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Item 6 of the provisional agenda

Proposal of a New UN Regulation on the Installation of Safety-Belts, Restraint Systems, Child Restraint Systems, ISOFIX Child Restraint Systems and i-Size Child Restraint Systems

Proposal for the 01 Series of Amendments

Submitted by the expert from Japan *

The text reproduced below was prepared by the expert from Japan to revise the proposal adopted at the seventy-fourth session of GRSP as ECE/TRANS/WP.29/GRSP/2023/32, that was amended by annex IV of ECE/TRANS/WP.29/GRSP/74 (GRSP-74-24-Rev.5). This would be a new series of amendments to the UN Regulation on the Installation of Safety-Belts, Restraint Systems, Child Restraint Systems, ISOFIX Child Restraint Systems and i-Size Child Restraint Systems, that resulted from the split of UN Regulation No. 16 into three new UN Regulations. The modifications to the existing text of the proposal of new UN Regulation (ECE/TRANS/WP.29/2024/152) are marked in bold for new or strikethrough for deleted characters.

* 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.



I. Proposal

Insert new paragraphs 2.44. and 2.47., to read:

- "2.44. **"Effective belt anchorage (EA)"** means the point used to determine conventionally, as specified in paragraph 5.4. of Regulation No. 14, the angle of each part of the safety-belt in relation to the wearer, that is, the point to which a strap would need to be attached to provide the same lie as the intended lie of the belt when worn, and which may or may not be the actual belt anchorage depending on the configuration of the safety-belt hardware at its attachment to the belt anchorage.
- 2.45. **"Buckle point"** means the centre point of the connecting part between the buckle and the buckle strap.
- 2.46. **"Bd point"** means the position of the buckle point when the occupant (Hybrid III fiftieth percentile male dummy or Hybrid III fifth percentile female dummy, at the manufacturer's discretion) is restrained in the design seat belt route.
- 2.47. **"Strap length"** means the length along the centre line of the surface of buckle strap."

Insert new paragraphs 5.2.3. to 5.2.3.2., to read:

- "5.2.3. The requirement below relating to the strap between the buckle point and the effective belt anchorage is only applicable to the rear seating positions of M₁ category vehicles.
- 5.2.3.1. The difference between the actual strap length and the straight-line distance between the point EA and Bd point shall be 80 mm or less.
- The above requirements may be shown by the actual vehicle, parts, drawings, or 3D data at the manufacturer's discretion.
- The correlation between actual vehicle and/or parts and the drawing or 3D data shall be demonstrated by the manufacturer.
- 5.2.3.2. The requirement of paragraph 5.2.3.1. shall not apply if any of the following conditions are satisfied:
- (a) The safety-belt assembly is equipped with a pre-loading device.
- (b) The manufacturer demonstrates to the satisfaction of the Technical Service with experimental data, simulation, or desktop strength calculations that the buckle strap assembly has the same performance as the requirement in point (c) below.
- (c) When the buckle strap assembly is tested using the method described in Annex 7 of this Regulation, the buckle point movement shall be no greater than 80 mm at a tensile load of 1,000 N ± 50 N. "

Insert new paragraphs 11. to 11.2.4., to read:

"11. Transitional Provisions

11.1. General

- 11.1.1. Contracting Parties applying this Regulation may grant type approvals according to any of the preceding series of amendments to this Regulation.
- 11.1.2. Contracting Parties applying this Regulation shall continue to grant extensions of existing approvals to any of the preceding series of amendments to this Regulation.

11.2. Transitional provisions applicable to the 01 series of amendments

- 11.2.1. 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 or refuse to accept type approvals under this Regulation as amended by the 01 series of amendments.
- 11.2.2. As from 1 September 2026, Contracting Parties applying this Regulation shall not be obliged to accept type approvals to any of the preceding series of amendments, first issued after 1 September 2026.
- 11.2.3. Contracting Parties applying this Regulation shall continue to accept type approvals issued according to the original form of this Regulation, first issued before 1 September 2026.
- 11.2.4. Notwithstanding the transitional provisions above, Contracting Parties who start to apply this Regulation after the date of entry into force of the 01 series of amendments are not obliged to accept type approvals which were granted in accordance with any of the preceding series of amendments to this Regulation / are only obliged to accept type approval granted in accordance with the 01 series of amendments."

Annex 2, amend to read:

"Annex 2

Arrangements of Approval Marks

(see paragraphs 4.5. to 4.5.2. of this Regulation)



$a = 8 \text{ mm min.}$

The above approval mark affixed to a vehicle shows that the vehicle type concerned was approved in the Netherlands (E4) pursuant to UN Regulation No. XXX under approval No. **0100**1234. The first two digits (**0100**) of the approval number indicate that the approval was granted in accordance with the requirements of UN Regulation No. XXX **as amended by the 01 series of amendments in its original form.** "

Insert new Annex 7, to read:

"Annex 7

Tensile Test Method of the Buckle Strap Assembly

1. General
 - 1.1. The test procedure in this annex shall be used for the tensile test of the buckle strap assembly described in paragraph 5.2.3.2. of this Regulation.
2. Test procedure
 - 2.1. Fix the bracket of the buckle strap assembly that was attached to the vehicle anchorage to the lower part of the tensile testing machine.

- 2.2. **Fix the buckle at a position on the loading line of the tensile testing machine, such that the distance between the buckle point and EA point is the same as the straight-line distance between the EA and Bd point described in paragraph 5.2.3.1. of this Regulation.**
- 2.3. **Attach the tongue to the buckle and set the belt of the tongue to the upper part of the tensile testing machine. The tension on the belt of the tongue is 4 ± 3 N. After that, the buckle is released.**
- 2.4. **Perform a tensile test and measure the load and the movement of the buckle. "**

II. Justification

1. GRSP, at its seventy-fourth session, adopted ECE/TRANS/WP.29/GRSP/2023/32 as amended by annex IV of the report the session (ECE/TRANS/WP.29/GRSP/74). However, since the work on splitting the UN Regulation was on hold, the secretariat was requested to submit the proposal to the next appropriate WP.29 and AC.1 sessions.
2. GRSP, at its seventy-fifth session, adopted proposal for a new UN Regulation on the installation of safety-belts, restraint systems, child restraint systems, ISOFIX child restraint systems and i-Size child restraint systems (ECE/TRANS/WP.29/GRSP/2024/5 as amended by annex III to the report the session (ECE/TRANS/WP.29/GRSP/75). Further, GRSP agreed to resume consideration on ECE/TRANS/WP.29/GRSP/2023/32 and requested Japan to adapt the proposal as the new series of amendments to the newly adopted UN Regulation.
3. The proposals above are technically equivalent to those agreed at the seventy-fourth session while the paragraph numberings are adapted to those of new UN Regulation. Further the guideline of transitional provisions adopted at the 183rd session of WP.29 (ECE/TRANS/WP.29/76) is also applied to this proposals.
4. The strap's paths between the effective safety-belt anchorage and the buckle are normally straight like the test bench specified in UN Regulation No. 129 (figure 1). However, the strap's paths between the effective belt-anchorage and the buckle of some vehicles in the market are not straight and are curved along the cushion (figure 2).

Figure 1

Photo of the Buckle Strap Path of the UN Regulation No. 129 Test Bench

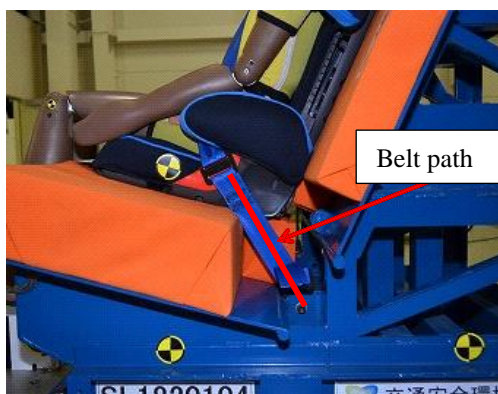
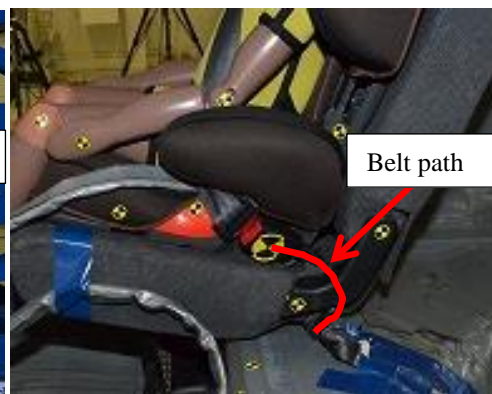


Figure 2

Photo of the Buckle Strap Path When Not Straight

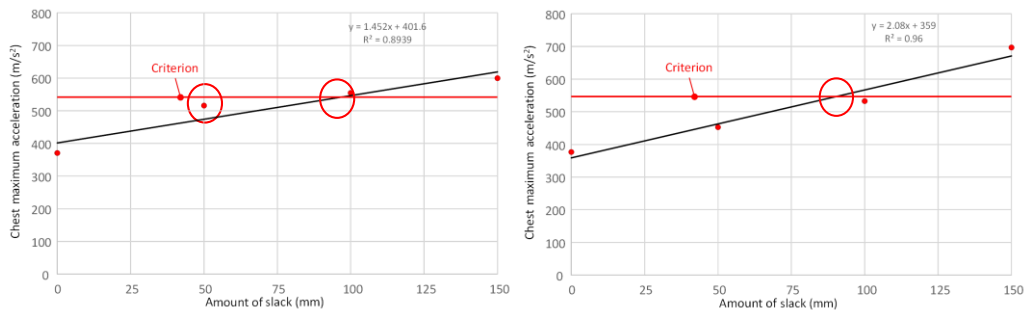


5. When the strap's paths between the effective belt anchorage and the buckle are not straight, the occupants can be thrown forward significantly in a frontal impact accident. If an occupant is seated in the booster seat attached by ISOFIX, there are cases where the seatbelt will slip up to the neck and submarining will occur (referred to in GRSP-69-24). This would increase the risk of injury to the neck and abdomen of a child occupant. In addition, the chest injury of the dummy increases. Figure 3 shows the relationship between the amount of slack in the buckle strap and the maximum 3 ms dummy chest acceleration for two types of Child Restraint Systems. When the buckle slack was 50 mm (see the left graph of figure 3), the maximum chest acceleration in one Child Restraint System approached the criteria of UN

Regulation No. 129. When the buckle slack was around 80 mm (see the right graph of figure 3), the maximum chest acceleration exceeded the noted criteria.

Figure 3

Relationship between the Amount of Slack of the Buckle Strap and Maximum 3ms Dummy Chest Acceleration



6. The increased slack in the buckle belt increased the passenger's excursion, which is detrimental to occupant safety (see GRSP-70-32).
7. Therefore, we recommend limiting the slack of the buckle belt.
8. These amendments mitigate the negative effects on the safety of the occupants.