United Nations ECE/TRANS/WP.29/GRSP/2019/15

Economic and Social Council

Distr.: General
25 September 2019

Original: English

Economic Commission for Europe

Inland Transport Committee

World Forum for Harmonization of Vehicle Regulations

Working Party on Passive Safety

Sixty-sixth session
Geneva, 10-13 December 2019
Item 8 of the provisional agenda
UN Regulation No. 16 (Safety-belts)

Proposal for Supplement 6 to the 07 series of amendments and for Supplement 1 to 08 series of amendments to UN Regulation No. 16 (Safety-belts)

Submitted by the expert from the International Organization of Motor Vehicle Manufacturers*

The text reproduced below was prepared by the expert from the International Organization of Motor Vehicle Manufacturers (OICA). The proposal aims to introduce an optional (on the choice of the manufacturer) test procedure for frontal airbags in combination with rearward facing child restraint systems in the rear seat to demonstrate that no deactivation of the airbag is needed. The aim of the proposal is to promote new airbag technologies. It is based on GRSP-65-08 distributed at the sixty-fifth session of the Working Party on Passive Safety. (GRSP). The modifications to the current text of the Regulation are marked in bold for new characters.

* In accordance with the programme of work of the Inland Transport Committee for 2014–2018 (ECE/TRANS/240, para. 105 and ECE/TRANS/2014/26, programme activity 02.4), 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.

Contents of the Regulation, amend to read:

"Contents

Text of the Regulation, amend to read:

Paragraphs 8.1.9. to 8.1.10., amend to read:

"8.1.9. In the case of a frontal protection airbag in the front passenger seat, the warning shall be durably affixed to each face of the passenger front sun visor in such a position that at least one warning on the sun visor is visible at all times, irrespective of the position of the sun visor. Alternatively, one warning shall be located on the visible face of the stowed sun visor and a second warning shall be located on the roof behind the visor, so, at least one warning is visible all times. It shall not be possible to easily remove the warning label from the visor and the roof without any obvious and clearly visible damage remaining to the visor or the roof in the interior of the vehicle.

If the vehicle does not have a sun visor or roof, the warning label shall be positioned in a location where it is clearly visible at all times.

In the case of a frontal protection airbag for other seats than the front seats in the vehicle, the warning shall be directly ahead of the relevant seat, and clearly visible at all times to someone installing a rear-facing child restraint on that seat. The requirements of this paragraph and paragraph 8.1.8. do not apply to those seating positions equipped with a device which automatically deactivates the frontal protection airbag assembly when any rearward facing child restraint is installed **or a frontal protection airbag fulfilling the requirements of 8.5.**

8.1.10. Detailed information, making reference to the warning, shall be contained in the owner's manual of the vehicle; as a minimum, the following text in all official languages of the country or countries where the vehicle could reasonably be

expected to be registered (e.g. within the territory of the European Union, in Japan, in Russian Federation or in New Zealand, etc.), shall at least include: NEVER use a rearward facing child restraint on a seat protected by an ACTIVE AIRBAG in front of it, DEATH or SERIOUS INJURY to the CHILD can occur"

The text shall be accompanied by an illustration of the warning label as found in the vehicle. The information shall be easily found in the owner's manual (e.g. specific reference to the information printed on the first page, identifying page tab or separate booklet, etc.).

The requirements of this paragraph do not apply to vehicles of which all passenger seating positions are equipped with a device which automatically deactivates the frontal protection airbag assembly when any rearward facing child restraint is installed **or a frontal protection airbag fulfilling the requirements of 8.5.**"

Insert new paragraphs 8.5. to 8.5.4.6., to read:

"**8.5.** **Alternative dynamic test procedure at the choice of the manufacturer for vehicle occupant seating positions in rear seating rows equipped with active frontal protection airbags combined with rearward facing child restraint systems (see also UN Regulation No. 129).**

8.5.1. **General: The dynamic test shall be performed on rearward facing Enhanced Child Restraint Systems which have not previously been under load. The rearward facing Enhanced Child Restraint System shall be subjected to frontal dynamic tests, in conformity with paragraph 8.5.4. below:**

8.5.2. **During the dynamic tests, no part of the Enhanced Child Restraint System affecting the restraint of the occupant shall fully or partially fracture, and no buckle, locking system or displacement system shall release or unlock.**

8.5.3. **Assessment criteria for frontal impact.**

8.5.3.1. **Dummy injury assessment criteria for frontal impact as in Table 4.**

-equal safety performance with and without activated frontal airbag should be shown to the technical service.

8.5.3.2 **Airbag deployment behaviour criteria**

-The deploying Airbag cushion surface shall not be in contact with the child's face.

-The airbag shall not cause an unexpected movement of the child's seat.

Table 4

Criterion	*Abbreviation*	*Unit*	*Q0*	*Q1*	*Q1.5*	*Q3*	*Q6*	
Head performance criterion	HPC* (15)		600	600	600	800	800	
Head acceleration 3 ms	A head Cum3 ms ***	g	75	75	75	80	80	
Upper neck tension Force	Fz	N	For monitoring purpose only**					
Upper neck flexion moment	My	Nm						
Chest acceleration 3 ms	A chest Cum 3 ms ***	g	55	55	55	55	55	
Chest deflection	TBC	mm	NA	For monitoring purpose only**				
Abdominal pressure	P	Bar	NA	NA	1.2	1.0	1.0	

*** HPC: see Annex 17 of Regulation 129.**

**** To be reviewed within 3 years following entry into force of the series 01 of Regulation 129.**

***** Cum 3ms means cumulative 3ms value.**

8.5.4. Detailed test description for frontal impact:

8.5.4.1. Frontal impact test shall be performed on rearward enhanced child restraint systems type approved according to UN Regulation No. 129 installed in the vehicle specific environment.

8.5.4.2. The ECRS shall be tested in its identified most critical position.

8.5.4.3. The tests shall be performed with the ECRS adjusted to the size of the dummy(ies) selected to cover the entire size range, in the child seating position representing the worst case for this dummy and impact orientation;

8.5.4.4. Test on trolley and vehicle body shell for frontal impact tests

8.5.4.4.1. The vehicle seats and ECRS shall be fitted and placed in a position chosen by the Technical Service conducting the approval tests to give the most adverse conditions in respect of strength, compatible with installation of the dummy in the vehicle. The position of the vehicle seat-back and ECRS shall be stated in the report.

8.5.4.4.2. Unless the instructions for fitting and use require otherwise, in the rearmost normally used position for child restraints intended for use in the rear seating position.

8.5.4.4.3 The following measurements shall be made:

8.5.4.4.3.1. The trolley speed immediately before impact (only for deceleration sleds, needed for stopping distance calculation);

8.5.4.4.3.2. The stopping distance (only for deceleration sleds), which may be calculated by double integration of the recorded sled deceleration;

8.5.4.4.3.3. The parameters required to perform the injury assessment against the criteria as mentioned in paragraph 8.5.3.1. above for at least the first 300 ms;

8.5.4.4.3.4. The trolley and vehicle body shell acceleration or deceleration for at least the first 300 ms.

8.5.4.4.4. After impact, the child restraint shall be inspected visually, without opening the buckle, to determine whether there has been any failure.

8.5.4.5. The conditions, taken from UN Regulation No. 129 for dynamic test are summarized as follows form rearward facing restraint, frontal impact:

(a) Speed: 50 + 0, -2 km/h

(b) Stopping distance during test: 650 +/- 50 mm

(c) Description of test pulse in annex X, appendix X

Alternatively, at the choice of the manufacturer the pulse from UN Regulation No. 94 can be used.

8.5.4.6. Dynamic test dummies

Size range indication (in cm)	≤ 60	60 < x ≤ 75	75 < x ≤ 87	87 < x ≤ 105	105 < x ≤ 125	
Dummy	Q0	Q1	Q1.5	Q3[2]	Q6	

"

Insert new Annex 19, to read:

"Annex 19

Description of curve of trolley's deceleration or acceleration and test devices (CRS)

Annex 19 - Appendix 1

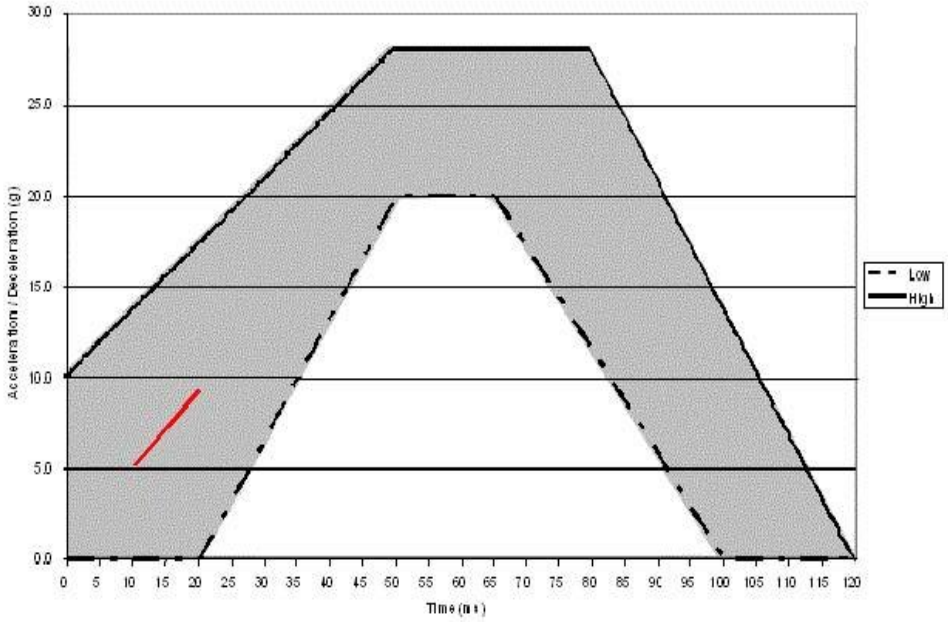
Frontal impact, curve of trolley's deceleration or acceleration, as function of time

In all cases the calibration and measuring procedures shall correspond to those defined in the International Standard ISO 6487; the measuring equipment shall correspond to the specification of a data channel with a channel frequency class (CFC) 60.

Curve of trolley's deceleration or acceleration, as function of time

Frontal impact – Test pulse 1

Definition of the different curves		
Time (ms)	***Acceleration (g)*** ***Low corridor***	***Acceleration (g)*** ***High corridor***
0	**-**	**10**
20	**0**	**-**
50	**20**	**28**
65	**20**	**-**
+80	**-**	**28**
100	**0**	**-**
120	**0**	**-**



The additional segment applies only for the acceleration sled."

II. Justification

1. The accident statistics in recent years show the benefits of protecting forward-facing occupants in case of a frontal crash, if the restraint system combines a safety belt and an airbag.

2. The safety belt and airbag system for the driver and the passenger in the first seats has been continuously optimised, however not in the rear.

3. It would be beneficial to use such systems also in the rear as it would allow for:

(a) Better protection of the head and neck, primarily for bigger occupants (50 per cent and 95 per cent);

(b) Lower level of belt force;

(c) Better protection of occupants against stiffer seat structures (e.g. rear-seat entertainment).

4. The implementation of an airbag in the rear is very complex due to the integration of the component, the geometrical situation and the many variances of possible seating positions. Therefore, it is recommended to develop for this situation an airbag technology of minimum risk during deployment of the airbag cushion, fulfilling the same or better performance and requirements specially for rearward-facing child restraints, as shown in paragraph 8.5. of this document. In this case, both an airbag deactivation and an airbag warning label would no longer be needed.