

**Economic and Social Council**Distr.: General
21 October 2016

English only

Economic Commission for Europe**Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on Passive Safety****Sixtieth session**

Geneva, 13–16 December 2016

Item 9 of the provisional agenda

Regulation No. 16 (Safety-belts)**Proposal for Supplement 9 to the 06 series of Amendments to Regulation No. 16 (Safety belts) and Supplement 1 to the 07 series of Amendments****Submitted by the expert from France***

The text reproduced below was prepared by the expert from France, on behalf of the informal group on Child Restraints Systems and updates the latest versions of Regulation No. 16. The modifications to the current text of the UN Regulation and ECE/TRANS/WP.29/2016/98 are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2016–2017 (ECE/TRANS/254, para. 159 and ECE/TRANS/2016/28/Add.1, cluster 3.1), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

GE.16-18307(E)



* 1 6 1 8 3 0 7 *

Please recycle



I. Proposal

Table of contents

Annex 17, insert a new Appendix 5 to read:

"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. ...

Appendix 5: Installation of booster seat fixtures"

Text of the Regulation,

Paragraph 2.30., amend to read

"2.30. "ISOFIX child restraint system" means a child restraint system, fulfilling the requirements of Regulation No. 44 **or Regulation No. 129**, which has to be attached to an ISOFIX anchorages system, fulfilling the requirements of Regulation No. 14."

Paragraph 2.38., amend to read:

"2.38. "Child restraint fixture" (CRF) means a fixture according to one ~~out~~ of the ~~eight ISOFIX fixtures size classes~~ defined in paragraph 4. of annex 17 - appendix 2 of this Regulation, and particularly whose dimensions are given from figure 1 to figure ~~7~~**8** in the previous mentioned paragraph 4. Those child restraint fixtures (CRF) are used, in this Regulation, to check which ~~what are the~~ ISOFIX child restraint systems size envelopes classes mentioned in Regulation No. 44 or in Regulation No. 129 ~~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.

Or a fixture, according to one of the two "booster seat" fixtures defined in Annex 17, Appendix 5 of this Regulation, and particularly whose dimensions are given in figures 2 and 3 of Annex 17, Appendix 5. These fixtures are used, in this Regulation, to check which booster seat size envelopes mentioned in Regulation No. 129 can be accommodated on vehicle seating positions, if any."

Paragraph 2.40., amend to read:

"2.40. "i-Size seating position" means a seating position, if any defined by the vehicle manufacturer, which is designed to accommodate ~~an~~ i-Size child restraint systems, as defined in Regulation No. 129, and fulfils the requirements defined in this Regulation."

Paragraph 8.2.1., amend to read:

"8.2.1. Safety-belts, restraint systems, **and** 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."

Paragraph 8.2.2., amend to read:

"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: ..."

Paragraph 8.2.2.3., amend to read:

"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."

Paragraph 8.3.5., amend to read:

"8.3.5. In order to inform the vehicle user(s) of the provisions made for the transport of children, vehicles of categories M₁, M₂, M₃ and N₁ shall meet the information requirements of Annex 17. Any vehicle of category M₁ 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."

Paragraph 8.3.6., amend to read:

"8.3.6. Any i-Size seating position shall allow the installation of the ISOFIX child restraint fixture "ISO/F2X"~~-(B1)~~, "ISO/R2"~~-(D)~~, and the support leg installation assessment volume as defined in Appendix 2 of Annex 17, **as well as the booster seat fixture "ISO/B2" as defined in Appendix 5 of Annex 17, without the ISOFIX attachments (see detail B). It shall be possible to occupy all adjacent i-Size seating positions simultaneously. This is deemed to be demonstrated when the vertical median planes of individual adjacent positions are at least 440 mm apart.**"

Annex 17, paragraph 1.1., amend to read:

"1.1. The vehicle manufacturer ...

...

In addition to the above defined information for the vehicle user, the vehicle manufacturer shall make available the information as defined by Appendix 3 of this Annex. For example, this information can be included in separate Annexes of the vehicle handbook, or in technical descriptions of the vehicle or on a dedicated webpage. **The location of this information shall be provided in the vehicle handbook.**"

Annex 17, paragraph 1.2., amend to read:

"1.2. A 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 (**or subsequent amendments**).

Seating positions, ~~or ISOFIX positions,~~ which are indicated by the vehicle manufacturer as being suitable for the installation of child restraints systems **of the universal category** shall comply with the provisions of Appendix 1 to this annex."

Annex 17, paragraph 1.3., amend to read:

"1.3. An ISOFIX child restraint **means a child restraint** ~~shall be~~ approved to Regulation No. 44, Supplement 5 to 03 series of amendments or to Regulation No. 129 (**or subsequent amendments**). **Positions**, which are indicated by the vehicle manufacturer as being suitable for the installation of ISOFIX child restraints systems shall comply with the provisions of Appendix 2 to this annex."

Annex 17, paragraph 1.4., amend to read:

"1.4. An i-Size child restraint means 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 and **Appendix 5** to this annex."

Annex 17, Appendix 2, paragraph 2.3., amend to read:

"2.3. Place cotton clothes on the seat-back and cushion, **if needed.**"

Annex 17, Appendix 2, paragraph 3.1., amend to read:

"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. **ISOFIX attachments, according to detail Y of figures 1 to 9, may adjust longitudinally between -10mm to +70mm to facilitate the interference check. The figures are showing the most extended positions.**"

Annex 17, Appendix 2, paragraph 3.3., amend to read:

"3.3. Should the above requirements not be met These alternative positions shall be described in the vehicle handbook and with the additional information specified **in table 2 and/or 3 given** in Appendix 3 to this annex. ..."

Annex 17, Appendix 2, paragraph 4., amend to read:

- "4. ISOFIX child restraint system **size envelope 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
 - **ISO/R2X: Reduced-Size Rearward Facing toddler CRS**

- E** – ISO/R1: Rearward Facing infant CRS
 – ISO/L1: Left Lateral Facing position CRS (carry-cot)
G – ISO/L2: Right Lateral Facing position CRS (carry-cot)

The fixtures ~~below~~ **above** shall be constructed with a mass between ~~5~~**10** and/or ~~15~~**13** kg +/- **0.2** kg and shall be of suitable durability and stiffness to satisfy the functional requirements, following the table below:

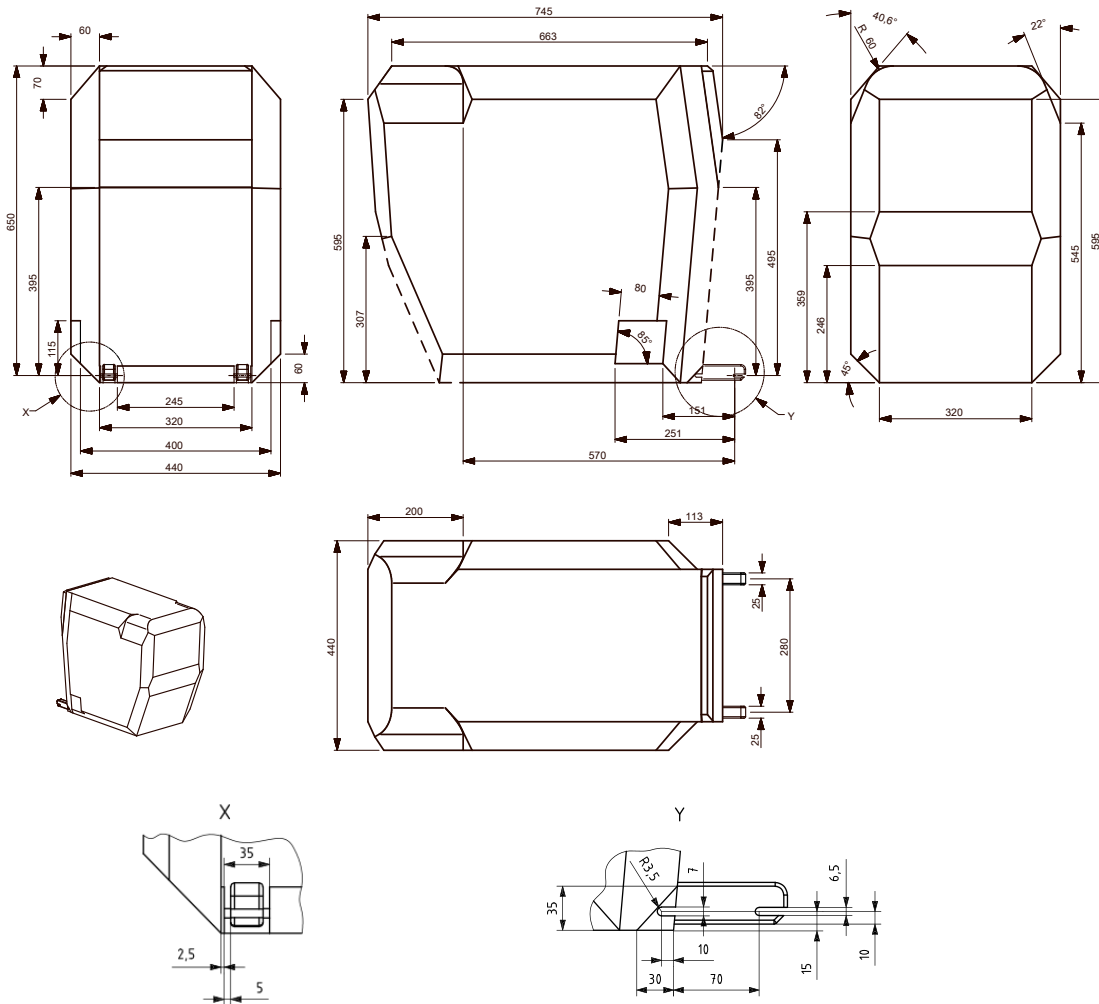
<i>CRF</i>	<i>Mass (kg)</i>	<i>Tolerance (kg)</i>
R1 ^a	10	± 0,2
R2 / R2X ^a	10	± 0,2
R3	13	± 0,2
L1 / L2	13	± 0,2
F2 / F2X ^a	13	± 0,2
F3	13	± 0,2
^a ISOFIX base mass taken into account.		

The physical centre of gravity of each CRF shall correspond to the geometrical centroid of the volume."

Annex 17, Appendix 2, insert new Paragraph 4.7.:

"4.7. Rearward facing infant child restraint systems envelope ISO/R2X

Figure 7
Reduced-Size Rearward Facing toddler CRS Envelope dimensions for a reduced-size rearward-facing CRS, modified for improved compatibility with the vehicle interior



Key

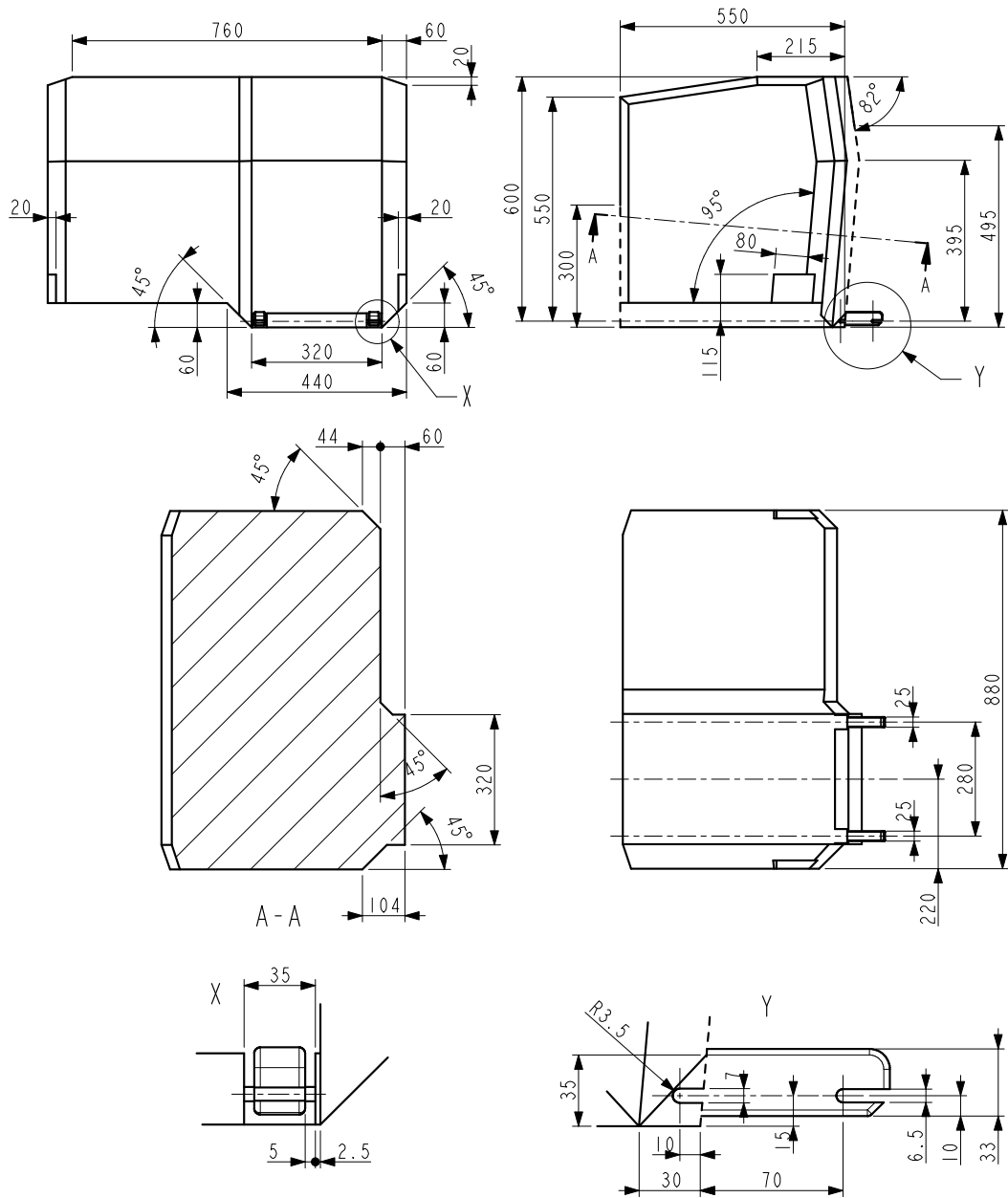
- 1 limits in the rearward and upward directions
- 2 dashed lines mark the area where an anti-rotation device, or similar (e.g. rebound bar), is allowed to protrude
- [3 the backward limitation (to the right in the figure) is given by the forward-facing envelope in Figure 2]
- 4 for further specifications of the connector area, see detail Y and ISO 13216-1:1999, Figures 2 and 3"

Annex 17, Appendix 2, paragraph 4.7.(former), renumber as para. 4.8. and amend to read:

"4.78. Lateral facing child restraint systems envelope

Figure 78
Envelope dimensions for lateral facing position CRS - ISO/L1- ~~ISOFIX SIZE CLASS F~~ or symmetrically opposite - ISO/L2 (figure shown) ~~ISOFIX CLASS G~~

Note: The envelope for a left lateral-facing infant CRS (ISO/L1) has dimensions symmetric to ISO/L2 with regard to its intermediate longitudinal plan.



Key

- 1** limits in the rearward and upward directions
- 2** dashed lines mark the area where an anti-rotation device, or similar (e.g. rebound bar), is allowed to protrude."

Figures 8 and 9, renumber as Figures 9 and 10.

Annex 17, Appendix 3., Table 1, amend to read:

" ...

Seat position number	Seating position								
	1	2	3	4	5	6	7	8	9
Seating position suitable for universal belted (yes/ no)									
i-Size seating position (yes/ no)									
Seating position suitable for lateral fixture (L1/ L2)									
Largest suitable rearward facing fixture (R1/ R2X / R2/ R3)									
Largest suitable forward facing fixture (F1/ F2X /F2/ F3)									
Largest suitable booster fixture (B2/B3)									

..."
 Annex 17, insert new Appendix 5 to read:

"Annex 17 – Appendix 5

Provisions on the installation of forward-facing booster seat child restraint systems of universal and specific categories installed on vehicle seating positions or i-Size seating positions

1. General

- 1.1. The test procedure and the requirements in this appendix shall determine the suitability of seating positions for installing booster seat fixtures ISO/B2 or ISO/B3, without ISOFIX attachments. Where the vehicle manufacturer has indicated that the vehicle position(s) will accommodate a particular CRF, then it shall be assumed that smaller CRFs of the same orientation can also be accommodated.
- 1.2. The tests may be carried out in the vehicle or in a representative part of the vehicle. Compliance with this requirement can be proven by a physical test or computer simulation or representative drawings.

2. Test procedure

i-Size positions in the vehicle, defined by the vehicle manufacturer, shall be checked to ensure that the ISO/B2 fixture listed in paragraph 4 of this Appendix can be accommodated, at least without ISOFIX connections.

- 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° 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 foremost positions. The seat backrest angle may also be adjusted, but not to a more upright angle than corresponding to a torso angle of 15°. If the front seat is adjustable

in height, adjust to the manufacturer's specification. In the absence of any specification, adjust the front seat to mid-height position, or the nearest position to mid height.

- 2.4. If necessary, head restraints may be adjusted or removed, if possible.
- 2.5. Set the shoulder anchorage to the position defined by the vehicle manufacturer.
- 2.6. Place cotton cloths on the seat-back and cushion, if needed.
- 2.7. Remove the ISOFIX attachments from the CRF, or retract them to a position fully inside the backseat line (reference line E, Figure 2 or 3).
- 2.8. Place the fixture (as described in Figure 2 or 3 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.
- 2.9. Arrange the seat belt through the CRF in approximately the correct position, and then fasten the buckle. Ensure that all webbing slack is removed. The fixture shall be restrained by the vehicle's seat belt.
- 2.10. Ensure that the fixture is located with its centreline on the apparent centreline of the seating position ± 25 mm with its centreline parallel with the centreline of the vehicle seat. The roll angle α (see figure 1) shall be within $0^\circ \pm 5^\circ$
- 2.11. 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.
- 2.12. 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.
 - 3.2. The roll angle α as shown in Figure 1 shall be equal to or less than 5° .
 - 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 by the arrows in Figure 1. The booster seat envelope is equipped with an adjustable backrest. Compatibility with the vehicle seating position shall be achieved in at least one position of the backrest range shown in Figure 2 or Figure 3.
 - 3.4. Should the above requirements not be met with the adjustments indicated in paragraphs 2.1. to 2.12. 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 described according to paragraph 1.1 of Annex 17 and in detailed technical information specified in Appendix 3.
4. Booster seat child restraint system fixtures:
 - (a) ISO/B2: Booster seat, reduced width 440 mm (figure 2)

(b) ISO/B3: booster seat, full width 520 mm (figure 3)

The fixtures above shall be constructed with a mass of 7 kg +/- 0,2 kg and shall be of suitable durability and stiffness to satisfy the functional requirements.

Figure 1
Positioning in seat

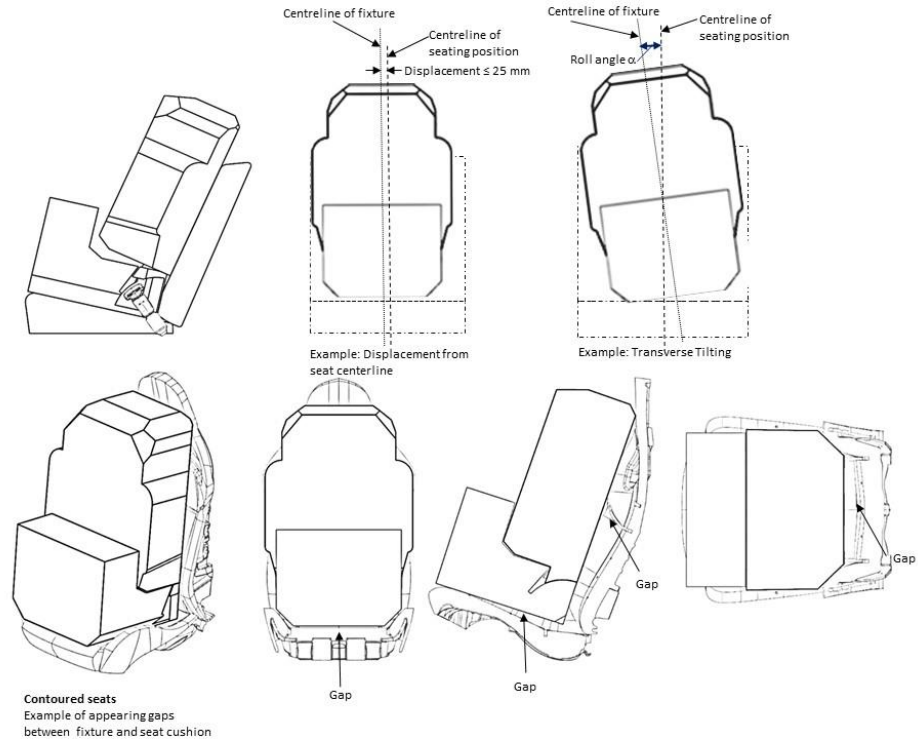


Figure 2
ISO/B2: Envelope dimensions for booster seat, reduced width 440 mm - without ISOFIX, or with connectors removed or stowed within the body of the fixture (behind line E, as defined by detail B).

Key E is the Reference axle of rotation of the backrest (90° to 110°) and reference line for retraction/stowing of ISOFIX

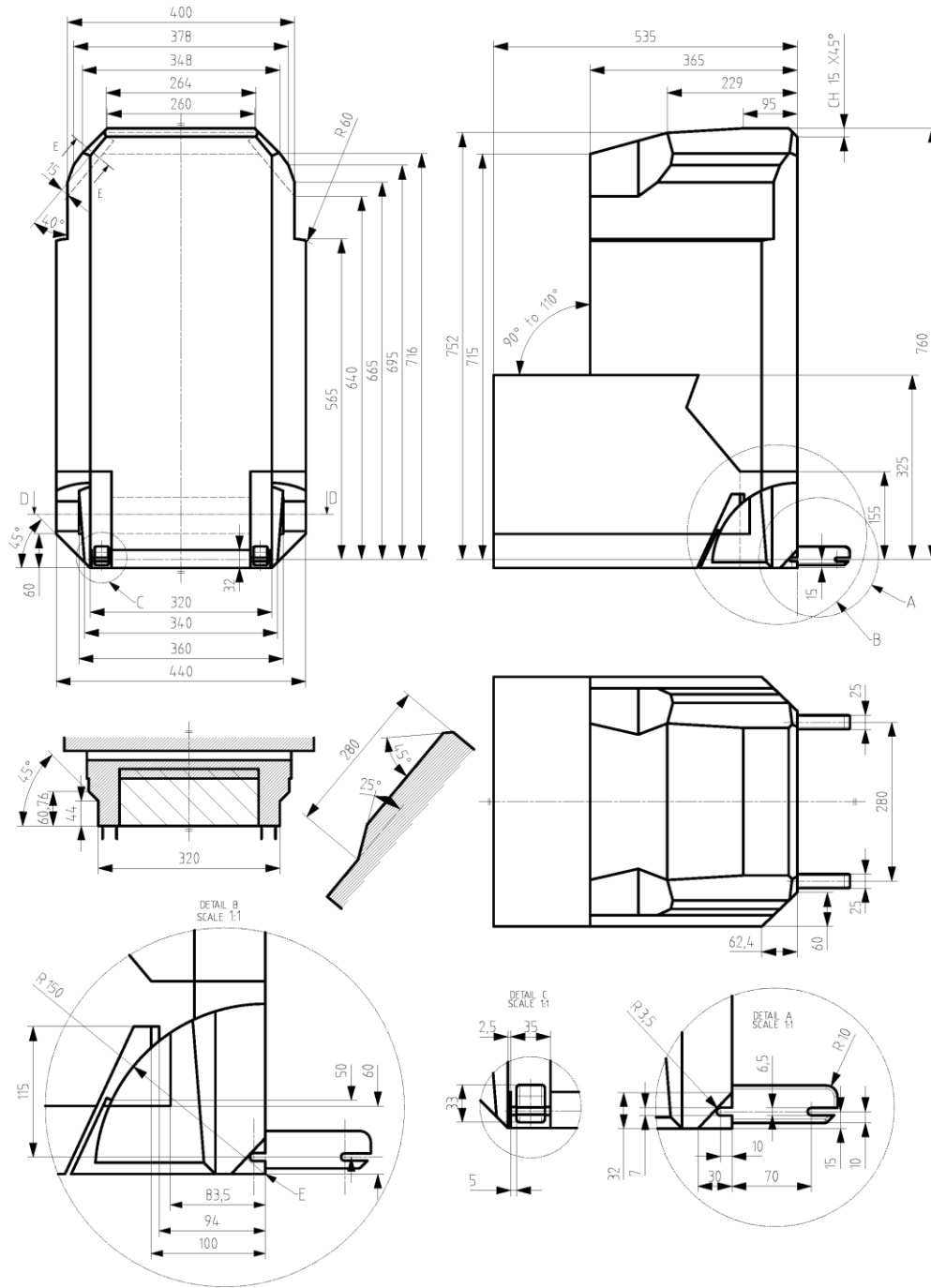
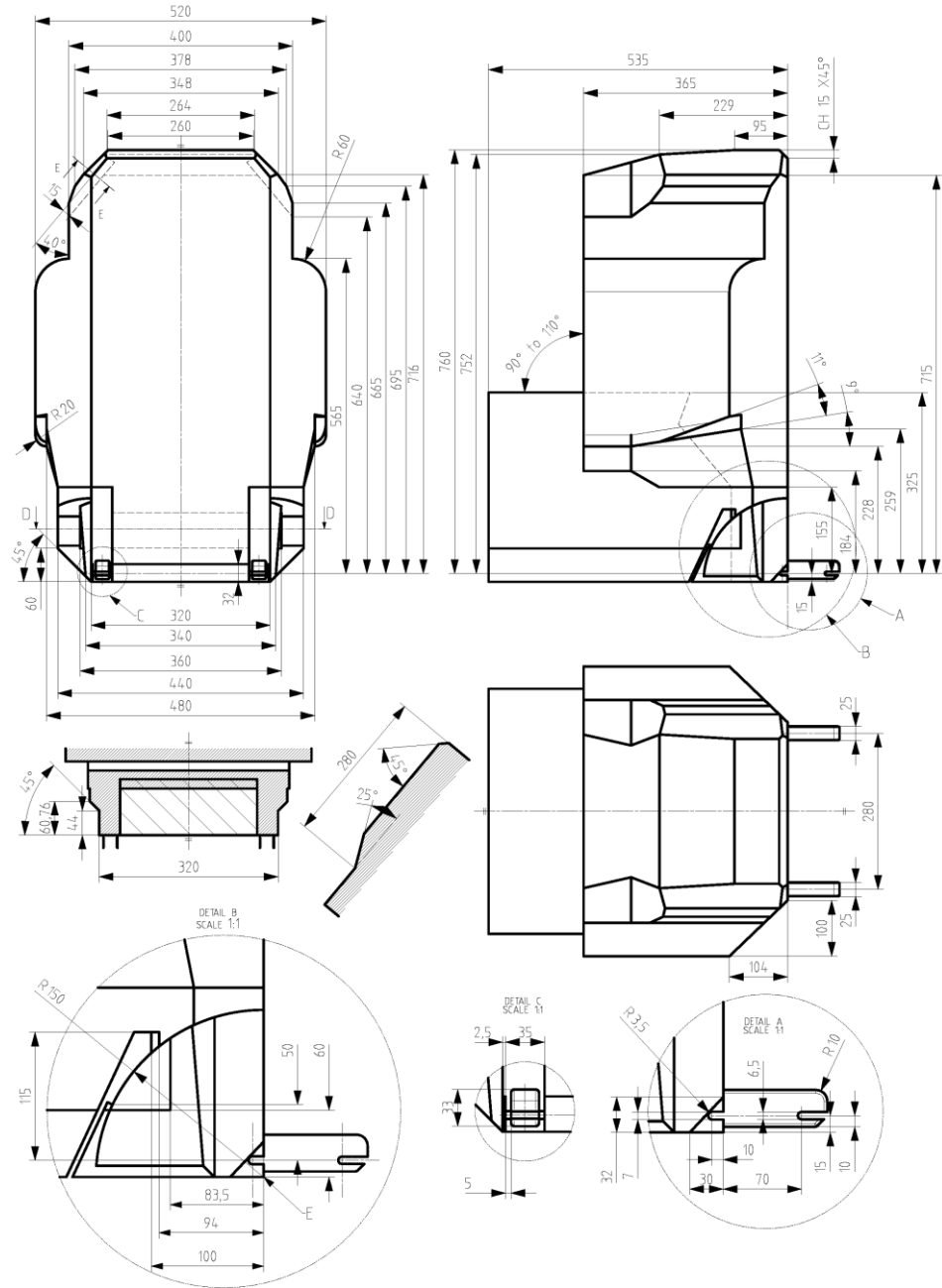


Figure 3
ISO/B3 - Envelope dimensions for booster seat, full width 520 mm - without ISOFIX,
or with connectors removed or stowed within the body of the fixture (behind line E, as
defined by detail B).

Key **E** is the reference axle of rotation of the backrest (90° to 110°) and
reference line for retraction/stowing of ISOFIX



II. Justification

Two "Booster Seat" fixtures (ISO/B2 and ISO/B3) were added to Regulation No. 16 to coincide with the implementation of Phase 2 of UN Regulation No. 129. These fixtures were developed within ISO/TC 22/SC 36/WG 2 (Child Restraint Systems) and follow the principle already established in Regulations No. 16 and No. 129 to ensure child restraint to car compatibility. An additional "Reduced-Size Rearward Facing toddler CRS" fixture (ISO/R2x) was added to facilitate compatibility in small cars/seating positions. The ISO/B2 booster seat fixture was added in the i-Size concept. Lateral facing fixtures (ISO/L1 and ISO/L2) have been upgraded.
