the correct installation on the vehicle.

1.1 Clean headlamp

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

1.1.1 Test procedure

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

1.1.1.1 (a) In the case where only one lighting function (driving or passing beam) is to be approved, the corresponding filament is lit for the prescribed time, **/

(b) In the case of a reciprocally incorporated passing lamp and driving lamp (dual filament lamp or two filament lamps):

. If the applicant declares that the headlamp is to be used with a single filament lit */ at a time, the test shall be

*/ Should two or more lamp filaments be simultaneously lit when headlamp flashing is used, this shall not be considered as being normal use of the filaments simultaneously.

**/ When the tested headlamp is grouped and/or reciprocally incorporated with 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 operation mode with an on/off time ratio of approximately one to one.

carried out in accordance with this condition, activating **/
each specified function successively for half the time
specified in paragraph 1.1;

- . In all other cases, */**/ the headlamp shall be subjected to
the following cycle until the time specified is reached:

15 minutes, passing-beam filament lit
5 minutes, all filaments lit.

- (c) In the case of grouped lighting functions all the individual
functions shall be lit simultaneously for the time specified for
individual lighting functions (a) also taking into account the
use of reciprocally incorporated lighting functions, (b)
according to the manufacturer's specifications.

1.1.1.2 Test voltage

The voltage shall be adjusted so as to supply 90 per cent of the
maximum wattage specified for filament lamps category HS₁ in
Regulation No. 37.

1.1.2 Test results

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.

1.1.2.2 Photometric test

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

Passing beam:

50 R - B 50 L - HV for headlamps designed for right-hand traffic,
50 L - B 50 R - HV for headlamps designed for left-hand traffic.

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 paragraph 2).

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.

1.2 Dirty headlamp

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

1.2.1 Preparation of the headlamp

1.2.1.1 Test mixture

The mixture of water and a polluting agent to be applied to the headlamp shall be composed of nine parts (by weight) of silica sand with a grain size distributed between 0 and 100 μm , one part (by weight) of vegetal carbon dust of a grain size distributed between 0 and 100 μm , 0.2 part (by weight) of NaCMC and an appropriate quantity of distilled water, the conductivity of which is lower than 1 mS/m for the purpose of this test.

The mixture must not be more than 14 days old.

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:

Point of E_{max} in driving beam, photometric distribution for a driving/passing lamp,

Point of E_{max} in driving beam, photometric distribution for a driving lamp only,

50 R and 50 V for a passing lamp only, designed for right-hand traffic,

50 L and 50 V for a passing lamp only, designed for left-hand traffic.

1.2.1.3 Measuring equipment

The measuring equipment shall be equivalent to that used during headlamp approval tests. A standard (reference) filament lamp shall be used for the photometric verification.

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 paragraph 1, shall be subjected to the test described in 2.1, without being removed from or readjusted in relation to its test fixture.

2.1 Test

The test shall be carried out in a dry and still atmosphere at an ambient temperature of 23°C \pm 5°C.

Using a mass production filament lamp which has been aged for at least one hour the headlamp shall be operated on passing beam without being dismantled from or readjusted in relation to its test fixture. (For the purpose of this test, the voltage shall be adjusted as specified in paragraph 1.1.1.2.) The position of the cut-off line in its horizontal part (between v_v and the vertical line passing through point B 50 L for right-hand traffic or B 50 R for left-hand traffic) 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.

2.2 Test results

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

2.2.2 However, if this value is more than 1.0 mrad but not more than 1.5/mrad ($1.0/\text{mrad} < \Delta r_I \leq 1.5$ mrad) a second headlamp shall be tested as described in paragraph/2.1 after being subjected three consecutive times to the cycle as described below, in order to stabilize the position of mechanical parts of the headlamp on a base representative of the correct installation on the vehicle:

Operation of the passing lamp for one hour (the voltage shall be adjusted as specified in paragraph 1.1.1.2),

Period of rest for one hour.

The headlamp type shall be considered as acceptable if the mean value of the absolute values Δr_I measured on the first sample and Δr_{II} measured on the second sample is not more than 1.0 mrad

$$\frac{\Delta r_I + \Delta r_{II}}{2} \leq 1 \text{ mrad}$$

3. CONFORMITY OF PRODUCTION

One of the sampled headlamps shall be tested according to the procedure described in paragraph/2.1 after being subjected three consecutive times to the cycle described in paragraph 2.2.2. 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 headlamp shall be subjected to the test after which the mean of the absolute values recorded on both samples shall not exceed 1.5 rad.

