

No. 4789. 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<sup>1</sup>

ENTRY INTO FORCE of amendments to Regulation No. 4<sup>2</sup> ("Uniform provisions for the approval of devices for the illuminating of rear registration plates of motor vehicles (except motor cycles) and their trailers") annexed to the above-mentioned Agreement

The amendments were proposed by the Government of the Netherlands and circulated by the Secretary-General to the Contracting Parties on 30 September 1988. They came into force on 28 February 1989, in accordance with article 12 (1) of the Agreement.

The text of the amendments (*Supplement 2 to Regulation No. 4 in its original form*) reads as follows:

Replace paragraph 4 by the following:

"4. Approval

- 4.1. If the two samples of a type of illuminating device submitted in accordance with paragraph 2 above satisfy the provisions of this Regulation, approval shall be granted.
- 4.2. An approval number shall be assigned to each type approved. Its first two digits (at present 00 corresponding to the original form of this Regulation) shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party may not assign this number to another type of device covered by this Regulation, except in the case of an extension of the approval to a device differing only in the colour of the light emitted.

<sup>1</sup> United Nations, *Treaty Series*, vol. 335, p. 211; vol. 516, p. 378 (rectification of the authentic English and French texts of article 1 (8)); vol. 609, p. 290 (amendment to article 1 (1)); and vol. 1059, p. 404 (rectification of the authentic French text of article 12 (2)); for subsequent actions, see references in Cumulative Indexes Nos. 4 to 15, as well as annex A in volumes 951, 955, 958, 960, 961, 963, 966, 973, 974, 978, 981, 982, 985, 986, 993, 995, 997, 1003, 1006, 1010, 1015, 1019, 1020, 1021, 1024, 1026, 1031, 1035, 1037, 1038, 1039, 1040, 1046, 1048, 1050, 1051, 1055, 1060, 1065, 1066, 1073, 1078, 1079, 1088, 1092, 1095, 1097, 1098, 1106, 1110, 1111, 1112, 1122, 1126, 1130, 1135, 1136, 1138, 1139, 1143, 1144, 1145, 1146, 1147, 1150, 1153, 1156, 1157, 1162, 1177, 1181, 1196, 1197, 1198, 1199, 1205, 1211, 1213, 1214, 1216, 1218, 1222, 1223, 1224, 1225, 1235, 1237, 1240, 1242, 1247, 1248, 1249, 1252, 1253, 1254, 1255, 1256, 1259, 1261, 1271, 1273, 1275, 1276, 1277, 1279, 1284, 1286, 1287, 1291, 1293, 1294, 1295, 1299, 1300, 1301, 1302, 1308, 1310, 1312, 1314, 1316, 1317, 1321, 1323, 1324, 1327, 1328, 1330, 1331, 1333, 1335, 1336, 1342, 1347, 1348, 1349, 1350, 1352, 1355, 1358, 1361, 1363, 1364, 1367, 1374, 1379, 1389, 1390, 1392, 1394, 1398, 1401, 1402, 1404, 1405, 1406, 1408, 1409, 1410, 1412, 1413, 1417, 1419, 1421, 1422, 1423, 1425, 1428, 1429, 1434, 1436, 1438, 1443, 1444, 1458, 1462, 1463, 1464, 1465, 1466, 1474, 1477, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1492, 1494, 1495, 1499, 1500, 1502, 1504, 1505, 1506, 1507, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1518, 1519, 1520, 1522, 1523 and 1524.

<sup>2</sup> *Ibid.*, vol. 493, p. 308 and vol. 932, p. 118.

- 4.3. Notice of approval or of refusal of approval of a type of illuminating device shall be communicated to the Parties to the Agreement which apply this Regulation by means of a form conforming to the model in annex 2 to this Regulation and of an attached drawing supplied by the applicant for approval, in a format not exceeding A 4 (210 x 297 mm) and if possible, on a scale 1:1.
- 4.4. Every illuminating device conforming to a type approved under this Regulation shall, in addition to the markings referred to in paragraph 3 (a) above, bear an international approval mark in conformity with annex 1, consisting of:
- 4.4.1. A circle surrounding the letter "E" followed by a number identifying the country which has granted approval; 1/
- 4.4.2. An approval number, in the vicinity of the circle;
- 4.4.3. The following additional symbol: the letter "L".
- 4.4.4. The first two digits of the approval number which indicate the most recent series of amendments to this Regulation may be placed in the vicinity of the additional symbol L.
- 4.5. The mark and symbols referred to in paragraphs 4.3.1, 4.3.2, and 4.3.3. shall be indelible and shall be clearly legible even when the illuminating device is mounted on the vehicle.
- 4.6. When two or more lamps are part of the same unit of grouped, combined or reciprocally incorporated lamps, approval is granted only if each of these lamps satisfies the requirements of this Regulation or of another Regulation. Lamps not satisfying any one of those Regulations shall not be part of such a unit of grouped, combined or reciprocally incorporated lamps.
- 4.6.1. Where grouped, combined or reciprocally incorporated lamps comply with the requirements of several Regulations, a single international approval mark may be applied, consisting of a circle surrounding the letter "E" followed by the distinguishing number of the country which has granted the approval, an approval number and, if necessary, the required arrow. This approval mark may be placed anywhere on the grouped, combined or reciprocally incorporated lamps provided that:
- 4.6.1.1. It is visible after their installation;
- 4.6.1.2. 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.
- 4.6.2. The identification symbol for each lamp appropriate to each Regulation under which approval has been granted, together with the corresponding series of amendments incorporating the most recent major technical amendments to the Regulation at the time of issue of the approval, shall be marked:
- 4.6.2.1. Either on the appropriate light-emitting surface,

- 4.6.2.2. Or in a group, in such a way that each lamp of the grouped, combined or reciprocally incorporated lamps may be clearly identified (see three possible examples in annex 1).
- 4.6.3. 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 a Regulation under which approval has been granted.
- 4.6.4. An approval number shall be assigned to each type approved. The same Contracting Party may not assign the same number to another type of grouped, combined or reciprocally incorporated lamps covered by this Regulation.
- 4.7. Annex 1 gives examples of arrangements of approval marks for a single lamp (figure 1) and for grouped, combined or reciprocally incorporated lamps (figure 2) with all the additional symbols referred to above."

Annex 1, amend to read:

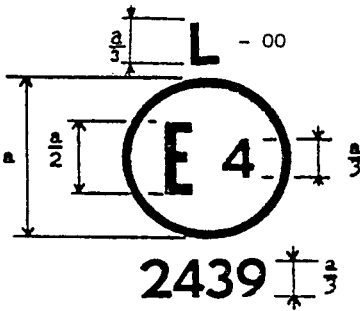
"Annex 1

ARRANGEMENT OF APPROVAL MARKS

Figure 1

(Marking for single lamps)

Model A



$a = 5 \text{ mm min.}$

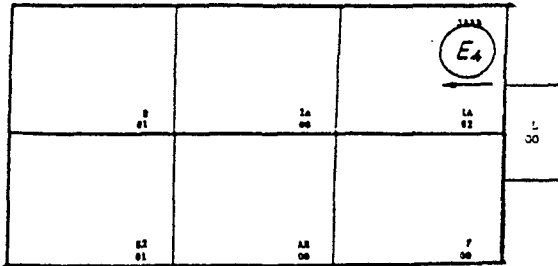
The device bearing the approval mark shown above is a device for the illumination of a vehicle's rear registration plate (L) approved in the Netherlands (E 4) pursuant to Regulation No. 4 under approval number 002439. The approval number indicates that the approval was granted in accordance with the requirements of Regulation No. 4 in its original form or as amended by supplements 1 and/or 2, as the case may be.

Figure 2

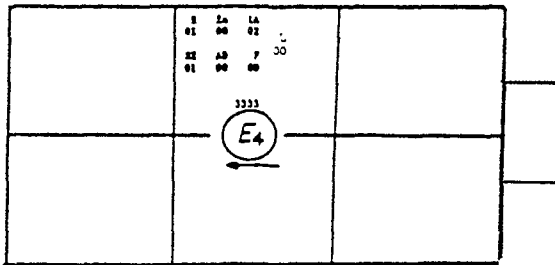
Simplified marking for grouped, combined or reciprocally incorporated lamps

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

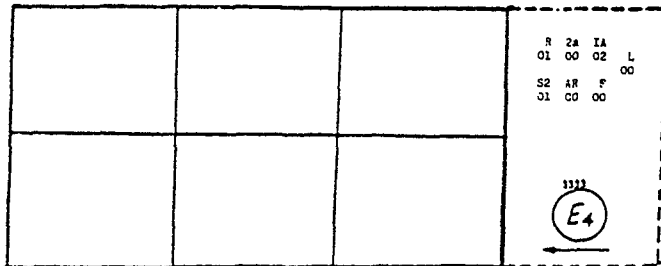
Model B



Model C



Model D



Note: The three examples of approval marks, models B, C and D represent three possible variants of the marking of a lighting device when two or more lamps are part of the same unit of grouped, combined or reciprocally incorporated lamps. This approval mark shows that the device was approved in the Netherlands (E 4) under approval number 3333 and comprising:

A retro reflector of class IA approved in accordance with the 02 series of amendments<sup>1</sup> to Regulation No. 3<sup>2</sup>;

A rear direction indicator of category 2a approved in accordance with Regulation No. 6<sup>3</sup> in its original form;

A red rear position lamp (R) approved in accordance with the 01 series of amendments<sup>4</sup> to Regulation No. 7<sup>5</sup>;

A rear fog lamp (F) approved in accordance with Regulation No. 38<sup>6</sup> in its original form;

A reversing lamp (AR) approved in accordance with Regulation No. 23<sup>7</sup> in its original form;

A stop lamp with two levels of illumination (S2) approved in accordance with the 01 series of amendments<sup>4</sup> to Regulation No. 7<sup>5</sup>;

A rear registration plate illuminating device (L) approved in accordance with Regulation No. 4<sup>8</sup> in its original form."

#### Note

1/ 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.

<sup>1</sup> United Nations, *Treaty Series*, vol. 1401, p. 254.

<sup>2</sup> *Ibid.*, vol. 480, p. 376; vol. 557, p. 274; vol. 1271, p. 268, and vol. 1401, p. 254.

<sup>3</sup> *Ibid.*, vol. 607, p. 282, and vol. 1465, p. 272.

<sup>4</sup> *Ibid.*, vol. 1404, p. 348.

<sup>5</sup> *Ibid.*, vol. 607, p. 308.

<sup>6</sup> *Ibid.*, vol. 1098, p. 295; vol. 1523, No. A-4789, and vol. 1607, No. A-4789.

<sup>7</sup> *Ibid.*, vol. 801, p. 432, and vol. 1038, p. 312.

<sup>8</sup> *Ibid.*, vol. 493, p. 308, and vol. 932, p. 118.

ENTRY INTO FORCE of amendments to Regulation No. 19<sup>1</sup> ("Uniform provisions concerning the approval of motor vehicle fog lamps") annexed to the Agreement of 20 March 1958 concerning the adoption of uniform conditions of approval and reciprocal recognition of approval for motor vehicle equipment and parts

The amendments were proposed by the Government of the Netherlands and circulated by the Secretary-General to the Contracting Parties on 30 September 1988. They came into force on 28 February 1989, in accordance with article 12 (1) of the Agreement.

The text of the amendments (*02 Series of amendments to Regulation No. 19*) reads as follows:

Page 2, concerns the French text only.

Page 2, delete the following sentence:

"The system of marking(s) should be completed."

Page 3, paragraph 3.3, penultimate subparagraph, write the number 24 as follows: "~~24~~" (English text only)

Paragraphs 4.2, 14.1, 14.2, 14.3 and annex 2, replace the reference to the 03 series of amendments by a reference to the 02 series of amendments

Paragraph 6.3, table, in the third column for "1000" read "750"

Annex 1, item 2, amend to read as follows:

"2. Front fog lamp using a filament lamp of type .....

Annex 4, footnote on page 9, for "reciprocally" read "mutually" (English text only)

Annex 4, paragraph 1.1.1.1, present the subparagraphs as follows:

"(a) in the case when only a front fog lamp ...

(b) in the case of a front fog lamp mutually incorporated with ...

5 minutes, all filaments (that can be lit simultaneously) lit;

(c) in the case of grouped lighting functions all the individual ..."

<sup>1</sup> United Nations, *Treaty Series*, vol. 768, p. 314; vol. 926, p. 99; vol. 981, p. 378, and vol. 1504, p. 384.

ENTRY INTO FORCE of amendments to Regulation No. 23<sup>1</sup> ("Uniform provisions concerning the approval of reversing lamps for power-driven vehicles and their trailers") annexed to the Agreement of 20 March 1958 concerning the adoption of uniform conditions of approval and reciprocal recognition of approval for motor vehicle equipment and parts

The amendments were proposed by the Government of the Netherlands and circulated by the Secretary-General to the Contracting Parties on 30 September 1988. They came into force on 28 February 1989, in accordance with article 12 (1) of the Agreement.

The text of the amendments (*Supplement 2 to Regulation No. 23 in its original form*) reads as follows:

Delete the present paragraph 4.2.

Re-number paragraphs 4.3., 4.4. and 4.5 as 4.2., 4.3. and 4.4.

Add a new paragraph 4.3.3, to read:

"4.3.3. The first two digits of the approval number which indicate the most recent series of amendments to this Regulation may be placed in the vicinity of the additional symbol 'AR'."

Paragraph 4.4., amend to read: "... paragraphs 4.3.1. and 4.3.2. shall ...".

Add a new paragraph 4.5. to read:

"4.5. When two or more lamps are part of the same unit of grouped, combined or reciprocally incorporated lamps, approval is granted only if each of these lamps satisfies the requirements of this Regulation or of another Regulation. Lamps not satisfying any one of those Regulations shall not be part of such a unit of grouped, combined or reciprocally incorporated lamps.

4.5.1. Where grouped, combined or reciprocally incorporated lamps comply with the requirements of several Regulations, a single international approval mark may be applied, consisting of a circle surrounding the letter "E" followed by the distinguishing number of the country which has granted the approval, an approval number and, if necessary, the required arrow. This approval mark may be placed anywhere on the grouped, combined or reciprocally incorporated lamps provided that:

4.5.1.1. It is visible after their installation;

4.5.1.2. 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.

<sup>1</sup> United Nations, *Treaty Series*, vol. 801, p. 432, and vol. 1038, p. 312.



- 4.5.2. The identification symbol for each lamp appropriate to each Regulation under which approval has been granted, together with the corresponding series of amendments incorporating the most recent major technical amendments to the Regulation at the time of issue of the approval, shall be marked:
- 4.5.2.1. Either on the appropriate light-emitting surface,
- 4.5.2.2. Or in a group, in such a way that each lamp of the grouped, combined or reciprocally incorporated lamps may be clearly identified (see three possible examples in annex 2).
- 4.5.3. 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 a Regulation under which approval has been granted.
- 4.5.4. An approval number shall be assigned to each type approved. The same Contracting Party may not assign the same number to another type of grouped, combined or reciprocally incorporated lamps covered by this Regulation."

Amend paragraph 4.6. to read:

- "4.6. Annex 2 gives examples of arrangements of approval marks for a single lamp (figure 1) and for grouped, combined or reciprocally incorporated lamps (figure 2) with all the additional symbols referred to above, in which the letters A and R are mingled."

Annex 2, amend to read:

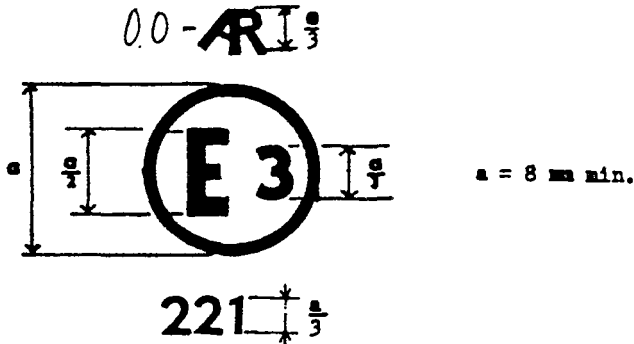
"Annex 2

ARRANGEMENT OF APPROVAL MARKS

Figure 1

(Marking for single lamps)

Model A



The device bearing the approval mark shown above is a reversing lamp approved in the Netherlands (E 4) pursuant to Regulation No. 23 under approval number 221.


The approval number indicates that the approval was granted in accordance with the requirements of Regulation No. 23 in its original form or as amended by supplements 1 and/or 2, as the case may be.

Figure 2


(Simplified marking for grouped, combined or reciprocally incorporated lamps)

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


Model B

	3333 		
	1A 02	2• 00	R 01
	F 00	AR 00	S2 01

Model C

	1A 02 F 00	2• 00 AR 00	R 01 S2 01
	3333 		

Model D

1A 02	2• 00	R 01	
F 00	AR 00	S2 01	
3333 			

Note: The three examples of approval marks, models B, C and D represent three possible variants of the marking of a lighting device when two or more lamps are part of the same unit of grouped, combined or reciprocally incorporated lamps. This approval mark shows that the device was approved in the Netherlands (E 4) under approval number 3333 and comprising:

A retro reflector of class IA approved in accordance with the O2 series of amendments to Regulation No. 3;

A rear direction indicator of category 2a approved in accordance with Regulation No. 6 in its original form;

A red rear position lamp (R) approved in accordance with the 01 series of amendments to Regulation No. 7;

A rear fog lamp (F) approved in accordance with Regulation No. 38 in its original form;

A reversing lamp (AR) approved in accordance with Regulation No. 23 in its original form;

A stop lamp with two levels of illumination (S2) approved in accordance with the 01 series of amendments to Regulation No. 7."

ENTRY INTO FORCE of amendments to Regulation No. 44<sup>1</sup> ("Uniform provisions concerning the approval of restraining devices for child occupants of power-driven vehicles (child restraint") annexed to the Agreement of 20 March 1958 concerning the adoption of uniform conditions of approval and reciprocal recognition of approval for motor vehicle equipment and parts

The amendments were proposed by the Government of the Netherlands and circulated by the Secretary-General to the Contracting Parties on 30 September 1988. They came into force on 28 February 1989, in accordance with article 12 (1) of the Agreement.

The text of the amendments (*Supplement 2 to the 02 Series of amendments to Regulation No. 44*) reads as follows:

Paragraph 2.8.3., amend to read:

"'crotch strap' means a strap or divided straps, where two or more pieces of webbing form the crotch strap which is attached to ..."

Add a new paragraph 6.1.3.4., to read as follows:

"6.1.3.4. In the case of child restraining straps or child restraint attachment strap utilizing belt anchorages to which are already fitted an adult belt or belts, the technical service shall check that:

The effective adult anchorage position is as approved under Regulation No. 14<sup>2</sup> or equivalent;

Effective operation of both devices is not hindered by the other;

The buckles of the adult and additional system must not be interchangeable.

In the case of child restraining devices utilizing bars, or extra devices attached to the anchorages approved under Regulation No. 14, which move the effective anchorage position outside the field of Regulation No. 14, the following points shall apply:

Such devices will only be approved as semi-universal or specific vehicle devices;

The technical service shall apply the requirements of annex 11 to this Regulation to the bar and the fastenings;

The bar will be included in the dynamic test, with the loading being applied to the mid-position and the bar and its greatest extension, if adjustable;

The effective position and operation of any adult anchorage by which the bar is fixed shall not be impaired."

Paragraph 6.2.3., add at the end:

"... The distance between the shoulder-straps in the vicinity of the neck should be at least the width of the neck of the appropriate manikin."

<sup>1</sup> United Nations, *Treaty Series*, vol. 1213, p. 204; vol. 1294, p. 374; vol. 1423, p. 261, and vol. 1485, No. A-4789.

<sup>2</sup> *Ibid.*, vol. 723, p. 302; vol. 778, p. 372; vol. 1006, p. 411; vol. 1143, p. 284; vol. 1380, p. 296, and vol. 1392, p. 558.

Add a new paragraph 6.2.12., to read as follows:

- "6.2.12. In case of booster cushions, the ease with which the straps and tongue of an adult belt pass through the fixture points must be examined. This goes particularly for booster cushions which are designed for the front seats of cars, which may have long semi-rigid stalks. The fixed buckle should not be allowed to pass through the fixture points of booster seats, or to permit a lie of belt completely different from that of the test-trolley.

Add new paragraph 8.1.3.6.3.4. and 8.1.3.6.3.5., to read:

- "8.1.3.6.3.4. The longitudinal plane passing through the centre line of the dummy shall be set midway between the two lower belt anchorages, however note shall also be taken of paragraph 8.1.3.2.1.3.
- 8.1.3.6.3.5. In the case of devices requiring the use of a standard belt, the shoulder strap may be positioned on the manikin prior to the dynamic test by the use of a light-weight masking tape of sufficient width and length."

Paragraph 8.1.3.7.4., insert in the last sentence, after "to the next" the following text:

"for instance when the configuration of the harness or the harness length is changed."

Add a new paragraph 8.1.4., to read as follows:

"8.1.4. Energy absorption test

For the impact test according to annex 4 of Regulation No. 21,<sup>1</sup> the child restraint system will be mounted in the test seat specified for the dynamic test in annex 6 of this Regulation. Using the method specified in Regulation No. 21, impact the child restraint system in the centre of the back at two heights as a minimum:

Lower: shoulder height of the smallest manikin for the weight range specified;

Upper: 75 mm below the top of the chair back. Impact shall be perpendicular to the surface + 10 degrees.

Further tests may be conducted if, for any reason, the above two tests are considered insufficient. In the case of rearward facing seats, this test shall be made with the child restraint mounted against the seat-back of the test seat. In the case of devices other than chairs the impact test may be conducted on surface liable to be contacted by the head of the appropriate dummy."

<sup>1</sup> United Nations, *Treaty Series*, vol. 801, p. 394, and vol. 1425, No. A-4789.

Paragraph 8.2.1.1.3., insert after the first sentence the following text:

"the geometric centre applies to that part of the surface of the buckle to which the release pressure is to be applied."

Add a new annex 14, to read as follows:

"Annex 14

EXPLANATORY NOTES

The explanatory notes given in this annex concern interpretation difficulties with the regulation. They are meant as a guide for the technical services performing the tests.

Paragraph 2.18.2. A semi-universal restraint specified for fitting to the rear seat in both a saloon and an estate type vehicle in which the whole belt assembly is identical is one 'type'.

Paragraph 2.18.3. The significance of changes in the dimensions and/or mass of the seat, padding or impact shield and the energy-absorbing characteristics or colour of the material are to be considered when deciding whether a new type has been created.

Paragraphs 2.18.4. and 2.18.5.

These paragraphs shall not apply to any safety belts separately approved in accordance with Regulation No. 16<sup>1</sup> which is necessary to anchor the child restraint to the vehicle or to restrain the child.

Paragraph 6.2.4. This shall be assessed by examination of the high-speed film results where visible penetration of the abdomen by any part of the restraint or riding up of any lap strap onto the chest, shall constitute a failure. (Twisting of the dummy out of the shoulder strap before the point of maximum displacement shall itself also be considered as a failure, but at the manufacturer's request two further tests may be performed with the appropriate dummy. All tests requirements must be met in full during these tests.)

Paragraph 7.1.4.3.1. Visible signs of penetration means penetration of the clay by the abdominal insert (under pressure from the restraint) but not bending of the clay without compression in a horizontal direction as for instance is brought about by simple bending of the spine. See also interpretation of paragraph 6.2.4.

Paragraph 7.2.1.5. The first sentence is complied with if the hand of the dummy could reach the buckle.

<sup>1</sup> United Nations, *Treaty Series*, vol. 756, p. 232; vol. 820, p. 420; vol. 893, p. 330; vol. 1153, p. 435; vol. 1413, No. A-4789; vol. 1499, No. A-4789, and vol. 1506, p. 268.

- Paragraph 7.2.2.1. This shall be used to ensure that separately approved guide-straps shall be easily attached and detached.
- Paragraph 7.2.4.1.1. Two straps are required. Measure the breaking load of the first strap. Measure the width of the second strap at 75 per cent of this load.
- Paragraph 8.1.2.2. 'Fastened to the seat' means the test seat as prescribed in annex 6. 'Specific devices may' means that a 'specific' restraint would normally be tested for overturning when installed in the test seat, but that testing in the vehicle seat was allowed.
- Paragraph 8.2.2.1.1. 'Having regard to normal conditions of use' means that this test should be performed with the restraint mounted on the test or vehicle seat but without the dummy.
- The dummy shall be used only to position the adjusting device. In the first instance the straps should be adjusted in accordance with paragraphs 8.1.3.6.3.2. or 8.1.3.6.3.3. (whichever is appropriate). The test should then be conducted after removal of the dummy.
- Paragraph 8.2.5.2.6. This paragraph shall not apply to guide straps which are approved separately under this Regulation."



ENTRY INTO FORCE of amendments to Regulation No. 57<sup>1</sup> ("Uniform provisions concerning the approval of headlamps for motor cycles and vehicles treated as such") annexed to the Agreement of 20 March 1958 concerning the adoption of uniform conditions of approval and reciprocal recognition of approval for motor vehicle equipment and parts

The amendments were proposed by the Government of the Netherlands and circulated by the Secretary-General to the Contracting Parties on 30 September 1988. They came into force on 28 February 1989, in accordance with article 12 (1) of the Agreement.

The text of the amendments (*01 Series of amendments to Regulation No. 57*) reads as follows:

Page i, annexes

Annex 2, amend to read:

"Arrangements of approval marks"

Add a new annex 5, to read:

"Annex 5 - Tests for stability of photometric performance of headlamps".

Paragraph 2.2. Delete "... class of ..."

Paragraph 2.4. Add

"... absorption and/or deformation during operation."

Paragraph 3. amend the title to read as follows:

"APPLICATION FOR APPROVAL OF A HEADLAMP 2/"

and add at the bottom of the page the following footnote 2/

"2/ Application for approval of a filament lamp see Regulation No. 37".<sup>2</sup>

Paragraph 4.1.2., delete the sentence:

"There are two ... (see annex 3)," and add at the end the following:

"All 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 shall be marked with an oblique stroke (/) placed behind the passing lamp symbol in the approval mark."

Paragraph 4.1.4., amend the head at the left of the table as follows:

"Exterior marking of the headlamps"

and delete class MA and the corresponding filament lamp.

<sup>1</sup> United Nations, *Treaty Series*, vol. 1317, p. 293.

<sup>2</sup> *Ibid.*, vol. 1073, p. 337; vol. 1254, p. 464; vol. 1336, p. 312; vol. 1358, p. 350; vol. 1438, p. 418; vol. 1484, p. 399, and vol. 1499, No. A-4789.

Paragraph 5.2., replace 00 by 01 and delete the rest of the text within brackets.

Footnote 2/ delete the sentence within the brackets.

Paragraph 5.3., add to the last sentence: "... or folded to that format."

Add a new paragraph 5.4.2., to read:

"5.4.2. In every case the relevant operating 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 the 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 beam symbol in approval mark.

Add at the end of paragraph 6.2.:

"... and they retain the characteristics prescribed by this Regulation."

Add the following new paragraphs 6.2.1, 6.2.2., to read:

6.2.1. 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 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 ( $E_m$ )."

Add a new paragraph 6.4., to read:

"6.4. 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."

Paragraph 7.2., rewrite:

- "7.2. For the measurement ...  
... filament lamp (S1 and/or S2, Regulation 37) with a smooth  
and colourless bulb shall be used. The standard filament ...  
for these lamps."

Paragraph 7.3., (in accordance with Regulation 20)

- change " $\pm 1,500$  mm" ( $\pm 8.53^\circ$ ) into " $\pm 5^\circ$ " and  
delete last part of the sentence "... measured ... 10 m."

Paragraph 7.5., insert photoelement instead of photo-receptor

Paragraph 8.1., replace "lights" by "light" and

- insert filament before lamp, and  
change the temperature into "2,856 K".

Paragraph 8.3., read:

"... selective yellow light, ..."

Paragraph 9., read:

- "9. Transitional Provisions
- 9.1. As from the date of entry into force of the 01 series of amendments to this Regulation no Contracting Party applying it shall refuse to grant approvals under this Regulation as amended by the 01 series of amendments.
- 9.2. As from 24 months after the date of entry into force mentioned in paragraph 9.1. above, Contracting Parties applying this Regulation shall grant approval only if the type of headlamp corresponds to the requirements of this Regulation as amended by the 01 series of amendments.
- 9.3. Existing MB-approvals granted under this Regulation before the date mentioned in paragraph 9.2. above shall remain valid.
- However, Contracting Parties applying this Regulation may prohibit the fitting of devices which do not meet the requirements of this Regulation as amended by the 01 series of amendments.
- 9.3.1. On vehicles for which type approval or individual approval is granted more than 24 months after the date of entry into force mentioned in paragraph 9.1. above.
- 9.3.2. On vehicles first registered more than 5 years after the date of entry into force mentioned in paragraph 9.1. above."

Paragraph 10., add: "... the photometric and colorimetric requirements ..."  
and: "... with annex 4 and paragraph 3 of annex 5 ...".

"Annex 1

(Maximum format : A 4 (210 x 297 mm))

2/



- Communication concerning - approval,
- refusal of approval,
- extension of approval,
- approval withdrawn,
- production definitely discontinued 1/

of a type of headlamp pursuant to Regulation No. 57.

Approval No. .... Extension No. ....

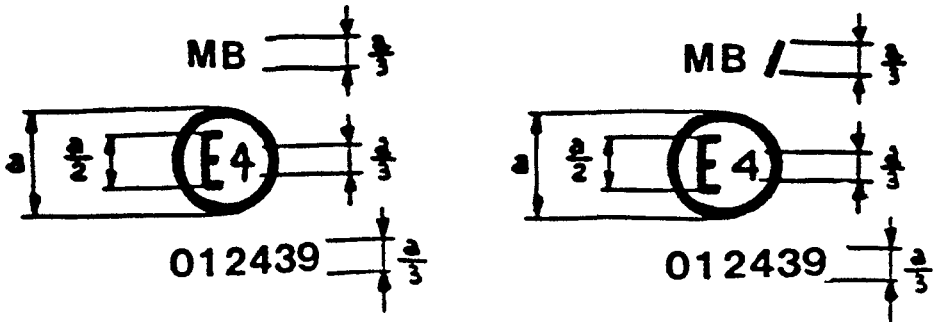
1. Headlamp submitted for approval as type MB, MB/ 1/ .....
2. Headlamp emitting, with a colourless lamp, a colourless beam/a selective yellow beam 1/ .....
3. Trade name or mark .....
4. Manufacturer's name and address .....
5. If applicable, name and address of manufacturer's representative .....
6. Submitted for approval on .....
7. Technical service responsible for conducting approval tests .....
8. Date of report issued by that service .....
9. Number of report issued by that service .....
10. Approval granted/refused/extended/withdrawn 1/ .....
11. Place .....
12. Date .....
13. Signature .....
14. The attached drawing No. ... bearing the approval number shows the headlamp.....
15. The list of documents filed with the administration service which has granted approval and available on request is annexed to this communication.

1/ Strike out what does not apply.

2/ Name of administration."

## "Annex 2

## ARRANGEMENT OF APPROVAL MARKS



a = 12 mm min.

The headlamp bearing the above approval mark has been approved in the Netherlands (E 4) under No. 012439. The approval number indicates that the approval was granted in accordance with the requirements of this Regulation as amended by the 01 series of amendments.

Note

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.

Identification of a headlamp meeting the requirements of Regulation No. 57. The headlamp is so designed, that the filament of the passing beam

can be lit together



shall not be lit together

simultaneously with driving beam and/or another reciprocally incorporated lighting function."

## Annex 3,

Change "H-H" to "h-h" and "V-V" to "v-v" throughout annex.

Paragraph 1., to read:

- "1. For aiming the aiming screen shall be located at a distance of at least 10 m front of the headlamp, the h-h line shall be horizontal. For measurement the photoelement shall be located at a distance of 25 m in front of the headlamp and perpendicular to the line joining the filament of the filament lamp and the point HV."

Paragraph 4.2., delete "continuously"

Paragraph 4.3., to read:

- "4.3. the maximum illumination ( $E_{\max}$ ) of the driving beam shall be at least 32 lx."

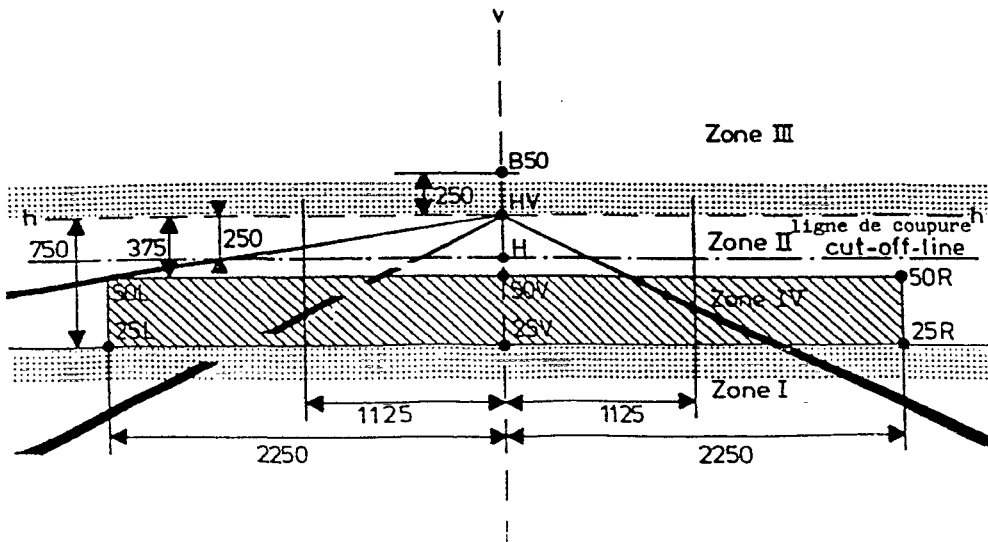
Paragraph 4.4.2., to read (after driving beam):

"... shall be not less than 12 lx for class MB-headlamps up to a distance of 1.125 m and not less than 3 lx to a distance of 2.25 m.

Paragraph 4.5., in the table, delete column for "Class A-headlamp" and insert instead of "Class B" "Class MB".

Paragraph 5., replace by the following diagram:

5. MEASURING AND AIMING SCREEN  
(dimensions in mm for 25 m distance)



Annex 4, paragraph 3,

insert "of" after "..., the conformity ..."

Add a new annex 5, to read:

"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, 50 L, B 50 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.

## 1. TEST FOR STABILITY OF PHOTOMETRIC PERFORMANCE

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

Note: \*/ 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.

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 of category S in the Regulation 37.

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.

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, 50 L, B 50 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 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  $\mu\text{m}$ , one part (by weight) of vegetal carbon dust of a grain size distributed between 0 and 100  $\mu\text{m}$ , 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  $E_{\text{max}}$  in driving beam, photometric distribution for a driving/passing lamp,

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

B 50 and 50 V for a passing lamp only

#### 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  $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ .

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 the vertical lines passing through point 50 L and 50 R) 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 ( $1.0 \text{ mrad} < \Delta r_I \leq 1.5 \text{ mrad}$ ) a second headlamp shall be tested as described in 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  $\Delta r_I$  measured on the first sample and  $\Delta r_{II}$  measured on the second sample is not more than 1.0 mrad

$$\left\{ \frac{\Delta r_I + \Delta r_{II}}{2} \leq 1.0 \text{ mrad} \right\}$$

## 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  $\Delta r$  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 mrad."

*Authentic texts of the amendments: English and French.*

*Registered ex officio on 28 February 1989.*

ENTRY INTO FORCE of Regulation No. 81 annexed to the Agreement of 20 March 1958 concerning the adoption of uniform conditions of approval and reciprocal recognition of approval for motor vehicle equipment and parts

The said Regulation came into force on 1 March 1989 in respect of France and Italy, in accordance with article 1 (5) of the Agreement:

*Regulation No. 81*

*Uniform provisions concerning the approval of rear-view mirrors, and of two-wheeled power-driven vehicles with or without side car with regard to the installation of rear-view mirrors on handlebars*

1. SCOPE

This Regulation applies:

- 1.1. To rear-view mirrors intended to be installed two- or three-wheeled power-driven vehicles not fitted with bodywork which partly or wholly encloses the driver and
- 1.2. \*/ To the installation of rear-view mirrors on power-driven vehicles defined in paragraph 1.1. above.

I - REAR-VIEW MIRRORS

2. DEFINITIONS

For the purpose of this Regulation,

- 2.1. "Rear-view mirror" means any device intended to give a clear view to the rear;
- 2.2. "Rear-view mirror type" means devices which do not differ in respect of the following main characteristics:
- 2.2.1. The dimensions and radius of curvature of the rear-view mirror reflecting surface,
- 2.2.2. The design, shape or materials of the rear-view mirrors, including the connection with the vehicle;
- 2.3. "Class of rear-view mirrors" means all devices having one or several features or functions in common.
- The rear-view mirrors mentioned in this Regulation are grouped in Class "L".
- 2.4. "r" means the average of the radii of curvature measured over the reflecting surface, in accordance with the method described in paragraph 2 of annex 6 to this Regulation;

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\*/ For power-driven vehicles having less than four wheels and fitted with bodywork which partly or wholly encloses the driver the requirements of Regulation No. 46 shall apply.

- 2.5. "Principal radii of curvature at one point obtained on the reflecting surface (r<sub>i</sub>) and (r'<sub>i</sub>)" means the values obtained using the apparatus defined in annex 6, measured on the arc of the reflecting surface contained in a plane parallel to the greatest dimension of the mirror and passing through its centre and on the arc perpendicular to it;
- 2.6. "Radius of curvature at one point on the reflecting surface (r<sub>p</sub>)" means the arithmetic average of the principal radii of curvature r<sub>i</sub> and r'<sub>i</sub>, i.e.:

$$r_p = \frac{r_i + r'_i}{2}$$

- 2.7. "Centre of the mirror" means the centroid of the visible area of the reflecting surface;
- 2.8. "Radius of curvature of the constituent parts of the rear-view mirror" means the radius "c" of the arc of the circle which most closely approximates to the curved form of the part in question.

### 3. APPLICATION FOR APPROVAL

- 3.1. The application for approval of a type of rear-view mirror shall be submitted by the holder of the trade name or mark or by his duly accredited representative.
- 3.2. For each type of rear-view mirror the application shall be accompanied by the undermentioned documents in triplicate and by the following particulars:
- 3.2.1. A technical description, including mounting instructions and specifying the type(s) of vehicles for which the rear-view mirror is intended,
- 3.2.2. Drawings sufficiently detailed to enable:
- 3.2.2.1. Compliance with the general specifications prescribed in paragraph 6 to be verified,
- 3.2.2.2. Compliance with the dimensions prescribed in paragraph 7.1. to be verified and
- 3.2.2.3. Compliance with the positioning of the spaces provided for the approval mark and prescribed by paragraph 4.2. below to be checked.
- 3.3. In addition, the application for approval shall be accompanied by four samples of the type of rear-view mirror. At the request of the technical service responsible for conducting approval tests supplementary samples may be required.

- 3.4. The competent authority shall verify the existence of satisfactory arrangements for ensuring effective control of the conformity of production before type-approval is granted.
4. MARKINGS
- 4.1. The samples of rear-view mirrors submitted for approval shall bear the trade name or mark of the manufacturer; this marking shall be clearly legible and be indelible.
- 4.2. Every rear-view mirror shall possess on its holder a space large enough to accommodate the approval mark, which must be legible when the rear-view mirror has been mounted on the vehicle; this space shall be shown on the drawings referred to in paragraph 3.2.2. above.
5. APPROVAL
- 5.1. If the samples submitted for approval meet the requirements of paragraphs 6 to 8 below, approval of the pertinent type of rear-view mirror 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 same Contracting Party may not assign the same number to another type of rear-view mirror.
- 5.3. Notice of approval or of extension or refusal of approval of a type of rear-view mirror pursuant to this Regulation shall be communicated to the Parties to the 1958 Agreement applying this Regulation, by means of a form conforming to the model in annex 1 to this Regulation.
- 5.4. There shall be affixed, conspicuously and in the space referred to in paragraph 4.2. above, to every rear-view mirror conforming to a type approved under this Regulation, in addition to the mark prescribed in paragraph 4.1., an international approval mark consisting of:

- 5.4.1. A circle surrounding the letter "E" followed by the distinguishing number of the country which has granted approval, 1/
- 5.4.2. An approval number,
- 5.4.3. An additional symbol in the form of the letter "L".
- 5.5. The approval mark and the additional symbol shall be clearly legible and be indelible.
- 5.6. Annex 3 to this Regulation gives an example of the arrangement of the approval mark and additional symbol.

## 6. GENERAL REQUIREMENTS

- 6.1. All rear-view mirrors shall be adjustable.
- 6.2. The edge of the reflecting surface shall be enclosed in a holder which, on its perimeter, shall have a value of "c"  $\geq$  2.5 mm at all points and in all directions. If the reflecting surface projects beyond the holder, the radius of curvature "c" of the edge of the projecting part shall be not less than 2.5 mm and shall return into the holder under a force of 50 N applied to the point of greatest projection relative to the holder in a horizontal direction approximately parallel to the longitudinal median plane of the vehicle.
- 6.3. When the rear-view mirror is mounted on a plane surface, all its parts, irrespective of the adjustment position of the device, including those parts remaining attached to the holder after the test set out in paragraph 8.2., which are in potential static contact with a sphere 100 mm in diameter shall have a radius of curvature "c" of not less than 2.5 mm.
- 6.3.1. Edges of fixing holes or recesses, which are less than 12 mm in width are exempt from the radius requirements of paragraph 6.3. provided they are blunted.

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1/ One 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.

- 6.4. The parts of rear-view mirrors that are made of a Shore A hardness not greater than 60 are exempt from the provisions set out in paragraphs 6.2. and 6.3. above.
7. SPECIAL SPECIFICATIONS
- 7.1. Dimensions
- 7.1.1. The minimum dimensions of the reflecting surface must be such that:
- 7.1.1.1. The area shall not be less than 69 cm<sup>2</sup>,
- 7.1.1.2. In the case of circular mirrors, the diameter shall not be less than 94 mm,
- 7.1.1.3. In the case of non-circular mirrors, the dimension will permit the inscription of a circle with a diameter of 78 mm on the reflecting surface.
- 7.1.2. The maximum dimensions of the reflecting surface must be such that:
- 7.1.2.1. In the case of circular mirrors, the diameter shall not be greater than 150 mm,
- 7.1.2.2. In the case of non-circular mirrors, the reflecting surface shall fit into a rectangle measuring 120 mm by 200 mm.
- 7.2. Reflecting surface and coefficient of reflection
- 7.2.1. The reflecting surface of a rear-view mirror shall be spherically convex.
- 7.2.2. Differences between the radii of curvature:
- 7.2.2.1. The difference between  $r_i$  or  $r'_i$  and  $r_p$  at each reference point shall not exceed 0.15  $r$ .
- 7.2.2.2. The difference between any of the radii of curvature ( $r_{p1}$ ,  $r_{p2}$  and  $r_{p3}$ ) and  $r$  shall not exceed 0.15  $r$ .
- 7.2.3. The value of " $r$ " shall not be less than 1,000 mm nor greater than 1,500 mm.

7.2.4. The value of the normal coefficient of reflection, determined according to the method described in annex 5 to this Regulation, shall not be less than 40%. If the mirror has two positions ("day" and "night"), the "day" position shall allow the colours of the signals used for road traffic to be recognized. The value of the normal coefficient of reflection in the "night" position shall not be less than 4%.

7.2.5. The reflecting surface shall retain the characteristics specified in paragraph 7.2.4., in spite of prolonged exposure to adverse weather conditions, in normal conditions of use.

## 8. TESTS

8.1. Rear-view mirrors shall be subjected to the tests described in paragraphs 8.2. and 8.3. below, to determine their behaviour under impact on and bending of the holder secured to the stem or support.

### 8.2. Impact test

8.2.1. Description of the test device:

8.2.1.1. The test device shall consist of a pendulum capable of swinging about two horizontal axes at right angles to each other, one of which is perpendicular to the front plane containing the "release" trajectory of the pendulum. The end of the pendulum shall comprise a hammer formed by a rigid sphere with a diameter of  $165 \pm 1$  mm and having a 5 mm-thick rubber covering of Shore A 50 hardness. A device shall be provided which permits determination of the maximum angle assumed by the arm in the plane of release. There shall be a support firmly fixed to the structure supporting the pendulum which serves to hold the specimens in compliance with the impact requirements stipulated in paragraph 8.2.2.6. below. Figure 1 below gives the dimensions of the test facility and the special design specifications.

8.2.1.2. The centre of percussion of the pendulum shall coincide with the centre of the sphere which forms the hammer. It is at a distance "l" from the axis of oscillation in the release plane which is equal to  $1 \text{ m} \pm 5 \text{ mm}$ . The reduced mass of the pendulum to its centre of percussion is  $m_0 = 6.8 \pm 0.05 \text{ kg}$ . The relationship between the centre of gravity of the pendulum and its axis of rotation is expressed in the equation:

$$m_0 = m \frac{d}{l}$$



(dimensions in mm)

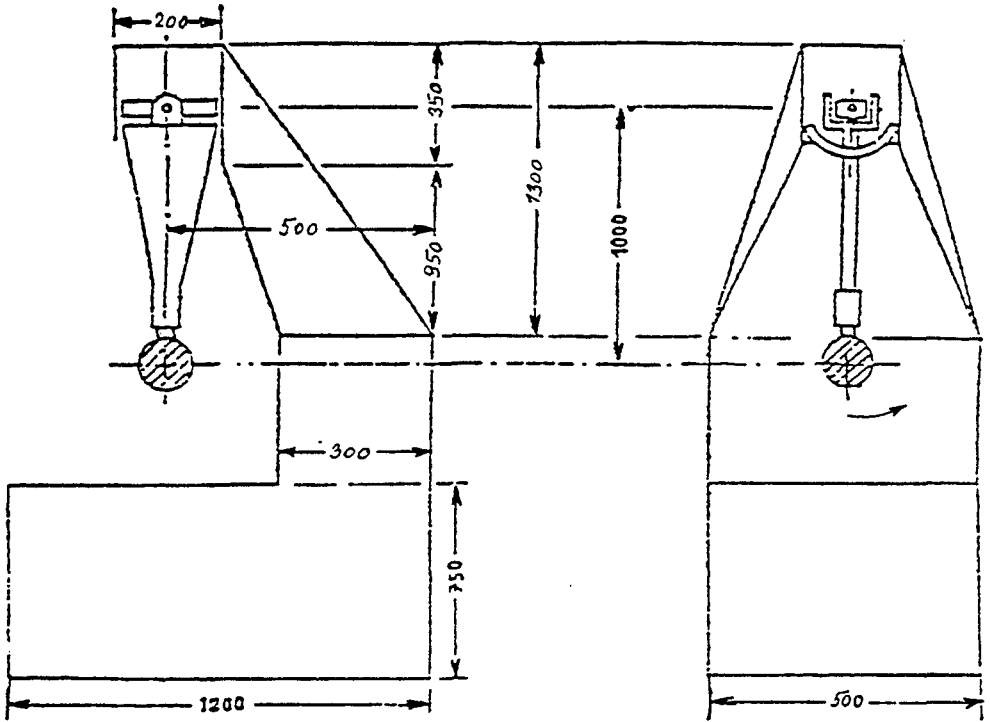


Figure 1

- 8.2.2. Description of the test:
- 8.2.2.1. The procedure used to clamp the rear-view mirror to the support shall be that recommended by the manufacturer of the device, or, where appropriate, by the vehicle manufacturer.
- 8.2.2.2. Positioning the rear-view mirror for the test.
- 8.2.2.2.1. Rear-view mirrors shall be positioned on the pendulum impact rig such that the axes which are horizontal and vertical when installed on a vehicle in accordance with the vehicle or rear-view mirror manufacturers' mounting instructions, are in a similar position.
- 8.2.2.2.2. When a rear-view mirror is adjustable in relation to the base, the test position shall be the least favourable for any pivoting device to operate within the limits provided by the mirror or vehicle manufacturer.
- 8.2.2.2.3. When the rear-view mirror has a device for adjusting its distance from the base, the device shall be set in the position where the distance between the holder and the base is shortest.
- 8.2.2.2.4. When the reflecting surface is mobile in the holder, it shall be adjusted so that the upper corner which is furthest from the vehicle, is in the position of greatest projection relative to the holder.
- 8.2.2.3. When the pendulum is in a vertical position, the horizontal and longitudinal vertical planes passing through the centre of the hammer, shall pass through the centre of the mirror as defined in paragraph 2.7. above. The longitudinal direction of oscillation of the pendulum shall be parallel to the longitudinal plane of the vehicle.
- 8.2.2.4. When, under the conditions governing adjustment prescribed in paragraphs 8.2.2.2.1. and 8.2.2.2.2. above, parts of the rear-view mirror limit the return of the hammer, the point of impact shall be shifted in a direction perpendicular to the axis of rotation or pivot in question. This displacement shall be that which is strictly necessary for the implementation of the test.

It shall be limited in such a way that the point of contact of the hammer is located at least 10 mm from the periphery of the reflecting surface.

- 8.2.2.5. The test consists in allowing the hammer to fall from a height corresponding to a pendulum angle of 60° from the vertical so that the hammer strikes the rear-view mirror at the moment when the pendulum reaches the vertical position.
- 8.2.2.6. The rear-view mirrors are subjected to impact in the following different conditions:
- 8.2.2.6.1. Test 1: The point of impact shall be as defined in paragraphs 8.2.2.3 or 8.2.2.4 above. The impact shall be such that the hammer strikes the rear-view mirror on the reflecting surface side.
- 8.2.2.6.2. Test 2: The point of impact shall be as defined in paragraphs 8.2.2.3. or 8.2.2.4. above. The impact shall be such that the hammer strikes the rear-view mirror on the opposite side to the reflecting surface.
- 8.3. Bending test on the holder fixed to the stem
- 8.3.1. Description of the test
- 8.3.1.1. The holder shall be placed horizontally in a device in such a way that the adjustment parts of the mounting can be clamped securely. In the direction of the greatest dimension of the holder, the end nearest to the point of fixing on the adjustment part shall be immobilized by means of a fixed step 15 mm wide, covering the entire width of the holder.
- 8.3.1.2. At the other end, a step identical with the one described above shall be placed on the holder so that the specified test load can be applied to it (see figure 2 below).
- 8.3.1.3. The end of the holder opposite that at which the force is applied may be clamped instead of kept in position as shown in figure 2.

Example of bending test apparatus for rear-view mirror holders

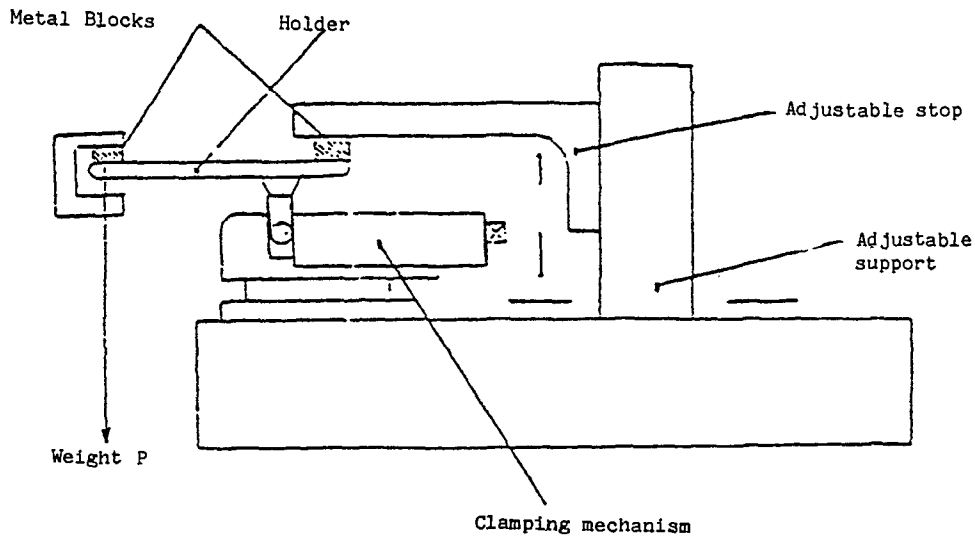


Figure 2

- 8.3.2. The test load shall be 25 kg applied for one minute.
- 8.4. Results of the tests
- 8.4.1. In the tests described in paragraph 8.2. above, the pendulum shall return in such a way that the projection on the release plane of the position taken by the arm makes an angle of at least 20° with the vertical.
- 8.4.1.1. The accuracy of the angle measurement shall be  $\pm 1^\circ$ .
- 8.4.2. The mirror shall not break during the tests described in paragraphs 8.2. and 8.3 above. However, breakage of the reflecting surface of the mirror shall be allowed if one of the following conditions is fulfilled:
- 8.4.2.1. The fragments of glass still adhere to the back of the holder or to a surface firmly attached to the holder, except that partial separation of the glass from its backing is permitted, provided this does not exceed 2.5 mm either side of the crack. It is permissible for small splinters to become detached from the surface of the glass at the point of impact;
- 8.4.2.2. The mirror is made of safety glass.
9. CONFORMITY OF PRODUCTION
- 9.1. Any rear-view mirror approved pursuant to this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements set forth in paragraphs 6. to 8. above.
- 9.2. In order to verify that the requirements of paragraph 9.1. are met, suitable controls of the production shall be carried out.
- 9.3. The holder of the approval shall, in particular:
- 9.3.1. Ensure existence of procedures for the effective control of the quality of rear-view mirrors,
- 9.3.2. Have access to the control equipment necessary for checking the conformity of each approved type,
- 9.3.3. Ensure that data of test results are recorded and that annexed documents shall remain available for a period to be determined in accordance with the administrative service,

- 9.3.4. Analyse the results of each type of test, in order to verify and ensure the stability of the rear-view mirror characteristics, making allowance for variation of an industrial production,
- 9.3.5. Ensure that for each type of rear-view mirror at least the tests prescribed in annex 7 to this Regulation are carried out,
- 9.3.6. Ensure that any samples or test pieces giving evidence of non-conformity with the type of test considered shall give rise to another sampling and another test. All the necessary steps shall be taken to re-establish the conformity of the corresponding production.
- 9.4. The competent authority which has granted type-approval may at any time verify the conformity control methods applicable to each production unit.
- 9.4.1. In every inspection, the test books and production survey records shall be presented to the visiting inspector.
- 9.4.2. The inspector may take samples at random which will be tested in the manufacturer's laboratory. The minimum number of samples may be determined according to the results of the manufacturer's own verification.
- 9.4.3. When the quality level appears unsatisfactory or when it seems necessary to verify the validity of the tests carried out in application of paragraph 9.4.2., the inspector shall select samples to be sent to the technical service which has conducted the type-approval tests.
- 9.4.4. The competent authority may carry out any test prescribed in this Regulation.
- 9.4.5. The normal frequency of inspections authorized by the competent authority shall be one per two year. In the case where negative results are recorded during one of these visits, the competent authority shall ensure that all necessary steps are taken to re-establish the conformity of production as rapidly as possible.
10. PENALTIES FOR NON-CONFORMITY OF PRODUCTION
- 10.1. The approval granted in respect of a type of rear-view mirror pursuant to this Regulation may be withdrawn if the requirements set forth above are not met.
- 10.2. 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.

11. MODIFICATION AND EXTENSION OF APPROVAL OF A TYPE OF REAR-VIEW MIRROR
- 11.1. Every modification of the vehicle type shall be notified to the administrative department which approved the type of rear-view mirror. The department may then either:
- 11.1.1. Consider that the modifications made are unlikely to have an appreciable adverse effect and that in any case the rear-view mirror still complies with the requirements; or
- 11.1.2. Require a further test report from the technical service responsible for conducting the tests.
- 11.2. Confirmation or refusal of approval, specifying the alterations shall be communicated by the procedure specified in paragraph 5.3 above to the Parties to the Agreement applying this Regulation.
- 11.3. The competent authority issuing the extension of approval shall assign a series number for such an extension and inform thereof the other Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in annex 1 to this Regulation.

12. PRODUCTION DEFINITELY DISCONTINUED

If the holder of the approval completely ceases to manufacture a type of rear-view mirror 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 1958 Agreement applying this Regulation by means of a communication form conforming to the model in annex 1 to this Regulation.

II - INSTALLATION OF REAR-VIEW MIRRORS

13. DEFINITIONS

For the purpose of this Regulation,

- 13.1. "The maximum design speed" as specified in paragraph 16.2. of this Regulation.
- 13.2. "Type of vehicle as regards rear-view mirrors" means vehicles which are identical in respect of the following basic features:
- 13.2.1. The geometrical features of the vehicle, liable to influence the installation of rear-view mirrors,
- 13.2.2. The positions and types of rear-view mirror specified.

14. APPLICATION FOR APPROVAL

- 14.1. The application for approval of a vehicle type with regard to the installation of rear-view mirrors shall be submitted by the vehicle manufacturer or by his duly accredited representative.
- 14.2. It shall be accompanied by the undermentioned documents in triplicate and by the following particulars:
- 14.2.1. A description of the vehicle type with respect to the items mentioned in paragraph 13.2. above;
- 14.2.2. A list of the components necessary to identify rear-view mirrors which can be installed in the vehicle;
- 14.2.3. Drawings showing the position of the rear-view mirror and its adapting components on the vehicle.
- 14.3. A vehicle representative of the vehicle type to be approved shall be submitted to the technical service responsible for conducting the approval tests.
- 14.4. The competent authority shall verify the existence of satisfactory arrangements for ensuring effective control of the conformity of production before type-approval is granted.

15. APPROVAL

- 15.1. If the vehicle type submitted for approval in accordance with paragraph 14 above meets the requirements of paragraph 16 of this Regulation, approval shall be granted.
- 15.2. 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 same Contracting Party may not assign the same number to another vehicle type.
- 15.3. Notice of approval or of extension or refusal of approval of a vehicle type pursuant to this Regulation shall be communicated to the Parties to the 1958 Agreement applying this Regulation, by means of a form conforming to the model in annex 2 to this Regulation.
- 15.4. There shall be affixed, conspicuously and in a readily accessible place specified on the approval form, to every vehicle conforming to a type approved under this Regulation an international approval mark consisting of:



- 15.4.1. A circle surrounding the letter "E" followed by the distinguishing number of the country which has granted approval, \*/
- 15.4.2. The number of this Regulation, followed by the letter "R", a dash and the approval number to the right of the circle prescribed in paragraph 15.4.1.
- 15.5. If the vehicle conforms to a vehicle type approved, under one or more other Regulations annexed to the Agreement, in the country which has granted approval under this Regulation, the symbol prescribed in paragraph 15.4.1. need not be repeated; in such a case, the Regulation and approval numbers and the additional symbols of all the Regulations under which approval has been granted in the country which has granted approval under this Regulation shall be placed in vertical columns to the right of the symbol prescribed in paragraph 15.4.1.
- 15.6. The approval mark shall be clearly legible and be indelible.
- 15.7. The approval mark shall be placed close to or on the vehicle data plate affixed by the manufacturer.
- 15.8. Annex 4 to this Regulation gives examples of arrangements of the approval mark.
16. REQUIREMENTS
- 16.1. The vehicle shall meet the following requirements:
- 16.1.1. The rear-view mirrors installed on the vehicle shall be of Class L type approved under this Regulation.
- 16.1.2. Rear-view mirrors shall be fixed in such a way that they remain steady under normal conditions of use.
- 16.2. Number
- 16.2.1. All two-wheeled vehicles with a maximum design speed not exceeding 100 km/h must be fitted with a rear-view mirror. This rear-view mirror must be fitted on the left side of the vehicle in countries with right-hand rule of the road, and on the right side of the vehicle in countries with left-hand rule of the road.
- 16.2.2. All two-wheeled vehicles with a maximum design speed exceeding 100 km/h must be fitted with two rear-view mirrors, one on the left and one on the right of the vehicle.

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\*/ See paragraph 5.4.1., footnote1/

### 16.3. Site

- 16.3.1. Rear-view mirrors must be mounted or adjusted in such a way that the distance of the centre of the reflective surface, as measured in a horizontal plane, is at least 280 mm outward from the longitudinal vertical plane passing through the centre of the steering head of the vehicle. Before the measurement, the handlebar shall be placed in the straight ahead position and the mirror(s) shall be adjusted to its (their) normal position.

### 16.4. Adjustment

- 16.4.1. Rear-view mirror(s) shall be such that the driver can adjust it (them) in the normal driving position.

## 17. CONFORMITY OF PRODUCTION

- 17.1. Any vehicle approved pursuant to this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements set out in paragraph 16 above.
- 17.2. In order to verify that the requirements of paragraph 17.1. above are met, suitable controls of the production shall be carried out.
- 17.3. The holder of the approval shall in particular:
- 17.3.1. Ensure existence of procedures for the effective control of the quality of the vehicles as regards all aspects relevant for compliance with the requirements set out in paragraph 16 above;
- 17.3.2. Ensure that for each type of vehicle sufficient checks are carried out as regards the number and type of the rear-view mirrors and the dimensions relevant for their correct installation in order to ensure that all vehicles in production comply with the specifications given for the vehicle which was submitted for type-approval;
- 17.3.3. Ensure that, if the checks carried out pursuant to paragraph 17.3.2. above give evidence of non-conformity of one or more vehicles with the requirements set out in paragraph 16 above, all necessary steps are taken to re-establish the conformity of the corresponding production.
- 17.4. The competent authority which has granted type-approval may at any time verify the conformity control methods applicable to each production unit. It may also carry out any random checks on serially-manufactured vehicles regarding the requirements set out in paragraph 16 above.
- 17.5. In the case where negative results are recorded during the verifications and checks pursuant to paragraph 17.4. above, the competent authority shall ensure that all necessary steps are taken to re-establish the conformity of production as rapidly as possible.

## 18. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

- 18.1. The approval granted in respect of a vehicle type pursuant to this Regulation may be withdrawn if the requirements set forth above are not met.
- 18.2. 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.

## 19. MODIFICATION AND EXTENSION OF APPROVAL OF THE VEHICLE TYPE

- 19.1. Every modification of the vehicle type shall be notified to the administrative department which approved the vehicle type. The department may then either:
- 19.1.1. Consider that the modifications made are unlikely to have an appreciable adverse effect and that in any case the vehicle still complies with the requirements; or
- 19.1.2. Require a further test report from the technical service responsible for conducting the tests.
- 19.2. Confirmation or refusal of approval, specifying the alterations shall be communicated by the procedure specified in paragraph 15.3 above to the Parties to the Agreement applying this Regulation.
- 19.3. The competent authority issuing the extension of approval shall assign a series number for such an extension and inform thereof the other Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in annex 2 to this Regulation.

## 20. PRODUCTION DEFINITELY DISCONTINUED

If the holder of the approval completely ceases to manufacture a vehicle type 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 1958 Agreement applying this Regulation by means of a communication form conforming to the model in annex 2 to this Regulation.

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

The Parties to the 1958 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.

Annex 1

(maximum format: A4 (210 x 297 mm))

COMMUNICATION



issued by: Name of administration:
.....
.....
.....

- concerning: 2/ APPROVAL GRANTED
APPROVAL EXTENDED
APPROVAL REFUSED
APPROVAL WITHDRAWN
PRODUCTION DEFINITELY DISCONTINUED

of a type of rear-view mirror pursuant to Regulation No. 81

Approval No. ... Extension No. ...

- 1. Trade name or mark of the equipment: .....
2. Equipment type: .....
3. Brief description including in particular the following information:
3.1. Main dimensions ) of the reflecting surface
3.2. Nominal radius of curvature )
4. Manufacturer's name and address: .....
5. If applicable, name and address of manufacturer's representative: .....
6. Equipment submitted for approval on: .....

- 7. Technical service responsible for conducting approval tests: .....
- 8. Date of report issued by that service: .....
- 9. Number of report issued by that service: .....
- 10. Vehicles for which the equipment is designed: .....
- 11. Approval is granted/refused/extended/withdrawn 2/
- 12. Reason(s) for extension of approval: .....
- 13. Place: .....
- 14. Date: .....
- 15. Signature: .....
- 16. A list of documents contained in the approval file transmitted to the administrative service which has granted approval is annexed to this communication.

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1/ Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in the Regulation).

2/ Strike out what does not apply.

Annex 2

(maximum format: A4 (210 x 297 mm))



COMMUNICATION

issued by:

Name of administration:

.....  
.....  
.....

- concerning: 2/ APPROVAL GRANTED
- APPROVAL EXTENDED
- APPROVAL REFUSED
- APPROVAL WITHDRAWN
- PRODUCTION DEFINITELY DISCONTINUED

of a type of vehicle with regard to the installation of rear-view mirrors pursuant to Regulation No. 81

Approval No. ...

Extension No. ...

1. Trade name or mark of the vehicle: .....
2. Vehicle type: .....
3. Vehicle maximum design speed:  $\leq 100$  km/h /  $> 100$  km/h 2/
4. Manufacturer's name and address: .....  
.....
5. If applicable, name and address of manufacturer's representative: .....  
.....

6. Trade name or mark of rear-view mirror(s): .....
7. Approval mark of the rear mirror: .....
8. Vehicle submitted for approval on: .....
9. Technical service responsible for conducting approval tests: .....
10. Date of report issued by that service: .....
11. Number of report issued by that service: .....
12. Approval is granted/refused/extended/withdrawn 2/
13. Reason(s) for extension of approval: .....  
.....
14. Place: .....
15. Date: .....
16. Signature: .....
17. A list of documents contained in the approval file transmitted to the administrative service which has granted approval is annexed to this communication.

---

1/ Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in the Regulation).

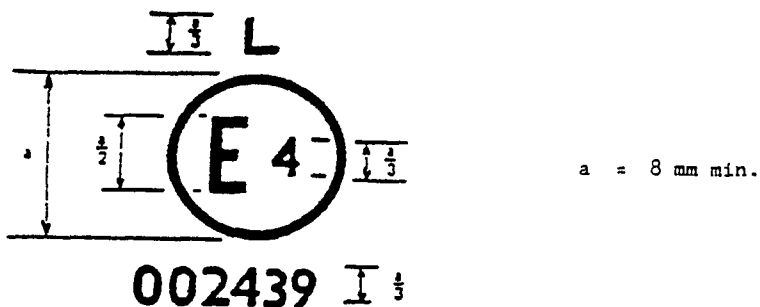
2/ Strike out what does not apply.



## Annex 3

## ARRANGEMENT OF THE REAR-VIEW MIRROR APPROVAL MARK

(See paragraph 5.4. of the Regulation)



The above approval mark affixed to a rear-view mirror indicates that the mirror is a rear-view mirror, of type L, which has been approved in the Netherlands (E 4) under approval number 002439. The first two digits of the approval number indicate that the approval was granted in accordance with the requirements of Regulation No. 81 in its original form.

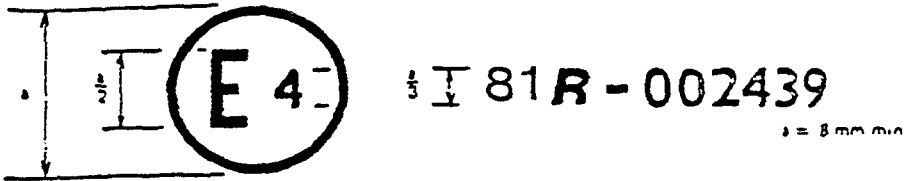
**Note:** The approval number and the additional symbol must be placed close to the circle and either above or below the "E" or to the left or right of that letter. The digits of the approval number must be on the same side of the "E" and point in the same direction. The additional symbol must be directly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

Annex 4

ARRANGEMENTS OF THE VEHICLE APPROVAL MARK CONCERNING THE INSTALLATION OF REAR-VIEW MIRRORS

Model A

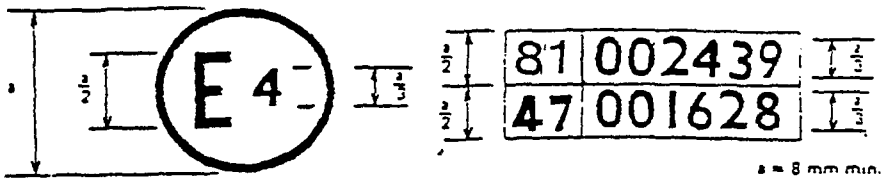
(See paragraph 15.4. of the Regulation)



The above approval mark affixed to a vehicle shows that the vehicle type concerned has been approved in the Netherlands (E 4) pursuant to Regulation No. 81 under approval number 002439. The first two digits of the approval number indicate that the approval was granted in accordance with the requirements of Regulation No. 81 in its original form.

Model B

(See paragraph 15.5. of the Regulation)



The above approval mark affixed to a vehicle shows that the vehicle type concerned has been approved in the Netherlands (E 4) pursuant to Regulations Nos. 81 and 47. 1/ The first two digits of the approval numbers indicate that, at the dates when the respective approvals were granted, Regulation No. 81 had not been modified, and Regulation No. 47 already included the 01 series of amendments.

1/ The second number is given as an example only.

## Annex 5

## TEST METHOD FOR DETERMINING REFLECTIVITY

## 1. DEFINITIONS

## 1.1. CIE standard illuminant A: 1/

$\lambda$	$\bar{x}$	$(\lambda)$
600	1.062	2
620	0.854	4
650	0.283	5

1.2. CIE standard source A: 1/ Gas-filled tungsten filament lamp operating at a correlated colour temperature of  $T_{68} = 2,855.6$  K.1.3. CIE 1931 standard colorimetric observer: 1/ Receptor of radiation whose colorimetric characteristics correspond to the spectral tristimulus values  $\bar{x}(\lambda)$ ,  $\bar{y}(\lambda)$ ,  $\bar{z}(\lambda)$  (see table).

## 1.4. CIE spectral tristimulus values: 1/ Tristimulus values of the spectral components of an equi-energy spectrum in the CIE (XYZ) system.

## 1.5. Photopic vision: 1/ Vision by the normal eye when it is adapted to levels of luminance of at least several candelas per square metre.

## 2. APPARATUS

## 2.1. General

## 2.1.1. The apparatus shall consist of a light source, a holder for the test sample, a receiver unit with a photodetector and an indicating meter (see figure 1), and a means of eliminating the effects of extraneous light.

## 2.1.2. The receiver may incorporate a light-integrating sphere to facilitate measuring the reflectance of non-flat (convex) mirrors (see figure 2).

## 2.2. Spectral characteristics of light source and receiver.

## 2.2.1. The light source shall consist of a CIE standard source A and associated optics to provide a near-collimated light beam. A voltage stabilizer is recommended to maintain a fixed lamp voltage during instrument operation.

- 2.2.2. The receiver shall have a photodetector with a spectral response proportional to the photopic luminosity function of the CIE (1931) standard colorimetric observer (see table). Any other combination of illuminant-filter-receptor giving the overall equivalent of CIE standard illuminant A and photopic vision may be used. When an integrating sphere is used in the receiver, the interior surface of the sphere shall be coated with a matt (diffusive) spectrally non-selective white coating.
- 2.3. Geometric conditions
- 2.3.1. The angle of the incident beam ( $\theta$ ) should preferably be  $0.44 \pm 0.09$  rad ( $25 \pm 5^\circ$ ) from the perpendicular to the test surface and shall not exceed the upper limit of the tolerance (i.e.  $0.53$  rad or  $30^\circ$ ). The axis of the receptor shall make an angle ( $\theta$ ) with this perpendicular equal to that of the incident beam (see figure 1). The incident beam upon arrival at the test surface shall have a diameter of not less than 19 mm. The reflected beam shall not be wider than the sensitive area of the photodetector, shall not cover less than 50% of such area, and as nearly as possible shall cover the same area segment as used during instrument calibration.
- 2.3.2. When an integrating sphere is used in the receiver section, the sphere shall have a minimum diameter of 127 mm. The sample and incident beam apertures in the sphere wall shall be of such a size as to admit the entire incident and reflected light beams. The photodetector shall be located so as not to receive direct light from either the incident or the reflected beams.
- 2.4. Electrical characteristics of the photodetector-indicator unit
- The photodetector output as read on the indicating meter shall be a linear function of the light intensity on the photosensitive area. Means (electrical and/or optical) shall be provided to facilitate zeroing and calibration adjustments. Such means shall not affect the linearity or the spectral characteristics of the instrument. The accuracy of the receptor-indicator unit shall be with  $\pm 2\%$  of full scale, or  $\pm 10\%$  of the magnitude of the reading, whichever is the smaller.
- 2.5. Sample holder
- The mechanism shall be capable of locating the test sample so that the axes of the source arm and receptor are intersect at the reflecting surface. The reflecting surface may lie within or at either face of the mirror sample, depending on whether it is a first-surface, second-surface, or prismatic "flip" type mirror.

### 3. PROCEDURE

#### 3.1. Direct calibration method

3.1.1. In the direct calibration method, air is used as the reference standard. This method is applicable for those instruments which are so constructed as to permit calibration at the 100% point by swinging the receiver to a position directly on the axis of the light source (see figure 1).

3.1.2. It may be desired in some cases (such as when measuring low-reflectivity surfaces) to use an intermediate calibration point (between 0 and 100% on the scale) with this method. In these cases a neutral density filter of known transmittance shall be inserted in the optical path, and the calibration control shall then be adjusted until the meter reads the percentage transmission of the neutral density filter. This filter shall be removed before making reflectivity measurements.

#### 3.2. Indirect calibration method

The indirect calibration method is applicable for those instruments with fixed source and receiver geometry. A properly calibrated and maintained reflectance standard is required. This reference standard should preferably be a flat mirror with a reflectance value as near as possible to that of the test samples.

#### 3.3. Non-flat (convex) mirror measurement

The measurement of the reflectance of non-flat (convex) mirrors requires the use of instruments which incorporate an integrating sphere in the receiver unit (see figure 2). If the instrument indicating meter indicates  $n_e$  divisions with a reference standard mirror of  $E$  per cent reflectance, then, with a mirror of unknown reflectance,  $n_x$  divisions will correspond to a reflectance of  $X$  per cent, given by the formula:

$$X = E \frac{n_x}{n_e}$$

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1/ Definitions taken from CIE Publication 50 (45), International Electrotechnical Vocabulary, Group 45: lighting.

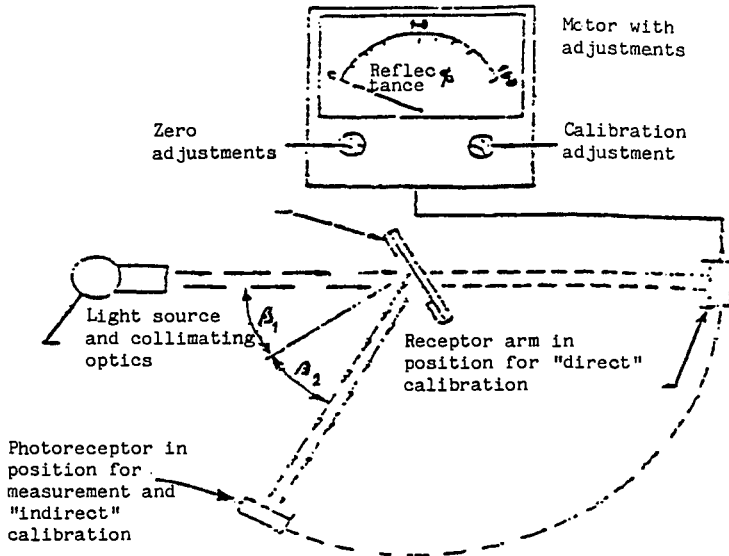


Figure 1 - Generalized reflectometer showing geometrics for the two calibration methods

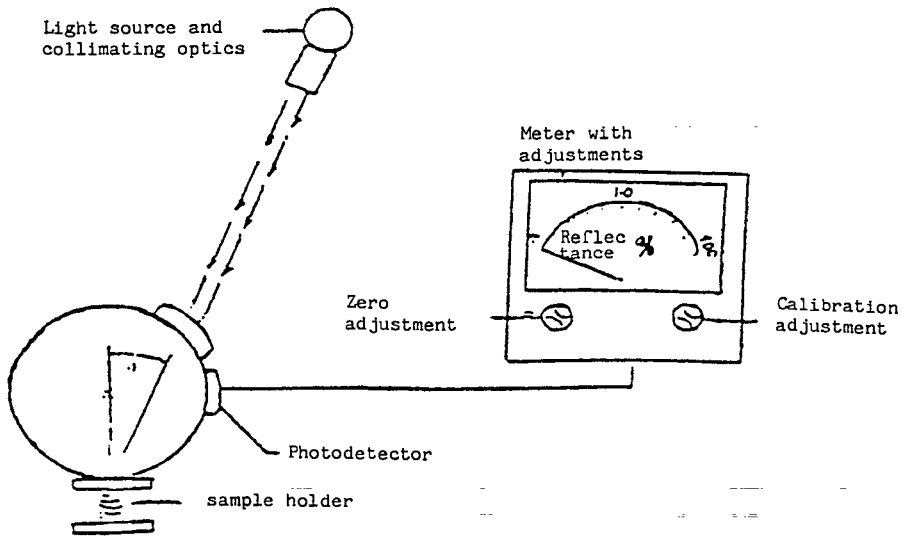


Figure 2 - Generalized reflectometer, incorporating an integrating sphere in the receptor

SPECTRAL TRISTIMULUS VALUES FOR THE CIE 1931 STANDARD COLORIMETRIC OBSERVER 1/  
(This table is taken from CIE Publication 50(45) (1970))

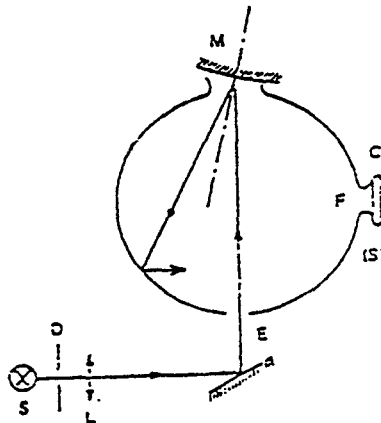
$\lambda$ nm	$x(\lambda)$	$\bar{y}(\lambda)$	$\bar{z}(\lambda)$
380	0.001 4	0.000 0	0.006 5
390	0.004 2	0.000 1	0.020 1
400	0.014 3	0.000 4	0.067 9
410	0.043 5	0.001 2	0.207 4
420	0.134 4	0.004 0	0.645 6
430	0.283 9	0.011 6	1.385 6
440	0.348 3	0.023 0	1.747 1
450	0.336 2	0.038 0	1.772 1
460	0.290 8	0.060 0	1.669 2
470	0.195 4	0.091 0	1.287 6
480	0.095 6	0.139 0	0.813 0
490	0.032 0	0.208 0	0.465 2
500	0.004 9	0.323 0	0.272 0
510	0.009 3	0.503 0	0.158 2
520	0.063 3	0.710 0	0.078 2
530	0.165 5	0.862 0	0.042 2
540	0.290 4	0.954 0	0.020 3
550	0.433 4	0.995 0	0.008 7
560	0.594 5	0.995 0	0.003 9
570	0.762 1	0.952 0	0.002 1
580	0.916 3	0.870 0	0.001 7
590	1.026 3	0.757 0	0.001 1
600	1.062 2	0.631 0	0.000 8
610	1.002 6	0.503 0	0.000 3
620	0.854 4	0.381 0	0.000 2
630	0.642 4	0.265 0	0.000 0
640	0.447 9	0.175 0	0.000 0
650	0.233 5	0.107 0	0.000 0
660	0.164 9	0.061 0	0.000 0
670	0.087 4	0.032 0	0.000 0
680	0.046 8	0.017 0	0.000 0
690	0.022 7	0.008 2	0.000 0
700	0.011 4	0.004 1	0.000 0
710	0.005 8	0.002 1	0.000 0
720	0.002 9	0.001 0	0.000 0
730	0.001 4	0.000 5	0.000 0
740	0.000 7	0.000 2 2/	0.000 0
750	0.000 3	0.000 1	0.000 0
760	0.000 2	0.000 1	0.000 0
770	0.000 1	0.000 0	0.000 0
780	0.000 0	0.000 0	0.000 0

1/ Abridged table. The values of  $\bar{y}(\lambda) = v(\lambda)$  are rounded off to four decimal places.

2/ Changed in 1966 (from 3 to 2).

## EXPLANATORY FIGURE

Example of device for measuring the reflection factor of spherical mirrors

Key

- C = Receiver
- D = Diaphragm
- E = Window of entry
- F = Window of measurement
- L = Lens
- M = Object window
- S = Light source
- (S) = Integrating sphere



**Annex 6****PROCEDURE FOR DETERMINING THE RADIUS OF CURVATURE "r" OF  
A MIRROR'S REFLECTING SURFACE**

1. Measurements
  - 1.1. Equipment

The "spherometer" described in figure 1 is used.
  - 1.2. Measuring points
    - 1.2.1. The principal radii of curvature shall be measured at 3 points situated as close as possible to positions at 1/3, 1/2 and 2/3 of the distance along the arc of the reflecting surface contained in a plane parallel to the greatest dimension of the mirror and passing through its centre and of the arc perpendicular to it.
    - 1.2.2. Where, because of mirror size, it is impossible to obtain measurement in the directions defined in item 1.2.1. the technical departments responsible for the tests may take measurements at this point in two perpendicular directions as close as possible to those prescribed above.
2. Calculation of the radius of curvature (r)

"r" expressed in mm is calculated using the formula:

$$r = \frac{r_{p1} + r_{p2} + r_{p3}}{3}$$

where  $r_{p1}$  is the radius of curvature of the first measuring point,  $r_{p2}$  at the second and  $r_{p3}$  at the third.

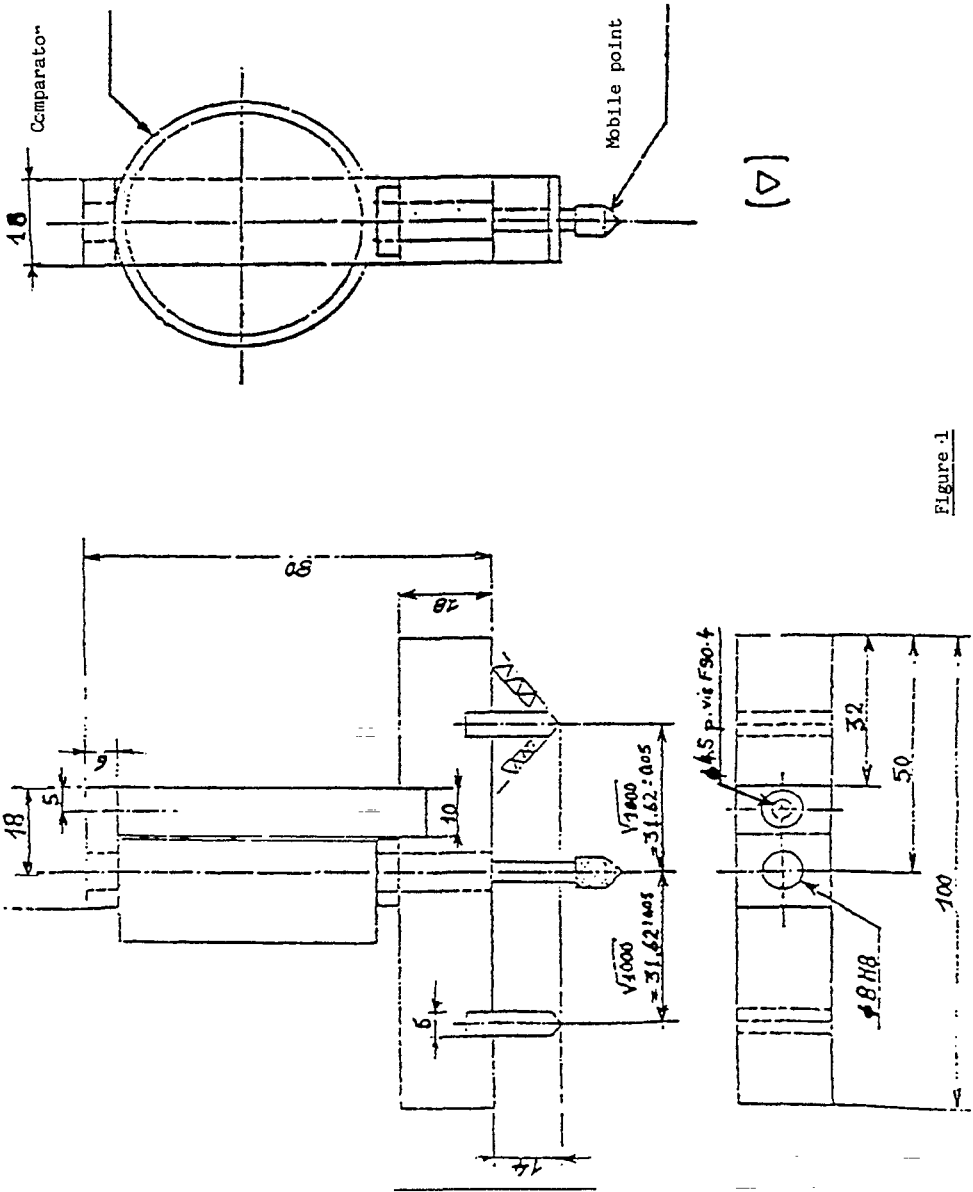


Figure 1

Annex 7

## CONTROL OF THE CONFORMITY OF PRODUCTION

## 1. DEFINITIONS

For the purpose of this annex,

"Type of deflection system" means a given combination of axes, swivel points and other articulating mechanisms which ensures deflection of the rear-view mirror in the direction of impact concerned.

## 2. TESTS

Rear-view mirrors shall be subjected to the following tests:

2.1. Reflecting surface

2.1.1. Verification of the nominal radius of curvature, pursuant to the requirements of paragraph 2 of annex 6 to this Regulation;

2.1.2. Measurement of the differences between radii of curvature pursuant to the requirements of paragraph 7.2.2. of this Regulation.

2.2. Deflection system

Impact test pursuant to the requirements of paragraph 8.2. of this Regulation.

## 3. FREQUENCY AND RESULTS OF TESTS

3.1. Verification of the nominal radius of curvature and measurement of the differences between radii of curvature

## 3.1.1. Frequency:

One test every three months, per approval number, per nominal radius of curvature.

## 3.1.2. Results:

All measurement results shall be recorded.

The maximum difference values prescribed in paragraph 7.2.2. of this Regulation shall be complied with.

3.2. Impact test

3.2.1. Frequency:

One test every three months, per approval number, per type of deflection system, per base configuration.

3.2.2. Results:

All results shall be recorded.

The provisions of paragraph 8.4. of this Regulation shall be complied with.

3.3. Selection of samples

The selection of samples to be tested shall take account of the quantity produced for each type of rear-view mirrors.

*Authentic texts of the Regulation: English and French.*

*Registered ex officio on 1 March 1989.*