

## **Supplement 4 to the 03 series of amendments to UN Regulation No. 129 (Enhanced Child Restraint Systems)**

### **Submitted by the expert from the European Association of Automotive Suppliers**

The text reproduced below was prepared by the expert from the European Association of Automotive Suppliers (CLEPA) to require all essential measurement information to be recorded in the Type Approval test report. The modifications to the formal document are marked in bold for new or strikethrough for deleted characters.

### **I. Proposal**

*Paragraph 7.5., amend to read*

- 7.5. The measuring procedures shall correspond to those defined in the latest version of ISO 6487 **with SAE J211 sign convention**. The channel frequency class shall be:

*Insert a new paragraph 8.1., to read:*

- “8.1. The information contained in the template in Annex 27 shall be provided in the Type Approval test report.**

*Paragraph 8.1., renumber as 8.2., amend to read:*

- “8.2.** The **production qualification** test report shall record the results of all tests and measurements including the following test data:
- (a) The type of device used for the test (acceleration or deceleration device),
  - (b) The total velocity change,
  - (c) The trolley speed immediately before impact only for deceleration sleds,
  - (d) The acceleration or deceleration curve during all the velocity change of the trolley and at least 300 ms,
  - (e) The time (in ms) when the head of the manikin reaches its maximum displacement during the performance of the dynamic test,
  - (f) The place occupied by the buckle during the tests, if it can be varied, and
  - (g) The name and address of the laboratory where tests have been performed,
  - (h) And any failure or breakage,
  - (i) The following dummy criteria: HPC, Head acceleration Cum 3ms, Upper neck tension force, Upper neck moment, Chest acceleration Cum 3ms, Chest deflection; Abdominal Pressure (in frontal and rear impact); and
  - (j) Adult safety-belt bench installation forces.

- (k) The minimum and maximum approved stature range for all categories of ECRS;
- (l) The internal dimensions according to Annex 18, for all categories of ECRS;
- (m) For booster cushions the minimum stature with corresponding sitting height according to paragraph 6.1.3.6

Paragraph 8.2-8.4., renumber as 8.3.-8.5,

Insert a new Annex 27

## “Annex 27

### Type Approval Test Report Template

This Annex contains a template for the minimum information that shall be provided in the Type Approval test report. How this information is presented in the Type Approval test report shall be the choice of the Technical Service. I.e. the layout, format, order of the information may be changed.

ECRS Description				
	ECRS Category (3.2.2.)	Stature Range	Orientation	Attachment
Category 1				
Category 2				
Category 3				
.....				

6.	General Requirements		
6.1.2.5. 6.1.3.4.	Measurement from Cr to load bearing point (Left & Right)		mm mm
6.1.2.6. 6.1.3.5.	Belt remaining on spool		mm

6.	General Requirements		
6.2.1.4.	Photographs of buckle position when smallest & largest dummies are installed		
6.2.1.5.	Angle $\alpha$ and $\beta$ measured with smallest & largest dummies	$\alpha$ $\beta$ $\alpha$ $\beta$	

<b>6. General Requirements</b>			
		Signed Declaration Received?	Test Report Reference (If applicable)
6.1.2.5.	Flammability		
6.1.2.6.	Toxicity		
<b>6.3.2.1. Internal measurement*</b>			
	Configuration measured:		
	ISO volume used to confirm external dimensions:		
	Internal measurements:		
A) Calculated Stature Range	Minimum	cm	
	Maximum	cm	
B) Sitting height measurement		mm	
C) Shoulder breadth measurement		mm	
D) Hip breadth measurement		mm	
E1) Min shoulder height measurement		mm	
E2) Max shoulder height measurement		mm	
F1) Min Abdomen depth measurement		mm	
F2) Max Abdomen depth measurement		mm	
G1) Min Upper leg thickness measurement		mm	
G2) Max Upper leg thickness measurement		mm	

\*Complete for each different configuration

<b>6.3.2.2. External measurement*</b>			
	Configuration measured:		
	ISO volume used to confirm external dimensions:		
	ECRS Adjustments that fit within volume (if applicable):		
	<ul style="list-style-type: none"> <li>• Head rest position</li> <li>• Recline position</li> <li>• Side wing position</li> </ul>		
	Verification photos of physical check		

\*Complete for each different configuration

6.6.1. Corrosion		
Test Reference number		
Description of parts tested		
Photo of Parts Pre-test		
Photo of Parts Post-test		
Description of results		
6.6.2. Energy Absorption		
Test Reference number		
	Description of impact site (photos)	Measured Acceleration (g)
Site 1		
Site 2		
Site 3		
.....		
All Results <60g		Pass/Fail

6.6.3. Overturning*					
Test Reference number					
ECRS Configuration	Integral / Non-integral RF / FF				
ATD					
Mass Applied (kg)					
Rotation	1	2	3	4	Pass/Fail
ATD Displacement					

\*Repeat for each configuration & ATDs

<b>6.6.5.</b>	<b>Resistance to temperature</b>	
Test Reference number		
Description of parts tested		
Photo of Parts Pre-test		
Photo of Parts Post-test		
Description of results		
Dynamic Test Reference using this ECRS		

<b>6.7.1.</b>	<b>Buckle Requirements</b>				
6.7.1.2.	Enclosed or non-enclosed buckle?				
	Surface area of button				
<b>6.7.1.4.</b>	<b>Shoulder strap positioner</b>	<b>Criteria</b>	<b>Measure</b>	<b>Pass/Fail</b>	
6.7.1.4.1.	Force required to close shoulder strap positioner	<15 N	N		
6.7.1.4.2.	The force required to release the device	<15 N	N		
6.7.1.4.3.	Height of shoulder strap positioner	<60 mm	mm		
	<b>Buckle Tests</b>	<b>Test No.</b>	<b>Criteria</b>	<b>Measure</b>	<b>Pass/Fail</b>
6.7.1.7.1.	Buckle Test under load		<80 N	N	
6.7.1.7.2.	Buckle No-load test		40-80 N	N	
6.7.1.8.	Buckle Strength Test		>4000 N >10000 N	N	

Clause	Requirement	Measurement	Value
<b>6.7.4.</b>	<b>Straps</b>		
	Test Reference		
6.7.4.1.	Width		
6.7.4.1.1.	The minimum width at the child-restraint straps which contact the dummy shall be 25 mm. These dimensions shall be measured during the strap strength test prescribed in paragraph 7.2.5.1. below, <ul style="list-style-type: none"> <li>• without stopping the machine and</li> <li>• under a load equal to 75 per cent of the breaking load of the strap</li> </ul>	min. Width, under load [mm]	
6.7.4.2.	Strength after room conditioning		
6.7.4.2.1.	On two sample straps conditioned as prescribed in paragraph 7.2.5.2.1., the breaking load of the strap shall be determined as prescribed in Paragraph 7.2.5.1.2. below.	Strap1 [kN] Strap2 [kN]	

6.7.4.2.2.	The difference between the breaking loads of the two samples shall not exceed 10 per cent of the greater of the two breaking loads measured.	Difference [%]	
6.7.4.3.	Strength after special conditioning:		
6.7.4.3.	Water	Water1 [kN]	
6.7.4.3.		Water2 [kN]	
6.7.4.3.		Differ. [%]	
6.7.4.3.	Cold	Cold1 [kN]	
6.7.4.3.		Cold2 [kN]	
6.7.4.3.		Differ. [%]	
6.7.4.3.	Hot	Hot1 [kN]	
6.7.4.3.		Hot2 [kN]	
6.7.4.3.		Differ. [%]	
6.7.4.3.	Light	Light1 [kN]	
6.7.4.3.		Light2 [kN]	
6.7.4.3.		Differ. [%]	
6.7.4.3.	Abrasion	Abrasion1	
6.7.4.3.		Abrasion2	
6.7.4.3.		Differ. [%]	
6.7.4.3.1.	On two straps conditioned as prescribed in one of the provisions of paragraph 7.2.5.2. below (except para. 7.2.5.2.1.), the breaking load of the strap shall be not less than 75 per cent of the average of the loads determined in the test referred to in paragraph 7.2.5.1.	Mean [kN]:	
6.7.4.3.1.		>75%	
6.7.4.3.2.	In addition, the breaking load shall be not less than:		
(a)	3.6 kN for Integral Enhanced Child Restraint Systems with an upper stature limit less than or equal to 105 cm	>3.6 kN	
(b)	5 kN for Integral Enhanced Child Restraint Systems with an upper stature limit greater than 105 cm but less than or equal to 125 cm	>5 kN	
(c)	7.2 kN for Integral Enhanced Child Restraint Systems with an upper stature limit greater than 125 cm	> 7 kN	

<b>6.7.5.</b>	<b>ISOFIX attachment specifications</b>	
6.7.5.1.	ISOFIX attachments and latching indicators shall be capable of withstanding repeated operations and shall, before the dynamic test prescribed in paragraph 7.1.3. of this Regulation, undergo a test comprising 2,000 ± 5 opening and closing cycles under normal conditions of use.	
6.7.5.2.	ISOFIX attachments shall have a locking mechanism which complies with the requirements specified in (a) or (b) as follows:	
6.7.5.2. (a)	Release of the locking mechanism of the complete seat, shall require two consecutive actions, the first of which should be maintained while the second is carried out; or	
6.7.5.2. (b)	The ISOFIX attachment opening force shall be at least 50 N when tested as prescribed in paragraph 7.2.8.	

<b>6.7.6.</b>	<b>Lock-off device</b>	
6.7.6.1.	The lock-off device shall be permanently attached to the Enhanced Child Restraint System.	
6.7.6.2.	The lock-off device shall not impair the durability of the adult belt and shall undergo the temperature test operation requirements given in paragraph 7.2.7.1.	
6.7.6.3.	The lock-off device shall not prevent the rapid release of the child.	
6.7.6.4.	Class A device	
	The amount of slip of the webbing shall not exceed 25 mm after the test prescribed in paragraph 7.2.9.1. below.	
6.7.6.5.	Class B device	
	The amount of slip of the webbing shall not exceed 25 mm after the test prescribed in paragraph 7.2.9.2. below.	

<b>6.3.2.3.</b>	<b>Mass (integral systems)</b>		
	<p>The mass of an integral ISOFIX Enhanced Child Restraint System (including inserts) combined with the mass of the largest child intended to use the Enhanced Child Restraint System shall not exceed 33 kg.</p> <p>For module systems the combined mass of the module &amp; base shall be recorded.</p> <p>This mass limit is also applicable for "Specific vehicle ISOFIX" Enhanced Child Restraint Systems.</p>	Mass of CRS [kg]	
		Max. Mass of Occupant [kg]	
		Mass of System [kg]	

<b>6.3.3.</b>	<b>ISOFIX attachments</b>
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<b>6.3.3.2</b>	<b>Dimensions</b>	
6.3.3.2	<p>Dimensions for the portion of the ISOFIX Child Restraint System attachment that engages the ISOFIX anchorage system shall not exceed the maximum dimensions given by the envelope in Figure 0(b).</p> <p>Figure 0(b): ISOFIX Maximum dimensions</p>	

<b>6.3.3.3</b>	<b>Partial latching indication</b>		
6.3.3.3	The ISOFIX Enhanced Child Restraint System shall incorporate means by which there is a clear indication that both of the ISOFIX attachments are completely latched with the corresponding ISOFIX lower anchorages.	latch indicator	[Y/N]
6.3.3.3	The indication means may be audible,	check	[Y/N]
6.3.3.3	tactile or	check	[Y/N]
6.3.3.3	visual or	check	[Y/N]
6.3.3.3	a combination of two or more.	check	[Y/N]
6.3.3.3	In case of visual indication it shall be detectable under all normal lighting conditions.	check	[Y/N]

6.3.4.	<b>ISOFIX Enhanced Child Restraint System top tether strap specifications</b>		
6.3.4.1.	<b>Top tether connector</b>		
6.3.4.1.	The top tether connector shall be ISOFIX top tether hook as shown in Figure 0(c), or similar devices that fit within the envelope given by Figure 0(c).  Figure 0(c): ISOFIX top tether connector (hook type) dimensions		[Y/N]
6.3.4.2.	<b>ISOFIX top tether strap features</b>		
6.3.4.2.	The ISOFIX top tether strap shall be supported by webbing (or its equivalent), having a provision for adjustment and release of tension.	check	[Y/N]
6.3.4.2.1.	ISOFIX Top tether strap length ISOFIX Enhanced Child Restraint System top tether strap length shall be at least 2,000 mm.	TT strap length [mm]	
6.3.4.2.2.	No-slack indicator The ISOFIX top tether strap or the ISOFIX Enhanced Child Restraint System shall be equipped with a device that will indicate that all slack has been removed from the strap. The device may be part of an adjustment and tension relieving device.	check	[Y/N]
6.3.4.2.3.	Dimensions Engagement dimensions for ISOFIX top tether hooks are shown in Figure 0(c).	check	

6.3.5.1.	<b>Support-leg and support-leg foot geometrical requirements</b>		
6.3.5.1.	The support leg, including its attachment to the Enhanced child restraint systems and the support-leg foot shall lie completely within the support leg dimension assessment volume (see also figures 1 and 2 of annex 19 of this Regulation), which is defined as follows:		
6.3.5.1. (a)	In width by two planes parallel to the X'-Z' plane separated by 200 mm, and centered around the origin; and	Width in Y [mm]	
6.3.5.1. (b)	In length by two planes parallel to the Z'-Y' plane and positioned at distances of 585 mm and 695 mm forward of the origin along the X' axis; and	min [mm]	
6.3.5.1. (b)	-> Distances in X	max [mm]	
6.3.5.1. (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, non-adjustable parts of the support leg shall not extend beyond a plane parallel to the X'-Y' plane, positioned at a distance of 285 mm below the origin and perpendicular to the X'-Y' plane.	min [mm]	
6.3.5.1. (c)	-> Height in Z	max [mm]	
6.3.5.1.	The support-leg may protrude the support-leg dimension assessment volume, providing it remains within the volume of the relevant CRF.	check	

6.3.5.2.	Where incremental adjustment is provided, the step between two locked positions shall not exceed 20 mm.	Adjustment increments [mm]	
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6.3.5.2.	The support leg foot assessment volume is defined as follows:		
6.3.5.2. (a)	In width by two planes parallel to the X'-Z' plane, separated by 200 mm, and centered around the origin; and	Width in Y [mm]	
6.3.5.2. (b)	In length by two planes parallel to the Z'-Y' plane and positioned at distances of 585 mm and 695 mm forward of the origin along the X' axis; and  -> Distances in X	min [mm]	
6.3.5.2. (b)		max [mm]	
6.3.5.2. (c)	In height by two planes parallel to the X'-Y' plane positioned at distances of 285 mm and 540 mm below the origin along the X' axis.  -> Height in Z	min [mm]	
6.3.5.2. (c)		max [mm]	
6.3.5.2.	It shall be permissible for the support-leg to be adjustable beyond the height limits in the Z' direction (as indicated by key 6 in Figure 3 of Annex 19), providing that no parts extend beyond the limiting planes in the X' and Y' directions.	check	[Y/N]
6.3.5.3.	<b>Support-leg foot dimensions</b>		
6.3.5.3.	The dimensions of the support-leg foot shall meet the following requirements:		
6.3.5.3. (a)	Minimum support-leg contact surface shall be 2,500 mm <sup>2</sup> , measured as a projected surface 10 mm above the lower edge of the support-leg foot (see Figure 0(d));	Contact Surface [mm <sup>2</sup> ]	
6.3.5.3. (b)	Minimum outside dimensions shall be 30 mm in the X' and Y' directions, with maximum dimensions being limited by the support-leg foot assessment volume;	min X' [mm]	
		min Y' [mm]	
6.3.5.3. (c)	Minimum radius of the edges of the support-leg foot shall be 3.2 mm.	Radius [mm]	

8.1	Minimum Dynamic Test Information (per test)	
Test Facility Name & Address		
Test Reference Number		
E CRS Configuration		
Recline Position (if applicable)		
Attachment Method		
Buckle Position (if applicable)		
Support Leg Length (if applicable)		
Top Tether Position (if applicable)		
Installation Belt Force (if applicable)		N
ATD		
Sled Type (Deceleration/Acceleration)		
Impact Speed		km/h
Total Velocity Change		km/h
Stopping Distance (deceleration only)		mm
Maximum Head Horizontal Excursion		mm
Time it occurs		ms
Maximum Head Vertical Excursion		mm
Time it occurs		ms
D-E plane exceedance?		
HPC		
Head acceleration Cum 3ms		g
Upper neck tension force (Fz+) <sup>#</sup>		N
Upper neck flexion moment (My+) <sup>#</sup>		Nm
Chest acceleration Cum 3ms		g
Chest deflection (in frontal and rear impact)		mm
Abdominal Pressure (in frontal and rear impact)		bar
Breakage of parts?		

<sup>#</sup>The measurement procedures shall follow those of ISO 6487 with SAE J211 sign convention.

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## **II. Justification**

1. This amendment requires all essential measurement information to be recorded in the Type Approval test report.
2. The aim is to improve the transparency of Type Approval testing results and ensure all assessments are carried out.