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Item 19 of the provisional agenda

Regulation No. 129 (Enhanced Child Restraint Systems)**Proposal for the 01 series of amendments to Phase 1 of
Regulation No. 129 (Enhanced Child Restraint Systems)****Submitted by the expert from France***

The text reproduced below was prepared by the expert from France. It introduces the amendments to UN Regulation No. 129 (Enhanced Child Restraint System (ECRS)) that were agreed upon by the experts of the Informal Working Group on Child Restraint Systems (IWG CRS). It supersedes ECE/TRANS/WP.29/GRSP/2015/09 and it is based on an informal document GRSP-57-20 distributed at the fifty-seventh session of the Working Party on Passive Safety (GRSP). The modifications to the existing text of the UN Regulation are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2012–2016 (ECE/TRANS/224, para. 94 and ECE/TRANS/2012/12, programme activity 02.4), 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.



I. Proposal

In all the text, except in paragraphs 5.2. and 6.3.2.2.1., replaces respectively,

"a Child Restraint Systems" or "a child restraint" by "an Enhanced Child Restraint Systems"

"Child Restraint Systems" or "child restraint" by "Enhanced Child Restraint Systems"

"CRS" by "ECRS"

"a CRS" by "an ECRS"

Paragraph 1., amend to read:

"1. Scope

This Regulation applies (in its Phase 1) to Integral Universal ISOFIX **Enhanced** Child Restraint Systems (i-Size) and, **to** Integral Specific vehicle **ISOFIX Enhanced** Child Restraint Systems for child occupants of power driven vehicles."

Paragraphs 2.3. and 2.4., amend to read:

"2.3. "i-Size" (Integral Universal ISOFIX **Enhanced** Child Restraint Systems) is a category of **Enhanced** Child Restraint System primarily designed for use in all i-Size seating position of a vehicle, as defined and approved according to Regulations Nos. 14 and 16.

2.4. "**Integral**" and "**Non-Integral**"

2.4.1. "**Integral**" is a class of **Enhanced** Child Restraint System, meaning that the child is restrained only by components which comprise the **Enhanced** Child Restraint System (e.g. strap harness, impact shield, etc.), and not by means connected directly to the vehicle (e.g. **adult** seat belt).

2.4.2. "**Non-Integral**" is a class of **Enhanced Child Restraint System, meaning that the retention of the child within the Enhanced Child Restraint System is achieved by means connected directly to the vehicle (e.g. adult seat belt).**"

Paragraphs 2.7., amend to read:

"2.7. "**Specific vehicle ECRS**"

2.7.1. "*Specific vehicle ISOFIX*" is a category of **Integral Enhanced** Child Restraint System connecting to specific vehicle types. All vehicle anchorages are to be approved according to Regulation No. 14. It is also an indication for **Enhanced** Child Restraint Systems including dashboard as a vehicle contact zone."

Paragraph 2.8., amend to read:

"2.8. "Size" indicates the stature of the Child.

2.8.1. "**Size range**" is a range for **which** the **Enhanced** Child Restraint System has been designed and approved.

2.8.2. **Enhanced** Child Restraint Systems may cover any size range provided that all requirements of **this Regulation** are fulfilled."

Paragraphs 2.17., amend to read:

"2.17. "*Vehicle Seat Fixture* (~~VSE~~)"

2.17.1. "**ISOFIX Vehicle seat fixture**" means a fixture, according to ISOFIX size classes whose dimensions are given in **Figures 1 to 7** of Appendix 2 to **Annex 17** to Regulation No. 16, used by an **Enhanced** Child Restraint System manufacturer to determine the appropriate dimensions of an ISOFIX **Enhanced** Child Restraint System and the location of its ISOFIX attachments."

Paragraph 2.21., amend to read:

"2.21. "**ECRS Belt**" means an **Enhanced Child Restraint System** comprising a combination of straps with a securing buckle, adjusting devices and attachments."

Paragraph 2.22., amend to read:

"2.22. "*Harness belt*" means an **ECRS** belt assembly comprising a lap ~~belt strap~~, shoulder restraints and a crotch strap."

Paragraph 2.23., amend to read:

"2.23. "*Y-shaped belt*" means an **ECRS** belt where the combination of straps is formed by a strap to be guided between the child's legs and a strap for each shoulder."

Paragraph 2.30., amend to read:

"2.30. "*Lap strap*" means a strap which, either in the form of a complete **ECRS** belt or in the form of a component of such an **ECRS** belt passes across the front of, and restrains, directly or not, the child's pelvis."

Paragraph 2.31., amend to read:

"2.31. "*Shoulder strap*" means that part of an **ECRS** belt which restrains the child's upper torso."

Paragraph 2.32., amend to read:

"2.32. "*Crotch strap*" means a ... it is designed to prevent the child sliding under the lap ~~belt strap~~ in normal use and prevent the lap ~~belt strap~~ moving up off the pelvis in an impact."

Paragraph 2.33., amend to read:

"2.33. "*Child-restraining strap*" means a strap which is a constituent part of the **ECRS** belt (harness) and restrains only the body of the child."

Paragraph 2.37., amend to read:

"2.37. "*Adjusting device*" means a device enabling the **ECRS** belt or its attachments to be adjusted to the physique of the wearer. The adjusting device may either be part of the buckle or be a retractor or any other part of the **ECRS** belt."

Paragraph 2.44., amend to read:

"2.44. "*Vehicle seat*" means a structure, which may or may not be integral with the vehicle structure, complete with trim and intended to seat one adult person. In this respect:

2.44.1. "*Group of vehicle seats*" means either a bench seat or a plurality of seats which are separate but side by side (i.e. so fixed that the front anchorages of

one seat are in line with the front or rear anchorages of another seat or on a line passing between those anchorages), each seat accommodating one or more seated adult persons.

- 2.44.2. "Vehicle bench seat" means a structure complete with trim and intended to seat more than one adult person.
- 2.44.3. "Vehicle front seats" means the group of seats situated foremost in the passenger compartment, i.e. having no other seat directly in front of them.
- 2.44.4. "Vehicle rear seats" are fixed, forward-facing seats situated behind another group of vehicle seats."

Paragraph 2.51., amend to read:

- "2.51. "ISOFIX position" means a location **as defined in paragraph 2.17. of Regulation N°14** ~~which allows for the installation of either:~~
- ~~(a) Universal ISOFIX Child Restraint System as defined in Regulation No. 44; or~~
 - ~~(b) A "specific vehicle ISOFIX" Child Restraint System as defined in Regulation No. 44 or a "specific vehicle ISOFIX" as defined in this Regulation; or~~
 - ~~(c) An i Size Child Restraint System suitable for use in specific ISOFIX seating positions as defined by the vehicle manufacturer according to Regulation No. 16."~~

Paragraph 2.55., amend to read:

- "2.55. "Shoulder strap positioner" means a device intended to maintain, ~~during normal transit conditions,~~ the appropriate shoulder strap position on the child's torso, **during normal transit conditions** by connecting the shoulder straps to one another."

Insert new paragraphs 2.56., to read:

- "2.56. "**Module**", is a part of an ECRS that is separate from the ISOFIX connectors and is in direct contact with the child. A module can be used as a stand-alone to restrain a child in a car. A base is allowed to accept more than one module (Module A, Module B, etc.)."

Paragraph 3.2.2., amend to read:

- "3.2.2. The applicant shall indicate the kind of application:
- (a) Application for an i-Size **Enhanced** Child Restraint Systems; or
 - (b) Application for a Specific vehicle ISOFIX;
 - (c) **Or any combination of (a), and (b) as long as they fulfil paragraph 5.4.2.2."**

Paragraph 3.2.3., amend to read:

- "3.2.3. For **Enhanced** Child Restraint Systems ... combination of the **Enhanced** Child Restraint System and the car or the ISOFIX seating position and the relevant car environment for which the manufacturer has requested a Specific vehicle ~~ISOFIX~~ approval. This documentation needs to indicate:
- (a) The available area around the **Enhanced** Child Restraint System when installed on the **vehicle** seating position. In particular it shall include

parts which might interfere with the **Enhanced** Child Restraint System during an impact;

- (b) All relevant vehicle parts which might influence the (rotational) movement of the **Enhanced** Child Restraint System during an impact, due to their strength or stiffness."

Paragraph 3.2.7., amend to read:

- "3.2.7. In case of a "specific vehicle ~~ISOFIX~~" application when tests are performed in a vehicle body shell, a body of the vehicle, including adult seats and the relevant parts of the car environment shall be available."

Paragraph 4.3., amend to read:

- "4.3. The orientation of the **Enhanced** Child Restraint System relative to the **vehicle. The size range(s) of the Enhanced Child Restraint System in centimetres and the maximum occupant mass allowed for the Integral Enhanced Child Restraint System in kilograms shall be clearly indicated on the product.**

The marking defined in this paragraph shall be visible with the **Enhanced** Child Restraint System in the vehicle, with the child in the **Enhanced** Child Restraint System."

Paragraph 4.5., amend to read:

- "4.5. In the case of **Integral Enhanced** Child Restraint Systems that can be used forward facing, it shall have the following label permanently attached and visible to the person installing an **Enhanced Child Restraint System** in the vehicle:

The manufacturer ..."

Paragraphs 4.6. and 4.6.1., amend to read:

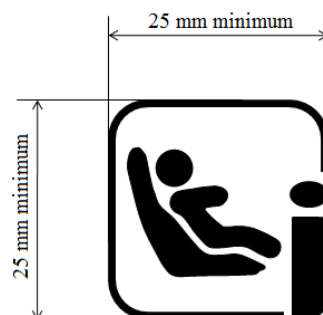
- "4.6. **Marking for integral ECRS including ISOFIX connections ~~i-Size~~ marking**

The marking shall be located on the part of the ECRS which includes the ISOFIX connectors.

One of the following information labels shall be permanently visible to someone installing the **Enhanced** Child Restraint System in a vehicle:

- 4.6.1. **The i-Size ECRS:**

i-Size logo. The symbol ... or by adequate relief if it is moulded or embossed;



Paragraphs 4.6.2. and 4.6.3., shall be deleted

- 4.6.2. ~~The size range of the Child Restraint System in centimeters;~~
 4.6.3. ~~The maximum occupant mass allowed for the Child Restraint System in kilograms.~~

Paragraphs 4.7., renumber as paragraph 4.6.2. and amend to read:

"4.6.2. *Specific Vehicle ISOFIX ECRS* ~~marking~~

If the product includes ISOFIX attachments, the following information shall be permanently visible to someone installing the restraint in a vehicle:

The ISO ISOFIX logo followed by the letter(s) that is/are appropriate for the ISOFIX size class(es) into which the product fits. As a minimum, a symbol consisting of a circle with a diameter of minimum 13 mm and containing a pictogram, the pictogram shall contrast with the background of the circle. The pictogram shall be clearly visible either by means of contrast colors or by adequate relief if it is moulded or embossed.



B, C and F

The *Specific vehicle ISOFIX Enhanced* Child Restraint System shall have a permanently attached label visible to the person installing the **Enhanced** Child Restraint System in the car, containing the following information:

Specific Vehicle ISOFIX  "

Paragraphs 4.8.(former), renumber as paragraph 4.7.

Paragraph 5.2., amend to read:

5.2. An approval number shall be assigned to each type approved. Its first two digits (at present 01 corresponding to the 01 series of amendments ~~which entered into force on 9 July 2013~~) 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 another type of **Enhanced** Child Restraint System covered by this Regulation.

A type of **Enhanced** Child Restraint System approved according to this Regulation shall not bear another approval mark according to Regulation No. 44 (Child Restraint Systems).

Paragraph 5.4.1.1., the reference to footnote ¹ and footnote ¹, renumber as footnote ²

Paragraphs 5.4.2. to 5.4.2.2., amend to read:

- "5.4.2. The following additional symbols:
- 5.4.2.1. The words "i-Size universal ISOFIX", or "specific vehicle ISOFIX" depending on the category of **Enhanced** Child Restraint System;
- 5.4.2.2. The size range for which the **Enhanced Child Restraint System** has been designed;

ECRS which can be converted into another configuration for taller children shall accommodate an uninterrupted range of child statures."

Paragraph 6.1.1., amend to read:

"6.1.1. **Enhanced** Child Restraint Systems in the i-Size category are for use in i-Size seating positions, when the **Enhanced** Child Restraint Systems are fitted in conformity with the vehicle manufacturer's instructions.

Enhanced Child Restraint Systems in the specific vehicle ISOFIX category are for use in all ISOFIX positions and also in the luggage area, if the restraints are fitted in conformity with the vehicle manufacturer's instructions."

Paragraph 6.1.2., amend to read:

"6.1.2. According to the category in which it belongs to, see Table 1, the **integral Enhanced** Child Restraint System shall be secured to the vehicle structure or to the vehicle seat structure:"

Paragraph 6.1.2.2., the title of Table 1, amend to read:

"Table 1
Possible configurations for type approval **for Integral Enhanced Child Restraint Systems.**"

Paragraph 6.1.3., renumber as paragraph 6.1.2.3.

Paragraph 6.2.1.2., amend to read:

"6.2.1.2. The **Enhanced** Child Restraint System shall be such that the child may be easily and readily restrained or removed. In the case of an **Enhanced** Child Restraint System in which the child is restrained by means of a harness belt or a Y-shaped belt without a retractor each shoulder restraint and lap strap shall be capable of movement relative to each other during the procedure prescribed in paragraph 6.7.1.4. below; in these cases the ~~belt assembly of~~ **Enhanced** Child Restraint System **belt assembly** may be designed with two or more connecting parts.

For Special Needs Restraints it is recognized that the additional restraining devices will restrict the speed by which a child can be restrained and removed. However, the additional devices shall be designed to release quickly so far as possible;"

Paragraph 6.2.1.4., amend to read:

"6.2.1.4. To prevent submarining, either by impact or through restlessness, a crotch strap shall be required on all **integral** forward-facing restraints incorporating an integral harness belt system."

Paragraph 6.2.1.5., amend to read:

"6.2.1.5. All restraint devices utilizing a "lap strap" shall positively guide the "lap strap" to ensure that the loads transmitted by the "lap strap" are transmitted through the pelvis. The assembly shall not subject weak parts of the child's body (abdomen, crotch, etc.) to excessive stresses.

Moreover, the design shall be such that compression loads shall not be imposed on the crown of the child's head in the event of a collision;"

Paragraph 6.2.1.7. amend to read:

"6.2.1.7. With the crotch strap attached and in its longest position if adjustable, it shall not be possible to adjust the lap strap to lie above the pelvis of both the smallest and largest dummy within the ~~mass groups~~ **"size range"** covered by the approval. For all forward-facing restraints, it shall not be possible to adjust the lap strap to lie above the pelvis of both the smallest and largest dummy within the ~~mass groups~~ **"size range"** covered by the approval."

Insert new paragraph 6.2.1.9., to read:

"6.2.1.9. At least the worst case configuration of the dynamic test for the Enhanced Child Restraint System shall be performed after conditioning according to paragraph 7.2.6."

Paragraph 6.2.5., amend to read:

"6.2.5. An **Enhanced** Child Restraint System may be designed for use in any ~~range of size~~ **range** specified by the manufacturer provided that it satisfies the requirements laid down in this Regulation."

Paragraphs 6.3.1.1. and 6.3.1.2., amend to read:

"6.3.1.1. The **Enhanced** Child Restraint System manufacturer shall declare in writing that the toxicity of materials used in the manufacture of restraint systems and accessible to the restrained child is in conformity with the relevant parts of EN 71-3:~~1994/A1:2000/AC~~ **in its last edited version**. Tests confirming the validity of the declaration may be carried out at the discretion of the test authority.

6.3.1.2. The **Enhanced** Child Restraint System manufacturer shall declare in writing that the flammability of materials used to manufacture the **Enhanced Child Restraint System** is in conformity with the relevant paragraphs of EN 71-2:~~2011~~ **in its last edited version**. Tests confirming the validity of the declaration may be carried out at the discretion of the test authority."

Paragraph 6.3.2.1., amend to read:

"6.3.2.1. Internal geometric characteristics
The Technical Service conducting the approval tests shall verify that the internal dimensions of the **Enhanced** Child Restraint System conform to the requirements of Annex 18. For any size within the size range declared by the manufacturer the ~~minimum~~ dimensions for **minimum** shoulder breadth, **minimum** hip breadth and **minimum** sitting height shall be fulfilled ~~together with~~ **as well as the dimensions for minimum and maximum shoulder height.**"

Paragraphs 6.3.2.2., amend to read:

"6.3.2.2. External dimensions
The Universal Integral Class Enhanced Child Restraint Systems shall be adjusted to the largest size of its declared stature range (height, depth and width dimensions as defined in Annex 18). The Enhanced Child Restraint System may be adjusted to other inclined positions (less or more reclined) that are outside the Vehicle Seat Fixture's height; in this case, the child restraint manufacturer's user manual shall clearly indicate that when used in one of these configurations, the Enhanced

Child Restraint System may not fit in all vehicles approved for a Universal fixture."

6.3.2.2.1. Integral Class Enhanced Child Restraint Systems

The maximum dimensions for width, height and depth of the **Enhanced** Child Restraint System and the locations of the ISOFIX anchorages system with which its attachments shall engage, shall be defined by the **ISOFIX** Vehicle Seat Fixture (~~VSF1~~) as defined in paragraph 2.17.1. of this Regulation.

- (a) i-Size Forward facing **Enhanced** Child Restraint Systems shall fit within the ISO/F2x size envelope for a reduced-height forward-facing toddler CRS ISOFIX SIZE CLASS B1;
- (b) i-Size Rearward facing **Enhanced** Child Restraint Systems shall fit within the ISO/R2 size envelope for a reduced-size rearward-facing toddler CRS ISOFIX SIZE CLASS D;
- (c) Specific vehicle ISOFIX **Enhanced** Child Restraint Systems **shall fit in vehicle(s) specified or shall may fit within any at least in one of ISO (R1, R2, R3, F2, F2X, F3, L1, L2) size envelope."**

Paragraph 6.3.5., the reference to footnote ² and footnote ², renumber as footnote ³

Paragraph 6.3.5.1., amend to read:

"6.3.5.1. Support-leg and support-leg foot geometrical requirements

...

- (c) In height by a plane parallel to the X'-Y' plane, positioned at a distance of 70 mm above **the** origin and **measured** perpendicular to the X'-Y' plane. Rigid, ... volume."

Paragraph 6.3.5.4. amend the text to read:

"6.3.5.4. Support-leg foot jig

A jig shall be used to check that the support-leg foot meets the requirements defined in paragraph 6.3.5.2. above (see Figure 0(e)). As an alternative a computer simulation shall also be considered satisfactory.

The jig is defined as the ISOFIX CRF corresponding to the size class of the **Enhanced Child Restraint System**. The jig is expanded with two 6 mm diameter ISOFIX low anchorages. The striped box positioned in front of the jig is positioned and sized according paragraph 6.3.5.2. above. The **ECRS** shall have its attachments latched when conducting the assessment."

Paragraph 6.6.3.1., amend to read:

"6.6.3.1. The **Enhanced** Child Restraint System shall be tested as prescribed in paragraph 7.1.2. of this Regulation; at no point during the whole test shall the manikin be fully ejected from the device. In addition when the test **bench** is in the upside down position, the dummy's head shall not move more than 300 mm from its original position in a vertical direction relative to the test **bench**; **this measurement shall be performed after the load has been removed."**

Paragraphs 6.6.4.1. to 6.6.4.1.4., amend to read:

"6.6.4.1. General: The **dynamic test shall be performed on Enhanced Child Restraint Systems which have not previously been under load and the**

Enhanced Child Restraint System shall be subjected to dynamic tests, in accordance with Table 4, in conformity with paragraph 7.1.3. below:

Table 4
Application of different criteria depending on test set up

<i>Frontal impact</i>				<i>Rear impact</i>		<i>Lateral impact</i>	
<i>Test on trolley+ standard seat</i>		<i>Test in car body</i>		<i>Test on trolley+ standard seat</i>	<i>Test in car body</i>	<i>Test on trolley+ standard seat</i>	
Forward facing	Rearward and lateral facing	Forward facing	Rearward and lateral facing	Rearward and lateral facing	Rearward and lateral facing	Forward facing	Rearward and lateral facing

Note 1: Standard seat means a test seat or test bench as defined in Annex 6.

Note 2: For lateral facing Enhanced Child Restraint Systems in lateral impact, if two positions are possible, then the dummy’s head shall be situated near the side door.

- 6.6.4.1.1. i-Size category **Enhanced** Child Restraint Systems shall be tested on the test ~~trolley by means of the test seat~~ **bench** prescribed in Annex 6, and in conformity with paragraph 7.1.3.1. below.
- 6.6.4.1.2. **Enhanced** Child Restraint Systems of the Specific vehicle categories shall be ~~tested~~ **assessed for fit** with each vehicle model for which the **Enhanced** Child Restraint System is intended. The Technical Service responsible for conducting the test may reduce the number of vehicle ~~models~~ **configurations** tested if they do not differ greatly in the aspects listed in paragraph 6.6.4.1.2.3. of this Regulation. ~~Theis~~ **Enhanced** Child Restraint System ~~may~~ **shall** be **dynamically** tested in one of the following ways:
 - 6.6.4.1.2.1. **Enhanced** Child Restraint Systems according to paragraph 2.7. and in conformity with paragraph 6.3. of this Regulation and which fit in **at least** an envelope defined in Regulation No. 16, Annex 17, Appendix 2, on the test ~~trolley by means of the test~~ bench prescribed in Annex 6 and in conformity with paragraph 7.1.3.1. of this Regulation or in a vehicle body shell in conformity with paragraph 7.1.3.2. of this Regulation.
 - 6.6.4.1.2.2. For **Enhanced** Child Restraint Systems which **are** in conformity with paragraph 6.3. of this Regulation (for example ECRS using no anti-rotation device or using additional anchorages) or do not fit in any envelope defined in Regulation No. 16, Annex 17, Appendix 2 on the test trolley in a vehicle body shell in conformity with paragraph 7.1.3.2. or in a complete vehicle in conformity with paragraph 7.1.3.3. of this Regulation.
 - 6.6.4.1.2.3. Using sufficient parts of the vehicle body shell to be representative of the vehicle structure and impact surfaces. If the **Enhanced** Child Restraint System is intended for use in the rear seat, these shall include the back of the front seat, the rear seat, the floor pan, the B and C pillars and the roof. If the **Enhanced** Child Restraint System is intended for use in the front seat, the parts shall include the dashboard, the A pillars, the windscreen, any levers or knobs installed in the floor or on a console, the front seat, the floor pan and the roof. The Technical Service responsible for conducting the test may permit items to be excluded if they are found to be superfluous. Testing shall be as prescribed in paragraph 7.1.3.2. of this Regulation, except for lateral impact.
- 6.6.4.1.3. The dynamic test shall be performed on Child Restraint Systems which have not previously been under load.

6.6.4.1.4. If an "Specific vehicle ISOFIX" **Enhanced** Child Restraint System is installed in the area behind the rearmost forward facing adult seat positions (for example, the luggage area), one test with the largest dummy/dummies, as allowed by the **Enhanced** Child Restraint System, on a complete vehicle as prescribed in paragraph 7.1.3.3. of this Regulation shall be performed. The other tests, including the conformity of production, may be done as prescribed in paragraph 7.1.3.2. of this Regulation, at the request of the manufacturer."

Paragraphs 6.6.4.1.6. to 6.6.4.1.6.2., amend to read:

"6.6.4.1.6. In the case of **an Enhanced** Child Restraint System making use of an anti-rotation device **and / or a shoulder strap positioner**, the dynamic test shall be carried out as follows:

6.6.4.1.6.1. With the anti-rotation device **and with the shoulder strap positioner** in use, and

6.6.4.1.6.2. without the anti-rotation device **and without the shoulder strap positioner** in use, unless a mechanism is provided to prevent incorrect use of the anti-rotation device **and / or the shoulder strap positioner.**"

Paragraph 6.6.4.3.1., amend to read:

"6.6.4.3.1. Injury assessment criteria for frontal and rear impact as in Table 5.

Table 5

Criterion	Abbreviation	Unit	Q0	Q1	Q1,5	Q3	Q6	Q10
Head performance criterion (only in case of contact during in-vehicle testing)	HPC* (15)		600	600	600	800	800	[800]
Head acceleration 3 ms	A head 3 ms	g	75	75	75	80	80	[80]
Upper neck tension Force	Fz	N	For monitoring purpose**					
Upper neck flexion moment	My	Nm	For monitoring purpose only***					
Chest acceleration 3 ms	A chest 3 ms	g	55	55	55	55	55	[55]
Chest deflection	TBC	mm	NA	For monitoring purpose**				
Abdominal pressure	P	Bar	NA	NA	1.2	1.2	1.2	1.2

*HPC: see Annex 17.

**To be reviewed within 3 years following entry into force of the series 01 of this Regulation.

***~~—To be reviewed within 3 years following entry into force of this Regulation.~~"

Paragraph 6.6.4.4.1., amend to read:

"6.6.4.4.1. **Enhanced** Child Restraint Systems of ~~i-Size~~ **universal** categories:"

Paragraph 6.6.4.4.1.1., amend to read:

"6.6.4.4.1.1. Forward facing **Enhanced** Child Restraint Systems

Head excursion: No part of the head of the dummy shall pass beyond the planes BA, DA and DE as defined in Figure 1 below . This shall be judged up to 300 ms or the moment that the dummy has come to a definitive standstill whatever occurs first."

Paragraph 6.6.4.4.2., amend to read:

"6.6.4.4.2. When **Enhanced** Child Restraint Systems of the "Specific vehicle **ISOFIX**" categories are tested in a complete vehicle or a vehicle body shell, the head performance criterion (HPC) and the Head Acceleration 3 ms shall be used as assessment criteria. Where there is no head contact, these criteria shall be satisfied without measurement, and recorded only as "No Head Contact". After a test, using a complete vehicle, it shall be possible to remove the fully assembled dummy from the **Enhanced** Child Restraint System without the use of mechanical leverage, or the use of tools on the Enhanced Child Restraint System or vehicle structure."

Paragraph 6.6.4.5., amend to read:

"6.6.4.5. Dummy criteria for lateral impact for forward, **lateral** and rearward facing **Enhanced** Child Restraint System."

Paragraph 6.6.4.5.1., amend to read:

"6.6.4.5.1. Main injury assessment criterion — Head containment

...

(b) Head shall not exceed ... Appendix 3, Figure 1.."

Paragraph 6.6.4.5.2., amend to read:

"6.6.4.5.2. Additional Injury assessment criteria for lateral impact

Criterion	Abbreviation	Unit	Q0	Q1	Q1,5	Q3	Q6	Q10
Head performance criterion	HPC (15)		600	600	600	800	800	For monitoring purpose only
Head acceleration 3 ms	A head 3 ms	g	75	75	75	80	80	
Upper neck tension force	Fz	N	For monitoring purpose only*					
Upper neck flexion moment	Mx	Nm	For monitoring purpose only*					

* To be reviewed within 3 years following entry into force of this Regulation. "

Paragraph 6.7.1.4. amend to read:

"6.7.1.4. It shall be possible to release the child from the restraint by a single operation on a single buckle **after release of the shoulder strap positioner, if any**. It is allowed to remove the child together with devices such as infant carrier/carry-cot/carry-cot restraints if the **Enhanced** Child Restraint System can be released by operation of a maximum of two release buttons."

Paragraph 6.7.2.7., amend to read:

"6.7.2.7. An adjuster mounted directly on the **Enhanced** Child Restraint System shall be capable of withstanding repeated operation and shall, before the dynamic test prescribed in paragraph 7.1.3. undergo a test comprising $5,000 \pm 5$ cycles as specified in paragraph 7.2.36."

Paragraph 6.7.3.1.2., amend to read:

"6.7.3.1.2. If the retractor is part of a lap **strap**, the retracting force ... are effected."

Paragraph 6.7.3.2.5., amend to read:

"6.7.3.2.5. If the retractor is part of a lap **strap**, ... are effected.

Paragraph 6.7.5., amend to read:

"6.7.5. ISOFIX attachment specifications

~~"ISOFIX attachments" and latching indicators shall be capable of withstanding repeated operations and shall, before the dynamic test prescribed in paragraph 7.1.3. below, undergo a test comprising 2,000 ± 5 opening and closing cycles under normal conditions of use.."~~

Paragraph 7.1.2.4., amend to read:

"7.1.2.4. Remove the load at a rate not exceeding 400 mm/min and measure **residual** displacement."

Paragraph 7.1.3., amend to read:

"7.1.3. Dynamic testing for frontal, rear and lateral impact:

- (a) Frontal impact test shall be performed on i-Size (Integral Universal ISOFIX **Enhanced** Child Restraint Systems) and, Specific vehicle ISOFIX **Enhanced** Child Restraint Systems;
- (b) Rear impact test shall be performed on i-Size and Specific Vehicle ISOFIX Rearward **and Lateral** facing **Enhanced** Child Restraint Systems;
- (c) Lateral impact test are performed only on the test bench for i-Size Integral Universal ISOFIX **Enhanced** Child Restraint Systems, and Specific vehicle ISOFIX;
- (d) **The ECRS shall be tested in its most upright used position. If this upright position falls outside the Seat Fixture, this position shall still to be chosen. However with width positions outside the Seat Fixture, for the lateral test the width position of lateral shock absorbers that still fit in the Vehicle Seat Fixture shall be chosen;**
- (e) **The lateral dynamic test(s) will be performed in this(ese) configuration(s);**
- (f) **For frontal and rear impacts, the tests shall be performed with the ECRS adjusted to the size of the dummy (ies) selected to cover the entire size range, in the child seating position representing the worst case for this dummy and impact orientation;**
- (g) **An anti rebound device acting on the vehicle seatback shall stay inside the seat fixture in one position, but may protrude beyond the seat fixture in its adjusted position according to the user manual."**

Paragraph 7.1.3.1.1., amend to read:

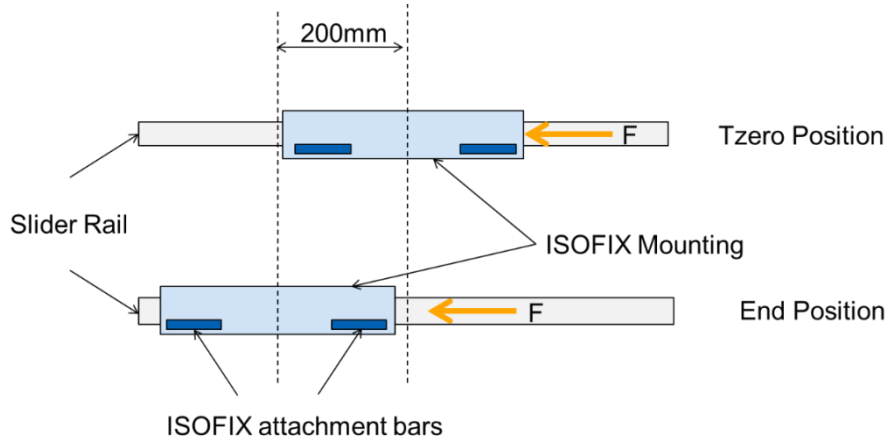
"7.1.3.1.1. Frontal ~~and rear~~ impact tests."

Paragraph 7.1.3.1.2.1., amend to read:

"7.1.3.1.2.1. The test ~~seat~~ **bench** shall be rotated 180° when testing its compliance with the requirements of the rear impact test."

Paragraph 7.1.3.1.3.2., amend to read:

"7.1.3.1.3.2 The lower ISOFIX anchorages should be movable in the Y direction to avoid damage to the attachments and test equipment. The ISOFIX anchorages shall be fixed to a sliding system allowing a movement of 200mm -0mm +50mm. **When measured with a dynamometer at a rate of 600-1200mm/min positioned in a plane parallel the sliding surface and aligned to the central axis of the sliding surface, the force required to move the sliding system (both anchorages together) throughout its entire range, shall not exceed 100N. This verification shall be performed every 50 tests or every 6 months whichever occurs first.**



"

Paragraph 7.1.3.1.3.5., shall be deleted

Paragraph 7.1.3.1.3.6., renumber as paragraph 7.1.3.1.3.5.

Paragraph 7.1.3.4., amend to read:

"7.1.3.4. The conditions for dynamic test are summarized in Table 6:

Table 6

..."

Paragraphs 7.1.3.5.2. and 7.1.3.5.2.1., amend to read:

"7.1.3.5.2. Installation for frontal, rear **and lateral** impacts.

7.1.3.5.2.1. Installation of a **Integral Universal ISOFIX Enhanced** Child Restraint Systems (**i-Size**); or **Integral Specific vehicle ISOFIX Enhanced** Child Restraint Systems on the test bench.

The unoccupied **ISOFIX Enhanced** Child Restraint System shall be attached to the ISOFIX anchorage system.

Securing the ISOFIX attachments to the ISOFIX lower anchorages shall be permitted to draw the unoccupied **Enhanced** Child Restraint System towards those anchorages.

An additional force of 135 +/- 15N shall be applied in a plane parallel to the surface of the test seat cushion. The force shall be applied along the centre line of the **Enhanced** Child Restraint System and at a height no more than 100 mm above the cushion.

If present, the top tether shall be adjusted to achieve a tension load of 50 +/- 5N. Alternatively, and if present, the support-leg shall be adjusted

according to the **Enhanced** Child Restraint System manufacturer's instructions.

The **Enhanced** Child Restraint System centre line shall be aligned with the centre line of the test bench.

The dummy shall be placed in the **Enhanced** Child Restraint System separate from the seat-back of the chair by a flexible spacer. The spacer shall be 2.5 cm thick and 6 cm wide. It shall have length equal to the shoulder height less the thigh height, both in the sitting position and relevant to the dummy size being tested. The resulting height of the spacer is listed in the table below for the different dummy sizes. The board should follow as closely as possible the curvature of the chair and its lower end should be at the height of the dummy's hip joint.

	<i>Q0</i>	<i>Q1</i>	<i>Q1.5</i>	<i>Q3</i>	<i>Q6</i>	<i>Q10</i> (design targets)
	Dimensions in mm					
Height of spacer device for positioning of dummy	173 ± 2	229 ± 2	237 ± 2	250 ± 2	270 ± 2	359 ± 2

Adjust the **ECRS** belt in accordance with the manufacturer's instructions, but to a tension of 250 ± 25 N above the adjuster force, with a deflection angle of the strap at the adjuster of $45 \pm 5^\circ$, or alternatively, the angle prescribed by the manufacturer.

The spacer shall then be removed and the dummy pushed towards to the seat back. Distribute the slack evenly throughout the harness.

The longitudinal plane passing through the centre line of the dummy shall be set midway between the two lower **ECRS** belt anchorages, however note shall also be taken of paragraph 7.1.3.2.1.3. above.

After installation, the dummy position shall be adjusted so that:

The dummy centre line and the **Enhanced** Child Restraint System centre line shall be aligned exactly with the centre line of the test bench.

The arms of the dummy shall be positioned symmetrically. Elbows shall be positioned in such a way that the upper arms are closely aligned with the sternum.

Hands shall be positioned on the thighs.

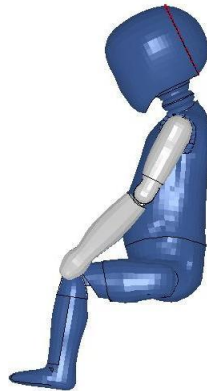
Legs shall be positioned parallel to one another or at least symmetrically.

For lateral impact, positive measures shall be taken to ensure the stability of the dummy is maintained until t_0 and this shall be confirmed using video analysis. Any means used to stabilise the dummy before t_0 shall not influence the dummy kinematics after t_0 .

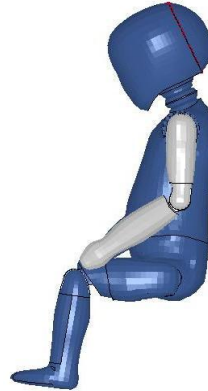
Because the foam of the test bench seat cushion will compress after installation of the **Enhanced** Child Restraint System, the dynamic test shall be conducted no more than 10 minutes after installation.

To allow the test bench seat cushion to recover, the minimum period between two tests using the same test bench seat cushion shall be 20 minutes.

Example for arm alignment:



Arms are aligned with sternum



Arms are not aligned with sternum

Paragraph 7.1.3.6., amend to read:

"7.1.3.6. i- Size indication

The dynamic tests shall be conducted with the largest dummy and the smallest dummy as defined in the following tables according to the size range indicated by the manufacturer for the **Enhanced** Child Restraint System.

Table 7
Selection criteria for the dummy according to the range

Size range indication (in cm)	≤ 60	$60 < x \leq 75$	$75 < x \leq 87$	$87 < x \leq 105$	$105 < x \leq 125$	$125 < x \leq 135$	> 135
Dummy	Q0	Q1	Q1.5	Q3	Q6	Q10 ¹	

¹ No lateral impact test is required for size range over 135 cm until Q10 dummy injury criteria for the lateral impact test are established.

Where the **Enhanced** Child Restraint System requires ... defined above."

Paragraph 7.1.3.6.3., amend to read:

"7.1.3.6.3. If the i-Size **Enhanced** Child Restraint System uses a support-leg, as an anti-rotation device the hereafter mentioned dynamic tests shall be carried out as follows:

- (a) The tests ... in Annex 6, Appendix 2, Figure 2;
..."

Paragraph 7.2.1.1.2., amend to read:

"7.2.1.1.2. The **Enhanced** Child Restraint System shall be removed from the test trolley bench or the vehicle without opening the buckle. ... dynamic test."

Paragraph 7.2.1.2.1., amend to read:

"7.2.1.2.1. A buckle assembly which has not previously been subjected to a load shall be mounted and positioned under a "no load" condition."

Paragraph 7.2.4.1.1. amend to read:

"7.2.4.1.1. The retracting forces shall be measured with the ~~safety~~ **ECRS** belt assembly, fitted to a dummy as for the dynamic test prescribed in paragraph 7.1.3. above. ... of 0.6 m/min."

Paragraph 7.2.6., amend to read:

"7.2.6. Conditioning test for adjusters mounted directly on a child restraint

Install the largest dummy for which the restraint is intended, as if for the dynamic test, including the standard slack as specified in paragraph 7.1.3.5. above. Mark a reference line on the webbing where the free end of the webbing enters the adjuster.

Remove the dummy and place the restraint in the conditioning rig shown in figure 1, Annex 165.

...."

Paragraph 7.5., amend to read:

"7.5. The measuring procedures shall correspond to those defined in the latest version of ISO 6487. The channel frequency class shall be:

Table 9

<i>Type of measurement</i>	<i>CFC(F_H)</i>	<i>Cut-off frequency (F_N)</i>
Trolley acceleration	60	see ISO 6487 Annex A
Belt loads	60	see ISO 6487 Annex A
Chest acceleration	180	see ISO 6487 Annex A
Head acceleration	1 000	1 650 Hz
Upper neck force	1 000	
Upper neck moment	600	
Chest deflection	600	
Abdominal pressure	180	

The sampling rate ... per second per channel)."

Paragraph 8.1., amend to read:

"8.1. The test report shall record the results of all tests and measurements including the following test data:

...

- (h) The following dummy criteria: HIC, Head Acceleration 3 ms, Upper Neck Tension Force, Upper Neck Moment, Thorax Chest Deflection; **Abdominal Pressure (in frontal impact)**
- (i) ~~The lap belt force.~~"

Paragraph 9.2., amend to read:

"9.2. Qualifying the production of **Enhanced Child Restraint Systems**

The production of each new approved type of **Enhanced Child Restraint System** ~~of categories i Size and specific to vehicle~~ shall be subjected to production qualification tests. Additional qualifications of production may be

prescribed following paragraph **11.4.**

For this purpose, a random sample of 5 **Enhanced** Child Restraint Systems will be taken from the first production batch. The first production batch is considered to be the production of the first block containing a minimum of 50 **Enhanced** Child Restraint Systems and a maximum of 5,000 **Enhanced** Child Restraint Systems."

Paragraph 9.2.1.2., amend to read:

"9.2.1.2. For each test described in paragraph 9.2.1.1. above, the injury criteria described in paragraph 6.6.4.3.1. above; and

For forward facing the head excursion described in paragraph 6.6.4.4.1.1. above;

For rearward facing and carrycots the head **excursion** described in paragraph 6.6.4.4.1.2.1. above ~~and head excursion described in 6.6.4.4.1.2.2. above;~~

Shall be measured."

Paragraph 9.2.2., amend to read:

"9.2.2. Dynamic tests for lateral impact

The monitoring of head acceleration on production samples will define acceptance criteria in lateral impact for production qualification as defined in paragraph 9. (to be review before finalising phase 3)"

Paragraph 11.1.3., renumber as paragraph 11.4.

Paragraph 14.2.1., amend to read:

"14.2.1. For "i-Size" category **Enhanced** Child Restraint Systems the following label shall be clearly visible on the exterior of the packing:

Notice

This is an "i-Size" **Enhanced** Child Restraint System. It is approved **according** to Regulation No.129, for use in, "i-Size compatible" vehicle seating positions as indicated by vehicle manufacturers in the vehicle users' manual.

If in doubt, consult either the **Enhanced Child Restraint System** manufacturer or the retailer.

Paragraphs 14.2.2. amend to read:

"14.2.2. For "Specific vehicle ~~ISOFIX~~" category **Enhanced** Child Restraint Systems information on the applicable vehicle shall be clearly visible at the point of sale without removing the **Enhanced Child Restraint System** from its packing;"

Paragraph 14.2.8. amend to read:

"14.2.8. For "~~i-Size~~ Special Needs Restraints" **Enhanced** Child Restraint Systems the following information shall be clearly visible at the point of sale without removing the **Enhanced Child Restraint System** from its packing:

This "~~i-Size~~ Special Needs Restraint" is designed to give extra support to children who have difficulty in sitting correctly in conventional seats. Always consult your doctor to make sure that this restraint system is suitable for your child.

Paragraph 14.3.1., amend to read:

"14.3.1. The "Size range" and **for integral Enhanced Child Restraint System** the maximum occupant mass for which the device is intended:"

Insert new paragraphs 16. to 16.4., to read:

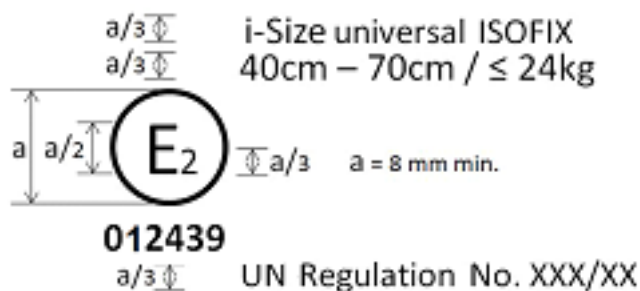
"16. Transitional provisions

- 16.1. As from the official date of entry into force of the 01 series of amendments, no Contracting Party applying this Regulation shall refuse to grant ECE approval under this Regulation as amended by the 01 series of amendments.
- 16.2. As from 1 September [20XX], Contracting Parties applying this Regulation shall grant approvals only if the Enhanced Child Restraint System type to be approved meets the requirements of this Regulation as amended by the 01 series of amendments.
- 16.3. Until 1 September [20XX], Contracting Parties applying this Regulation can continue to grant type approvals to Enhanced Child Restraint Systems which comply with the requirements of this Regulation as in its original version.
- 16.4. Until 1 September [20XX], Contracting Parties applying this Regulation shall not refuse to grant extensions of approval to the original version of this Regulation. "

Annex 2, amend to read:

"Annex 2

Arrangements of the approval mark



The **Enhanced** Child Restraint System bearing the above approval mark is a device capable of being fitted in any i-size compatible vehicle **seating position** and of being used

for the 40 cm \varnothing - 70 cm size range and mass limit of 24 kg; it is approved in France (E 2) under the number 012439. The approval number indicates that the approval was granted in accordance with the requirements of the Regulation concerning the approval of **Enhanced Child Restraint Systems** used onboard of motor vehicles as amended by the 01 series of amendments. In addition the name of the regulation has to be identified on the approval mark followed by the series of amendment according to which the approval has been granted.



The **Enhanced** Child Restraint System bearing the above approval mark is a device not capable of being fitted in every vehicle and capable of being used for the 40 cm \varnothing - 70 cm size range and mass limit of 24 kg; it is approved in France (E 2) under the number 012450. The approval number indicates that the approval was granted in accordance with the requirements of the Regulation concerning the approval of Specific vehicle ISOFIX **Enhanced** Child Restraint Systems used onboard of motor vehicles as amended by the 01 series of amendments. In addition the name of the regulation has to be identified on the approval mark followed by the series of amendment according to which the approval has been granted."

Annex 6, paragraph 3.1.2., amend to read:

"3.1.2. Rigid seating, **made from a rigid metal sheet**, dimensions of which are given in Appendix 1 to this annex. ~~The rear part of the seating is made from a rigid sheet metal. The front part of the seating is also made of a 20 mm diameter tube;~~"

Annex 6, paragraph 3.1.5., Table 1, amend to read:

" Table 1

...

Indentation Load Deflection (ILD)	EN ISO 2439B (40 % compression)	480 (+/15%)	N
--------------------------------------	------------------------------------	--------------------	---

...

"

Annex 6, Appendix 1, shall be deleted

Insert new Appendix 1, to read:

"Annex 6 - Appendix 1

Figure 1
Dimensions in mm of the seat and the seat cushions

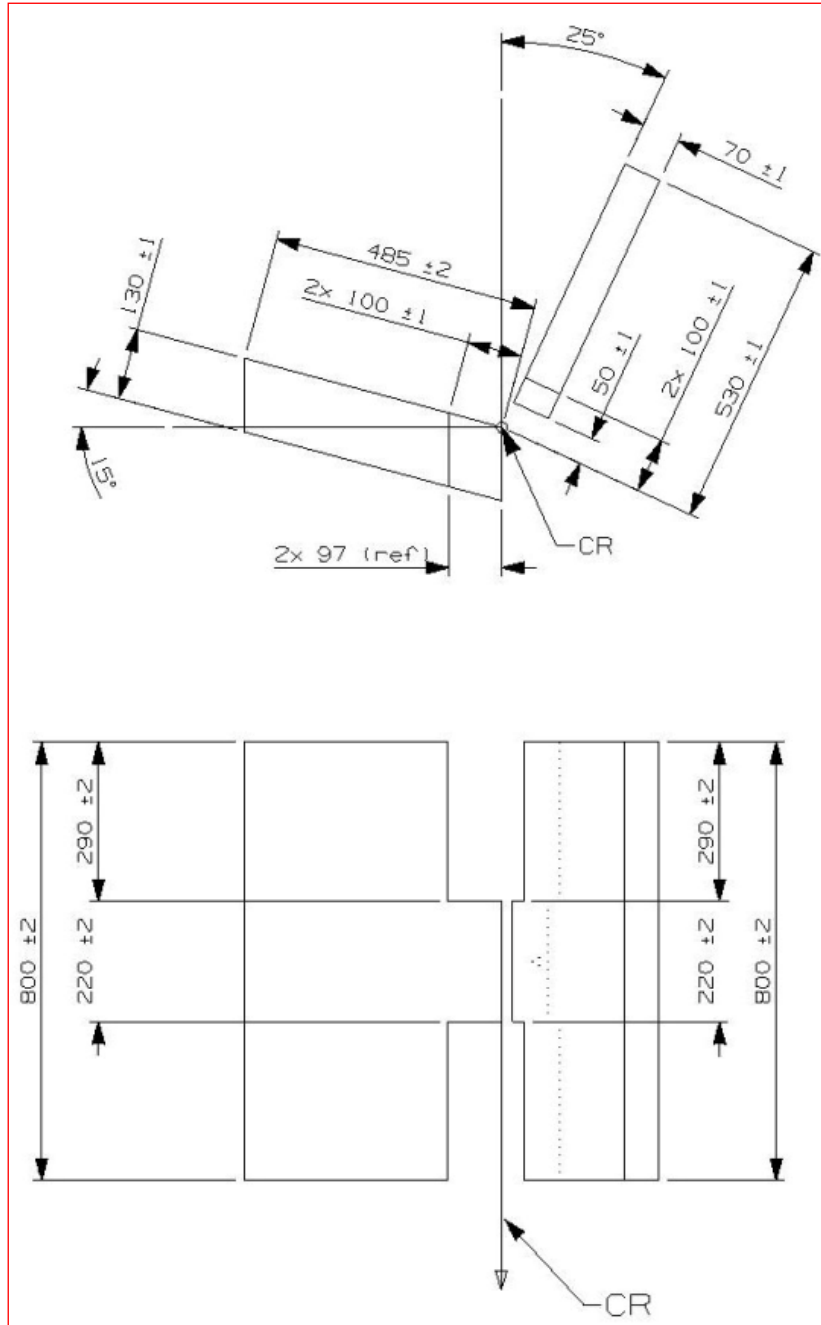


Figure 2
Dimensions of the aluminium bottom-plate and dimensions of the aluminium backrest plate

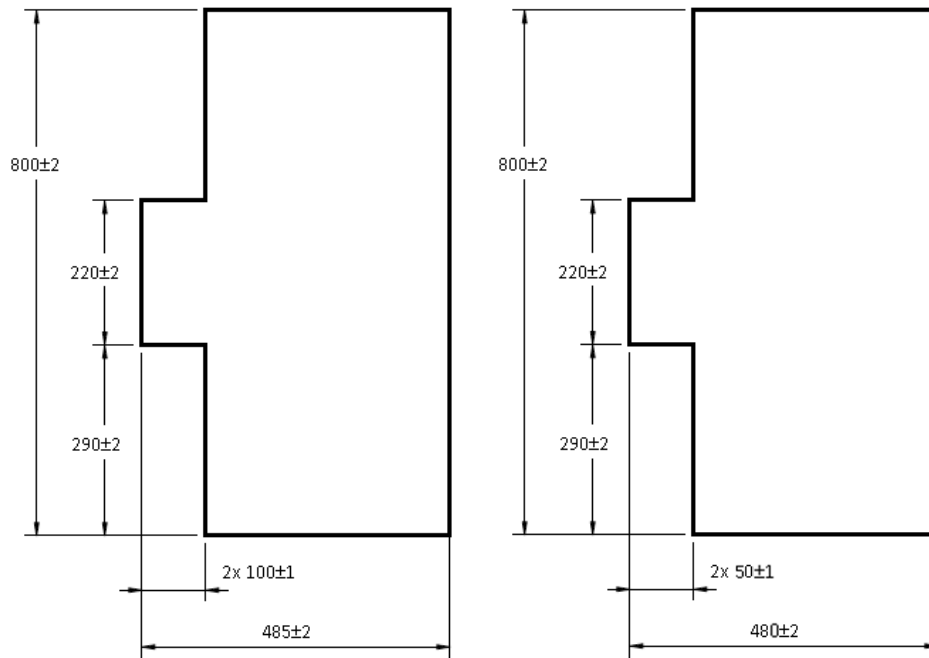
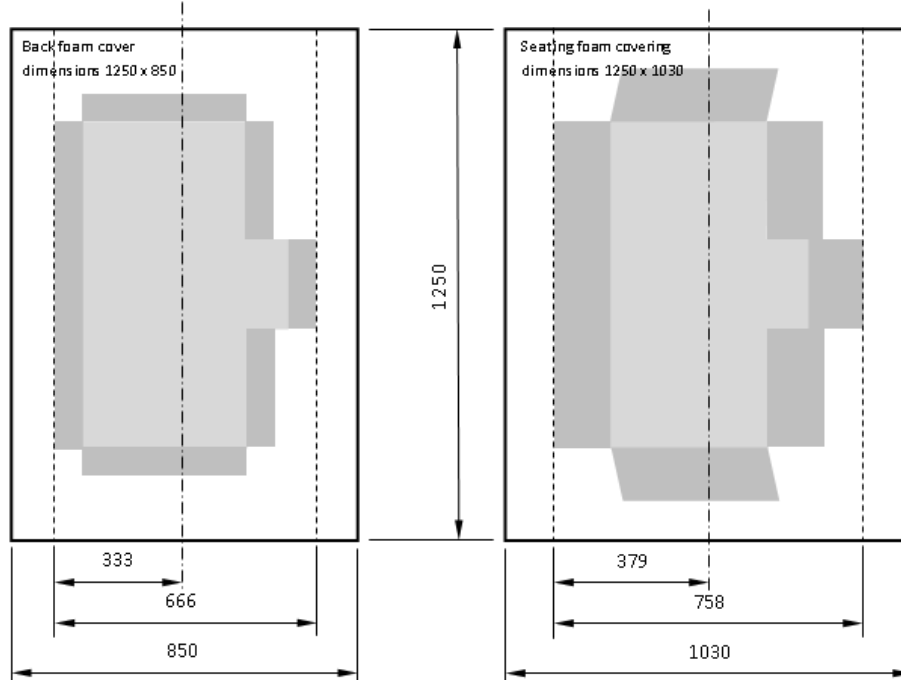


Figure 3
Dimensions of the cover material (dimensions in mm)



Annex 6, Appendix 2, amend to read:

"Annex 6 - Appendix 2

Arrangement and use of anchorages on the test trolley

1. The anchorages shall be positioned as shown in the figure below.
2. **Enhanced** Child Restraint Systems in the i-Size "universal", "specific" and "restricted" categories shall use the following anchorage points: H₁ and H₂.
3. For testing of **Enhanced Child Restraint Systems** with top tether, the anchorage G₁ or G₂ shall be used.
4. In the case of **Enhanced Child Restraint Systems** utilising a support-leg, the Technical Service shall select the anchorages to be used according to paragraph 3. above and with the support-leg adjusted as specified in paragraph 7.1.3.6.3. of this Regulation.
5. The structure carrying the anchorages shall be rigid. The upper anchorages shall not be displaced by more than 0.2 mm in the longitudinal direction when a load of 980 N is applied to them in that direction. The trolley shall be so constructed that no permanent deformation shall occur in the parts bearing the anchorages during the test.

Figure 1

Top View – Bench with ISOFIX anchorages (Tolerance general: ±2 mm)

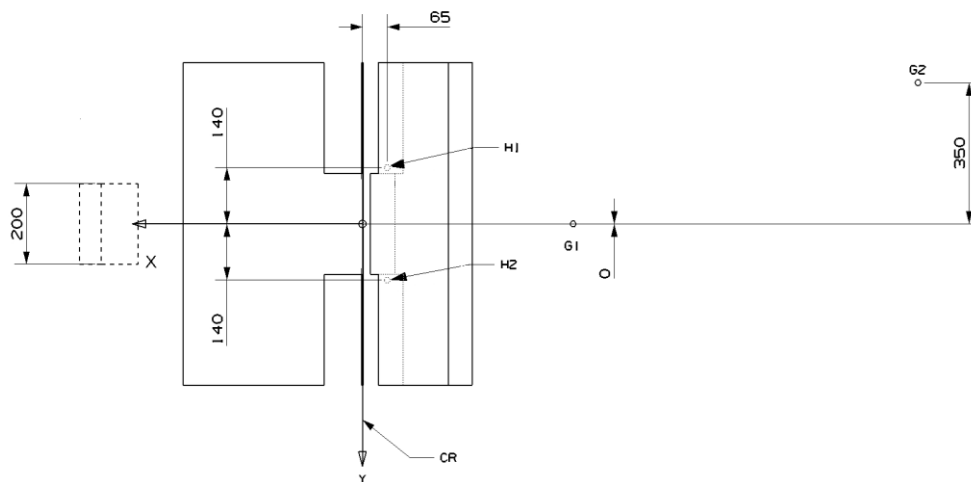
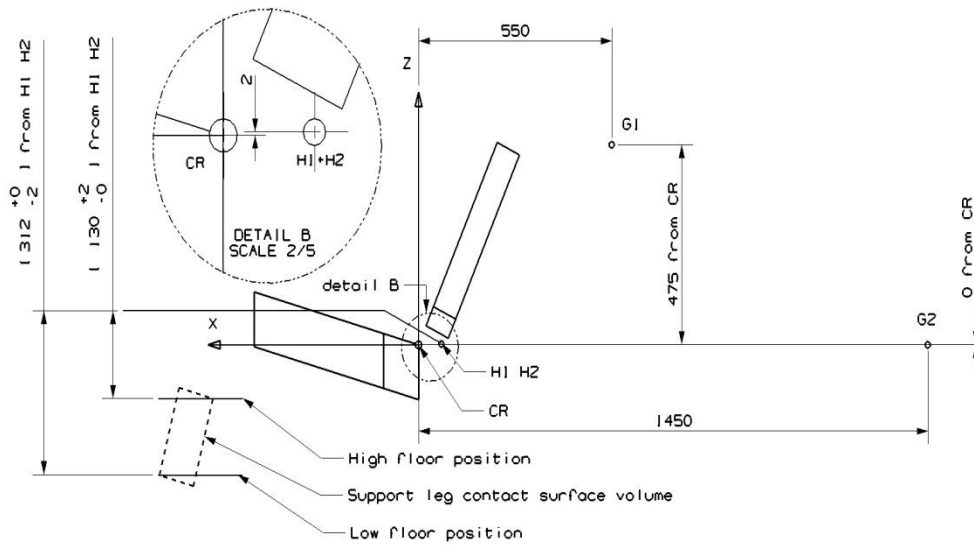


Figure 2
Side View – Bench with anchorages (Tolerance general: ± 2 mm)



Annex 6, Appendix 3, amend to read:

"Annex 6 - Appendix 3

Definition of side impact door

1. Door panel definition

The dimension and initial position of the impact door relative to the bench are described in the following figures.

The stiffness and strength of the door panel shall be sufficient to avoid excessive oscillation or significant deformation during lateral dynamic test.

Figure 1

Door panel geometry and position at T0 – Top view

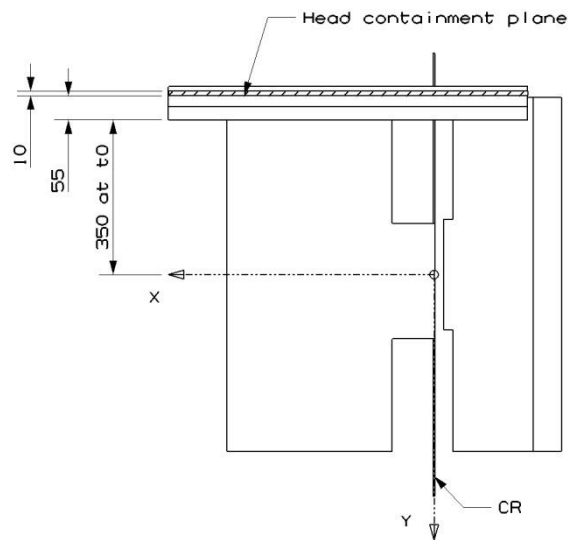


Figure 2
Door panel geometry – Side view (Tolerance general: ±2 mm and ±1 degree)

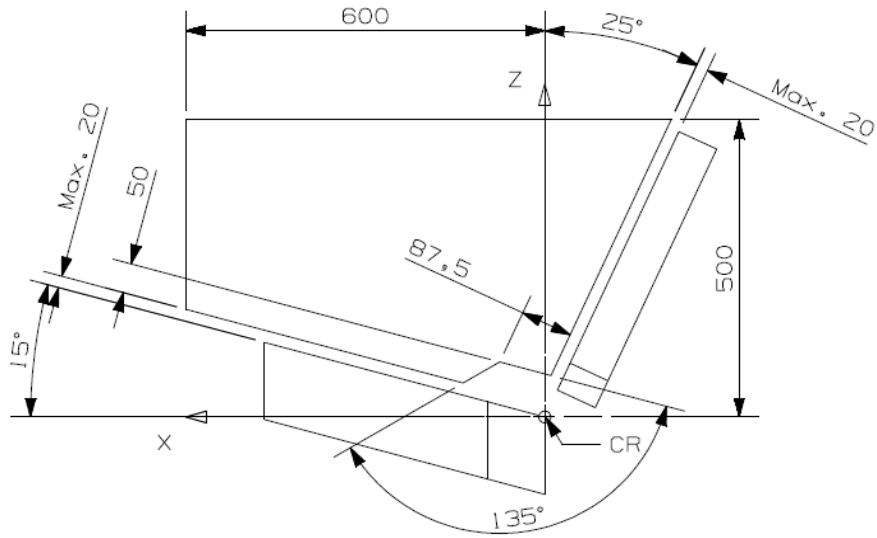
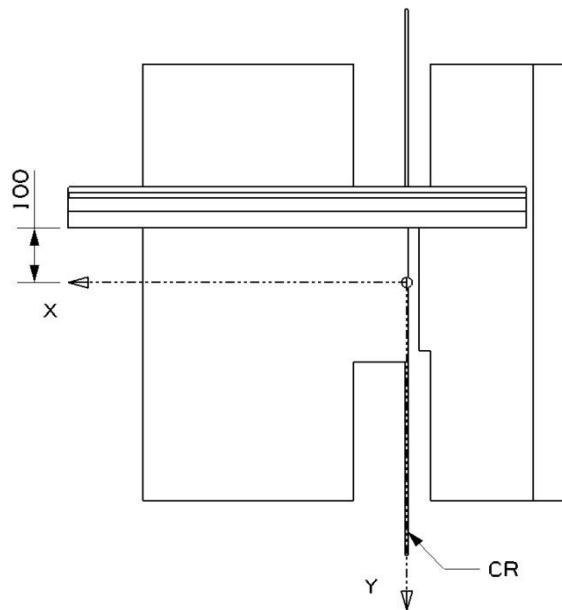


Figure 3
Door panel approximate maximum intrusion – Side view (For information)



2. Panel padding specification

2.1. General

The impact surface of the door panel shall be entirely covered with a padding material of 55 mm in thickness (see Figure 1 above). The material shall comply with the performance criteria specified in paragraph 2.3. (figure 4 below) of this appendix when tested in accordance with paragraph 2.2. of this appendix.

A material combination meeting these requirements is described in paragraph 2.4. of this appendix. ~~The door panel is padded with 55 mm padding material (Annex 6, Appendix 3, Figure 1), which has to comply with the performance criteria as described in Appendix 3 to this Regulation, paragraph 2.3. realised in a test set up as described in Appendix 3 to this Regulation, paragraph 2.2.~~

2.2. Test procedure for the assessment of panel padding material

The test set up consists of a simple drop test using a spherical head form. The spherical head form has a diameter of 150 mm and a mass of 6 kg (± 0.1 kg). The impact speed is 4 m/s (± 0.1 m/s). The instrumentation should allow the assessment of the time of first contact between the impactor and the sample as well as the head form acceleration at least in direction of impact (Z-direction).

The material sample should have the dimensions of 400 x 400 mm. The sample should be impacted in its centre.

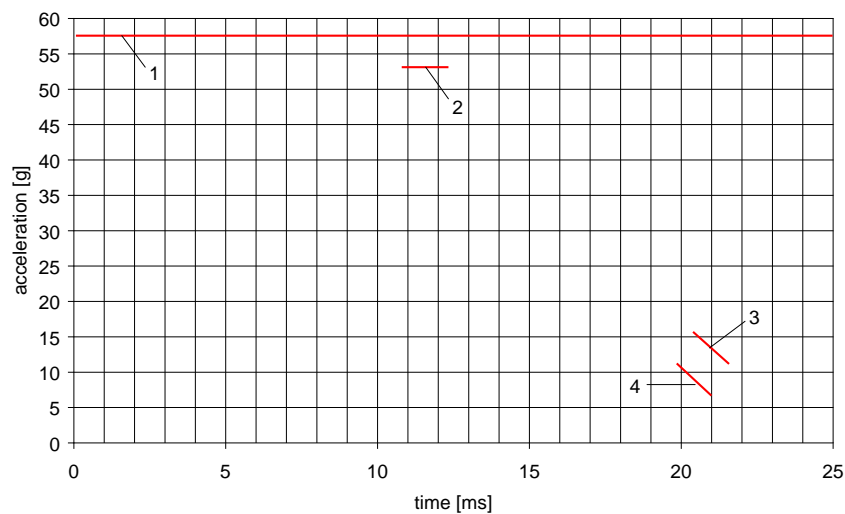
2.3. Performance criteria for the padding material

The time of first contact between sample material and head form (t_0) is 0 ms.

The impactor acceleration shall not exceed 58 g.

Figure 4

Corridor for the padding material



Key

1 - Upper limit of 58 g

2 - Lower limit for the maximum peak at 53 g (11 to 12 ms)

3 - Upper limit for the decline of acceleration (15 g at 20,5 ms to 10 g at 21,5 ms)

4 - Lower limit for the decline of acceleration (10 g at 20 ms to 7 g at 21 ms)

2.4. **Example of material meeting the test requirements:**

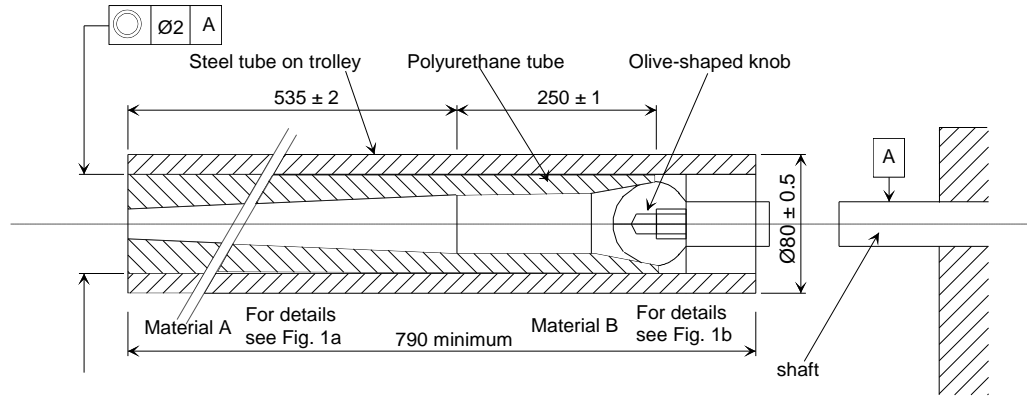
Rubber cell foam Polychloropren CR4271 measuring 35 mm in thickness attached to the door panel structure to which shall then be attached a subsequent layer of Styrodur C2500 20 mm in thickness. The Styrodur needs to be replaced after each test."

Annex 6, insert new Appendix 4, to read:

"Annex 6 - Appendix 4

**Stopping device
Frontal impact dimensions (in mm)**

Figure 1



Play defined according to external diameter of polyurethane tube (light push fit)

3.2 surface finish

Figure 1a
Material A

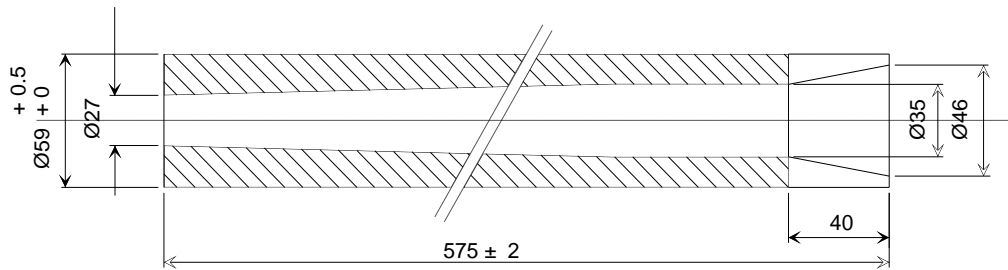


Figure 1b
Material B

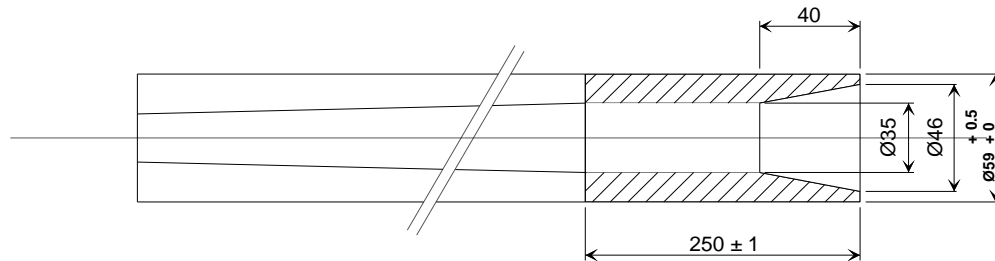
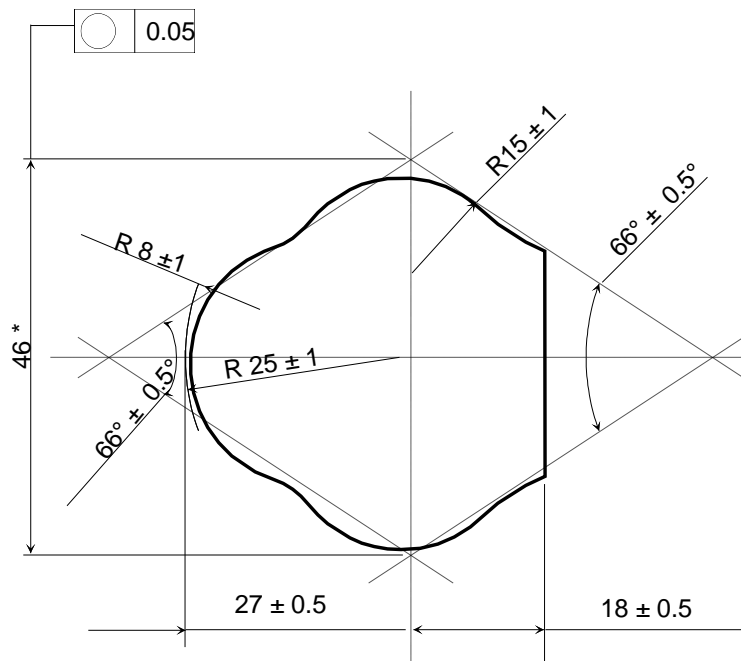


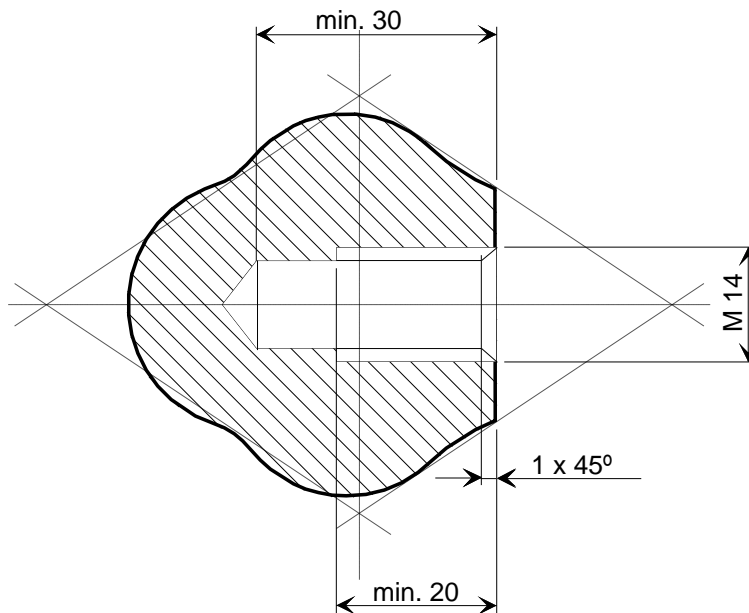
Figure 2
Stopping device olive-shaped knob



* This dimension can vary between 43 and 49 mm

Dimensions in mm

Figure 3
Stopping device olive-shaped knob



Dimensions in mm

Figure 4
Stopping Device (assembled)

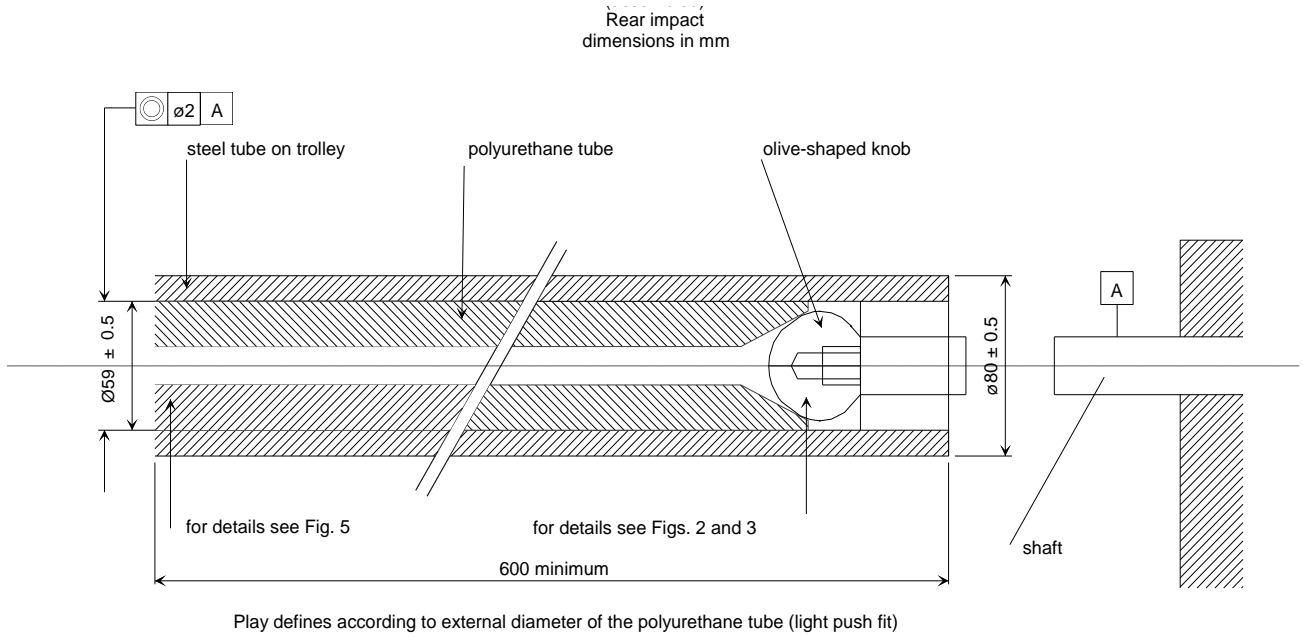
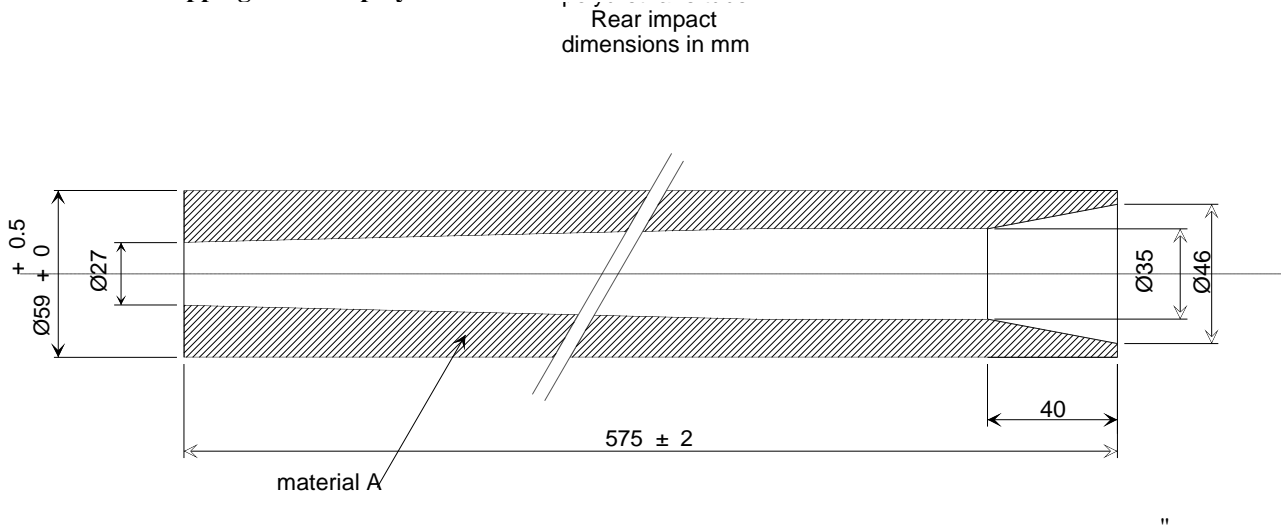
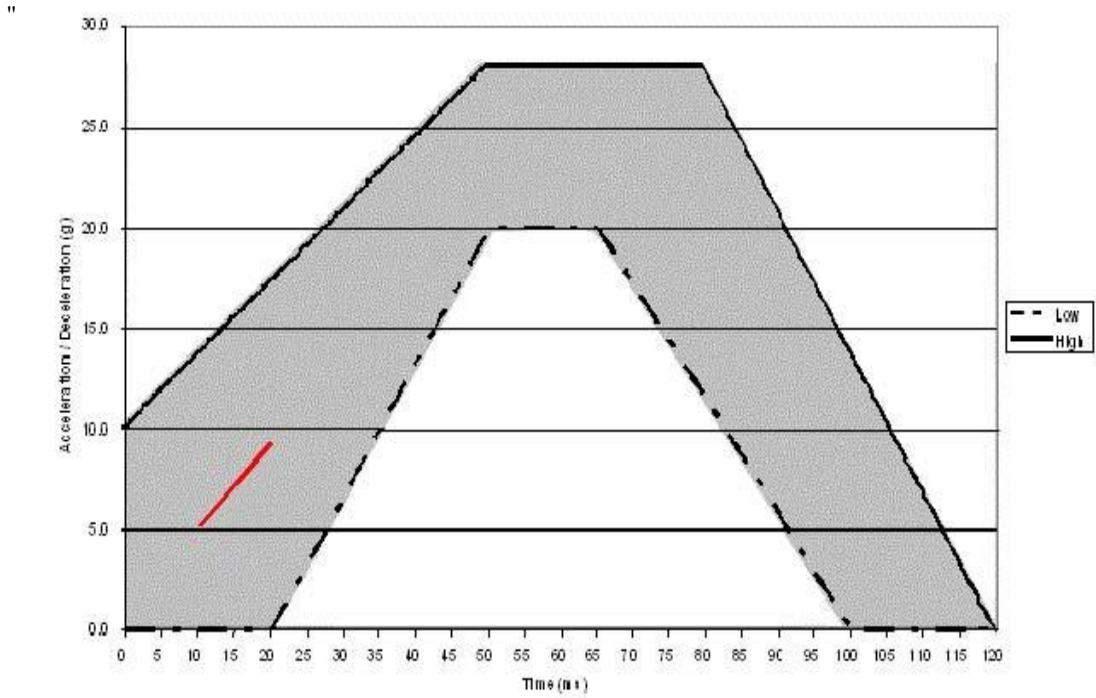


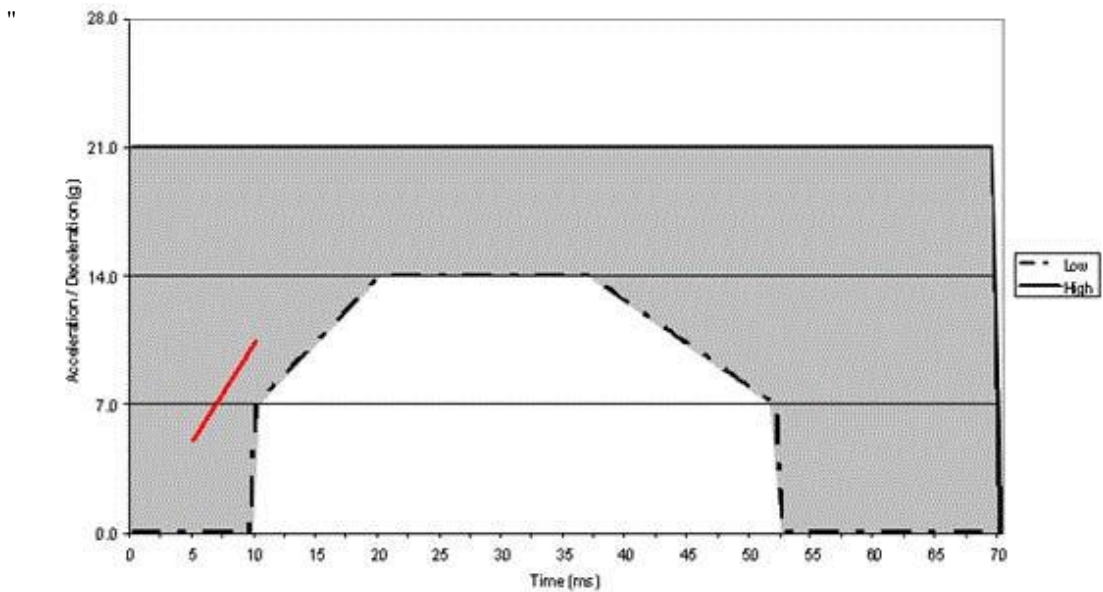
Figure 5
Stopping Device – polyurethane tube



Annex 7, Appendix 1, the figure, amend to read:



Annex 7, Appendix 2, the figure, amend to read:



Annex 7, Appendix 4, shall be deleted

Annex 8, paragraph 1 to 1.2.2., amend to read:

- "1. General
- 1.1. The dummies prescribed in this Regulation are described in this annex, in technical drawings [held by Humanetics Innovative Solutions Inc. and in the user manuals delivered with the dummies. **The abdominal pressure sensors prescribed in this Regulation are described in this annex, in technical drawings held by the French institute of science and technology for transport, spatial planning, development and networks (IFSSTAR) and in the user manuals delivered with the instrumentation.**]
- 1.2. Alternative dummies **and abdominal instrumentation** may be used provided that:
- 1.2.1. Their equivalence can be demonstrated to the satisfaction of the Type Approval Authority, and
- 1.2.2. Their use is recorded in the test report, and in the communication form described in Annex 1 to this Regulation."

Annex 8, paragraph 3.5., amend to read:

- "3.5. Abdomen
- The abdomen is foam covered with skin. Biomechanical data from children has been used to determine the required stiffness. The Q0 abdomen has a simplified layout with an integral foam part for the complete torso. **For frontal impact, the abdomen of the Q1.5, Q3, Q6 and Q10 are instrumented using Abdominal Pressure Twin Sensors (APTS).**"

Annex 8, paragraph 4.1., amend to read:

- "4.1. Mass

Table 1
Q-dummy mass distributions

	<i>Q0</i>	<i>Q1</i>	<i>Q1.5</i>	<i>Q3</i>	<i>Q6</i>	<i>Q10 Design targets</i>
<i>Mass in [kg]</i>						
Head + Neck (incl. acc. mount)	1.103 ± 0.106	2.41 ± 0.10	2.80 ± 0.10	3.17 ± 0.10	3.94 ± 0.10	4.219 ± 0.15
Torso (incl. acc. mount and chest deflection sensor, not including APTS)	1.540 ± 0.1508	4.21 ± 0.25	4.74 ± 0.25	6.00 ± 0.30	9.07 ± 0.40	14.285 ± 0.50 (incl. suit)
Legs (together)	0.58 ± 0.063	1.82 ± 0.20	2.06 ± 0.20	3.54 ± 0.10	6.90 ± 0.10	12.5048 ± 0.44

Arms (together)	0.28 ± 0.032	0.89 ± 0.20	1.20 ± 0.20	1.48 ± 0.10	2.49 ± 0.10	4.00 3.98 ± 0.20
Suit	0.2708 ± 0.052	0.27 ± 0.05	0.30 ± 0.05	0.40 ± 0.10	0.55 ± 0.10	(see torso) 0.63 ± 0.10
Total	3.473 ± 0.3921	9.6 ± 0.80	11.10 ± 0.80	14.59 ± 0.70	22.95 ± 0.80	35.584 ± 1.39

The installation of Abdominal Pressure Twin Sensors (APTS) in frontal impact may add up 0.2 kg to the Q1.5 and 0.5kg to the Q3, Q6 and Q10 dummies.

Annex 8, Table 2 and the notes, amend to read:

"Table 2

Q-dummy dimensions

No.		Q0	Q1	Q1.5	Q3	Q6	Q10 (design targets)
<i>Dimensions in mm</i>							
17	Seating height (head tilted forward)	355 ± 9	479 ± 9	499 ± 9	544 ± 9	601 ± 9	< 748 ± 9
18	Shoulder height (sitting)	225 ± 7	298 ± 7	309 ± 7	329 ± 7	362 ± 7	473 ± 7
	Stature (head tilted forward)	-	740 ± 9	800 ± 9	985 ± 9	1143 ± 9	< 1443 ± 9
5	Chest depth	-	114 ± 5	113 ± 5	146 ± 5	141 ± 5	171 ± 5
15	Shoulder width	230 ± 7	227 ± 7	227 ± 7	259 ± 7	305 ± 7	334.8 ± 7
13	Neck diameter	44	61.9 ¹	61.9 ¹	61.9 ¹	61.9 ¹ 58.0 ² 76.0 ³	65.0 ¹ 85.9 ⁴
12	Hip width	-	191 ± 7	194 ± 7	200 ± 7	223 ± 7	270 ± 7
1	Back of buttocks to front of knees	130 ± 5	211 ± 5	235 ± 5	305 ± 5	366 ± 5	4885.4 ± 5
2	Back of buttocks to popliteus	-	161 ± 5	185 ± 5	253 ± 5	299 ± 5	4184.9 ± 5

¹ The neck diameter is taken as the diameter of the top and bottom plate of the Q dummy necks.

Middle disks are 56.9 mm

² Q6 neck disk at top

³ Q6 neck disk at bottom

⁴ Neck shield diameter

No.		Q0	Q1	Q1.5	Q3	Q6	Q10 (design targets)
21	Thigh height, sitting		69	72	79	92	114
	Height of spacer device for positioning of dummy ⁴	173 ± 2	229 ± 2	237 ± 2	250 ± 2	270 ± 2	359 ± 2

⁴ ~~See section 7.1.3.5.2.1: Height of spacer device (hinged board or similar flexible device) equals shoulder height sitting minus thigh height sitting.~~

Notes:

1. Adjustments of joints

Joints should **preferably** be adjusted according to procedures included in the Q-dummy manuals.⁵

2. Instrumentation

Instrumentation in the Q family of dummies shall **preferably** be installed and calibrated according to procedures contained in the Q-dummy manuals.²ⁿ

⁴ See paragraph 7.1.3.5.2.1.: Height of spacer device (hinged board or similar flexible device) equals shoulder height sitting minus thigh height sitting.

⁵ The technical specifications and detailed drawings of Q-dummy, and the for their adjustment for the tests of this Regulation are deposited in a transitory way on the website of the informal working group on **Enhanced** Child Restraint Systems (www2.unece.org/wiki/display/trans/Q-dummy+drawings) of the UNECE, Palais de Nations, Geneva, Switzerland. At the time of the adoption of this Regulation by the World Forum for Harmonization of Vehicle Regulations (WP.29), the text restricting the use of the drawings and technical specifications will be removed from the individual pages and they will be reloaded on the above-mentioned website. After a time period needed by the Informal Working Group to finalize the examination of the technical specifications and drawings of dummies to cover the phase 2 of the Regulation, the final and agreed drawings will be relocated in the Mutual Resolution of the 1958 and 1998 Agreements, hosted in the website of the World Forum WP.29.”

Annex 8, paragraph 4.2., Note 2, amend to read:

"2. Instrumentation

Instrumentation in the Q family of dummies shall **preferably** be installed and calibrated according to procedures contained in the Q-dummy manuals¹ **and the APTS manual.**"

Annex 12, paragraph 2.2., amend to read:

"2.2. Minimum conditions for the control of conformity of Child Restraint Systems of categories "Universal", "~~Semi Universal~~" and "~~Restricted~~", in relation to the dynamic tests according to paragraph 1.6. above."

Annex 12, paragraph 2.3., amend to read:

"2.3. For "~~Specific vehicle ECRS ISOFIX~~" devices according to paragraph 2.1.2.4.1. above, the **Enhanced** Child Restraint System manufacturer may choose Conformity of Production procedures according to either paragraph 2.2. above, on a test bench, or paragraphs 2.3.1. and 2.3.2. below, in a vehicle body shell."

Annex 12, paragraph 2.3.1., amend to read:

"2.3.1. For "~~Specific vehicle ISOFIX ECRS~~" devices, the following test frequencies shall apply once every eight weeks:..."

Annex 14, paragraph 1, amend to read:

"1. Place the device on the test ~~seat~~ **bench** described in Annex 6. Reclinable devices shall be set in the most upright position. Place the smallest manikin in the device in accordance with the manufacturer's instructions. Mark a point "A" on the backrest on the same horizontal level as the shoulder of the smallest manikin at a point 2 cm inside the outer edge of the arm. All internal surfaces above the horizontal plane passing through point A, shall be tested in accordance with **Annex 13**. This area shall include the backrest and side wings, including the inner edges (zone of radius) of the side wings. In the case of carrycot devices where a symmetrical installation of the dummy is not possible according to the device and manufacturer instructions, the area complying with **Annex 13** shall be all internal surfaces above a point "A", as previously defined, in the head direction, when measured with this dummy in the carrycot in its worst position consistent with the manufacturer instructions and the carrycot positioned on the test bench.

If a symmetrical installation of the dummy in the carrycot may be possible, the whole inner area shall comply with Annex 13."

¹ The technical specifications and detailed drawings of Q-dummy **and APTS**, and the technical specifications for their adjustment for the tests of this Regulation are deposited in a transitory way on the website of the informal working group on Child Restraint Systems (<https://www2.unece.org/wiki/display/trans/Q-dummy+drawings>) of the UNECE, Palais de Nations, Geneva, Switzerland. At the time of the adoption of this Regulation by the World Forum for Harmonization of Vehicle Regulations (WP.29), the text restricting the use of the drawings and technical specifications will be removed from the individual pages and they will be reloaded on the above-mentioned website. After a time period needed by the Informal Working Group to finalize the examination of the technical specifications and drawings of dummies to cover the phase 2 of the Regulation, the final and agreed drawings will be relocated in the Mutual Resolution of the 1958 and 1998 Agreements, hosted in the website of the World Forum WP.29.

Annex 17, paragraph 1.2.4., amend to read:

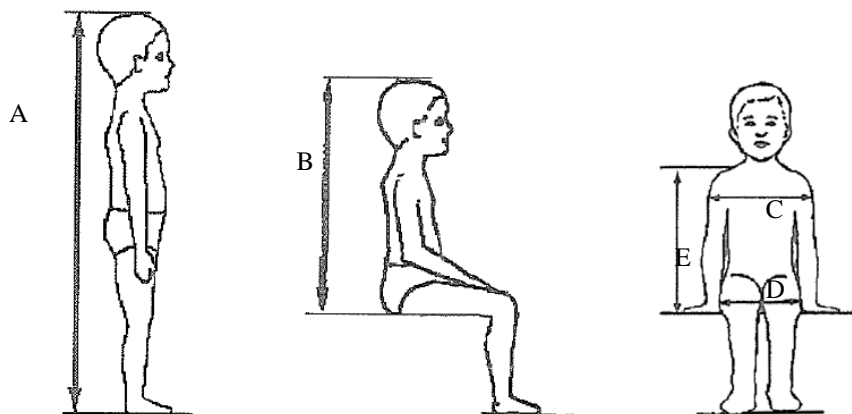
"1.2.4. values of HPC for which the time interval (t1 - t2) is greater than ~~36~~ **15** ms are ignored for the purposes of calculating the maximum value."

Annex 18, amend to read:

"Annex 18

Geometrical dimensions of i-Size-Enhanced Child Restraint Systems

1. Figure 1



<i>Stature cm</i>	<i>Minimum Sitting height cm</i>	<i>Minimum Shoulder breadth cm</i>	<i>Minimum Hip breadth cm</i>	<i>Minimum Shoulder height cm</i>	<i>Maximum Shoulder height cm</i>
<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E1</i>	<i>E2</i>
	<i>95%ile</i>	<i>95%ile</i>	<i>95%ile</i>	<i>5%ile</i>	<i>95%ile</i>
40	NA	NA	NA	NA	NA
45	39.0	12.1	14.2	27.4	29.0
50	40.5	14.1	14.8	27.6	29.2
55	42.0	16.1	15.4	27.8	29.4
60	43.5	18.1	16.0	28.0	29.6
65	45.0	20.1	17.2	28.2	29.8
70	47.1	22.1	18.4	28.3	30.0
75	49.2	24.1	19.6	28.4	31.3
80	51.3	26.1	20.8	29.2	32.6
85	53.4	26.9	22.0	30.0	33.9
90	55.5	27.7	22.5	30.8	35.2
95	57.6	28.5	23.0	31.6	36.5
100	59.7	29.3	23.5	32.4	37.8
105	61.8	30.1	24.9	33.2	39.1
110	63.9	30.9	26.3	34.0	40.4

<i>Stature cm</i>	<i>Minimum Sitting height cm</i>	<i>Minimum Shoulder breadth cm</i>	<i>Minimum Hip breadth cm</i>	<i>Minimum Shoulder height cm</i>	<i>Maximum Shoulder height cm</i>
<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E1</i>	<i>E2</i>
	<i>95%ile</i>	<i>95%ile</i>	<i>95%ile</i>	<i>5%ile</i>	<i>95%ile</i>
115	66.0	32.1	27.7	35.5	41.7
120	68.1	33.3	29.1	37.0	43.0
125	70.2	34.5	30.5	38.5	44.3
130	72.3	35.7	31.9	40.0	46.1
135	74.4	36.9	33.3	41.5	47.9
140	76.5	38.1	34.7	43.0	49.7
145	78.6	39.3	36.3	44.5	51.5
150	81.1	41.5	37.9	46.3	53.3

~~When~~ **All lateral dimensions are** measured under a contact force of 50 N with the device described in Figure 2 of this annex **and** the following tolerances will ~~be applied to the dimensions:~~

Minimum Sitting height:

- ~~From 40~~ up to 87 cm B - **5 per cent**
- From stature from 87 cm and up to 150 cm B - **10 per cent**,

~~Minimum shoulder breadth: C - 0+2 cm~~

~~Minimum hip breadth: D - 0+2 cm~~

Minimum shoulder height (5 percentile): E1 $_{-2}^{+0}$ cm

Maximum shoulder height (95 percentile): E2 $_{-0}^{+2}$ cm

The mass of the device described in Figure 2 of this annex shall be 10 kg +/- 1 kg"

Annex 22, insert new paragraph 2.5., to read:

"2.5. For Infant carrier module the following label shall be clearly visible on the exterior of the packing:

Notice

This is an Enhanced Infant Carrier Module to be used in combination with i-size product approved according to Regulation No. 129, for use in, "i-Size compatible" vehicle seating positions as indicated by vehicle manufacturers in the vehicle user's manual. This module could also be used as a stand-alone infant carrier according to the instructions of the Enhanced Child Restraint System manufacturer.

If in doubt, consult either the manufacturer or the retailer of the Enhanced Child Restraint System.

II. Justification

1. The proposed amendment introduces some corrections to the original version of the Regulation as part of Phase 1 of this UN Regulation.

2. The text includes modifications proposed by GRSP up to and including its fifty-seventh session (Geneva, 18–22 May 2015) as well as those of the IWG CRS up to and including its fifty-third session (London, 2 September 2015).

3. The text includes modifications on paragraph 7.1.3.1.3.2. proposed by the Technical Special Group (TSG).

The friction in the ISOFIX anchorage sliding system has been identified as a potential source of inter-laboratory variation. It is proposed that a maximum sliding force is specified to minimise this effect. The forces measured by two of the laboratories that attend the Technical Services Group were both less than 50N. Acknowledging the small sample of test rigs, it was proposed to set a limit of 100N. This force limit can also be used by laboratories to check for damage of the ISOFIX anchorage sliding system

4. The reference document is the original text of UN Regulation No. 129, Corrigendum 1 and Supplements 1, 2, 3 and 4.
