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Acts whose titles are printed in light type are those relating to day-to-day management of agricultural matters, and are generally valid for a limited period.

The titles of all other acts are printed in bold type and preceded by an asterisk.

II

*(Non-legislative acts)***ACTS ADOPTED BY BODIES CREATED BY
INTERNATIONAL AGREEMENTS**

Only the original UN/ECE texts have legal effect under international public law. The status and date of entry into force of this Regulation should be checked in the latest version of the UN/ECE status document TRANS/WP.29/343, available at:
<http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29docstts.html>

**Regulation No 17 of the Economic Commission for Europe of the United Nations (UN/ECE) —
Uniform provisions concerning the approval of vehicles with regard to the seats, their anchorages
and any head restraints 2019/1723**

Incorporating all valid text up to:

09 series of amendments — Date of entry into force: 28 May 2019

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1. SCOPE

This Regulation applies to:

- (a) Vehicles of categories M₁ and N ⁽¹⁾ with regard to the strength of seats and their anchorages and with regard to their head restraints;
- (b) Vehicles of categories M₂ and M₃ ⁽¹⁾ with regard to seats not covered by Regulation No 80, in respect of the strength of seats and their anchorages, and in respect of their head restraints;
- (c) Vehicles of category M₁ with regard to the design of the rear parts of seat backs and the design of devices intended to protect the occupants from the danger resulting from the displacement of luggage in a frontal impact.

It does not apply to vehicles with regard to side-facing or rearward-facing seats, or to any head restraint fitted to these 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 their anchorages, the design of the rear parts of the seat-backs and the characteristics of their head restraints;
- 2.2. 'Vehicle type' means a category of motor vehicles which do not differ in such essential respects as:
 - 2.2.1. The structure, shape, dimensions, materials and the mass of the seats, although the seats may differ in covering and colour; differences not exceeding 5 per cent in the mass of the approved seat type shall not be considered significant;
 - 2.2.2. The type and dimensions of the adjustment, displacement and locking systems of the seat-back and seats and their parts;
 - 2.2.3. The type and dimensions of the seat anchorages;
 - 2.2.4. The dimensions, frame, materials and padding of head restraints, although they may differ in colour and covering;
 - 2.2.5. The type and dimensions of the attachments of the head restraint and the characteristics of the part of the vehicle to which the head restraint is attached, in the case of a separate head restraint;
- 2.3. 'Seat' means a structure which may or may not be integral with the vehicle structure complete with trim, intended to seat one person. Depending on its orientation, a seat is defined as follows:
 - 2.3.1. 'Forward-facing seat' means a seat which can be used whilst the vehicle is in motion and which faces towards the front of the vehicle in such a manner that the vertical plane of symmetry of the seat forms an angle of less than + 10 ° or – 10 ° with the vertical plane of symmetry of the vehicle;
 - 2.3.2. 'Rearward-facing seat' means a seat which can be used whilst the vehicle is in motion and which faces towards the rear of the vehicle in such a manner that the vertical plane of symmetry of the seat forms an angle of less than + 10 ° or – 10 ° with the vertical plane of symmetry of the vehicle;
 - 2.3.3. 'Side-facing seat' means a seat which can be used whilst the vehicle is in motion and which faces towards the side of the vehicle in such a manner that the vertical plane of symmetry of the seat forms an angle of 90 ° (± 10 °) with the vertical plane of symmetry of the vehicle;

⁽¹⁾ As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.6, para. 2 — <http://www.unece.org/trans/main/wp29/wgs/wp29gen/wp29resolutions.html>

- 2.4. 'Bench seat' means a structure complete with trim, intended to seat more than one adult person;
- 2.5. 'Anchorage' means the system by which the seat assembly is secured to the vehicle structure, including the affected parts of the vehicle structure;
- 2.6. '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:
 - 2.6.1. Longitudinal displacement;
 - 2.6.2. Vertical displacement;
 - 2.6.3. Angular displacement;
- 2.7. 'Displacement system' means a device by which the seat or one of its parts can be displaced and/or rotated, without a fixed intermediate position, to permit easy access of occupants to the space behind the seat concerned;
- 2.8. 'Locking system' means a device ensuring that the seat and its parts are maintained in the position of use;
- 2.9. 'Folding seat' means a seat, which is normally folded, can be easily operated and is designed for occasional use by an occupant;
- 2.10. 'Transverse plane' means a vertical plane perpendicular to the median longitudinal plane of the vehicle;
- 2.11. 'Longitudinal plane' means a plane parallel to the median longitudinal plane of the vehicle;
- 2.12. 'Head restraint' means a device whose purpose is to limit the rearward displacement of an adult occupant's head in relation to his torso in order to reduce the danger of injury to the cervical vertebrae in the event of an accident;
 - 2.12.1. 'Integrated head restraint' means a head restraint formed by the upper part of the seat-back. Head restraints meeting the definitions of paragraphs 2.12.2 or 2.12.3 below but which can only be detached from the seat or the vehicle structure by the use of tools or by partial or complete removal of the seat covering, meet the present definition;
 - 2.12.2. 'Detachable head restraint' means a head restraint consisting of a component separable from the seat designed for insertion and positive retention in the seat-back structure;
 - 2.12.3. 'Separate head restraint' means a head restraint consisting of a component separate from the seat, designed for insertion and/or positive retention in the structure of the vehicle;
- 2.13. 'R point' means the seating reference point as defined in Annex 3, Appendix 3 to this Regulation;
- 2.14. 'Reference line' means the line on the manikin reproduced in Annex 3, Appendix 1, Figure 1, to this Regulation.
- 2.15. 'Partitioning system' means parts or devices which, in addition to the seat-backs, are intended to protect the occupants from displaced luggage; in particular, a partitioning system may be constituted by netting or wire mesh located above the level of the seat-backs in their upright or folded down position. Head restraints fitted as standard equipment for vehicles equipped with such parts or devices shall be considered as part of the partitioning system. However, a seat equipped with a head restraint shall not be considered as being on its own a partitioning system.
- 3. APPLICATION FOR APPROVAL
 - 3.1. The application for approval of a vehicle type shall be submitted by the vehicle manufacturer or by his duly accredited representative.
 - 3.2. It shall be accompanied by the following documents in triplicate and the following particulars:

- 3.2.1. A detailed description of the vehicle type with regard to the design of the seats, their anchorages, and their adjustment, displacement and locking systems;
- 3.2.1.1. A detailed description and/or drawings of the partitioning system, if applicable.
- 3.2.2. Drawings, on an appropriate scale and in sufficient detail, of the seats, their anchorages on the vehicle, and their adjustment, displacement and locking systems.
- 3.2.3. In the case of a seat with a detachable head restraint:
 - 3.2.3.1. A detailed description of the head restraint, specifying in particular the nature of the padding material or materials;
 - 3.2.3.2. A detailed description of the location, the type of support and the attachments for mounting the head restraint on the seat.
- 3.2.4. In the case of a separate head restraint:
 - 3.2.4.1. A detailed description of the head restraint, specifying in particular the nature of the padding material or materials;
 - 3.2.4.2. A detailed description of the location, and the attachments for fitting the head restraint to the structure of the vehicle.
- 3.3. The following shall be submitted to the Technical Service responsible for the approval tests:
 - 3.3.1. A vehicle representative of the vehicle type to be approved or the parts of the vehicle which the Technical Service deems necessary for approval tests;
 - 3.3.2. An additional set of the seats with which the vehicle is equipped, with their anchorages.
 - 3.3.3. For vehicles with seats fitted or capable of being fitted with head restraints, in addition to the requirements set out in paragraphs 3.3.1 and 3.3.2 above:
 - 3.3.3.1. In the case of detachable head restraints: an additional set of seats, fitted with head restraints, with which the vehicle is equipped, together with their anchorages.
 - 3.3.3.2. In the case of separate head restraints: an additional set of the seats with which the vehicle is equipped, with their anchorages, an additional set of the corresponding head restraints and the part of the vehicle structure to which the head restraint is fitted, or a complete structure.
- 4. APPROVAL
 - 4.1. If the vehicle submitted for approval pursuant to this Regulation meets the relevant requirements (seats fitted with head restraints or capable of being fitted with head restraints), approval of the vehicle type shall be granted.
 - 4.2. An approval number shall be assigned to each type approved. Its first two digits (at present 09, corresponding to the 09 series of amendments) shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party may not assign the same number either to the same vehicle type equipped with other types of seats or head restraints or with seats anchored differently on the vehicle (this applies both to seats with and to those without head restraints) or to another vehicle type.
 - 4.3. Notice of approval or extension or refusal of approval of a vehicle type pursuant to this Regulation shall be communicated to the Parties to the Agreement applying this Regulation by means of a form conforming to the model in Annex 1 to this Regulation.
 - 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:
 - 4.4.1. A circle surrounding the letter 'E' followed by the distinguishing number of the country which has granted approval⁽²⁾;

⁽²⁾ The distinguishing numbers of the Contracting Parties to the 1958 Agreement are reproduced in Annex 3 to the Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev. 6, Annex 3 — <http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html>

- 4.4.2. The number of this Regulation, followed by the letter 'R', a dash and the approval number, to the right of the circle prescribed in paragraph 4.4.1 above.
- 4.4.3. However, if the vehicle is equipped with one or more seats fitted or capable of being fitted with head restraints, approved as meeting the requirements under paragraphs 5.1 and 5.2 below, the number of this Regulation shall be followed by the letters 'RA'. The form conforming to the model in Annex 1 to this Regulation shall indicate which seat(s) of the vehicle is (are) fitted or capable of being fitted with head restraints. The marking shall also indicate that any remaining seats in the vehicle, not fitted or capable of being fitted with head restraints, are approved and meet the requirements of paragraph 5.1 below of this Regulation.
- 4.5. If the vehicle conforms to a vehicle type approved under one or more other Regulations annexed to the Agreement in the country which has granted approval under this Regulation, the symbol prescribed in paragraph 4.4.1 above need not be repeated; in such a case the Regulation and approval numbers and the additional symbols of all the Regulations under which approval has been granted in the country which has granted approval under this Regulation shall be placed in vertical columns to the right of the symbol prescribed in paragraph 4.4.1 above.
- 4.6. The approval mark shall be clearly legible and be indelible.
- 4.7. The approval mark shall be placed close to or on the vehicle data plate affixed by the manufacturer.
- 4.8. Examples of arrangements of approval marks are given in Annex 2 to this Regulation.
5. REQUIREMENTS
- 5.1. General requirements
- 5.1.1. The installation of side-facing seats shall be prohibited in vehicles of categories M₁, N₁, M₂ (of class II, III and B) and M₃ of a technically permissible laden mass not exceeding 10 tonnes (of class II, III and B).
- 5.1.2. It does not apply to ambulances or to vehicles intended for use by the armed services, civil defence, fire services and forces responsible for maintaining public order.
- 5.2. General requirements applicable to all seats of vehicles of category M₁ ⁽³⁾
- 5.2.1. Every adjustment and displacement system provided shall incorporate a locking system, which shall operate automatically.
- Locking systems for armrests or other comfort devices are not necessary unless the presence of such devices will cause additional risk of injury to the occupants of a vehicle in the event of a collision.
- Folding seats shall lock automatically in the position of use by occupants.
- 5.2.2. The unlocking control for a device as referred to in paragraph 2.7 of this Regulation shall be placed on the outside of the seat close to the door. It shall be easily accessible, even to the occupant of the seat immediately behind the seat concerned.
- 5.2.3. The rear parts of seats situated in area 1, defined in paragraph 6.8.1.1 below shall pass the energy dissipation test in accordance with the requirements of Annex 6 to this Regulation.
- 5.2.3.1. This requirement is deemed to be met if in the tests carried out by the procedure specified in Annex 6 to this Regulation the deceleration of the headform does not exceed 80 g continuously for more than 3 ms. Moreover, no dangerous edge shall occur during or remain after the test.
- 5.2.3.2. The requirements of paragraph 5.2.3 shall not apply to rearmost seats, to back-to-back seats or to seats that comply with the provisions of Regulation No 21 'Uniform Provisions concerning the Approval of Vehicles with regard to their Interior Fittings' (E/ECE/324-E/ECE/TRANS/505/Rev.1/Add.20/Rev.2, as last amended).

⁽³⁾ Vehicles of category M₂, which are approved to this Regulation as an alternative to Regulation No 80 (in line with paragraph 1.2 to that Regulation) shall also meet the requirements of this paragraph.

- 5.2.4. The surface of the rear parts of seats shall exhibit no dangerous roughness or sharp edges likely to increase the risk of severity of injury to the occupants. This requirement is considered as satisfied if the surface of the rear parts of seats tested in the conditions specified in paragraph 6.1 below exhibit radii of curvature not less than:

2,5 mm in area 1,

5,0 mm in area 2,

3,2 mm in area 3.

These areas are defined in paragraph 6.8.1 below.

- 5.2.4.1. This requirement does not apply to:

- 5.2.4.1.1. the parts of the different areas exhibiting a projection of less than 3,2 mm from the surrounding surface, which shall exhibit blunted edges, provided that the height of the projection is not more than half its width;

- 5.2.4.1.2. Rearmost seats, to back-to-back seats or to seats that comply with the provisions of Regulation No 21 'Uniform Provisions concerning the Approval of Vehicles with regard to their Interior Fittings' (E/ECE/324-E/ECE/TRANS/505/Rev.1/Add.20/Rev.2, as last amended);

- 5.2.4.1.3. Rear parts of seats situated below a horizontal plane passing through the lowest R point in each row of seats. (Where rows of seats have different heights, starting from the rear, the plane shall be turned up or down forming a vertical step passing through the R point of the row of seats immediately in front);

- 5.2.4.1.4. Parts such as 'flexible wire mesh'.

- 5.2.4.2. In area 2, defined in paragraph 6.8.1.2 below, surfaces may exhibit radii less than 5 mm, but not less than 2,5 mm provided that they pass the energy-dissipation test prescribed in Annex 6 to this Regulation. Moreover, these surfaces shall be padded to avoid direct contact of the head with the seat frame structure.

- 5.2.4.3. If the areas defined above contain parts covered with material softer than 50 Shore A hardness, the above requirements, with the exception of those relating to the energy-dissipation test in accordance with the requirements of Annex 6, shall apply only to the rigid parts.

- 5.2.5. No failure shall be shown in the seat frame or in the seat anchorage, the adjustment and displacement systems or their locking devices during or after the tests prescribed in paragraphs 6.2 and 6.3 below. Permanent deformations, including ruptures, may be accepted, provided that these do not increase the risk of injury in the event of a collision and the prescribed loads were sustained.

- 5.2.6. No release of the locking systems shall occur during the tests described in paragraph 6.3 below and in Annex 9, paragraph 2.1 to this Regulation.

- 5.2.7. After the tests, the displacement systems intended for permitting or facilitating the access of occupants shall be in working order; they shall be capable, at least once, of being unlocked and shall permit the displacement of the seat or the part of the seat for which they are intended.

Any other displacement systems, as well as adjustment systems and their locking systems are not required to be in working order.

In the case of seats provided with head restraints, the strength of the seat-back and of its locking devices is deemed to meet the requirements set out in paragraph 6.2 when, after testing in accordance with paragraph 6.4.3.6 below, no breakage of the seat or seat-back has occurred: otherwise, it shall be shown that the seat is capable of meeting the test requirements set out in paragraph 6.2 below.

In the case of seats (benches) with more places to sit than head restraints and in case the manufacturer chooses not to apply 53 daNm during the test of paragraph 6.4, the seat back strength test of paragraph 6.2 has to be performed in addition to the test of paragraph 6.4.

- 5.3. General specifications applicable to seats of vehicles of categories N₁, N₂ and N₃ and to seats of vehicles of categories M₂ and M₃ not covered by Regulation No 80.

With the exception of the provisions of paragraph 5.1, the requirements also apply to side-facing seats of all categories of vehicles.

- 5.3.1. Seats and bench seats shall be firmly attached to the vehicle.
- 5.3.2. Sliding seats and bench seats shall be automatically lockable in all the positions provided.
- 5.3.3. Adjustable seat-backs shall be lockable in all the positions provided.
- 5.3.4. All seats which can be tipped forward or have fold-on backs and folding seats shall lock automatically in the position of use by occupants.

These requirements do not apply to folding seats fitted in wheelchair spaces or areas for standing passengers of vehicles of category M₂ or M₃ of Class I, II or A and folding seat(s) fitted in the access passages of vehicles of category M₂ or M₃.

- 5.4. Mounting of head restraints

- 5.4.1. A head restraint shall be mounted on every outboard front seat in every vehicle of category M₁. Seats fitted with head restraints, intended for fitment in other seating positions and in other categories of vehicles may also be approved to this Regulation.

- 5.4.2. A head restraint shall be mounted on every outboard front seat in every vehicle of category M₂ with a maximum mass not exceeding 3 500 kg and of category N₁; head restraints mounted in such vehicles shall comply with the requirements of Regulation No 25, as amended by 04 series of amendments.

- 5.5. Special requirements for seats fitted or capable of being fitted with head restraints

- 5.5.1. The presence of the head restraint shall not be an additional cause of danger to occupants of the vehicle. In particular, it shall not in any position of use exhibit any dangerous roughness or sharp edge liable to increase the risk or seriousness of injury to the occupants.

- 5.5.1.1. Parts of the front and rear faces of head restraints situated in area 1 as defined in paragraph 6.8.1.1.3 below, shall be so padded as to prevent any direct contact of the head with the components of the structure and shall meet the requirements of paragraph 5.2.4 above.

- 5.5.1.2. Parts of the front and rear faces of head restraints situated in area 2, as defined in paragraph 6.8.1.2 below, shall be so padded as to prevent any direct contact of the head with the components of the structure and shall meet the requirements of paragraph 5.2.4 above applicable to the rear parts of seats situated in area 2. In the case of head restraints integrated with the seat back, the front face of the head restraint is considered as the area located above a plane perpendicular to the reference line at 540 mm from the R point and between two vertical longitudinal planes at 85 mm on either side of the reference line.

- 5.5.2. Parts of the front and rear faces of the head restraints situated in area 1, as defined in paragraph 6.8.1.1.3 below shall pass the energy absorption test.

- 5.5.2.1. This requirement is deemed to be met if in the tests carried out by the procedure specified in Annex 6 the deceleration of the headform does not exceed 80 g continuously for more than 3 ms. Moreover, no dangerous edge shall occur during or remain after the test.

- 5.5.3. The requirements of paragraphs 5.5.1 and 5.5.2 above, shall not apply to rear parts of head restraints designed to be fitted to seats behind which no seat is provided.

- 5.5.4. The head restraints shall be secured to the seat or to the vehicle structure in such a way that no rigid and dangerous parts project from the padding of the head restraint or from its attachments to the seat-back as a result of the pressure exerted by the headform during the test.

- 5.5.5. In the case of a seat fitted with head restraints, the provisions of paragraph 5.2.3 may, after agreement of the Technical Service, be considered to be met if the seat fitted with its head restraint complies with the provisions of paragraph 5.5.2 above.
- 5.6. Height of head restraints
- 5.6.1. The height of head restraints shall be measured as described in paragraph 6.5 below.
- 5.6.2. For head restraints not adjustable for height, the height shall be not less than 800 mm in the case of front seats and 750 mm in the case of other seats.
- 5.6.3. For head restraints adjustable for height:
- 5.6.3.1. The height shall be not less than 800 mm in the case of front seats and 750 mm in the case of other seats; this value shall be obtained in a position between the highest and lowest positions to which adjustment is possible;
- 5.6.3.2. There shall be no 'use position' resulting in a height of less than 750 mm;
- 5.6.3.3. In the case of seats other than the front seats the head restraints may be such that they can be displaced to a position resulting in a height of less than 750 mm, provided that such position is clearly recognisable to the occupant as not being included for the use of the head restraint;
- 5.6.3.4. In the case of front seats head restraints may be such that they can be automatically displaced when the seat is not occupied, to a position resulting in a height of less than 750 mm, provided that they automatically return to the position of use when the seat is occupied.
- 5.6.4. The dimensions mentioned in paragraphs 5.6.2 and 5.6.3.1 above may be less than 800 mm in the case of front seats and 750 mm in the case of other seats to leave adequate clearance between the head restraint and the interior surface of the roof, the windows or any part of the vehicle structure; however, the clearance shall not exceed 25 mm. In the case of seats fitted with displacement and/or adjustment systems, this shall apply to all seat positions. Furthermore, by derogation to paragraph 5.6.3.2 above, there shall not be any 'use position' resulting in a height lower than 700 mm.
- 5.6.5. By derogation to the height requirements mentioned in paragraphs 5.6.2 and 5.6.3.1 above, the height of any head restraint designed to be provided in rear centre seats or seating positions shall be not less than 700 mm.
- 5.7. In the case of a seat capable of being fitted with a head restraint, the provisions of paragraphs 5.2.3 and 5.5.2 above shall be verified.
- 5.7.1. The height of the part of the device on which the head rests, measured as described in paragraph 6.5 below, shall in the case of a head restraint adjustable for height be not less than 100 mm.
- 5.8. There shall be no gap of more than 60 mm between the seat-back and the head restraint in the case of a device not adjustable for height. If the head restraint is adjustable for height it shall, in its lowest position, be not more than 25 mm from the top of the seat-back. In the case of seats or bench seats adjustable in height provided with separate head restraints, this requirement shall be verified for all the positions of the seat or bench seat.
- 5.9. In the case of head restraints integral with the seat-back, the area to be considered is:
- Above a plane perpendicular to the reference line at 540 mm from the R point.
- Between two vertical longitudinal planes passing at 85 mm on either side of the reference line. In this area, one or more gaps which regardless of their shape can show a distance 'a' of more than 60 mm when measured as described in paragraph 6.7 below, are permitted provided that, after the additional test under paragraph 6.4.3.3.2 below, the requirements of paragraph 5.12 below are still met.
- 5.10. In the case of head restraints adjustable for height one or more gaps, which regardless of their shape can show a distance 'a' of more than 60 mm when measured as described in paragraph 6.7 below, are permitted on the part of the device serving as a head restraint provided that, after the additional test under paragraph 6.4.3.3.2 below, the requirements of paragraph 5.12 below are still met.

- 5.11. The width of the head restraint shall be such as to provide appropriate support for the head of a person normally seated. As determined according to the procedure described in paragraph 6.6 below, the head restraint shall cover an area extending not less than 85 mm to each side of the vertical median plane of the seat for which the head restraint is intended.
- 5.12. The head restraint and its anchorage shall be such that the maximum backward displacement X of the head permitted by the head restraint and measured in conformity with the static procedure laid down in paragraph 6.4.3 below, is less than 102 mm.
- 5.13. The head restraint and its anchorage shall be strong enough to bear without breakage the load specified in paragraph 6.4.3.6 below. In the case of head restraints integral with the seat-back, the requirements of this paragraph shall apply to the part of the seat-back structure situated above a plane perpendicular to the reference line at 540 mm from the R point.
- 5.14. If the head restraint is adjustable, it shall not be possible to raise it beyond the maximum operational height except by deliberate action on the part of the user distinct from any act necessary for its adjustment.
- 5.15. The strength of the seat-back and of its locking devices is deemed to meet the requirements set out in paragraph 6.2 below when, after testing in accordance with paragraph 6.4.3.6 below, no breakage of the seat or seat-back has occurred; otherwise, it shall be shown that the seat is capable of meeting the test requirements set out in paragraph 6.2 below.
- 5.16. Special requirements regarding the protection of occupants from displaced luggage
- 5.16.1. Seat-backs

Seat-backs and/or head restraints located such that they constitute the forward boundary of the luggage compartment, all seats being in place and in the normal position of use as indicated by the manufacturer, shall have sufficient strength to protect the occupants from displaced luggage in a frontal impact. This requirement is deemed to be met if, during and after the test described in Annex 9, the seat-backs remain in position, and the locking mechanisms remain in place. However, the deformation of the seat-backs and their fastenings during the test is permitted, provided that the forward contour of the parts of the tested seat-back and/or head restraints, that are harder than 50 Shore A, does not move forward of a transverse vertical plane which passes through:

- (a) A point of 150 mm forward of the R point of the seat in question, for the parts of the head restraint;
- (b) A point of 100 mm forward of the R point of the seat in question, for parts of the seat-back;

excluding the rebound phases of the test blocks.

For integrated head restraints, the limit between the head restraint and the seat-back is defined by the plane perpendicular to the reference line 540 mm from the R point.

All measurements shall be taken in the longitudinal median plane of the corresponding seat or seating position for each seating position constituting the forward boundary of the luggage compartment.

During the test described in Annex 9, the test blocks shall remain behind the seat-back(s) in question. In case of damage to a safety-belt retractor, it shall be verified that the retractor is locked as a result of the test or that it can be locked by a manual pull out of the strap.

5.16.2. Partitioning systems

At the request of the vehicle manufacturer, the test described in Annex 9 may be carried out with the partitioning systems in place, if these systems are fitted as standard equipment for the particular type of vehicle.

Partitioning systems, netting wire mesh located above the seat-backs in their normal position of use, shall be tested according to paragraph 2.2 of Annex 9.

This requirement is deemed to be met if, during the test, the partitioning systems remain in position. However, the deformation of the partitioning systems during the test is permitted, provided that the forward contour of the partitioning (including parts of the tested seat-back(s) and/or head restraint(s) that are harder than 50 Shore A) does not move forward of a transverse vertical plane which passes through:

- (a) A point of 150 mm forward of the R point of the seat in question, for parts of the head restraint;

- (b) A point of 100 mm forward of the R point of the seat in question, for parts of the seat-back and part of the partitioning system others than the head restraint.

For integrated head restraint, the limit between the head restraint and the seat-back is the one defined in paragraph 5.16.1.

All measurements shall be taken in the longitudinal median plane of the corresponding seat or seating position for each seating position constituting the forward boundary of the luggage compartment.

After the test, no sharp or rough edges likely to increase the danger or severity of injuries of the occupants shall be present. In case of damage to a safety-belt retractor, it shall be verified that the retractor is locked already or that it can be locked by a manual pull out of the strap.

- 5.16.3. The requirements mentioned in paragraphs 5.16.1. and 5.16.2. above shall not apply to luggage retention systems which are activated automatically in case of an impact. The manufacturer shall demonstrate to the satisfaction of the Technical Service that the protection offered by such systems is equivalent to that described in paragraphs 5.16.1. and 5.16.2.

6. TESTS

6.1. General specifications applicable to all tests

- 6.1.1. The seat-back, if adjustable, shall be locked in a position corresponding to a rearward inclination as close as possible to 25° from the vertical of the torso reference line of the manikin described in Annex 3, unless otherwise specified by the manufacturer.

- 6.1.2. When a seat, its locking mechanism and its installation are identical or symmetrical with respect to another seat on the vehicle, the Technical Service may test only one such seat.

- 6.1.3. In the case of seats with adjustable head restraints, the tests shall be conducted with the head restraints placed in the most unfavourable position (generally, the highest position) allowed by its adjusting system.

- 6.1.4. Folding seats shall be tested in the position of use by occupants.

6.2. Test of strength of the seat-back and its adjustment systems

- 6.2.1. A force producing a moment of 53 daNm in relation to the R 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. In the case of a bench seat, where part or all of the supporting frame (including that of the head restraints) is common to more than one seating position, the test shall be conducted simultaneously for all those seating positions.

6.3. Test of strength of the seat anchorage and the adjustment, locking and displacement systems.

- 6.3.1. A longitudinal horizontal deceleration or, at the choice of the applicant, acceleration of not less than 20 g shall be applied for 30 milliseconds in a direction to the whole shell of the vehicle imitating a frontal collision, in accordance with the requirements of Annex 7, paragraph 1. At the request of the manufacturer the test pulse described in Annex 9 — Appendix may be used alternatively.

- 6.3.2. A longitudinal deceleration or, at the choice of the applicant, acceleration in accordance with the requirements of paragraph 6.3.1 shall be applied imitating a rear collision.

- 6.3.3. The requirements of paragraphs 6.3.1 and 6.3.2 above shall be verified for all positions of the seat. In the case of seats fitted with an adjustable head restraint, the test shall be conducted with the head restraints placed in the most unfavourable position (generally the highest position) allowed by its adjusting system. During the test the seat shall be so positioned that no external factor shall prevent the release of the locking systems.

These conditions shall be considered to be met if the seat is tested after being adjusted in the following positions:

The longitudinal adjustment is fixed one notch or 10 mm rearward of the most forward normal driving position or position of use as indicated by the manufacturer (for seats with independent vertical adjustment, the cushion shall be placed in its highest position);

The longitudinal adjustment is fixed one notch or 10 mm forward of the most rearward normal driving position or position of use as indicated by the manufacturer (for seats with independent vertical adjustment, the cushion shall be placed in its lowest position), and, where appropriate, in accordance with the requirements of paragraph 6.3.4 below.

- 6.3.4. In cases where the arrangement of the locking systems is such that, in a seat position other than those defined in paragraph 6.3.3 above, the distribution of the forces on the locking devices and seat anchorages would be less favourable than with either configuration defined in paragraph 6.3.3 above, the tests shall be conducted for that less favourable seating position.
- 6.3.5. The test conditions of paragraph 6.3.1 above shall be considered to be satisfied if, at the request of the manufacturer, they are replaced by a collision test of the complete vehicle in running order against a rigid barrier as laid down in paragraph 2 of Annex 7 to this Regulation. In this case, the seat shall be adjusted for the least favourable conditions of distribution of stresses in the anchorage system as provided for in paragraphs 6.1.1, 6.3.3 and 6.3.4 above.
- 6.4. Test of the performance of the head restraint
 - 6.4.1. If the head restraint is adjustable, it shall be placed in the most unfavourable position (generally the highest position) allowed by its adjustment system.
 - 6.4.2. In the case of a bench seat, where part or all of the supporting frame (including that of the head restraints) is common to more than one seating position, the test shall be conducted simultaneously for all those seating positions.
 - 6.4.3. Test
 - 6.4.3.1. All lines, including the projections of the reference line, shall be drawn in the vertical median plane of the seat or seating position concerned (see Annex 5 to this Regulation).
 - 6.4.3.2. The displaced reference line is determined by applying to the part simulating the back of the manikin referred to in Annex 3 to this Regulation an initial force producing a rearward moment of 37,3 daNm about the R point. In the case of simultaneous testing of bench seats, the rearward moment shall be applied to all seating positions of the bench simultaneously, irrespective of this position being equipped with or without head restraint.
 - 6.4.3.3. By means of a spherical headform 165 mm in diameter an initial force producing a moment of 37,3 daNm about the R point is applied at right angles to the displaced reference line at a distance of 65 mm below the top of the head restraint, the reference line being kept in its displaced position in accordance with paragraph 6.4.3.2 above. In the case of simultaneous testing of bench seats, the force shall be applied to all head restraints as present on the bench seats simultaneously.
 - 6.4.3.3.1. If the presence of gaps prevents the application of the force prescribed in paragraph 6.4.3.3 above at 65 mm from the top of the head restraint, the distance may be reduced so that the axis of the force passes through the centre line of the frame element nearest to the gap.
 - 6.4.3.3.2. In the cases described in paragraphs 5.9 and 5.10 above, the test shall be repeated by applying to each gap, using a sphere of 165 mm in diameter, a force:

Passing through the centre of gravity of the smallest of the sections of the gap, along transversal planes parallel to the reference line, and

Reproducing a moment of 37,3 daNm about the R point.
 - 6.4.3.4. The tangent Y to the spherical headform, parallel to the displaced reference line, is determined.
 - 6.4.3.5. The distance X, provided for in paragraph 5.11 above, between the tangent Y and the displaced reference line is measured.
 - 6.4.3.6. To check the effectiveness of the head restraint, the initial load specified in paragraphs 6.4.3.3 and 6.4.3.3.2 is increased to 89 daN unless the breakage of the seat or seat-back occurs earlier. At the request of the manufacturer the load of paragraph 6.4.3.2 is increased simultaneously to 53 daNm for seating positions without head restraints only to allow simultaneous compliance with paragraphs 5.15 and 6.2.
 - 6.5. Determination of the height of the head restraint
 - 6.5.1. All lines, including the projection of the reference line, shall be drawn in the vertical median plane of the seat or seating position concerned, the intersection of such plane with the seat determining the contour of the head restraint and of the seat-back (see Figure 1 of Annex 4 to this Regulation).

- 6.5.2. The manikin described in Annex 3 to this Regulation shall be placed in a normal position on the seat.
- 6.5.3. The projection of the reference line of the manikin shown in Annex 3 to this Regulation is then, in the seat concerned, drawn in the plane specified in paragraph 6.4.3.1 above.
- The tangent S to the top of the head restraint is drawn perpendicular to the reference line.
- 6.5.4. The distance 'h' from the R point to the tangent S is the height to be taken into consideration in implementing the requirements of paragraph 5.6 above.
- 6.6. Determination of the width of the head restraint (see Figure 2 of Annex 4 to this Regulation)
- 6.6.1. The plane S1, perpendicular to the reference line and situated 65 mm below the tangent S defined in paragraph 6.5.3 above, determines a section in the head restraint bounded by the outline C.
- 6.6.2. The width of the head restraint to be taken into consideration in implementing the requirements of paragraph 5.11 above, is the distance 'L' measured in the plane S1 between the vertical longitudinal planes P and P'.
- 6.6.3. The width of the head restraint shall if necessary also be determined in the plane perpendicular to the reference line 635 mm above the R point of the seat, this distance being measured along the reference line.
- 6.7. Determination of distance 'a' of head restraint gaps, (see Annex 8 to this Regulation)
- 6.7.1. The distance 'a' shall be determined for each gap and in relation to the front face of the head restraint, by means of a sphere having a diameter of 165 mm.
- 6.7.2. The sphere shall be put into contact with the gap in a point of the gap area which allows the maximum sphere intrusion, considering no load is to be applied.
- 6.7.3. The distance between the two points of contact of the sphere with the gap will constitute the distance 'a' to be considered for the evaluation of the provisions under paragraphs 5.9 and 5.10 above.
- 6.8. Tests for checking energy dissipation on the seat-back and head restraint
- 6.8.1. The surfaces of the rear parts of seats to be checked are those situated in the areas defined below which can be contacted by a 165 mm diameter sphere when the seat is mounted in the vehicle.
- 6.8.1.1. Area 1
- 6.8.1.1.1. In the case of separate seats without head restraints, this area shall include the rear part of the seat-back between the longitudinal vertical planes situated at 100 mm on either side of the longitudinal median plane of the seat centre line, and above a plane perpendicular to the reference line 100 mm below the top of the seat-back.
- 6.8.1.1.2. In the case of bench seats without head restraints, this area shall extend between the longitudinal vertical planes situated at 100 mm on either side of the longitudinal median plane of each designated outboard seating position defined by the manufacturer and above a plane perpendicular to the reference line 100 mm below the top of the seat-back.
- 6.8.1.1.3. In the case of seats or bench seats with head restraints, this area shall extend between the longitudinal vertical planes, on either side of and 70 mm from the longitudinal median plane of the seat or of the seating position concerned and situated above the plane perpendicular to the reference line 635 mm from the R point. For the test, the head restraint, if adjustable shall be placed in the most unfavourable position (generally the highest) permitted by its adjustment system.
- 6.8.1.2. Area 2
- 6.8.1.2.1. In the case of seats or bench seats without head restraints and seats or bench seats with detachable or separate head restraints, area 2 shall extend above a plane perpendicular to the reference line 100 mm distant from the top of the seat-back, other than parts of area 1.

6.8.1.2.2. In the case of seats or bench seats with integrated head restraints, area 2 shall extend above a plane perpendicular to the reference line 440 mm distant from the R point of the seat or of the seating position concerned, other than parts of area 1.

6.8.1.3. Area 3

6.8.1.3.1. Area 3 is defined as the part of the back of the seat or the bench seats situated above the horizontal planes defined in paragraph 5.2.4.1.3 above, excluding parts situated in area 1 and area 2.

6.9. Equivalent test methods

If a test method other than those specified in paragraphs 6.2, 6.3, 6.4 above and Annex 6 is used, its equivalence shall be proved.

7. CONFORMITY OF PRODUCTION

The conformity of production procedures shall comply with those set out in the Agreement, (Schedule 1, E/ECE/TRANS/505/Rev.3), with the following requirements:

7.1. Every vehicle approved pursuant to this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements set out in paragraph 5 above. However, in the case of head restraints as defined in paragraph 2.12.2 and 2.12.3 above, nothing shall prevent the vehicle from conforming to the vehicle type approved, even if it is marketed with seats not fitted with head restraints.

7.2. The Type Approval Authority which granted type approval may at any time verify the conformity control methods applied for each production unit. The authority may also carry out random checks on serially-manufactured vehicles in respect to the requirements set out in paragraph 5 above.

8. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

8.1. The approval granted in respect of a vehicle type pursuant to this Regulation may be withdrawn if the requirements laid down in paragraph 7.1 above are not complied with or if the vehicles fail in the checks prescribed in paragraph 7 above.

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

9. MODIFICATIONS OF THE VEHICLE TYPE AND EXTENSION OF APPROVAL WITH RESPECT TO THE SEATS, THEIR ANCHORAGES AND/OR THEIR HEAD RESTRAINTS

9.1. Every modification of the vehicle type with respect to the seats, their anchorages and/or their head restraints shall be notified to the Type Approval Authority which approved the vehicle type. The Authority may then either:

9.1.1. Consider that the modifications made are unlikely to have an appreciable adverse effect, and that in any event the vehicle still complies with the requirements; or

9.1.2. Consider that the modifications are sufficiently unimportant for the results specified in paragraph 6.2, 6.3 and 6.4 above to be verified by calculations based on the approval test results; or

9.1.3. Require a further report from the Technical Service responsible for conducting the tests.

9.2. Confirmation or refusal of approval, specifying the modifications, shall be communicated to the Parties to the Agreement applying this Regulation by means of the procedure laid down in paragraph 4.3 above.

9.3. The Type Approval Authority issuing the extension of approval shall assign a series number for such an extension and inform thereof the other Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in Annex 1 to this Regulation.

10. PRODUCTION DEFINITELY DISCONTINUED

- 10.1. If the holder of the approval completely ceases to manufacture a device approved in accordance with this Regulation, he shall so inform the authority which granted the approval. Upon receiving the relevant communication that authority shall inform thereof the other Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in Annex 1 to this Regulation.

11. INSTRUCTION FOR USE

- 11.1. For seats fitted with adjustable head restraints, the manufacturers shall provide instructions on how to operate, adjust, lock and, where applicable, remove the head restraints.

12. NAMES AND ADDRESSES OF TECHNICAL SERVICES RESPONSIBLE FOR CONDUCTING APPROVAL TESTS AND OF TYPE APPROVAL AUTHORITIES

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

13. TRANSITIONAL PROVISIONS

- 13.1. As from the official date of entry into force of the 06 series of amendments, no Contracting Party applying this Regulation shall refuse to grant approvals under this Regulation as amended by the 06 series of amendments.
- 13.2. As from 1 October 1999, Contracting Parties applying this Regulation shall grant approvals only if the requirements of this Regulation, as amended by the 06 series of amendments, are satisfied.
- 13.3. As from 1 October 2001, Contracting Parties applying this Regulation may refuse to recognise approvals which were not granted in accordance with the 06 series of amendments to this Regulation.
- 13.4. As from the official date of entry into force of the 07 series of amendments, no Contracting Party applying this Regulation shall refuse to grant approvals under this Regulation as amended by the 07 series of amendments.
- 13.5. As from 24 months after the date of entry into force of the 07 series of amendments, Contracting Parties applying this Regulation shall grant approval only if the vehicle type to be approved complies with the requirements of this Regulation as amended by the 07 series of amendments.
- 13.6. As from 48 months after the date of entry into force of the 07 series of amendments, existing approvals to this Regulation shall cease to be valid, except in the case of vehicle types which comply with the requirements of this Regulation as amended by the 07 series of amendments.
- 13.7. As from the official date of entry into force of the 08 series of amendments, no Contracting Party applying this Regulation shall refuse to grant approvals under this Regulation as amended by the 08 series of amendments.
- 13.8. As from 24 months after the date of entry into force of the 08 series of amendments, Contracting Parties applying this Regulation shall grant approvals only if the requirements of this Regulation, as amended by the 08 series of amendments, are satisfied.
- 13.9. As from 36 months after the date of entry into force of the 08 series of amendments, Contracting Parties applying this Regulation may refuse to recognise approvals which were not granted in accordance with the 08 series of amendments to this Regulation.
- 13.10. Notwithstanding paragraphs 13.8 and 13.9, approvals of the vehicle categories which are not affected by the 08 series of amendments shall remain valid and Contracting Parties applying the Regulation shall continue to accept them.
- 13.11. As long as there are no requirements forbidding side-facing seats in their national requirements at the time of acceding to this Regulation, Contracting Parties may continue to allow the fitting of side-facing seats for the purpose of national approval and in this case these bus categories cannot be type approved under this Regulation.

- 13.12. As from the official date of entry into force of the 09 series of amendments, no Contracting Party applying this Regulation shall refuse to grant or refuse to accept type approvals under this Regulation as amended by the 09 series of amendments.
- 13.12.1. As from 1 September 2020, Contracting Parties applying this Regulation shall not be obliged to accept type approvals to the preceding series of amendments that were first issued on or after 1 September 2020.
- 13.12.2. Until 1 September 2022, Contracting Parties applying this Regulation shall accept type approvals to the preceding series of amendments that were first issued before 1 September 2020.
- 13.12.3. As from 1 September 2022, Contracting Parties applying this Regulation shall not be obliged to accept type approvals issued to the preceding series of amendments to this Regulation.
- 13.12.4. Notwithstanding paragraph 13.12.3, Contracting Parties applying this Regulation shall continue to accept type-approvals to the preceding series of amendments to this Regulation, for vehicles which are not affected by the changes introduced by the 09 series of amendments.
- 13.12.5. Contracting Parties applying this Regulation shall not refuse to grant type approvals according to any preceding series of amendments to this Regulation or extensions thereof.
-

ANNEX 1

COMMUNICATION

(maximum format: A4 (210 × 297 mm))



Issued by:

Name of administration

.....

.....

concerning ⁽²⁾: Approval granted

Approval extended

Approval refused

Approval withdrawn

Production definitively discontinued

of a vehicle type with regard to the strength of the seats and their anchorages, in the case either of seats fitted or capable of being fitted with head restraints or of seats not capable of being fitted with such devices and the characteristics of head restraints pursuant to Regulation No 17

Approval No Extension No

1. Trade name or mark of the motor vehicle
2. Vehicle type
3. Manufacturer's name and address
4. If applicable, name and address of the manufacturer's representative
5. Description of seats
6. Number of seats fitted or capable of being fitted with head restraints, adjustable or not adjustable
7. Description of the adjustment, displacement and locking systems of the seat or of its parts and a description of occupant protection system against displacement of luggage:
8. Description of seat anchorage:
9. Longitudinal position of the seats during the tests:
10. Type of device: deceleration/acceleration ⁽²⁾
11. Vehicle submitted for approval on:
12. Technical Service responsible for conducting approval tests:
13. Date of report issued by that Service:
14. Number of report issued by that Service:
15. Remarks
16. Approval is granted/extended/refused/withdrawn ⁽²⁾
17. Reason(s) of extension (if applicable)
18. Position of approval mark on the vehicle
19. Place:
20. Date:
21. Signature:

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

Drawings, diagrams and plans of the seats, their anchorage on the vehicle, the adjustment and displacement systems of the seats and their parts, and their locking devices;

Photographs of the seats, their anchorages, the adjustment and displacement systems of the seats and their parts, and their locking devices, and of additional occupant protection system against displacement of luggage.

Note: In the case of seats fitted with head restraints as defined in paragraphs 2.12.2 and 2.12.3 of this Regulation, the head restraint shall be shown on all drawings, diagrams and photographs.

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

⁽²⁾ Strike out which does not apply.

ANNEX 2

ARRANGEMENTS OF THE APPROVAL MARK

MODEL A

(see paragraphs 4.4, 4.4.1, 4.4.2 and 4.4.3 of this Regulation)

Vehicle with at least one seat fitted or capable of being fitted with a head restraint

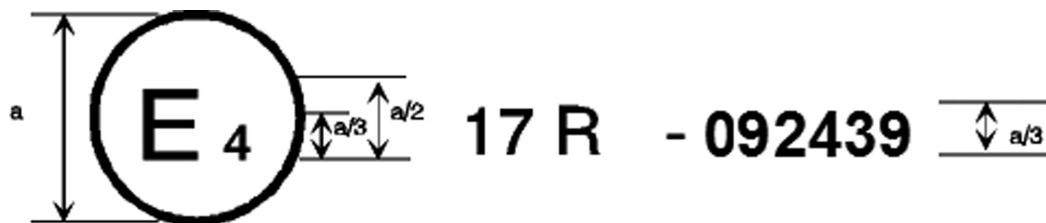
 $a = 8 \text{ mm min.}$

The above approval mark when affixed to a vehicle shows that the vehicle type concerned, with regard to the strength of the seats fitted or capable of being fitted with head restraints and with regard to characteristics of the head restraints, has been approved in the Netherlands (E 4) pursuant to Regulation No 17, under the approval number 092439. The first two digits of the approval number indicate that the Regulation already contained the 09 series of amendments at the time of approval. The above approval mark also shows that the vehicle type was approved pursuant to Regulation No 17 with regard to the strength of any seats on the vehicle which are not fitted or capable of being fitted with head restraints.

MODEL B

(see paragraphs 4.4; 4.4.1 and 4.4.2 of this Regulation)

Vehicle with seats not fitted or not capable of being fitted with head restraints

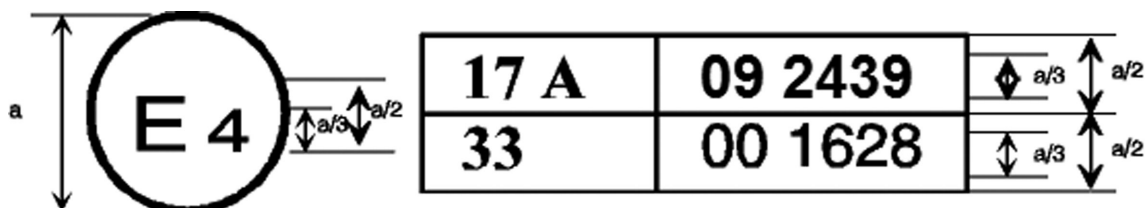
 $a = 8 \text{ mm min.}$

The above approval mark when affixed to a vehicle shows that the vehicle type has seats not fitted or capable of being fitted with head restraints, and has, with regard to the strength of the seats and their anchorages, been approved in the Netherlands (E 4) pursuant to Regulation No 17 under the approval number 092439. The first two digits of the approval number indicate that the Regulation already contained the 09 series of amendments at the time of approval.

MODEL C

(see paragraphs 4.5 of this Regulation)

Vehicle with at least one seat fitted or capable of being fitted with a head restraint

 $a = 8 \text{ mm min.}$

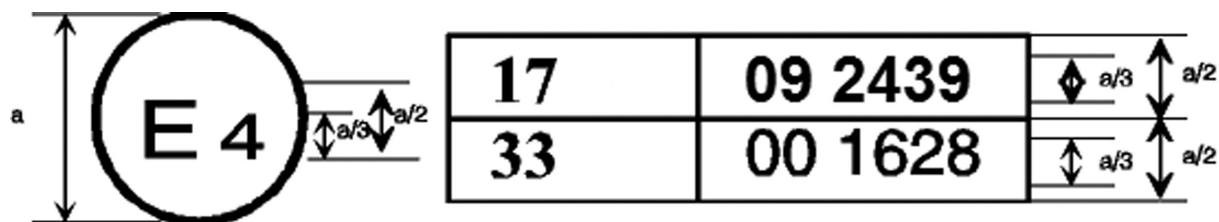
The above approval mark when affixed to a vehicle shows that the vehicle type has at least one seat fitted or capable of being fitted with a head restraint, and was approved in the Netherlands (E 4) pursuant to Regulations Nos 17 and 33 ⁽¹⁾.

The approval numbers indicate that, on the dates when approval was granted, Regulation No 17 included the 09 series of amendments but UN Regulation No 33 was still in its original form. The above approval mark also shows that the vehicle type was approved pursuant to Regulation No 17 with regard to the strength of any seats on the vehicle which are not fitted or capable of being fitted with head restraints.

MODEL D

(see paragraphs 4.5 of this Regulation)

Vehicle with seats not fitted or not capable of being fitted with head restraints



$a = 8 \text{ mm min.}$

The above approval mark when affixed to a vehicle shows that the vehicle type has seats not fitted or capable of being fitted with head restraints, and was approved in the Netherlands (E 4) pursuant to Regulations Nos 17 and 33 ⁽¹⁾. The approval numbers indicate that, on the dates when approval was granted, Regulation No 17 included the 09 series of amendments but UN Regulation No 33 was still in its original form.

⁽¹⁾ The second number is given merely as an example.

ANNEX 3

PROCEDURE FOR DETERMINING THE 'H' POINT AND THE ACTUAL TORSO ANGLE FOR SEATING POSITIONS IN MOTOR VEHICLES ⁽¹⁾

Appendix 1 — Description of the three dimensional 'H' point machine ⁽¹⁾

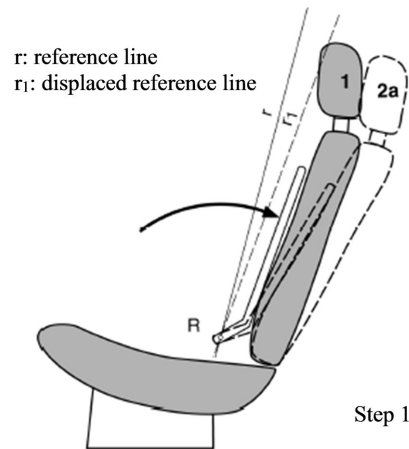
Appendix 2 — Three-dimensional reference system ⁽¹⁾

Appendix 3 — Reference data concerning seating positions ⁽¹⁾

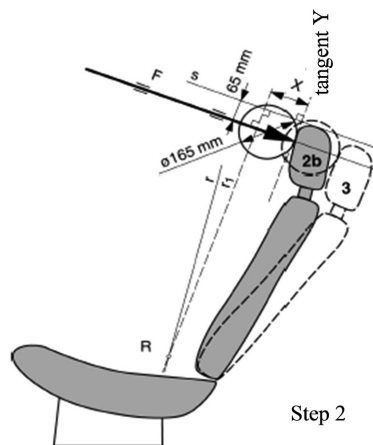
⁽¹⁾ The procedure is described in Annex 1 and its Appendices 1, 2 and 3 to the Consolidated Resolution on the Construction of Vehicles (R.E.3) (document ECE/TRANS/WP.29/78/Rev.6 — <http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html>)

ANNEX 5

DETAILS OF LINES AND MEASUREMENTS TAKEN DURING TESTS



1. Original unloaded position.
- 2a. Displaced position by applying to the manikin's back a moment of 373 Nm about the R point, defining the position of the displaced reference line r_1 .
- 2b. Displaced position by applying to the 165 mm sphere a force F producing a moment of 373 Nm about the R point, keeping the displaced reference line r_1 in place.
3. Position after displacement by the force F increased to 890 N.



ANNEX 6

TEST PROCEDURE FOR CHECKING ENERGY DISSIPATION**1. INSTALLATION, TEST APPARATUS, RECORDING INSTRUMENTS AND PROCEDURE****1.1. Setting up**

The seat, as mounted in the vehicle, shall be firmly secured to the test bench with the attachment parts provided by the manufacturer, so as to remain stationary when the impact is applied.

The seat-back, if adjustable, shall be locked in the position specified in paragraph 6.1.1 of this Regulation.

If the seat is fitted with a head restraint, the head restraint shall be mounted on the seat-back as in the vehicle. Where the head restraint is separate, it shall be secured to the part of the vehicle structure to which it is normally attached.

If the head restraint is adjustable, it shall be placed in the most unfavourable position allowed by its adjusting systems.

1.2. Test apparatus

1.2.1. This apparatus consists of a pendulum whose pivot is supported by ball-bearings and whose reduced mass (*) at its centre of percussion is 6,8 kg. The lower extremity of the pendulum consists of a rigid headform 165 mm in diameter whose centre is identical with the centre of percussion of the pendulum.

1.2.2. The headform shall be fitted with two accelerometers and a speed-measuring device, all capable of measuring values in the direction of impact.

1.3. Recording instruments

The recording instruments used shall be such that measurements can be made with the following degrees of accuracy:

1.3.1. Acceleration:

Accuracy = $\pm 5\%$ of the actual value;

Frequency class of data channel: class 600 corresponding to ISO Standard 6487 (1980);

Cross-axis sensitivity = $< 5\%$ of the lowest point on the scale.

1.3.2. Speed:

Accuracy: $\pm 2,5\%$ of the actual value;

Sensitivity: 0,5 km/h.

1.3.3. Time recording:

The instrumentation shall enable the action to be recorded throughout its duration and readings to be made to within one one-thousandth of a second;

The beginning of the impact at the moment of first contact between the headform and the item being tested shall be detected on the recordings used for analysing the test.

1.4. Test procedure**1.4.1. Tests on the seat-back**

With the seat installed as indicated in paragraph 1.1 of this annex, the direction of impact from the rear towards the front shall be situated in a longitudinal plane at an angle of 45° from the vertical.

The impact points shall be selected by the test laboratory in area 1 as defined in paragraph 6.8.1.1 of this Regulation, or if necessary in area 2 as defined in paragraph 6.8.1.2 of this Regulation, on surfaces exhibiting radii of curvature less than 5 mm.

(*) The relationship of the reduced mass 'mr' of the pendulum to the total mass 'm' of the pendulum at a distance 'a' between the centre of percussion and the axis of rotation and at a distance 'l' between the centre of gravity and the axis of rotation is given by the formula:

$$m_r = m \frac{l}{a}$$

1.4.2. Tests on the head restraint

The head restraint shall be fitted and adjusted as indicated in paragraph 1.1 of this annex. Impacts shall be performed on points selected by the test laboratory in area 1 as defined in paragraph 6.8.1.1 of this Regulation, and possibly in area 2 as defined in paragraph 6.8.1.2 of this Regulation, on surfaces exhibiting radii of curvature less than 5 mm.

1.4.2.1. For the rear face, the direction of impact from the rear towards the front shall be in a longitudinal plane at an angle of 45° from the vertical.

1.4.2.2. For the front face, the direction of impact from the front towards the rear shall be horizontal in a longitudinal plane.

1.4.2.3. The front and rear zones are respectively bounded by the horizontal plane tangential to the top of the head restraint as determined in paragraph 6.5 of this Regulation.

1.4.3. The headform shall strike the test item at a speed of 24,1 km/h: this speed shall be achieved either by the mere energy of propulsion or by using an additional impelling device.

2. RESULTS

The deceleration rate shall be taken as the average of the readings on the two accelerometers.

3. Equivalent procedures (see paragraph 6.9 of this Regulation).

ANNEX 7

METHOD FOR TESTING THE STRENGTH OF SEAT ANCHORAGES AND THEIR ADJUSTMENT, LOCKING AND DISPLACEMENT SYSTEMS**1. TEST OF RESISTANCE TO INERTIA EFFECTS**

- 1.1. The seats to be tested shall be mounted on the vehicle body for which they are designed. This vehicle body shall be firmly anchored on a test trolley as prescribed in the following paragraphs.
- 1.2. The method used for anchoring the vehicle body on the test trolley shall not result in a reinforcement of the seat anchorages.
- 1.3. The seats and their parts shall be adjusted and locked as prescribed in paragraph 6.1.1 and in one of the positions described in paragraph 6.3.3 or 6.3.4 of this Regulation.
- 1.4. If the seats of a group do not present essential differences in the sense of paragraph 2.2 of this Regulation, the tests prescribed in paragraphs 6.3.1 and 6.3.2 of this Regulation may be carried out with one seat adjusted to its foremost position and the other seat adjusted to its rearmost position.
- 1.5. The trolley deceleration or acceleration is measured with data channels of frequency class (CFC) 60 corresponding to the characteristics of International Standard ISO 6487 (2002).

2. COLLISION TEST OF THE COMPLETE VEHICLE AGAINST A RIGID BARRIER

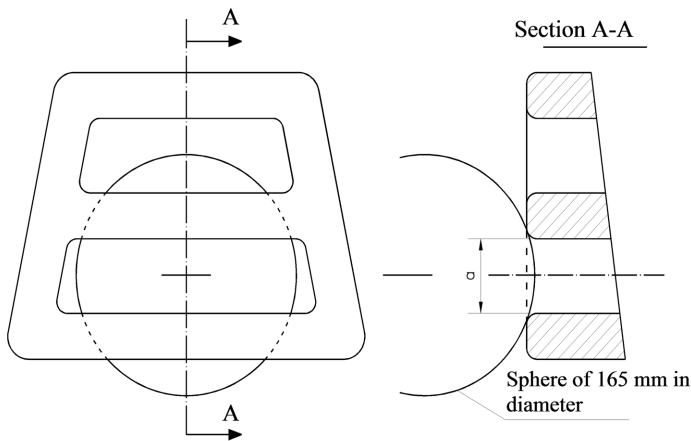
- 2.1. The barrier shall consist of a block of reinforced concrete of not less than 3 m width, not less than 1,5 m height and not less than 0,6 m thickness. The front face shall be perpendicular to the final part of the run-up track and shall be covered with plywood boards 19 V 1 mm thick. At least 90 tonnes of earth shall be compressed behind the block of reinforced concrete. The barrier of reinforced concrete and earth may be replaced by obstacles having the same front surface, provided that they give equivalent results.
 - 2.2. At the moment of impact the vehicle shall run free. It shall reach the obstacle on a course perpendicular to the collision wall; the maximum lateral misalignment allowed between the vertical median line of the front of the vehicle and the vertical median line of the collision wall shall be V 30 cm; at the moment of impact the vehicle shall no longer be subjected to the action of any additional steering or propelling device. The speed on impact shall be between 48,3 km/h and 53,1 km/h.
 - 2.3. The fuel feed system shall be filled to at least 90 per cent of its capacity with fuel or an equivalent liquid.
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ANNEX 8

DETERMINATION OF DIMENSION ‘A’ OF HEAD RESTRAINT GAPS

Figure 1

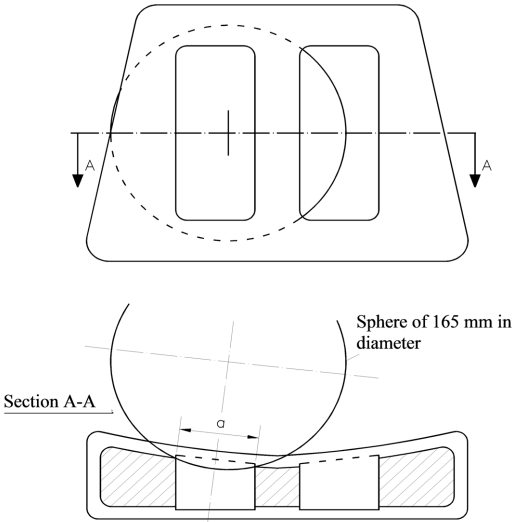
Example of horizontal gaps



Note: Section A-A is to be made in a point of the gap area which allows the maximum sphere intrusion, without exerting any load.

Figure 2

Example of vertical gaps



Note: Section A-A is to be made in a point of the gap area which allows the maximum sphere intrusion, without exerting any load.

ANNEX 9

TEST PROCEDURE FOR DEVICES INTENDED TO PROTECT THE OCCUPANTS AGAINST DISPLACEMENT OF LUGGAGE**1. TEST BLOCKS**

Rigid blocks, with the centre of inertia in the geometric centre.

Type 1

Dimensions: 300 mm × 300 mm × 300 mm

Mass: All edges and corners rounded to 20 mm
18 kg

Moment of inertia $0,3 \pm 0,05 \text{ kgm}^2$ (around all 3 principal axis of inertia of the luggage blocks)

Type 2

Dimensions: 500 mm × 350 mm × 125 mm

Mass: all edges and corners rounded to 20 mm
10 kg

2. TEST PREPARATION**2.1. Test of seat-backs (see Figure 1)****2.1.1. General requirements**

2.1.1.1. At the option of the car manufacturer, parts whose hardness is lower than 50 Shore A can be removed from the tested seat and head restraint for the tests.

2.1.1.2. Two type 1 test blocks shall be placed on the floor of the luggage compartment. In order to determine the location of the test blocks in the longitudinal direction, they shall first be positioned such that their front side contacts that part of the vehicle which constitutes the forward boundary of the luggage compartment and that their lower side rests on the floor of the luggage compartment. They shall then be moved backwards and parallel to the longitudinal median plane of the vehicle until their geometrical centre has traversed a horizontal distance of 200 mm. If the dimensions of the luggage compartment do not allow a distance of 200 mm and if the rear seats are horizontally adjustable, these seats shall be moved forward to the limit of the adjustment range intended for normal occupant use, or to the position resulting in a distance of 200 mm, whichever is less. In other cases, the test blocks shall be placed as far as possible behind the rear seats. The distance between the longitudinal median plane of the vehicle and the inward facing side of each test block shall be 25 mm to obtain a distance of 50 mm between both blocks.

2.1.1.3. During the test, the seats shall be adjusted to ensure that the locking system cannot be released by external factors. If applicable, the seats shall be adjusted as follows:

The longitudinal adjustment shall be secured one notch or 10 mm in front of the rearmost possible position of use specified by the manufacturer (for seats with independent vertical adjustment, the cushion shall be placed to its lowest possible position). The test shall be carried out with the seat-backs in their normal position of use.

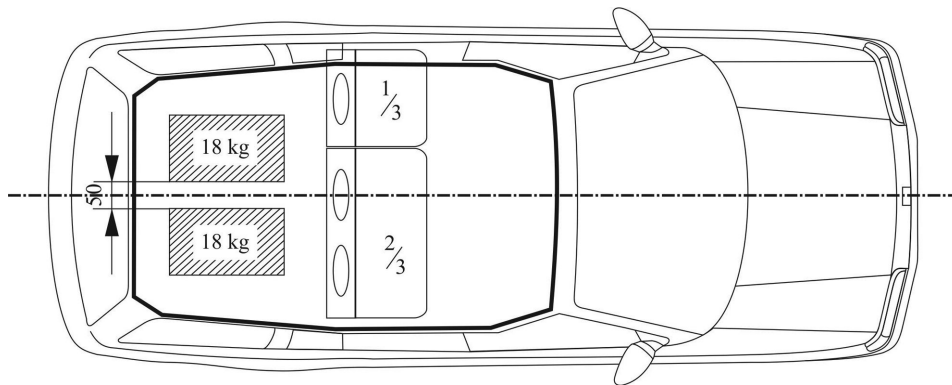
2.1.1.4. If the seat-back is fitted with a head restraint, the test shall be carried out with the head restraint placed in the highest position, if adjustable.

2.1.1.5. If the back(s) of the rear seat(s) can be folded down, they shall be secured in their upright normal position by the standard locking mechanism.

2.1.1.6. Seats behind which the type 1 blocks cannot be installed are exempted from this test.

2.1.1.7. All seating positions of the seat row under test shall be fitted with all components of its safety-belt providing the restraining function that are part of the seat.

Figure 1

Positions of test blocks before test of rear seat-backs**2.1.2. Vehicles with more than two rows of seats**

2.1.2.1. If the rearmost row of seats is removable and/or can be folded down by the user according to the manufacturer's instructions in order to increase the luggage compartment area, then the seat row immediately in front of this rearmost row shall also be tested.

2.1.2.2. However, in this case, the Technical Service, after consultation with the manufacturer, may decide not to test one of the two rearmost rows of seats if the seats and their attachments are of similar design and if the test requirement of 200 mm is respected.

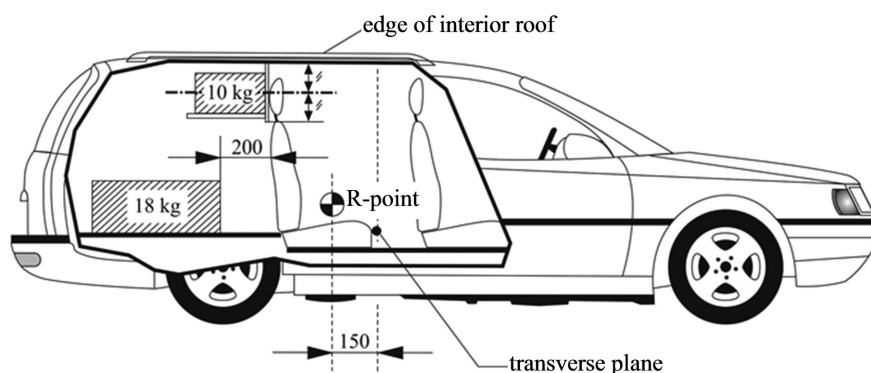
2.1.3. When there is a gap, allowing sliding of one type 1 block past the seats, then the test loads (two type 1 blocks) shall be installed behind the seats after agreement between the Technical Service and the manufacturer.

2.1.4. The exact test configuration shall be noted in the test report.

2.2. Test of partitioning systems

For the test of the partitioning systems above the seat-backs, the vehicle shall be fitted with a fixed raised test floor having a load surface that locates the centre of gravity of the test block centrally between the top edge of the bordering seat-back (without taking into account the head restraints) and the bottom edge of the roof lining. A type 2 test block is placed on the raised test floor with its largest surface 500×350 mm, centrally in relation to the longitudinal axis of the vehicle and with its surface 500×125 mm to the front. Partitioning systems behind which the type 2 test block cannot be installed are exempted from this test. The test block is placed directly in contact with the partitioning system. In addition, two type 1 test blocks are positioned in accordance with paragraph 2.1 in order to perform a simultaneous test on the seat-backs (see Figure 2).

Figure 2

Testing of a partitioning system above the backrest

2.2.1. If the seat-back is fitted with a head restraint, the test shall be carried out with the head restraint placed in the highest position, if adjustable.

3. DYNAMIC TESTING OF SEAT-BACKS AND PARTITIONING SYSTEMS USED AS LUGGAGE RESTRAINT SYSTEMS

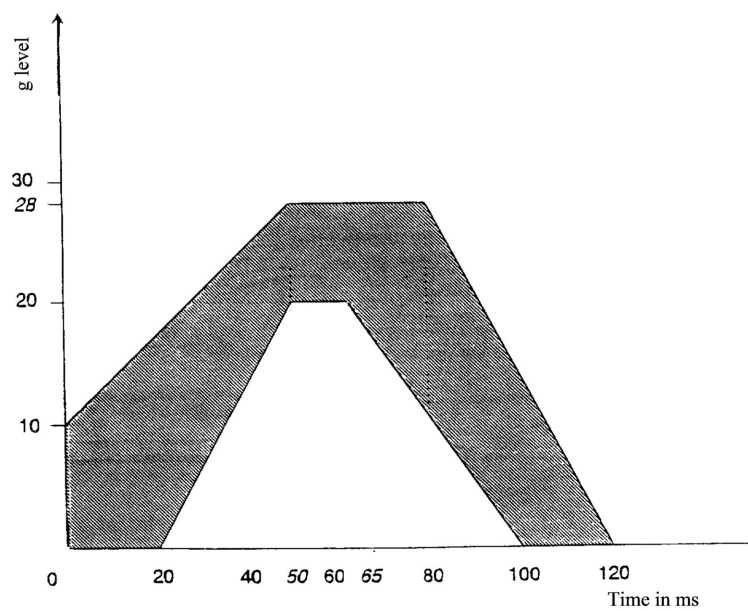
- 3.1. The body of the passenger car shall be anchored securely to a test sled, and this anchorage shall not act as reinforcement for seat-backs and the partitioning system. After the installation of the test blocks as described in paragraph 2.1 or 2.2, the passenger car body shall be decelerated or, at the choice of the applicant, accelerated such that the curve remains within the area of the graph in Annex 9, Appendix, and the total velocity change ΔV is $50 + 0/-2$ km/h. With the agreement of the manufacturer, the above described test pulse corridor can be used alternatively to fulfil the test of the seat strength according to paragraph 6.3.1 of this Regulation.
-

ANNEX 9

Appendix

Corridor of sled's deceleration or acceleration as a function of time

(Simulation of frontal impact)



Only the original UN/ECE texts have legal effect under international public law. The status and date of entry into force of this Regulation should be checked in the latest version of the UN/ECE status document TRANS/WP.29/343, available at:

<http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29fdocstts.html>

Regulation No 80 of the Economic Commission for Europe of the United Nations (UN/ECE) — Uniform provisions concerning the approval of seats of large passenger vehicles and of these vehicles with regard to the strength of the seats and their anchorages 2019/1724

Incorporating all valid text up to:

Supplement 3 to the 03 series of amendments — Date of entry into force: 10 February 2018

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ANNEXES

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1. SCOPE

1.1. This Regulation applies to:

- (a) Passenger seats for forward-facing installation in vehicles of categories M₂ and M₃, of Classes II, III and B ⁽¹⁾;
- (b) Vehicles of categories M₂ and M₃ of Classes II, III and B ⁽¹⁾ in respect of their passenger seat anchorages and seat installation.
- (c) It does not apply to rearward-facing seats or to any head restraint fitted to these seats.

1.2. At the request of the manufacturer, vehicles of category M₂ ⁽¹⁾ approved to Regulation No 17 shall be deemed to meet the requirements of this Regulation.

1.3. Vehicles where some seats benefit from the derogation provided in paragraph 7.4 to Regulation No 14 shall be approved to this Regulation.

1.4. The installation of side-facing seats shall be prohibited in vehicles of categories M₂ (of class II, III and B) and M₃ (of class II, III and B) with the exception of vehicles of category M₃ (of class II, III and B) of a technically permissible maximum laden mass exceeding 10 tonnes provided the requirements of paragraph 7.4 are met.

1.5. Paragraph 1.4 shall not apply to ambulances or to vehicles intended for use by the armed services, civil defence, fire services and forces responsible for maintaining public order.

2. DEFINITIONS

For the purposes of this Regulation:

2.1. 'Approval of a seat' means an approval of a seat type as a component in relation to the protection of the occupants of forward-facing seats with regard to their strength and the design of the seat backs;

2.2. 'Approval of a vehicle' means an approval of a vehicle type with regard to the strength of the parts of the vehicle structure to which seats are to be secured, and with regard to the installation of seats;

2.3. 'Seat type' means seats which do not differ essentially with respect to the following characteristics likely to affect their strength and their aggressiveness:

2.3.1. Structure, shape, dimensions and materials of the load bearing parts;

2.3.2. Types and dimensions of the seat back adjustment and locking system;

2.3.3. Dimensions, structure and materials of the attachments and supports (e.g. legs);

2.4. 'Vehicle type' means vehicles which do not differ essentially in respect of:

2.4.1. The constructional features relevant to this Regulation; and,

2.4.2. The type or types of type approved seat(s) fitted to the vehicle, if any.

2.5. 'Seat' means a structure likely to be anchored to the vehicle structure, including its trim and attachment fittings, intended to be used in a vehicle, and to seat one or more adult persons. Depending on its orientation, a seat is defined as follows:

2.5.1. 'Forward-facing seat' means a seat which can be used while the vehicle is in motion and which faces towards the front of the vehicle in such a manner that the vertical plane of symmetry of the seat forms an angle of less than +10° or -10° with the vertical plane of symmetry of the vehicle.

⁽¹⁾ As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.6, para. 2 — <http://www.unece.org/trans/main/wp29/wgs/wp29gen/wp29resolutions.html>

- 2.5.2. 'Rearward-facing seat' means a seat which can be used while the vehicle is in motion and which faces towards the rear of the vehicle in such a manner that the vertical plane of symmetry of the seat forms an angle of less than $+10^{\circ}$ or -10° with the vertical plane of symmetry of the vehicle.
- 2.5.3. 'Side-facing seat' means a seat which can be used whilst the vehicle is in motion and which faces towards the side of the vehicle in such a manner that the vertical plane of symmetry of the seat forms an angle of 90° ($\pm 10^{\circ}$) with the vertical plane of symmetry of the vehicle;
- 2.6. 'Individual seat' means a seat designed and constructed for the accommodation of one seated passenger;
- 2.7. 'Double seat' means a seat designed and constructed for the accommodation of two seated passengers side by side; two seats side by side and having no interconnection shall be regarded as two individual seats;
- 2.8. 'Row of seats' means a seat designed and constructed for the accommodation of three or more seated passengers side by side; several individual or double seats arranged side by side shall not be regarded as a row of seats;
- 2.9. 'Seat cushion' means the part of the seat which is arranged almost horizontally and designed to support a seated passenger;
- 2.10. 'Seat-back' means the part of the seat that is almost vertical, designed to support the passenger's back, shoulders and, possibly, his head;
- 2.11. 'Adjustment system' means the device by which the seat or its parts can be adjusted to a position suited to the seated occupant;
- 2.12. 'Displacement system' means a device enabling the seat or one of its parts to be displaced laterally or longitudinally without a fixed intermediate position of the seat or one of its parts, to facilitate access by passengers;
- 2.13. 'Locking system' means a device ensuring that the seat and its parts are maintained in the position of use;
- 2.14. 'Anchorage' means a part of the floor or of the body of a vehicle to which a seat may be fixed;
- 2.15. 'Attachment fittings' means bolts or other components used to attach the seat to the vehicle;
- 2.16. 'Trolley' means the test equipment made and used for dynamic reproduction of road accidents involving frontal collision;
- 2.17. 'Auxiliary seat' means a seat for the manikin mounted on the trolley to the rear of the seat to be tested. This seat shall be representative of the seat to be used in the vehicle behind the seat to be tested;
- 2.18. 'Reference plane' means the plane passing through the points of contact of the heels of the manikin, used for the determination of the H point and the actual angle of torso for the seating position of motor vehicles according to the prescriptions of Annex 4;
- 2.19. 'Reference height' means the height of the top of the seat above the reference plane;
- 2.20. 'Manikin', a manikin corresponding to the specifications for HYBRID II or III⁽²⁾ for forward-facing seats; or a manikin corresponding to the specifications for side impact dummy according to Regulation No 95, Annex 6 for side facing seats;
- 2.21. 'Reference zone', means the space between two vertical longitudinal planes, 400 mm apart and symmetrical with respect to the H-point, and defined by rotation from vertical to horizontal of the headform apparatus, described in Regulation No 21, Annex 1. The apparatus shall be positioned as described in that annex to Regulation No 21 and set to its maximum length of 840 mm and its minimum length of 736 mm for residual limitation of said space;

(²) The technical specifications and detailed drawings of HYBRID II and III, corresponding to the principal dimensions of the fiftieth percentile male of the United States of America, and the specifications for its adjustment for this test are deposited with the Secretary-General of the United Nations and may be consulted on request at the secretariat of the Economic Commission for Europe, Palais des Nations, Geneva, Switzerland.

- 2.22. '3-point belt' for the purposes of this Regulation also includes belts with more than three anchorage points;
- 2.23. 'Seat spacing' means, in the case of seats facing in the same direction, the distance between the front of a seat squab and the back of the seat squab of the seat preceding it, measured horizontally at the height of 620 mm above the floor.
3. APPLICATION FOR APPROVAL
- 3.1. The application for approval of a seat shall be submitted by the seat manufacturer or by his duly accredited representative.
- 3.2. The application for approval of the vehicle shall be submitted by the vehicle manufacturer or by his duly accredited representative.
- 3.3. The application for approval of a seat or a vehicle shall be accompanied by the following documents in triplicate and the following particulars:
- 3.3.1. For approval of a seat:
- 3.3.1.1. A detailed description of the seat, its attachment fittings and its adjustment, displacement and locking systems;
- 3.3.1.2. Drawings, on an appropriate scale and in sufficient detail, of the seat, its attachment fittings and adjustment, displacement and locking systems;
- 3.3.2. For approval of a vehicle:
- 3.3.2.1. A detailed description of the parts of the structure of the vehicle used as anchorages;
- 3.3.2.2. Drawings, on an appropriate scale and in sufficient detail, of the parts of the vehicle used as anchorages.
- 3.4. The following shall be submitted to the technical service responsible for the approval tests:
- 3.4.1. Two seats representative of the type to be approved, in the case of approval of a seat;
- 3.4.2. A part of the vehicle structure, in the case of approval of a vehicle.
4. APPROVAL
- 4.1. If the seat submitted for approval under this Regulation meets the relevant requirements of paragraph 5 below, approval of that seat type shall be granted.
- 4.2. If the vehicle submitted for approval under this Regulation meets the relevant requirements of paragraphs 6 and 7 below, approval of that vehicle type shall be granted.
- 4.3. An approval number shall be assigned to each type approved. Its first two digits (at present 03, corresponding to the 03 series of amendments) shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party shall not assign the same number to any other seat type or any other vehicle type.
- 4.4. Notice of approval or of extension or refusal of approval of a seat type and/or a vehicle type pursuant to this Regulation shall be communicated to the Parties to the 1958 Agreement applying this Regulation, by means of a form conforming to the model in Annex 1 and/or Annex 2 to this Regulation.
- 4.5. There shall be affixed, conspicuously and in a readily accessible place specified on the approval form, to every seat conforming to a seat type approved under this Regulation and to every vehicle conforming to a vehicle type approved under this Regulation an international approval mark consisting of:
- 4.5.1. A circle surrounding the letter 'E' followed by the distinguishing number of the country which has granted approval⁽³⁾;

⁽³⁾ The distinguishing numbers of the Contracting Parties to the 1958 Agreement are reproduced in Annex 3 to Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev. 6, Annex 3 — <http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html>

- 4.5.2. The number of this Regulation, followed by the letter R, a dash and the approval number, placed to the right of the circle prescribed in paragraph 4.5.1.
- 4.6. The approval mark shall be clearly legible and shall be indelible.
- 4.7. As the case may be, the approval mark shall be placed on the seat or seats or on, or close to, the data plate affixed to the vehicle by the manufacturer.
- 4.8. Examples of arrangements of approval marks are given in Annex 3.
5. REQUIREMENTS FOR SEATS
- 5.1. Each type of forward-facing seat shall be subject to the test requirements of either Appendix 1 (dynamic test) or Appendices 5 and 6 (static test) at the request of the manufacturer.
- 5.2. The tests which the seat type has passed shall be recorded in the communication form concerning the approval of a seat type and conforming to the model in Annex 1.
- 5.3. Every adjustment and displacement system provided shall incorporate a locking system, which shall operate automatically.
- 5.4. The adjustment and locking systems shall not be required to be in full working order after the test.
- 5.5. A head restraint shall be mounted on every outboard front seat in every vehicle of category M₂ with a maximum mass not exceeding 3 500 kg. This head restraint shall comply with the requirements of UN Regulation No 25, as amended by the 04 series of amendments.
6. REQUIREMENTS FOR SEAT ANCHORAGES OF A VEHICLE TYPE
- 6.1. The anchorages for the seats of the vehicle shall be capable of withstanding:
- 6.1.1. Either the test described in Appendix 2;
- 6.1.2. Or, if a seat is mounted on the part of the vehicle structure being tested, the tests prescribed in Appendix 1. The seat need not to be an approved seat provided that it satisfies the requirements of paragraph 3.2.1 of the abovementioned appendix.
- 6.2. Permanent deformation, including breakage, of an anchorage or of the surrounding area shall be permissible provided that the prescribed force has been sustained throughout the prescribed period.
- 6.3. When there is more than one type of anchorage on a vehicle, each variant shall be tested in order to obtain an approval for the vehicle.
- 6.4. One test may be used to approve simultaneously a seat and a vehicle.
- 6.5. In the case of vehicles of category M₃, seat anchorages shall be deemed to comply with the requirements of paragraphs 6.1 and 6.2 if the safety-belt anchorages of the corresponding seating positions are fitted directly to the seats to be installed and these belt anchorages comply with the requirements of Regulation No 14, if necessary with the derogation provided in paragraph 7.4.
7. REQUIREMENTS FOR INSTALLATION OF SEATS IN A VEHICLE TYPE
- 7.1. All forward-facing seats installed shall be approved to the requirements of paragraph 5 of this Regulation and subject to the following conditions:
- 7.1.1. The seat shall have a reference height of at least 1 m; and
- 7.1.2. The H-point of the seat immediately behind shall be less than 72 mm higher than the H-point of the seat in question or, if the seat behind has the H-point more than 72 mm higher, the seat in question shall be tested and approved for installation in such a position.
- 7.2. When approved to Appendix 1, Test 1 and 2 shall apply, except as follows:
- 7.2.1. Test 1 shall not apply where the rear of the seat cannot be struck by an unrestrained passenger (i.e. there is no forward or side-facing seat directly behind the seat to be tested).

7.2.2. Test 2 shall not apply:

7.2.2.1. If the rear of the seat cannot be struck by a restrained passenger; or

7.2.2.2. If the seat behind is a forward-facing seat fitted with a 3-point belt with anchorages that comply fully with Regulation No 14 (without derogation); or

7.2.2.3. If the seat fulfils the requirements of Appendix 6 to this Regulation.

7.3. When approved to Appendices 5 and 6, all tests shall apply, except as follows:

7.3.1. The test of Appendix 5 shall not apply if the rear of the seat cannot be struck by an unrestrained passenger (i.e. there is no forward or side-facing seat directly behind the seat to be tested).

7.3.2. The test of Appendix 6 shall not apply:

7.3.2.1. If the rear of the seat cannot be struck by a restrained passenger; or

7.3.2.2. If the seat behind is a forward-facing seat fitted with a 3-point belt with anchorages that comply fully with Regulation No 14 (without derogation).

7.4. The installation of side-facing seats shall be subject to the following conditions:

7.4.1. The seat shall have a reference height of at least 1 m;

7.4.2. The plane through the H-points of adjacent side-facing seats shall be parallel to the reference plane;

7.4.3. The horizontal distance between the H-point lines of two adjacent side facing seats shall not exceed 725 mm and shall not be less than 450 mm, measured horizontally between the vertical longitudinal planes passing through the centres of these seating positions, (see Appendix 7, Figure 1); and

7.4.4. The passengers in side-facing seats shall be safeguarded by a vehicle part (e.g. partition, wall or seat back of a forward-facing seat) forward of the foremost side-facing seat. This vehicle part shall meet the requirements of Appendix 7. It shall maintain its safeguard function during testing.

8. CONFORMITY OF PRODUCTION

The conformity of production procedures shall comply with those set out in the Agreement, Appendix 2 (E/ECE/324-E/ECE/TRANS/505/Rev.2), with the following requirements:

8.1. Seats and or vehicles approved to this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements set out in paragraphs 5, 6 and 7 above.

8.2. In order to verify that the requirements of paragraph 8.1 are met, suitable controls of the production shall be carried out. In this case, suitable controls mean checking the dimensions of the product as well as the existence of procedures for the effective control of the quality of products.

8.3. The competent authority which has granted the Type Approval may at any time verify the conformity control methods applicable to each production unit and carry out on samples any test deemed necessary among the tests carried out for the approval. The normal frequency of these verifications shall be once a year.

9. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

9.1. The approval granted in respect of a seat type and/or a vehicle type pursuant to this Regulation may be withdrawn if the requirements set forth above are not met.

9.2. If a Contracting Party to the Agreement applying this Regulation withdraws an approval it has previously granted, it shall forthwith so notify the other Contracting Parties applying this Regulation, by means of a communication form conforming to the model in Annex 1 and/or Annex 2 to this Regulation.

10. MODIFICATION AND EXTENSION OF APPROVAL OF THE SEAT TYPE AND/OR THE VEHICLE TYPE

10.1. Every modification of the seat type and/or the vehicle type shall be notified to the Type Approval Authority which approved the seat type and/or the vehicle type. The authority may then either:

10.1.1. Consider that the modifications made are unlikely to have an appreciable adverse effect and that in any case the seat and/or the vehicle still complies with the requirements; or

10.1.2. Require a further test report from the Technical Service responsible for conducting the tests.

10.2. Confirmation or refusal of approval, specifying the alterations shall be communicated by the procedure specified in paragraph 4.4 above to the Parties to the Agreement applying this Regulation.

10.3. The Type Approval Authority issuing the extension of approval shall assign a series number for such an extension and inform thereof the other Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in Annex 1 and/or Annex 2 to this Regulation.

11. PRODUCTION DEFINITELY DISCONTINUED

If the holder of the approval completely ceases to manufacture a vehicle type approved in accordance with this Regulation, he shall so inform the authority which granted the approval. Upon receiving the relevant communication that authority shall inform thereof the other Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in Annex 1 and or Annex 2 to this Regulation.

12. TRANSITIONAL PROVISIONS

12.1. As from the official date of entry into force of the 02 series of amendments, no Contracting Party applying this Regulation shall refuse to grant approvals under this Regulation as amended by the 02 series of amendments.

12.2. As from 1 November 2012 Contracting Parties applying this Regulation shall grant approvals only if the requirements of this Regulation, as amended by the 02 series of amendments, are satisfied.

12.3. As from 1 November 2014, approvals granted in conformity to this Regulation shall cease to be valid, except those granted in conformity with the requirements of this Regulation as amended by the 02 series of amendments.

12.4. As from 1 November 2014, Contracting Parties applying this Regulation may refuse first national or regional registration (first entry into service) of a vehicle which has not been type approved in conformity with the requirements of the 02 series of amendments to this Regulation.

12.5. Even after the date of entry into force of the 02 series of amendments, approvals of the components to the 01 series of amendments to this Regulation shall remain valid and Contracting Parties applying this Regulation shall continue to accept them and shall not refuse to grant extensions of approval to the 01 series of amendments to this Regulation.

12.6. As from the official date of entry into force of the 03 series of amendments, no Contracting Party applying this Regulation shall refuse to grant approvals under this Regulation as amended by the 03 series of amendments.

12.7. As from 24 months after the date of entry into force of the 03 series of amendments Contracting Parties applying this Regulation shall grant approvals for new vehicle types only if the requirements of this Regulation, as amended by the 03 series of amendments, are satisfied.

12.8. Starting 60 months after the entry into force of the 03 series of amendments to this Regulation, Contracting Parties applying this Regulation may refuse national or regional type approval and may refuse first national or regional registration (first entry into service) of a vehicle which does not meet the requirements of the 03 series of amendments to this Regulation.

12.9. Even after the date of entry into force of the 03 series of amendments, approvals of components to the 01 or 02 series of amendments to this Regulation shall remain valid and Contracting Parties applying this Regulation shall continue to accept them and shall not refuse to grant extensions of approval to the 01 or 02 series of amendments to this Regulation.

13. NAMES AND ADDRESSES OF TECHNICAL SERVICES RESPONSIBLE FOR CONDUCTING APPROVAL TESTS AND OF TYPE APPROVAL AUTHORITIES

The Parties to the 1958 Agreement applying this Regulation shall communicate to the United Nations Secretariat the names and addresses of the Technical Services responsible for conducting approval tests and of the Type Approval Authorities which grant approval and to which forms certifying approval or extension or refusal or withdrawal of approval, issued in other countries, are to be sent.

APPENDIX 1

Test procedures for seats according to paragraph 5 and/or anchorages according to paragraph 6.1.2 and/or the installation of side-facing seats according to paragraph 3 of Appendix 7

1. REQUIREMENTS

1.1. The tests are to determine:

1.1.1. If the seat occupant(s) is (are) correctly retained by the seat(s) in front of him (them) and/or by the use of a safety belt.

1.1.1.1. This requirement shall be considered satisfied if the forward movement of any part of the trunk and the head of the manikin does not pass beyond the transversal vertical plane situated at 1,6 m from the R point of the auxiliary seat;

1.1.2. If the seat occupant(s) is (are) not seriously injured.

1.1.2.1. This requirement shall be considered satisfied if the following biomechanical acceptability criteria for the instrumented manikin, determined in accordance with Appendix 4, are met; that is:

1.1.2.2. For a manikin in an auxiliary forward-facing seat the following biomechanical acceptability criteria have to be met:

1.1.2.2.1. The head injury criterion HIC is less than 500;

1.1.2.2.2. The thorax acceptability criterion (ThAC) is less than 30 g except for periods totalling less than 3 ms ($g = 9,81 \text{ m/s}^2$);

1.1.2.2.3. The femur acceptability criterion (FAC) is less than 10 kN and the value of 8 kN is not exceeded for periods totalling more than 20 ms;

1.1.2.3. For a manikin in an auxiliary side-facing seat the following biomechanical acceptability criteria have to be met:

1.1.2.3.1. The head injury criterion HIC is less than 500;

1.1.2.3.2. The thorax acceptability criteria:

(a) Rib Deflection Criterion (RDC) less than or equal to 42 mm;

(b) Soft Tissue Criterion (VC) less or equal to 1,0 m/sec;

1.1.2.3.3. The pelvis acceptability criterion:

Pubic Symphysis Peak Force (PSPF) less than or equal to 6 kN;

1.1.2.3.4. The abdomen acceptability criterion:

Abdominal Peak Force (APF) less than or equal to 2,5 kN internal force (equivalent to external force of 4,5 kN).

1.1.3. If the seat and the seat mountings are strong enough.

1.1.3.1. This requirement shall be considered satisfied if:

1.1.3.1.1. No part of the seat, the seat mountings or the accessories becomes completely detached during the test;

1.1.3.1.2. The seat remains firmly held, even if one or more anchorages are partly detached, and all the locking systems remain locked during the whole duration of the test;

1.1.3.1.3. After the test no structural part of the seat or accessories has any fracture or sharp or pointed edges or corners likely to cause any bodily injury.

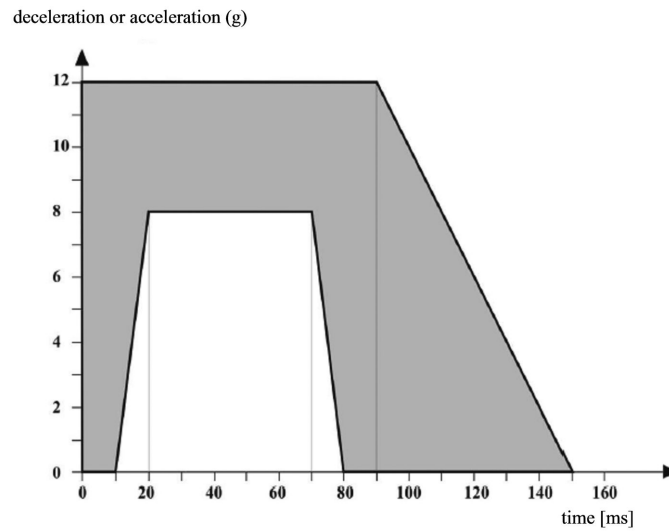
- 1.2. All fittings forming part of the back of the seat or accessories thereto shall be such as to be unlikely to cause any bodily injury to a passenger during impact. This requirement shall be considered satisfied if any part contactable by a sphere 165 mm in diameter presents a radius of curvature of at least 5 mm.
- 1.2.1. If any part of the fittings and accessories referred to above is made of a material of hardness less than 50 Shore A on a rigid backing, the requirements set out in paragraph 1.2 above shall apply only to the rigid backing.
- 1.2.2. The parts of the back of the seat such as adjustment devices for the seat and accessories shall not be subject to any requirements of paragraph 1.2 if in the position of rest they are situated below a horizontal plane 400 mm above the reference plane, even if the occupant might enter into contact with them.
2. PREPARATION OF THE SEAT TO BE TESTED
- 2.1. The seat to be tested shall be mounted:
 - 2.1.1. Either on a testing platform representative of the body of a vehicle,
 - 2.1.2. Or on a rigid testing platform.
- 2.2. The anchorage on the testing platform provided for the test seat(s) shall be identical to or have the same characteristics as that used in vehicle(s) in which the seat is intended to be used.
- 2.3. The seat to be tested shall be complete with all upholstery and accessories. If the seat is fitted with a table, it shall be in the stowed position.
- 2.4. If adjustable laterally, the seat shall be positioned for maximum extension.
- 2.5. If adjustable, the seat back shall be adjusted so that the resulting inclination of the torso of the manikin used for determining the H-point and the actual torso angle for seating positions in motor vehicles is as close as possible to that recommended by the manufacturer for normal use or, in the absence of any particular recommendation by the manufacturer, as near as possible to 25° towards the rear in relation to the vertical.
- 2.6. If the seat back is equipped with a head restraint adjustable for height, it shall be in its lowest position.
- 2.7. Safety-belts of an approved type, conforming to Regulation No 16 and mounted on anchorages installed according to Regulation No 14 (including, if appropriate, the derogation provided in paragraph 7.4 to that Regulation) shall be fitted to both the auxiliary seat and the seat to be tested.
3. DYNAMIC TESTS
- 3.1. Test 1

The testing platform shall be mounted on a trolley.
- 3.2. Auxiliary seat

The auxiliary seat may be of the same type as the seat being tested and shall be located parallel to and directly behind the seat being tested. The two seats shall be at the same height, adjusted identically and on a seat spacing of 750 mm.
- 3.2.1. If an auxiliary seat of a different type is used this shall be mentioned in the communication form concerning the approval of a seat type and in conformity to the model in Annex 1 to this Regulation.
- 3.3. Manikin
- 3.3.1. The manikin shall be placed unrestrained on the auxiliary seat so that its plane of symmetry corresponds to the plane of symmetry of the seating position in question.

- 3.3.2. Irrespective of the seating position of the dummy, the angle between the upper arm and the torso arm reference line on each side shall be $40^{\circ} \pm 5^{\circ}$. The torso arm reference line is defined as the intersection of the plane tangential to the front surface of the ribs and the longitudinal vertical plane of the dummy containing the arm. The legs shall be extended to the maximum and shall, if possible, be parallel; the heels shall touch the floor.
- 3.3.3. Each manikin required shall be installed on a seat in accordance with the following procedure:
 - 3.3.3.1. The manikin shall be placed on the seat as close as possible to the desired position,
 - 3.3.3.2. A flat rigid surface 76 mm × 76 mm in area shall be placed as low as possible against the front of the manikin's torso,
 - 3.3.3.3. The flat surface shall be pressed horizontally against the manikin's torso at a load of between 25 and 35 daN:
 - 3.3.3.3.1. The torso shall be drawn forward by the shoulders to the vertical position, then laid back against the seat back. This operation shall be performed twice;
 - 3.3.3.3.2. Without the torso moving, the head shall be placed in a position such that the platform supporting the measuring instruments contained in the head is horizontal and that the median sagittal plane of the head is parallel to that of the vehicle (for side-facing seats, the median sagittal plane of the head shall be parallel to the vertical median plane of the seat).
 - 3.3.3.4. The flat surface be carefully removed,
 - 3.3.3.5. The manikin shall be moved forward on the seat and the installation procedure described above repeated,
 - 3.3.3.6. If necessary, the position of the lower members shall be corrected,
 - 3.3.3.7. The measuring instruments installed shall not in any way affect the movement of the manikin during impact,
 - 3.3.3.8. The temperature of the system of measuring instruments shall be stabilised before the test and maintained so far as possible within a range between 19 °C and 26 °C.
- 3.4. Impact simulation
 - 3.4.1. The total velocity change of the trolley simulating the impact shall be between 30 and 32 km/h.
 - 3.4.2. The deceleration or, at the choice of the applicant, acceleration of the trolley during the impact simulation shall be in accordance with the provisions shown in the figure below. Except for intervals totalling less than 3 ms, the curve of the trolley's deceleration or acceleration as function of time shall remain between the limit curves shown in the figure.
 - 3.4.3. Furthermore, the average deceleration or acceleration shall be comprised between 6,5 and 8,5 g.
- 3.5. Test 2
 - 3.5.1. Test 1 shall be repeated with a manikin seated in the auxiliary seat: the manikin shall be restrained by a safety-belt fitted and adjusted in accordance with the manufacturer's instructions. The number of safety-belt anchorage points for the purpose of Test 2 shall be recorded in the communication form concerning the approval of a seat type and conforming to the model in Annex 1 to this Regulation.
 - 3.5.2. The auxiliary seat shall be either of the same type as the seat being tested or of a different type, the details of which shall be recorded in the communication form concerning the approval of a seat type and conforming to the model in Annex 1 to this Regulation.
 - 3.5.3. Test 2 may also be applied to vehicle parts other than a seat, as referred to in paragraph 8.1.7 of Regulation No 16 and paragraph 5.3.5 of Regulation No 14.

- 3.5.4. In the case where Test 2 is conducted with the manikin restrained by a 3-point belt and the injury criteria are not exceeded, the auxiliary seat shall be considered to have met the requirements relating to the static test loads and movement of the upper anchorage during the test specified in Regulation No 14 with regard to this installation.
- 3.5.5. Test 2 may also be applied to side-facing seats. In this case the auxiliary seat as mentioned in paragraph 3.2 shall be a side-facing seat and shall be located as specified in Appendix 7.



APPENDIX 2

Test procedure for the anchorages of a vehicle in application of paragraph 6.1.1

1. TEST APPARATUS

- 1.1. A rigid structure sufficiently representative of the seat intended for use on the vehicle is fixed by the means of fixation (bolts, screws, etc.) provided by the manufacturer to the parts of the structure submitted to the tests.
- 1.2. If several seat types differing from one another in respect of the distance between the front and back ends of their feet can be mounted on the same anchorage, the test shall be carried out with the shortest footing. This footing shall be described on the type approval certificate.

2. TEST PROCEDURE

2.1. A force F shall be applied.

- 2.1.1. At a height of 750 mm above the reference plane and on the vertical line containing the geometrical centre of the surface bounded by the polygon having the different anchorage points as apexes or, if applicable, the extreme anchorages of the seat, by the rigid structure as defined in paragraph 1.1 above;

2.1.2. In the horizontal direction and directed to the front of the vehicle;

2.1.3. In a delay as short as possible and for a duration of at least 0,2 s.

2.2. The force F shall be determined either

2.2.1. By the following formula: $F = (5\,000 \pm 50) \times i$ where:

F is given in N and i represents the number of seating positions of the seat for which the anchorages to be tested are to be approved; or, if requested by the manufacturer,

2.2.2. In accordance with the representative loads measured during dynamic tests as described in Appendix 1 to this Regulation.

APPENDIX 3

MEASUREMENTS TO BE MADE

1. All measurements necessary shall be made with measurement systems corresponding to the specifications of International Standard ISO 6487:1987 entitled 'Measurement techniques in impact tests: Instrumentation'.
2. Dynamic test
 - 2.1. Measurements to be made on the trolley

The characteristics of the deceleration or acceleration of the trolley shall be measured, from the decelerations or accelerations measured on the rigid frame of the trolley, with measurement systems with a CFC of 60.
 - 2.2. Measurements to be made on manikins

The readings of the measuring devices shall be recorded through independent data channels of the following CFC:

 - 2.2.1. Measurements in the head of the manikin

The resultant triaxial acceleration referring to the centre of gravity (γ_r) ⁽¹⁾ shall be measured with a CFC of 600.
 - 2.2.2. Measurements in the thorax of the manikin.

The resultant acceleration at the centre of gravity shall be measured with a CFC of 180. The deflection of the ribs and the Viscous Criterion (VC) shall be measured with a CFC of 180.
 - 2.2.3. Measurements in the femur of the manikin

The axial compression force shall be measured with a CFC of 600.
 - 2.2.4. Measurements in the abdomen of the manikin.

The abdominal forces shall be measured with a CFC of 600.
 - 2.2.5. Measurements in the pelvis of the manikin.

The pubic force shall be measured with a CFC of 600.

⁽¹⁾ Expressed in g (= 9,81 m/s²) the scalar value of which is calculated according to the following formula:

$$\gamma_r^2 = \gamma_l^2 + \gamma_v^2 + \gamma_t^2$$

where:

γ_l = value of instant longitudinal acceleration;

γ_v = value of instant vertical acceleration;

γ_t = value of instant transversal acceleration.

APPENDIX 4

DETERMINATION OF ACCEPTABILITY CRITERIA

1. Frontal impact (forward-facing seat)

1.1. Head injury criterion (HIC)

- 1.1.1. This injury criterion (HIC) is calculated on the basis of the resultant triaxial acceleration measured according to Appendix 3, paragraph 2.2.1 by the following expression:

$$HIC = (t_2 - t_1) \left[\frac{1}{t_2 - t_1} \int_{t_1}^{t_2} y_r dt \right]^{2,5}$$

in which t_1 and t_2 are any values of time during the test, HIC being maximum value for an interval t_1, t_2 . The values of t_1 and t_2 are expressed in seconds.

1.2. Thorax acceptability criterion (ThAC)

- 1.2.1. This criterion is determined by the absolute value of resultant acceleration, expressed in g and measured according to Appendix 3, paragraph 2.2.2, and by the acceleration period, expressed in ms.

1.3. Femur acceptability criterion (FAC)

This criterion is determined by the compression load expressed in kN, transmitted axially on each femur of the manikin and measured according to Appendix 3, paragraph 2.2.3, and by the duration of the compression load, expressed in ms.

2. Side impact (side-facing seat)

2.1. Head injury criterion (HIC) see above paragraph 1.1.

2.2. Thorax acceptability criterion

- 2.2.1. Chest deflection: the peak chest deflection is the maximum value of deflection on any rib as determined by the thorax displacement transducers.

2.2.2. Viscous criterion (VC):

The peak viscous response is the maximum value of VC on any rib which is calculated from the instantaneous product of the relative thorax compression related to the half thorax and the velocity of compression derived by differentiation of the compression. For the purposes of this calculation the standard width of the half thorax rib cage is 140 mm.

$$VC = \max \left[\frac{D}{0,14} \times \frac{dD}{dt} \right]$$

where D (metres) = rib deflection

The calculation algorithm to be used is set out in Regulation No 95, Annex 4, Appendix 2.

2.3. Abdomen acceptability criterion

The peak abdominal force is the maximum value of the sum of the three forces measured by transducers mounted 39 mm below the surface on the crash side.

2.4. Pelvis acceptability criterion

The pubic symphysis peak force (PSPF) is the maximum force measured by a load cell at the pubic symphysis of the pelvis.

APPENDIX 5

STATIC TEST REQUIREMENTS AND PROCEDURE

1. REQUIREMENTS

1.1. The requirements for seats tested according to this appendix are to determine:

1.1.1. If the seat occupants are correctly retained by the seats in front of them;

1.1.2. If the seat occupants are not seriously injured; and

1.1.3. If the seat and the seat mountings are strong enough.

1.2. The requirements of paragraph 1.1.1 above shall be considered satisfied if the maximum displacement of the central point of application of each force prescribed in paragraph 2.2.1 measured in the horizontal plane and in the longitudinal median plane of the relevant seating position does not exceed 400 mm.

1.3. The requirements of paragraph 1.1.2 above shall be considered satisfied if the following characteristics are met:

1.3.1. The maximum displacement of the central point of application of each of the forces prescribed in paragraph 2.2.1, measured as described in paragraph 1.2, is not less than 100 mm;

1.3.2. The maximum displacement of the central point of application of each of the forces prescribed in paragraph 2.2.2, measured as described in paragraph 1.2, is not less than 50 mm.

1.3.3. All fittings forming part of the back of the seat or accessories thereto shall be such as to be unlikely to cause any bodily injury to a passenger during impact. This requirement shall be considered satisfied if any part contactable by a sphere 165 mm in diameter presents a radius of curvature of at least 5 mm.

1.3.4. If any part of the fittings and accessories referred to above is made of a material of hardness less than 50 shore A on a rigid backing, the requirements set out in paragraph 1.3.3 above shall apply only to the rigid backing.

1.3.5. The parts of the back of the seat such as adjustment devices for the seat and accessories shall not be subject to any requirements of paragraph 1.3.3 if in the position of rest they are situated below a horizontal plane 400 mm above the reference plane, even if the occupant might enter into contact with them.

1.4. The requirements of paragraph 1.1.3 shall be considered satisfied if:

1.4.1. No part of the seat, the seat mountings or the accessories becomes completely detached during the test;

1.4.2. The seat remains firmly held, even if one or more anchorages is (are) partly detached, and all the locking systems remain locked during the whole duration of the test;

1.4.3. After the test no structural part of the seat or accessories has any fracture or sharp or pointed edges or corners likely to cause any bodily injury.

2. STATIC TESTS

2.1. Test apparatus

2.1.1. This consists of cylindrical surfaces with a radius of curvature equal to 82 ± 3 mm and a width:

2.1.1.1. At least equal to the width of the seat-back of each seating position of the seat to be tested for the upper form;

2.1.1.2. Equal to $320 - 0/+10$ mm for the lower form as shown in the figure of this appendix.

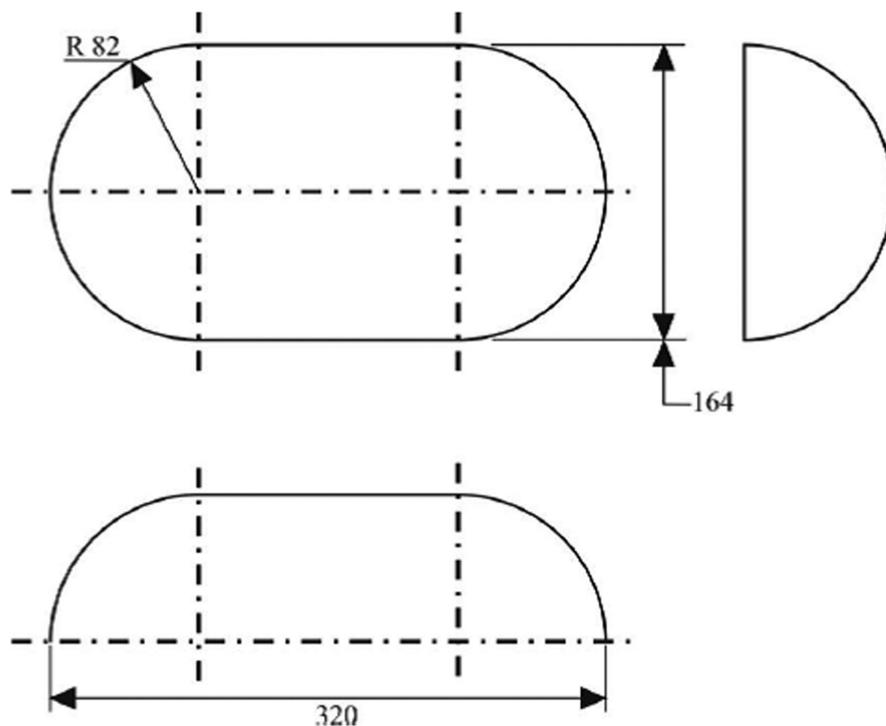
2.1.2. The surface resting against the parts of the seat shall be made of a material the hardness of which is not less than 80 Shore A.

2.1.3. Each cylindrical surface shall be equipped with at least one force transducer able to measure the forces applied in the direction defined in paragraph 2.2.1.1.

2.2. Test procedure

- 2.2.1. A test force to $\frac{1000}{H_1} \pm 50$ N shall be applied using a device, conforming to paragraph 2.1 above, to the rear part of the seat corresponding to each seating position of the seat.
- 2.2.1.1. The direction of application of the force shall be situated in the vertical median plane of the seating position concerned; it shall be horizontal and from the rear towards the front of the seat.
- 2.2.1.2. This direction shall be situated at the height H_1 which shall be between 0,70 m and 0,80 m and above the reference plane. The exact height shall be determined by the manufacturer.
- 2.2.2. A test force equal to $\frac{2000}{H_2} \pm 100$ N shall be applied simultaneously to the rear part of the seat corresponding to each seating position of the seat in the same vertical plane and in the same direction at the height H_2 which shall be between 0,45 and 0,55 m above the reference plane, with a device conforming to paragraph 2.1 above. The exact height shall be determined by the manufacturer.
- 2.2.3. The test form shall be maintained as far as possible in contact with the rear of the seat during the application of the forces specified in paragraphs 2.2.1 and 2.2.2 above. They shall be able to pivot in a horizontal plane.
- 2.2.4. Where a seat consists of more than one seating position, the forces corresponding to each seating position shall be applied simultaneously and there shall be as many upper and lower forms as seating positions.
- 2.2.5. The initial position of each seating position of each of the forms shall be determined by bringing the test devices into contact with the seat with a force equal to at least 20 N.
- 2.2.6. The forces indicated in paragraphs 2.2.1 and 2.2.2 above shall be applied as rapidly as possible and shall be maintained together at the specified value, whatever the deformation, for at least 0,2 seconds.
- 2.2.7. If the test has been carried out with one or more forces but not with all forces greater than those specified in paragraphs 2.2.1 and 2.2.2 above and if the seat complies with the requirements, the test shall be considered to be satisfied.

Static test apparatus



APPENDIX 6

ENERGY ABSORPTION CHARACTERISTICS OF THE REAR PART OF SEAT BACKS

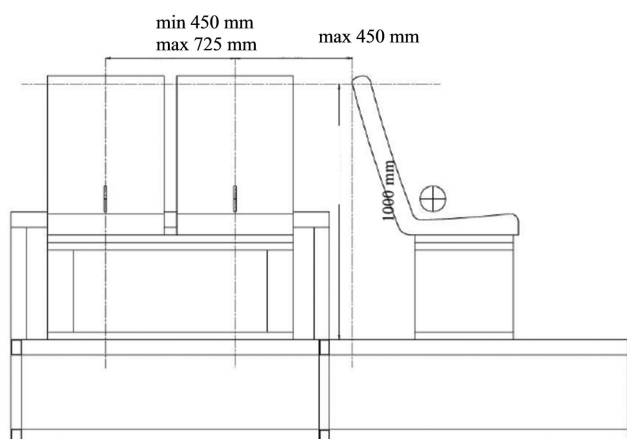
1. Elements of the rear part of seat backs situated in the reference zone, as defined in paragraph 2.21 of this Regulation, shall be verified at the request of the manufacturer according to the energy absorbing requirements set out in Annex 4, to Regulation No 21. For this purpose, all accessories fitted shall be tested in all positions of use, except tables which shall be considered in the stowed position.
 2. This test shall be referred to in the communication form concerning the approval of a seat type conforming to the model in Annex 1 to this Regulation. A drawing showing the area of the part of the seat back, verified by the energy dissipation test, shall be enclosed.
 3. This test may be applied to parts of a vehicle other than a seat (paragraph 3.5.3 of Appendix 1 and paragraph 2.3 of Appendix 7).
-

APPENDIX 7

Requirements for the safeguarding of passengers in side-facing seats according to paragraph 7.4.4

1. The distance between the foremost side-facing seat and the vehicle part forward of this foremost side-facing seat shall not exceed 450 mm. All measurements are to be taken 1 000 mm above the reference plane of the foremost side-facing seat (see Figure 1).

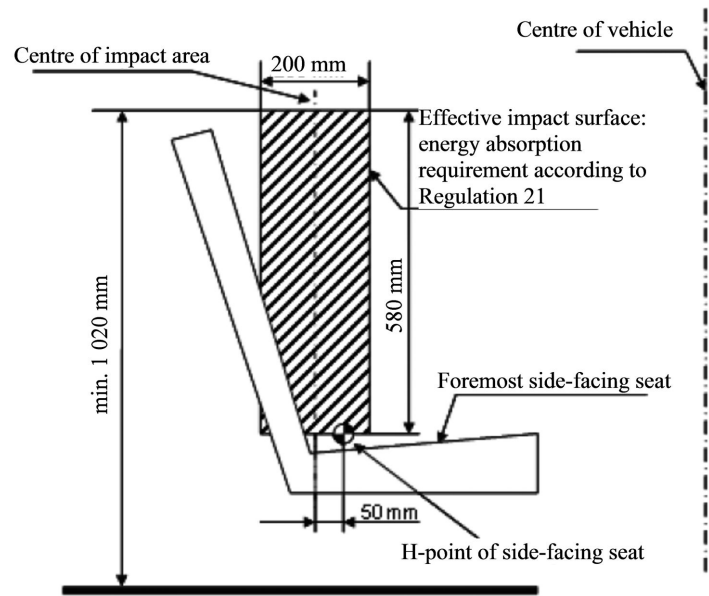
Figure 1

Positioning requirements for side-facing seats

2. The vehicle part (e.g. partition, wall or seat back of a forward facing seat) in front of the foremost side-facing seat shall fulfil the following requirements in order to safeguard the passenger in that foremost side-facing seat (see Figure 2):
 - 2.1. The height of the vehicle part, based on the reference plane of the foremost side-facing seat, must not be less than 1 020 mm; and
 - 2.2. The effective impact surface of the vehicle part has a width of 200 mm and a height of 580 mm. This surface shall be positioned so that the vertical centre-line is located 50 mm behind the H-point of the foremost side-facing seat; and
 - 2.3. The corresponding surface of the vehicle part in place projected onto a vertical plane through this H-point, shall cover at least 95 per cent of the effective impact surface. This vehicle part shall fulfil the energy absorption requirement by Appendix 6.
 - 2.3.1. If there is a gap in the corresponding surface (typically two forward-facing seats with a gap in between) a distance shall be determined for each gap by means of a sphere having a diameter of 165 mm. The sphere shall be put into contact with the gap in a point of the gap area which allows the maximum sphere intrusion, considering no load is to be applied. The distance between the two points of contact of the sphere must be less than 60 mm;
3. At the manufacturers' choice, a test according to Appendix 1 with the appropriate manikin for side-facing seats may be conducted.

Figure 2

Positioning requirements for the vehicle part forward of the foremost side-facing seat



ANNEX 1

COMMUNICATION

(maximum format: A4 (210 × 297 mm))



Issued by:

Name of administration

.....

.....

concerning ⁽²⁾: Approval granted
 Approval extended
 Approval refused
 Approval withdrawn
 Production definitively discontinued

of a seat type or types with regard to its (their) strength pursuant to Regulation No 80

Approval No Extension No

1. Trade name or mark of the seat:
2. Seat type:
3. Manufacturer's name and address:
4. If applicable, name and address of the manufacturer's representative:
5. Additional information:
- 5.1. Brief description of the seat type, its attachment fittings and its adjustment, displacement and locking systems including the minimum distance between fitting points:
- 5.2. Position and arrangement of seats:
- 5.3. Seats, if any, which incorporate a safety belt anchorage:
- 5.4. Energy absorption test of the rear part of the seat-back: yes/no ⁽²⁾
- 5.5. Drawings showing the area of the rear part of the seat-back verified for energy dissipation:
- 5.6. Seat approved in accordance with paragraph 5.1 of this Regulation (dynamic test): yes/no ⁽²⁾
 - 5.6.1. Test 1 according to Appendix 1: yes/no ⁽²⁾
 - 5.6.2. Test 2 according to Appendix 1: yes/no ⁽²⁾
 - 5.6.3. Description of the safety-belts and anchorages used for the purpose of test 2:
 - 5.6.4. Type of auxiliary seat used for test 2 (if different from the type of seat approved):
- 5.7. Seat approved in accordance with paragraph 5.1 of this Regulation (static test): yes/no ⁽²⁾
- 5.8. Test according to Appendix 5: yes/no ⁽²⁾
- 5.9. Test according to Appendix 6: yes/no ⁽²⁾
6. Seat submitted for approval on:
7. Type of device: deceleration/acceleration ⁽²⁾
8. Technical Service, responsible for the approval test:
9. Date of report issued by that Service:
10. Number of report issued by that Service:
11. Approval granted/refused/extended/withdrawn ⁽²⁾

12. Position of approval mark on the seat:
13. Place:
14. Date:
15. Signature:
16. The following documents, bearing the approval number shown above, are available on request:

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

(²) Strike out which does not apply.

ANNEX 2

COMMUNICATION

(maximum format: A4 (210 × 297 mm))



Issued by:

Name of administration

.....

.....

concerning ⁽²⁾: Approval granted
 Approval extended
 Approval refused
 Approval withdrawn
 Production definitively discontinued

of a type of a vehicle with regard to the strength of the seat anchorages pursuant to Regulation No 80

Approval No Extension No

1. Trade name or mark of the vehicle:
2. Vehicle type:
3. Manufacturer's name and address:
4. If applicable, name and address of the manufacturer's representative:
5. Additional information:
 - 5.1. Brief description of the vehicle type according to its anchorages and minimum value of the distance between the anchorages:
 - 5.2. Make and type of type approved seats (if any):
 - 5.3. For each row of seats: individual/bench, fixed/adjustable, fixed back/adjustable back, tipping back/inclining back ⁽²⁾
 - 5.4. Position and arrangement of seats (type approved seats and other seats):
 - 5.5. Seats, if any, which incorporate a safety belt anchorages:
6. Vehicle submitted for approval on:
7. Technical Service, responsible for the approval test:
8. Date of report issued by that Service:
9. Number of report issued by that Service:
10. Approval granted/refused/extended/withdrawn ⁽²⁾
11. Location of approval mark on the vehicle:
12. Place:
13. Date:
14. Signature:
15. The following documents, bearing the approval number shown above, are available on request:

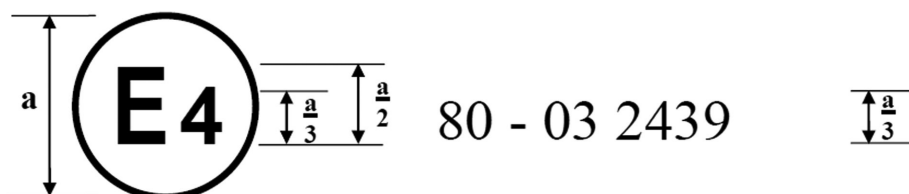
⁽¹⁾ Distinguishing number of the country which has granted, extended, refused or withdrawn approval (see approval provisions in the Regulation).

⁽²⁾ Strike out which does not apply.

ANNEX 3

ARRANGEMENTS OF APPROVAL MARKS

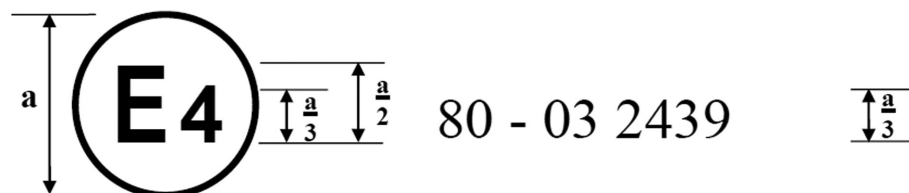
1. Arrangement in the approval mark for a seat



a = 8 mm min

The above approval mark affixed to a seat shows that the seat type concerned has, with regard to the strength of the seats, the test being carried out in accordance with paragraph 2 of Annex 4, been approved in the Netherlands (E4) under number 032439. The approval number indicates that the approval was granted in accordance with the requirements of Regulation No 80 as amended by the 03 series of amendments.

2. Arrangement in the approval mark for a vehicle type



a = 8 mm min

The above approval mark, affixed to a vehicle, shows that this type of vehicle has been approved in the Netherlands (E4) under number 032439 with regard to the strength of the anchorages on the vehicle. The approval number indicates that the approval was granted in accordance with the requirements of Regulation No 80 as amended by the 03 series of amendments.

ANNEX 4

Procedure for determining the 'H' point and the actual torso angle for seating position in motor vehicles ⁽¹⁾

Appendix 1 — Description of the three dimensional 'H' point machine (3-D H machine) ⁽¹⁾ ⁽²⁾

Appendix 2 — Three-dimensional reference system ⁽¹⁾

Appendix 3 — Reference data concerning seating positions ⁽¹⁾

⁽¹⁾ The procedure is described in Annex 1 to the Consolidated Resolution on the Construction of Vehicles (RE.3) (document ECE/TRANS/WP.29/78/Rev.2). www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html

⁽²⁾ For details of the construction of the 3 DH machine refer to Society of Automotive Engineers (SAE), 400 Commonwealth Drive, Warrendale, Pennsylvania 15096, United States of America. The machine corresponds to that described in ISO Standard 6549-1980.

