CRS-26-08

Transmitted by the expert from United Kingdom

Informal document **GRSP-INF CRS 26 - XX**
26th meeting of the GRSP INF CRS
5 July 2011

Proposal for amendments to Draft new Regulation on uniform provisions concerning the approval of enhanced Child Restraint Systems used onboard of motor vehicles

The text reproduced below was prepared by the expert from the United Kingdom It is based on Informal Document No. GRSP-49-39. The modifications to the proposed text contained in that document are marked in underline or strikethrough characters.

I. Proposal

Paragraph 2.2, amend to read:

"2.2 "*Child restraint type*" means a Child Restraint System which does not differ in such essential respects as:

the category in which the restraint is ~~intended to be~~ type approved;

the geometry of the Child Restraint System."

Paragraph 2.3, amend to read:

"2.3 "ⓘ*-Size*" (Integral Universal ISOFIX Child Restraint Systems) is a category of Child Restraint System for use in all ⓘ-Size seating position**s** of a vehicle, as defined and approved according to Regulations No. 14 and 16. This does not preclude the fitting of such an ⓘ-Size Child Restraint System in specific ISOFIX seating positions specified by vehicle manufacturer according to regulation 16."

Paragraph 2.5, amend to read:

"2.5 "*ISOFIX*" is a system that provides a method of connecting a Child Restraint System to a vehicle. It is based on two vehicle anchorages and two corresponding attachments on the Child Restraint System in conjunction with a means to limit the pitch rotation of the Child Restraint System. All three vehicle anchorage**s** ~~and the vehicle floor contact surface~~ are to be approved according to Regulation No. 14**."**

Paragraph 2.9, amend to read:

"2.9 "*Orientation*" ~~is the indication that~~ indicates the direction(s) in which a Child Restraint System ~~can be used forward facing and/or rearward facing,~~ has been approved for use**.** ~~t~~The following distinctions ~~is~~ are made:

(a) forward-facing means facing in the normal direction of travel of the vehicle;

(b) rearward-facing means facing in the direction opposite to the normal direction of travel of the vehicle;

(c) lateral-facing means facing perpendicular to the normal direction of travel of the vehicle."

Delete paragraph 2.17:

~~2.17. "SFAD SL" means the Static Force Application Device as defined in Regulation No. 14, annex 9, to be modified with an additional support leg test probe, as exemplarily shown in Regulation No. 14, annex 10."~~

Paragraph 2.52, amend to read:

"2.**52.** "*ISOFIX position*" means a location which allows for the installation of either:

(a) ~~either~~ ~~an~~ universal ISOFIX Child Restraint System as defined in Regulation No. 44; or,

(b) ~~or~~ 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) ~~or~~ an ⓘ-Size Child Restraint System**,** suitable for use in specific ISOFIX ~~seating~~ positions ~~specified~~ as identified by the vehicle manufacturer according to Regulation 16."

Paragraph 3.2.2, amend to read:

"3.2.2. The applicant shall indicate the kind of application:

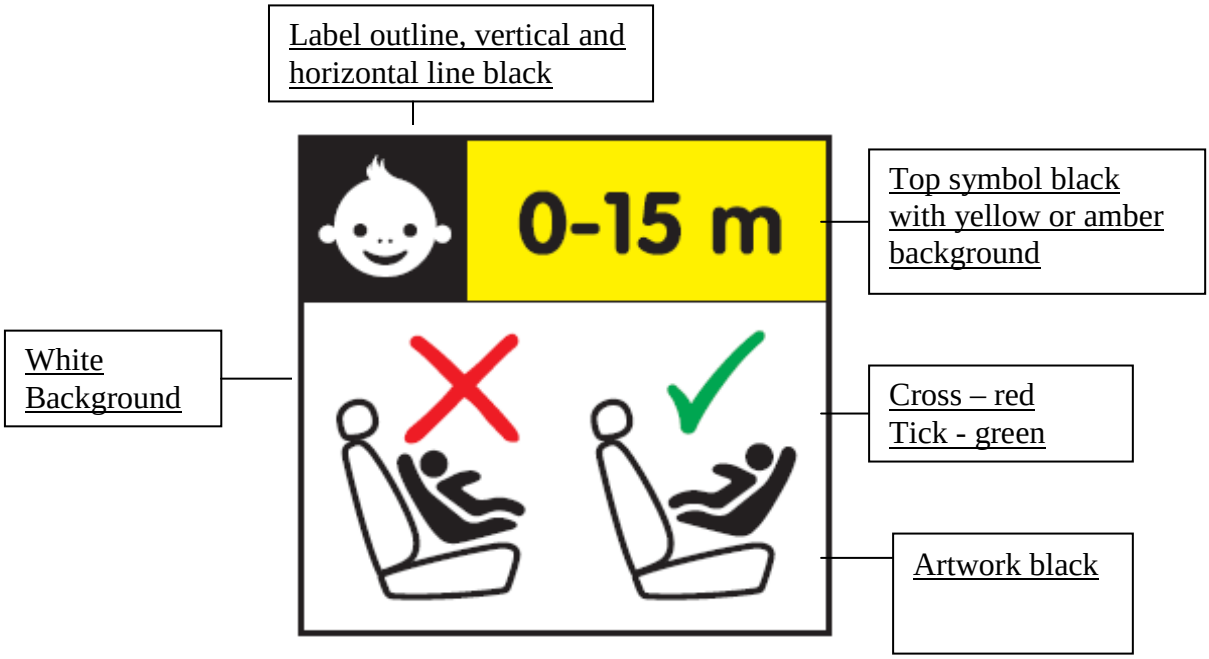
(a**)**~~.~~ Application for an ⓘ-Size ~~Integral Universal ISOFIX~~ child restraint system~~s~~, or
(b**)**~~.~~ Application for a "Specific vehicle ISOFIX" child restraint system~~s~~**."**

Paragraph 3.2.3, amend to read:

"3.2.3. For Child Restraint Systems tested 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 7.1.3.2., the applicant ~~needs to~~ shall submit documentation (drawings and/or pictures) as approved by type approval authority regarding the car or the ISOFIX seating position and the relevant car environment for which the manufacturer has requested a "Specific vehicle ISOFIX" approval. "

The informal working group should consider in more detail what documentation would be expected in relation to this requirement e.g. detailed engineering drawings and photographs etc.

Paragraph 4.5, amend diagram to read:



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 Child Restraint System conform to the requirements of Annex ~~19~~ 18. For any size within the size range declared by the manufacturer the minimum dimensions for shoulder breadth, hip breadth and sitting height shall be fulfilled together with the minimum and maximum dimensions of shoulder height."

Paragraph 6.3.2.2, amend to read:

"6.3.2.2. External dimensions

The maximum dimensions for width, height and depth of the Child Restraint System, and the locations of the ISOFIX anchorages system with which its attachments shall

engage, shall be defined ~~for the ISOFIX Child Restraint System manufacturer~~ by the Vehicle Seat Fixture (VSF) as defined in paragraph 2.18~~24~~. of this Regulation.

(a) ⓘ-Size Forward facing Child Restraint Systems shall fit within the ISO/F2x size envelope ~~dimensions~~ for a reduced-height forward-facing toddler CRS (height 650 mm) ISOFIX SIZE CLASS B1.

(b) ⓘ-Size Rearward facing Child Restraint Systems shall fit within the ISO/R2 size envelope ~~dimensions~~ for a reduced-size rearward-facing toddler CRS ISOFIX SIZE CLASS D.

~~(c) ⓘ-Size Lateral facing Child Restraint Systems must fit within the ISO/L1 or ISO/L2 size envelope dimensions for a reduced-size rearward-facing toddler CRS ISOFIX SIZE CLASS F & G~~

(d) "~~Integral~~ Specific Vehicle ISOFIX" Child Restraint Systems ~~could~~ may fit within any ISO size envelope ~~dimensions~~.

Paragraph 6.3.5, amend to read:

"6.3.5. ⓘ-Size Child Restraint System support-leg and support-leg foot requirements

ⓘ-Size Child restraint systems fitted with support-legs have to comply with the geometrical provisions defined in 6.3.5. and its subparagraphs.

~~For verifying c~~Compliance with the requirements specified in paragraphs 6.3.5.1. and 6.3.5.2. may be verified by a physical assessment ~~test jig~~ or ~~CAD~~ computer simulation ~~may be used~~.

The geometrical requirements in paragraphs 6.3.5.1. to~~hrough~~ 6.3.5.4. are referenced to a coordinate system, whose origin is located centrally between the two ISOFIX ~~connectors~~ attachments and on the centreline of the corresponding ISOFIX anchorage system.

The orientation~~s~~ of the axes of the coordinate system is referenced to the child restraint fixture(s):

- the X ~~orientation~~ axis shall be parallel to the Child Restraint Fixture (CRF) [3] bottom surface and in ~~to~~ the median longitudinal plane of the CRF.

- the Y ~~orientation~~ axis shall be perpendicular to the median longitudinal plane of the CRF.

- the Z ~~orientation~~ axis shall be perpendicular to the CRF bottom surface.

In fulfilling the requirements of this section, the Child Restraint System shall be installed in accordance with the user manual of the Child Restraint System. The storage position of the support-leg is excluded from these requirements."

The Informal working group should consider developing and including a definition of 'ISOFIX connectors'. The group should also consider developing a diagram outlining the principles of the 3D coordinate system used in this regulation to aid the understanding of the reader, similar to those contained in Reg 14, Annex 4 and Reg 16, annex 15.

Paragraph 6.3.5.1., amend to read:

"6.3.5.1. ~~Geometrical~~ ~~s~~Support-leg and support-leg foot geometrical requirements

The support leg, including~~.~~ its attachment to the child restraint system and the support-leg foot**,** shall lie ~~has to~~ completely ~~lie~~ within ~~a~~ the support leg dimension assessment volume (see also figures 1 and 2 of annex 19 of this Regulation), which is defined as follows:

- In width by two planes**,** parallel to ~~and 100 mm apart from~~ the X-Z plane**,** separated by 200mm, and centred around the origin ~~of the coordinate system defined in 6.3.5.~~; and

- In length by two planes**,** parallel to the Z-Y plane, and positioned at distances of ~~perpendicular to the X-Y plane and X-Z plane [median longitudinal plane of the child restraint fixture] of the coordinate system defined above,~~ 585 mm and 695 mm forward of the origin along the X axis ~~apart in X-direction from the origin~~; and

- In height ~~above the level of the CRF bottom surface~~ by a plane**,** parallel to the X-Y plane, positioned at a distance of ~~and~~ [70][85] mm above the origin and perpendicular to the X-Y plane**.** ~~CRF bottom surface. Below the level of the CRF bottom surface there shall be a limitation for~~ r Rigid, non-adjustable parts shall not extend beyond a plane parallel to the X-Y plane, positioned at a distance of ~~in Z direction defined by a plane parallel to and~~ 270 mm below the origin and perpendicular to the X-Y plane**.** ~~CRF bottom surface, f~~ For parts adjustable in Z direction there shall be no limitation in height below the level of the CRF bottom surface**,** providing it is also possible to adjust them to meet the requirements of the support leg dimension assessment volume.

Paragraph 6.3.5.2., amend to read:

"6.3.5.2. Support-leg foot adjustability requirements

The support-leg shall be adjustable in order to ensure that the support-leg foot can be positioned throughout the height range ~~is able to reach at least any height between the upper and the lower height limit in z-direction~~ of the support leg foot assessment volume as specified below (see also figure 3 and 4 of ~~a~~Annex 19 of this Regulation). ~~In case of~~ Where incremental adjustment is provided, ~~there shall be no~~ the step between two locked positions ~~of more than~~ shall not exceed 20 mm.

The support leg foot assessment volume is defined as follows:

- In width by two planes**,** parallel to ~~and 100 mm apart from~~ the X-Z plane ~~of the coordinate system defined in 6.3.5.~~ **,** separated by 200mm, and centred around the origin; and

- In length by two planes ~~perpendicular to the x-y plane and X-Y plane [median longitudinal plane of the child restraint fixture] of the coordinate system defined above,~~ parallel to the Z-Y plane, and positioned at distances of 585 mm and 695 mm forward of ~~apart in X direction from~~ the origin along the X axis; and

- In height by two planes**,** parallel to the X-Y plane, positioned at distances of ~~CRF bottom surface, one plane 270~~ 285mm and ~~a second plane 525~~ 540mm below the origin along the X axis ~~CRF bottom surface.~~

It shall be permissible for the support-leg to be adjustable beyond the height limits in the Z ~~direction given below in order to reach additional positions above the upper and below the lower height limit in Z direction given by the support leg foot assessment volume,~~ providing that no parts extend beyond the limiting planes in the X and Y directions."

Paragraph 6.6.4.3, amend to read:

"6.6.4.3.Dummy-criteria for frontal and rear impact ~~only for phase 2~~."

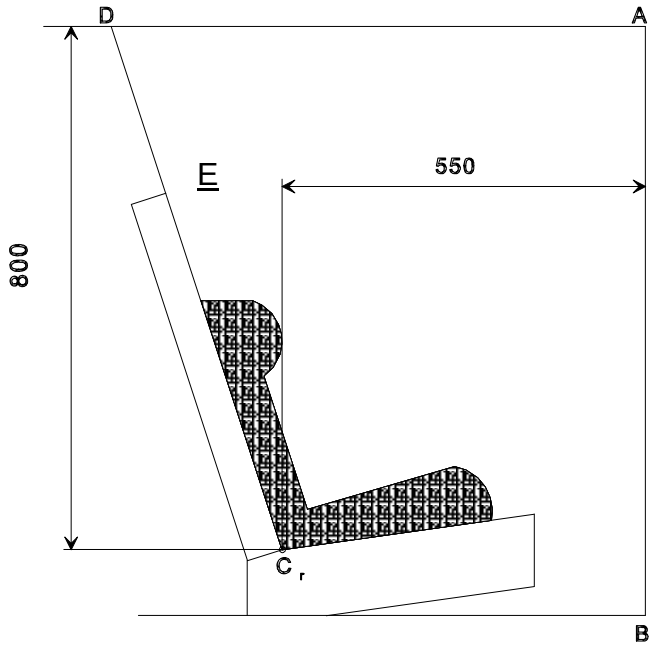
Paragraph 6.6.4.3.1, Table 3:

Move footnote 5 to the same page as Table 3 and amend to read:

"5 HPC: see A~~a~~nnex ~~18~~17

Paragraph 6.6.4.4.1.1.1., Figure 1

Add node E.



Paragraph 6.6.4.4.2., amend to read :

"6.6.4.4.2. When ~~C~~child restraint systems of the Specific vehicle ISOFIX category ~~when~~ are tested in a complete vehicle or a vehicle body shell, the dummy head shall not come into contact with any part of the vehicle. However, if there is contact, the head performance ~~impact~~ criterion HPC ~~HIC~~ and the Head Acceleration 3ms shall be used as assessment criteria. After a ~~In~~ tests ~~s~~ using a ~~with~~ complete vehicle~~,s~~ it shall be possible to remove the dummy ~~manikins~~ from the child restraint system without the use of tools ~~after the test~~."

More fundamentally, this paragraph contains two contradictory sentences – head contact is firstly specifically prohibited, and then subsequently permitted under certain circumstances. The informal working group should review the intention of this paragraph and re-word or replace as necessary.

The intention of the final sentence should also be considered. If it is to require removal of the dummy without dismantling, then it should say that.

Paragraph 7.1.3.5.2.1., amend to read:

7.1.3.5.2.1. Installation of a ~~Place the~~ Child Restraint System on the test bench.

The ~~unloaded~~ unoccupied ISOFIX 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 ~~unloaded~~ unoccupied child restraint system towards those anchorages.

~~Allow the ISOFIX Child Restraint System latch mechanism to pull the unloaded Child Restraint System toward the seat bight anchorages H1-H2.~~

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

If present, ~~adjust~~ the top tether shall be adjusted to achieve a tension load of 50+/- 5N. Alternatively, and i~~I~~f present, ~~adjust~~ the support-leg shall ~~to~~ be adjusted according to the child restraint system manufacturer's instructions.

The Child Restraint System centre line shall be aligned ~~exactly~~ with the centre line of the test bench.

~~Place~~ ~~t~~The dummy shall be placed in the Child Restraint System, separated from the seat-back of the chair by ~~with a hinged board or~~ a ~~similar~~ flexible spacer. The spacer shall be ~~device~~ 2.5 cm thick, ~~and~~ 6 cm wide. It shall ~~and~~ have ~~of~~ length equal to the shoulder height ~~sitting (Annex 8)~~ less the thigh height ~~sitting (Annex 8)~~ , both in the sitting position, and relevant to the dummy size being tested ~~between the dummy and the seat-back of the chair~~. The resulting length 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.

	Q0	*Q1*	*Q1.5*	*Q3*	*Q6*	*[Q10] (design targets)*
						Dimensions in [mm]
Height of spacer device for positioning of dummy		229±2	237±2	250±2	270±2	359±2

Adjust the 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 ± 5°, or alternatively, the angle prescribed by the manufacturer. ******see justification for comment******

The spacer shall then be ~~R~~removed and ~~the flexible device and push~~ the dummy pushed towards ~~to~~ the seat back. Distribute ~~and arrange~~ the slack evenly throughout ~~within~~ the harness ~~so that it is distributed evenly~~.

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

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

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

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

Hands shall be positioned on the thighs.

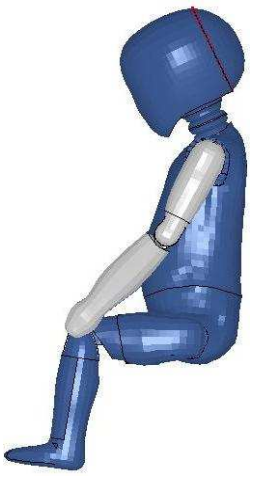
Legs shall be positioned parallel to one another, or at least symmetrically.

For lateral impact ~~only~~, positive measures shall be taken to ensure the stability of the dummy is maintained ~~: CRS and dummy shall be kept stable~~ until t0, and this shall be confirmed using video analysis. ~~to be checked by markers at dummy, CRS and sled.~~ Any means used to stabilise the dummy before t0 shall not influence the dummy kinematics after t0.

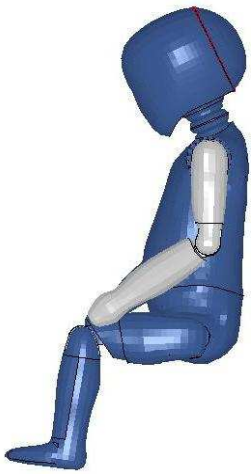
Because the foam of the test bench seat cushion will compress after installation of the Child Restraint System, the dynamic test shall be conducted no more than 10 minutes after installation~~, as possible~~.

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

Paragraoh 7.3.1.6, amend to read:

"7.1.3.6. ⓘ-Size indication

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

Table 6
Selection criteria for the dummy according to the range:

~~*Minimum*~~ *size range indication*	*≤ 60*	*60 < x ≤ 75*	*75 < x ≤ 87*	*87 < x ≤ 105*	*105 < x ≤ 125*	*>125*
Dummy	**Q0**	**Q1**	**Q1.5**	**Q3**	**Q6**	**Q10**

Where ~~In case of substantial modification of~~ the Child Restraint System requires substantial modification for ~~installation between~~ different sizes (e.g., convertible Child Restraint System) or if the size range covers more than [3 or 4] size ranges, a ~~the~~ relevant intermediate dummy(ies) as selected by the Technical Service ~~according to the manufacturers advice~~ shall be tested in addition to the dummy(ies) defined above."

Paragraph 14.2.1, amend to read:

"14.2.1. For "ⓘ-Size" category Child Restraint Systems the following label shall be clearly visible on the exterior of the ~~at the point of sale without removing the~~ packing:

Notice

This is an "ⓘ-Size" Child Restraint System. It is approved to Regulation [No. X], for use in, "ⓘ-Size compatible" vehicle seating positions as

indicated by vehicle manufacturers in the vehicle users' manual.

~~A Child Restraint System will fit in at least one of the ISOFIX positions detailed in the vehicle handbook, if the vehicle manufacturer has declared that the vehicle is "ⓘ-Size compatible.~~

~~This Child Restraint System has been classified as "ⓘ-Size" under more stringent conditions than those which applied to earlier designs which do not carry this notice.~~

If in doubt, consult either the child restraint manufacturer or the retailer.

"

II. Justification

2.2 Removes ambiguity. The child restraint type is linked to the category in which it has actually been approved. The intention of the manufacturer is irrelevant.

2.3 The deleted text would be more appropriately contained in the definition of ⓘ-Size seating position proposed for the amendment to Regulation 16 contained in GRSP-49-07.

2.5 English language edit.

2.9 English language edit.

2.17 This definition is not used in this regulation and does not therefore require defining.

2.52 English language edit. It additionally recognises that Reg 44 and the new regulation do not use the same definitions. The first uses and defines the term "Specific Vehicle", whilst the latter, having a different scope, uses and defines the term "Specific Vehicle ISOFIX".

3.2.2 English language edit. It additionally removes the words 'Integral Universal ISOFIX' because these are inherent in all ⓘ-Size child restraint systems by virtue of the definition in paragraph 2.3.

3.2.3 English language edit and remove abbreviations. It is also suggested that more detail is provided regarding the level of information expected regarding this requirement. This will promote a more consistent application of the requirements across Type Approval Authorities and Technical Services.

4.5 Verbal descriptions provided for colour scheme to ensure that marking of products is standardised even when the regulation is available only in grey scale.

6.3.2.1 Corrects reference to Annex 19.

6.3.2.2 English language edit. Text deleted as the content of this paragraph is not intended only for specific readers or users of the regulation. Paragraph reference to the Vehicle Seat Fixture is amended.

6.3.5 Adds '@-Size' to the paragraph title as this paragraph refers only to restraint systems of this type, and enables deletion of the 2nd section. 3rd section amended to improve English and remove reference to an undefined test jig. It also replaces the term 'CAD' with the more generic terminology of 'computer'. Section 4 suggests adding a definition of 'ISOFIX connectors' as one is not currently provided. A diagram outlining the principles of the 3D coordinate system would also improve the understanding and clarity for the reader.

6.3.5.1 English language edit. It also removes the 'CRF bottom surface' from being a datum from which any measurement is made because such a device has already been used to establish an origin for the 3D coordinate system.

6.3.5.2 English language edit. As above, it also removes the 'CRF bottom surface' from being a datum from which any measurement is made because such a device has already been used to establish an origin for the 3D coordinate system.

6.6.4.3 It is acknowledged that some criteria are being monitored only to generate further evidence at this stage, but there are criteria that are intended to apply in Phase 1, e.g. Chest acceleration.

6.6.4.3.1 Required to ensure that Footnote 5 is adjacent to Table 3 and correct reference to Annex 17.

6.6.4.4.1.1.1 Point E has been omitted from diagram..

6.6.4.4.2 English language edit. Also amends reference from HIC to HPC and 'manikins' to 'dummy' as previously agreed. This section contains two sentences that are apparently contradictory – the first prohibits head contact of any description, the second permits head contact under certain conditions. This paragraph should be reviewed with respect to its technical requirement and/or wording. Finally, the section refers to the removal of the dummy without tools. It is believed that the intention of this paragraph is to require the removal of the dummy without dismantling the dummy. If this is the case, then the paragraph should state this.

7.1.3.5.2.1 English language edit.

Paragraph which reads 'Adjust the 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 ± 5°, or alternatively, the angle prescribed by the manufacturer.' Is unclear and requires review.

Is the paragraph which reads 'The longitudinal plane passing through the centre line of the dummy shall be set midway between the two lower belt anchorages, however note shall also be taken of paragraph 7.1.3.2.1.3. ' irrelevant for this phase which does not utilise the lower belt anchorages.

7.3.1.6 English language edit. Places the duty on Technical Services to select an appropriate intermediate dummy rather than the manufacturer.

14.2.1 Text amended to remove the requirement for Point of Sale information. Whilst this may be desirable, WP.29 has a mandate to regulate for type approval regulations only and not for consumer protection legislation.

Remove unnecessary paragraph since proposal moved from one suggesting that a vehicle manufacturer could voluntarily declare their vehicle as being 'ⓘ-Size ready' to one in which the vehicle manufacturer would declare only a given seating position as being 'ⓘ-Size ready'.

Consider removing paragraph which reads 'This Child Restraint System has been classified as "ⓘ-Size" under more stringent conditions than those which applied to earlier designs which do not carry this notice.' on the grounds that this requirement has limited longevity.