

## **Proposal for Supplement 6 to the 06 series of amendments to Regulation No. 16 (Safety-belt)**

The modifications to the existing text of the Regulation are marked in bold for new or strikethrough for deleted characters.

This informal document shows the amendments introduced in GRSP-56-14 as a consolidated version of the Regulation.

### **I. Proposal**

#### **2. Definitions**

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2.10. "*Child restraint*" means a safety device as defined in Regulation No. 44 or Regulation No. 129.

2.11. "*Rearward-facing*" means facing in the direction opposite to the normal direction of travel of the vehicle.

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2.29. "*ISOFIX*" is a system for the connection of child restraint systems to vehicles which has two vehicle rigid anchorages, two corresponding rigid attachments on the child restraint system, and a mean to limit the pitch rotation of the child restraint system.

2.30. "*ISOFIX child restraint system*" means a child restraint system, fulfilling the requirements of Regulation No. 44, which has to be attached to an ISOFIX anchorages system, fulfilling the requirements of Regulation No. 14.

2.31. "*ISOFIX position*" means a system which allows installing:

- (a) Either a universal ISOFIX forward facing child restraint system as defined in Regulation No. 44,
- (b) Or a semi-universal ISOFIX forward facing child restraint system as defined in Regulation No. 44,
- (c) Or a semi-universal ISOFIX rearward facing child restraint system as defined in Regulation No. 44,
- (d) Or a semi-universal ISOFIX lateral facing position child restraint system as defined in Regulation No. 44,
- (e) Or a specific vehicle ISOFIX child restraint system as defined in Regulation No. 44,
- (f) Or an i-Size child restraint system as defined in Regulation No. 129,
- (g) Or a specific vehicle ISOFIX child restraint system as defined in Regulation No. 129.

2.32. "*Universal booster seating position*" means a location in the vehicle which permits installation of a universal booster seat child restraint system and a universal booster cushion child restraint system, as defined in Regulation No. 129.

~~2.32.~~2.33. "*ISOFIX anchorages system*" means a system made up of two ISOFIX low anchorages, fulfilling the requirements of Regulation No. 14, and which is

designed for attaching an ISOFIX child restraint system in conjunction with an anti-rotation device.

- 2.33.34. "*ISOFIX low anchorage*" means one 6 mm diameter rigid round horizontal bar, extending from vehicle or seat structure to accept and restrain an ISOFIX child restraint system with ISOFIX attachments.
- 2.34.35. "*Anti-rotation device*"
- (a) An anti-rotation device for an ISOFIX universal child restraint system consists of the ISOFIX top-tether,
  - (b) An anti-rotation device for an ISOFIX semi-universal child restraint system consists of a top tether, the vehicle dashboard or a support leg intended to limit the rotation of the restraint during a frontal impact,
  - (c) An anti-rotation device for an i-Size child restraint system consists of either a top tether or a support leg, which is intended to limit the rotation of the restraint during a frontal impact,
  - (d) For ISOFIX, i-Size, universal and semi-universal, child restraint systems the vehicle seat itself does not constitute an anti-rotation device.
- 2.35.36. "*ISOFIX top tether anchorage*" means a feature, fulfilling the requirements of Regulation No. 14, such as a bar, located in a defined zone, designed to accept an ISOFIX top tether strap connector and transfer its restraint force to the vehicle structure.
- 2.36.37. A "*guidance device*" is intended to help the person installing the ISOFIX child restraint system by physically guiding the ISOFIX attachments on the ISOFIX child restraint into correct alignment with the ISOFIX low anchorages to facilitate engagement.
- 2.37.38. "*ISOFIX marking fixture*" means something that informs someone wishing to install an ISOFIX child restraint system of the ISOFIX positions in the vehicle and the position of each corresponding ISOFIX anchorages system.
- 2.38.39. "*Child restraint fixture*" (CRF) means a fixture according to one out of the eight ISOFIX size classes defined in paragraph 4. of Annex 17 – Appendix 2 to this Regulation, and particularly whose dimensions are given from Figure 1 to Figure 7 in the previous mentioned paragraph 4. Those child restraint fixtures (CRF) are used, in this Regulation, to check what are the ISOFIX child restraint systems size classes which can be accommodated on the vehicle ISOFIX positions. Also one of the CRF, the so-called ISO/F2 (B), which is described in Figure 2 of the previous mentioned paragraph 4., is used in Regulation No. 14 to check the location and the possibility of access to any ISOFIX anchorages system.
- 2.39.40. "*i-Size support leg installation assessment volume*" means a volume, which ensures the dimensional and geometrical compatibility between the support leg of an i-Size child restraint system and an i-Size seating position of a vehicle.
- 2.40.41. "*i-Size seating position*" means a seating position, if defined by the vehicle manufacturer, which is designed to accommodate an i-Size child restraint system, as defined in Regulation No. 129, and fulfils the requirements defined in this Regulation.

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## **8. Requirements concerning the installation in the vehicle**

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- 8.2. General requirements
- 8.2.1. Safety-belts, restraint systems, ISOFIX child restraint systems according to Table 2 of Annex 17 – Appendix 3, as well as i-Size child restraint systems according to Table 3 of Annex 17 – Appendix 3, shall be fixed to anchorages and in case of i-Size child restraint systems, supported by a vehicle floor contact surface, conforming to the specifications of Regulation No. 14, such as the design and dimensional characteristics, the number of anchorages, and the strength requirements.
- 8.2.2. The safety-belts, restraint systems and child restraint systems recommended by the manufacturer according to Tables 1 to 3 of Annex 17 – Appendix 3, shall be so installed that they will work satisfactorily and reduce the risk of bodily injury in the event of an accident. In particular, they shall be so installed that:
- 8.2.2.1. The straps are not liable to assume a dangerous configuration;
- 8.2.2.2. That the danger of a correctly positioned belt slipping from the shoulder of a wearer as a result of his/her forward movement is reduced to a minimum.
- 8.2.2.3. The risk of the strap deteriorating through contact with sharp parts of the vehicle or seat structure, and child restraint systems recommended by the manufacturer according to Tables 1 to 3 of Annex 17 – Appendix 3, is reduced to a minimum.
- 8.2.2.4. The design and installation of every safety-belt provided for each seating position shall be such as to be readily available for use. Furthermore, where the complete seat or the seat cushion and/or the seat back can be folded to permit access to rear of the vehicle or to goods or luggage compartment, after folding and restoring those seats to the seating position, the safety-belts provided for those seats shall be accessible for use or can be easily recovered from under or behind the seat, by one person, according to instructions in the vehicle users handbook, without the need for that person to have training or practice.
- 8.2.2.5. The Technical Service shall verify that, with the buckle tongue engaged in the buckle:
- 8.2.2.5.1. The possible slack in the belt does not prevent the correct installation of child restraint systems recommended by the manufacturer, and
- 8.2.2.5.2. In the case of three-point belts, a tension of at least 50 N can be established in the lap section of the belt by external application of tension in the diagonal section of the belt, when positioned:
- (a) On a 10-year manikin as specified in Annex 8, Appendix 1 to Regulation No. 44 and set in accordance with Annex 17, Appendix 4 to the present Regulation;
- (b) Or on the fixture specified in Annex 17, Appendix 1, Figure 1 of this Regulation for the seats that enable the installation of a child restraint device of universal category.
- ...
- 8.3.5. In order to inform the vehicle user(s) of the provisions made for the transport of children, vehicles of categories M<sub>1</sub>, M<sub>2</sub>, M<sub>3</sub> and N<sub>1</sub> shall meet the information requirements of Annex 17. Any vehicle of category M<sub>1</sub> shall be equipped with ISOFIX positions, in accordance with the relevant prescriptions of Regulation No. 14.
- The first ISOFIX position shall allow at least the installation of one out of the three forward-facing fixtures as defined in Appendix 2 of Annex 17; the second ISOFIX position shall allow at least the installation of one out of the three rear-facing fixtures as defined in Appendix 2 of Annex 17. For this second ISOFIX position, in case where the installation of the rear-facing

fixture is not possible on the second row of seats of the vehicle due to its design, the installation of one out of the six fixtures is allowed in any position of the vehicle.

- 8.3.6. Any i-Size seating position shall allow the installation of the ISOFIX child restraint fixtures "ISO/F2X" (B1), "ISO/R2" (D) and the support leg installation assessment volume as defined in Appendix 2 to Annex 17.

The support leg installation assessment volume is characterized as follows (see also Annex 17, Appendix 2, Figures 8 and 9, to this Regulation):

- (a) Lateral limitation:

By two planes parallel to and 100 mm apart from the median longitudinal plane of the child restraint fixture installed in the respective seating position;

- (b) Forward limitation:

By a plane perpendicular to the plane given by the child restraint fixture bottom surface and perpendicular to the median longitudinal plane of the child restraint fixture, 695 mm apart from the plane passing through the centerlines of the ISOFIX lower anchorages and being perpendicular to the CRF bottom surface;

- (c) Rearward limitation:

(i) Above the level of the bottom surface of the child restraint fixture by the front surface of the child restraint fixture, and

(ii) Below the level of the bottom surface of the child restraint fixture by a plane perpendicular to the plane given by the child restraint fixture bottom surface and perpendicular to the median longitudinal plane of the child restraint fixture, 585 mm apart from the plane passing through the centerlines of the ISOFIX lower anchorages and being perpendicular to the CRF bottom surface;

- (d) Height limitation:

(i) Above the level of the bottom surface of the child restraint fixture by a plane which is parallel to the child restraint bottom surface and 85 mm above this surface, and

(ii) Below the level of the bottom surface of the child restraint fixture by the upper surface of the vehicle floor (incl. trim, carpet, foam, etc.).

The pitch angle used for the geometrical assessment above shall be as measured in paragraph 5.2.3.4. of Regulation No. 14.

There shall be no interference between the support leg installation assessment volume and any vehicle part.

~~Compliance with this requirement can be proven by a physical test or computer simulation or representative drawings.~~

**Compliance with these installation requirements may be assessed by a physical test, computer simulation, representative drawings, or any other means deemed acceptable to the type approval authority.**

- 8.3.7. Any Universal booster seating position shall allow the installation of the universal booster child restraint fixtures as defined in Annex 17, Appendix 5 –ISO F4, without ISOFIX attachments (see detail B).

**Compliance with these installation requirements may be assessed by a physical test, computer simulation, representative drawings, or any other means deemed acceptable to the type approval authority.**

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## Annex 17

### **Requirements for the installation of safety-belts and restraint systems for adult occupants of power-driven vehicles on forward facing seats, for the installation of ISOFIX child restraint systems and i-size child restraint systems**

1. Compatibility with child restraint systems
  - 1.1. The vehicle manufacturer shall include in the vehicle handbook advice on the suitability of each passenger seating position for the carriage of children up to 12 years old (or up to 1.5 m tall), or the fitting of child restraint systems. This information shall be given in the national language, or at least one of the national languages, of the country in which the vehicle is offered for sale.
    - 1.1.1. For each forward-facing passenger seating position, and for each ISOFIX position, the vehicle manufacturer shall either:
      - (a) Indicate that the seating position is suitable for child restraints of the "universal" category (see paragraph 1.2.3. below);
      - (b) Indicate if the ISOFIX position is suitable for ISOFIX child restraint systems of the "universal" category (see paragraph 1.2.3. below);
      - (c) Provide a list of child restraint systems of the "semi-universal", "restricted" or "vehicle-specific" categories, suitable for that vehicle seating position, indicating the mass group(s) for which the restraints are intended;
      - (d) Provide a list of ISOFIX child restraint systems of the "semi-universal", "restricted" or "vehicle specific" categories, suitable for that vehicle ISOFIX position, indicating the mass group and the ISOFIX size class for which the ISOFIX child restraints are intended;
      - (e) Provide a built-in child restraint system, indicating the mass group(s) for which the restraint is intended and the corresponding configuration(s);
      - (f) Provide any combination of (a), (b), (c), (d), (e);
      - (g) Indicate the mass group(s) of the children which shall not be carried in that seating position.
    - 1.1.2. The vehicle manufacturer shall identify within the handbook each seating position which is also suitable for the accommodation of:
      - (a) **Any universal booster child restraint system (see paragraph 1.5 below);**
      - (b) any i-Size child restraint system (see paragraph 1.3.4. below); or
  - 1.2. If a seating position is only suitable for use with forward-facing child restraint systems, this shall be indicated.

Tables in a suitable format for the above information are given in Appendix 3 to this annex.
  - 1.2.3. A child restraint system or ISOFIX child restraint system, of the universal category means a child restraint approved to the "universal" category of Regulation No. 44, Supplement 5 to 03 series of amendments. Seating positions, or ISOFIX positions, which are indicated by the vehicle manufacturer as being suitable for the installation of child restraints systems or ISOFIX child restraints systems shall comply with the provisions of Appendix 1 or 2 to this annex. Where applicable any restriction on the simultaneous use on adjacent positions of ISOFIX child restraint systems and/or between ISOFIX-positions and adult

seating positions shall be reported in the relevant Table 2 of Appendix 3 to this annex.

- 1.3.4. An i-Size child restraint system means a child restraint system approved to the i-Size category of Regulation No. 129. Seating positions, which are indicated by the vehicle manufacturer as being suitable for the installation of i-Size child restraints systems shall comply with the provisions of Appendix 2 to this annex. Where applicable, any restriction on the simultaneous use on adjacent positions of ISOFIX child restraint systems or i-Size child restraint systems and/or between ISOFIX positions, i-Size positions and adult seating positions shall be reported in the relevant Table 2 of Appendix 3 to this annex.
- 1.5. Universal booster child restraint system means a child restraint system approved to the universal booster category of Regulation No. 129, (booster seats and booster cushions). Seating positions, which are indicated by the vehicle manufacturer as being suitable for the installation of universal booster child restraints systems shall comply with the provisions of Appendix 5 to this annex.

## Annex 17 - Appendix 1

### Provisions concerning the installation of "universal" category child restraint systems installed with the safety-belt equipment of the vehicle

1. General
  - 1.1. The test procedure and the requirements in this appendix shall be used to determine the suitability of seating positions for the installation of child restraints of the "universal" category.
  - 1.2. The tests may be carried out in the vehicle or in a representative part of the vehicle.
2. Test procedure
  - 2.1. Adjust the seat to its fully rearward and lowest position.
  - 2.2. Adjust the seat-back angle to the manufacturer's design position. In the absence of any specification, an angle of 25 degrees from the vertical, or the nearest fixed position of the seat-back, should be used.
  - 2.3. Set the shoulder anchorage to the lowest position.
  - 2.4. Place a cotton cloth on the seat-back and cushion.
  - 2.5. Place the fixture (as described in Figure 1 of this appendix) on the vehicle seat.
  - 2.6. If the seating position is intended to accommodate a forward-facing or rearward-facing universal restraint system, proceed according to paragraphs 2.6.1., 2.7., 2.8., 2.9. and 2.10. below. If the seating position is intended to accommodate only a forward-facing universal restraint system, proceed according to paragraphs 2.6.2., 2.7., 2.8., 2.9. and 2.10. below.
    - 2.6.1. Arrange the safety-belt strap around the fixture in approximately the correct position as shown in Figures 2 and 3, then latch the buckle.
    - 2.6.2. Arrange the safety-belt lap strap approximately in the correct position around the lower part of the fixture of 150 mm radius as shown in Figure 3, then latch the buckle.

- 2.7. Ensure that the fixture is located with its centreline on the apparent centreline of the seating position  $\pm 25$  mm with its centreline parallel with the centreline of the vehicle.
- 2.8. Ensure that all webbing slack is removed. Use sufficient force to remove the slack, do not attempt to tension the webbing.
- 2.9. Push rearwards on the centre of the front of the fixture with a force of  $100 \text{ N} \pm 10 \text{ N}$ , applied parallel to the lower surface, and remove the force.
- 2.10. Push vertically downwards on the centre of the upper surface of the fixture with a force of  $100 \text{ N} \pm 10 \text{ N}$ , and remove the force.
3. Requirements
  - 3.1. The base of the fixture shall contact both the forward and rearward parts of the seat cushion surface. If such contact does not occur due to the belt access gap in the test fixture, this gap may be covered in line with the bottom surface of the test fixture.
  - 3.2. The lap portion of the belt shall touch the fixture on both sides at the rear of the lap belt path (see Figure 3).
  - 3.3. Should the above requirements not be met with the adjustments indicated in paragraphs 2.1., 2.2. and 2.3. above, the seat, seat-back and safety-belt anchorages may be adjusted to an alternative position designated by the manufacturer for normal use at which the above installation procedure shall be repeated and the requirements again verified and met. This alternative position shall be included as an information in the Table 1 given in Appendix 3 to this annex.

Figure 1  
Specifications of the fixture

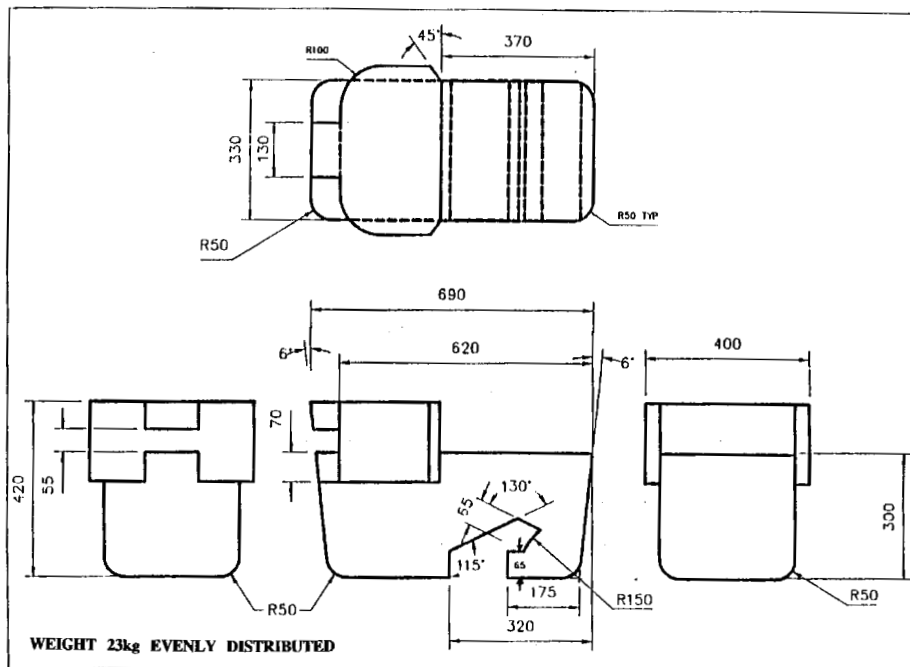
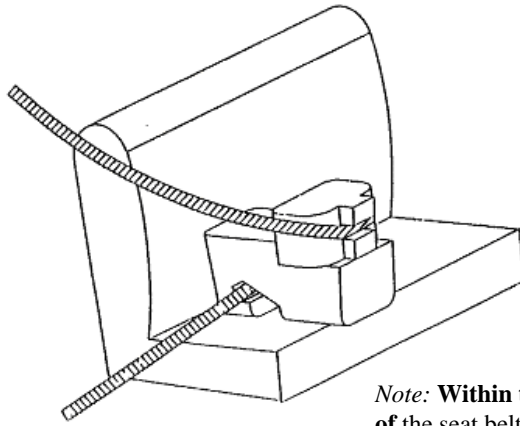


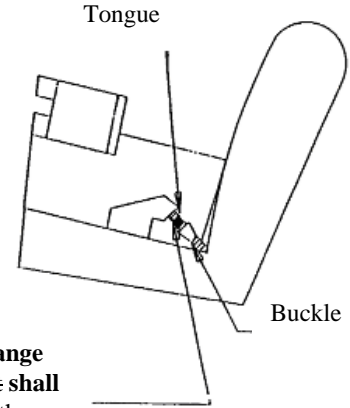
Figure 1: Specifications of the fixture

Figure 2  
**Installation of fixture onto vehicle seat**  
(see paragraph 2.6.1.)



*Note: Within the adjustment range of the seat belt the webbing must shall contact, at a minimum, part of the curved edge on both sides of the fixture.*

Figure 3  
**Check for compatibility**  
(see paragraphs 2.6.1. and 3.2)



Lap belt only shown



## Annex 17 - Appendix 2

### **Provisions concerning the installation of forward-facing and rearward-facing ISOFIX child restraint systems of universal and semi-universal categories installed on ISOFIX or i-Size positions**

1. General
  - 1.1. The test procedure and the requirements in this appendix shall be used to determine the suitability of ISOFIX positions for the installation of ISOFIX child restraint systems of universal and semi-universal categories, as well as to determine the suitability of i-Size seating positions for installing i-Size child restraint systems..
  - 1.2. The tests may be carried out in the vehicle or in a representative part of the vehicle.

For i-Size seating positions, compliance with the i-Size support leg installation requirements may be assessed by a physical test, computer simulation or representative drawings.
2. Test procedure

For any ISOFIX position in the vehicle, as indicated by the vehicle manufacturer, in Table 2 of Appendix 3, as well as for any i-Size seating position if any, as indicated by the vehicle manufacturer in Table 3 of Appendix 3, it has to be checked that it is possible to accommodate the corresponding child restraint fixture(s) (CRF) and additionally in case of an i-Size seating position, the i-Size support leg installation assessment volume:

  - 2.1. When checking a CRF, on a seat, with or without i-Size support leg installation assessment volume, this seat may be adjusted longitudinally to its rearmost position and in its lowest position.
  - 2.2. Adjust the seat-back angle to the manufacturer's design position and the head restraint in the lowest and rearmost position. In the absence of any specification an angle of the seat-back corresponding to a torso angle of 25° from the vertical, or the nearest fixed position of the seat-back, shall be used.

When checking a CRF, on a rear seat, with or without i-Size support leg installation assessment volume, the vehicle seat located in front of this rear seat may be adjusted longitudinally forward but not further than the mid position between its rearmost and fore most positions. The seat backrest angle may also be adjusted, but not to a more upright angle than corresponding to a torso angle of 15°.
  - 2.3. Place a cotton cloth on the seat-back and cushion.
  - 2.4. Place the CRF, with or without i-Size support leg installation assessment volume, on the ISOFIX or i-Size position.
  - 2.5. Push, towards ISOFIX anchorages system, on the center between the ISOFIX anchorages with a force of 100 N ± 10 N, applied parallel to the lower surface, and remove the force.

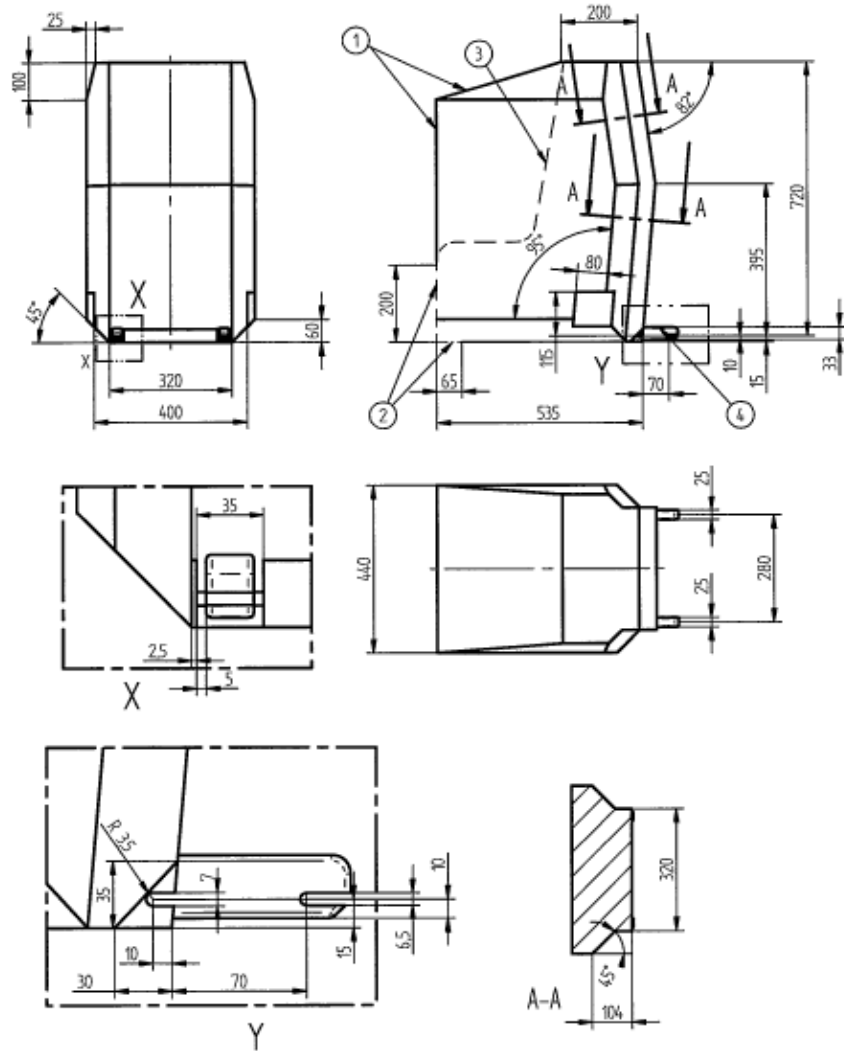
- 2.6. Attach the CRF, with or without i-Size support leg installation assessment volume, to the ISOFIX anchorages system.
- 2.7. Push vertically downwards on the centre of the upper surface of the fixture with a force of  $100\text{ N} \pm 10\text{ N}$ , and remove the force.
3. Requirements
- The following testing conditions only apply for the CRF(s), with or without i-Size support leg installation assessment volume, when accommodated in the ISOFIX and/or i-Size position. It is not required that the CRF(s), with or without i-Size support leg installation assessment volume, shall be able to move in and out of the ISOFIX and/or i-Size position under these conditions.
- 3.1. It has to be possible to accommodate the CRF(s), with or without i-Size support leg installation assessment volume, without interference with the vehicle interior. The CRF base shall have a pitch angle of  $15^\circ \pm 10^\circ$ , above the horizontal plane passing through the ISOFIX anchorages system.
- 3.2. The ISOFIX top tether anchorage, if any, shall remain accessible.
- 3.3. Should the above requirements not be met with the adjustments indicated in paragraph 2. above, the seats, the seat-backs, the head restraints may be adjusted to alternative positions designated by the manufacturer for normal use following which the above installation procedure shall be repeated and the requirements verified and met. These alternative positions shall be included as information in Table 2 and/or 3 given in Appendix 3 to this annex. Passenger seats in front of i-Size seating positions may also be displaced to a position forward of the normal position of use. In such cases, the vehicle manufacturer shall provide information in the vehicle handbook, that the respective passenger seat shall not be occupied in such positions of displacement.
- 3.4. Should the above requirements not be fulfilled when some removable interior fittings were present, such fittings may be removed and then requirements of paragraph 3. have to be verified again and fulfilled. In such a case corresponding information shall be included in Table 2 and/or 3 of Appendix 3 of this annex.
4. ISOFIX child restraint system size classes and fixtures
- A – ISO/F3: Full-Height Forward Facing toddler CRS
  - B – ISO/F2: Reduced-Height Forward Facing toddler CRS
  - B1 – ISO/F2X: Reduced-Height Forward Facing toddler CRS
  - C – ISO/R3: Full-Size Rearward Facing toddler CRS
  - D – ISO/R2: Reduced-Size Rearward Facing toddler CRS
  - E – ISO/R1: Rearward Facing infant CRS
  - F – ISO/L1: Left Lateral Facing position CRS (carry-cot)
  - G – ISO/L2: Right Lateral Facing position CRS (carry-cot)
- The fixtures below shall be constructed with a mass between 5 and 15 kg and shall be of suitable durability and stiffness to satisfy the functional requirements.

<i>Mass group</i>	<i>ISOFIX size class</i>	<i>Fixture (CRF)</i>
0 – up to 10 kg	F	ISO/L1
	G	ISO/L2
	E	ISO/R1
0+ - up to 13 kg	C	ISO/R3
	D	ISO/R2
	E	ISO/R1
I - 9 to 18 kg	A	ISO/F3
	B	ISO/F2
	B1	ISO/ F2X
	C	ISO/R3
	D	ISO/R2

4.1. Full-height forward-facing toddler child restraint systems envelope

Figure 1

**ISO/F3 envelope dimensions for a full-height forward-facing toddler CRS  
(height 720 mm) ISOFIX SIZE CLASS A**



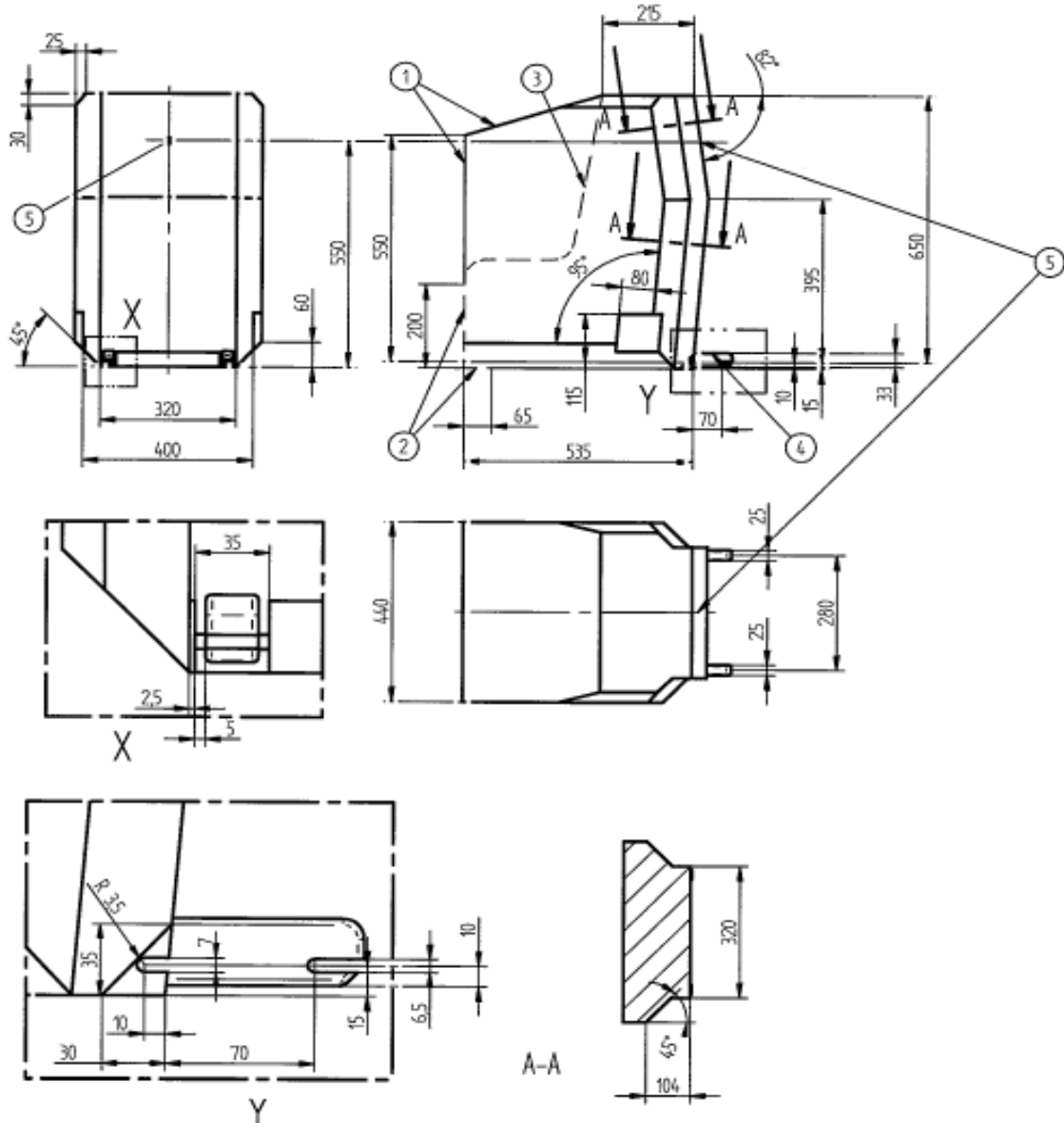
Key

- 1 Limits in the forward and upwards directions
- 2 Dashed line marks area where a support leg, or similar, of a specific vehicle CRS is allowed to protrude.
- 3 N/A
- 4 Further specifications of the connector area are given in Regulation No. 44

4.2. Reduced-height forward-facing toddler child restraint systems envelope

Figure 2

**ISO/F2 envelope dimensions for a reduced-height forward-facing toddler CRS, (height 650 mm) – ISOFIX SIZE CLASS B**



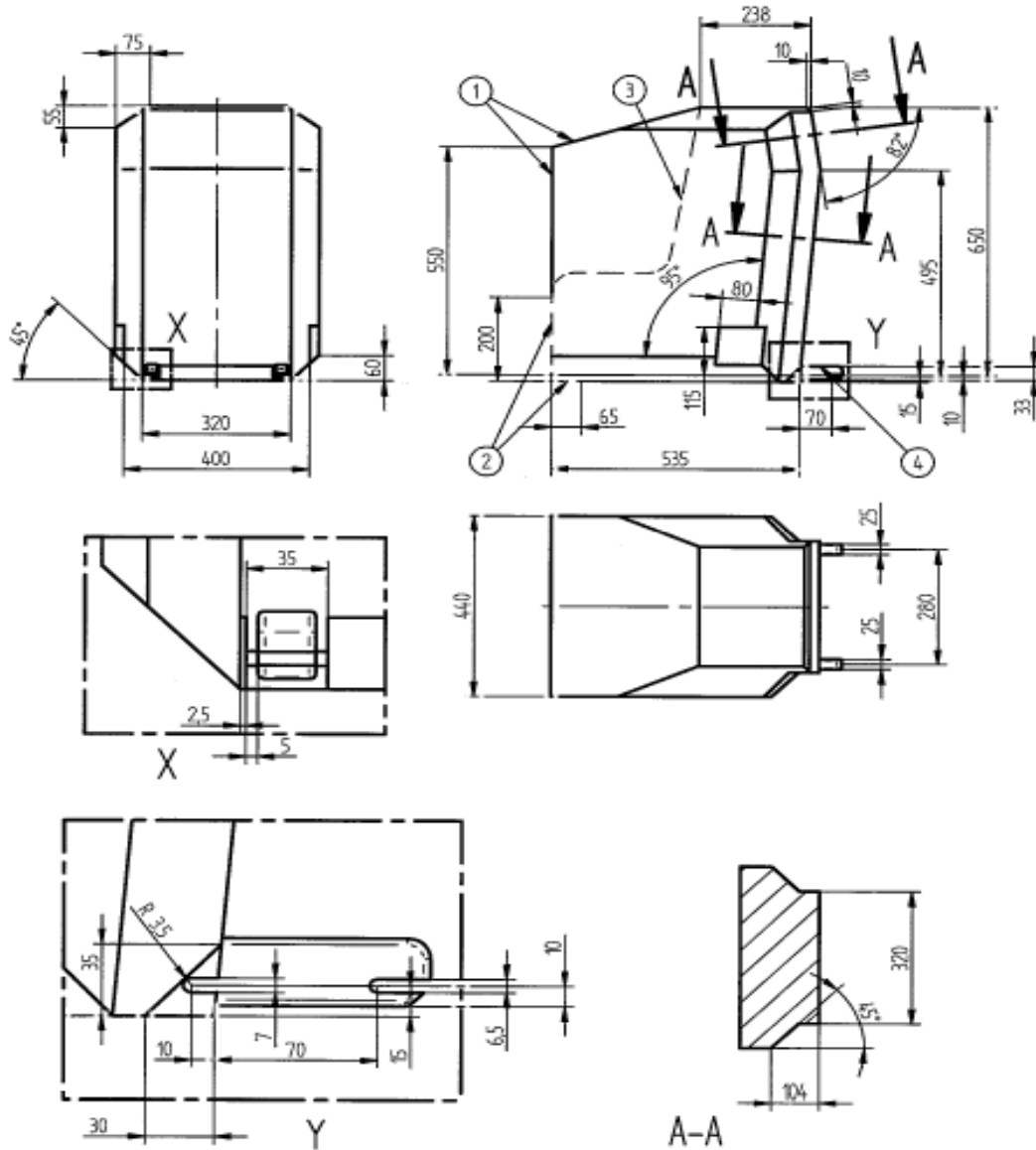
Key

- 1 Limits in the forward and upwards directions
- 2 Dashed line marks area where a support leg, or similar, of a specific vehicle CRS is allowed to protrude.
- 3 N/A
- 4 Further specifications of the connector area are given in Regulation No. 44
- 5 Attachment point for the top tether strap.

4.3. Reduced-height second version back shape forward-facing toddler child restraint systems envelope

Figure 3

**ISO/F2X envelope dimensions for a reduced-height second version back surface shape forward-facing toddler CRS, (height 650 mm) – ISOFIX SIZE CLASS B1**



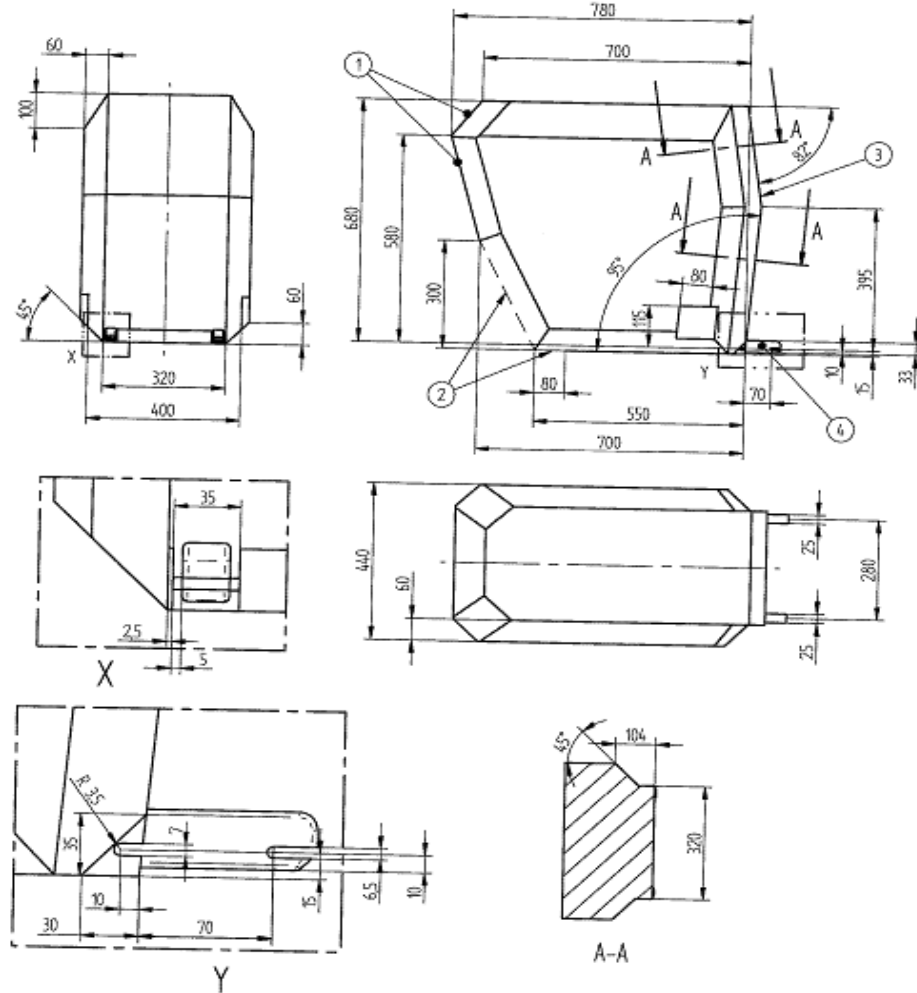
Key

- 1 Limits in the forward and upwards directions
- 2 Dashed line marks area where a support leg, or similar, of a specific vehicle CRS is allowed to protrude.
- 3 N/A
- 4 Further specifications of the connector area are given in Regulation No. 44.

4.4. Full-size rearward facing toddler child restraint system envelope

Figure 4

**ISO/R3 envelope dimensions for a full-size rearward-facing toddler  
CRS ISOFIX SIZE CLASS C**



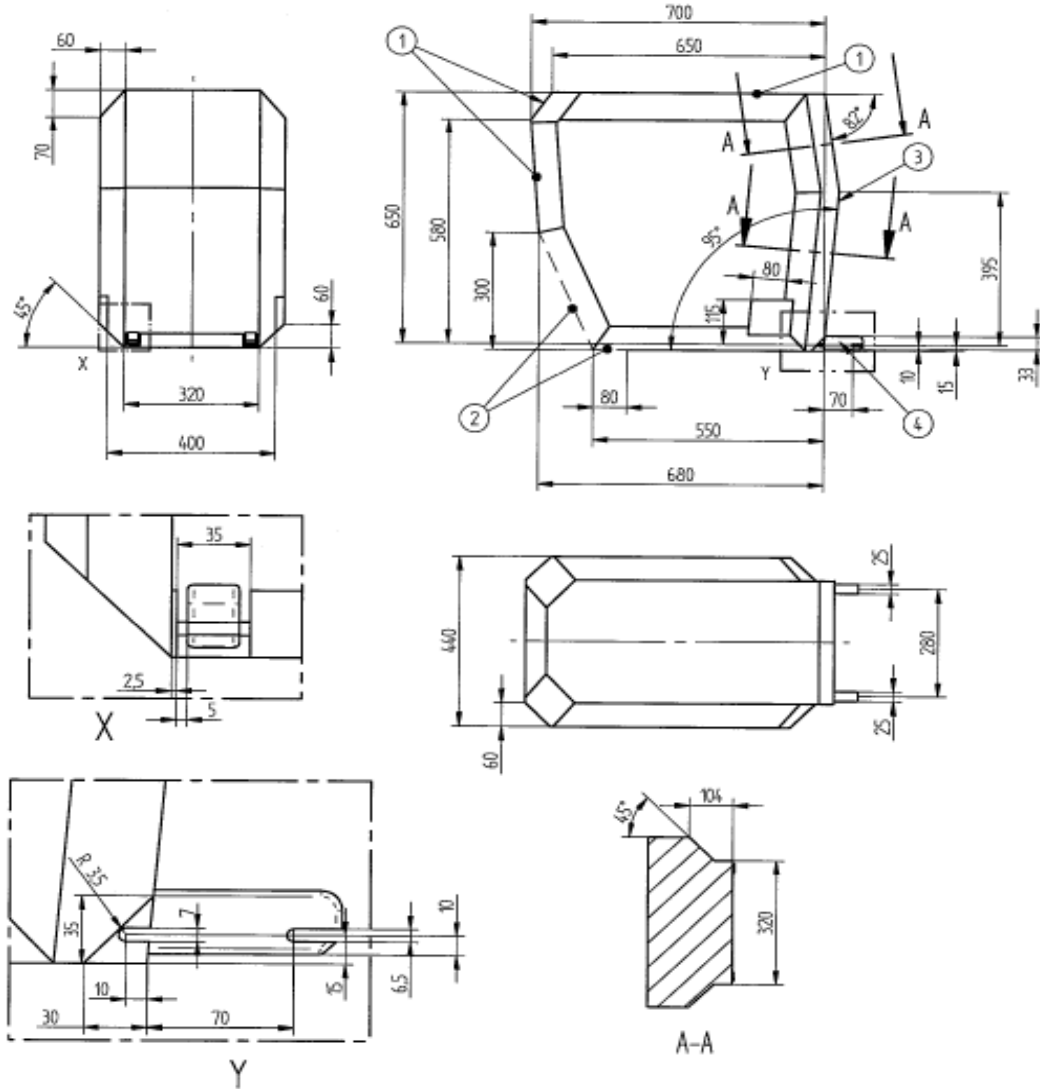
Key

- 1 Limits in the rearward and upwards directions
- 2 Dashed line marks area where a support leg, or similar, of a specific vehicle CRS is allowed to protrude.
- 3 The backwards limitation (to the right in the figure) is given by the forward-facing envelope in Figure 2
- 4 Further specifications of the connector area are given in Regulation No. 44.

4.5. Reduced-size rearward-facing toddler child restraint systems envelope

Figure 5

**ISO/R2 envelope dimensions for a reduced-size rearward-facing toddler CRS  
ISOFIX SIZE CLASS D**



Key

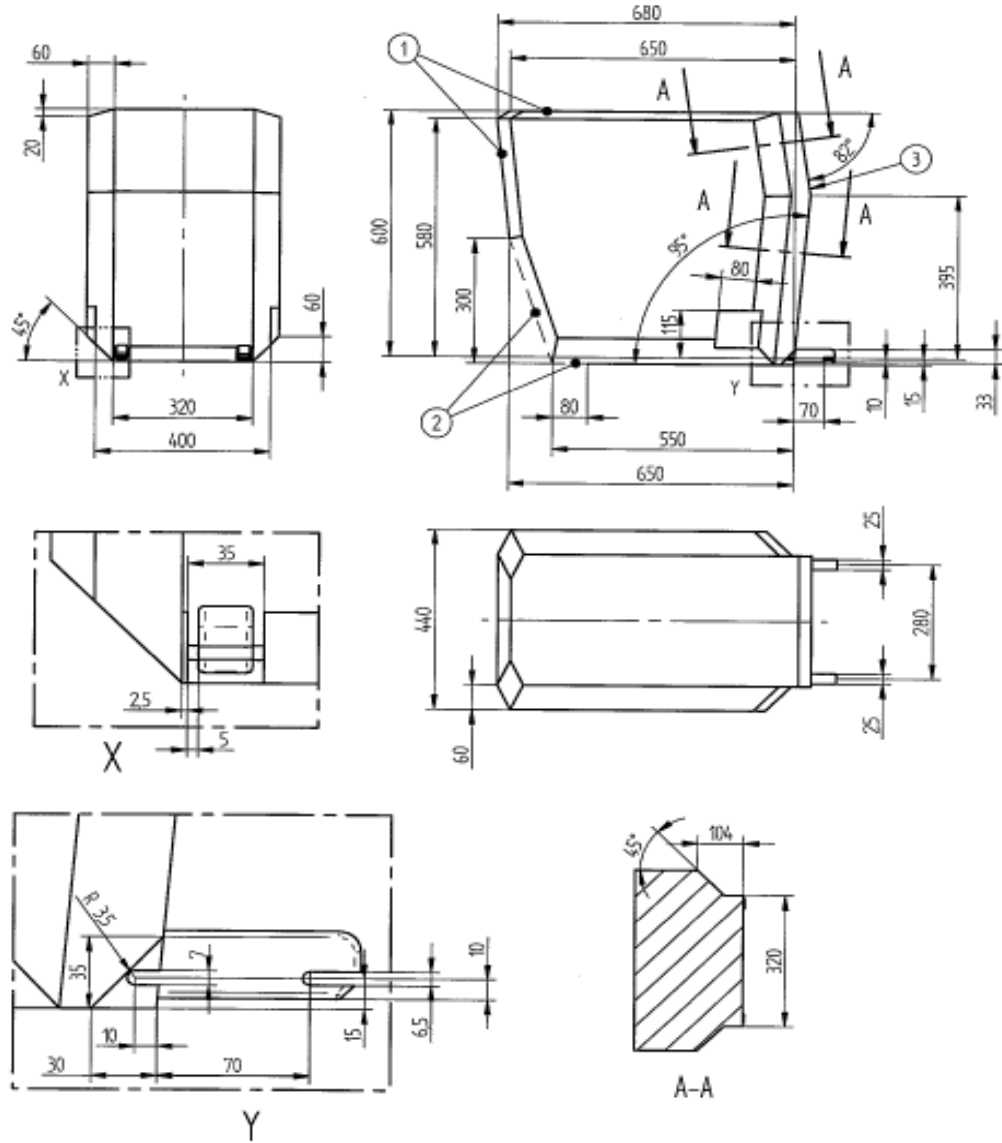
- 1 Limits in the rearward and upwards directions
- 2 Dashed line marks area where a support leg, or similar, of a specific vehicle CRS is allowed to protrude.
- 3 The backwards limitation (to the right in the figure) is given by the forward-facing envelope in Figure 2
- 4 Further specifications of the connector area are given in Regulation No. 44.



4.6. Rearward facing infant child restraint systems envelope

Figure 6

**ISO/R1 envelope dimensions for an infant-size rearward-facing CRS ISOFIX  
SIZE CLASS E**



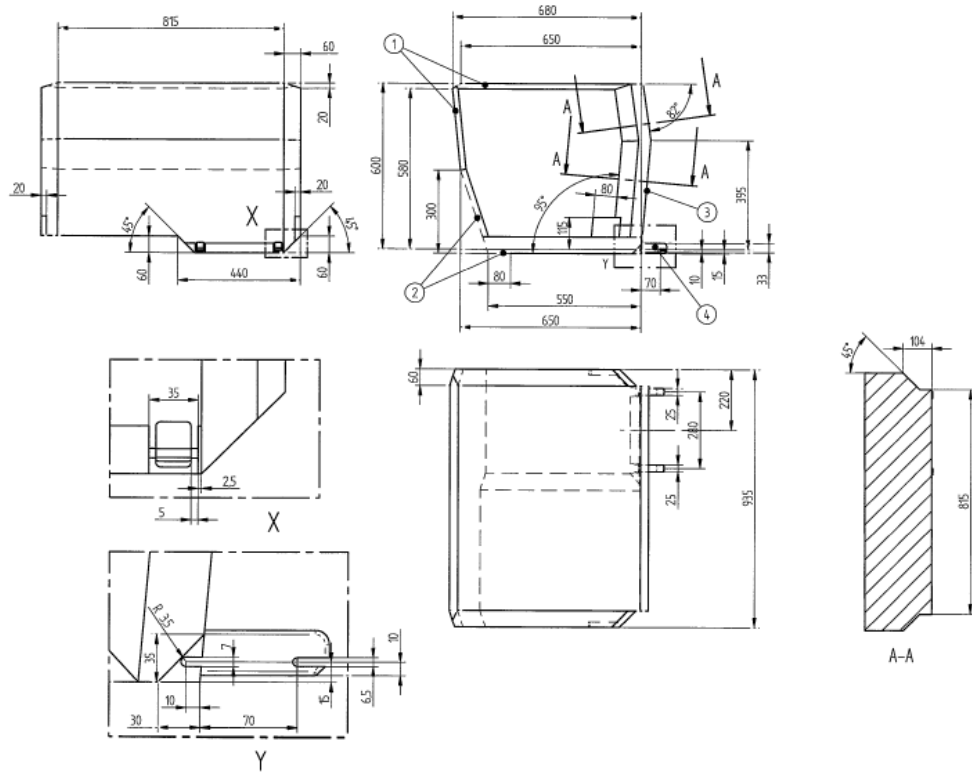
Key

- 1 Limits in the rearward and upwards directions
- 2 Dashed line marks area where a support leg, or similar, of a specific vehicle CRS is allowed to protrude.
- 3 The backwards limitation (to the right in the figure) is given by the forward-facing envelope in Figure 2
- 4 Further specifications of the connector area are given in Regulation No. 44.

4.7. Lateral facing child restraint systems envelope

Figure 7

**Envelope dimensions for lateral facing position CRS – ISO/L1- ISOFIX SIZE CLASS F  
or symmetrically opposite – ISO/L2 – ISOFIX CLASS G**

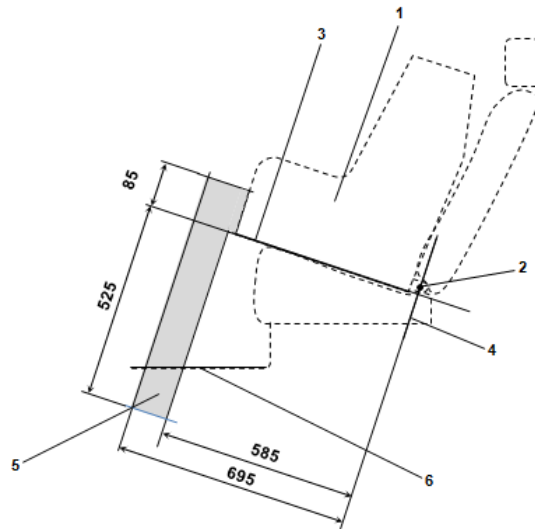


Key

- 1 Limits in the rearward and upwards directions
- 2 Dashed line marks area where a support leg, or similar, of a specific vehicle CRS is allowed to protrude.
- 3 The backwards limitation (to the right in the figure) is given by the forward-facing envelope in Figure 2
- 4 Further specifications of the connector area are given in ISO 13216-1, Figures 2 and 3.

Figure 8

**Side view of the i-Size support leg installation assessment volume for assessing compatibility of the i-Size seating positions with support legs of i-Size child restraint systems**



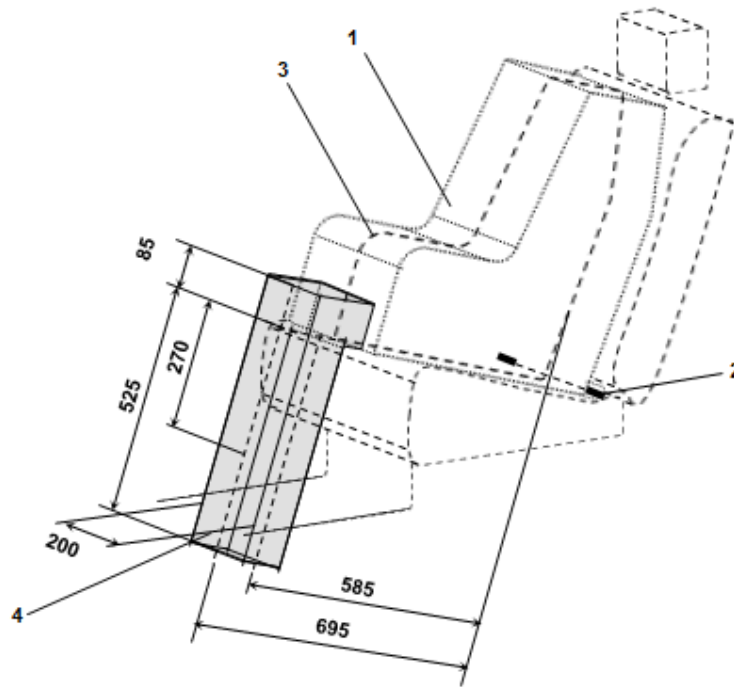
*Key:*

1. Child Restraint Fixture (CRF).
2. ISOFIX low anchorages bar.
3. Plane formed by the bottom surface of the CRF when installed in the designated seating position.
4. Plane passing through the lower anchorage bar and oriented perpendicular to the median longitudinal plane of the CRF and perpendicular to the plane formed by the bottom surface of the CRF when installed in the designated seating position.
5. i-Size support leg installation assessment volume representing the geometrical boundaries for an i-Size ISOFIX child restraint system support leg.
6. Vehicle floor.

*Note:* Drawing not to scale.

Figure 9

**3D view of the i-Size support leg installation assessment volume for assessing compatibility of the i-Size seating positions with support legs of i-Size child restraint systems**



*Key:*

1. Child Restraint Fixture (CRF).
2. ISOFIX low anchorages bar.
3. Median longitudinal plane of the CRF.
4. i-Size support leg installation assessment volume.

*Note:* Drawing not to scale.

## Annex 17 – Appendix 3

Table 1

**Example** Table of vehicle handbook information on child restraint systems installation suitability for various seating positions

<i>Mass Group</i>	<i>Seating position (or other site)</i>				
	<i>Front passenger</i>	<i>Rear outboard</i>	<i>Rear centre</i>	<i>Intermediate outboard</i>	<i>Intermediate centre</i>
Group 0 up to 10 kg					
Group 0+ up to 13 kg					
Group I 9 to 18 kg					
Group II 15 to 25 kg					
Group III 22 to 36 kg					

Key of letters to be inserted in the above table:

- U = Suitable for "universal" category restraints approved for use in this mass group.
- UF = Suitable for forward-facing "universal" category restraints approved for use in this mass group.
- L = Suitable for particular child restraints given on attached list. These restraints may be of the "specific vehicle", "restricted" or "semi-universal" categories.
- B = Built-in restraint approved for this mass group.
- X = Seat position not suitable for children in this mass group.

**Note:** When this information is included into a single table it is not necessary to provide a further separate table in the vehicle handbook.

Table 2

**Example** Table of vehicle handbook information on ISOFIX child restraint systems installation suitability for various ISOFIX positions

Mass Group	Size class	Fixture	Vehicle ISOFIX positions					
			Front passenger	Rear outboard	Rear centre	Intermediate outboard	Intermediate centre	Other sites
Carycot	F	ISO/L1						
	G	ISO/L2						
		(1)						
0 – up to 10 Kg	E	ISO/R1						
		(1)						
0+ – up to 13 kg	E	ISO/R1						
	D	ISO/R2						
	C	ISO/R3						
		(1)						
I – 9 to 18 kg	D	ISO/R2						
	C	ISO/R3						
	B	ISO/F2						
	B1	ISO/F2X						
	A	ISO/F3						
		(1)						
II – 15 to 25 kg		(1)						
III – 22 to 36 kg		(1)						

(1) = For the CRS which do not carry the ISO/XX size class identification (A to G), for the applicable mass group, the car manufacturer shall indicate the vehicle specific ISOFIX child restraint system(s) recommended for each position.

Key of letters to be inserted in the above table

IUF = Suitable for ISOFIX forward child restraints systems of universal category approved for use in the mass group

IL = Suitable for particular ISOFIX child restraint systems (CRS) given in the attached list. These ISOFIX CRS are those of the "specific vehicle", "restricted" or "semi-universal" categories.

X = ISOFIX position not suitable for ISOFIX child restraint systems in this mass group and/or this size class.

**Note: When this information is included into a single table it is not necessary to provide a further separate table in the vehicle handbook.**

[Table 3

**Example table of vehicle handbook information for R129 Enhanced child restraint systems for installation in various seating positions**

	Seating position							
	Front passenger outboard	Front passenger centre	Rear outboard left	Rear outboard right	Rear centre	Intermediate outboard left	Intermediate outboard right	Intermediate centre
i-Size Child Restraint Systems	<b>i-U</b>							
<b>Universal booster seat</b>	<b>U</b>		<b>U</b>					
<b>Universal booster cushion</b>	<b>U</b>			<b>NU</b>				

*Note:* Orientation is normal driving direction; columns for seating positions not available in a vehicle can be deleted.

*Key of letters to be inserted in the above table in row*

**“Child Restraint Systems approved under UN-Regulation No. 129”:**

- i-U Suitable for i-Size "universal" Child Restraint Systems forward and rearward facing.
- U Universal
- NU Not-universal => booster cushion only!
- i-UF Suitable for forward-facing i-Size "universal" Child Restraint Systems only.
- i-L Suitable for particular “Specific vehicle ISOFIX” Enhanced child restraint systems (ECRS) given in the attached list. These ISOFIX ECRS are those of the "specific vehicle" category. If not approved for all ISO volumes, the available ISO volume(s) shall be indicated after the L in brackets using the reference letter (e.g. B1, B, E) and restrictions to this volume(s) shall be explained in the vehicle handbook.**
- U Integral universal child restraint systems fixed by adult seat belt.**
- X Seating position not suitable for Enhanced Child Restraint Systems **approved under UN-Regulation No. 129.**]

## Annex 17 – Appendix 4

### Installation of 10-year manikin

- (a) Adjust the seat to its fully rearward position.
- (b) Adjust the seat height in accordance with the manufacturer's specifications. In the absence of any specification, adjust the seat to the lowest position.
- (c) Adjust the seat back angle to the manufacturer's design position. In the absence of any specification, an angle of 25 degrees from the vertical, or the nearest fixed position of the seat back, should be used.
- (d) Set the shoulder anchorage to the lowest position.
- (e) Set the manikin on the seat ensuring that the pelvis is in contact with the seat back.
- (f) The longitudinal plan passing by the manikin centre line will be on the apparent centre line of the seating position.

## Annex 17, Appendix 5

### Provisions concerning the installation of Universal Booster Seat enhanced child restraint systems

1. **General**
  - 1.1. **The test procedure and the requirements in this appendix shall be used to determine the suitability of seating positions for the installation of child restraints of the "universal booster seat" and "universal booster cushion" category.**
  - 1.2. **The tests may be carried out in the vehicle or in a representative part of the vehicle.**

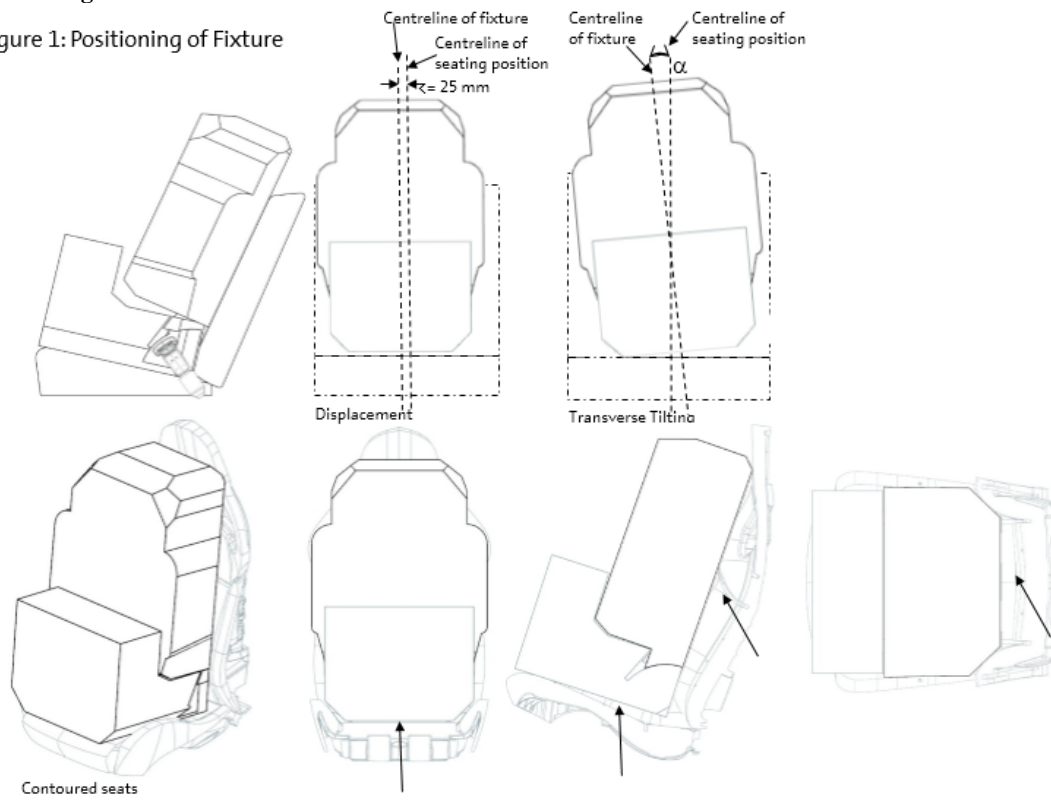
**Compliance with these installation requirements may be assessed by a physical test, computer simulation, representative drawings, or any other means deemed acceptable to the type approval authority.**
2. **Test procedure**
  - 2.1. **Adjust the seat to its fully rearward and lowest position.**
  - 2.2. **Adjust the seat-back angle to the manufacturer's design position. In the absence of any specification, a torso angle of 25 degrees from the vertical, or the nearest fixed position of the seat-back, should be used.**
  - 2.3. **When checking a CRF, on a rear seat, the vehicle seat located in front of this rear seat may be adjusted longitudinally forward but not further than the mid position between its rearmost and fore most positions. The seat backrest angle may also be adjusted, but not to a more upright angle than corresponding to a torso angle of 15°.**



- 2.4. If necessary head restraints may be adjusted or removed.
- 2.5. Set the shoulder anchorage to the position defined by the vehicle manufacturer.
- 2.6. Place a cotton cloth on the seat-back and cushion.
- 2.7. Place the fixture (as described in Figure 1 of this appendix) on the vehicle seat. The top of the fixture may touch the vehicle roof. Compression of the seat cushion is allowed to move the fixture into position.
- 2.8. The fixture shall be restrained by the vehicle's seat belt which shall be installed as shown in figure 2.
- 2.9. Ensure that the fixture is located with its centreline on the centreline of the seating position [ $\pm 25$ ] mm with its centreline parallel with the centreline of the vehicle seat.
- 2.10. Push rearwards on the centre of the front of the fixture with a force  $100\text{ N} \pm 10\text{ N}$ , applied parallel to the lower surface, and remove the force.
- 2.11. When possible, push vertically downwards on the centre of the upper surface of the fixture with a force of  $100\text{ N} \pm 10\text{ N}$ , and remove the force.
3. Requirements
  - 3.1. It shall be possible to secure the fixture in the seating position using the 3-point seat belt and to buckle up the seat belt. The lap portion of the belt shall touch the fixture on both sides at the rear of the lap belt path (see Figure 2).
  - 3.2. The roll angle as shown in Figure 1 shall be equal to or less than  $5^\circ$ .
  - 3.3. The base of the fixture shall be in contact with the seat cushion, and the back face of the fixture shall be in contact with the seat back or head restraint. Full contact with the seat is not necessary, "gaps" due to the vehicle seats contours are permitted as shown in Figure 1.
  - 3.5. Should the above requirements not be met with the adjustments indicated in paragraphs 2.1. to 2.5. above, the seat, seat-back and safety-belt anchorages may be adjusted to an alternative position designated by the manufacturer for normal use at which the above installation procedure shall be repeated and the requirements again verified and met. This alternative position shall be included as information in the appropriate table.
  - 3.6. Where the 135cm CRF cannot be installed, then install the booster cushion CRF (lower part of the figure2) following the above procedure.
4. The fixture below shall be constructed with a mass of  $10\text{ kg} \pm 5\text{ kg}$  and shall be of suitable durability and stiffness to satisfy the functional requirements.

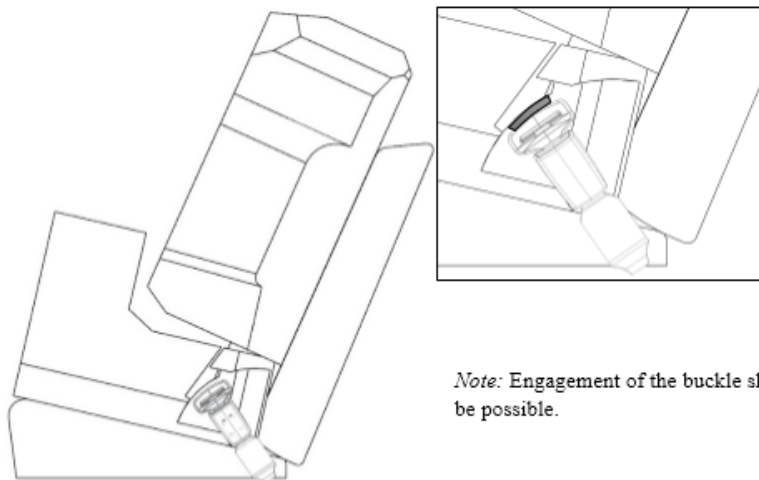
**Figure 1  
Positioning in Seat**

Figure 1: Positioning of Fixture



**Figure 2  
Belt buckling**

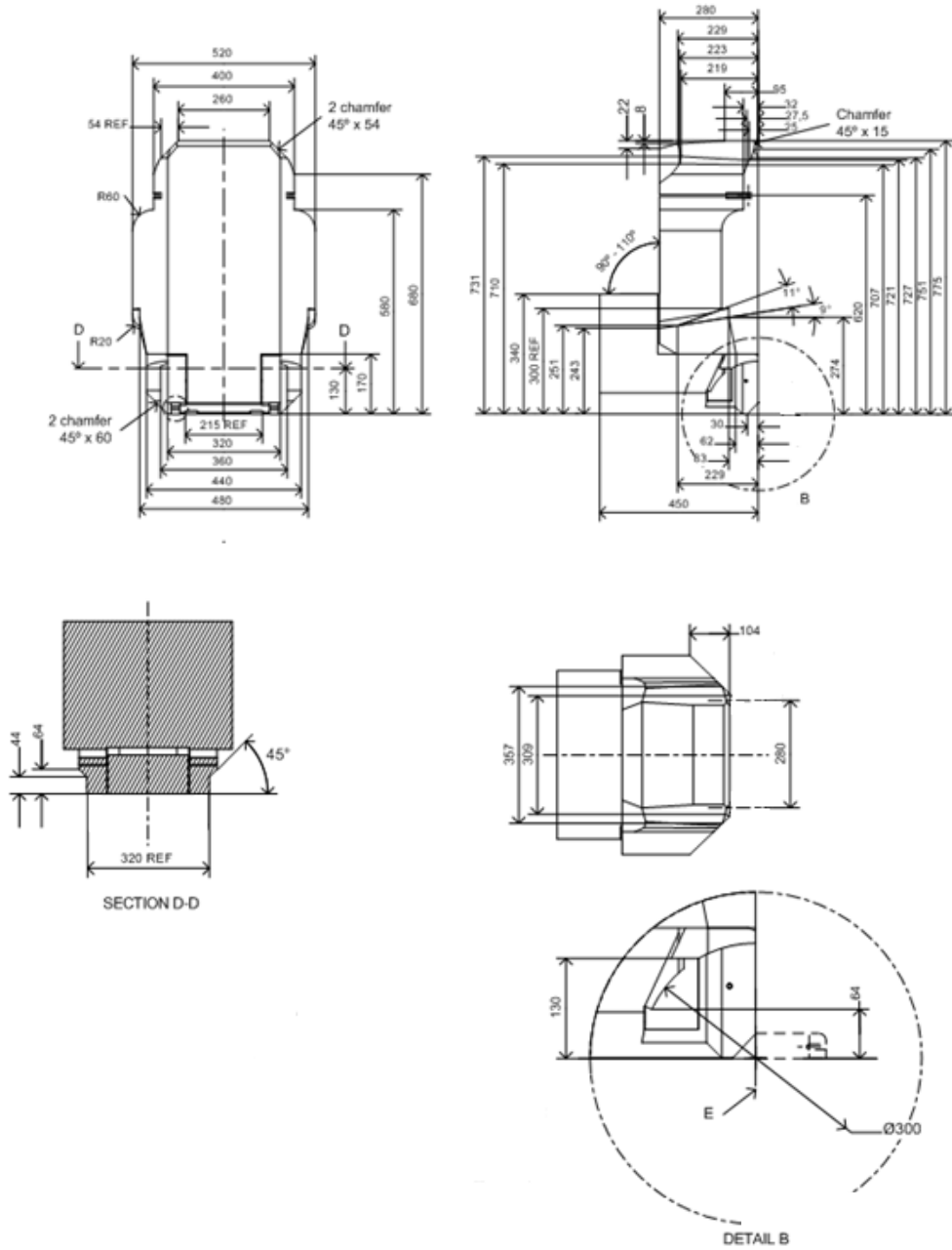
Figure 2 Belt Buckling



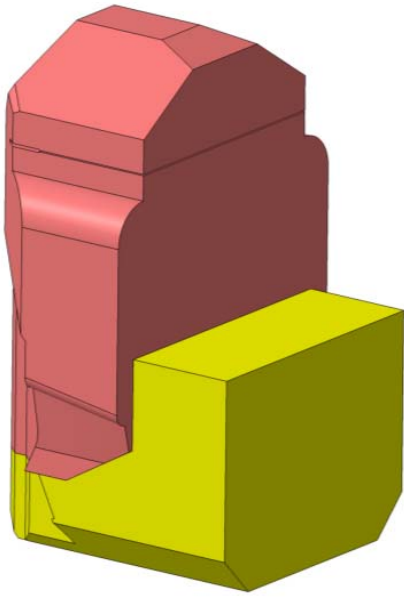
*Note:* Engagement of the buckle shall be possible.

***Note:* Engagement of the buckle shall be possible.**

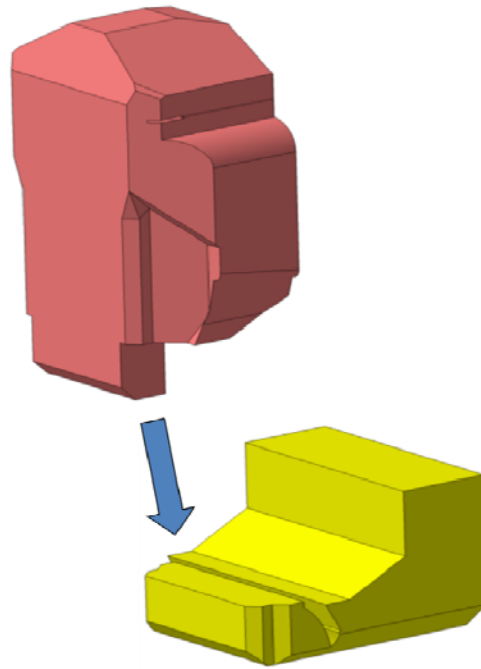
**Figure 3**  
**Universal Booster Seat Fixture: without ISOFIX, or with anchorages removed or stowed within the body of the fixture (behind line E, as defined by detail B).**



E: Reference line for stowing of ISOFIX attachment



**To update:** Complete 135 cm CRF



cushion only CRF"

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