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**Economic Commission for Europe**

Inland Transport Committee

**World Forum for Harmonization of Vehicle Regulations**

**194th session**

Geneva, 12–15 November 2024

Item 4.8.21 of the provisional agenda

**1958 Agreement:**

**Consideration of draft amendments to existing**

**UN Regulations submitted by GRSP**

Proposal for Supplement 2 to the 04 series of amendments to UN Regulation No. 129 (Enhanced Child Restraint systems)

 Submitted by the Working Party on Passive Safety[[1]](#footnote-2)\*

 The text reproduced below was adopted by the Working Party on Passive Safety (GRSP) at its seventy-fifth session (ECE/TRANS/WP.29/GRSP/75, para. 25). It is based on ECE/TRANS/WP.29/GRSP/2024/11 not amended. It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Administrative Committee (AC.1) for consideration at their November 2024 sessions.

*Paragraph 6.3.1.2.,* amend to read:

"6.3.1.2. The flammability of Enhanced Child Restraint Systems submitted for approval shall be assessed by one of the following methods:

… of EN 71-2:2020 with a maximum rate …"

*Insert new paragraph 16.13.,* to read:

"16.13. As from the official date of entry into force of the 04 series of amendments, no Contracting Party applying this Regulation shall refuse to grant or refuse to accept UN type-approvals under this Regulation as amended by the 04 series of amendments."

*Paragraphs 16.13. (former) to 16.15., renumber as paragraphs 16.14. to 16.16.*

*Annex 27,* amend to read:

**"Annex 27**

**List of Minimum Contents for the Test Reports included in the Type-Approval Application**

This annex contains a list of the minimum content and information that shall be provided in the test reports that are included for a new Type Approval Application. For Type Approval Extensions only the information related to the changes to the ECRS shall be provided.

How this information is presented in the Type Approval Application 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)Integral ECRSNon-integral ECRS | mmmm |
| 6.1.2.6. 6.1.3.5. | Belt remaining on spoolIntegral ECRSNon-integral ECRS | mmmm |
|  | If a gauge or fixture is used to verify the required dimensions, instead of recording precise measurements, verification photos of the physical check shall be provided |  |

| *6.* | *General Requirements* |
| --- | --- |
|  |  |
| 6.2.1.8. | Lap strap position when smallest & largest dummies are installed |  |  |
| 6.2.1.5. | Angle α and β measured with smallest & largest dummies  | α1β1α2β2 |  |
| If a gauge or fixture is used to verify the required dimensions, instead of recording precise measurements, verification photos of the physical check shall be provided |  |  |

| *6.* | *General Requirements* |
| --- | --- |
|  |  |
|  |  | Signed Declaration Received? | Test Report Reference (If applicable) |
| 6.3.1.1.  | Toxicity |  |  |
| 6.3.1.2.  | Flammability |  |  |

| *6.3.2.1.* | *Internal measurement\** |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  | Configuration measured: |  |
|  | ISO volume used to confirm external dimensions: |  |
|  | Internal measurements: |  |
|  | Calculated Stature Range | Minimum | cm |
| Maximum | cm |
|  | Sitting height measurement | mm |
|  | Shoulder breadth measurement | mm |
|  | Hip breadth measurement | mm |
|  | E1) Min shoulder height measurementE2) Max shoulder height measurement | mmmm |
|  | F1) Min Abdomen depth measurement (If Applicable)F2) Max Abdomen depth measurement (If Applicable) | mmmm |
|  | G1) Min Upper leg thickness measurement (If Applicable)G2) Max Upper leg thickness measurement (If Applicable) | mmmm |

\*Complete for each different configuration

| *6.3.2.2.* | *External measurement\** |
| --- | --- |
|  |  |
|  | Configuration measured:e.g. Lateral Facing, Rearward Facing, Forward Facing Integral, Booster Seat, Booster Cushion |  |
|  | ISO volume used to confirm external dimensions: |  |
|  | ECRS Adjustments that fit within volume (if applicable): |  |
|  | Head rest positionRecline positionSide wing position |  |
|  | Verification photos of physical check |  |
|  | Or |  |
|  | Verification image if checked using CAD drawing |  |

\*Complete for each different configuration

| *6.6.1.* | *Corrosion* |
| --- | --- |
|  |  |
| Test Reference number |  |
| Description of parts tested  |
|  |
| Description of results: |
|  |

| *6.6.2.* | *Energy Absorption* |
| --- | --- |
|  |  |
| Test Reference number |  |
|  | Description of impact site | 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-integralRF / FFBooster Seat / Booster Cushion |  |
| ATD |  |  |
| Mass Applied (kg) |  |  |
| Rotation | 1 | 2 | 3 | 4 | Pass/Fail |
| ATD Displacement (mm) |  |  |  |  |  |

\*Repeat for each configuration & ATDs

| *6.6.5.* | *Resistance to temperature* |
| --- | --- |
|  |  |
| Test Reference number |  |
| Description of parts tested  |
|  |
| Description of results |
| Dynamic Test Reference using this ECRS |  |

| *6.7.1.* | *Buckle Requirements* |
| --- | --- |
|  |  |
| 6.7.1.2. | Enclosed or non-enclosed buckle? |  |
|  | Surface area of button |  |
|  | If a gauge or fixture is used to verify the required dimensions, instead of recording precise measurements, verification photos of the physical check shall be provided |  |

| *6.7.1.4.* | *Shoulder strap positioner* | *Criteria* | *Measure* | *Pass/Fail* |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| 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 |  |

| ***6.7.1.7.*** | *Buckle Tests* | *Test No.* | *Criteria* | *Measure* | *Pass/Fail* |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
| 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* |
| --- | --- | --- | --- |
|  |  |  |  |
| 6.7.4. | Straps |   |  |
|  | Test Reference |  |  |
| 6.7.4.1. | Width |   |  |
| 6.7.4.1.1. | The minimum width at the child-restraint straps which make contact with the dummy shall be 25 mm. These dimensions shall be measured during the strap strength test prescribed in paragraph 7.2.5.1. below, • without stopping the machine and • under a load equal to 75 per cent of the breaking load of the strap | min. Width, under loadmm  |  |
| 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:  |  |
|  | >75% |  |
| 6.7.4.3.2.6.7.4.4. | In addition, the breaking load shall be not less than 3.6 kN for the restraints of i-Size Enhanced Child Restraint Systems.It shall not be possible to pull the complete strap through any adjusters, buckles or anchoring points. | Verification photos of the physical check shall be provided. |  |

| *6.7.5.* | *ISOFIX attachment specifications* |
| --- | --- |
|  |  |
| 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. |  |

| *6.7.6.*  | *Lock-off device* |  |
| --- | --- | --- |
|  |  |  |
| 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. |  |

| *6.3.2.3.* | *Mass (integral systems)* |
| --- | --- |
|  |  |
| 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. For module systems the combined mass of the module & base shall be recorded. This mass limit is also applicable for "Specific vehicle ISOFIX" Enhanced Child Restraint Systems. | Mass of CRSkg |  |
| Max. Mass of Occupantkg |  |
| Mass of Systemkg |  |

| *6.3.3.* | *ISOFIX attachments* |
| --- | --- |
|  |  |
| 6.3.3.2. | Dimensions |   |
| 6.3.3.3. | Partial latching indication |   |   |
| 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.* | *ISOFIX Enhanced Child Restraint System top tether strap specifications* |
| 6.3.4.1. | Top tether connector |   |   |
| 6.3.4.1. | The top tether connector shall be an ISOFIX top tether hook as shown in Figure 3(c), or similar devices that fit within the envelope given by Figure 3(c). The same connector shall also be used as the lower tether hook (if applicable; see paragraph 6.3.6,).Figure 3(c): ISOFIX top tether or lower tether connector (hook type) dimensions |   | Y/N |
| 6.3.4.2. | ISOFIX top tether strap features |   |   |
| 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. | The ISOFIX top tether straps shall fulfil the requirements specified in paragraphs 6.7.4.2. to 6.7.4.4. |  | pass/ fail |
| 6.3.4.2.2. | ISOFIX Top tether strap lengthISOFIX Enhanced Child Restraint System top tether strap length shall be at least 2,000 mm.  | TT strap lengthmm  |   |
| 6.3.4.2.3. | No-slack indicatorThe 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 |
| 6.3.4.2.4. | DimensionsEngagement dimensions for ISOFIX top tether hooks / lower tether hooks are shown in Figure 3(c).  | check |   |

| *6.3.5.1.* | *Support-leg and support-leg foot geometrical requirements* |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| 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 centred around the origin; and | Width in Ymm |  |
| 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-> Distances in X | min / mm |  |
| 6.3.5.1. (b) | 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.-> Height in Z | min / mm |  |
| 6.3.5.1. (c)  | 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 |  |
|  | If a gauge or fixture is used to verify the required dimensions, instead of recording precise measurements, verification photos of the physical check shall be provided |  |  |
| 6.3.5.2. | Where incremental adjustment is provided, the step between two locked positions shall not exceed 20 mm. | Adjustment incrementsmm |   |
| 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 centred around the origin; and  | Width in Ymm |   |
| 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.* | *Support-leg foot dimensions* |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| 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 mm2, measured as a projected surface 10 mm above the lower edge of the support-leg foot (see Figure 3(d)); | Contact Surfacemm² |   |
| 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. | Radiusmm |   |
|  | If a gauge or fixture is used to verify the required dimensions, instead of recording precise measurements, verification photos of the physical check shall be provided |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| *6.3.6.* | *Lower tether strap specifications* |  |  |
|  |  |  |  |
| 6.3.6.1. | The lower tether straps shall fulfil the requirements specified in paragraphs 6.7.4.2. to 6.7.4.4. |   | pass/fail |
| 6.3.6.2. | Lower tether strap length:Enhanced Child Restraint System lower tether strap length shall be at least 900 mm including lower tether connector. | LT strap lengthmm  |   |
| 6.3.6.3. | Lower Tether No-slack indicator:The lower tether strap or the 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  |
| 6.3.6.4. | Lower tether Retractor:An automatically locking retractor can be used to replace the provision for adjustment and release of the tension in the lower tether strap and the no slack indicator. In this case the retractor shall fulfil the requirements specified in paragraph 6.7.3.2. | check | Y/Npass/fail |
| 6.3.6.5. | DimensionsEngagement dimensions for lower tether hooks are shown in paragraph 6.3.4.2.4., Figure 3(c). | check |  |

|  |  |  |  |
| --- | --- | --- | --- |
| ***6.3.7.*** | ***Generic lower tether bracket specifications*** |  |  |
|  |  |  |  |
| 6.3.7.1. | The generic lower tether brackets supplied by the manufacturer of the child restraint, shall be accompanied by mounting instructions including required torque application and a note that this shall be done by qualified personnel only. | Torque [Nm] | pass/fail… |
| 6.3.7.2. | Dimensions and material specifications bracket:(a) The generic lower tether bracket shall have dimensions according to Figure 3 (f);(b) The outer edges of the lower tether bracket shall be at least blunted. | checkcheck |  |
| 6.3.7.3. | Mounting material bracketThe mounting material consists of:(a) M6x8 flange buttonhead hexagon socketcap screw; see figure 3 (g);(b) M6 washer; see figure 3 (h);(c) M6 -8 shoulder washer; see figure 3 (i). | checkcheckcheck |  |

|  |  |  |  |
| --- | --- | --- | --- |
| *6.3.8.* | *Generic lower tether bracket strength test* |  |  |
|  |  |  |  |
| 6.3.8.1. | Force applicationApply a force of 2,500 N to each generic lower tether bracket, by means of a representative lower tether strap 38 mm ± 3 mm wide that is fitted at one end with suitable hardware for applying the force and at the other end with a lower tether hook for the attachment to the lower tether bracket. For anchorages designed to be used for two adjacent CRS positions, or in case of a single LTA, the force shall be 5,000 N. | Measured forceN |
| 6.3.8.2. | Force directionTwo tests are performed; See figure 3 (j) and 3 (k):(a) The force shall be applied in a direction of 55° ± 5° against plane AB, measured in a plane parallel to the rigid surface XY, and a direction of 45° ± 5° against the rigid surface XY, measured in plane AB; see figure 3 (j);(b) The force shall be applied in a direction perpendicular (90 ± 5°) to the rigid surface XY. | check | pass/fail |
| 6.3.8.3. | The load shall be attained within 30 s, and shall be maintained for a minimum of 0.2 s. | check | pass/fail |
| 6.3.8.4. | When testing in accordance with paragraphs 6.3.8.1. to 6.3.8.3., excursion is not limited, and permanent deformation of the generic lower tether bracket with respect to the rigid structure it is attached to is acceptable provided that the anchorage does not break or separate from the rigid structure. | check | pass/fail |

| *8.1* | *Minimum Dynamic Test Information (per test)* |  |
| --- | --- | --- |
|  |  |  |
| Test Facility Name & Address |  |  |
| Test Reference Number |  |  |
| ECRS Configuration (e.g. integral harness, non-integral booster seat) |  |  |
| ECRS Orientation (e.g. Forward Facing, Rearward Facing, Lateral Facing) |  |  |
| Recline Position (if applicable) (e.g. Upright, Reclined) |  |  |
| Attachment Method (e.g. seat belt, ISOFIX, …) |  |  |
| Buckle Position (if applicable) |  |  |
| Support Leg Length (if applicable) |  |  |
| Top Tether Position (if applicable) |  |  |
| Installation Belt Forces (if applicable) | N |  |
| Test Dummy |  |  |
|  |  |  |
| Sled Type (Deceleration/Acceleration) |  |  |
| Test Bench Type (Test on trolley+standard seat/Test in car body)If testing in car body, specify make/model |  |  |
| 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 |  |  |
| Resultant Head acceleration Cum 3ms | G |  |
| Upper neck tension force (Fz+)\* | N |  |
| Upper neck flexion moment (My+)\* | Nm |  |
| Resultant Chest acceleration Cum 3ms | G |  |
| Chest deflection (in frontal and rear impact) | Mm |  |
| Abdominal Pressure (in frontal and rear impact) | Bar |  |
|  |  |  |
| Breakage of parts? |  |  |

\* The measurement procedures shall follow those of ISO 6487 with SAE J211 sign convention."

1. \* In accordance with the programme of work of the Inland Transport Committee for 2024 as outlined in proposed programme budget for 2024 (A/78/6 (Sect. 20), table 20.5), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate. [↑](#footnote-ref-2)