

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 1958¹

ENTRY INTO FORCE OF REGULATION NO. 16 (UNIFORM PROVISIONS CONCERNING THE APPROVAL OF SAFETY BELTS FOR ADULT OCCUPANTS OF POWER-DRIVEN VEHICLES) AS AN ANNEX TO THE ABOVE-MENTIONED AGREEMENT

The said Regulation came into force on 1 December 1970 in respect of Belgium, France and the Netherlands, in accordance with article 1 (5) of the Agreement.

Authentic texts of the Regulation: English and French.

Registered ex officio on 1 December 1970.

1. SCOPE

This Regulation applies to safety belts, other than those fitted with retractors, which are designed for installation in power-driven vehicles with three or more wheels by being firmly anchored to the structure and are intended for separate use, i.e. as individual equipment, by adults occupying seats facing forward.

2. DEFINITIONS

2.1. *Safety belt* (seat belt, belt)

An arrangement of straps with a securing buckle, adjusting devices and attachments which is capable of being anchored to a power-driven vehicle and is designed to diminish the risk of injury to its wearer, in the event of collision or of abrupt deceleration of the vehicle, by limiting the mobility of the wearer's body without transmitting abnormal stresses to it. Such an arrangement is generally referred to as a "belt assembly", which term also embraces any device for absorbing energy or for retracting the belt.

2.1.1. *Lap belt*

A belt which passes across the front of the wearer's pelvic region either as a belt in itself or as a component of a belt assembly.

2.1.2. *Diagonal belt*

A belt which passes diagonally across the front of the chest from the hip to the opposite shoulder either as a belt in itself or as a component of a belt assembly including a lap belt.

¹ United Nations, *Treaty Series*, vol. 335, p. 211; for subsequent actions, see references in Cumulative Indexes Nos. 4 to 8, as well as annex A in volumes 601, 606, 607, 609, 630, 631, 652, 656, 659, 667, 669, 672, 673, 680, 683, 686, 696, 723, 730, 740, 752 and 754.

2.1.3. *Three-point belt*

Any belt assembly comprising a lap belt and a diagonal belt and anchored at three points.

2.1.4. *Harness belt*

A belt comprising a lap belt and shoulder straps.

2.2. *Type*

Belts of different " types " are belts differing substantially from one another; the differences may relate in particular to :

2.2.1. rigid parts (buckle, attachments, etc.);

2.2.2. the material, weave, dimensions, and colour* of the straps; or

2.2.3. the geometry of the belt assembly.

2.3. *Strap*

A flexible component designed to hold the body and to transmit stresses to anchorages and the like.

2.4. *Buckle*

A quick-release device enabling the wearer to be held by the belt. The buckle may incorporate the adjusting device.

2.5. *Adjusting device*

A device enabling the belt to be adjusted according to the requirements of the individual wearer and to the position of the seat. The adjusting device may be part of the buckle.

2.6. *Attachments*

Parts of the belt, including the necessary securing components, which enable it to be attached to the anchorages on the vehicle.

2.7. *Energy absorber*

Device designed to disperse energy independently of or jointly with the strap and forming part of a belt assembly.

2.8. *Retractor*

Device to accommodate part or the whole of the strap of a safety belt.

2.9. *Anchorages*

Parts of the vehicle structure to which the belt attachments are to be secured.

3. APPLICATION FOR APPROVAL

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

*If a manufacturer changes the colour of the strap from that used in the belt submitted for approval, the competent authority shall decide whether to broaden the approval given or, in order to verify how the modified material behaves as compared with the approved material, to subject the new strap to the strap tests only.

- 3.2. The application for approval relating to each type of belt shall be accompanied by :
 - 3.2.1. a technical description of the belt type, specifying the straps and other materials used and accompanied by drawings of these items. The description shall mention the colour of the model submitted for approval ;
 - 3.2.2. three samples of the belt type ; and
 - 3.2.3. a ten-metre length of each type of strap used in the belt type.

4. MARKINGS

The samples of a belt type submitted for approval in conformity with the provisions of paragraph 3.2.2. above shall be clearly and indelibly marked with the manufacturer's name, initials or trade name or mark.

5. APPROVAL

- 5.1. If the samples of a type of belt which are submitted in conformity with the provisions of paragraph 3 above meet the requirements of paragraphs 4. and 6. to 10. of this Regulation, approval shall be granted.
- 5.2. An approval number shall be assigned to each type approved. The same Contracting Party may not assign the same number to another type of belt covered by this Regulation.
- 5.3. Notice of approval or of refusal of approval of a type of belt shall be communicated to the Parties to the Agreement¹ which apply this Regulation by means of a form conforming to the model in annex 1 to the Regulation and of a drawing of the belt, supplied by the applicant for approval, in a format not exceeding A 4 (210 × 297 mm) or folded to that format and on an appropriate scale.
- 5.4. In addition to the marks prescribed in paragraph 4, above, the following particulars shall be affixed in a suitable space to every belt conforming to a type approved under this Regulation :
 - 5.4.1. an international approval mark consisting of :
 - 5.4.1.1. a circle surrounding the letter " E " followed by the distinguishing number of the country which has granted approval ;*
 - 5.4.1.2. the approval number, below the circle ;
 - 5.4.2. the following additional symbol or symbols in a square above the circle :
 - 5.4.2.1. the letter " A " in the case of a three-point belt, the letter " B " in the

¹ United Nations, *Treaty Series*, vol. 335, p. 211.

* 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 and 11 for the United Kingdom; subsequent numbers shall be assigned to other countries in the chronological order in which they ratify the Agreement concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts, or in which they accede to that Agreement, and the numbers thus assigned shall be communicated by the Secretary-General of the United Nations to the Contracting Parties to the Agreement.

case of a lap belt, the letter " C " in the case of a harness belt and the letter " D " in the case of a diagonal belt;

5.4.2.2. the symbols referred to in paragraph 5.4.2.1. shall be supplemented by the letter " e " in the case of a belt with an energy absorber.

5.5. Annex 2 to this Regulation gives examples of the arrangement of the approval mark.

5.6. The particulars referred to in paragraph 5.4. shall be clearly legible and be indelible, and may be affixed either by means of a label or by direct marking. The label or marking shall be resistant to wear.

5.7. The labels referred to in paragraph 5.6. above may be issued either by the authority which has granted the approval or, subject to that authority's authorization, by the manufacturer.

6. GENERAL SPECIFICATIONS

6.1. Each sample submitted in conformity with paragraph 3.2.2. above shall meet the specifications set forth in paragraphs 6. to 10. of this Regulation.

6.2. The belt shall be so designed and constructed that, when correctly installed and properly worn by an occupant, its satisfactory operation is assured and it reduces the risk of bodily injury in the event of an accident.

6.3. The straps of the belt shall not be liable to assume a dangerous configuration, more particularly if one of them should break.

7. RIGID PARTS

7.1. *General*

7.1.1. All rigid parts of the safety belt, such as buckles, adjusting devices, attachments and the like, shall be so designed that when installed and positioned they do not increase the risk of bodily injury to the wearer of the belt or to other occupants of the vehicle in the event of an accident. They shall not have sharp edges liable to cause wear or breakage of the straps by chafing.

7.1.2. All rigid parts shall be protected against corrosion. After undergoing the corrosion test prescribed in paragraph 10.2. below they shall not exhibit any deterioration likely to impair the proper functioning of the device nor any significant corrosion visible to the unaided eye of a qualified observer.

7.1.3. Rigid parts intended to absorb energy or to be subjected to or to transmit a load shall not be fragile.

7.2. *Buckle*

7.2.1. The buckle shall be so designed as to preclude any possibility of incorrect use. This means, *inter alia*, that it must not be possible for the buckle to be left in a partially-closed condition. The procedure for opening the buckle

must be evident. Wherever the buckle is in contact with the wearer it shall not be narrower than the strap.

- 7.2.2. The buckle, even when not under tension, shall remain closed whatever the position of the vehicle. While it must not be possible to open it inadvertently or without a noticeable effort, the buckle shall be such that a rescuer can release the occupant from the belt. The buckle shall be easy to use and to grasp; it shall be capable of being opened by a simple movement of either hand when not under tension and when under the tension specified in paragraph 10.7.2. below. Where the opening of a buckle is controlled by a button, the latter shall have an area of not less than 4.5 cm² (0.7 sq. in) and a width of not less than 10 mm (0.4 in) for applying the force required to open the buckle.
- 7.2.3. The buckle shall be capable of withstanding repeated operation and shall undergo 500 opening and closing cycles; the springs of closing buckles shall, in addition, be actuated 4,500 times in conditions of normal use.
- 7.2.4. The force required to open the buckle in the test as prescribed in paragraph 10.7: below shall not exceed 11.6 daN (12 kp; 27 lb) and the operating device must be able to withstand this force without distortion.
- 7.2.5. The buckle shall be tested for strength as prescribed in paragraph 10.5.1. It must not break, be seriously distorted or become detached under the tension set up by the prescribed load.

7.3. *Adjusting device*

- 7.3.1. An adjusting device must be readily accessible to the wearer so that he can easily adjust the belt to suit his body size and the position of the vehicle seat.
- 7.3.2. Variations in strap tension shall not cause inadvertent changes in the adjustment of the belt.
- 7.3.3. The adjusting device shall be tested for strength as prescribed in paragraph 10.5.1. It must not break or become detached under the tension set up by the prescribed load.

7.4. *Attachments*

The attachments shall be tested for strength as prescribed in paragraph 10.5.2. They must not break or become detached under the tension set up by the prescribed load.

8. BELT STRAPS

8.1. *General*

- 8.1.1. The characteristics of the straps shall be such as to ensure that their pressure on the wearer's body is distributed as evenly as possible over their width and that they do not twist even under tension. They shall have energy-absorbing and energy-dispersing capacities.
- 8.1.2. The width of the strap under a load of 980 daN (1,000 kp; 2,200 lb) shall be not less than 46 mm (1 $\frac{13}{16}$ in). A minimum of 43 mm (1 $\frac{11}{16}$ in) shall be allowed in the case of the shoulder straps of a harness belt. This dimension

shall be measured during the breaking-strength test prescribed in paragraph 10.4., and without stopping the machine.

8.2. *Strength after room-conditioning*

In the case of the two strap samples conditioned in conformity with paragraph 10.3.1. the breaking load of the strap, determined as prescribed in paragraph 10.4. below, shall be not less than 1,470 daN (1,500 kp; 3,300 lb). The difference between the breaking loads of the two samples shall not exceed 10 per cent of the greater of the breaking loads measured.

8.3. *Strength after special conditioning*

In the case of the two strap samples conditioned in conformity with one of the provisions of paragraph 10.3. (except 10.3.1) below, the breaking load of the strap shall be not less than 75 per cent of the load determined in the test referred to in paragraph 8.2. and not less than 1,470 daN (1,500 kp; 3,000 lb). The competent authority may dispense with one or more of these tests if the composition of the material used or information already available renders the test or tests superfluous.

9. BELT ASSEMBLY

9.1. The belt assembly shall be subjected to a dynamic test in conformity with paragraph 10.6. below.

9.2. The dynamic test shall be performed on two belt assemblies which have not previously been under load. During the test the following requirements shall be met:

9.2.1. the belt assembly shall not break and the buckle shall not open; and

9.2.2. the forward displacement shall be between 100 mm (4 in) and 200 mm (8 in) at pelvic level in the case of lap belts and between 200 mm (8 in) and 300 mm (12 in) at chest level in the case of other types of belt, this displacement being the displacement in relation to the reference points shown in annex 4, figure 1, to this Regulation.

10. TESTS

10.1. *Use of samples submitted for approval of a type of belt* (see annex 7)

10.1.1. Two belt assemblies are required for the assembled-belt test and for the buckle-opening test.

10.1.2. One belt assembly shall be used as a source of samples of belt components for the corrosion and buckle-strength tests.

10.1.3. The sample of strap shall be used for testing the strap's breaking strength. Part of this sample shall be preserved so long as the approval remains valid.

10.1.4. The technical service responsible for approval testing shall be entitled to ask for a number of samples additional to those referred to in paragraphs 3.2.2. and 3.2.3. above.

10.2. *Corrosion test*

A sample of every metal part of the belt shall be immersed for 15 minutes in a boiling 10-per-cent solution of sodium chloride and immediately thereafter in a similar solution at room temperature; it shall then be taken out of the solution and, without being wiped, left to dry at room temperature for 24 hours. It shall then be inspected for signs of corrosion.

10.3. *Conditioning of straps for the breaking-strength test*

Samples cut from the strap, as referred to in paragraph 3.2.3. above, shall be conditioned as follows:

10.3.1. *Room-conditioning*

The strap shall be kept for 24 hours in an atmosphere having a temperature of $20 \pm 5^{\circ}\text{C}$ and a relative humidity of 65 ± 5 per cent. If the test is not carried out immediately after conditioning, the specimen shall be placed in a hermetically-closed receptacle until the test begins. The breaking load shall be determined within five minutes after removal of the strap from the conditioning atmosphere or from the receptacle.

10.3.2. *Light-conditioning*

10.3.2.1. The provisions of Recommendation ISO/R 105-1959, "Tests for colour fastness of textiles", as amended by addendum I (ISO/R 105-1959/A1-1963) and addendum II (ISO/R 105/11-1963), shall apply. The strap shall be exposed to sunlight in the conditions of insolation and for the time necessary to produce fading of Standard Blue Dye No. 7 to a contrast equal to grade 4 on the grey scale.

10.3.2.2. After exposure the strap shall be kept for 24 hours in an atmosphere having a temperature of $20 \pm 5^{\circ}\text{C}$ and a relative humidity of 65 ± 5 per cent. The breaking load shall be determined immediately afterwards.

10.3.3. *Cold-conditioning*

10.3.3.1. The strap shall be kept for 24 hours in an atmosphere having a temperature of $20 \pm 5^{\circ}\text{C}$ and a relative humidity of 65 ± 5 per cent.

10.3.3.2. The strap shall then be kept for $1\frac{1}{2}$ hour on a plane surface in a low-temperature chamber in which the air temperature is $-30 \pm 5^{\circ}\text{C}$. It shall then be folded and the fold shall be loaded with a weight of 2 kg (4 lb) previously cooled to -30°C . When the strap has been kept under load for 30 minutes in the same low-temperature chamber, the weight shall be removed and the breaking load shall be measured within five minutes after removal of the strap from the low-temperature chamber.

10.3.4. *Heat-conditioning*

10.3.4.1. The strap shall be kept for 3 hours in a heating cabinet in an atmosphere having a temperature of $60 \pm 5^{\circ}\text{C}$ and a relative humidity of 65 ± 5 per cent.

10.3.4.2. The breaking load shall be determined within five minutes after removal of the strap from the heating cabinet.

10.3.5. *Exposure to water*

- 10.3.5.1. The strap shall be kept fully immersed for 3 hours in distilled water, at a temperature of 20 ± 5 °C, to which a trace of a wetting agent has been added. Any wetting agent suitable for the fibre under test may be used.
- 10.3.5.2. The breaking load shall be determined within ten minutes after removal of the strap from the water.

10.4. *Test of breaking strength of strap (static test)*

- 10.4.1. The test shall be carried out each time on two new samples of strap, of sufficient length, conditioned in conformity with the provisions of paragraph 10.3.
- 10.4.2. Each strap shall be gripped between the clamps of a tensile-testing machine. The clamps shall be so designed as to avoid breakage of the strap at or near them. The speed of traverse shall be about 100 mm/min (4 in/min). The free length of the specimen between the clamps of the machine at the start of the test shall be 200 mm + 40 mm — 0 mm (8 in + $1\frac{9}{16}$ in — 0. in).
- 10.4.3. When the load reaches 980 daN (1,000 kp; 2,200 lb), the width of the strap shall be measured without stopping the machine.
- 10.4.4. The tension shall then be increased until the strap breaks, and the breaking load shall be noted.
- 10.4.5. If the strap slips or breaks at or within 10 mm ($\frac{3}{8}$ in) of either of the clamps at a load lower than the prescribed minimum breaking load, the test shall be invalid and a new test shall be carried out on another specimen.

10.5. *Strength test for rigid parts*

- 10.5.1. The buckle and the adjusting device shall be connected to the tensile-testing apparatus by the parts of the belt assembly to which they are normally attached, and the load shall then build up to 980 daN (1000 kp; 2,200 lb). However, if the buckle or the adjusting device is part of the attachment the buckle or adjusting device shall be tested with the attachment, in conformity with paragraph 10.5.2. below.
- 10.5.2. The attachments shall be tested in the same manner, but the load shall be 1,470 daN (1,500 kp; 3,300 lb) and shall, subject to the provisions of the second sentence of paragraph 10.6.2. below, be applied in the least favourable direction likely to occur in a vehicle in which the belt is correctly installed.

10.6. *Dynamic test of the belt assembly*

- 10.6.1. The buckles of the belt assemblies to be tested shall have met the requirements of paragraph 7.2.3. above.
- 10.6.2. The belt assembly shall be mounted on a trolley equipped with the seat and the anchorages defined in annex 3 to this Regulation. However, if the belt assembly is intended for a specific vehicle or for specific types of vehicle, the distances between the manikin and the anchorages shall be determined by the service conducting the tests, either in conformity with the instruc-

tions for fitting supplied with the belt or in conformity with the data supplied by the manufacturer of the vehicle.

- 10.6.3. The belt assembly shall be attached to the manikin defined in annex 4 to this Regulation as follows: A board 25 mm (1 in) thick shall be placed between the back of the manikin and the seat back. The belt shall be firmly adjusted to the manikin. The board shall then be removed and the manikin placed against the seat back. If the buckle is of the eccentric type it shall lock only through the action of its spring; it shall not be forced or snapped into the locked position. If a metal-to-metal buckle is used, a check shall be made to ensure that the mode of engagement of the two parts entails no risk of reducing the reliability of locking or the strength of the buckle.
- 10.6.4. The free ends of the straps shall extend sufficiently far beyond the adjusting devices to allow for slip.
- 10.6.5. The trolley shall then be so propelled that at the moment of impact its free running speed is 50 km/h \pm 1 km/h (30 m.p.h. \pm 0.6 m.p.h.) and the manikin remains stable. The stopping distance of the trolley shall be 40 cm \pm 5 cm (15.8 in \pm 2 in). The trolley shall remain horizontal throughout deceleration. Deceleration of the trolley shall be achieved by using the stopping device shown in annex 3 to this Regulation. The curve of its deceleration as a function of time shall be within the area defined in annex 5.
- 10.6.6. The trolley speed immediately before impact and the maximum forward displacement of the manikin shall be measured.
- 10.6.7. After impact, the belt assembly and its rigid parts shall be inspected visually, without opening the buckle, to determine whether there has been any failure or breakage. It shall also be ascertained, after the test, whether the parts of the trolley bearing the anchorages have undergone any visible permanent deformation.

10.7. *Buckle-opening test*

- 10.7.1. A belt assembly having already undergone the assembled-belt test in conformity with paragraph 10.6. above shall be used for this test.
- 10.7.2. After the test prescribed in paragraph 10.6. above, a load of 66.6 daN (68 kp; 149 lb) shall be applied horizontally to the manikin in order to load the belt assembly, and the force needed to open the buckle when it is so loaded shall be measured.
- 10.7.3. The buckle-opening force shall be applied by a spring-balance or other measuring device in the manner and direction normal for opening the buckle.
- 10.7.4. The buckle-opening force shall be measured and any failure of the buckle noted.
- 10.7.5. After the buckle-opening test, the components of the belt assembly which have undergone the tests prescribed in paragraph 10.6. shall be inspected in order to determine the exact extent of the damage sustained by the belt assembly in the dynamic test.

10.8. *Test report*

The test report shall specify the trolley speed, the maximum forward displacement of the manikin, the place — if it can be varied — occupied by the buckle during the test, the buckle-opening force, and any failure or breakage. If by virtue of paragraph 10.6.3.¹ the anchorage points prescribed in annex 3 have not been respected, the test report shall describe how the belt assembly is installed and shall specify important angles and dimensions. The report shall also mention any distortion or breakage of the buckle that has occurred during the test.

11. CONFORMITY OF PRODUCTION

- 11.1. Every safety belt bearing the particulars referred to in paragraph 5.4. above shall conform to the approved type and comply with the conditions prescribed in paragraphs 6. to 10. above.
- 11.2. In order to verify conformity as aforesaid, a sufficient number of random checks shall be performed on serially-produced belts.
- 11.3. Belts offered or to be offered for sale shall be used for the tests.
- 11.4. The belts selected for verification of conformity with an approved type shall undergo such tests as may be chosen by the competent authority from among those described in paragraphs 9. and 10. above.

12. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

- 12.1. The approval granted in respect of a type of belt may be withdrawn if belts bearing the particulars referred to in paragraph 5.4. above fail to pass the random checks or do not conform to the type approved.
- 12.2. If a Contracting Party to the Agreement applying this Regulation withdraws an approval it has previously granted, it shall forthwith notify the other Contracting Parties applying this Regulation thereof by means of a copy of the approval form bearing at the end, in large letters, the signed and dated annotation " APPROVAL WITHDRAWN ".

13. INSTRUCTIONS

Every safety belt shall be accompanied by the instructions referred to in annex 6 to this Regulation.

14. OBSERVATIONS ON THE TYPES OF BELT

- 14.1. Every approval granted under this Regulation relates, by virtue of paragraph 5.1. above, to a particular type of belt; accordingly, article 3 of the Agreement to which the Regulation is annexed shall not prevent the Contracting Parties to the Agreement from:
 - 14.1.1. forbidding the use of one or more of the types of belt enumerated in paragraphs 2.1.1. to 2.1.4. on vehicles or certain categories of vehicles registered in their territory; or
 - 14.1.2. forbidding the use of one or more of the types of belt enumerated in paragraphs 2.1.1. to 2.1.4. for certain seats of vehicles registered in their territory.

¹ Should read: 10.6.2. — Devrait se lire : 10.6.2.

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

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

ANNEX I

(Maximum format: A 4 (210 × 297 mm))

NAME OF ADMINISTRATION

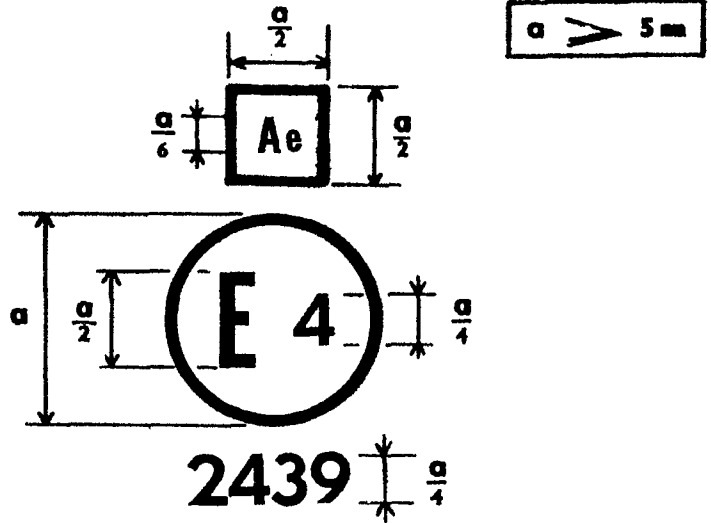


Communication concerning the approval (or refusal or withdrawal of approval) of a type of safety belt for adult occupants of power-driven vehicles, pursuant to Regulation No. 16

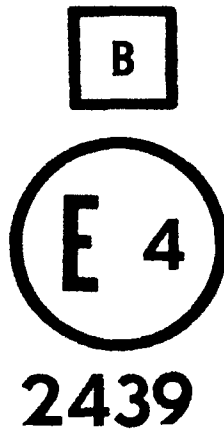
- Approval No.
1. Lap belt/diagonal belt/three-point belt/harness belt/belt fitted with energy absorber.*
2. Trade name or mark.
3. Manufacturer's designation of the belt type
4. Manufacturer's name
5. If applicable, name of his representative
6. Address
7. Submitted for approval on
8. Technical service conducting approval tests
9. Date of test report issued by that service.
10. Number of test report issued by that service
11. Approval granted/refused *for general use/for use in a particular vehicle or in particular types of vehicle*
12. Position and nature of the marking
13. Place
14. Date.
15. Signature
16. The following documents, bearing the approval number shown above, are attached to this communication:
. . . . drawings, diagrams and plans of the safety belt;
. . . . photographs of the safety belt.

* Strike out what does not apply.

ANNEX 2
ARRANGEMENT OF THE APPROVAL MARK



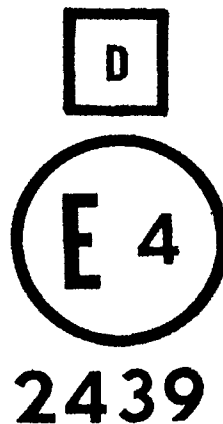
The belt bearing the above approval mark is a three-point belt (" A ") approved in the Netherlands (E4) under the number 2439 and fitted with an energy absorber (e).



The belt bearing the above approval mark is a lap belt (" B ") approved in the Netherlands (E4) under the number 2439 and having no energy absorber.



The belt bearing the above approval mark is a harness belt (" C ") approved in the Netherlands (E4) under the number 2439 and fitted with an energy absorber (e)



The belt bearing the above approval mark is a diagonal belt (" D ") approved in the Netherlands (E4) under the number 2439 and having no energy absorber.

ANNEX 3

DESCRIPTION OF TROLLEY, SEAT AND ANCHORAGES

1. TROLLEY

The trolley, carrying the seat only, shall weigh $400 \text{ kg} \pm 20 \text{ kg}$ ($880 \text{ lbs} \pm 44 \text{ lb}$).

2. SEAT

The seat shall be of rigid construction and present a smooth surface. The particulars given in the diagram appended to this annex shall be respected, care being taken that no metal part can come into contact with the belt.

3. ANCHORAGES

The anchorages shall be positioned as shown in the diagram in appendix 1 to this annex. The points, which correspond to the arrangement of the anchorages, show where the ends of the belt are to be connected to the trolley or to the load transducer, as the case may be. The structure carrying the anchorages shall be rigid. The upper anchorage must not be displaced by more than 0.2 mm (0.08 in) in the longitudinal direction when a load of 98 daN (100 kp; 220 lb) is applied to it in that direction.

4. STOPPING DEVICE

This device consists of two identical absorbers mounted in parallel. Each absorber comprises

- an outer casing formed from a steel tube;
- a polyurethane energy-absorber tube;
- a polished-steel olive-shaped knob penetrating into the absorber; and
- a shaft and an impact plate.

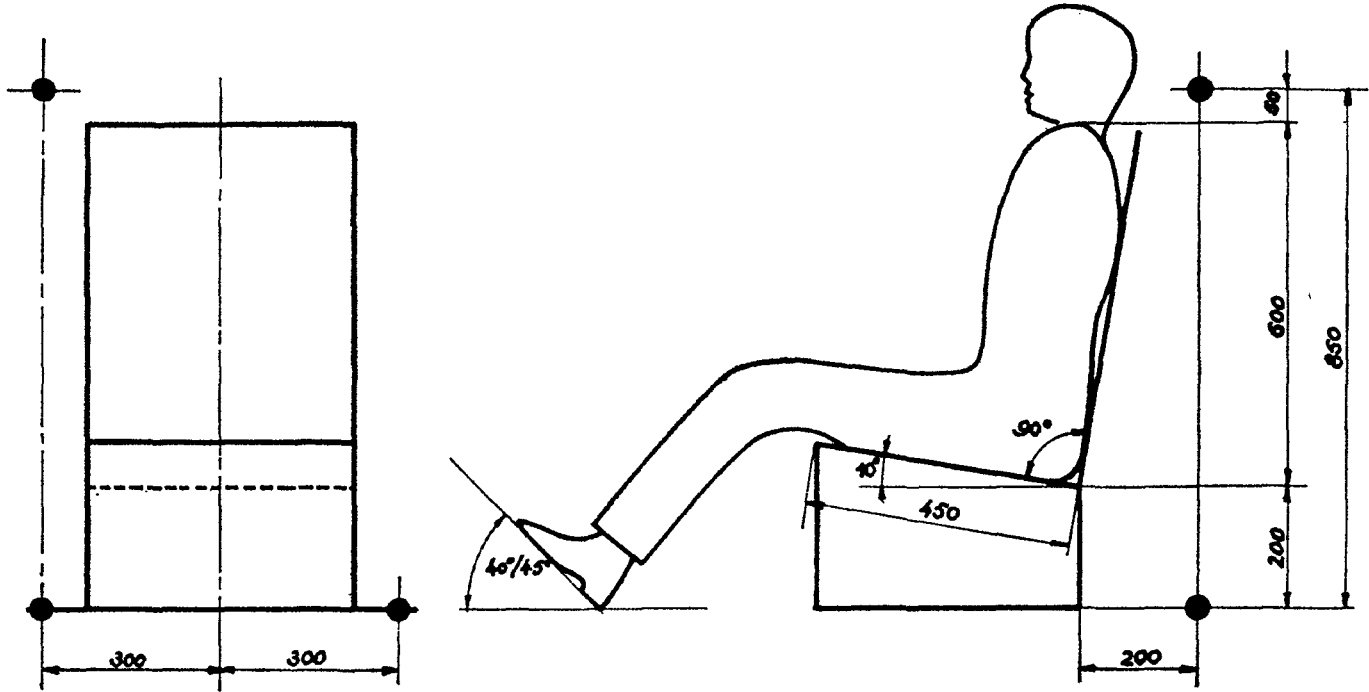
The dimensions of the various parts of this absorber are shown in the diagrams reproduced in appendix 2 to this annex.

The characteristics of the absorbing material are given in appendix 3 to this annex.

The requirements which the stopping device must meet are given in annex 5.

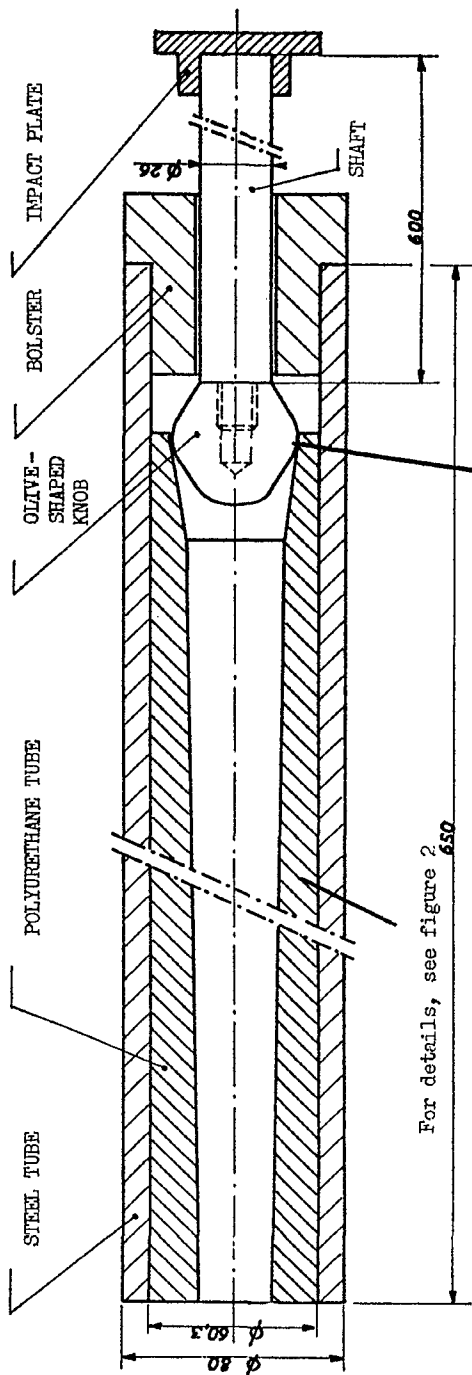
Any device giving identical results can be accepted.

Annex 3. Appendix 1
TROLLEY; SEAT; ANCHORAGES



Dimensions in mm

Annex 3. Appendix 2
 STOPPING DEVICE
 (As assembled)



For details, see figure 3

Play between the two tubes : 0.65 mm
 External diameter of the polyurethane tube : 59 mm
 The dimensions given are those of the steel tube and the shaft

FIGURE 1

Annex 3. Appendix 2
STOPPING DEVICE
(Polyurethane tube)

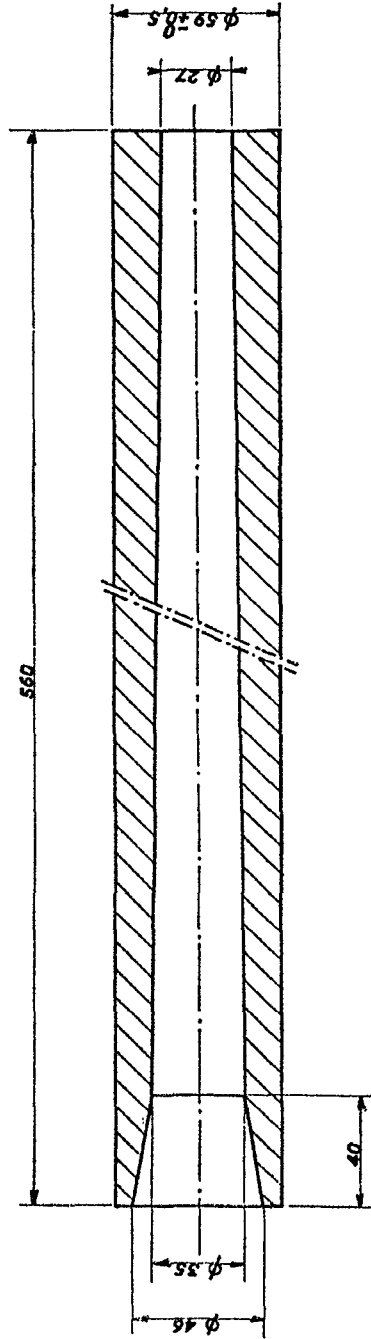


FIGURE 2

Annex 3. Appendix 2

STOPPING DEVICE
(Olive-shaped knob)

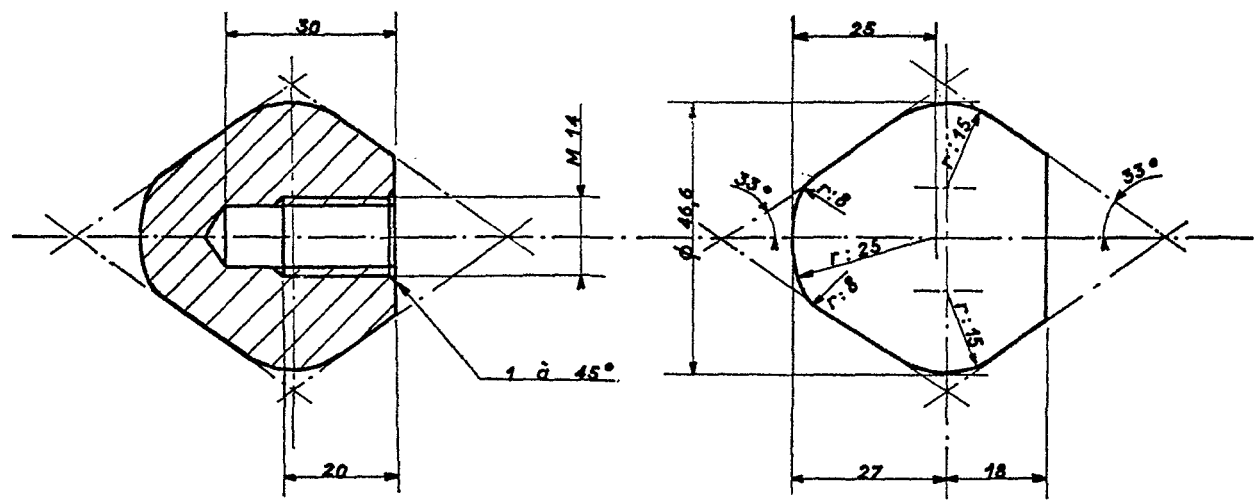


FIGURE 3

Annex 3. Appendix 3

CHARACTERISTICS OF THE ABSORBING MATERIAL
(ASTM Method D 735 unless otherwise stated)

Shore hardness A: 95 ± 2

Breaking strength: $R_o \geq 350 \text{ kg/cm}^2$

Minimum elongation: $A_o \geq 400 \%$

Module at 100 % elongation: $\geq 110 \text{ kg/cm}^2$

at 300 % elongation: $\geq 240 \text{ kg/cm}^2$

Low-temperature brittleness (ASTM Method D 736): 5 hours at -50°C

Compression set (Method B): 22 hours at $70^\circ \text{C} < 45 \%$

Density at 25°C : 1.05 to 1.10

Ageing in air (ASTM Method D 573):

70 hours at 100°C — Shore hardness: max. variation ± 3

— breaking strength: decrease $< 10 \%$ of R_o

— elongation: decrease $< 10 \%$ of A_o

— weight: decrease $< 1 \%$

Immersion in oil (ASTM Method No. 1 Oil):

70 hours at 100°C — Shore hardness: max. variation ± 4

— breaking strength: decrease $< 15 \%$ of R_o

— elongation: decrease $< 10 \%$ of A_o

— volume: swelling $< 5 \%$

Immersion in oil (ASTM Method No. 3 Oil):

70 hours at 100°C — breaking strength: decrease $< 15 \%$ of R_o

— elongation: decrease $< 15 \%$ of A_o

— volume: swelling $< 20 \%$

Immersion in distilled water:

— breaking strength: decrease $< 35 \%$ of R_o

1 week at 70°C

— elongation: increase $< 20 \%$ of A_o

ANNEX 4

DESCRIPTION OF MANIKIN

I. GENERAL DESCRIPTION

The parts of the manikin shall have the dimensional and weight characteristics appropriate to the corresponding parts of the body of a fiftieth-percentile adult male, as defined in tables 1 and 2 and figures 1 and 2.

The components of the manikin shall have a range of kinematic patterns (possibilities of relative movement) similar to those of an adult, as defined in table 2 and figure 2. The head, torso, arm and leg components shall have characteristics ensuring normal movement during impact. They shall include

functional equivalents of the spinal column, rib cage and sternum, pelvis, joints at the neck, shoulder, elbow, knee and hip, and exterior coverings.

2. MANIKIN-COMPONENT REQUIREMENTS

- 2.1. *Head*: The head shall consist of composite structures geometrically similar to those of the human head. The basic structure shall have an accessible interior ballast and a pliable external covering with appropriate surface contours. The connecting and supporting structure for the head shall be capable of maintaining an erect head position up to a horizontal acceleration of 2 g. An internal cavity may be provided for instrumentation.
- 2.2. *Torso*: The connecting and supporting structures shall allow the manikin to maintain a simulated sitting position similar to that of a human occupant of a vehicle. The design of the connecting and supporting structures shall be such that the manikin, restrained at the knees by a belt, will bend forwards during acceleration.
- 2.2.1. *Shoulders*: The shoulder structures shall be geometrically and functionally similar to the human shoulder complex.
- 2.2.2. *Thorax*: The dynamic rigidity of the thorax shall be 16 ± 2 kg/mm (900 ± 100 lb/in). This rigidity is determined by dividing the force applied to the thorax by the deflection within the range of 19-25 mm.
- 2.2.2.1. The dynamic rigidity of the thorax may be determined by using either a complete manikin or a thorax assembly only. When the complete manikin is used, the forward impact of a seated occupant is simulated. When only the thorax assembly is used, the total weight of thorax and mounting shall be 20.4 ± 2.3 kg (45 ± 5 lb).
- 2.2.2.2. Impact shall be made on a target 6 in (152 mm) in diameter, which may be covered with 0.5 in (13 mm) of padding material.
- 2.2.2.3. The centre of impact shall be on the vertical centreline of the sternum at a distance of 457 ± 15 mm (18 ± 0.5 in) from the top of the head of an erect manikin.
- 2.2.2.4. The major force axis shall be normal to the sternum.
- 2.2.2.5. The impact velocity shall be 7 ± 2 m/s (22 ± 7 ft/sec.).
- 2.2.2.6. The deflection of the sternum shall be determined by measuring the movement of the sternum relative to the spinal column.
- 2.2.3. The simulated abdominal structure shall be soft and pliable.
- 2.2.4. The pelvic structure shall be geometrically similar to that of the human pelvis.
- 2.3. The range of motion of each of the limb components is defined in table 2 and figure 2. All joints shall have adjustment devices which can be set to hold the components of the manikin in any position against an acceleration of 2 g in any direction.

3. The external covering of the manikin shall be soft, pliable, tear-resistant and elastic. The covering may be discontinuous except at torso sections in contact with belts during impact tests.
4. When measuring instrumentation is placed on or in the dummy, the masses and centres of gravity specified in figure 1 and table 1 shall be maintained.

Annex 4. Appendix

FIG. 1. CENTRES OF GRAVITY, WEIGHTS AND DIMENSIONS OF BODY

(See table 1)

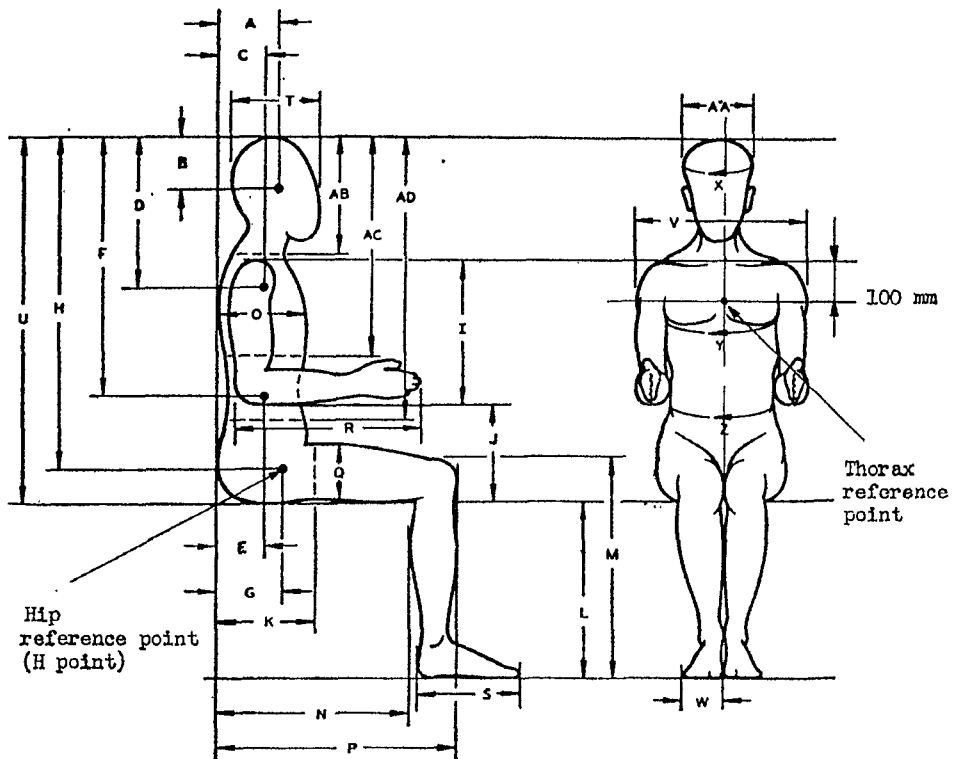


Table 1

CENTRES OF GRAVITY, WEIGHTS AND DIMENSIONS
OF A FIFTIETH-PERCENTILE MALE BODY

(See fig. 1)

Letter Designation	Title	Value	
		mm	in.
	<u>Centres of gravity</u>		
A	Head (forward from backline of body)	201.60	4.0
B	Head (below top of head)	119.40	4.7
C	Shoulders (forward of backline)	96.50	3.8
D	Shoulders (below top of head)	358.10	14.1
E	Abdomen (forward of backline)	124.50	4.9
F	Abdomen (below top of head)	528.30	20.8
G	Buttocks (forward of backline)	134.60	5.3
H	Buttocks (below top of head)	792.50	31.2
	Head-and-trunk whole (forward of backline)	119.40	4.7
	Head-and-trunk whole (below top of head)	576.60	22.7
	<u>Segment weights</u>	kg	lb
	Head	5.073	11.2
	Shoulders and upper thorax	7.837 ± 0.150	17.3
	Lower thorax and upper abdomen	10.419 ± 0.150	23.0
	Lower abdomen, buttocks and upper thighs	16.988 ± 0.2	37.5
	Upper arm (each)	2.446	5.4
	Forearm (each)	1.540	3.4
	Hand (each)	0.634	1.4
	Upper leg (each)	7.973	17.6
	Lower leg (each)	3.126	6.9
	Foot (each)	1.268	2.8
	Total weight of test device	74.3 ± 1.40	164 ± 3
	<u>Segment section lines</u>	mm	in.
JB	Head	236.20	9.3
AC	Shoulders	429.30	16.9
AD	Abdomen	637.50	25.1
K	Buttocks	254.00	10.0
I	Shoulder-to-elbow length	358.1 ± 7.6	14.1 ± 0.3
J	Elbow rest height (erect)	241.3 ± 12.7	9.5 ± 0.5
L	Popliteal height	439.4 ± 5.1	17.3 ± 0.2
M	Knee height (sitting)	543.6 ± 7.6	21.4 ± 0.3
N	Buttock-popliteal length	495.3 ± 7.6	19.5 ± 0.3
O	Chest depth	228.6 ± 10.7	9.0 ± 0.4
P	Buttock-knee length	642.6 ± 7.6	23.3 ± 0.3
Q	Thigh clearance	144.8 ± 7.6	5.7 ± 0.3
R	Elbow-to-finger-tip length	475 ± 12.7	18.7 ± 0.5
S	Foot length	266.7 ± 5.1	10.5 ± 0.2
T	Head length	195.6 ± 5.1	7.7 ± 0.2
U	Sitting height (erect)	906.8 ± 12.7	35.7 ± 0.5
V	Shoulder breadth	454.7 ± 10.2	17.9 ± 0.4
X	Head circumference	571.5 ± 12.7	22.5 ± 0.5
Y	Chest circumference	957.6 ± 25.4	37.7 ± 1.0
Z	Waist circumference (sitting)	838.2 ± 25.4	33.0 ± 1.0
AA	Head breadth	154.9 ± 5.1	6.1 ± 0.2

FIG. 2. RANGES OF MOTION

(See table 2)

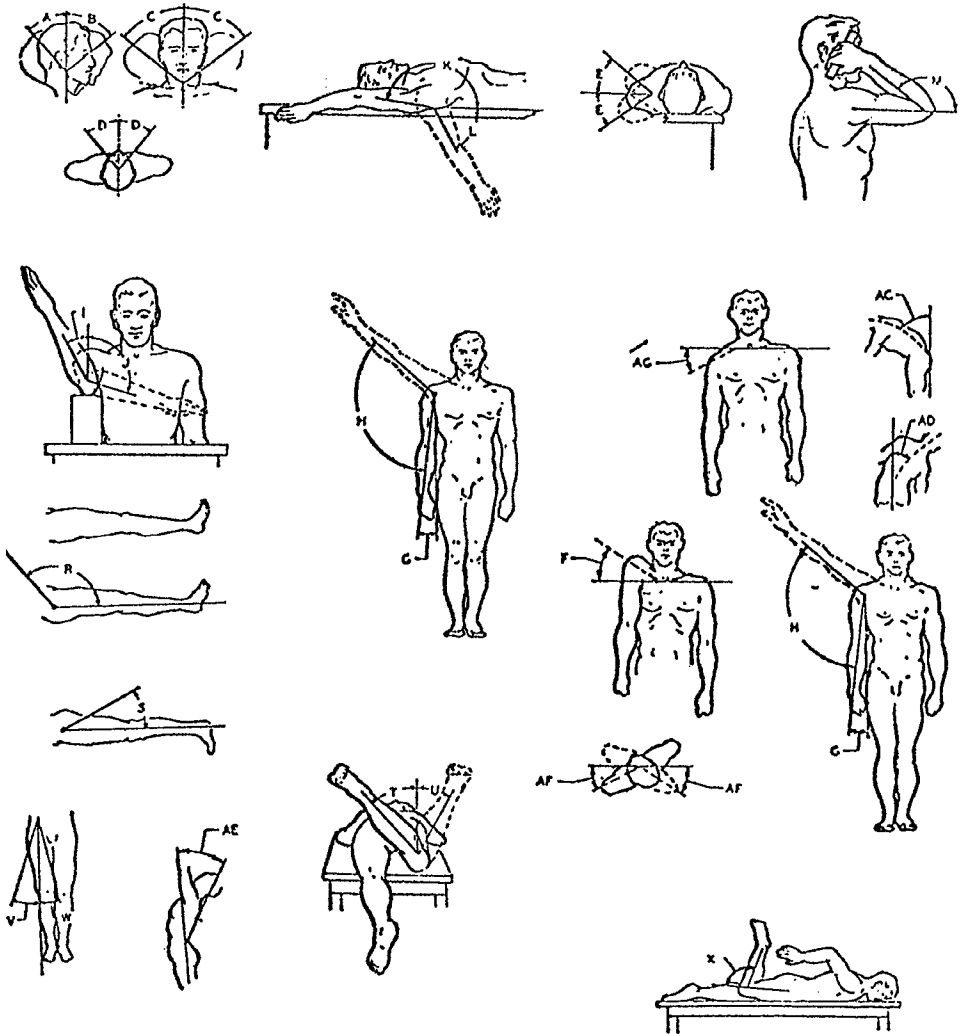


Table 2

RANGES OF MOTION AND TERMINOLOGY

NOTE :

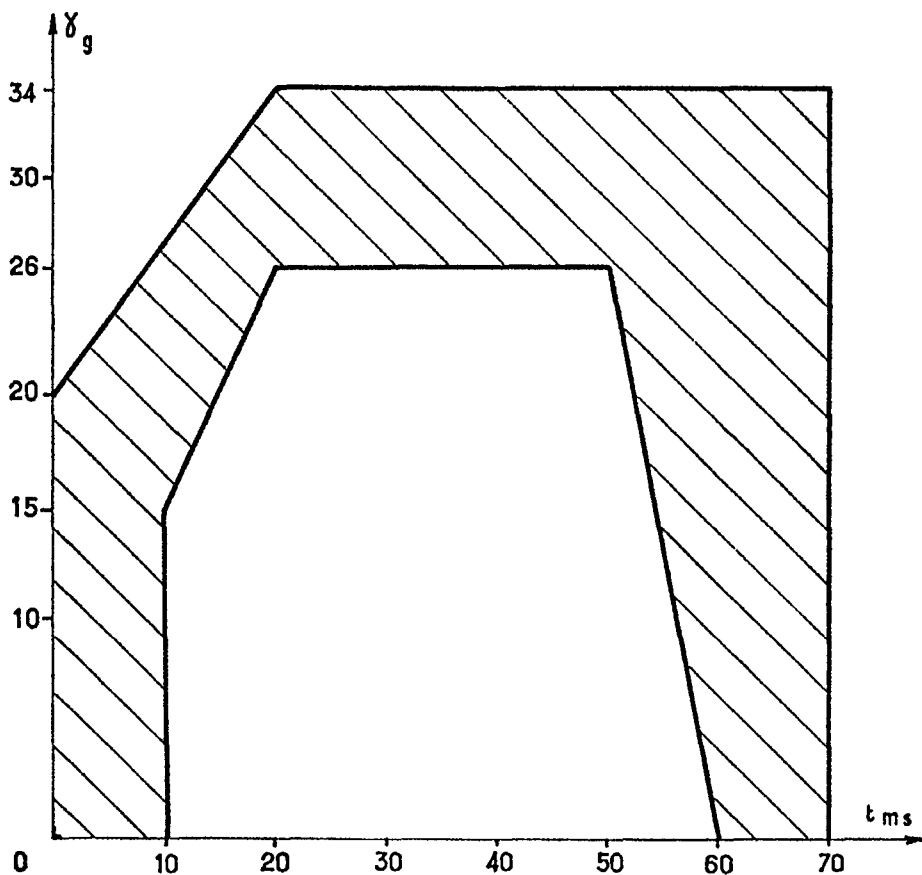
The motions are described and measured from a referenced "anatomical position", which is defined as : "an erect standing posture". Some of the movements described in this list may be best achieved mechanically by not simulating the normal anatomical relationships of the skeletal components.

Reference letter	Type of movement	Angle, degrees
	Head with respect to torso	
B	Flexion	60 + 10
A	Hyperextension	60 + 45
C	Lateral flexion	± 40 ± 10
D	Rotation	± 70 ± 10
	Shoulder girdle with respect to torso	
E	Anterior-posterior excursion	± 10
F	Elevation	20 + 10
AG	Depression	10 + 10
	Upper arm at shoulder	
G	Adduction	0)
H	Abduction	135) + 10
I	Medial rotation	90)
J	Lateral rotation	0) + 10
K	Flexion	180)
L	Hyperextension	60) + 10
	Forearm at elbow	
M	Flexion	135'
	Thigh at hip	
R	Flexion	120'
S	Hyperextension	45 + 10
U	Medial rotation	50)
T	Lateral rotation	50) + 10
W	Adduction	10)
V	Abduction	50) + 10
	Lower leg of knee	
X	Flexion	135'
	Long axis of torso	
AC	Flexion	40'
AE	Hyperextension	30 + 5
AD	Lateral flexion	35 + 10
AF	Rotation	35 + 10

ANNEX 5

DESCRIPTION OF CURVE OF TROLLEY'S DECELERATION AS A FUNCTION OF TIME

(Curve for testing stopping devices)



The deceleration curve of the trolley weighted with inert mass to produce a total weight of $455 \text{ kg} + 20 \text{ kg}$ ($1,000 \text{ lbs.} + 44 \text{ lbs.}$) must remain within the hatched area above.

FIG. 1

ANNEX 6

INSTRUCTIONS

Every safety belt shall be accompanied by instructions of the following content or kind in the language or languages of the country in which it is to be placed on sale:

1. The belt is designed to be used by only one person; it is not intended for children under six years old.

2. The belt must be attached to the anchorages provided by the vehicle manufacturer; if the vehicle is not equipped with such anchorages, the belt must be installed in accordance with the instructions of the belt manufacturer.

3. Instructions for correct use in such respects as :

- the need to avoid slack in the belts;
- how to use the belt so as best to protect the vehicle's occupant;

- the need to avoid twisting the straps during use;
- the need so to position the straps as to prevent their being worn or broken through chafing against sharp edges and the like;
- stowage of the belt when not in use;
- cleaning the belt;
- the need to replace the belt when it has been stressed through impact — in which event a check of the belt anchorages is also to be recommended.

4. If the vehicle is delivered by its maker with safety belts installed, the instructions referred to in paragraphs 1 to 3 above need not be supplied by the belt manufacturer if they are included in the instruction manual for the vehicle.

ANNEX 7

CHRONOLOGICAL ORDER OF TESTS

Relevant provisions of Regulation Paragraphs	Test	Samples												
		Belt No.			Strap sample No.									
		1.	2	3	1	2	3	4	5	6	7	8	9	10
4.6.2.,6.3.	Inspection of assembled belt	x												
7.1.1.,7.2.1., 7.2.2.,7.3.1., 7.3.2.,8.1.1.														
7.1.2.,10.2.	Corrosion tests on all rigid parts			x										
7.2.5.,10.5.1.	Strength of buckle			x										
7.3.3.,10.5.1.	Strength of adjusting device			x										
7.4.,10.5.2.	Strength of attachments			x										
8.2.,10.3.1., 10.4.	Strength of strap after room-conditioning				x									
8.1.2.,10.4.	Check of strap width				x									
8.3.,10.4.	Strength of strap after special conditioning:													
10.3.2.	light-conditioning						xx							
10.3.3.	cold-conditioning							xx						
10.3.4.	heat-conditioning								xx					
10.3.5.	exposure to water												xx	
10.6.1.,7.2.3.	Conditioning of buckle	x	x											
9.,10.6., 10.7.5.	Dynamic test of assembled belt	x	x											
7.2.4.,10.7.	Buckle-opening test	x	x											

ENTRY INTO FORCE OF REGULATION NO. 17 (UNIFORM PROVISIONS CONCERNING THE APPROVAL OF VEHICLES WITH REGARD TO THE STRENGTH OF THE SEATS AND OF THEIR ANCHORAGES) AS AN ANNEX TO THE AGREEMENT OF 20 MARCH 1958¹ 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 December 1970 in respect of France and the Netherlands, in accordance with article 1 (5) of the Agreement.

Authentic texts of the Regulation: English and French.

Registered ex officio on 1 December 1970.

1. SCOPE

This Regulation applies to seats of private cars and to their attachment fittings, adjustment and mounting. It does not apply to seats with built-in seat belt anchorages, to folding ("tip up") seats, or to side-facing or rearward-facing seats.

2. DEFINITIONS

For the purposes of this Regulation,

- 2.1. " *Approval of a vehicle* " means the approval of a vehicle type with regard to the strength of the seats and of their anchorages;
- 2.2. " *Vehicle type* " means a category of power-driven vehicles which do not differ in such essential respects as:
 - 2.2.1. the structure, shape, dimensions and materials of the seats;
 - 2.2.2. the types and dimensions of the seat-back adjustment and locking systems;
 - 2.2.3. the type and dimensions of the seat anchorage and of the affected parts of the vehicle-body shell;
- 2.3. " *Anchorage* " means the system by which the seat assembly is secured to the vehicle-body shell, including the affected parts of the vehicle-body shell;
- 2.4. " *Adjustment system* " means the device by which the seat or its parts can be adjusted to a position suited to the morphology of the seated occupant; this device may, in particular, permit of:
 - 2.4.1. longitudinal displacement;
 - 2.4.2. vertical displacement;
 - 2.4.3. angular displacement;
- 2.5. " *Displacement system* " means a device enabling the seat or one of its parts to be displaced angularly or longitudinally, without a fixed intermediate position, to facilitate access by passengers;

¹ See note 1 on p. 232 of this volume.

- 2.6. " *Locking system* " means a device ensuring that the seat and its parts are maintained in the position of use;
- 2.7. " *Folding (tip-up) seat* " means a seat whose back can be folded forward onto the seat and whose seat can be pivoted forward in relation to the floor.

3. APPLICATION FOR APPROVAL

- 3.1. The application for approval of a vehicle type with regard to the strength of the seats and of their anchorages shall be submitted by the vehicle manufacturer or by his duly accredited representative.
- 3.2. It shall be accompanied by the undermentioned documents in triplicate and by the following particulars:
 - 3.2.1. a detailed description of the vehicle type with regard to the design of the seats, of their anchorage, and of their adjustment and locking systems;
 - 3.2.2. drawings, on an appropriate scale and in sufficient detail, of the seats, of their anchorage to the vehicle, and of their adjustment and locking systems.
- 3.3. There shall be submitted to the technical service responsible for conducting the approval tests:
 - 3.3.1. a vehicle which is representative of the vehicle type to be approved; and
 - 3.3.2. an additional set of the seats with which the vehicle is equipped, with their anchorages.

4. APPROVAL

- 4.1. If the vehicle type submitted for approval pursuant to this Regulation meets the requirements of paragraphs 5 to 7 below, approval of that vehicle type shall be granted.
- 4.2. An approval number shall be assigned to each type approved. The same Contracting Party may not assign the same number either to the same vehicle type equipped with other types of seats or with seats anchored differently to the vehicle, or to another vehicle type.
- 4.3. Notice of approval or of refusal of approval of a vehicle type pursuant to this Regulation shall be communicated to the Parties to the Agreement¹ which apply this Regulation by means of a form conforming to the model in annex I to the Regulation and of drawings of the seats and their anchorages, supplied by the applicant for approval, in a format not exceeding A 4 (210 × 297 mm) or folded to that format and on an appropriate scale.
- 4.4. There shall be affixed, conspicuously and in a readily accessible place specified on the approval form, to every vehicle conforming to a vehicle type approved under this Regulation, an international approval mark consisting of :

¹ United Nations, *Treaty Series*, vol. 335, p. 211.

- 4.4.1. a circle surrounding the letter " E " followed by the distinguishing number of the country which has granted approval; *
- 4.4.2. the number of this Regulation, followed by the letter " R ", a dash and the approval number, below the circle.
- 4.5. The approval mark shall be clearly legible and be indelible.
- 4.6. Annex 2 to this Regulation gives an example of the arrangement of the approval mark.

5. GENERAL SPECIFICATIONS

- 5.1. Every adjustment and displacement system provided shall incorporate a locking system, which shall operate automatically.
- 5.2. The unlocking control for a device as referred to in paragraph 2.5. shall be easily accessible, even to the occupant of the seat immediately behind the seat concerned.

6. TESTS

6.1. *Test of strength of seat back and of its locking systems*

- 6.1.1. For this test, the seat back, if adjustable, shall be locked in a position corresponding to a rearward inclination of as close as possible to 25° from the vertical of the reference line of the torso of the manikin described in annex 3, unless otherwise prescribed by the manufacturer.
- 6.1.2. A force producing a moment of 53 mdaN (54 mkgf, 4,700 inch-pounds) in relation to the H point shall be applied longitudinally and rearwards to the upper part of the seat-back frame through a component simulating the back of the manikin shown in annex 3 to this Regulation.

6.2. *Test of strength of seat anchorage and of seat locking systems*

- 6.2.1. The systems shall, in all seated positions, withstand the forces prescribed in paragraph 6.2.2. Nevertheless, this requirement shall be deemed to be met if the test carried out in the positions specified in paragraph 6.2.5. and, where appropriate, in paragraph 6.2.6. is satisfactory.
- 6.2.2. A horizontal longitudinal force passing through the centre of gravity of the complete seat and equal to 20 times the weight of the complete seat shall be applied to the seat frame. Two tests shall be performed on the same seat, the force being applied once in the forward and once in the rearward direction. If the seat comprises separate parts each secured to the frame, the tests shall be performed on each part in the manner described above. If the seat comprises components secured in part to the vehicle-body shell and supporting one another by some of their parts, the tests shall be performed

* 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 and 11 for the United Kingdom; subsequent numbers shall be assigned to other countries in the chronological order in which they ratify the Agreement concerning the Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts, or in which they accede to that Agreement, and the numbers thus assigned shall be communicated by the Secretary-General of the United Nations to the Contracting Parties to the Agreement.

simultaneously by applying to the centre of gravity of each part the forces corresponding to each component considered separately.

- 6.2.3. For the test prescribed in paragraph 6.2.1., the link between the seat back and the cushion may be reinforced, on condition that the reinforcing components are secured to the frame of the seat back level with the point of application of the force, and at the most forward point of the frame of the cushion.
- 6.2.4. The conditions prescribed in paragraph 6.2.2. above may be regarded as met if two forces, each equal to one-half of the prescribed force, are applied level with the centre of gravity to the lateral load-bearing components of the seat frame.
- 6.2.5. The seat shall be tested
 - 6.2.5.1. in the position in which the occupant is seated furthest forward, the cushion being placed in the highest forward position when the force is applied in a forward direction; and
 - 6.2.5.2. in the position in which the occupant is seated furthest rearward, the cushion being placed in the lowest rearward position when the force is applied in a rearward direction.
- 6.2.6. In cases where the arrangement of the locking systems is manifestly such that in a seat position other than those defined in paragraphs 6.2.5.1. and 6.2.5.2 a distribution of the forces on the locking systems and seat anchorage would be less favourable than with the configurations defined in those paragraphs, the tests shall be repeated in that seat position.

6.3. *Tests of resistance of locking systems to inertia effects*

- 6.3.1. If a horizontal longitudinal acceleration of 20 g is applied in the forward and in the rearward direction to the seat assembly, no release of the locking systems shall be determinable.
- 6.3.2. A calculation of inertia effects on all components of the locking systems may be accepted in place of the dynamic test prescribed in paragraph 6.3.1. above. Frictional forces shall be disregarded in such a calculation.

6.4. Equivalent methods of testing shall be permitted provided that the results specified in paragraphs 6.1., 6.2. and 6.3. above can be obtained either entirely by means of the substitute test or by calculation from the results of the substitute test. If any method other than that described in paragraphs 6.1., 6.2. and 6.3. above is used, proof of its equivalence shall be required.

7. INSPECTION

- 7.1. No failure shall be determinable in the seat frame or in the seat anchoring, adjustment and displacement systems or their locking devices during the tests prescribed in paragraphs 6.1. and 6.2. The adjustment and displacement systems and their locking devices shall not, however, be required to be in working order after these tests. The displacement system referred to in paragraph 2.5. must, however, be capable of being unlocked after testing.

8. MODIFICATIONS OF VEHICLE TYPE OR OF THE VEHICLE'S SEATS OR THEIR ANCHORAGE ON THE VEHICLE

- 8.1. Every modification of the vehicle type or of the vehicle's seats or their anchorage on the vehicle shall be notified to the administrative department which approved the vehicle type. The department may then either :
- 8.1.1. consider that the modifications made are unlikely to have an appreciable adverse effect, and that in any case the vehicle still meets the requirements ;
or
- 8.1.2. require a further report from the technical service responsible for conducting the tests.
- 8.2. Notice of confirmation of approval, specifying the modifications, or of refusal of approval, shall be communicated by the procedure specified in paragraph 4.3. above to the Parties to the Agreement which apply this Regulation.

9. CONFORMITY OF PRODUCTION

- 9.1. Every vehicle bearing an approval mark as prescribed under this Regulation shall, with regard to the type of seats, to their anchorage on the vehicle, to their adjustment and displacement systems and to their locking devices conform to the vehicle type approved.
- 9.2. In order to verify conformity as prescribed in paragraph 9.1. above, a sufficient number of random checks shall be performed on serially-produced vehicles bearing the approval mark required by this Regulation.
- 9.3. As a general rule, the checks as aforesaid shall be confined to the measurement of dimensions. If necessary, however, the vehicles or the seats shall be subjected to tests conforming to the requirements of paragraph 6 above.

10. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

- 10.1. The approval granted in respect of a vehicle type pursuant to this Regulation may be withdrawn if the requirements laid down in paragraph 9.1. above are not complied with or if the vehicles fail in the checks prescribed in paragraph 9 above.
- 10.2. If a Party to the Agreement which applies this Regulation withdraws an approval it has previously granted, it shall forthwith notify the other Contracting Parties applying this Regulation thereof by means of a copy of the approval form bearing at the end, in large letters, the signed and dated annotation " APPROVAL WITHDRAWN ".

11. NAMES AND ADDRESSES OF TECHNICAL SERVICES CONDUCTING APPROVAL TESTS, AND OF ADMINISTRATIVE DEPARTMENTS

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

ANNEX I

(Maximum format : A 4 (210 × 297 mm))



NAME OF
ADMINISTRATION

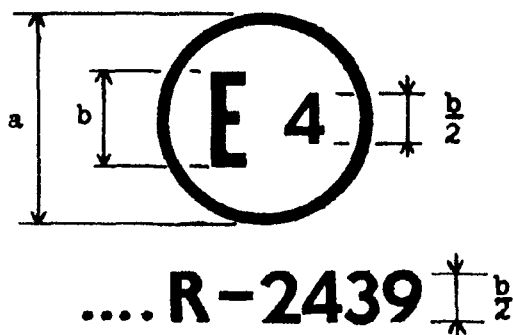
*Communication concerning the approval
(or refusal or withdrawal of approval) of a type of vehicle
with regard to the strength of the seats and of their anchorages,
pursuant to Regulation No. 17*

- Approval No.
1. Trade name or mark of the power-driven vehicle
 2. Vehicle type
 3. Manufacturer's name and address
 4. If applicable, name and address of manufacturer's representative
 5. Description of seats
 6. Description of the adjustment, displacement and locking systems either of the seat or of its parts
 7. Description of seat anchorage
 8. Vehicle submitted for approval on
 9. Technical service conducting approval tests
 10. Date of report issued by that service
 11. Number of report issued by that service
 12. Approval granted/refused *
 13. Position of approval mark on the vehicle
 14. Place
 15. Date
 16. Signature
 17. The following documents, bearing the approval number shown above, are annexed to this communication :
 - drawings, diagrams and plans of the seats, of their anchorage on the vehicle, of the adjustment and displacement systems of the seats and of their parts, and of their locking devices;
 - photographs of the seats, of their anchorage, of the adjustment and displacement systems of the seats and of their parts, and of their locking devices.

* Strike out what does not apply.

ANNEX 2

ARRANGEMENT OF THE APPROVAL MARK



	a	b
Minimum dimensions	12	5.6

(millimètres)

The above approval mark affixed to a vehicle shows that, pursuant to Regulation No. 17 the vehicle type concerned has, with regard to the strength of the seats and their anchorage, been approved in the Netherlands (E4) under approval number 2439.

ANNEX 3

TEST PROCEDURE FOR DETERMINING THE H POINT

1. Definition

The H point, which indicates the position in the passenger compartment of a seated occupant, is the point, in a longitudinal vertical plane, through which passes the theoretical axis of rotation between the leg and the torso of a human body, represented by a manikin.

2. Determination of H points

2.1. An H point shall be determined for each seat provided by the vehicle manufacturer. When the seats in the same group of seats can be regarded as similar (bench seat, identical seats etc.), only one H point will be determined for each group of seats, the manikin being placed in a position regarded as typical of the group. This position will be :

2.1.1. for the front group, the driver's seat ;

2.1.2. for the rear group or groups, an outside seat.

2.2. Whenever an H point is being determined, the seat in question shall be placed in the rearmost position for driving or use intended by the manufacturer, the back, if adjustable, being arranged to be nearly vertical.

3. *Description of the manikin*

- 3.1. A three-dimensional manikin shall be used with a weight and contour corresponding to that of an adult male of average height. Such a manikin is depicted in the appendix, pages 1 and 2.
- 3.2. The manikin consists of :
 - 3.2.1. Two components, one simulating the back and the other the body base, hinged along an axis representing the axis of rotation between the torso and the thigh; the projection of this axis on the manikin's side is the manikin's H point;
 - 3.2.2. two components simulating the legs and hinged in relation to the component representing the body base;
 - 3.2.3. two components simulating the feet, connected to the legs by hinges simulating the ankles.
 - 3.2.4. In addition, the component simulating the body base is fitted with a level by means of which its setting can be varied transversely.
- 3.3. Body segment weights are attached at appropriate points corresponding to the relevant centres of gravity, so as to bring the total weight of the manikin up to about 74.4 daN (75.8 kp, 167 lb). Details of the various weights are shown in the table at the top of page 2 of the appendix to this annex.

4. *Setting up the manikin*

The three-dimensional manikin is set up in the following manner :

- 4.1. Level vehicle and adjust the seats as described in paragraph 2.2.
- 4.2. Cover the seat to be tested with a piece of cloth to facilitate the correct setting up of the manikin.
- 4.3. Place the manikin on the seat concerned.
- 4.4. Arrange the feet of the manikin in the following manner :
 - 4.4.1. for the driver's position, place the right foot in a position of rest on the accelerator, and arrange the left foot so that the level for checking the transverse setting of the manikin's body base returns to the horizontal;
 - 4.4.2. for the rear seats, the feet should be so arranged that, as far as possible, they are in contact with the front seats; if the feet then rest on parts of the floor which are on different levels, the foot which first comes into contact with the front seat serves as a reference point, and the other foot is arranged so that the level indicating the transverse setting of the manikin's body base returns to the horizontal;
 - 4.4.3. if the H point is being determined for a middle seat, the two feet are placed astride the tunnel.
- 4.5. Apply the weights to the thighs, bring the transverse level on the manikin's body base back to the horizontal, and apply the weights to the component representing the body base.
- 4.6. Move the manikin away from the seat back by using the hinged knee bar, and tilt the back forwards. Reposition the manikin on the seat of the vehicle by

sliding the body base back until resistance is felt, then replace the manikin's back against the seat back.

- 4.7. Apply a load of about 10 daN (10.2 kp, 22.5 lb) twice to the manikin in a horizontal direction. The direction and point of application of the load are shown by a black arrow in the appendix (page 2).
- 4.8. Install the weights on the right and left sides and then the torso weights. Keep the manikin's transverse level at the horizontal.
- 4.9. While keeping the manikin's transverse level at the horizontal, tilt the back forwards until the torso weights are above the H point, so as to eliminate any friction with the seat back.
- 4.10. Return the back of the manikin gently to its original position so as to complete the setting up. The manikin's transverse level should be at the horizontal. If it is not, repeat the process described above.

5. Results

- 5.1. The manikin having been set up as described in paragraph 4, the H point of the seat in question is the H point on the manikin.
- 5.2. The Cartesian co-ordinates of the H point are each measured to an accuracy of within 1 mm. The same applies to the co-ordinates representing specific points of the passenger compartment. The projections of these points on a vertical longitudinal plane are then plotted on a graph.

Annex 3 — Appendix

COMPONENTS OF THREE-DIMENSIONAL MANIKIN

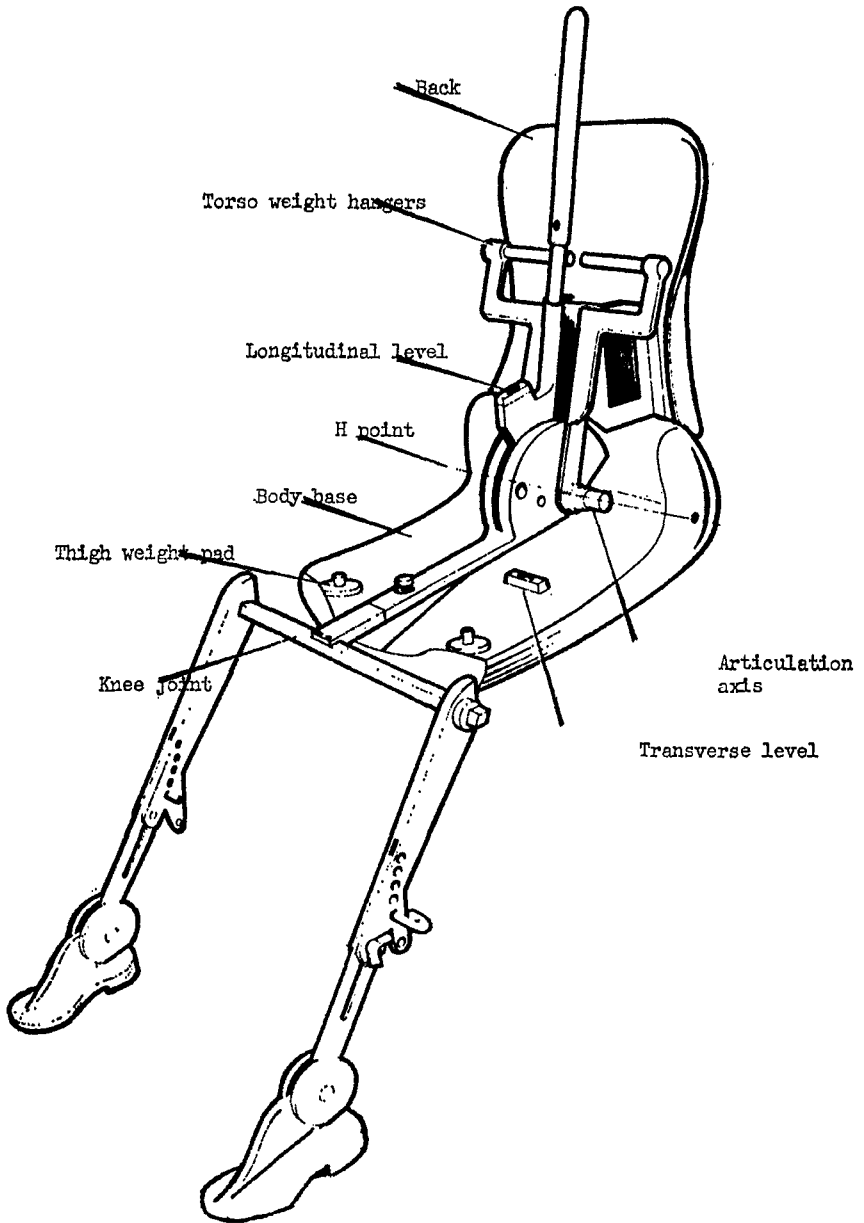


FIG. 1

DIMENSIONS AND WEIGHT OF MANIKIN

<u>Weight of manikin</u>	kg	lbs
Components simulating back and base of body	16.6	36.6
Torso weights	7.8	17.3
Body-base weights	6.8	15.1
Thigh weights	<u>13.2</u>	<u>29.1</u>
Leg weights		
Total:	75.6	167.0

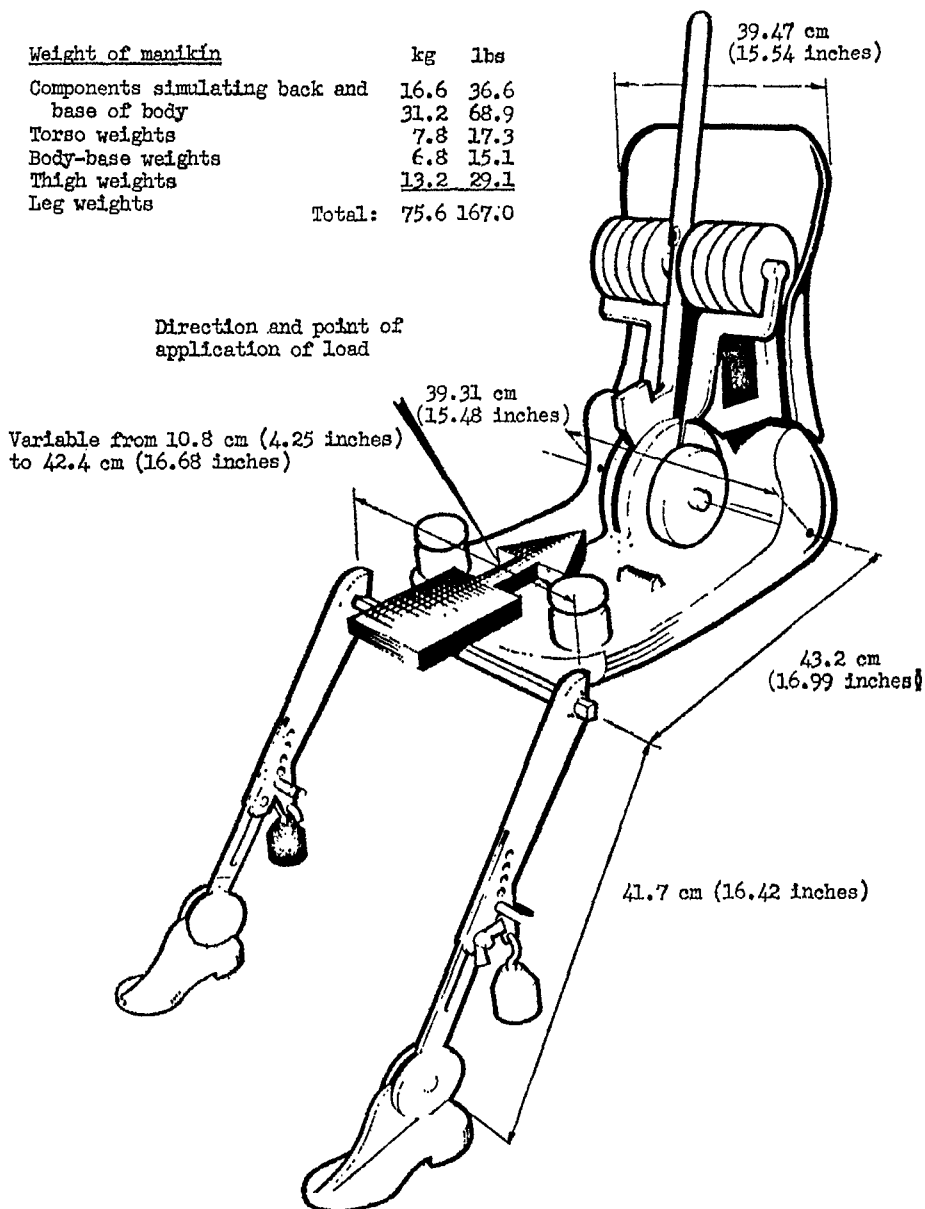


FIG. 2