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COLLECTION RELIEE DES DOCUMENTS "COM"

COM (75)619

Vol. 1975/0235

COMMISSION OF THE EUROPEAN COMMUNITIES

COM(75) 619 final
Brussels, 8 December 1975

Proposal for a

COUNCIL DIRECTIVE

on the approximation of the laws of the Member States relating to the filed of vision of motor-vehicle drivers

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(submitted to the Council by the Commission)

EXPLANATORY MEMORANDUM

I. General

1. The Chapter on the field of vision also forms part of the procedure for the Community type approval of motor vehicles and of their trailers covered by the Council Directive of 6 February 1970[1].

2. On 5 August 1968[2] the Commission addressed to the Council a proposal on, inter alia, the field of vision. The Council felt that it was inappropriate to examine these requirements before the adoption of the Directive on type approval since this Directive instituted the administrative procedure for the various directives of a technical nature. In the meantime, other international organizations have begun work on harmonization in this field. The field of vision is one of the characteristics which influence the overall design of a vehicle. It is therefore desirable that the harmonization of the technical requirements should extend in scope beyond the frontiers of the European Communities, so that Community motor manufacturers are not obliged to substantially modify vehicles intended for sale in non-member countries. The Commission therefore felt that it was justified that the Council should not begin to examine its proposal until the international work on the subject had reached a certain stage of fruition. After difficult and laborious discussions, tangible results have now been achieved in the form of a draft regulation relating to the field of vision which could satisfy the construction requirements for both "European" and "American" types of vehicle at the same time.

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(1) OJ No L 42, 23 February 1970
(2) OJ No C 125, 28 November 1968.

These results have been submitted to the Commission's group of experts on "Motor vehicles" which has delivered a positive opinion. However, some experts expressed hesitation with regard to the number of degrees laid down for the angles of binocular obstruction (item 5.1.2. in Annex I).

The initial redrafting of the proposal for a directive of July 1968 was so extensive that the Commission felt it worthwhile to put forward a new proposal for a directive.

II. Comments on the proposal for a directive

Its scope is restricted to motor vehicles falling within category M_1 (private motor vehicles), intended for use on the road, having at least four wheels and a maximum design speed in excess of 25 km/h (Article 1).

Article 2 incorporates the requirements relating to the field of vision in the EEC type approval procedure.

Since at the moment some new Member States do not operate their own type approval procedure it is necessary to lay down provisions enabling vehicles complying with the requirements of the Directive (Article 3) (1) to be used in those Member States.

Where the prototype has been modified, the Member State which has carried out type approval must be able to assess whether new tests should be carried out (Article 4).

Article 5 lays down the procedure for adapting the requirements set out in the annexes to technical progress. This procedure is set out in Article 13 of the Council Directive of 6 February 1970 on the type approval of motor vehicles and of their trailers.

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(1) OJ No L 73 of 27 March 1972 "Documents concerning the accession to the European Communities of the Kingdom of Denmark, Ireland, the United Kingdom and Northern Ireland".

Act concerning the conditions of accession and the adjustments to the Treaties - Annex I, Title X.

Article 6 provides for two deadlines : before expiry of the first deadline the Member States shall adopt and publish the measures necessary in order to comply with the Directive. The second deadline determines the date on which all of the Member States must simultaneously implement the common rules (Article 6, (1)).

Finally, the Commission must be informed, within reasonable time, of any draft provision drawn up by the Member States in the field covered by the Directive, since such information will enable the Commission to prepare any comments on the draft considered necessary (Article 6, (2)).

CONSULTATION OF THE EUROPEAN PARLIAMENT AND OF THE ECONOMIC AND SOCIAL COMMITTEE

The opinion of both these bodies is required as laid down in the provisions of Article 100, (2).

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 100 thereof;

Having regard to the proposal from the Commission;

Having regard to the Opinion of the European Parliament;

Having regard to the Opinion of the Economic and Social Committee;

Whereas the technical requirements which motor vehicles must satisfy in accordance with national law relate, inter alia, to the field of vision of the driver thereof;

Whereas these requirements differ from one Member State to another; whereas it is therefore necessary that all Member States adopt the same requirements, either in addition to or in place of their existing rules, in order to allow the EEC type-approval procedure, which was the subject of Council Directive No 70/156/EEC (1) of 6 February 1970 on the approximation of laws of the Member States relating to the type-approval of motor vehicles and their trailers, to be applied in respect of each type of vehicle;

Whereas it is appropriate to make use of certain technical requirements adopted by the UN Economic Commission for Europe in its Regulation No ... (Uniform provisions concerning the approval of vehicles with regard to the field of vision of motor vehicle drivers) (2) which is 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;

(1) OJ No L 42, 23.2.1970, p. 1.
(2) EEC document from Genova ...

Whereas these requirements apply to motor vehicles of category M_1 (the international classification of motor vehicles is given in the above mentioned Council Directive 70/156/EEC of 6 February 1970);

Whereas the approximation of national laws relating to motor vehicles entails the reciprocal recognition by Member States of the tests carried out by each of them on the basis of common requirements; whereas in order to work properly such a system involves the application of these requirements by all Member States with effect from the same date,

HAS ADOPTED THIS DIRECTIVE :

Article 1

For the purposes of this Directive, "vehicle" means any motor vehicle of class M_1 (defined in Annex I of Council Directive No 70/156/EEC of 6 February 1970) designed for use on the road, having at least four wheels and a maximum design speed exceeding 25 km/h.

Article 2

No Member State may refuse to grant EEC type-approval or national type-approval of a vehicle on grounds relating to the drivers field of view if it satifies the requirements laid down in Annexes I, II and III.

Article 3

No Member State may refuse the registration or may prohibit the sale, entry into service or use of any vehicle on grounds relating to the driver's field of view if it satisfies the requirements laid down in Annexes I, II and III.

Article 4

The Member State which has granted type-approval shall take the necessary measures to ensure that it is informed of any modification of a part or characteristic referred to in item 2.2. of Annex I. The competent authorities of that State shall determine whether fresh tests should be carried out on the modified vehicle type and a fresh report drawn up. Where such tests reveal a failure to comply with the requirements of this Directive, the modification shall not be approved.

Article 5

The amendments necessary to adapt the provisions of Annexes I, II, III and IV to take account of technical progress shall be adopted in accordance with the procedure laid down in Article 13 of Council Directive No 70/156/EEC of 6 February 1970.

Article 6

1. Member States shall adopt and publish by 1 June 1977 the provisions necessary to comply with this Directive and shall forthwith inform the Commission thereof. They shall implement these provisions with effect from 1 January 1978.
2. After notification of this Directive, Member States shall take steps to inform the Commission, in sufficient time for it to make comments, of any draft laws, regulations or administrative provisions which they intend to adopt in the field covered by this Directive.

Article 7

This Directive is addressed to the Member States.

List of Annexes

Annex I : Scope, definitions, application for EEC type-approval, EEC-type-approval, required specifications, test procedure (*).

Annex II : Procedure for determining the "H" point and the real seat-back angle and for verifying their relationship to the R point and the design seat-back angle (*).

Annex III : Method for determining the dimensional relationships between the vehicle's primary reference marks and the three-dimensional reference grid (*).

Annex IV : Annex to the EEC type-approval certificate with regard to the driver's field of vision.

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(*) The technical requirements of this annex are basically similar to that of UN Economic Commission for Europe Regulation N° ..... , in particular the sub-divisions of the sections are the same. Where an item of Regulation ..... has no corresponding item in this Annex, the number is shown in brackets for the record.

ANNEX I

SCOPE, DEFINITIONS, APPLICATION FOR EEC TYPE-APPROVAL, EEC TYPE-APPROVAL, REQUIRED SPECIFICATIONS, TEST PROCEDURE

1. SCOPE

1.1. This Directive applies to the 180° forward field of viex of the drivers of vehicles of category M_1.

1.1.1. It is designed to ensure an adequate field of view when the windscreen and other glazed surfaces are dry and clean.

1.2. The requirements of this Directive are so worded as to apply to vehicles of category M_1 in which the driver is on the left. In vehicles of category M_1 in which the driver is on the right these requirements shall be applied by inverting the criteria where appropriate.

2. DEFINITIONS

For the purpose of this Directive :

(2.1.)

2.2. "Vehicle type" with regard to the field of view means a category of motor vehicles which does not differ in such essential respects as :

2.2.1. such external and internal forms and arrangements within the area specified in item 1 as may affect visibility; and

2.2.2. the shape and geometrical characteristics of the windscreen and its mounting;

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2.3. "three-dimensional reference grid" means a reference system which consists of a vertical longitudinal plane X-Z, a horizontal plane X-Y and a vertical transverse plane Y-Z (see Annex III Appendix figure 5); the grid is used to determine the dimensional relationship between the position of design points on drawings and their position on the actual vehicle. The procedure for situating the vehicle relatively to the grid is specified in Annex III, all coordinates referred to ground zero shall be based on a vehicle with its driver and one front-seat passenger, the driver and the passenger each weighing 75 kg.;

2.4. "primary reference marks" means holes, surfaces, marks and identification signs on the vehicle body. The type of reference mark used and the position of each mark relative to the X, Y and Z coordinates of the three-dimensional reference grid and to a design ground plane shall be specified by the manufacturer. These marks may be the control points used for body-assembly purposes;

2.5.* "seat-back angle" means the inclination of the seat-back in relation to the vertical;

2.6.* "actual seat-back angle" means the angle formed by the vertical through the "H" point with the torso reference line of the human body represented by the manikin described in item 2 of Annex II.

2.7.* "design seat-back angle" means the angle prescribed by the manufacturer which :

2.7.1. determines the seat-back angle for the lowest and most rear-ward normal driving position or position of use given for each seat by the vehicle manufacturer;

2.7.2. is formed at the "R" point by the vertical and torso reference line;

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(*) See Annex II.

2.7.3. corresponds theoretically to the actual seat-back angle;

2.8. "V points" means points whose position in the passenger compartment is determined as a function of vertical longitudinal planes passing through the centres of the outermost designated seating positions on the front seat and in relation to the R point and the design angle of the seat-back, which points are used for verifying compliance with the field-of-view requirements;

2.9.* "R point or seating reference point" is the reference point specified by the manufacturer which has coordinates determined in relation to the vehicle structure and corresponds to the theoretical position of the point of torso/thighs rotation (H point) for the lowest and most rear-ward normal driving position or position of use given to each seating position provided by the vehicle manufacturer;

2.10* "H point" is the intersection of a longitudinal vertical plane and the theoretical axis of rotation between the thighs and the torso of a human body represented by the manikin described in Annex II. It indicates the position of a seated occupant in the passenger compartment;

2.11. "windscreen datum points" means points situated at the intersection with the windscreen of lines radiating forward from the V points to the outer surface of the windscreen;

2.12. "transparent area" means that area of a vehicle windscreen or other glazed surface whose light transmittance measured at right angles to the surface, is not less than 70 per cent;

2.13. "P points" means the points about which the driver's head rotates when he views objects on a horizontal plane at eye level;

2.14. "E points" means points representing the centres of the driver's eyes and used to assess the extent to which A pillars obscure the field of view;

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* See Annex II.

2.15. "A pillar" means any roof support forward of the vertical transversal plane located 68 mm in front of the V points and includes non-transparent items, such as windscreen mouldings and door frames, attached or contiguous to such a support;

2.16. "Horizontal seat-adjustment range" means the range designated by the manufacturer for the adjustment of the driver's seat in the direction of the X axis (see item 2.3. above);

2.17. "extended seat-adjustment range" means the range designated by the manufacturer for the adjustment of the seat in the direction of the X axis (see item 2.3.) beyond the range of normal driving positions specified in 2.15. and used for converting seats into beds or facilitating entry into the vehicle.

3. APPLICATION FOR EEC TYPE-APPROVAL

3.1. The application for EEC type-approval of a vehicle type with regard to the driver's field of view shall be submitted by the vehicle manufacturer or by his authorised representative.

3.2. It shall be accompanied by the following documents in triplicate, and by the following particulars;

3.2.1. a description of the vehicle with regard to the items mentioned in item 2.1. above, together with dimensional drawings and either a photograph or an exploded view of the passenger compartment. The numbers and/or symbols identifying the vehicle type shall be specified; and

3.2.2. particulars of the primary reference marks in sufficient detail to enable them to be readily identified and the position of each in relation to the others and to the R point to be verified.

3.3. A vehicle representative of the vehicle type to be approved, as referred to in item 5 shall be submitted to the technical service conducting approval tests.

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4. EEC TYPE-APPROVAL

(4.1.)

(4.2.)

4.3. A certificate conforming to the model shown in Annex IV shall be attached to the EEC type-approval certificate.

(4.4.) - (4.4.1.) - (4.4.2.)

(4.5.)

(4.6.)

(4.7.)

(4.8.)

5. REQUIRED SPECIFICATIONS

5.1. Driver's field of view

5.1.1. The transparent area of the windscreen must include at least the windscreen datum points; these are :

5.1.1.1. a horizontal datum point forward of V_1 and 17° to the left (see Annex III, Appendix figure 1);

5.1.1.2. an upper vertical datum point forward of V_1 and 7° above the horizontal;

5.1.1.3. a lower vertical datum point forward of V_2 and 5° below the horizontal;

5.1.1.4. to verify compliance with the forward-view requirement on the opposite half of the windscreen, three additional datum points symmetrical to the points defined in item 5.1.1.1. to 5.1.1.3. above in relation to the median longitudinal plane of the vehicle are obtained.

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5.1.2. The angle of binocular obstruction of each A pillar shall not exceed 6° at the level of the pivotal points P_1 and P_2 of the head (see Annex III, Appendix figure 2).

5.1.2.1. The angle of binocular obstruction is measured in a horizontal plane between tangents connecting :

5.1.2.1.1.-E_1 to the rear-ward side and E_2 to the forward side of the left A pillar; and

5.1.2.1.2.-E_3 to the forward side and E_4 to the rear-ward side of the right A pillar.

5.1.3. There shall be no binocular obstructions, other than those created by A pillar and/or vent window division bars, rear-view mirrors and windscreen wipers in the driver's 180° forward direct field of view below a horizontal plane through V_1 and above three planes through V_2 one being perpendicular to the plane X-Z and declining forward 4° below the horizon and the other two being perpendicular to the plane Y-Z and declining 4° below the horizon (see Annex III, Appendix figure 3). However, rear view mirrors may not be mounted within the field of vision defined above if, when they are located in a different position, the requirements of Directive 71/127/EEC (*) relating to rear view mirrors are no longer met.

5.2. Position of the V points

5.2.1. The positions of the V points in relation to the R point, as indicated by xyz coordinates from the three-dimensional reference grid, are as shown by Tables I and IV.

5.2.1.1. Table I indicates the basic coordinates for a design seat-beack angle of 25°. The positive direction for the coordinates is indicated in Annex III, Appendix, Figure I.

TABLE I

V point	x	y	z
V_1	68 mm	- 5 mm	665 mm
V_2	68 mm	- 5 mm	589 mm

(*) OJ N° L 68, p. 1 of 22 March 1971

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5.3. Positions of the P points

5.3.1. The positions of the P points in relation to the R point, as indicated by the xyz coordinates from the three-dimensional reference grid, are as shown by Tables II, III and IV.

5.3.1.1. Table II indicates the basic coordinates for a design seat-back angle of 25°. The positive direction for the coordinates is indicated in Annex III, Appendix, figure 1.

TABLE II

P point	x	y	z
P_1	-35 mm	- 20 mm	627 mm
P_2	63 mm	47 mm	627 mm

5.3.1.2. Table III indicates the further corrections to be made to the coordinates of P_1 and P_2 when the horizontal seat-adjustment range as defined in item 2.16. exceeds 108 mm. The positive direction for the coordinates is indicated in Annex III, Appendix, figure 5.

TABLE III

HORIZONTAL SEAT-ADJUSTMENT RANGE	$\triangle$ X
108 - 120 mm	- 13 mm
121 - 132 mm	- 22 mm
133 - 145 mm	- 32 mm
146 - 158 mm	- 42 mm
more than 158 mm	- 48 mm

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5.4. Correction for design seat-back angles other than 25°

Table IV indicates the further corrections to be made to the x and z coordinates of each P point and each V point when the design seat-back angle is not 25°. The positive direction for the coordinates is indicates in Annex III, Appendix, figure 1.

TABLE IV

Seat-back angle (in °)	Horizontal Co-ordinates x	Vertical Co-ordinates z	Seat-back angle (in °)	Horizontal Co-ordinates x	Vertical Co-ordinates z
5	- 186 mm	28 mm	23	-17 mm	5 mm
6	- 176 mm	27 mm	24	- 9 mm	2 mm
7	- 167 mm	27 mm	25	0 mm	0 mm
8	- 157 mm	26 mm	26	9 mm	- 3 mm
9	- 147 mm	26 mm	27	17 mm	- 5 mm
10	- 137 mm	25 mm	28	26 mm	- 8 mm
11	- 128 mm	24 mm	29	34 mm	-11 mm
12	- 118 mm	23 mm	30	43 mm	-14 mm
13	- 109 mm	22 mm	31	51 mm	-17 mm
14	- 99 mm	21 mm	32	59 mm	-21 mm
15	- 90 mm	20 mm	33	67 mm	-24 mm
16	- 81 mm	18 mm	34	76 mm	-28 mm
17	- 71 mm	17 mm	35	84 mm	-31 mm
18	- 62 mm	15 mm	36	92 mm	-35 mm
19	- 53 mm	13 mm	37	100 mm	-39 mm
20	- 44 mm	11 mm	38	107 mm	-43 mm
21	- 35 mm	9 mm	39	115 mm	-47 mm
22	- 26 mm	7 mm	40	123 mm	-52 mm

5.5. Positions of the E points

5.5.1. E_1 and E_2 are each 104 mm from P_1.
E_2 is 65 mm from E_1 (see Annex III, Appendix, figure 4).

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5.5.2. The line joining E_1 and E_2 is rotated about P_1 until it is normal with the vehicle centre-line, provided that :

5.5.2.1. in such position a tangent from E_1 to the rearward edge of the left A pillar forms an angle of 120° with the line $E_1 - E_2$, or that

5.5.2.2. where the angle so included is more than 120°, rotation of the line $E_1 - E_2$ about P_1 shall be continued until the resultant included angle equals 120° (See annex III, Appendix, figure 2).

5.5.3. E_3 and E_4 are each 104 mm from P_2. E_3 is 65 mm from E_4. (See Annex III, Appendix, figure 4).

5.5.4. The line joining E_3 and E_4 is rotated about P_2 until it forms an angle of 120° with the tangent from E_4 to the rearward edge of the right A pillar (see Annex III, Appendix, figure 2).

6. TEST PROCEDURE

6.1. Driver's field of view

6.1.1. The dimensional relationship between the vehicle's primary reference marks and the three dimensional reference grid shall be determined from the procedure prescribed in Annex III.

6.1.2. The position of the points V_1 and V_2 are determined in relation to the R point as indicated by xyz coordinates from the three-dimensional reference grid and are shown in Tables I at item 5.2.1.1. and IV at item 5.4. The windscreen datum-points shall then be found from the correctly located V points as prescribed in item 5.1.1.

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6.1.3. The relationship between the P points, the R point, and the centre line of the driver's seating position, as indicated by xyz coordinates from the three-dimensional reference grid, shall be determined from Tables II and III in item 5.3. The correction for design seat-back angles other than 25° is shown in Table IV at item 5.4.

6.1.4. The angle of binocular obscuration as prescribed in item 5.1.2. shall be measured in the horizontal plane as indicated in Annex III, Appendix, figure 2. The relationship between P_1 and P_2 which are connected to E_1 and E_2 and E_3 and E_4 respectively is shown in Annex III, Appendix, figure 2.

6.1.4.1. The line joining E_1 and E_2 shall be set at 120° to the tangent from the outer edge of the left A pillar which passes through E_1; the angle of binocular obscuration is then measured between the tangential line connecting E_1 to the outer edge of the left A pillar and the tangential line connecting E_2 to the inner edge of the left A pillar.

6.1.4.2. The line joining E_3 and E_4 shall be set at 120° to the tangent from the outer edge of the right A pillar which passes through E_4 ; the angle of binocular obscuration is then measured between the tangential line connecting E_4 to the outer edge of the right A pillar and the tangential line connecting E_3 to the inner edge of the right A pillar.

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ANNEX II

PROCEDURE FOR DETERMINING THE "H" POINT AND THE ACTUAL SEAT-BACK ANGLE AND FOR VERIFYING THEIR RELATIONSHIP TO THE "R" POINT AND THE DESIGN SEAT-BACK ANGLE

1. DEFINITIONS

1.1. "H point": see item 1.1. of Annex IV to Directive N° 70/60/EEC (*).

1.2. "R point" or "seating reference point" : see item 1.2. of Annex IV to Directive N° 74/60/EEC.

1.3. "Seat-back angle" means the inclination of the seat-back in relation to the vertical.

1.4. "Actual seat-back angle" means the angle formed by the vertical though the "H" point with the torso reference line of the human body represented by the manikin described in item 3.

1.5. "Design seat-back angle" means the angle prescribed by the manufacturer which :

1.5.1. determines the seat-back angle for the lowest and most rearward normal driving position or position of use given to each seat by the vehicle manufacturer;

1.5.2. is formed at the "R" point by the vertical and the torso reference line;

1.5.3. corresponds theoretically to the actual seat-back angle.

2. DETERMINATION OF "H" POINTS AND ACTUAL SEAT-BACK ANGLES : See Item 2 of Annex IV to Directive N° 74/60/EEC.

3. DESCRIPTION OF THE MANIKIN : See Item 3 of Annex IV to Directive 74/60/EEC.

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(*) O.J. N° L 38, p. 2 of 11 February 1974.

4. SETTING UP OF THE MANIKIN :
See Item 4 of Annex IV to Directive 74/60/EEC.

5. RESULTS

5.1. When the manikin has been set up as described in Item 4, the "H" point and the actual seat-back angle of the vehicle seat considered are constituted by the "H" point and the angle of inclination of the manikin's torso reference line.

5.2. The coordinates of the "H" point in relation to three mutually perpendicular planes, and the actual seat-back angle, shall be measured for comparison with the data supplied by the vehicle manufacturer.

6. VERIFYING THE RELATIVE POSITIONS OF THE "R" AND "H" POINTS AND THE RELATIONSHIP BETWEEN THE DESIGN SEAT-BACK ANGLE AND THE ACTUAL SEAT-BACK ANGLE

6.1. The results of the measurements carried out in conformity with item 5.2. for the "H" point and the actual seat-back angle shall be compared with the coordinates of the "R" point and the design seat-back angle as supplied by the vehicle manufacturer.

6.2. The relative positions of the "R" point and the "H" point and the relationship between the design seat-back angle and the actual real seat-back angle shall be considered to be satisfactory for the seat in question if the "H" point, as defined by its coordinates, lies within a longitudinal rectangle whose horizontal and vertical sides are 30 mm and 20 mm long respectively, and whose diagonals intersect at the "R" point, and if the actual seat-back angle is within 3° of the design seat-back angle.

6.2.1. If these conditions are met, the "R" point and the design seat-back angle shall be used for the test and, if necessary, the manikin shall be so adjusted that the "H" point coincides with the "R" point and the actual seat-back angle coincides with the design seat-back angle.

6.3. If the "H" point or the actual seat-back angle does not satisfy the requirements of item 6.2. above, the "H" point or the actual seat-back angle shall be determined twice more (three times in all). If the results of two of these three operations satisfy the requirements, the results of the test shall be considered to be satisfactory.

6.4. If at least two of the three results do not satisfy the requirements of item 6.2., the result of the test shall be considered to be not satisfactory.

6.5. If the situation described in item 6.4. above arises, or if verification cannot be effected because the manufacturer has failed to supply information regarding the position of the "R" point or regarding the design seat-back angle, the average of the results of the three determinations may be used and be regarded as applicable in all cases where the "R" point or the design seat-back angle is referred to in this Directive.

6.6. For verifying the relative positions of the "R" point and the "H" point and the relationship between the design seat-back angle and the actual seat-back angle in a serially-produced vehicle the rectangle referred to in item 6.2. above shall be replaced by a square of 50 mm side and the actual seat-back angle shall not differ by more than $\pm$ 5° from the design seat-back angle.

ANNEX III

METHOD FOR DETERMINING THE DIMENSIONAL RELATIONSHIPS BETWEEN THE VEHICLE'S PRIMARY REFERENCE MARKS AND THE THREE-DIMENSIONAL REFERENCE GRID

1. RELATIONSHIP BETWEEN REFERENCE GRID AND VEHICLE PRIMARY REFERENCE MARKS

To verify specific dimensions on or within a vehicle submitted for approval in accordance with this Directive, the relationship between the coordinates of the three-dimensional reference grid, defined in item 2.3. of Annex I, which has been laid out at the initial vehicle-design stage, and the positions of the primary reference marks defined in item 2.3. of Annex I, must be established accurately so that specific points on the manufacturer's drawings can be identified on an actual vehicle produced from those drawings.

2. METHOD FOR ESTABLISHING RELATIONSHIP OF REFERENCE GRID TO REFERENCE MARKS

To enable this to be done, it is necessary to construct a ground reference plane which is marked with the X-X measurement and the Y-Y measurement. One method of achieving this is set out in figure 6 of the appendix to this annex, the reference plane being a firm, flat, level surface upon which the vehicle stands, and which has two steel tapes firmly fixed to its surface. The tapes to be graduated in millimetres, the X-X tape to be not less than 8 metres long, the Y-Y tape to be not less than 4 metres long. The two tapes are to be set at right angles to each other as shown in figure 6 of the appendix to this annex. The intersection of these tapes to be ground zero.

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3. VERIFICATION OF ACCURACY

To prove that the reference plane or test area is level it will be necessary to establish the deviations from ground zero along both the x and the y tapes at intervals of 250 mm and to record the readings obtained so that corrections can be made when checking the vehicle.

4. ACTUAL TEST ATTITUDE

In order to provide for minor changes in suspension height, etc., it will be necessary to have available a means of bringing the primary reference marks to the correct coordinate positions relative to the design attitude before further measurements are taken. In addition, it must be possible to make minor lateral and/or longitudinal adjustments of the vehicle's position so as to place it accurately in relation to the reference grid.

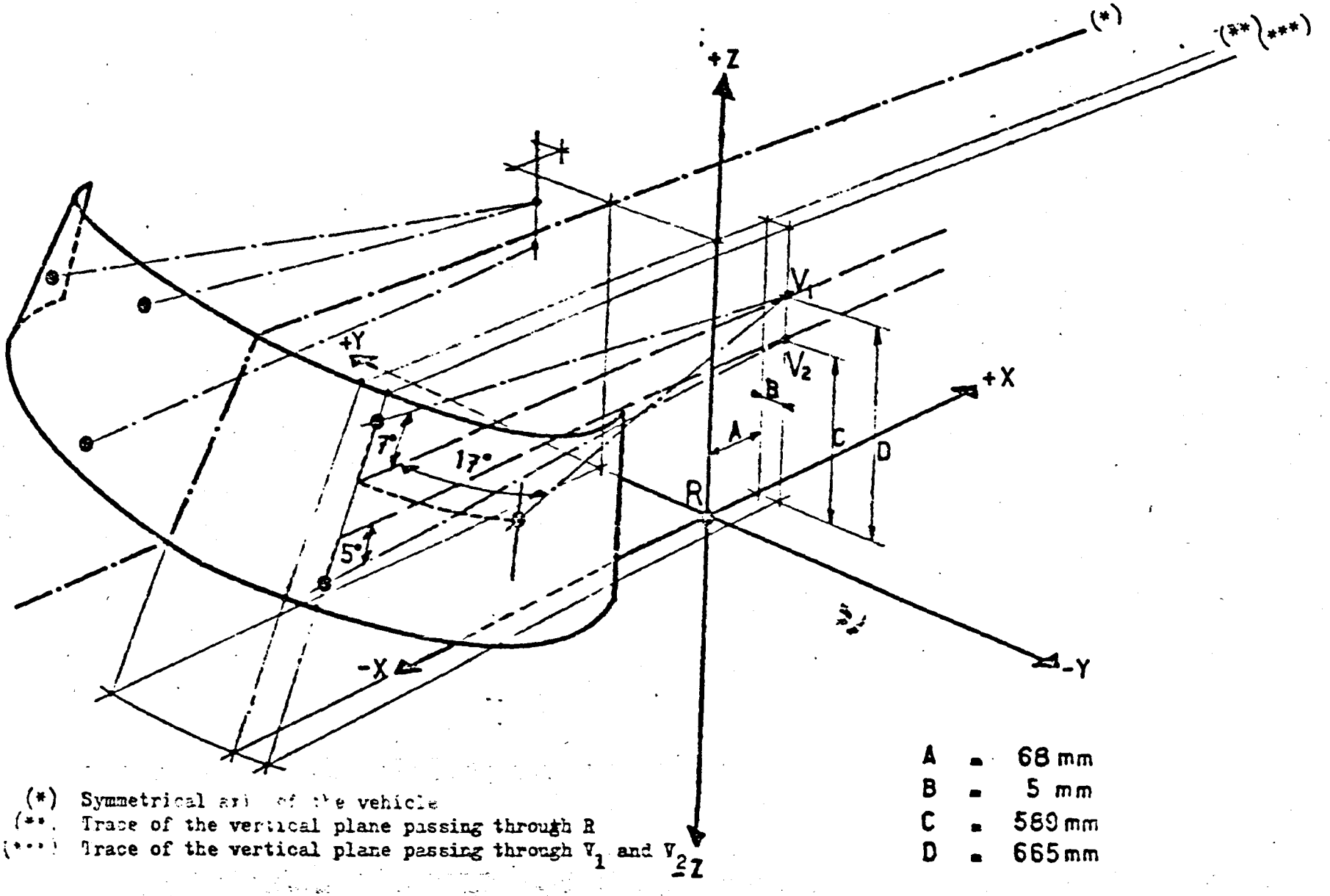
5. RESULTS

The vehicle having been correctly placed relatively to the reference grid and in its design attitude, the site of the necessary points for studying the forward vesibility requirements can be readily determined.

Test methods to determine these requirements may include the use of theodolites, light sources or shadow devices, or any other method which can be shown to give equivalent results.

Figure 1

DETERMINATION OF "V" POINTS



(*) Symmetrical axis of the vehicle
(**) Trace of the vertical plane passing through R
(***) Trace of the vertical plane passing through V_1 and V_2

A = 68 mm
B = 5 mm
C = 589 mm
D = 665 mm

Figure 2 PILLAR OBSCURATION

Diagram showing layout of P points and E points
for viewing the left-hand and right-hand pillars

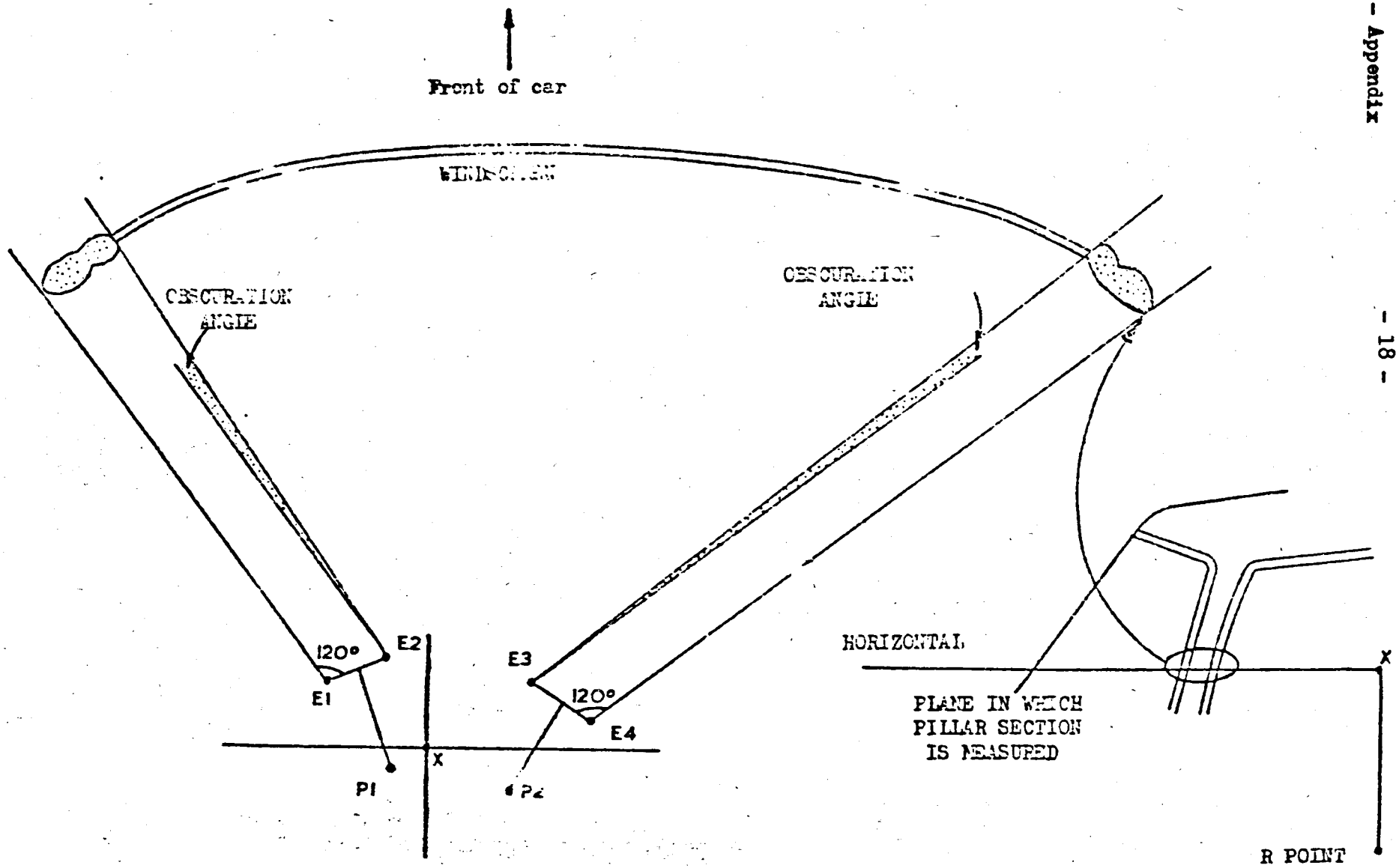
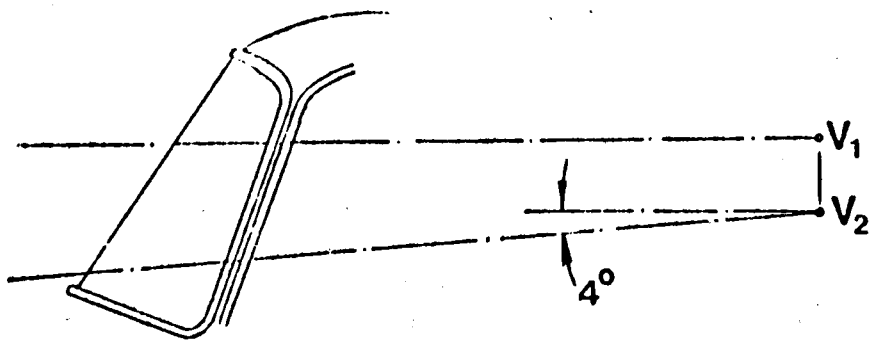


Figure 3 EVALUATION OF BINOCULAR OBSCURATIONS



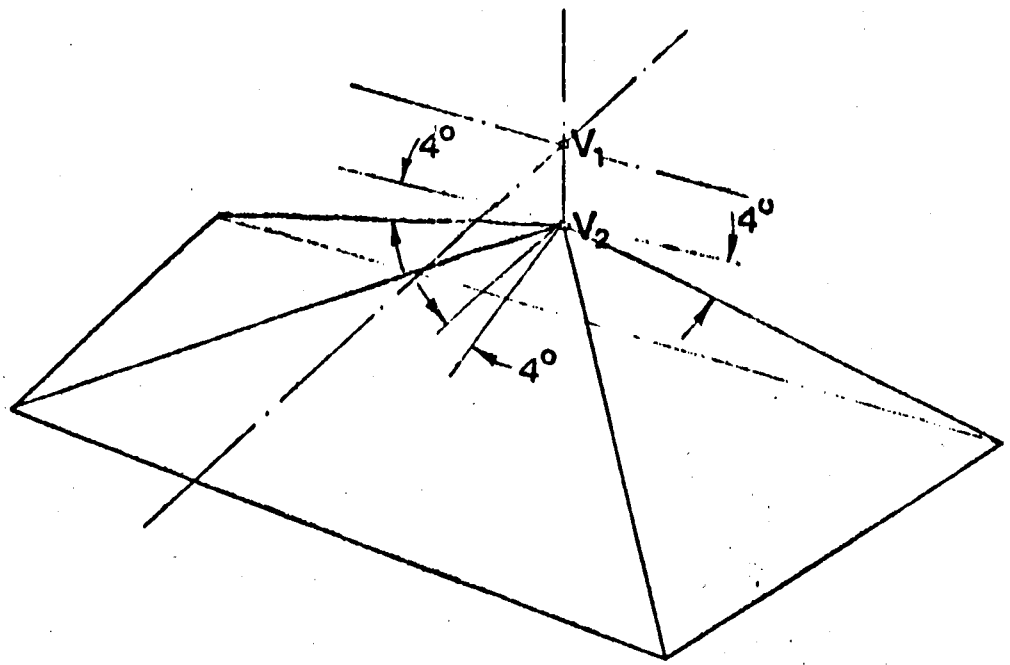


Figure 4

DIMENSIONED DIAGRAM SHOWING RELATIVE POSITIONS
OF E POINTS AND P POINT

Figure 5

THREE-DIMENSIONAL REFERENCE GRID

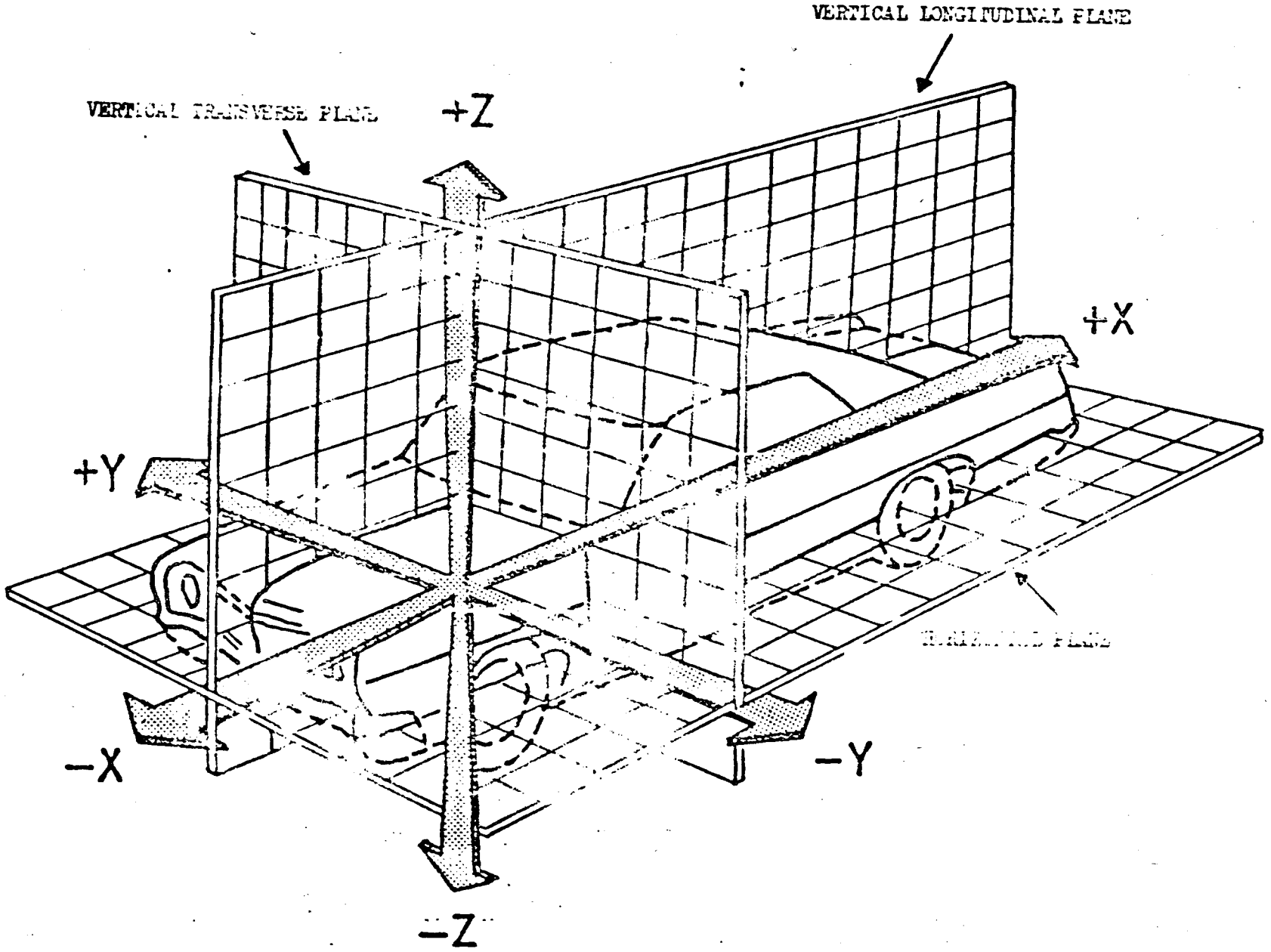
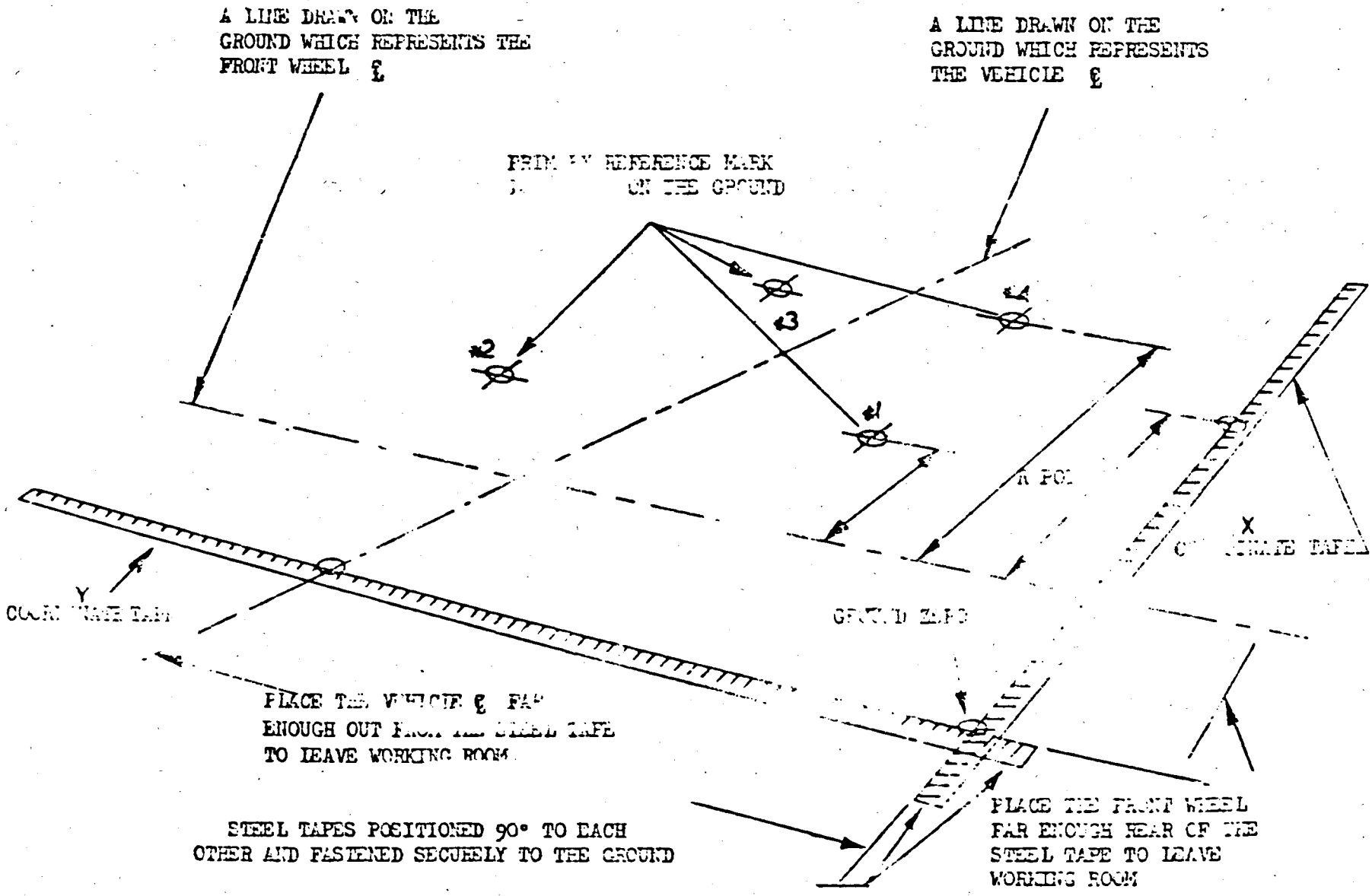


Figure 6 LEVEL WORK SPACE



ANNEX IV

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

Name of administration

ANNEX TO THE EEC VEHICLE TYPE-APPROVAL CERTIFICATE WITH REGARD TO THE DRIVER'S FIELD VISION

(Article 4 (2) and Article 10 of the Council Directive N° 70/156/EEC on the approximation of the laws of the Member States relating to the type-approval of motor vehicles and their trailers)

Type-Approval N° ....

1. Trade name or mark of the vehicle .....
2. Vehicle type .....
3. Manufacturer's name and address .....
4. Where applicable, name and address of manufacturer's authorised representative .....
.....
5. Brief description of the vehicle .....
6. Identification data for R point of Driver's designated seating position in relation to position of primary reference marks .....
.....
7. Identification, sites and relative positions of primary reference mark .....

./.

Annex IV

8. Vehicle submitted for type-approval on .....

9. Technical service conducting type-approval tests .....

10. Date of report issued by that service .....

11. Number of report issued by that service .....

12. Type-approval in respect to the driver's field of vision is granted/refused *

13. Place .....

14. Date .....

15. Signature .....

16. The following documents, bearing the type-approval number shown above, are annexed to this communication :

..... dimensioned drawings

..... exploded view of photograph(s) of the passenger compartment

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* Strike out what does not apply.