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**Economic Commission for Europe**

Inland Transport Committee

**World Forum for Harmonization of Vehicle Regulations****Working Party on Passive Safety Provisions****Seventy-first session**

Geneva,

Item x of the provisional agenda

**UN Regulation No. 129 (Enhanced Child Restraint Systems)****Proposal for New series of amendments****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 amend UN Regulation No.129 to introduce Lower Tether Straps. The modifications to the current text of the UN Regulation are marked in bold for new or strikethrough for deleted characters.

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\* In accordance with the programme of work of the Inland Transport Committee for 2022 as outlined in proposed programme budget for 2022 (A/76/6 (part V, sect. 20), para. 20.76), 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.



## 2. Definitions

Paragraph 2.12., amend to read:

§ 2.12. "*Anti-rotation device*"

Means a device intended to limit the rotation of the Enhanced Child Restraint System during a vehicle impact and consisting of:

- (a) A top-tether strap; or
- (b) A support-leg; and/or

**(c) Lower tether strap(s)**

Meeting the requirements of this Regulation and fitted to an ISOFIX anchorage system and ISOFIX top tether anchorages or vehicle floor contact surface meeting the requirements of UN Regulation No. 14 or UN Regulation No. 145.

An "Anti-rotation device" for a "specific vehicle" Belted Enhanced Child Restraint System may comprise a top tether, a support leg or, any other means capable of limiting the rotation.

**Paragraph 2.14., amend to read:**

§ 2.14. "Tension relieving device " means a system, which allows to release the device that adjusts and maintains the tension in the ISOFIX top tether strap **or in the lower tether strap(s)**.

**Insert new paragraphs 2.63 to 2.63.4 to read:**

§ 2.63. "***Lower tether strap***" means a webbing strap (or equivalent) which extends from the lower area of a Specific Vehicle Belted Enhanced Child Restraint System to the lower tether anchorage, and which is equipped with an adjustment device, a tension-relieving device, and a lower tether connector.

§ 2.63.1 "***Lower tether anchorage***" means a feature fulfilling the requirements of UN Regulation No. 14 or UN Regulation No. 145, such as a bar, located in a defined zone, designed to accept a lower tether connector, and transfer its restraint force to the vehicle structure.

§ 2.63.2. "***Lower tether connector***" means a device intended to be attached to a lower tether anchorage or lower tether attachment.

§ 2.63.3. "***Lower tether hook***" means a lower tether connector typically used to attach a lower tether strap to a lower tether anchorage as defined in figure 3(c) of § 6.3.4.2.3.

§ 2.63.4. "***Lower tether attachment***" is a device to secure the lower tether strap to the Specific Vehicle Belted Enhanced Child Restraint System.

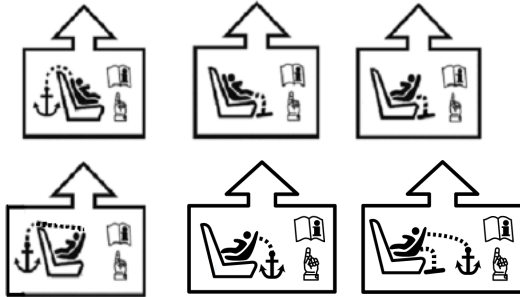
**Paragraph 4.14., amend to read:**

## 4.14. Additional markings

The following information may be conveyed by pictograms and/or text. The marking shall indicate:

.....

- (c) The position and if necessary, the routing of top tethers, **lower tethers**, or other means of limiting Enhanced Child Restraint System rotation requiring action by the user, shall be indicated using one **or more** of the following symbols as appropriate:



Insert symbol of lower tether and combination of lower tether with support leg

## § 6. General specifications

Paragraph 6.3.4.2.3., amend to read

### § 6.3.4.2.3.

Figure 3(c)

ISOFIX top tether or **Lower tether** connector (hook type) dimensions.....

Insert new paragraph 6.3.6.

### § 6.3.6. Specific vehicle belted Enhanced Child Restraint System lower tether strap specifications

§ 6.3.6.1. The lower tether strap shall be supported by webbing (or its equivalent), having a provision for adjustment and release of tension. In this case the lower tether straps shall fulfil the requirements specified in 6.7.4.2. till 6.7.4.4.

#### § 6.3.6.2. Lower tether strap length

Enhanced Child Restraint System lower tether strap length shall be at least [700 mm]; including Lower tether hook if present.

#### § 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.

#### § 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 6.7.3.2.

#### § 6.3.6.5. Dimensions

Engagement dimensions for lower tether hooks are shown in 6.3.4.2.3 Figure 3 (c).

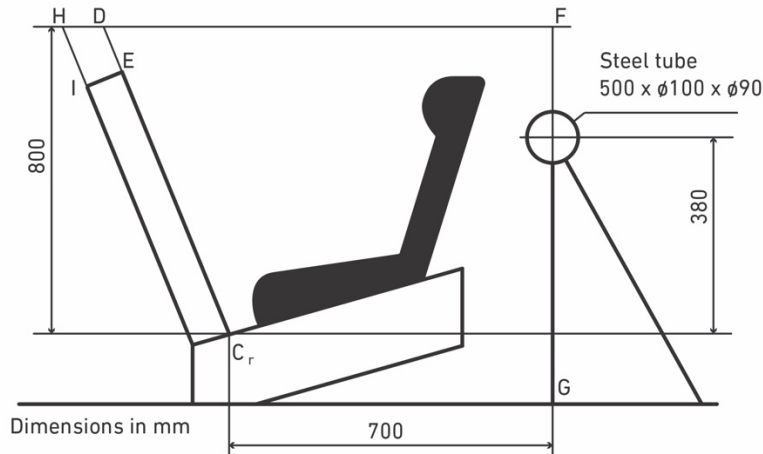
**Paragraph 6.6.4.4.1.2.1., amend to read**

**6.6.4.4.1.2.1** Head excursion: no part of the head of the dummy shall pass beyond the planes .....

Where a test is conducted with paragraphs 6.6.4.1.6.1.1. or paragraph 6.6.4.1.6.1.2. or paragraph 6.6.4.1.8.2. above, only the second test results without 100 mm diameter bar will be considered. **A tolerance of +10 per cent shall be applicable to the head excursion value distance between Cr point and plane DF and the dummy should not pass beyond the plane HI, parallel to plane DE.**

**Figure 5, amend to read**

Figure 5  
Arrangement for testing a rearward-facing device, not supported by the dashboard

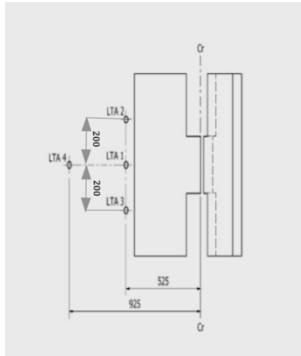


**Paragraph 6.7.4.3.2., amend to read**

In addition, the breaking load shall be not less than 3.6 kN for the restraints of ~~i-Size~~ Enhanced Child Restraint Systems.

**Annex 6, Appendix 2, figure 5, amend to read:**

Figure 5

**Top View – Bench with Lower strap tether anchorages** (Dimensions in mm; **Tolerance general:  $\pm 2$  mm**)  
(LTA 1, LTA 2, LTA 3 and LTA 4)Dimensions in mm; **Tolerance general:  $\pm 2$  mm.**

## Amend to read Annex 24

### **Additional attachment points required for securing rearward facing Enhanced Child Restraint System, of category Specific vehicle Belted, to motor vehicles**

1. This annex applies only to the additional anchorages for attaching Enhanced Child Restraint in the Specific vehicle Belted category or to bars or other special items used to secure child-restraining devices to the bodywork, whether or not they make use of UN Regulation No. 14 or UN Regulation No. 145, **or follow the specification of ISO 13216-4:2020** on ISOFIX anchorage systems, ISOFIX top tether anchorages, **Lower tether anchorage(s)**, and i-Size seating positions.
2. ~~The anchorages shall be determined by the manufacturer of the child restraint system and details shall be submitted for approval to the Technical Service conducting the tests.~~  
The manufacturer of the child restraint system shall describe how the child restraint system attaches to different vehicles and should submit this for approval to the Technical Service conducting the tests.  
The Technical Services may consider information obtained from the vehicle manufacturer.
3. The manufacturer of the child restraint ~~shall~~ **can** provide the necessary parts for fitting the anchorages and a special plan for each vehicle showing their exact location.
4. ~~The child restraint manufacturer shall indicate if the anchorages required for attaching the restraint to the vehicle structure are in accordance with the position and strength requirements of paragraph 3. onwards in the recommendation given to Governments intending to adopt specific requirements relating to anchorages for child restraints used in passenger cars.~~

## JUSTIFICATION

Introduction of Lower Tethers (Based on ISO 13216 – 4:2020)

### 1. Background

Rearward facing CRSs have been available on the market since late 1960's and are used for infants as well as toddlers. In the Nordic countries, they have been used as the main CRS for children up to approximately four years of age since the introduction and have provided evidence of excellent protection.

Most of the large rearward facing CRSs use lower tethers, which are attached to the floor area or seat in front of or below the seating position of the CRS. There is more than 40 years of experience of lower tether usage. Some cars have pre-installed anchorages in which the lower tethers can easily be attached. The most common positions of the anchorages are on the seat rails in front of the CRS (inside, outside, or end of seat rails), but alternative placements are also used. However, the majority of the vehicles have no pre-installed anchorages, whereby the tethers are routed around the seat chassis, the seat cushion or other parts that can be accessed.

The primary attachment of the rearward facing CRS is the ISOFIX or the vehicle seat belt. In addition, a support leg is usually used together with the lower tethers. The lower tethers also provide superior effect in rollover or turnover events.

#### Description and applicability of lower tether anchorages

Lower tether anchorages (LTA), for rearward facing child restraint systems (CRSs) in passenger cars, are used to enhance protection of children in cars. The lower tethers help to reduce CRS rotation in rear impacts, during the rebound phase in frontal impacts and in rollover events.

Lower tethers are used to increase mounting stability and to reduce rotation in a rear impact as well as rebound effects in a frontal impact. The usability and reliability of lower tether attachments can be greatly improved when lower tether anchorages are pre-installed in the vehicle. The primary attachment of the rearward facing CRS is the ISOFIX or the vehicle seat belt. In addition, a support leg is used and especially with belt installed CRS this is combined with lower tethers. The lower tethers also provide superior effect in rollover or turnover events.

Lower tether anchorages for rearward facing CRSs are similar to, and for most aspects comparable to, the top tether anchorages for forward facing CRSs.

In line with ISOFIX, standardization of LTA enables pre-installed anchorages with adequate performance within a designated zone. Pre-installed anchorages will improve the usability and reliability of attaching the lower tethers. This can be pre-installed LTA by the car manufacturer or Retrofit LTA, installed in a way that they meet the requirements according ISO 13216 – 4:2020. In addition, having dedicated anchorages reduce the risk of tethers routed in a way that can damage the car interior, seat chassis, cables under the seat etc.

Dedicated pre-installed anchorages will ensure ease-of-use, reduce risk of misuse and simplify the mounting of a rearward facing CRS. With the use of lower tethers and specified LTA and tether connectors (click-in function in analogy with ISOFIX connectors) the CRS can be easily attached.

The aim of this document is to focus on the primary attachment of the ECRS with the vehicle seat belt in combination with a support leg in combination with lower tether strap(s) for a vehicle specific belted enhanced child restraint system.

### 2. STRAPS

Straps are already included in UNECE R 129 | 03 series and as such it is not necessary to add additional requirements for lower tether straps. For reasons of standardisation, it is therefore better to bring down all the features to a common scale without distorting the differences in the range of the values.

In accordance with § 3.2.5. it is stated that a 10-metre length of each type of strap used in the Enhanced Child Restraint System must be handed in.

### 3. LOWER TETHER CONNECTOR

For reasons of standardisation the same approach for lower tether straps will be respected as it was done for top-tether straps. This includes the tension relieve device, no-slack indicator, and the use of the lower tether connector (hook type) which will be the same as the ISOFIX top-tether connector (hook type) used for top-tethers.

The lower tether straps should be permanently connected to the ECERS in the similar to what is agreed for the top-tether strap(s). This is based on the plug & play principle.

### 4. RETRACTORS

In case a retractor will be used in combination with lower tether straps, the function of the tension relieve device and no-slack indicator will be taken over by the retractor. Additional information label on the webbing of the lower tether strap(s) can be used to inform the user about the correct use of the lower tether straps.

In the current version of UNECE R 129 retractor testing is included. In the dynamic tests, the retractors (if used) will have to withstand the forces which are exposed to the retractors.

### 5. ANTI-ROTATION DEVICE

By making use of an anti-rotation device without lower tethers straps the tests without lower tether straps in use, should be carried out when there is no mechanism or audible and visual warning system. Since the lower tether straps are relevant to stop the rotation in a rear impact, the relevant plane DF can be passed with an additional 10%, in the same way as defined for forward facing tests with plane AB. For the passage of plane DE, a new plane HI parallel to plane DE is defined, to make the assessment well defined.

### 6. WARNINGS

In accordance with the marking of top-tether straps anchorages, lower tether strap anchorages will be marked as well to guide users to install the lower tethers in the correct way and to use the correct anchorages. A reference to the instruction's manual is included as well.

### 7. ANNEX 24

The attachments for lower tethers in vehicles are not always there and can for example be established with retrofit solutions. To remain the possibility to use CRS systems with lower tethers in different vehicles without fixed Lower Anchorage Points Annex 24 is written. When Lower Tether Anchorage Points as well as Retrofit Lower Tether Anchorage Points are well defined in R145 and R14, Annex 24 might become obsolete.